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ABSTRACTS

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01-001

Minimal Impact of Casopitant, a Novel Nk-1 Receptor Antagonist, on the Pharmacokinetics of Dolasetron And Granisetron

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Objectives: Casopitant, in development for the prevention of post-operative and chemotherapy-induced nausea and vomiting, is a weak to moderate inhibitor of CYP3A4. Dolasetron (present as hydrodolasetron in the plasma in vivo) and granisetron are metabolized by CYP2D6, CYP3A4, and CYP1A1, and are likely to be co-administered with casopitant. The aim of this study was to assess the impact of casopitant on the pharmacokinetics of hydrodolasetron and granisetron after repeat-dose oral administration.

Methods: Two cohorts of healthy subjects received either oral dolasetron (100 mg once-daily for 3 days, n=18) or oral granisetron (2 mg once-daily for 3 days, n=19) alone (Period 1) and combined with oral casopitant (150 mg Day 1, 50 mg Days 2 and 3; Period 2). Each Period was separated by 5-14 days. Genotypical CYP2D6 extensive metabolizers (EMs; n=9) and poor metabolizers (PMs; n=9) were enrolled in the dolasetron arm of the study. Pharmacokinetics of hydrodolasetron and granisetron were assessed on Days 1 and 3 of each Period.

Results: The results of Analysis of Variance (ANOVA) show that the largest change in hydrodolasetron exposure was a 24% increase in AUC on Day 1 and 30% increase in Cmax on Days 1 and 3 in CYP2D6 EMs. The exposure of hydrodolasetron was ~2-fold higher in CYP2D6 PMs compared to EMs. The results of ANOVA suggest casopitant has no significant impact on granisetron exposure. Co-administration of casopitant and dolasetron or granisetron was well tolerated. Forty-five adverse events were reported in 22 subjects; all were mild or moderate in intensity. The most common adverse events were headache (31%), somnolence (25%), constipation (17%) and dizziness (11%). All adverse events resolved. There were no serious adverse events.

Conclusions: The minimal changes in hydrodolasetron and granisetron exposure observed with a 3-day oral regimen of casopitant (the highest clinical dose) are not considered clinically relevant.

01-002

Single Oral Dose And 3-Day IV/Oral Regimens of a Novel Neurokinin-1 (Nk-1) Receptor Antagonist, Casopitant, Are Effective In Reducing the Severity of Nausea In Patients Receiving Highly Emetogenic Chemotherapy (HEC)

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Objectives: The visual analog scale (VAS) is commonly used to measure the severity of nausea, a common side effect of HEC. Yet, patients with cancer often find it difficult to complete the VAS. Therefore, an additional 4-point nausea categorical scale was used to assess the severity of nausea in this phase III trial.

Methods: A phase III, multicenter, randomized, double-blind, active-controlled, parallel group study evaluated the superiority of casopitant to standard care (SC) for prevention of CINV in patients receiving HEC (cisplatin $\geq$70 mg/m^2). Complete Response (CR; no vomiting/retching or rescue medications) in the first 120 hrs of receiving HEC was the primary endpoint. All patients received dexamethasone/ondansetron IV on Day 1 (D1), followed by dexamethasone on D2-4. Additionally, patients received either casopitant 150 mg PO on D1, casopitant 90 mg IV on D1 plus casopitant 50 mg PO on D2-3 or placebo. Treatment comparisons for the results of the nausea categorical scale were made on the modified ITT population, using the non-zero correlation test.

Results: Compared to SC, patients receiving single oral dose and 3-day IV/oral casopitant regimens showed a significant reduction in severity of nausea. The categorical scale results also correlated well with the VAS results for nausea and significant nausea (P=0.0001).

Conclusions: The addition of casopitant to SC significantly reduced the severity of nausea in patients receiving cisplatin-based HEC which is consistent with results observed using the VAS. The nausea categorical scale appears to be an effective instrument is assessing the severity of nausea in patients receiving chemotherapy.

Nausea severity category	Active Control (n =265) %	Casopitant 150 mg PO D1[#] (n=266) %	Casopitant 90 mg IV D1/50 mg PO D2-3* (n=269) %
None	47	61	57
Mild	24	20	19
Moderate	15	11	16
Severe	14	9	8

[#]Non-zero correlation P=0.0197, *Non-zero correlation P= 0.001.

01-004

Palonosetron Plus Prednisolone In Patients Receiving Fractionated Radiotherapy Plus Weekly Cisplatin

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Objectives: Guidelines do not include evidence-based recommendations for prophylaxis of nausea and vomiting in patients receiving combined chemo-radiotherapy. This study aimed to investigate the efficacy and tolerability of the 5-HT_3-receptor antagonist, palonosetron, plus prednisolone in women receiving fractionated radiotherapy plus weekly cisplatin.

Methods: Women with cervical cancer stage IB-IIIA received 27-30 fractions of radiotherapy, 5 fractions/week (day 1-5) plus concomitant weekly cisplatin (day 2, 40 mg/m^2). Palonosetron was given as a single i.v. dose of 0.25 mg 30 min before start of cisplatin infusion and prednisolone was given as oral doses of 100 mg×1 day 2 (the day of cisplatin), 50 mg×2, 25 mg×2 and 25 mg×1, days 3, 4 and 5 respectively. Patients completed a daily diary card scoring number of vomits, dry retches, degree of nausea (none, mild, moderate, severe), and rescue medication. Complete response (CR) was defined as no vomits or dry retches and no rescue medication.

Results: At present, 18 patients have completed the study. In the first course, the CR rate was 94% day 1-3 (after cisplatin) and 89% day 1-5. None of the patients needed rescue medication. No nausea was seen in 56% (days 1-3) and 50% (days 1-5), and among patients who suffered from nausea this was scored as mild in 89%, and moderate in 11% (days 1-5). Patients completed 74 out of 85 courses of weekly cisplatin plus radiotherapy with the scheduled antiemetic therapy. The sustained no vomiting rate (no vomits or dry retches during the entire course of therapy) was 69%.

Conclusions: Palonosetron plus prednisolone was very effective in prophylaxis of emesis, but less effective in prevention of nausea. The majority of patients, who suffered from nausea, did, however, score this as mild. A randomized, double-blind study will soon be initiated.

01-005

Can Nausea Be Used Reliably As a Primary Endpoint For Future Antiemesis Trials: A Methodology Study Based On Analysis of All Large Phase Iii Trials with Nk_1 Antagonists In 5197 Patients

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Objectives: Marked progress has been made in the control of chemotherapy-related emesis. Trials with NK_1 antagonists have demonstrated that emesis control exceeds nausea control. Hazard ratios in NK_1 trials for vomiting and nausea control respectively of 2.38 and 1.31 indicate the magnitude of difference (Gralla, Proc ASCO 2008). Future trials may need to focus on nausea as a primary trial endpoint. If so, can nausea as scored by visual analog scales (VAS) reliably measure this toxicity?

Methods: We analyzed all Phase III, large (>200 patients per arm) double-blind randomized clinical trials (RCTs) testing the role of NK_1 antagonists (aprepitant or casopitant) with dexamethasone plus a $5HT_3$ antagonist in highly (cisplatin) or moderately emetic (cyclophosphamide, anthracyclines) settings. Nausea was evaluated by VAS as the percentage with no nausea (VAS <5 mm) or no significant nausea (VAS <25 mm). PubMed search identified 4 RCTs (2398 patients) with cisplatin and 2 RCTs in the moderately emetic group (2799 patients). The differences between ranges of control of emesis and of nausea were compared to determine if reproducibility was similar for these endpoints.

Results: The trials were fairly similar in design and reporting. For nausea results, some trials did not report both VAS <5 mm and VAS <25 mm in acute and delayed settings. Nonetheless, when results were analyzed by the same parameters, ranges for nausea scores were consistently narrower than ranges for emesis. This indicates comparable reliability with emesis, as seen in the table below.

Highly Emetic Chemotherapy Control Rates: N=2398 patients; RCTs=4 (NK_1 antagonist arms)

	Acute Emesis	Delayed Emesis	Overall 5-day Emesis	Acute Nausea (no significant)	Delayed Nausea (none)	Delayed Nausea (no significant)	Overall 5-day Nausea (none)	Overall 5-day Nausea (no significant)
Range	84–95%	72–86%	66–89%	91–92%	51–53%	73–76%	48–57%	71–78%

Moderately Emetic Chemotherapy Control Rates: N=2799 patients; RCTs=2 (NK

	Acute Emesis	Delayed Emesis	Overall 5-day Emesis	Acute Nausea (none or no significant)	Overall 5-day Nausea (none)	Overall 5-day Nausea (no significant)
Range	86–89%	73–81%	76–81%	Not Reported	33–38%	59–61%

No significant nausea = VAS <25 mm; none = VAS <5 mm

Conclusions: Based on this analysis, patient-reported nausea using VAS is at least as reliable as emesis and should be a suitable primary endpoint. In future trials, it would be helpful for nausea VAS scores to be reported in acute and delayed settings, for the entire period, for "no" nausea and "no significant" nausea, as well as reporting the mean and median results.

01-006

Pharmacokinetics And Bioavailability of Transdermal Granisetron After a 6-Day Application of Three Patch Sizes, Compared To 2 Mg Once-Daily Oral Dose of Granisetron For 5 Days

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Objectives: The granisetron Trans Dermal System (gTDS, Sancuso®) is a novel self-adhesive patch, of drug in polymer matrix with a transparent backing. It was developed to deliver therapeutic levels of granisetron over periods of up to a week for the management of CINV.

Methods: 12 healthy male subjects received oral granisetron (2 mg) for 5 days and 3 dosages of gTDS in patch sizes of 15, 33 and 52 cm^2; in a randomised crossover design. The gTDS was applied for 6 days to the upper outer arm.

Results: Following oral dosing granisetron was quantifiable in subjects at 1 hour, and maximal mean concentration reached at 2 hours at 4.7 ng/mL. Over 6 days granisetron was slowly absorbed from gTDS with maximal concentrations reached 48 h post-application with mean C_{max} of 1.15, 2.08 and 3.85 ng/mL for 15, 33 and 52 cm^2 patches. Concentrations then decreased slowly until patch removal, 144 hours, with mean values of 1.6, 1.1, 0.5 ng/mL respectively. After multiple oral dosing; the overall exposure after 5 days was 302 ng/mL.h, and C_{avg} 2.6 ng/mL. This corresponded to an $AUC_{(0-\infty)}$ for the 52 cm^2 patch of 420 ng/mL.h and C_{avg} 2.2 ng/mL. The between-subject variability of the granisetron PK after oral dosing was high, but similar magnitude to gTDS. A total of 27 adverse events were reported, most commonly headache, dizziness and constipation. 2 of these related to skin events.

Conclusions: This study confirmed dose proportionality of the three gTDS sizes and a 52 cm^2 gTDS achieves a similar exposure (as determined by C_{avg}) to that of a 2 mg oral dose. The safety of the product was acceptable, with minimal skin irritation. The novel granisetron patch may have utility in treating CINV where prolonged delivery of drug is an advantage.This study was sponsored by ProStrakan Ltd.

01-007

How Familiar Are Oncologists with Therapeutic Care and Supportive Care Guidelines?

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Objectives: To investigate how likely oncologists are to apply therapeutic and supportive care guidelines in daily practice.

Background: Guidelines have been established for the treatment of specific cancers by various organizations including the National Comprehensive Cancer Network

(NCCN), American Society of Clinical Oncology (ASCO), European Organisation for Research and Treatment of Cancer (EORTC), and the European Society for Medical Oncology (ESMO). Supportive care guidelines have also been established for treating chemotherapy-induced nausea and vomiting (CINV) by the Multinational Association of Supportive Care in Cancer (MASCC), NCCN, ASCO and ESMO.

Methods: 557 oncologists from five countries: France (N=101), Germany (N=100), Italy (N=101), the United Kingdom (N=102), and the United States (N=153) completed an online survey. Oncologists were asked how familiar they were with therapeutic and supportive care guidelines and how often they applied each set of guidelines in their daily practice.

Results:

Guidelines	United States (N=153)		Europe (N=404)	
	Somewhat or Very Familiar with Guidelines	Frequently or Always Applied in Practice	Somewhat or Very Familiar with Guidelines	Frequently or Always Applied in Practice
Therapeutic Care				
ASCO	94.8%	60.8%	92.8%	56.7%
NCCN	98.0%	76.5%	50.7%	24.0%
ESMO	19.6%	2.0%	69.6%	31.4%
EORTC	36.0%	3.3%	81.7%	43.8%
Supportive Care				
MASCC	22.2%	7.2%	27.7%	11.9%
ASCO	88.9%	56.9%	81.4%	47.3%
NCCN	94.8%	68.6%	43.3%	18.8%
ESMO	15.0%	3.9%	55.9%	25.7%
EORTC	20.3%	5.9%	69.8%	34.9%

Conclusions: Oncologists are more familiar with therapeutic care guidelines than with supportive care guidelines from the same organization. However the likelihood of following a therapeutic or supportive care guideline with which the physician is familiar is similar. While ASCO guidelines are widely recognized, US oncologists tend to be more familiar with NCCN guidelines while European oncologists are more familiar with ESMO or EORTC guidelines.

01-008

Phase III Results of a Single Oral and a 3-Day IV/Oral Dosing Regimen For the Novel Neurokinin-1 (Nk-1) Receptor Antagonist, Casopitant, In the Prevention of Chemotherapy-Induced Nausea and Vomiting (CINV) In Patients Receiving Highly Emetogenic Chemotherapy (HEC)

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Objectives: Casopitant, a novel NK-1 receptor antagonist, demonstrated efficacy in preventing CINV in patients receiving after HEC in a phase II dose-ranging trial. Here, we report a phase III trial evaluating single oral dose and 3-day IV/oral dosing casopitant regimens with ondansetron/dexamethasone (OND/DEX) for the prevention of CINV in patients receiving HEC.

Methods: This multinational, double-blind, active-controlled trial enrolled 810 patients (99% received cisplatin-based HEC regimens up to 6 cycles). Patients were randomized to an active control regimen (OND 32 mg IV and DEX 20 mg PO on D1; DEX 8 mg PO BID D2-4) (CTRLH), a single oral dose casopitant regimen (OND 32 mg IV, DEX 12 mg PO and casopitant 150 mg PO D1; DEX 8 mg PO BID D2-4) (CAS1H) or a 3-day IV/oral casopitant regimen (OND 32 mg IV, DEX 12 mg PO, and casopitant 90 mg IV D1; DEX 8 mg PO QD D2-4 and casopitant 50 mg PO D2-3) (CAS IV/PO/H) for up to 6 cycles. DEX doses were adjusted for casopitant interaction. Complete response (CR; no vomiting/no retching, no rescue medications) in the first 120 hrs of HEC was the primary endpoint.

Results: CAS1H and CAS/IV/PO/H regimens had statistically significant improvements in CR rates compared with CTRL (86% and 80% vs 66% [$P<0.0001$, $P=0.0004$], respectively), which were maintained in cycles 2-6. Secondary endpoints of acute and delayed CR, no vomiting, no significant nausea (VAS≤25 mm), and no nausea (VAS≤5 mm) were also improved. Casopitant was generally well tolerated with a similar adverse event frequency across arms. Neutropenia, leukopenia and anemia were the most common adverse events, with neutropenia and injection site reactions slightly more common in the CAS/IV/PO/H arm.

Conclusions: The CAS1H and CAS/IV/PO/H regimens demonstrated statistically significant improvements in CR and were well tolerated. A single dose of casopitant with OND/DEX appears to provide antiemetic protection against acute and delayed CINV after HEC.

01-009

Casopitant, a Novel Neurokinin-1 (Nk-1) Receptor Antagonist, Improves the Quality of Life of Patients Receiving Highly Emetogenic Chemotherapy (Hec)

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Objectives: The Functional Living Index - Emesis (FLIE) questionnaire is an 18-item, validated patient-reported outcome (PRO) measure of the impact of nausea and vomiting on daily life of patients receiving HEC.

Methods: A phase III, multicenter, randomized, double-blind, active-controlled, parallel group study was conducted to confirm the superiority of casopitant, administered in combination with standard care (SC: dexamethasone + ondansetron), to SC for prevention of CINV in patients receiving HEC (cisplatin ≥70 mg/m^2). The primary endpoint was the proportion of patients achieving Complete Response (CR), defined as no vomiting/retching and no rescue medications over the first 120 hours following the initiation of their first HEC cycle. All patients received dexamethasone plus ondansetron on Day 1 (D1), followed by dexamethasone BID on D2-4. In addition, patients received either casopitant 150 mg PO on D1 (n=266), casopitant 90 mg IV on D1/50 mg PO on D2-3 (n=269) or placebo (n=265). Patients completed FLIE in a patient diary on D1 and on D6. The PRO endpoint was 'no impact on daily life' (NIDL) defined as a Total FLIE score >108 (range 18–126). Treatment comparisons were made on the modified intent-to-treat (mITT) population, using the chi-square test.

Results: 79% of patients in both casopitant regimens met the NIDL criteria compared to 65% in SC (P=0.0005 for single dose, P=0.0003 for 3-day regimen). In addition, NIDL based on individual domains of nausea and vomiting also favored casopitant. The NIDL based on the Total FLIE score was also shown to be strongly associated with the clinical endpoint CR (P<0.0001) for both casopitant regimens.

Conclusions: Casopitant, when added to SC, significantly reduced the impact of both nausea and vomiting on daily life activities in patients receiving cisplatin-based HEC.

01-010

Phase III Results of a Single Oral, 3-Day Oral, And 3-Day IV/Oral Regimen of Casopitant, a Novel Neurokinin-1 (Nk-1) Receptor Antagonist, For Chemotherapy-Induced Nausea And Vomiting (CINV) In Patients Receiving Moderately Emetogenic Chemotherapy (MEC)

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Objectives: Casopitant, a novel NK-1 receptor antagonist, demonstrated efficacy in preventing CINV in patients receiving MEC in a phase II dose-ranging trial. Here we report the results of a phase III trial evaluating oral and IV/oral dosing regimens of casopitant in combination with ondansetron/dexamethasone (OND/DEX) for the prevention of CINV due to an anthracycline and cyclophosphamide (AC)-based MEC regimen.

Methods: This multinational, double-blind, active-controlled trial enrolled 1933 patients with breast cancer (96%). All patients received DEX 8 mg IV on D1 and OND 8 mg BID PO D1-3. Patients were randomized to receive either no additional therapy (CTRL), a single oral dose (150 mg PO D1) of casopitant (CAS1), a 3-day oral (150 mg PO D1 + 50 mg PO D2-3) casopitant regimen (CAS3), or a 3-day IV/oral (90 mg IV D1 + 50 mg PO D2-3) casopitant regimen (CAS IV/PO) for up to 4 cycles. The primary endpoint was complete response (CR; no vomiting/no retching, no rescue medications) in the first 120 hours after MEC.

Results: CAS1, CAS3, and CAS IV/PO plus OND/DEX produced statistically significant improvements in overall CR rates compared with CTRL (73%, 73%, 74% vs 59% [P<0.0001 for all comparisons]), and this clinical benefit appeared to be maintained in cycles 2-4. Improvement in the secondary endpoint of no vomiting was also observed. Casopitant was generally well tolerated with AE frequency similar across arms. Common AEs were neutropenia, alopecia, fatigue, leukopenia, and constipation; injection site reactions were infrequent but slightly more common in the IV/oral arm.

Conclusions: Addition of a CAS1, CAS3, or CAS IV/PO regimen to OND/DEX achieved statistically significant improvements in CR over 5 days compared to CTRL. All

casopitant regimens provided improvement in the reduction of emetic events in patients receiving initial and repeat cycles of MEC and were generally well tolerated.

01-011

Delayed Nausea And Vomiting Following Oxaliplatin-Based Chemotherapy: An Unrecognized Problem

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Objectives: Oxaliplatin (OX) is a widely used platinum agent. Early phase I and II studies suggested that oxaliplatin has significant potential to cause nausea (N) and vomiting (V) but its full emetogenic profile has not been reported. Other platinum compounds such as cisplatin and carboplatin have the ability to cause delayed (>24 hours post chemotherapy) NV. This study sought to prospectively evaluate the frequency of delayed N/V with OX-based chemotherapy following day 1 prophylaxis with a 5-HT3 antagonist (5-HT3A) and dexamethasone (DEX).

Methods: Eligibility: Pts > age 18 with colon cancer receiving OX (85–100 mg/m2) as part of a FOLFOX (folinic acid, 5-fluorouracil, oxaliplatin) regimen for the first time. Performance status: 0–2. Antiemetic treatment: 5-HT3A (ondansetron, dolasetron, or granisetron) at an approved dose and DEX 20 mg PO/IV on day 1 prior to OX. No routine prophylaxis for delayed N/V was given. Episodes of V, N, and use of rescue antiemetics were recorded in patient diaries. Four point (none, mild, moderate, severe) categorical scales were used to assess N. Study period: 120 hours after OX. Definitions: complete response (CR) - no V and no use of rescue antiemetics (RA); complete control (CC) - no V, no N and no RA.

Results: Pts: 37; evaluable 36; median age: 70 (34–85); M/F 47%/53%. History of moderate - heavy ethanol use: 9 pts (25%). Acute CR: 92% (33/36); Delayed CR: 50% (18/36); Delayed CC: 39% (14/36); Overall CR (0–120 hrs): 50% (18/36); Overall CC: 36% (13/36).

Conclusions: The use of a 5-HT3A and DEX prior to OX results in excellent control (CR - 92%) of acute (≤24 hours) emesis. Without additional antiemetics, the complete response rate in the delayed period (hours 24–120) decreased to 50%. These results suggest a need for routine antiemetic prophylaxis for delayed N and V following OX-based chemotherapy. Supported in part by Sanofi-Aventis.

01-012

Effect of Casopitant, a Novel Nk-1 Receptor Antagonist, On the Pharmacokinetics of Co-Administered Ondansetron And Dexamethasone

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Objectives: Casopitant (substrate and weak-to-moderate inhibitor of CYP3A) is in development for the prevention of chemotherapy-induced nausea and vomiting (CINV). The current study evaluated the pharmacokinetic interactions between casopitant, dexamethasone (substrate and inducer of CYP3A), and ondansetron (mixed CYP substrate) in healthy adult subjects.

Methods: In a two-part, three-period, single-sequence study, subjects in Part A received: Regimen A, oral casopitant (150 mg once-daily Day 1, 50 mg once-daily Days 2–3); Regimen B, oral dexamethasone (20 mg once-daily Day 1 and 8 mg twice-daily Days 2–3) and IV ondansetron (32 mg single-dose Day 1); Regimen C, casopitant as in Regimen A, ondansetron as in Regimen B, and a reduced dose of oral dexamethasone (12 mg once-daily Day 1, 8 mg once-daily Days 2–3). Subjects in Part B received: Regimen D, same as Regimen A; Regimen E, IV dexamethasone (8 mg single-dose Day 1) and oral ondansetron (8 mg twice-daily Days 1-3); Regimen F: casopitant as in Regimen D, and dexamethasone and ondansetron as in Regimen E.

Results: Part A) Casopitant AUC in Regimen C was increased 28% on Day 1 but decreased 34% on Day 3 compared to casopitant alone in Regimen A. When given with casopitant and ondansetron in Regimen C, dexamethasone AUC was 17% lower on Day 1, but similar on Day 3, compared to Regimen B. Ondansetron exposure was equivalent in Regimens B and C. Part B) Casopitant AUC in Regimen F was similar to Regimen D on Days 1 and 3. Dexamethasone AUC increased 21% when given with oral casopitant and oral ondansetron (Regimen F compared to Regimen E). Ondansetron exposure was equivalent in Regimens E and F.

Conclusions: When repeat-dose oral dexamethasone is to be co-administered with casopitant, a reduction in dexamethasone dose (as employed in Phase III CINV studies) may be considered. Ondansetron exposure is not affected by casopitant.

01-013

Assessing Nausea And Vomiting In Patients Taking Oral Cancer Therapy At Home

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Objectives: Chemotherapy has traditionally been hospital/clinic based, intravenous, and often single day treatment. The wider availability of oral chemo- and targeted therapy has led to patient self-administration over 5 or 14 days or continuously in the case of newer agents. Tools for assessing patients' nausea or vomiting (CINV), such as the MASCC Antiemesis Tool are targeted towards the conventional pattern of acute and delayed emesis and may not translate for daily oral chemotherapy. A 14 day diary was developed to assess CINV.

Methods: Patients prescribed oral chemotherapy were educated on the use of the diary. Each treatment day they were asked to record any episodes of vomiting including time and any perceived triggering factors, nausea on a 4 point scale of 0 (none) to 3 (severe), and any antiemetics taken. At the completion of chemotherapy they were asked if they had missed any doses. An investigator contacted the first 11 patients at home at pre-arranged times to assess progress.

Results: Forty patients were recruited into the study, 22 (55%) female, mean age 58 years (range 34 to 87). Twenty one took capecitabine, eight temozolamide with others on cyclophosphamide, erlotinib, sunitinib and procarbazine. Diagnoses were colorectal (18), brain (8), breast (7) and ovarian (1) cancer, and lymphoma (3). Two patients were withdrawn before starting and 4 diaries were not returned, leaving 34 assessable patients. The majority of patients filled in the diary, although several adapted it or did not answer all questions, particulalrly those who experienced no nausea or vomiting. Comparing telephone interview notes from 11 patients during the recording period it was found that 3 patients completed diaries restrospectively. CINV incidence with the different oral regimens will be presented.

Conclusions: A diary was effective for assessing CINV during one cycle of oral chemotherapy. Further refinement or other methods could improve adherence.

01-014

Implementation of Evidence-Based Antiemetic Guidelines In the Haematology Setting

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Objectives: Recommendations of antiemetic guidelines published by various oncology groups are largely based on the emetogenic potential of individual chemotherapeutic drugs. Application of such drug-based guidelines in our institution becomes a challenge as majority of chemotherapy regimens used in the haematology setting are multi-day and multi-drug. Inappropriate prescribing thus results, with intravenous granisetron 3 mg used for all regimens regardless of emetogenic potential. Our objective is to design a simplified set of regimen-based antiemetic guidelines and determine if it can be implemented to guide antiemetic prescribing without compromising quality of patient care.

Methods: After a systematic review of the current literature, we stratified our commonly used haematology chemotherapy regimens into four levels of emetogenic potential based on drug combination, drug dose and treatment duration. A set of regimen-based antiemetic guidelines was then drafted and disseminated. Patients were monitored for emesis control via a self-administered survey form for 12 weeks each prior to (Phase I) and after (Phase II) implementation of guidelines.

Results: Sixty and 32 survey responses were collected in Phases I and II respectively. During the acute phase, 66.7% and 78.1% of patients achieved complete emesis control, with corresponding mean nausea severity scores of 1.06 and 1.32, in Phases I and II respectively. During the delayed phase, 53.3% and 50.0% of patients achieved complete emesis control, with corresponding mean nausea severity scores of 1.70 and 2.37, in Phases I and II respectively. Overall, the proportion of patients achieving complete emesis control in both Phases I and II were similar at 48.3% and 46.9%, with mean number of breakthrough antiemetics required at 0.48 and 0.47, respectively. There was no statistical difference in all outcomes measured.

Conclusions: The results showed that our guidelines can promote the appropriate use of antiemetics and potentially save unnecessary drugs costs without compromising the quality of patient care.

01-015

Single Dose of Palonosetron And Dexamethasone To Control Nausea, Vomiting And To Improve Food Intake (Fi) In Patients (Pts) Treated with High Emetogenic Chemotherapy (Hec)

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Objectives: Chemotherapy-induced nausea and vomiting (CINV) adversely affects quality of life in cancer pts, leading to serious metabolic complications. Our prospective study evaluated the efficacy of a single-dose palonosetron plus dexamethasone to control emesis in pts receiving HEC. Moreover, we evaluated also the improvement of their FI, in the week following therapy administration.

Methods: 30 pts, affected with advanced soft tissue sarcoma, cervix, bladder and breast cancer were treated with palonosetron 250 mcg (bolus e.v.) and dexamethasone 20 mg given before chemotherapy administration. Nausea, vomiting and FI were monitored by a self-given questionnaire including a 7 days diary. Complete Response (CR), defined as no vomiting and no rescue therapy, was the primary endpoint, Complete Control (CC) defined as CR and no more than mild nausea was the secondary endpoint. Endpoints were evaluated during the acute (0–24 hrs), the delayed (25–168 hrs) and overall (0–168 hrs) phases.

Results: 86.6% and 83.3% of pts achieved CR and CC respectively, during the acute phase, while 80% and 76.6% of pts achieved CR and CC respectively, during the delayed phase. CR pts had a median FI of 1438.46 Kcal at day 1, while not controlled patients had a median FI of 300 kcal. The difference between the two groups is statistically significant ($p<0.0001$). 66, 60 and 60% of pts didn't complain nausea respectively at day 1, day 4 and overall phase. The degree of nausea at day 1 and day 4 statistically correlated with FI ($r^2=0.82$ and $r^2=0.81$, respectively). Patients complaining no nausea had a better FI vs pts with mild nausea (+644 Kcal at day 4).

Conclusions: Our preliminary results confirm the efficacy of a single dose palonosetron plus dexamethasone to control CINV and to guarantee an adequate caloric intake in cancer patients submitted to HEC. Disclosure: Partially supported by a grant of Italfarmaco Italy

01-016

Single Dose Palonosetron (0.25 Mg) For The Prevention of Acute And Delayed Nausea And Vomiting In Patients Undergoing Hdct And Stem Cell Transplantation

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Objectives: Patients undergoing high dose chemotherapy (HDCT) and stem cell transplant (SCT) universally experience significant acute and delayed-CINV (60-100%) and emesis control still remains sub-optimal. Palonosetron (PALO), a new 5-HT3-RA with higher receptor affinity, demonstrated high activity in acute-CINV control. In this study, we evaluated the activity of a single dose (0.25 mg) of PALO for clinical control of acute and delayed CINV in HDCT and SCT setting.

Methods: Thirty pts (M/F=14/16), median age 41 yrs (r 33–69), with diagnosis of lymphoma (15) and myeloma (15) were accrued after informed consent. Standard HDCT (Melphalan=15, BEAM=15) were used. All pts received a single iv PALO dose plus 8 mg DMS, delivered 30' before starting of HDCT. All 30 pts recorded acute (24 h) and delayed (120 h) emetic episodes and rated intensity of nausea on MASCC Antiemesis Tool (MAT). Quality of life was also self-assessed (120 h) in 18 of 30 pts, through a validated Functional Living Index-Emesis questionnaire (FLIE score), evaluating CINV impact on daily activities, with the endpoint of "No impact of CINV on daily life"(NIDL).

Results: As to acute-CINV evaluation, all 30 pts (100%) achieved a complete response (CR=no emesis, no need for rescue therapy) with only 11 pts (37%) experiencing non significant nausea (median intensity=4, r 1–10). As to delayed-CINV, 21 pts (70%) obtained a CR with 23 pts (77%) suffering of nausea (median intensity=6, r 1–10). FLIE scores for delayed-CINV summed to 45% of NIDL in the 18 pts evaluated.

Conclusions: Single dose of PALO before HDCT and SCT may represent a new strategy able to achieve an optimal (100% CR) control of acute CINV and a significant reduction of both episodes and intensity of delayed CINV, leading up to 45% of NIDL. The impressive activity of PALO might be further improved by a different schedule of administration.

01-017

Multiple-Day Dosing of Palonosetron (Palo) May Enhance Emesis And Nausea Prevention In Patients Receiving High-Dose Melphalan Chemotherapy Prior To Stem Cell Transplant (Sct)

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Objectives: Despite multiagent antiemetic prophylaxis, SCT regimens have historically been associated with very high rates of emesis (80% of patients) and nausea (95% of patients) during the first week of treatment [Ballen et al. 2001]. With demonstrated superior emesis prevention versus ondansetron with conventional single-day chemotherapy, PALO was evaluated in patients receiving multiple-day high-dose chemotherapy before SCT.

Methods: In this phase II, randomized double-blind study, adults with multiple myeloma receiving 2-day melphalan (100 mg/m^2/d) were assigned to 1, 2 or 3 daily doses of PALO 0.25 mg IV before SCT (Day 0), along with dexamethasone 20 mg prophylaxis Days -2 and -1. The primary efficacy endpoint was Complete Protection (no emesis throughout the 7-day study). Nausea, rescue antiemetics, adverse events, and other parameters were also assessed.

Results: In total, 73 patients were randomized to PALO dose groups: A) Day -2 (N=24); B) Days -2, -1 (N=24); C) Days -2, -1, 0 (N=25). There were no significant between-group differences in median age (59–61 yrs), gender (54–71% male), previous chemotherapy (24–33% naïve), or chronic alcohol use history (42–63% no). No emesis rates throughout the 7 days were 42%, 42%, and 44%, for groups A, B, and C, respectively (table). In the respective groups, 8%, 33% and 24% of patients required no rescue antiemetics, and 8%, 29% and 16% reported no nausea throughout the 7-day study. Some trends towards improved efficacy favoring groups B and C were evident on individual days. PALO was well tolerated; there was no clear dose response in adverse reactions, which included diarrhea (16%), constipation (12%), headache (11%), and insomnia (8%).

No Emesis Rates, Intent-to-Treat Population, % of Patients

Time Period	A) PALO Day -2 (N=24)	B) PALO Days -2, -1 (N=24)	C) PALO Days -2, -1, 0 (N=25)	p-value[a]
7-day Complete Protection (Days -2 through 4)	41.7	41.7	44.0	0.434
Day -2 (-48 to -24 hrs)	95.8	95.8	96.0	0.488
Day -1 (>-24 to 0 hrs)	87.5	91.7	96.0	0.141
Day 0 (>0 to 24 hrs)	66.7	79.2	92.0	0.015
Day 1 (>24 to 48 hrs)	66.7	75.0	76.0	0.235
Day 2 (>48 to 72 hrs)	54.2	70.8	68.0	0.161
Day 3 (>72 to 96 hrs)	75.0	70.8	76.0	0.465
Day 4 (>96 to 120 hrs)	75.0	83.3	80.0	0.337

[a]p-value based on the exact one-sided Jonckheere-Terpstra Trend Test

Conclusions: PALO appeared safe and very effective at preventing emesis and nausea in patients receiving multi-day high-dose melphalan, with a trend towards better efficacy in patients receiving multiple days of PALO versus single-day PALO. Supported by MGI PHARMA, INC.

01-018

Population Pharmacokinetics of Transdermal Granisetron - Data From a Development Programme of a Novel Granisetron Patch

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Objectives: A granisetron patch (gTDS) has been developed to deliver therapeutic levels of granisetron over multiple days chemotherapy. The gTDS is applied 24–48 h before chemotherapy and can be left on for additional 4–6 days. This population PK (popPK) analysis presents cumulative PK data from the gTDS development programme.

Methods: Data from 3 clinical trials in healthy subjects (proof of concept, relative bioavailability, skin sensitisation study;

total n=48) and one phaseII and one phaseIII studies in patients (total n=793) was pooled in a popPK analysis. Firstly, a popPK approach was taken to model oral and gTDS data from a crossover study. Secondly data from the phaseII and III trials, in CINV, was pooled and the model fitted to the dataset. The model was used to investigate granisetron exposure and possible relationship to: age; gender; healthy subjects and patients; renal function. Additionally, the exposure-effect relationship (Total Control of CINV) was explored.

Results: A two-compartment model with zero order release from the patch to a buffer compartment provided best fit. Between-subject variability of CL/F was high, and less variation seen within subjects following multiple patch applications. Data from oral dosing was consistent with this. Clearance was lower in cancer patients than healthy subjects following gTDS administration. There was no effect on clearance by age, gender, weight or renal function. No relationship on Total Control of CINV was seen with C_{max} or AUC $_{0\text{-}24\ h}$ in the range present in the clinical studies.

Conclusions: The pharmacokinetics of granisetron are characterised by high interpatient variability of clearance. Our studies showed that neither gender, age, renal function or fraction absorbed accounts for this. However exposure in patients was higher than healthy subjects. Exposure in the studied range had no influence on Total Control of CINV when applied as gTDS patch or after oral administration. Supported by ProStrakan

01-019

Phase Iii Results For the Novel Neurokinin-1 (Nk-1) Receptor Antagonist, Casopitant: 3-Day Iv/Oral Dosing Regimen For Chemotherapy-Induced Nausea And Vomiting (Cinv) In Patients (Pts) Receiving Multiple Cycles of Highly Emetogenic Chemotherapy (Hec)

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Objectives: In a phase II dose-ranging trial, casopitant, a novel NK-1 antagonist, demonstrated efficacy in preventing CINV in pts receiving HEC. Here we present results of a 3-day IV/oral regimen of casopitant added to ondansetron/dexamethasone (OND/DEX) for the prevention CINV events in pts receiving HEC

Methods: This multinational, double-blind, active-controlled trial included 810 pts with 99% of pts receiving cisplatin-based chemotherapy (up to 6 cycles). Pts were randomized to a 3-day IV/oral dose arm (casopitant 90 mg IV + OND 32 mg IV + DEX 12 mg PO) on D1 plus casopitant 50 mg PO Hidden formatting deleted. Delete this text!_LINK2">D2-3 + DEX 8 mg PO QD D2-4, or either a single dose casopitant arm (150 mg PO + OND 32 mg IV + DEX 12 mg PO) on D1, or an active control (CTRL) arm (OND 32 mg IV + DEX 20 mg PO) on D1 plus DEX 8 mg PO BID D2-4. Complete Response (CR; no vomiting/retching, rescue medications) in the first 120 hrs of HEC was the primary endpoint

Results: A statistically significant improvement (at a 2.5% level of significance adjusted for two primary comparisons) in CR rate in cycle 1 compared with CTRL was observed. This clinical benefit appeared to be maintained for up to 6 cycles. Significant improvements were observed in CR in the acute and delayed phases, as well as in vomiting, during cycle 1. Clinically meaningful improvements in the reported secondary endpoints of no significant nausea (SN), and no nausea were also observed. Casopitant was generally well tolerated. AE frequency was similar across the arms with neutropenia, leukopenia and anemia being the most frequent. Injection site reactions were infrequent but slightly more common in the IV/oral arm.

Conclusions: In pts receiving HEC, a 3-day IV/oral regimen of casopitant added to OND/DEX demonstrated a clinically meaningful reduction in CINV events.

02-020

Use of a Standardized Web-Based Tool (Wbt) For Evaluation of Bone Health In Breast Cancer Patients (Bcp)

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Objectives: ASCO guidelines recommend aromatase inhibitors (AI) adjuvant therapy in postmenopausal hormone receptor positive breast cancer patients. Aromatase inhibitors can cause significant bone loss over the long term and increase treatment related morbidity. This study measures a web-based tool use for osteoporosis evaluation, using the American Board Internal Medicine Practice Improvement Module (ABIM PIM) for osteoporosis.

Methods: We performed a retrospective chart review (2004-06) of BCP on adjuvant AI without prior tamoxifen use; documentation of osteoporosis risk factors and processes of care were reviewed using the American Board Internal Medicine Practice Improvement Module for osteoporosis

Results: Of 228 BCP identified from the hospital tumor registry, 28 (93% Caucasian, 7% race not documented) were eligible for analysis; mean age was 64 years (range 42–90).

Post menopausal status was documented by history in 26 (92%); by LH, FSH and estradiol levels in 2(8%) BCP. All tumors expressed estrogen receptors; 26(92%) expressed progesterone receptors. Chart review revealed documentation of tobacco use in 19(71%); exercise level in 12 (43%); fall screen in 1(4%); vitamin D level in 0 (0%); appropriate vitamin D intake in 10(36%) and calcium intake in 6 (21%) charts respectively. Bone density scan was done in 21(75%) BCP. Of 17 (60%) BCP eligible for antiresorptive therapy; only 1 (6%) had documentation of prescribed therapy.

Conclusions: The ABIM PIM osteoporosis survey is a useful WBT in AI treated BCP. It identifies patients at high risk of osteoporosis and reveals deficiencies in chart documentation. By identifying high-risk patients in a timely fashion, management modifications can be made, potentially reducing osteoporosis related complications. We conclude that use of WBT in select patient populations enhances quality of patient care and could potentially decrease treatment related morbidity.

02-021

Risk Factors For Osteonecrosis of the Jaws (Onj): A Case-Control Study

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Objectives: Numerous case reports and series of ONJ, a previously rare condition, have been published recently. A vast majority of these cases have been associated with exposure to bisphosphonates (BP) and dental treatment. Risk factors for development of ONJ have not been adequately reported. The global objective of this ongoing study is to determine the association of medical, dental and demographic risk factors with development of bone necrosis in the jaws.

Methods: This case-control study identified ONJ cases through dental practitioners and health care organizations enrolled in three NIH-funded practice-based research networks, located in Alabama, New York and Washington State, respectively. Three controls for each case are selected at random from the same dental practice. The enrollment goal is 174 cases and 522 controls and will be achieved by 31 March 2008. We collect data on patient demographics, medical conditions and systemic drug exposure as well as extensive dental diagnoses and procedures for a period of three years prior to ONJ diagnosis for cases, and three years prior to the date of enrollment for controls. These data are gathered from medical and dental records as well as from direct patient interviews. Data are recorded on study forms by trained research assistants and then double-entered in the computer database. We will use univariate and multivariable models and regression analyses to determine the association of multiple factors with development of ONJ. These factors will include BP exposure, diagnosis of cancer, treatment with cytotoxic and/or corticosteroid medication as well as oral and dental diseases and treatments.

Conclusions: This carefully designed case-control study will provide robust data on medical and dental risk factors for ONJ. The results will also inform treatment and prevention guidelines for dental practitioners faced with BP exposed patients. This research is supported by grants U01-DE-16746 and U01-DE-16747 from the National Institute of Dental and Craniofacial Research, National Institutes of Health”

02-022

Gender Based Differences In the Relationship Between Body Composition Alterations, As Measured By Computerized Tomography (Ct) Imaging, And Survival, In Locally Advanced Pancreatic Cancer (Lapc) Receiving Chemoradiation

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Objectives: Pancreatic cancer has high mortality and frequency of cachexia. We explored the relationship between body composition alterations and survival in LAPC patients.

Methods: 18 males and 23 females with LAPC participated in a Phase-I trial (bevacizumab with concurrent radiotherapy and capecitabine). The average cross-sectional normalized muscle tissue (MT) and adipose tissue (AT) volumes from 4 consecutive slices over L3, were obtained from abdominal CT images done before and after chemoradiation (median 104 days). Distinct visceral (VAT) and subcutaneous (SAT) components made up AT.

Results: Median age (59 years) and BMI (26) were similar in both genders. Males had higher weight (80.7 vs. 63 kg, $p<0.003$), MT and VAT ($p<0.0001$), but did not differ in SAT. Following chemoradiation, median percentage loss (%) was for weight 5.2, MT 3, VAT 12, and SAT 11, with no gender difference ($p>0.5$). Weight loss correlated with losses in MT ($r=0.67$, p 0.002), SAT (0.63, 0.004) and AT (0.75, 0.0004) in males; in females, with SAT (0.45, 0.03) and AT (0.44, 0.04) losses. Median survival in males (240 days) and females (282 days) did not differ ($p=0.3$). In

both, weight loss was associated with decreased survival. Only in males, the losses in MT and AT were additional significant factors. In multivariate analysis, MT loss remained an independent prognostic factor. Males with MT loss >3% (N=9) had poorer survival than those with ≤3% loss (N=9), (156 vs. 223 days, p=0.003), and at baseline had higher BMI and SAT (p<0.02), but did not differ in MT, albumin, hemoglobin, or WBC.

Conclusions: In the population studied, males and females did not differ in overall survival, and losses in weight, MT and AT. In males, the loss in MT predicted poorer survival. Further study is warranted.

02-023

Relationship Between Inflammation And Symptom Distress In Cachectic Cancer Patients Assessed At a Cachexia Clinic In a Comprehensive Cancer Center

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Objectives: Inflammation is implicated in the pathogenesis of cancer cachexia and also in many other symptoms of cancer. Serum CRP is a clinically useful marker for the severity of inflammation. The relationship between CRP and symptom distress in weight losing cancer patients is not well known.

Methods: We reviewed the charts of 67 advanced cancer pts referred to the CC with IWL. We explored the relationship between inflammation as measured by CRP and symptom severity (Edmonton Symptom Assessment Scale). Correlation analysis (Spearmans Rank) and cluster analysis was performed.

Results: The median age was 64 years (95% CI 60–66), predominantly males (66%). 46% of patients had gastrointestinal malignancies. Median weight loss over 5 months was 12% (95% CI 10–19 %). Median rate of weight loss (kilograms/week) was 0.8 (95% CI 0.54–0.99) and 0.91 (0.29–1.06) in the 1 and 2 months preceding consultation, respectively. The median CRP was 1.95 mg/dL (95% CI 1-3.1), and correlated with the weight loss rates described earlier (p<0.05). CRP levels of 1 or higher (43 pts) were found to correlate with sleep (r 0.47; p<0.01), wellbeing (0.43;< 0.01), depression (0.31; <0.05), appetite (0.29; 0.05) with trends for fatigue (0.26; 0.09) and drowsiness (0.28; 0.06). Factor analysis revealed a two factor solution with Factor 1 (fatigue, wellbeing, appetite) and Factor 2 (depression, SOB, CRP, sleep) explaining 99 % of the variance.

Conclusions: Our study suggests an association between CRP and multiple concurrent symptoms that are commonly experienced by weight losing advanced cancer patients. Therapies that target inflammation may help in ameliorating symptom distress in these patients.

02-024

Randomised Phase Iii Clinical Trial of 5 Different Arms of Treatment For Patients with Cancer-Related Anorexia/Cachexia Syndrome (Cacs): Interim Results

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Objectives: CACS is a multifactorial syndrome characterized by tissue wasting, particularly lean body mass (LBM), metabolic alterations, fatigue, anorexia, reduced food intake.

Methods: In April 2005 we started a phase III randomised study to establish the most effective and safest treatment of CACS addressing as primary endpoints: LBM, resting energy expenditure (REE), total daily physical activity, IL-6 and TNF-alpha levels, fatigue. Sample size: 475 patients. Eligibility criteria: hystologically confirmed tumors of any site; loss of body weight ≥5% in the last 3 months and/or abnormal laboratory values; life expectancy >4 months. Patients were treated with either antineoplastic therapy or supportive care. All patients received as basic oral treatment poliphenols plus alpha lipoic acid plus carbocysteine plus Vitamins A, C, E. Patients were then randomised to one of the following 5 arms: 1) Medroxyprogesterone Acetate (MPA)/Megestrol Acetate (MA); 2) Pharmaco-nutritional support containing EPA; 3) L-carnitine; 4) Thalidomide; 5) MPA/MA + Pharmaco-nutritional support + L-carnitine + Thalidomide. Treatment duration 4 months. Interim analyses were planned after every 100 randomized patients.

Results: At January 2008, 219 patients were randomized and 195 evaluable: M/F 102/93, mean age 62 years (range 30–81), 96% stage IV. A first interim analysis on 125 patients showed a worsening of LBM, REE and MFSI-SF in arm 2 in comparison to the others and therefore it was withdrawn from the study. A second interim analysis on 204 patients showed a significant improvement of REE and fatigue in arm 3 and 5, a significant decrease of IL-6 in arm 3 and TNF alpha in arms 3, 4 and 5. Moreover, arm 1 was significantly less effective for primary efficacy endpoints and therefore it was withdrawn from the study. As for toxicity, 1 patient discontinued MPA for deep vein thrombosis and 1 patient discontinued L-carnitine for severe diarrhea.

Conclusions: The study is in progress.

02-025

Efficacy of Iv Zoledronic Acid Compared To Iv Ibandronic Acid In Patients with Bone Metastasis - a Study From Eastern India

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Objectives: Ibandronic acid is a third generation bisphosphonate which acts by inhibition of osteoclasts. Zoledronic acid also has a similar mechanism of action. This study was designed to study superiority or inferiority of either agent over other in terms of efficacy in reducing bone pain and complications in patients with bone metastases.

Methods: From Jan 2005 to Dec 2007, 190 patients of various malignancies with bone metatstasis were enrolled and were randomized to receive monthly IV infusions of Ibandronate or Zoledronate and were analysed for pain relief, skeletal related events and adverse events.

Results: Patients in both the arms were well matched for their diagnosis, stage of disease, burden of skeletal disease and performance status. Different diagnoses were, carcinoma breast (n=84), carcinoma prostate (n=46), myeloma (n=38), carcinoma lung (n=18), others (n=4). Median follow up was 15 months. At 15 months, mean increases in British Pain Inventory pain scores were lower with zoledronate compared to ibandronate (0.43 vs 0.88 [p=0.02]). Analgesic use as defined by 4 point analgesic scale was less with zoledronate as compared to ibandronate. Incidence of skeletal related events was not significantly different between two arms (33% for zoledronate vs 39% for ibandronate [p=0.2]). Median time to first skeletal related event was not reached in either arm. At 15 months of median follow up, percentage of patients with skeletal related events were 38% in zoledronate arm vs 42% in ibandronate arm (p=0.06). Zoledronate caused fever in 20 (9.5%) patients. Ibandronte caused hypocalcemia in 3 patients. No cases of osteonecrosis of jaw were observed.

Conclusions: Zoledronate is the preferred bisphosphonate in developing countries for its shorter infusion time and availability of cheap generic brands. This study also indicates that it may be slightly better than ibandronate in reducing bone pain and preventing skeletal related events.

02-026

Electric Device For Bisphosphonate-Induced Osteonecrosis

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Objectives: Osteonecrosis of the jaw (ONJ) is serious adverse event in patients (pts) who administer bisphosphonates for metastatic bone disease. Its management outcome remains poor. To improve results of conventional treatment we've used electric therapy device ("SCENAR", US Patent N 5257623) which was tested in some fields of supportive care. This is attempt to show our experience in SCENAR-technology usage for ONJ.

Methods: In preliminary trial 28 pts with bisphosphonate-related ONJ (mean age 59,2 years, range 36–81 years) were enrolled; nosologic forms: breast cancer 9 pts, prostate cancer 7 pts, lung cancer 6 pts, multiple myeloma 3 pts, renal cell cancer 2 pts, far-advanced malignancy without verified primary site - 1 patient. Clinical picture was presented with pain (at rest & jaw movement), swelling, exposed bone; suppuration was noted in 3 pts. Dental surgery prior to bisphosphonate therapy was in almost all pts. After signing the informed consent every patient 15 SCENAR-procedures was performed in addition to conventional supportive care. During these procedures various cutaneous and mucosal areas were treated, their choice was based upon patient's complaints, their technique was described earlier.

Results: In 17 pts (60,7%) positive results were achieved. They felt better, had partial pain relief (the relief ratings on VAS were significantly improved). In 5 of 19 pts with exposed oral maxillofacial bone the lesions had tendency to heal; in 2 of these 5 pts radiographic changes have become less obvious.

Conclusions: In our study group adding SCENAR to standard therapy appeared to result in more promising outcome then available literature data were presented. Further research is necessary to establish its exact position in multimodal approach for bisphosphonate-related ONJ.

03-027

Impact of the National Coverage Determination (Ncd) On Erythropoiesis-Stimulating Agent (Esa) Use In Medicare Cancer Patients Receiving Chemotherapy: Hematologic And Transfusion Outcomes

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Objectives: The purpose of this study was to determine the impact of Medicare's NCD on clinical outcomes for patients with chemotherapy-induced anemia requiring ESA therapy. This policy limited ESA coverage to Hb levels <10 g/dL at initiation and during the maintenance period.

Methods: This was a retrospective observational study of an electronic medical record database within a large oncology/hematology practice. Inclusion criteria consisted of Medicare cancer chemotherapy patients receiving ≥2 ESA doses, excluding patients with myelodysplastic syndrome (MDS) or prior ESA therapy. Cohorts were defined based on date of initial ESA administration (Pre-NCD cohort: 1/1/2007-4/30/2007; Post-NCD cohort 8/1/2007-11/30/2007) with follow-up until the last ESA dose + 35 days or 7/30/2007 or 1/31/08 for the cohorts, respectively. Due to limited follow-up in the Post-NCD cohort, longitudinal hemoglobin (Hb) levels and transfusions during the initial eight weeks were reported.

Results: A total of 299 Medicare patients received ESAs for 8 weeks (Pre-NCD 243, Post-NCD 56). The proportion of women was similar between cohorts (Pre-NCD 57% vs Post-NCD 61%, $p=0.59$) while mean age was greater in the Pre-NCD cohort (71.2±9.6 vs 67.0±10.0; $p=0.005$). Tumor type distribution was similar between cohorts. Hb levels were significantly higher in the Pre-NCD cohort compared to the Post-NCD cohort at each measured timepoint (Mean Hb, g/dL, Pre- vs Post-NCD: Baseline, 10.7 vs 9.6; $p<0.0001$, 4-week Hb, 11.0 vs 10.1; $p<0.0001$; 8-week Hb, 11.2 vs 10.2; $p<0.0001$). A greater proportion of patients required transfusion in the Post-NCD cohort (Pre-NCD 9.5% vs Post-NCD 19.6%; $p=0.03$).

Conclusions: This study found lower Hb values and higher transfusion rates in Medicare cancer chemotherapy patients treated with ≥2 ESA doses following adoption of the NCD. Limitations include brief follow-up time in the Post-NCD cohort, sample size, and generalizability to other oncology/hematology sites within the United States. Supported by Centocor Ortho Biotech Services LLC

03-028

Evaluation of Side Effects In Cancer Patients During Oncological Care - A Project of the Supportive Care Group of the Tumor Center Berlin

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Objectives: The therapeutic options in tumour treatment protocols include a maximum of tumour cell reduction and at the same time a minimum of side effects in order to secure a good quality of life for the cancer patient. Temporary side effects have been accepted in relation to the benefit risk calculation. A questionnaire for cancer patients was developed to improve the management of side effects of the cancer treatment, to optimize the patient - doctor - communication and to register individual problems of the patient.

Methods: Cancer patients received a questionnaire with 25 items and were asked for their problems during or after the last tumour specific treatment before having the consultation with the doctor. Gender, age, Karnofsky-index and treatment protocol were additional registered. During September 2007 until December 2007 a total of 272 questionnaires could be collected. The qualitative items have been evaluated with the contigens table method and the parameter free x2 test (Chi-Square-Test).

Results: More than 50% of the patients documented additional important points influencing their well being. Nearly all of the evaluated patients had some tumour therapy specific side effects. The most pronounced problem was the physical exhaustion in71% of the evaluated patients. More than 50% were influenced in their quality of life by more than normal fatigue since the start of their tumour specific therapy. Significant differences could be evaluated in relation to the age, diagnosis and tumour therapy with respect to the symptoms.

Conclusions: The questionnaire was be found to be a good method to improve the communication between the patient and the doctor. It was easier to point out individual

problems for the patient. The care givers can focus more precisely on important side effects of the tumour specific therapy in order to improve the quality of life of the treated patient.

03-029

The Association of Advanced Directives with the Presence of A Do Not Resuscitate(Dnr) Order In Hospitalized Patients with Advanced Cancer Seen In Palliative Care Consultation (Pcc) At a Comprehensive Cancer Center (Ccc)

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Objectives: Multiple studies have documented the poor outcome of cardiopulmonary resuscitation(CPR) in hospitalized patients with advanced cancer. Determining resuscitation status for such patients is emotionally charged and requires expert communication with patients and families that is sensitive to their understanding of the disease process, treatment options, values and goals. Advanced directives(AD) such as medical power of attorney(MPOA), living wills(LW) and out-of-hospital DNR orders (OOHDNR) offer an opportunity for patients to document future health care preferences. This study was conducted to evaluate the association of AD with inpatient DNR orders (I-DNR) for hospitalized patients with advanced cancer seen in PCC.

Methods: Demographic data, presence and type of AD and I-DNR status were collected retrospectively from 200 consecutive patients. Analysis was descriptive.

Results: Median(range) patient age was 61 years(7–87), with 59% female, 64% Caucasian and 17% African-American. Cancer diagnosis: solid tumor-82%, hematological-18%. CPR was considered medically inappropriate in 154/200(77%). Prior to PCC, 68/200(34%) were I-DNR. After PCC, this rose to 153/200(77%), all considered medically inappropriate for CPR. 61/200(31%) died prior to discharge; 1 received CPR. The median(interquartile range) time(days) between I-DNR and death was 6(4–9) and 25(15–40) for inpatient and outpatient deaths, respectively ($p<0.0001$). 66/200(33%) had ≥1 AD: MPOA-51 (26%), LW-49(25%), OOHDNR-19(10%). The presence of ≥1 AD was not associated with the presence of an I-DNR order in this population, nor with the presence of a LW or a MPOA individually. The presence of OOHDNR was associated with the presence of an I-DNR($p<0.01$); 2/19 (11%) were completed before the I-DNR.

Conclusions: Knowledge of AD status does not predict I-DNR status or CPR appropriateness. I-DNR status may provide an opportunity for discussion of OOHDNR. Additional research evaluating the impact of patients' understanding of their medical situation on completion and content of AD is indicated to more effectively link personal values and goals to relevant health care outcomes.

03-030

The Family Conference In Patient Care: A Systematic Review

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Objectives: Family conferences (FC) are a major means of communicating with families of patients with advanced or complex illnesses like cancer. FC are time consuming, involve multiple staff, and are costly. Because of these factors it is important to understand the FC evidence base. We reviewed the literature focusing on the FC in healthcare.

Methods: We searched 6 computerized databases; references searched by hand, and textbooks in relevant disciplines reviewed. Papers were reviewed using the four main elements from the British Medical Journal Evidence-based Medicine Toolkit: Patient, Intervention, Comparison and Outcome to grade the strength of evidence. Studies were graded as randomized control trial (RCT), cohort, case series, or opinion.

Results: Four medical practice areas predominated in the FC studies: Oncology/Palliative Care (ONC), Intensive Care Unit (ICU), Acute Care (AC), Family Practice (FP). 1 RCT and 3 ICU cohort studies, and 2 FP cohort studies were designed with outcomes to the family conference as an intervention. Sixty-four others were either lower quality cohort studies, case series, case reports, or opinion papers that identified FC, FC guidelines, knowledge and skills required of facilitators, needs of the family, FC barriers, and communication techniques.

Conclusions: One FC RCT demonstrated the importance of a format with a proactive end-of-life conference coupled with a brochure. Prospective single arm ICU studies had positive outcomes. FC guidelines are largely based on expert opinion and case series for information needs. Outcomes research is needed to confirm the FC anecdotal benefits claimed, regardless of the medical setting and trajectory of illness.

03-031

The Interdisciplinary Team: Themes

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Objectives: An Interdisciplinary team (IDT) collaborates to manage patient care in our 23 bed acute care palliative medicine unit (ACPMU. An observational study was undertaken to identify patient care planning issues (Themes) discussed by the IDT.

Methods: The IDT includes physicians, unit/consult/hospice/case management nurses, and a social worker. The IDT meets daily for 30 minutes to plan patient care. One day a week over an 8 week period a research fellow recorded complexities of IDT patient care planning.

Results: Issues for 59 patients recorded and developed into 9 themes. Themes: 1) multidisciplinary perspectives 2) transition from anti-tumor treatment 3) caregiving 4) goals of care 5) resource use 6) psychosocial assessment 7) clinical operations 8) discharge resources 9) spokesperson. The Ward method of hierarchical cluster analysis grouped the 9 themes into 4 clinically relevant clusters.The four clusters are: Cluster 1: (Themes 5, 7) Inappropriate resource utilization associates with the need for clinical operations review. Cluster 2: (Themes 6,9,8) A family spokesperson and psychosocial assessment with Family Conference support discharge planning. Cluster 3: (Themes 3,4 and 6,9,8) Caregiving concerns and unclear goals of care bracket together with discharge planning, psychosocial assessment, and a spokesperson. Cluster 4: (Themes 1,2) Differing viewpoints arise from the unique skills and knowledge of the various disciplines that make up the IDT and link together the information needed to assist in transition from anti-tumor treatment.

Conclusions: 9 IDT themes represent our clinical practice. There may be more themes, thus further research needed. The analysis of clinically informative clusters can be used to provide an educational format to review issues as the IDT plans patient care.

03-032

Breast Cancer Sufferers in Resource Poor Nations: NGO's Initiatives in Rural/Tribal India For Improving Access to Care

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Objectives: Indian-cancer-record-data demonstrates, subsidized Psychosocial support/HRT & treatment-availability major issues for Breast-cancer sufferers in resource-poor-nations. Hence our Non-Govt-Organisation analysed/started this public health-policy recommendation. NGO's close to rural/tribal communities. Cost of running NGO less than medical-institution. Anti-cancer drugs cost causes poor-compliance. Govt-Health-Depts need to workout formula to increase access to chemotherapy. In resource-poor-setting unaffordable-cost of nursing care causes high-mortality. We suggest to establish common training program to develop of sound & sustainable cancer care programs for rural-communities.

Methods: Our NGO-volunteers have strength of 28. Cost of chemo-nursing beyond reach of common-women in developing-nations. No national program for financial help to breast-cancer-sufferers. In breast-cancer-sufferers Individual's sexual-identity, sexual-relationship is dramatically wounded. Women suffer silently physically/emotionally. Hence we need Rx-nursing-programs designed towards poor-housewives from rural/tribal India. Community efforts are not-cohesive. Our NGO since one year offers guidance for Rx-funding, guidance/counselling to those going to city-oncology-centres. This project is unique as we are training farmers & village leaders to develop peer-peer model.Depending on support given by donors we give these poor people little financial assistance to cover treatment cost. We help in getting access to governmental hospitals, we started with two towns & intend to spread our help in 12 villages by 2009.

Results: We did face hiccups in mobilising volunteers/resources. This strategy minimum maintenance-cost & high-acceptability. Forums like **MASCC** should help like-minded NGO-activists to come together & form workgroup to develop this cost-cutting concept.

Conclusions: Economical-factors/access to therapy changes out-come of Breast-cancer-Rx. With little training our community NGO in rural/tribal India formed a well knit volunteers group who is giving free part-time dedicated service. HRT/psychosocial-support does affect QOL to reduce difficulties of resource poor-southern-countries. We urge MASCC-2008-symposium-participants & Pharma Exhibitors at Houston to share views/expertise on this burning issue

03-033

Opioid Prescribing In Advanced Cancer: How Can We Improve Safe, Effective Prescribing By Generalists?

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Objectives: A retrospective audit of opioid prescribing practices in advanced cancer patients at a university teaching hospital showed significant variances from the WHO guidelines in respect of choice of drug, route, dose, frequency of administration and dose titration. Prescribing by specialist palliative doctors (SPD) achieved 16 of the 18 standards, while non-SPD (NSPD) met 6 of the 18 standards despite regular interdepartmental teaching by SPDs on the principles of safe rational opioid prescribing to non-specialist staff. The aim of the audit was to evaluate if individualised case-based education in relation to the gold standard improves opioid prescribing among NSPD.

Methods: This is a prospective observational cohort study of opioid prescribing as the second phase in this audit cycle. Over a four month period all consecutive cancer patient admissions were screened for opioid prescribing. Exclusion criteria included: prescriptions for pain related to treatment; symptoms other than pain; and prescribing considered to have a significant adverse outcome. Three groups were evaluated for prescribing: SPDs; department of medicine NSPD; all other doctors (AOD). Recording included: pain (using a VAS); side-effects; and variance from the WHO guidelines. The intervention included: as prescribing by NSPD was noted to be at variance with the standard a case-based teaching module highlighting the variance, enquiring into the cause and emphasising safe, effective principles was instituted. As a control prescribing by AOD was noted but no intervention was made.

Results: Preliminary results indicate improved pain control and improved compliance with the established standard in the intervention group.

Conclusions: As individualised opioid analgaesic regime remains the mainstay of cancer pain control we have shown that short case-based teaching with individual doctors improves compliance with the established standard, better pain control and fewer side-effects.

04-034

Interest In Use of Complementary Therapies For Cure Among Patients On a Palliative Care Unit

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Objectives: Complementary and alternative medicine (CAM) use is common among patients with terminal cancer; reasons for such use are many and include hope of cure. We examined characteristics of palliative care patients interested in using CAM on an acute Palliative Care Unit (PCU), focusing particularly on those interested in CAM for cure.

Methods: Eligible patients were >18 years old, English-speaking, and admitted to the PCU from September 2006–January 2008. Participants completed the Preferences for Complementary Therapy questionnaire, as well as measures of spirituality (Functional Assessment of Chronic Illness Therapy-Spiritual (FACIT-Sp)) and symptom burden (Edmonton Symptom Assessment Scale (ESAS)). ECOG performance status was recorded. The influence of sex, age, income, education, symptom burden, performance status, and spirituality on patients' preference for future CAM use for cure was determined using stepwise logistic regression.

Results: Of the 101 patients recruited, the median age was 60.0 years, 58 (57.4%) were female, 66.3% were of European descent, and 36.6% lived alone. Twenty-eight percent had a household income of <20,000 and 58% had no post-secondary education. All had metastatic cancer; the most common primary sites were gastrointestinal (25.7%), lung (22.8%), and breast (13.9%). Mean ESAS symptom distress score was 33.3 (15.3) and median performance status (ECOG) was 2. Eighty-four (83.2%) patients had used some form of CAM in past, and 94 (93.1%) were interested in future use. The most common therapy previously used for cure was spiritual healing and prayer (n= 31; 30.7%). Multivariable predictors of patient interest in future CAM use for cure included income and spiritual faith (Table 1).

Conclusions: There is considerable interest in CAM use among patients on an acute PCU, including for cure. PCUs offering CAM should be aware of reasons for use by patients, and provide educational information so that patients can make informed decisions.

Table 1: Individual and multivariable predictors of interest in CAM use for cure

Predictor	Individual Predictors*		Multivariable Predictors†	
	Odds Ratio (95% CI)	P-value	Odds Ratio (95% CI)	P-value
Age	0.855 (0.39–1.89)	0.699	0.962 (0.92–1.01)	0.121
Sex	0.987 (0.96–1.02)	0.392	0.365 (0.11–1.19)	0.095
Facit-Sp Faith subscale	1.09 (0.99–1.19)	0.076	1.14 (1.01–1.28)	0.031
Facit-Sp Meaning and Peace subscale‡	0.962 (0.90–1.04)	0.297	-	-
ESAS distress score‡	1.01 (0.99–1.04)	0.353	-	-
Performance status‡	0.899 (0.57–1.43)	0.652	-	-
Education (>high school)‡	1.12 (0.50–2.52)	0.785	-	-
Income (≤$40,000)	2.87 (1.13–7.29)	0.027	6.34 (1.91–21.03)	0.003

*Individual predictors were age- and sex-adjusted, except for age, which was sex-adjusted, and sex, which was age-adjusted.

†If $p<0.15$ in univariate analysis, predictor was included in the multivariate model. Age and sex were forced into the multivariate model. ‡Did not enter the multivariate model.

04-035
Polyprenol For Treatment Steroid-Resistant Asthma In Cancer Patients

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Objectives: Cancer treatment regimes, including chemotherapy, radiotherapy and cortocosteroids could induce a hyporesponsiveness of glucocorticoid receptors (GR) in cancer patients with asthma. The prevalence of steroid resistant asthma (SRA) in cancer patients is even lower than that of steroid sensitive asthma (SSA), but these patients are at very high risk of hospitalizations and death. Plant Polyprenol (PP) is approved as a substitute of Dolichyl Phosphate (DP) which decreases P-glycoprotein, enhances IL-10 synthesis and alpha GP isoforms expression in vitro. In a proof of our previous study, the effect of oral administration of PP was investigated in cancer patients with SRA.

Methods: The patient's (n=62) forced expiratory volume in one second (FEV1) and forced vital capacity (FVC) were measured. Patients with forced expiratory volume in 1 s (FEV1) <70% predicted were studied. SSA patients were with FEV1 increased >30% after a 1-wk course of oral prednisone 20 mg twice daily and SRA if they failed to increase >15%. Dolichol (Dol) in blood and urine were assayed by HPLC method. Dolichyl phosphate, alpha- and beta-GR isoforms expression were measured in CD4+ T-cells.

Results: 20 days course of PP 5 mg supplementation in SRA patients returned DolP concentration in blood, urine and T- cells to the normal level. 8 of the 10 SRA patients demonstrated a significantly increase FEV up to 30% after 2-wk course of oral prednisone 20 mg twice daily and 10 mg of PP.

Conclusions: Presented findings provide evidence that PP supplementation in patients with SRA enhanced the expression of alpha GP isoforms, restore the possibility to induce IL-10 synthesis and made CD4+ T-cells more responsive to steroids. Plant Polyprenol and prednisone increase FEV and FVC in SRA patients. These preliminary results may have important implications for the design of alternative treatment approaches for steroid resistant asthma in cancer patients.

04-036
A Retrospective Review: the Benefit of Qigong In Cancer Patients

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Objectives: Cancer patients experience multiple symptoms related to either the cancer itself or late treatment effects. They often seek supportive complementary and alternative medicine (CAM), which used as adjuncts to conventional treatments. Numerous physical & psychological benefits have been reported through the practice of Qigong. We investigated the effectiveness of Qigong in the management of symptoms of distress and physical well-being in cancer patients

Methods: Retrospective cohort study of patients with advanced cancer from McGill Cancer Nutrition Rehabilitation Program (CNRP). We investigated the effect of Qigong on quality of life using Edmonton symptom assessment

scale (ESAS). Pts enrolled in qigong were instructed in 30–45 min. session of Qigong and then practiced Qigong 1-2 times/week, under the guidance of a certified Qigong instructor. All other pts received standard care from CNRP team. ESAS was completed on each CNR visit.

Results: 75 pts, 32F and 39 M, aged 62 (SD 11) were selected from CNRP since Feb 2005. 27/75 participated in qigong practice and 48/75 similar pts were chosen as a historical control. At the baseline the two group were no different in reporting clinically significant depression (12/25 vs 18/48), nervousness (10/25 vs 20/48), insomnia (11/27 vs 28/48) and poor QoL (15/27 vs (20/48). After three visits to CNRP or 6 weeks practice of qigong the prevalence of clinically significant symptoms are decreased in both group. However significant difference was observed only in pts practicing Qigong. The mean score changed significantly in QoL from 4.2 to 3 ($p<0.05$), depression from 3.2 to 1.6 ($p<0.05$), nervousness from 3.0 to 1.7($p=0.05$) and insomnia from 3.7 to 2.7 ($p=0.03$) in qigong group.

Conclusions: The results suggest that Qigong training may be effective in reducing depression, nervousness, insomnia and improve QoL in cancer patients following a short period of practice**.** Prospective pilot study should be performed. The study was supported by the Vineberg Family Foundation

05-037

E/Tablets For Real-Time Monitoring of Fatigue In the Outpatient Oncology Clinic

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Objectives: To use e/Tablets to describe fatigue prevalence in 2 oncology populations, and examine correlations between fatigue and other patient reported concerns.

Methods: Using e/Tablets (wireless tablet PCs; SOS, Inc.), over 6 months (4 timepoints), gastrointestinal (GIC) and breast (BC) cancer patients completed: review of systems (Patient Cancer Monitor; PCM); Functional Assessment of Cancer Therapy (FACT); MD Anderson Symptom Inventory (MDASI); NCCN Distress Scale (Distress). Visits corresponded to usual outpatient oncology visits. PCM rates fatigue on a 0-10 numerical rating scale (NRS).

Results: BC patients (n=55) were mean age 51 (SD 12); 78% white. Data were collected at baseline, visit 2 (13 days [SD 9]), visit 3 (28 days [SD 15]), visit 4 (44 days [SD 22]). Across 218 visits, no fatigue was reported in 17%, mild (NRS 1-3) in 36%, moderate (NRS 4-6) in 29%, severe (NRS >6) in 18%. As fatigue increased, FACT-G physical well-being worsened (27 [SD 1], 23 [SD 3], 17 [SD 6], 13 [SD 8]); all other subscales had similar patterns. Fatigue levels correlated highly with: FACT-G physical (-0.82, $p<0.0001$), functional (-0.53, $p<0.0001$), total (-0.72, $p<0.0001$); MDASI severity (0.62, $p<0.0001$), interference (0.71, $p<0.0001$); Distress (0.68, $p<0.0001$). GIC results mirrored BC. GIC patients (n=88) were mean age 55 (SD 11); 66% male; 80% white. Data were collected at baseline, visit 2 (17 days [SD 10]), visit 3 (36 days [SD 20]), visit 4 (60 days [SD 32]). Across 350 visits, no fatigue was reported in 15%, mild in 36%, moderate in 37%, severe in 11%. As fatigue increased, all survey subscales worsened; fatigue levels were highly correlated with survey subscale scores similar to BC.

Conclusions: Cancer-related fatigue correlates with decreased physical functioning and increased distress. E/Tablet data correspond with clinical observation and standard measures, suggesting utility for (1) longitudinal monitoring of cancer-related fatigue, and (2) evaluating fatigue interventions' effectiveness. (Support: Pfizer, Inc.)

05-038

Examining Fatigue, Sleep, And Circadian Rhythms Before a Series of Four Breast Cancer Adjuvant Chemotherapy Treatments Within a Randomized Clinical Trial

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Objectives: No studies have reported the relationships between fatigue and sleep and circadian rhythms 48 hours before a series of four anthracycline-based adjuvant chemotherapy treatments for breast cancer. Examining these relationships will evaluate recovery from prior treatments. The purpose of the study was to examine fatigue, sleep, and circadian rhythms before four breast cancer adjuvant chemotherapy treatments within a RCT with a sleep intervention designed to modify fatigue.

Methods: The control group received equal time and attention and healthy-eating information. Women (N=219), were post-operative, Stage I-IIIA breast cancer; mean age=52.1(29–79); most married and employed. Piper's Integrated Fatigue Model guided the study. Instruments included: Piper Fatigue Scale total score and item # 7 (daily

Fatigue Intensity); Pittsburgh Sleep Quality Index (PSQI), and wrist actigraph (worn 48 hours before each treatment). Descriptive statistics, Spearman correlations, & mixed model analysis were performed.

Results: Fatigue intensity before each treatment was mild, but increasing over time [<4.0(1-10)] and sleep was poor (>5) for both groups at treatments 1 and 4. The intervention group had better sleep at treatment 4 [$F(1,370)=4.31$),$p<.039$] than the control group. Actigraphs recorded no differences between groups and stable values for Total Sleep Time and Percent Awake at Night. Number of Awakenings and Minutes Awake after Sleep Onset were higher than normal. Circadian rhythms (mesor, amplitude) were 10-15% below normal. In the control group only, higher daily fatigue intensity was correlated with poor subjective sleep ($p<0.05$) before treatments 1 and 4; and with lower mesor and amplitude prior to treatment 3.

Conclusions: Fatigue and sleep remained similar to values before the first treatment at treatments 2, 3, & 4, indicating recovery from prior treatments. Clinicians need to assess and treat fatigue and sleep disturbances and intervene early to prevent moderate to severe fatigue and poor sleep both during treatment and in cancer survivors.

05-039

Cancer-Related Fatigue: The Barriers And Facilitators To Exercise Across the Cancer Trajectory

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Objectives: Despite the array of evidence to support exercise as an effective form of managing cancer-related fatigue and the potential biopsychosocial benefits that can be gained, exercise adherence among the general cancer population remains poor. Qualitative research in this area is minimal; to date no studies have explored the barriers to exercise across the cancer trajectory. This study aimed to address this and ascertain if findings vary across the disease trajectory.

Methods: Participants for 5 focus groups were recruited via palliative and supportive care charities and through the regional Cancer Centre, Belfast. Questions were based on social cognitive theory constructs aimed at exploring exercise adherence issues. Focus groups were transcribed verbatim, analysed using grounded theory and validated using researcher triangulation.

Results: 26 participants (10 Male, 16 Female) with varied diagnoses and staging were recruited into the study. Barriers to exercise were categorised under: physical deconditioning, treatment side effects, lack of confidence, social isolation, difficulty in establishing routine and environment. Facilitators to exercise were those which met the participants' needs, these were categorised under the concepts of an exercise programme being: supervised, group based and tailored to the individual. Participants expressed that the positive side effects of exercise and social support would assist them towards becoming more physically active. Alternative therapies, spiritualism and self-preservation were used as a means of self help.

Conclusions: By gaining an insight into the highly personal experience of cancer-related fatigue, its impact on quality of life and subsequently how it enforces sedentary behaviour, healthcare professionals can put in place strategies to facilitate individuals with cancer towards a more physically active lifestyle. "Supported by the Department for Education and Learning."

05-040

Exploring Online Communities Working with Scientists To Understand Fatigue And Other Symptoms

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Objectives: Fatigue, one of the most prevalent and difficult to treat cancer-related symptoms, significantly reduces comfort, impairs the ability to engage in activities, and is difficult to communicate and define. More robust information about cancer-related fatigue and related symptoms is needed and obtainable from descriptions of survivors' experience. Research about mechanisms of symptom control and toxicity reduction would be enhanced if they were guided by models that incorporated all the elements of the symptoms that patients experience. To accomplish these goals, cancer survivors dialogued online to describe their fatigue and other symptoms, and then a basic scientist joined the virtual dialogue to learn from survivors important elements in their experiences.

Methods: Two national organizations which have functioning on-line support groups recruited participants by asking

members of these groups to consent to participating in this online discussion research group, which consisted of their dialoguing together in asynchronous, threaded discussion-forum interfaces. Participants dialogued for 4 months, followed by a month of dialogue with a scientist. They also completed pre and post participation demographic data and symptom ratings using the MDASI (M.D. Anderson Symptom Inventory). Data from the surveys were described and change scores were calculated. Texts from the dialogue were analyzed using phenomenological techniques.

Results: A total of 28 persons participated in two group. All except one were female, and all were Caucasian. Most were married and had some college education. They reported low symptoms that did not change significantly from pre to post participation. Phenomenological analysis revealed three themes, descriptions of "bone sucking fatigue", a search for meaning or answers about the fatigue, and remedies tried.

Conclusions: Participants were happy to participate in this novel application of online technology. Their descriptions add to what is known about symptoms in survivors, which are especially striking for persons rating their symptoms as mild.

05-041

Systematic Review And Meta-Analysis of Exercise For the Management of Cancer Related Fatigue

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Objectives: To carry out a systematic review to evaluate the effect of exercise on cancer-related fatigue (CRF) during cancer treatment.

Methods: Search strategy: The Cochrane Controlled Trials Register (CENTRAL/CCTR), MEDLINE (1966 to December 2007), EMBASE (1980 to December 2007), CINAHL (1982 to December 2007), British Nursing Index (January 1984 to December 2007), AMED (1985 to December 2007), SIGLE (1980 to December 2007), and Dissertation Abstracts International (1861 to December 2007) were all searched using key words. Reference lists of all studies identified for inclusion and relevant reviews were also searched. In addition, relevant journals were hand searched and experts in the field of cancer-related fatigue were contacted. **Selection criteria**: Randomised controlled trials that investigated the effect of exercise on CRF during cancer treatment in adults were included. **Data collection & analysis:** Two review authors independently assessed the methodological quality of studies and extracted data based upon predefined criteria. Where data were available meta-analyses were performed for fatigue using a random-effects model.

Results: Thirteen studies were identified that investigated the effect of exercise on CRF solely in participants receiving cancer treatment. A meta-analysis was used to combine the post test results of the 13 studies. Fifteen comparisons were possible due to the inclusion of two intervention groups in two studies. However, Post-test means +/- SD were not available for five of the 15 comparisons. The remaining ten comparisons provided data for 528 participants who received an exercise intervention and 401 participants in the Control arm. At the end of the intervention period exercise was statistically more effective than the control intervention (SMD -0.18, 95% CIs -0.32 to -0.05).

Conclusions: Exercise can be regarded as beneficial in the management of cancer related fatigue for individuals receiving treatment for cancer. Further research is required to determine the optimal type, intensity and timing of an exercise intervention.

05-042

Motor Task Failure In Cancer Related Fatigue (Crf) Is More Attributed To Central Fatigue But Less To Muscle Fatigue

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Objectives: Impaired neuromuscular junction transmission and central activation failure results in less muscle fatigue during a sustained muscle contraction in CRF. We hypothesized that muscle signals during motor activity in CRF will change less compared to healthy controls.

Methods: Twelve patients with CRF and 12 matched controls performed a sustained isometric elbow flexion contraction using the right arm at 30% maximal level (S30) until failure to maintain the task. During the S30, EMG signals from the elbow flexor, extensor muscles and elbow flexion force were recorded. EMG amplitude and power at peak and median frequencies were analyzed at the beginning and end of S30.

Results: Median frequency decreased with fatigue in both groups. The value of the median frequency (59.3 Hz) in CRF at the beginning of S30 was similar to the median frequency (58.6 Hz) in controls at the end of S30. The

power at both the peak and median frequencies was similar between the two groups at the beginning of the S30 but patients experienced significantly smaller power increase at the end of the S30. Amplitude (root mean square) of the EMG was similar between groups at the beginning of the S30 but the amplitude had a significantly smaller increase at the end of the S30 in the CRF. The peak, median frequencies, power at these frequencies, and EMG amplitude at the end of S30 in CRF were not different from the values of controls at the beginning of the S30.

Conclusions: These findings suggest that CRF patients and controls had similar levels of perceived fatigue but the level of muscle fatigue at the end of the S30 was less in CRF. The feeling of fatigue at the end of the S30 in CRF is attributed to central rather than peripheral (muscle) mechanisms.

05-043

Exercise Management of Cancer-Related Fatigue: A Survey of Current Physiotherapy Practice Within The UK

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Objectives: To determine current physiotherapy practice regarding the exercise management of Cancer-Related Fatigue (CRF) within the UK. CRF affects 70-100% of cancer patients and currently exercise has the strongest evidence base for treating CRF (NCCN, 2007), however very little is known about the exercise recommended or used with cancer patients. In addition the current evidence base is weak in its external validity, limiting evidence based practice.

Methods: Ethical approval for an anonymous, census survey was granted and a postal questionnaire was distributed in June 2007 to 368 practising physiotherapist members of the Association of Chartered Physiotherapists in Oncology and Palliative Care, a special interest group of the professional body the Chartered Society of Physiotherapy within the UK. Data was analysed descriptively and presented as summary statistics.

Results: A valid response rate of 65% (223) was achieved. Therapists had a mean of 6.8 years (SD=5.6) experience in oncology and/or palliative care. The sample represented a range of work settings and included therapists with experience in palliative (97%), end of life (86%) and curative care (53%). Therapists reported using exercise with a range of cancer patient groups, during all stages of disease. Low level exercise intensities are most commonly used, including comfort or symptom limited exercise (96%) and low to moderate intensity interval training (82%). Walking (99%), bed and chair based exercises (93%) and stretching (73%) are the most commonly used and recommended exercises, 30% of therapists also run exercise classes.

Conclusions: Current physiotherapy use of exercise to manage CRF within the UK is varied in the exercise programmes and patient groups involved. This information supports the need to widen and strengthen the evidence base to support current practice. Further research should be clinically relevant involving under researched patients groups and exercise programmes.

05-044

Too Tired To Recover? Outcomes of a Cancer-Related Fatigue (Crf) Clinic

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Objectives: Background/Objectives Fatigue is a prevalent symptom in cancer patients. We began a CRF Clinic in 1998 and report on 260 patients evaluated between 1998 and 2005. Our study objectives were to determine CRF treatment success and number of visits until improvement.

Methods: Methods CRF patients were identified and their data validated. The Brief Fatigue Inventory was used as our primary outcome measure. Fatigue categories included severe and non-severe (moderate/mild). Treatment success was defined as reducing baseline fatigue to the lesser fatigue category/subcategory. Patients' baseline and follow-up (FU) fatigue categories were determined. Descriptive statistics and fatigue category baseline/FU differences were obtained. For patients with treatment success, the FU visit # at which the fatigue reduction was achieved was recorded and served as our secondary outcome measure.

Results: Results Demographics: 260 patients with baseline fatigue data were identified and had a mean age of 56 years (range 24–86 years); 66% (n=172) were female, 82% (n=212)

white, and 65% (n=168) married. The most frequent diagnostic groups were breast (33%, n=87) and leukemia/lymphoma/myeloma (17%, n=45). Nearly half of patients reported severe fatigue (47%, n=123); of those with non-severe fatigue, 80% (n=110) had moderate and 20% (n=27) mild fatigue. Treatment success: 54% (n=140) had at least one FU. Of these, 68% (47 of 69) with severe fatigue decreased to non-severe. Additionally, 50% (29 of 58) of moderately fatigued patients reduced to mild fatigue. Overall, 60% (76 of 127) achieved targeted fatigue reductions. Treatment length: Of 76 successfully treated patients, 62% (n=47) reported success by FU#1, and 21% (n=16) by FU#2. Thus, 83% (63 of 76) of patients achieved fatigue reductions within two FUs.

Conclusions: Conclusion Our CRF Clinic improved fatigue for a majority of returning patients within 2 FUs. Future investigations include determining factors affecting responders and non-responders.

05-045

Psychological Distress, Gender, Education And Development of Cancer-Related Fatigue Among Patients Undergoing Chemotherapy: A Urcc Ccop Study

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Objectives: Cancer-related fatigue (CRF) is a debilitating symptom that affects patients' psychosocial functioning and quality of life. Reported incidence rates of CRF vary from 70 to 100%. The causes of CRF have been attributed to a combination of biopsychosocial factors including physiologic changes related to the malignant tumor, physical side effects of cancer treatment, and psychological correlates of the cancer diagnosis and associated treatments. The present study examines the contributions of psychosocial distress and patients' demographics to cancer-related fatigue.

Methods: 854 cancer patients beginning chemotherapy at 23 geographically different URCC CCOP affiliates were assessed for fatigue. Fatigue levels and psychological distress were assessed at Cycles 2 and 4 using psychometrically valid measures. An unbiased conditional tree analysis was conducted to examine the effects of psychosocial distress and socio-demographics on CRF. A total of 642 cancer patients (202 males and 440 females) between 18 and 90 years old provided complete data.

Results: Baseline tension/anxiety, reported cognitive difficulties, gender and education contributed significantly to fatigue at cycle 4 among patients with low to moderate baseline fatigue (all ps≤.01). Patients' psychosocial distress and socio-demographics had no significant effect on severe fatigue.

Conclusions: Psychological distress and socio-demographics influence the development of CRF. Efforts to control CRF should consider and integrate information about patients' psychological states and socio-demographic backgrounds.

05-046

Different Nations, Different Views: Cancer-Related Fatigue In German Paediatric Patients

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Objectives: Studies from the USA and Great Britain demonstrate the existence of Cancer-related fatigue (CRF) in paediatric oncology. That is a difference to Germany: Here the topic CRF in paediatric oncology is hardly considered by the science. Since 2006 the questionnaire PedsQL 3.0 Multidimensional Fatigue Scale exists in German language.To provide a primary impression with this first German version of the standardized questionnaire in clinical research. In order to be able to estimate the force of expression of these first data, they were compared with the reference values from the USA.

Methods: 66 children in the Centre for Paediatric Oncology at the University Frankfurt were examined by patient questionnaires. If their parents were present, a parent's questionnaire was handed out to them. As reference, the results of the patients were compared to data from 240 healthy children in Frankfurt.

Results: This clinical pre-study confirmed the existence of CRF in paediatric oncology by low values in the dimensions 'general fatigue' and 'fatigue related to sleep/rest'. The answers were compared with the data of the healthy children and the results from the USA. The German oncological group shows lower values than the American group. Otherwise the healthy population in Germany is very tired, the American control group demonstrates less Fatigue.

Conclusions: German parents score lower in estimating their children's fatigue than American parents. Comparison of the responses from parent and children indicate that parents underestimate CRF in their children. There is a difference in the perception of CRF in Germany and the USA. The researcher presents his practical experiences to reduce CRF.

05-047

Fatigue In Breast Cancer Patients: A Follow-Up Study

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Objectives: Fatigue is one the most common reported symptom among breast cancer patients. The objective of this study was to examine fatigue in breast cancer patients during a year after initial treatment.

Methods: As part of a study on quality of life in breast cancer patients, fatigue was assessed in a sample of newly diagnosed breast cancer patients prospectively. Fatigue was measured at three points in time: at diagnosis, three months after initial treatment, and a year after the second examination (follow-up period=18 months) using the EORTC QLQ-C30 fatigue subscale (scores ranging from 0 to 100 with higher score indicating a greater symptom). In addition to descriptive analysis of data, the relationship between fatigue and demographic and clinical variables was studied.

Results: In all, 167 breast cancer patients were entered into the study during one complete calendar year. The mean age of patients was 47.2 (SD=13.5) years, and the vast majority of cases (82%) underwent mastectomy and the disease stage was as follows: 17% local, 46% loco-regional and 37% metastatic. The fatigue scores for the three assessments times were 17.8, 33.1, and 36.2 respectively indicating a considerable increase during the time. With regard to patients' age, scores did not show any significant differences at two last assessments but at the baseline a significant result was emerged suggesting that younger and older patients were more fatigued (P=0.02). Fatigue significantly was differed among patients with different disease stage (P< 0.001) indicating that mtastatic patients suffered more. However, there were no significant differences between different treatment groups.

Conclusions: The findings suggest that fatigue is time dependent and more a perceptional symptom that might differ depending on patients' clinical or demographic status or both. Indeed fatigue should be managed based on perceptions of any single patient at any given point in time.

05-048

Probability of Fatigue Occurrence Among Colo-Rectal Cancer Patients

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Objectives: To identify the predictive factors of fatigue and to calculate the probability of occurrence of fatigue among colo-rectal cancer patients.

Methods: Transversal study conducted from July/2006 to July/2007. Non-probabilistic sample of 157 adult out-patients with primary colo-rectal cancer recruited from 4 oncology clinics at Sao Paulo, Brazil (mean age 60± 11.7 years; 54% male; educational level 10.7±5.4 years). Fatigue, the dependent variable of this study, was assessed by the Piper Fatigue Scale-revised (0-10; α=0.94), and patients were considered fatigued when they scored 4 or higher. Independent variables were assessed by an Identification Profile, Beck Depression Inventory (0-63; cut-score: >13, α=0.83), Karnofsky Scale (0%-100%; cut-score: 5), and Pain scale (0-10; cut-score: >6). Univariate analysis identified risk factors and forward stepwise logistic regression analyses identified predictive factors. Probability was calculated by logistic regression mathematical formula.

Results: Public oncology clinic, pain, sleep disturbance, poor performance status and depression were significantly associated to fatigue ($p<0.05$) and were considered risk factors. Regression analyses revealed that depression (OR: 4.2; 95%CI 1.68-10.39), performance status (OR: 3.2; 95% CI 1.37-7.51), and sleep disturbance (OR: 3.2; 95%CI 1.30-8.09) independently predicted fatigue. When the three predictive factors were present in concomitance, the probability patients had fatigue was 80%, and while the three factors were absent, the probability was 8%. The specificity and sensibility of this model were 81.9% and 58.6%, respectively. A numeric scale for fatigue measurement (0-10), which highly correlates to the Piper Scale, can reduce chance of not detecting fatigue cases.

Conclusions: The findings of this study suggest that by assessing depression, performance status and sleep disturbance is possible to know the probability a colo-rectal cancer patient will have fatigue. The results allowed the construction of a Prediction Table which can be easily applied in clinical oncology practice for the prediction of fatigued cancer patients.

05-049

Fatigue In Testicular Cancer Survivors

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Objectives: Fatigue has been described in breast and ovarian cancer survivors. Many of these survivors were exposed to platinum compounds, commonly used to treat testicular cancer. This study aimed to describe the prevalence of fatigue among testicular cancer survivors (TCS).

Methods: TCS, for at least 2 years, were surveyed utilizing the Brief Fatigue Inventory, Hospital Anxiety and Depression Scale, and SF-12. Their records were reviewed for demographics, comorbidities, and complications of treatment of testicular cancer. Historical controls (152 males) from a previous study were used for comparison. Standard descriptive statistics and chi-square tests were used to describe and compare the prevalence of fatigue.

Results: Mean age was 41 years (18-74), 79.2% white, mean follow-up 8.2 years, 72.9 % had nonseminoma, 96.9% orchiectomy, 43.8% other surgeries, 20.8% received radiation, and 81.3% platinum-based compounds. Depression was present in 8.3% and anxiety in 28.1%. Fatigue was reported by 44.8% of the survivors (Mild 24.0%, Moderate 15.6%, and Severe 5.2%). Fatigue level was significantly lower ($p<0.0001$) than the historical controls (total 90.1%, Mild 44.1%, Moderate 32.2%, and Severe 13.8%). Mean age of controls was 56 years. SF-12 results shows a Physical Component Summary (PCS) of 56.4 and Mental Component Summary (MCS) of 49.2 (PCS 50.6 and MCS 50.4 for males in general population).

Conclusions: Recent study of Nordic TCS had failed to show any statistically significant difference in fatigue score between survivors and controls. In our study of American TCS, the rate of fatigue in testicular cancer survivors was significantly lower than local historical controls. This is probably due to an older age of our controls and the lower incidence of severe anxiety and depression in our survivors. Our results suggest that fatigue is unlikely to be related to platinum or orchiectomy but may be more related to age, malignancy type, anxiety, and depression.

05-050

Fatigue In Gynaecological Cancer Patients: A Prospective Longitudinal Survey

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Objectives: Fatigue in gynaecological cancer has received minimal investigation. The aims of this survey were to analyse the fatigue experienced over 12 months by a gynaecological cancer population, to determine if the fatigue was more severe than that reported by non-cancer females, and to explore the variables associated with Cancer-Related Fatigue (CRF). Ethical Approval was obtained from the Office for Research Ethics Committees Northern Ireland (ORECNI).

Methods: A prospective longitudinal survey was implemented involving gynaecological cancer patients from three cancer centres, and age and gender matched controls with no cancer history. Data was collected over a 12 month period during and after anti-cancer treatment. Fatigue was assessed using the Multidimensional Fatigue Symptom Inventory-Short Form (MFSI-SF).

Results: Sixty-five cancer patients (mean age=57.4, SD 13.9) and 60 non-cancer subjects (mean age 55.4, SD 13.6) participated. General Linear Modelling (GLM) indicated that females with cancer had significantly worse fatigue than non-cancer females at all time points ($p=0.00$). The GLM also indicated that the level of CRF changed with time ($p=0.02$). A forward stepwise regression demonstrated that psychological distress level was the only independent predictor of CRF during anti-cancer treatment ($p=0.00$), explaining 44% of the variance in fatigue. After treatment, both psychological distress level ($p=0.00$) and physical symptom distress ($p=0.03$) were independent predictors of fatigue, accounting for 81% of the variance.

Conclusions: Individuals with gynaecological cancer experienced significantly worse fatigue than cancer-free women during treatment, and fatigue persisted after treatment was complete. Psychological distress was found to be an important indicator of CRF in this population. These findings signify a need for research regarding the management of CRF in women with gynaecological cancer.

05-051

Functional Brain-Muscle Signal Coupling Is Impaired In Cancer Related Fatigue

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Objectives: 1) We hypothesized that corticomuscular communications are impaired in CRF, which would lead to a reduction in functional coupling between the brain and muscle signals during a voluntary muscle contraction. EEG-EMG coherence is an estimate of brain-muscle signals coupling; 2) To understand EMG-EEG coherence in CRF compared to controls

Methods: Seven patients with advanced solid cancer and 8 matched healthy controls completed a Brief Fatigue Inventory (BFI) to assess perceived fatigue. All the subjects performed a sustained isometric elbow flexion contraction of the right arm at 30% maximal level (S30) until task failure. During the S30, a 128-channel EEG, surface EMG signals of the elbow flexor and extensor muscles, and elbow flexion force were recorded. Coherence between the EEG and EMG of the muscles was determined during the first half and second half of the S30.

Results:CRF patients showed significantly higher ($P<0.01$) BFI scores (5.37 ± 1.01 for CRF and 0.85 ± 0.56 for controls) and shorter duration of S30 ($P<0.01$) (S30 lasted for 320 s for CRF and 550 s for controls). EEG-EMG coherence in beta frequency (15–35 Hz) in the non-fatigued stage was significantly lower ($P<0.01$) in CRF vs. controls (average normalized EEG coherence with EMG of an elbow flexor 3.52 ± 0.41 for CRF and 4.71 ± 0.51 for controls). However, the level of coherence was similar in the fatigue stage between the two groups as a result of lowering of the coherence in the control group in the fatigue stage.

Conclusions: These data suggest that the strength of brain-muscle signal coupling in CRF under a "non-fatigued" condition matches that under a fatigued condition in controls, indicating that the patients were already centrally fatigued at rest.

06-052

Reduced Sexual Enjoyment, Interest, And Performance Are a Concern of Gi And Breast Cancer Patients

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Objectives: To determine how commonly oncology patients report sexual problems, and how these concerns relate to other patient-reported outcomes (PROs).

Methods: E/Tablets, wireless tablet personal computers used to collect survey information in the clinic, were used to collect data from gastrointestinal (GIC) and breast (BC) cancer outpatients during 4 visits over ≤6 months. Measures included: sexual problems (i.e., "problems with reduced sexual enjoyment, interest or performance") on a 0-10 numerical rating scale (NRS), quality of life (Functional Assessment of Cancer Therapy-General; FACT-G); MD Anderson Symptom Inventory (MDASI); NCCN Distress Scale (Distress).

Results: In 88 GIC patients (mean age 55 [SD 11]; 66% male; 80% white), mild (NRS 1-3) sexual problems were reported in 24%, moderate (NRS 4-6) in 18%, and severe (NRS >6) in 18%. As sexual problems increased, FACT-G functional well-being (FWB) decreased (mean FWB for none, mild, moderate and severe sexual problems, respectively): 21.3 [SD 4.7], 18.6 [SD 3.7], 15.7 [SD 5.0], 13.7 [SD 6.4]. Level of sexual problems correlated highly with all FACT-G subscales: FACT-G physical (-.39, $p<.001$), social (-.52, $p<.0001$), functional (-.45, $p<.0001$), emotional (-.27, $p=.01$), and total (-.55, $p<.0001$). Similar patterns emerged for MDASI, Distress, contentment with quality of life, and feeling bothered by side effects of treatment. In 55 BC patients (mean age 51 [SD 12]; 78% white), mild sexual problems were reported in 24%, moderate in 14%, and severe in 13%. Correlations of sexual problems in BC patients with other PROs were similar to those in GIC patients.

Conclusions: E/Tablets captured information on sexual concerns in two cancer populations. Reductions in sexual enjoyment, interest and performance were common and correlated with decreases in a broad range of PROs including quality of life, other symptoms, and distress.

06-053

Assesessment of the Prevalence of Sexual Dysfunction, Depression And Anxiety In Undderserved And Minority Patients with Gynecologic Cancers

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Objectives: Hispanics and African Americans comprise 33% and 18% of the population in Harris County, Texas. Our goal was to assess the prevalence and severity of depression, anxiety, and sexual dysfunction in underserved and minority women in the gynecologic oncology clinic at a county hospital over a 6 month period.

Methods: Eligible women were asked to complete the Female Sexual Function Index (FSFI), the Hospital Anxiety and Depression Scale (HADS) and a demographic survey anonymously. Surveys were in English and Spanish. An FSFI score=11 on either subscale was considered a case of psychological morbidity. Summary statistics were calculated for the HADS sub scores. A univariate analysis of demographic factors by sexual dysfunction was completed. A logistic regression model was created from the significant factors in the univariate analysis with $p<.25$. Terms were eliminated via backwards regression techniques for a final model if statistically significant. Statistical imputation techniques estimated missing data to calculate HADS and FSFI scores.

Results: Respondents were Hispanic (51.8%), African-American (23.8%) and Caucasian (22.6%) Eighty five per cent had sexual dysfunction (95% exact CI 78.32%-89.89%). Twenty two percent reported a sexual abuse history of 167 women with usable scores, 24.5% were borderline abnormal and 20.4% were abnormal for depression. 24.5% were borderline abnormal and 29.3% were abnormal for anxiety. Unmarried, older age (average age 50 years) and presence of children were related to sexual dysfunction. Fewer Hispanics reported sexual dysfunction than African-American or White women (77% vs. 92%). Women who had higher FSFI scores tended to have lower HADS scores.

Conclusions: Underserved and minority women with gynecologic cancers have high levels of sexual dysfunction. More research is needed in order to address and intervene in this important aspect of survivorship.

07-054

Efficacy of a Factor Xa Inhibitor In the Resolution of VEnous Thrombo-Embolisms (Vte): A Randomized, Phase Iii Trial of Anticoagulation Versus Anticoagulation Plus Inferior Vena Cava (Ivc) Filter

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Objectives: Thrombosis is a major cause of death in patients with cancer. More than 20% have VTE propagation and re-thrombosis on standard anticoagulation (Prandoni 2007). The role and benefit of IVC filters remains controversial. Resolution of DVT takes an average of 6 months in non-cancer patients (Asbeutah 2004); thrombi remain detectable in 50% after a year (Kearon 2004).

Methods: Patients with malignancy were eligible with an acute VTE (DVT and/or PE), and were randomized to fondaparinux (FS) alone [5 mg SC patients <50 kg, 7.5 mg SC patients 50–100 kg and 10 mg SC patients >100 kg] vs FS+IVC filter. 106 patients are planned. The primary endpoint is survival without recurrent VTE. Secondary endpoints include safety and clot resolution, given in this report. After safety review in patients >65 yrs, FS was reduced to 5 mg during the study. Patients were evaluated every 2 weeks for 4 weeks then every 4 weeks.

Results: To date 35 patients were randomized. All have stage IV; 94% on chemotherapy, median age 67 (range 38–89). Diagnoses: lung (25%), GI (22%), and breast (19%) cancers; 9% have brain metastases. Of patients re-evaluated with DVTs: 16/21, 76% [95% CI: 53–92%] had complete or partial clot resolution (average of 40 days). Of those with PE: 10/11, 91% [95% CI: 59–100%] had complete clot resolution. Toxicities were more prominent in patients >65, 1 with marked ecchymosis, 1 with fatal hemorrhage into a brain metastasis.

Conclusions: This study remains blinded to treatment arm; however, current observations are important: 1) complete clot resolution is observed in many, despite past studies using low molecular weight heparins not reporting such resolution in cancer patients; 2) the factor Xa inhibition may be responsible for this clot resolution; 3) FS was well tolerated and appears safe in those over age 65 at our recommended lower dose.

07-055

A Significant Survival Advantage Is Found with Anticoagulation Without the Use of Ivc Filters In Elderly Cancer Patients with Venous Thromboembolism Based On a Retrospective Analysis

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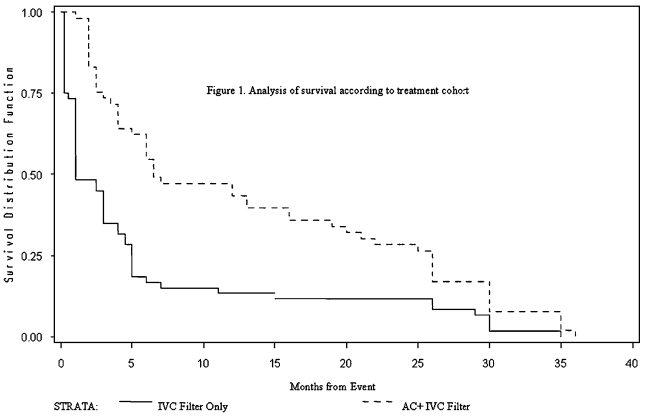
Objectives: Cancer patients have an increased incidence of VTE. Age, alone, is a risk factor for VTE; the frequency doubles each year after the age of 49. Consequently, elderly cancer patients have a compound risk for thrombosis. IVC filters are used extensively in the US; over 40,000 are inserted annually. The impact on survival of elderly cancer patients receiving IVC filters has not been studied.

Methods: A retrospective study examined 99 cancer patients, >65 years of age, with VTE in order to compare the effects of IVC filter placement with anticoagulation (AC) therapy on survival. Patients were stratified into 3 cohorts: AC (n=33), IVC filter (52), and IVC filters+AC (14).

Results: Treatment groups did not differ with respect to age, gender, or albumin levels. Groups did differ for PS ($P < 0.033$ chi-square test, better PS was associated with AC only) and for type of thrombus ($P < 0.007$ chi-square, DVT was associated with AC, PE with IVC, and DVT/PE with AC+IVC). Survival was significantly greater in patients treated with AC (13 mos) compared to IVC filters (1.75 mos) or IVC+AC (4.75 mos) ($p < 0.0016$). IVC patients were 1.96 times more at risk of death than AC only (hazard ratio .510; 95%CI .317-.818). Multivariate analysis revealed that PS and type of thrombus were not confounders and had no effect on survival.

Conclusions: IVC filters are used extensively in elderly cancer patients for the treatment of a VTE, no statistically sound data compares IVC filters with AC in cancer patients. Based on this analysis, AC should be considered primary therapy for older cancer patients with VTE while IVC filters should be considered a therapeutic option mainly when AC is strictly contraindicated. We are currently addressing this issue with a prospective phase III randomized trial.



07-056

Initial And Long-Term Outcomes of Splenectomy In Adult Immune Thrombocytopenic Purpura (Itp) Patients: A Systematic Review And Meta-Analysis

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Objectives: Splenectomy is a common therapy for adults with chronic ITP. Laparoscopic splenectomy was introduced in 1991 with the goal of reducing complication rates. This study estimates both the initial surgical non-response rate and the long-term relapse rate of splenectomy in the post-laparoscopic era.

Methods: PubMed was searched for articles published between January 1, 1991 and October 3, 2006. Selection criteria included: chronic ITP, study enrollment in 1990 or later, ≥12 months of follow-up, ≥15 patients with ITP, ≥75% of patients ≥14 years of age, and not undergoing a second splenectomy. Splenectomy failure rates were collected according to author-defined platelet response criterion (platelet counts $<50\times10^9$/L or $<30\times10^9$/L in 75% of studies). Relapse rates post-splenectomy (using the same platelet response criteria) were also collected. A meta-analysis was conducted to estimate pooled surgical failure rates and pooled relapse rates in responders by weighting the study-specific estimates by the inverse of their variances, using Stata 9™. The pooled relapse rate was converted to a probability using the formula, $e^{(-\text{rate} \times \text{time})}$.

Results: We identified 161 articles for detailed review; 24 met our inclusion criteria and all were observational studies. These studies represent 1138 laparoscopic splenectomies (66 or 5.8% were converted to open splenectomy during surgery), and 317 open or undefined splenectomies.

The average surgical failure rate across 21 studies reporting data was 12% (95% CI: 10–14%). The average long-term relapse rate per person-year across all studies was 53 per 1000 patient-years (95% CI: 45-62%). This corresponds to a 5% per year failure rate, or 32% failure rate after 5 years, for all patients initiating surgery.

Conclusions: Splenectomy, although part of standard care, is not always initially successful and does not provide a durable response in all patients. The benefits and risks of splenectomy must be weighed with respect to newer medical therapies and treatments in development. Supported by Amgen, Inc.

07-057

The Antithrombotic Agent of Choice For Prophylaxis of Thalidomide Induced Deep Vein Thrombosis - Warfarin Or Low Dose Aspirin ??- An Indian Experience

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Objectives: Thalidomide and dexamethasone combination has become one of the most widely used treatment of newly diagnosed multiple myeloma. Thalidomide is a known thrombogenic agent with the reported incidence of thrombogenicity of 12-26% when used in combination with dexamethasone. There is no standard of care for prevention of thalidomide induced deep vein thrombosis. The study was carried out to compare the efficacy of low dose aspirin with warfarin in preventing deep vein thrombosis in patients on treatment with thalidomide and dexamethasone for multiple myeloma.

Methods: 78 patients of multiple myeloma who were treated with thalidomide and pulsed dexamethasone from Jan 2005 to Dec 2007 were randomized to receive either warfarin (target INR 2.0–3.0) or aspirin at a fixed daily dose of 75 mg/day.

Results: 34 patients received warfarin while the other 34 patients received aspirin as thromboprophylaxis. The two cohorts were well matched for age and disease characteristics. 2 patients (6%) suffered venous thrombosis in the aspirin arm while 1 patient (3%) suffered venous thrombosis in the warfarin arm. The difference was not statistically significant ($p=0.08$). No patient developed pulmonary embolism. There was no mortality attributed to antithrombotic agent in either arm. The patients who received warfarin had much higher incidence of haemorrhage (n=16) compared to those who received aspirin (n=2). There were significant logistic issues with getting weekly prothrombin time and INR test done in patients who received warfarin.

Conclusions: This study shows that aspirin is non inferior to warfarin in preventing venous thrombosis induced by thalidomide in combination with dexamethasone with lesser incidence of bleeding and the convenience of avoiding frequent INR monitorings. Although its mechanism of action in preventing venous thrombosis is still elusive, in developing countries, low dose aspirin is usually the antithrombotic agent of choice in this setting.

07-058

Reduction In Immunoglobulin (Ivig Or Anti D) Use In Patients with Chronic Immune Thrombocytopenic Purpura (Itp) Receiving Romiplostim (Amg 531): Results From Two Phase 3 Randomized Placebo-Controlled Trials

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Objectives: Romiplostim is an investigational Fc-peptide fusion protein (peptibody) that stimulates thrombopoiesis by the same mechanism as endogenous thrombopoietin. We report pooled data on acute use of immunoglobulins (IVIG or Anti D) in both splenectomized and nonsplenectomized patients from 2 randomized, double blind, placebo-controlled phase 3 studies evaluating efficacy and safety of romiplostim in adult patients with chronic ITP.

Methods: Immunoglobulins were allowed as rescue medication at the physicians discretion, and concomitant medications were continued. No difference was observed between splenectomized and nonsplenectomized patients; therefore pooled results are shown.

Results: Of the 125 patients enrolled, 63 were splenectomized (placebo, 21; romiplostim, 42), and 62 were nonsplenectomized (placebo, 21; romiplostim, 41), all with mean baseline platelet counts of $<30\times10^9$/L. In the 24-week study period, there were 19 immunoglobulin administrations among 83 romiplostim patients, and 68 immunoglobulin administrations among 42 placebo patients. The cumulative probability of incurring immunoglobulin use in 24 weeks was 0.51 (SE: 0.08) for the placebo arm and 0.13 (SE: 0.04) for the romiplostim arm, with a hazard ratio of 5.31 (95% CI: 2.55-11.06, $p<0.001$). Per-cycle immunoglobulin use ranged from 19% to 29% in the placebo arm, and from 0% to 6% in the romiplostim

arm ($p \leq 0.01$ in all cycles). Subgroup analysis of patients with an overall response (defined as either platelet count $\geq 50 \times 10^9$/L for ≥6 weeks during the last 8 weeks of treatment in the absence of rescue medications at any point in the study, or ≥4 weekly platelet counts $\geq 50 \times 10^9$/L in the absence of rescue medications in the previous 8 weeks) showed that compared to placebo patients, overall responders to romiplostim had even greater reduction in immunoglobulin use in each cycle (0 to 4%, $p < 0.006$).

Conclusions: Romiplostim treatment was associated with significantly reduced immunoglobulin use in both splenectomized and nonsplenectomized patients with chronic ITP. Supported by Amgen, Inc.

08-059

Antibiotic Stewardship Initiative In the Intensive Care Unit (Icu): Evidence From a Quality Improvement Project Supporting the Development of a Multidisciplinary Antimicrobial Stewardship Team (Mast)

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Objectives: Cancer patients are at high-risk for infections. There is substantial use of antibiotics in such patients and antimicrobial resistance has become a problem, especially in the ICU. The relatively dry pipeline for new antimicrobials demands judicious use of available agents. In January 2006, we launched an Antibiotic Stewardship Initiative focusing on vancomycin and carbapenem usage in the ICU.

Methods: Previous data from our institution showed that extended use of carbapenems and vancomycin was associated with multidrug-resistant Pseudomonas and with vancomycin resistant Enterococcus infection, respectively. Judicious use was defined as the use of carbapenems or vancomycin for ≤7 days, unless clinically or microbiologically indicated. From September to December 2006, we evaluated the process of our antibiotic stewardship in the ICU, monitored the compliance with the judicious use, made recommendations and conducted educational activities, using a new Infectious Diseases dedicated team.

Results: Our interventions increased the compliance with the judicious use of vancomycin and carbapenems in the ICU from 68.2% during Nov-Dec'05 to 91.7% during Nov-Dec'06. Also, there was a reduction in the number of patients with non-judicious use of antibiotics (from 57 to 13 patients) and in the length of stay in ICU from 631 to 175 patient-days in ICU (equivalent to a reduction of cost of stay in ICU from $4,524,901 to $1,254,925). There was not enough data to show an impact in antimicrobial resistance.

Conclusions: Based on our results and following the recent recommendations from nation-wide organizations, we recommend the development of a dedicated Multidisciplinary Antimicrobial Stewardship Team that would not be a financial burden and would promote and monitor the appropriate use of antibiotics.

08-060

Molecular Epidemiology of a Clonal Outbreak of Epidemic Multidrug-Resistant (Mdr) Escherichia Coli Causing Bloodstream Infection In Cancer Patients

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Objectives: Multidrug-resistant Escherichia coli (MDR E. coli) bacteremia has emerged as an important health care problem in our cancer patients, not only for its resistance pattern but also because of its increasing incidence and severity. We therefore felt the need to investigate for clonality, to determine the possibility of horizontal transmission in our institution.

Methods: A case control study was conducted comparing 58 patients with MDR E. coli bacteremia compared with 115 high-risk controls. MDR E. coli was defined as resistance to quinolones plus at least one of the following: piperacillin, ceftazidime or cefepime. In order to determine the possibility of one or more clonal clusters of E. coli strains causing bloodstream infection in cancer patients at MD Anderson Cancer Center, we pursued a DNA analysis of 22 MDR E. coli isolates. Pulsed-field gel electrophoresis (PFGE) technique with Xbal was used to identify DNA interstrain variability.

Results: A multivariate analysis of the case control study showed that prior hospitalization within 30 days of admission was the only independent risk factor for MDR E. coli bacteremia. The results of our PFGE analysis showed diverse DNA patterns among the MDR E coli strains. One group of 6 isolates (27.3%) displayed an identical DNA banding pattern and another group of 2 isolates also showed distinct DNA pattern. These 8 isolates (36.4%) were closely related since

they differed from each other by only 1 DNA band, representing a clonal outbreak. The remaining 14 isolates differed in 2 or more DNA fragments among each other.

Conclusions: Molecular methods confirmed the findings of a case control study suggesting a nosocomial clonal transmission of MDR E. coli at our center. Infection control measures have been implemented in our institution.

08-061

Electrophoretic Karyotyping And Antifungal Susceptibility of Sequentially Oral *Candida* Spp. Isolates of Hematopoietic Stem Cell Transplant (Hsct) Recipients

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Objectives: The purpose of this study was to perform a prospective analyzes of the oral *Candida* carriage in HSCT patients and the susceptibility to fluconazole. In addition, to analyze the electrophoretic karyotyping (EK) of isolates associated with oral candidosis (OC) in order to determine the similarity between colonization and infection strains.

Methods: Thirty-five sequential HSCT (21 allo-HSCT and 14 auto-HSTC) patients were enrolled on this study. Unstimulated saliva were collected in 5 different periods: A:before conditioning regimen; B:during the nadir (neutrophills less than 500cels/mm^3); C: after engraftment (neutrophills higher than 500cels/mm^3 by 48 h); D: day +50; E: day +100; and a new sample were colleted in the presence of OC up to day +100. The minimal inhibitory concentration (MIC) was established following microdilution CSLI protocol and the EK was performed by pulsed-field gel electrophoresis (PFGE).

Results: Oral colonization by *Candida* was found in 57% of the patients. *C. albicans* and *C. parapsilosis* were the most frequent species (63% and 20%, respectively). During the prophylactic fluconazole use (200 mg/day) a reduction of the 60% in colonized patients as well as a reduction of CFU/mL were observed. In the post-engraftment period there was an increase of the CFU/mL (range 2–8.725). In the later period of the HSCT, 4 patients developed OC. All of these 4 patients were initially colonized by *C. albicans* and 3 of them exhibited strains with the same EK pattern during infection event. Sequential *C. albicans* with similar EK pattern exhibited small MIC variation.

Conclusions: The persistence of the same strain of *C. albicans* during the period of study may suggest that inherent host factors predispose the oral infection in the post-engraftment period. The previous oral colonization appears to be a pre-requisite for OC development.

08-062

Clinical And Economic Impact of Hospitalization For Methicillin-Resistant *Staphylococcus Aureus* Infections Among Community-Dwelling Cancer Patients In Texas

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Objectives: Methicillin-Resistant *Staphylococcus aureus* (MRSA) is becoming an increasingly common and serious cause of infections in both healthcare facilities and the community. Yet, the outcomes of these infections among cancer patients remain undescribed. We conducted a population-based study of incidence trend, mortality, and cost of MRSA-related hospitalizations among community-dwelling cancer patients.

Methods: From the Texas Hospital Discharge Database, we identified all Texas residents with cancer who were admitted with a primary or admitting diagnosis of infection between 1/1/1999 and 12/31/2004. Patients who were transferred from another healthcare or law enforcement facility were excluded. The billing records of the eligible patients were examined for ICD-9 codes indicating MRSA infections. We computed the 1999–2004 statewide annual risk of MRSA-related hospitalization using age-standardized cancer prevalence estimates derived from national cancer prevalence data and state-specific census data and projections. We transformed hospital charges into costs using Medicare cost-to-charge ratios for Texas and then inflated them to 2008.

Results: From 1999 to 2004, a total of 2,725 hospitalizations due to MRSA infections occurred among community-dwelling cancer patients in Texas. Skin/wound infections and pneumonia alone predominated, accounting for 32% and 21%, respectively, of all the MRSA-related hospitalizations. The estimated risk of MRSA-related hospitalization nearly doubled during the study period, increasing from 53 per 100,000 persons with a history of cancer in 1999 to 105 per 100,000 in 2004 (Cochrane-Armitage test for trend, $p<0.001$). The rate of in-hospital

mortality was 5.1%. The mean length of stay was 9.7 days, whereas the mean cost per admission was $16,717.

Conclusions: MRSA-related hospitalization of community-dwelling cancer patients result in significant clinical and economic burden. The estimated risk of hospitalization due to MRSA in Texas increased nearly two-fold within a 6-year period. Further study of preventive strategies to reduce the burden of MRSA on cancer patients is warranted.

08-063

The Influence of Risk Factors On the Clinical Response And Speed of Response In the Patients with Febrile Neutrepenia (Fn)

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Objectives: We evaluate the clinical response (CR) (24 hours t° <37.8°C and subjective response) and speed of response (SR), regarding the risk factors: performance status (PS 0 vs. PS 1), type of tumor (solid tumors vs. lymphoma), type of infection (clinically/microbiologically documented vs. fever of unknown origin), duration of neutropenia (<7 days vs. ≥7 days) in the whole group of patients with FN.

Methods: Patients were randomly treated with cefoperazone vs cefoprazone/amikacin as empirical treatment of FN. We were analyzed 119 episodes of FN. Two groups were similar regarding the sex, age, chemotherapy, underlying disease, presence of documented infection (40 vs.30) and fever of unknown origin (22 vs. 27), mean duration of neutropenia (6.16 vs. 6.77 days respectively).

Results: There were significant differences in the CR regarding the PS (PS 1 vs. PS 2, $p<0.001$), type of infections (clinically/microbiologically documented vs. fever of unknown origin, $p<0.001$), duration of neutropenia (<7 days vs. ≥7 days, $p<0.001$), but there were no significant differences in the CR between solid tumors vs. lymphomas, $p=0.6$, in the whole group of episodes of FN. The speed of clinical response was significantly influenced by PS ($p<0.001$), duration of neutropenia ($p=0.01$), type of infections ($p<0.001$), but there are no significant differences in the speed of response regarding the type of tumor ($p=0.7$). Patient with better PS, fever of unknown origin, and duration of neutropenia less than 7 days, were significantly better in the CR and speed of response.

Conclusions: Response rate were similar in both groups, (77% vs. 82%, $p=0.59$), median time to clinical response was 4 days for both regimens (mean days 4.18 vs. 4.39, CI 0.95, lower 4, upper 5, $p=0.32$). There were no differences between type of tumor, but the PS, type of infection and duration of neutropenia significantly influenced the CL and SR.

08-064

Disseminated Salmonellosis In a Patient Treated with Temozolomide

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Objectives: Temozolomide is a new chemotherapeutic agent frequently associated with selective $CD4^+$ T-lymphocytopenia. Patients with cell-mediated immune defects are at higher risk for acquiring infections with Salmonella species. We describe a case of disseminated salmonellosis in a patient treated with temozolomide.

Methods: A 38 year old man with right temporal anaplastic astrocytoma presented with fever (39.6°C) and severe right hip pain. The patient had received temozolomide-based chemotherapy until the previous month and was also receiving chronic dexamethasone. He was leukopenic (WBC=2500/μL) and had a reduced absolute CD4 count (240/μL). He was not neutropenic. MRI of the right hip showed the presence of joint effusion suggestive of septic arthritis. Turbid fluid was aspirated from the joint. Gram stain revealed many white blood cells but no organism. Cultures of the joint aspirate grew Salmonella-serogroup C1 and Serratia marcescens. One blood culture also grew the same Salmonella serotype. The organism was susceptible to all agents tested (ampicillin, trimethoprim-sulfamethoxazole, cephalosporins and quinolones). HIV serology was negative. The patient was successfully treated with surgical drainage and moxifloxacin for four weeks (to which the Serratia isolate was also susceptible).

Results: Temozolomide induces prolonged and selective $CD4^+$ lymphopenia, thereby increasing the risk of opportunistic infections. Our patient had disseminated Salmonella infection in the setting of CD4 lymphopenia, which could be explained by previous treatment with temozolomide. The human organism depends on cell-mediated immunity for eradication of Salmonella infections through a Th1-type CD4 T-cell response and specific antibodies by B cells. While the association of temozolomide with lymphopenia and opportunistic infections is well recognized, no case of Salmonella infection has been described in the context of temozolomide treatment.

Conclusions: Although corticosteroid use and malignancy itself increase the risk for Salmonella infection, we hypothesize that temozolomide had an important role by depleting the CD4 lymphocytes.

08-065

Cytomegalovirus Infection In Patients with Solid Tumors

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Objectives: CMV infection, a known cause of morbidity and mortality among pts with hematologic malignancies and HSCT recipients, has rarely been studied in pts with solid tumors (ST). We sought to determine the risk factors for, and outcome of CMV antigenemia (CMV-A) and CMV disease (CMV-D) among these pts.

Methods: We reviewed the records of pts with ST with either CMV-A and/or CMV-D between July 1998 & Dec. 2005. CMV-A and CMVD were defined as the presence of antigenemia alone and end organ infection, respectively.

Results: Forty-Three patients (26 males & 17 females) were identified. The median age was 59 yrs (range: 2–85 yrs). The underlying malignancies included lung (13), gastrointestinal (10), genitourinary (7), sarcoma/melanoma (7), neurological (5), and salivary duct (1). Twenty-eight (65%) pts had CMV-A and 15 (35%) had CMV-D, mainly pneumonia (13/15, 87%). Most episodes occurred in pts who had progressive malignancy with distant metastases (65%), were on active chemotherapy (45%), and/or were on steroids (50%). Severe lymphopenia (ALC<300/dl) was found in 44% of pts. When compared to CMV-A, pts with CMV-D had higher mean peak CMV-A (90 vs. 25; p=0.06), metastatic or progressive malignancy (p=0.05) and were in the ICU (p=0.0001), Thirty-three pts (77%) received antiviral therapy, mainly with ganciclovir (14/15 with CMV-D and 19/28 with CMV-A) with a median duration of 16 d (range: 2–35d). CMV-related mortality was higher in pts with CMV-D (33% vs. 7%; p=0.03). Five out of 7 pts (71%) who died had CMV pneumonia.

Conclusions: Pts with ST could be at risk for CMV infection and it should be suspected in pts with severe lymphopenia and have metastatic disease. CMV pneumonia is associated with high mortality in these pts.

08-066

Pegfilgrastim In Patients Receiving Cancer Chemotherapy: Impact On Early All-Cause Mortality

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Objectives: Myelosuppression represents a major cause of dose-limiting toxicity in cancer patients receiving chemotherapy. Studies of the impact of myeloid growth factors in cancer patients with various comorbidities are needed.

Methods: A prospective study of 4,458 consecutive adult patients receiving cancer chemotherapy was conducted at randomly selected U.S. practice sites between 2002 and 2006. Progression-free survival (PFS) and overall survival (OS) within 60 days of chemotherapy were calculated and adjusted hazard ratios (HRs; 95% CI) were estimated by a Cox regression model incorporating time-dependent covariates.

Results: Patient age ranged from 18–97 years (41% >65). Stage IV disease, ECOG performance status (PS) >1 or major comorbidity were observed in 38%, 46% and 28%, respectively. Median period of observation was 75 days. Progressive or recurrent disease was reported in 298 (6.7%) while 137 (3.1%) died. Causes of death included 88 of progressive disease, 13 infection, 6 respiratory failure, 6 cardiac and 24 of other/unknown causes. Pegfilgrastim was administered to 1,209 patients based on the judgment of the oncologist with 620 receiving primary prophylaxis starting in cycle 1. Patients receiving prophylactic pegfilgrastim experienced superior PFS (HR=0.65, 0.46–0.92; P=.011) and OS (HR=0.41, 0.21–0.81; P=.008). In univariate analysis, any use of pegfilgrastim as a time-dependent covariate resulted in better PFS [HR=0.54; 0.40–0.72. P<.001] and OS [HR=0.40; 0.23–0.68, P<.001] compared to no pegfilgrastim. In multivariate analysis, pegfilgrastim use was associated with better PFS [HR=0.62; 0.44–0.88, P=.007] and OS [HR=0.44; 0.23–0.84, P=.012] after adjustment for other significant covariates including ECOG PS, Charlson comorbidity index, age, body mass index, cancer type and stage and year on study with stratification for oncology practice.

Conclusions: While pegfilgrastim support was individualized, the results presented here indicate that unselected cancer patients receiving chemotherapy with various comorbid conditions may experience better PFS and OS than patients not receiving pegfilgrastim.

08-067

Comparison of Infectious Episodes (Ie) And Mortality Due To Infections In Older Patients with Acute Myelogenous Leukemia (Aml) Or High-Risk Myelodysplastic Syndrome (Hr-Mds)Receiving Intensive Chemotherapy (Ic) And Low Intensity Therapy (Tt)

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Objectives: Infectious complications are frequent and severe complications in elderly patients with AML and HR-MDS receiving IC. TT emerges as an alternative to treat older patients with expected less complication. The aim of this review was to evaluate the IE among older patients treated with TT and compare to those treated with IC.

Methods: We retrospectively reviewed 319 patients older than 50 with AML or HR/MDS that received induction IC (209) or TT (110) as induction therapy from January 2005 to December 2006.

Results: Patients characteristics.

	IC (N=209)	TT (N=110)	P value
Median age (r)	65 (50–85)	72 (52–86)	<0.001
Sex F/M (%)	45/55	35/65	0.085
Good Performance Status	100	94	<0.001
Protected environment (PE) (%)	88	15	<0.001

Significantly fewer patients on TT had infections. Antibacterial, antifungal and antiviral prophylaxis was given in all 209 cycles of CT but in only 90(32%) of the 277 TT cycles. Types of infections are shown in table 2.

	IC	TT	P value
Number of patients without infections, n(%)	54(26)	55(50)	<0.001
No. infectious episodes	220	76	
Bacterial, n(%)	47(21)	18(24)	0.674
Fungal, n(%)	14(6)	2 (3)	0.215
Viral, n(%)	5(2)	3(4)	0.435
Pneumonia, n(%)	45(20)	14(18)	0.704
FUO, n(%)	101(46)	29(38)	0.242
UTI, n(%)	3(1)	5(7)	0.016
Skin, n(%)	5(2)	5(6)	0.073

Overall mortality was similar in the 2 groups (9% in IC and 6% in TT, p=0.395) as well as the infection-related mortality 10/209 (5%) and 3/110 (3%) in the IC and TT respectively, p=0.665).

Conclusions: Although patients receiving TT were significantly older, with the worst performance status, received TT outside PE, and a small number of them received prophylaxis, they developed significantly fewer infections. Mortality due to infections was also very low. The need of infectious prophylaxis for patients on TT should be evaluated.

08-068

Fungiscope - The Global Registry For Rare Fungal Infections

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Objectives: The incidence of invasive fungal infections is increasing worldwide and rare fungi - neither belonging to the genera *Aspergillus, Candida, Pneumocystis* or *Cryptococcus*, nor being endemic or regional, such as *Histoplasma spp.* or *Coccidioides spp.* - are increasingly identified as causative pathogens. Reliable, evidence based treatment recommendations for these species have not been established, yet.

Methods: We are coordinating a global registry for cases of rare invasive fungi. Our objective is to broaden the knowledge on epidemiology, to determine the clinical pattern of disease, to describe and improve diagnostic procedures and therapeutic regimens, as well as to facilitate exchange of clinical isolates among the contributors. Entry of retrospective data occurs via a web-based registration system (MACRO) that focuses on demographic information, underlying diseases, risk factors, details on the infection (pathogen, localization, specimen collection) therapy and outcome. Inclusion criteria include cultural, histopathological, antigen, or DNA evidence of invasive fungal infection. *Aspergillus spp., Candida spp., Cryptococcus neoformans, Pneumocystis jiroveci* or any endemic fungal infection, such as coccidioidomycosis or histoplasmosis, as well as colonization or other non-invasive infections are exclusion criteria.

Results: 15 cases of rare invasive fungal infections have been documented, including *Absidia corymbifera, Cunninghamella bertholletiae, Penicillium marneffei, Rhizomucor pusillus*, as well as *Acremonium spp., Fusarium spp., Coccidioides spp.*, and *Trichoderma spp*. Clinical results are partly pending. Most patients were in an immunocompromised state as a result of their underlying disease,

chemotherapy or transplantation. 14 additional cases have been pre-registered.

Conclusions: The clinical relevance of invasive fungal infections by rare fungi is increasing steadily. In a short period of time, actual cases from Germany, Austria, Italy and the United Kingdom could be documented, showing the broad spectrum of pathogens. Further investigators and coordinators are cordially invited to contribute to the success of Fungiscope. Fungiscope is supported by Astellas Pharma and Gilead Sciences.

08-069

Methicillin Resistant *Staphylococcus Aureus* Pneumonia In Cancer Patients: High Failure Rate with Vancomycin

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Objectives: To evaluate the outcome of cancer patients with Methicillin resistant *Staphylococcus aureus* pneumonia *(*MRSA-p) and the factors associated with mortality and failure to vancomycin.

Methods: We retrospectively reviewed the records of patients who developed MRSA-P between 1/03- 12/06. Patients were selected if they had pneumonia and MRSA as the only pathogen isolated from bronchoalveolar lavage (BAL).

Results: A total of 40 episodes of MRSA-P were diagnosed, being ventilator associated pneumonia (VAP) 25% of them. The median age was 58 y. (range: 17-89 y) and 65% were males. The majority of patients had solid tumors (63%). Most patients had multifocal pneumonia (75%), severe sepsis (63%), and high Apache II score (mean 19±7) at onset of infection. Concurrent MRSA bacteremia was seen in 15% of patients. Vancomycin was used in 34 episodes (85%) as initial therapy but 21 episodes (61.7%) had progression of MRSA-p despite of it. The median minimal inhibitory concentration (MIC) for vancomycin was 2.0 ug/mL. A trend between MIC≥1 and mortality was observed ($p=0.09$). Overall mortality was 20% (7 patients) and was associated with failure to vancomycin ($p=0.009$), sepsis ($p<0.001$) and respiratory failure ($p<0.001$). Mean vancomycin trough was 12.35± 6.78 *u*g/ml and was not significantly associated to mortality or failure to vancomycin.

Conclusions: MRSA-P in cancer patients is associated with significant morbidity and mortality. Initial therapy with vancomycin in cancer patients is associated with high failure rates despite achievement of recommended vancomycin trough concentrations. Mortality is more commonly associated with failure to vancomycin. Alternative therapy for MRSA-P in these patients should be considered initially.

08-070

Neutropenic Enterocolitis Complicating Taxane-Based Chemotherapy

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Objectives: Background: Neutropenic enterocolitis (NEC) is usually seen in patients with hematologic malignancies treated with agents such as cytosine arabinoside and idarubicin. NEC is being increasingly recognized in patients receiving taxane based chemotherapy.

Methods: Case report: A 58 year old lady with inflammatory carcinoma of the right breast presented to our emergency department with low grade fever, severe and diffuse abdominal pain, and diarrhea three days after receiving docetaxel. She was severely neutropenic (ANC= 0) and had tenderness in the lower abdominal quadrants and absent bowel sounds. CT scan showed diffuse bowel thickening consistent with NEC.

Results: She received general supportive care and parenteral antibiotic therapy (meropenem + ciprofloxacin). All cultures and C. difficile toxin were negative. After initial improvement the patient developed GI bleeding and bower perforation, both well described complications of NEC. She required right hemicolectomy lysis of massive adhesions, and placement of a right ureteral stent. She is currently in stable condition. We have identified several other cases of NEC following taxane therapy.

Conclusions: NEC is a serious, potentially life-threatening complication of antineoplastic chemotherapy. It is usually seen in patients with hematologic malignancies who have received anthracycline therapy. It is being increasingly associated with taxane therapy as well. The overall management is conservative but surgery is required for complications such as GI hemorrhage and/or perforation as illustrated by our patient. Clinicians should have a heightened awareness of NEC in patients developing abdominal symptoms/signs following taxane chemotherapy.

08-071

Oral Aspects And Dental Management of Oral Infections In Immunosupressed Patients

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Objectives: Actimomycosis is a rare, chronic disease caused by a group of anaerobic g(+) bacteria that normally colonize the mouth, colon and urogenital tract. Due to its propensity to mimic many other diseases, mostly in immunossupressed patient, clinicians should be aware of its multiple presentations.

Methods: We describe herein a case of unusual presentation of an Actimomycosis in a immunossupressed patient under corticotherapy due a ITP, that presented an Actinomycosis lesion an one week followed a tooth extraction. This patient was referred to the Oral Medicine Ambulatory for oral lesion evaluation. It was a violaceus, hemorrhagic lesion which took the hard and soft palate, bilaterally. A biopsy result showed an inflammatory process related with a numerous Actinomyces colonies. The patient was treated with antibioticotherapy and the remission of the lesion was achieved. Invasive aspergillosis is a serious problem in imunossupressed patients and lung is the mains affected site. Granulocytopenia associated with intensive regimens for cancer treatment is the main predisposing factor. Two cases of oral aspergillosis will be presented herein, that happened during the neutropenic phase followed the conditioning regimen in two HSCT patients. In both cases, ulcerative, necrotic and hemorrhagic lesions were observed in oral cavity. The lesions were explored and clots were removed. The biopsy results showed a aspergilosis infection. Both patients had died even after systemic treatment (antifungal).

Conclusions: Oral infection in imunossupressed patient can represent a high risk of mortality. We presented clinical aspects of oral Actinomycosis and Aspergilosis in different imunossupressed patients and also, the local management for diagnosis and treatment.

09-072

Trastuzumab Causes Gastrointestinal Side Effects In Her2-Overexpressing Breast Cancer Patients

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Objectives: Past studies have demonstrated the effectiveness of Trastuzumab in improving disease free survival in patients with HER2-overexpressing breast cancer. However, trastuzumab administration has been associated with gastrointestinal side effects including diarrhoea and vomiting. The specific toxicities have not been well characterised thus posing a challenge for the management of such symptoms in the clinic. Thus, the aim of this study was to characterise the gastrointestinal toxicities associated with Trastuzumab administration as a single agent or in combination with chemotherapy in HER2-overexpressing breast cancer patients.

Methods: All patients (n=46) who received Trastuzumab as a single agent or in conjunction with cytotoxic chemotherapy within the Royal Adelaide Hospital Cancer Centre from 2002-2007 were identified and included in this study. A retrospective analysis of case notes was conducted. Symptoms that indicate gastrointestinal distress were recorded. All patients were de-identified.

Results: Overall, Trastuzumab, as a single agent or in combination with chemotherapy, induced gastrointestinal toxicities following 27% of administrations. Moreover, Trastuzumab as a single agent induced toxicities following 22% of administrations. The most prominent of these were non-GIT related toxicities, such as fatigue and headaches (10.4% of administrations) and nausea and vomiting (7.1% of administrations). Diarrhoea, abdominal pain and constipation were also observed following a small subset of administrations. Furthermore, elderly patients (≥60 years) experienced significantly higher frequency of toxicity (34.7%) in comparison to younger patients (18.5%). Similarly, patients with metastatic disease displayed toxicities following significantly larger Trastuzumab administrations (15.7% vs. 38.2%).

Conclusions: Trastuzumab has the potential to induce a range of gastrointestinal toxicities in HER2-overexpressing breast cancer patients. These toxicities are specific and separate to those caused by concurrent chemotherapy. Moreover, age and disease status of patients were identified as risk factors that increase vulnerability of patients to Trastuzumab-induced toxicity.

09-073

Crypt Cell Damage In the Intestine Does Not Mediate the Gastrointestinal Toxicities Associated with Trastuzumab Administration

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Objectives: Overexpression of the HER2 receptor has been characterised in 25-30% of breast cancer and is associated with increased tumour aggressiveness. Inhibition of the HER2 receptor by the targeted therapy drug Trastuzumab has demonstrated potent anti-tumour effects in patients with HER2-overexpressing cancers. However, the HER2 receptor is also expressed in the gastrointestinal tract where it AIDS in maintaining mucosal layer integrity through regulation of crypt cell proliferation, death and differentiation. Thus, the aim of the present study was to evaluate whether cross-reactivity of Trastuzumab with HER2 receptors in intestinal crypt cells could lead to changes in kinetics of normal cell survival and division.

Methods: IEC-6 cells, which display characteristics of undifferentiated crypt cells, were used to evaluate changes in cell population and proliferation following treatment with Trastuzumab, as a single agent or in combination with the chemotherapeutic drug Doxorubicin. The methylene blue and XTT assays were employed to investigate changes in cell death and proliferation, respectively.

Results: In vitro data indicated no significant difference in cell death or proliferation following Trastuzumab treatment ($p > 0.05$). In contrast, cells treated with 50 μg/ml Trastuzumab and Doxorubicin in combination showed a significant decrease in proliferation (61.6% of control) in comparison to Doxorubicin-treated cells (73.8% of control) (p

Conclusions: Crypt cell damage in the intestine does not occur following single agent Trastuzumab treatment. Moreover, Trastuzumab acts synergistically with Doxorubicin to exacerbate chemotherapy-induced damage to the mucosa through cytostasis potentiation.

09-074

Pain Caused By Radiation-Induced Mucositis Is Debilitating And Poorly Controlled By Opioid Analgesics Among Patients with Head And Neck Cancer

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Objectives: Radiation (RT) to the oral cavity (OC), oropharynx (OP), larynx (L), or hypopharynx (HP) causes severe and debilitating mucositis in most patients (pts), particularly when chemotherapy (CT) is administered concomitantly. There are no available agents to prevent mucositis in pts with these cancers, thus, the standard of care is pain control, using opioids when pain is severe. We prospectively studied the risk and severity of mucositis during RT, its impact on daily activities, and analgesic use.

Methods: The Triad Burden of Illness study is an international, 41-center, prospective study of the risks for and outcomes of RT- and CT-induced mucositis. At baseline and daily during RT, pts with L/HP or OC/OP cancers completed a previously validated survey describing severity of mouth and throat soreness (MTS) measured from 0 ("no soreness") to 4 ("extreme soreness"), its interference with drinking, eating, talking, and sleeping measured from 0 ("not limited") to 4 ("unable to do"), and use of analgesics.

Results: To date, 191 evaluable pts have completed RT; 77% were males, and 88% were non-Hispanic whites. All received single daily fractions of RT; 60% had concomitant CT, 57% had intensity modulated RT, and 34% had concomitant boost. Most pts (98%) developed mucositis; 82% reported severe pain (MTS 3-4). Despite regular analgesic use (>4 days per week) by 83%, and opioid use by 65%, mean MTS remained >2 from weeks 5 – 7 of RT. Use of analgesics, opioids and limitations to daily activities were significantly associated with mucositis severity.

Conclusions: The pain caused by radiation-induced mucositis is severe, debilitating and poorly controlled by analgesics among pts with head and neck cancers. Preventive strategies are needed. Supported by a grant from AMGEN Corp.

	Maximum MTS 0-2 N=34 % of total (CI)	Maximum MTS 3-4 N=157 % of total (CI)	P value
Regular analgesic use	65 (49-81)	87 (82-92)	0.001
Opioid use	44 (27-62)	70 (62-77)	0.004
Activity limited	6 (1-20)	92 (87-96)	<0.001
a lot or unable	21 (9-38)	97 (93-99)	<0.001
to do Drinking	24 (11-41)	83 (77-89)	<0.001
Eating Talking	21 (9-38)	71 (63-78)	<0.001
Sleeping			

09-075

Recombinant Human Intestinal Trefoil Factor (Rhitf) Oral Spray For Prophylaxis of Chemotherapy-Induced Oral Mucositis

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Objectives: Background: In preclinical studies, recombinant human intestinal trefoil factor (rhITF) administered enterally resulted in reduced gastrointestinal damage induced by mucotoxic agents. Purpose: To assess safety and efficacy of an aqueous oral spray formulation of rhITF administered topically to the oral mucosa of patients at risk for oral mucositis (OM) secondary to high-dose chemotherapy. Results from two separate studies are presented in the context of the overall development strategy for rhITF.

Methods: Study 1: Oral mucosal swab samples were obtained from healthy volunteers after administering a single dose of either 12 mg rhITF (N=7) or placebo (N=3) oral spray to the oral cavity. The swabbed specimens were analyzed by Western blotting using a human ITF-specific antibody. Study 2: Safety and efficacy of the rhITF oral spray were assessed in a multicenter, randomized, double-blind, placebo-controlled trial involving 99 colorectal cancer patients receiving chemotherapy and at risk for OM (3 arms – placebo; 3 mg [low dose]; & 24 mg [high dose] rhITF, 8 times/day for 14 days).

Results: Study 1: Based on oral mucosal swabbed specimens, endogenous ITF levels on the oral mucosa were low (~0.30 ng/mg wet weight) and varied little over 120 min. Application of the rhITF oral spray (12 mg) increased ITF immunoreactivity by >500-fold. Residence half-life of rhITF approximated 10-20 min. Study 2: Treatment of colorectal cancer patients in the second chemotherapy cycle with either low or high dose rhITF significantly reduced frequency (placebo 48.5%, rhITF 9.1-12.1%, $p<0.001$ [Chi-square]) and severity of WHO grade >2 OM versus placebo (AUC: WHO scores, $p<0.01$; OMAS scores, $p<0.01$ [ANOVA]). Incidence of adverse events was low (3-6%) and not significantly different among the treatment groups.

Conclusions: rhITF delivered topically to oral mucosa by oral spray may represent a safe, effective and convenient technology for preventing chemotherapy-induced oral mucositis. Supported by The GI Company Inc.

09-076

Comparison of Conventional Paper Diaries And Interactive Voice Response Technology As Data Collection Methods In Clinical Mucositis Research

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Objectives: Interactive Voice Response (IVR) is an increasingly popular automated data collection method in clinical research. IVR uses the telephone to administer survey questions and record responses, which are entered by pressing the telephone keypad or by speaking into the system. The objectives of this study were to examine the concordance of data, and adherence of mucositis study subjects, between paper diaries and IVR.

Methods: 15 head and neck cancer patients, participating in a mucositis study, were asked to complete a paper diary and IVR call(s) daily, over a 6-7 week course of radiation therapy. Each data collection method asked for responses to 10 questions addressing study drug use, side-effects and concomitant medications. Validated criteria were used to assess consistency of responses (concordance) for each question, for each subject, for each day, between paper diaries and IVR. Adherence was assessed by comparing the number of completed paper diaries or IVR calls to the total expected number for each subject.

Results: 1889 of 2211 (85.4%) responses were consistent between the two data collection methods. Concordance was high for questions requiring limited memory recall and lower for questions requiring greater recall. Adherence was significantly higher ($p<0.001$) for the paper diaries (481 completed of 605 expected, 79.5%) as compared to the IVR

calls (540 completed of 816 expected, 66.2%). The odds that a subject would complete a paper diary were 1.91 times the odds of completing an IVR call (95% CI 1.68-2.19).

Conclusions: Although there is high concordance overall between data collected through paper diaries and IVR, each method may be more suitable to certain question types. The observed difference in adherence indicates that the paper diary may be a more effective method of data collection in this patient population. These findings have important implications for the design of future mucositis studies.

09-077

Screening Oncology Supportive Care Agents For Potential Biodefence Applications : Mucositis Therapies

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Objectives: Agents that help treat mucositis in the clinic may have valuable biodefence applications. Prophylactic agents could be used by the armed forces where there is risk of imminent radiation exposure. Mitigating agents may be applicable to the general population, to be taken following nuclear attack or accidental radiation exposure. In both cases agents may be taken in combination with haematological therapies, in addition to standard supportive care measures. As part of the NIH Medical Countermeasures against Radiological and Nuclear Threats (MCART) program we have been establishing baseline irradiation conditions in mice for screening mucositis mitigating agents. Such agents face a difficult task - they must accelarate damage recognition/repair, change cell migration rates to maintain barrier function, or increase crypt regneration rates. As a further challenge, to allow a feasible means of distribution, agents should be effective if administered no earlier than 24 hrs following radiation exposure, and via an easily accessible route, e.g. s.c. or p.o.

Methods: The effect of a range of high radiation doses on intestinal crypt survival and bifuration, diarrhoea severity/ duration and mouse morbidity have been characterised. Lower doses of irradiation are also being analysed since they cause less gastrointestinal damage but ablate the bone marrow. In such cased the intestine may be more easily rescued. We have undertaken several drug screens and more will be evaluated over the lifetime of the program. Agents are also screened for haematological efficacy, and if successful are evaluated in other species.

Results: We have found that whilst crypt regeneration is a robust readout, the diarrhoea and morbidity can be more variable, and appear to relate to the type of placebo treatment, reflecting levels of rehydration.

Conclusions: Mice are not routinely given medical management, other than antibiotics, but these data indicate that additional supportive care may help standardise the assays.

09-078

Exploration of the Tnf Stress Signalling Pathway In Irinotecan-Induced Mucositis

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Objectives: Ligand binding of Tnf to Tnfr1 initiates a cascade of events which culminate in cell death and/or inflammation. There is extensive cross talk between apoptosis, Nfκb and Jnk signalling pathways that emanate from Tnfr1, and each of these pathways have been implicated in the pathobiology of mucositis. The present study investigated gene expression changes following irinotecan treatment and correlated these changes to overt histological damage in the colon.

Methods: Microarray analysis was carried out on rat colon treated with irinotecan. Differentially expressed genes were selected for real time PCR validation due to their implication in Tnf, Nfκb and Mapk signalling. Primers were designed with Primer3 (version 4.0) and NetPrimer to detect Tnfr1, Jun, Gadd45α, Map3 k6, Atf4 and Nfκb1. Real time data was analysed by the delta delta CT method. Quantification of apoptosis in embedded tissue was also carried out using the TUNEL assay.

Results: Apoptosis significantly increased in the colon by 6 h following treatment, recovered somewhat at 24 h, and returned to base line at 72 h. Tnfr1 expression was significantly increased at 6 and 72 h ($p<0.001$). Jun was significantly increased at all time points investigated, with peak fold changes at 1 and 24 h ($p<0.001$). Gadd45α showed a transient 3-fold increase in expression at 1 hour ($p<0.05$). Map3 k6 *(Ask2)* had a sustained increase in expression at each time point following irinotecan treatment ($p<0.05$). Atf4 expression was significantly increased at 1 and 72 h ($p<0.05$), while Nfκb1 did not show significant differential expression following irinotecan.

Conclusions: Early response genes Jun, Gadd45α and Atf4 were the first to be upregulated by irinotecan, suggesting their involvement in apoptosis induction. Tnfr1 and Map3 k6 peaked later, indicating a more likely role in sustaining and amplifying the signalling that leads to overt tissue damage, particularly through inflammation.

09-079

Gene Expression And Pathway Activation In the Jejunum Following 5-Fu Treatment; Comparison with Irinotecan

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Objectives: The use of 5-FU in the treatment of solid tumours is often associated with gastrointestinal toxicity, particularly diarrhoea. The main features include massive apoptosis within epithelial layers of intestine and a limited inflammatory response. This is phenotypically similar to irinotecan. As such, this study aimed to determine gene expression changes and pathway activation that are unique to 5-FU and which are common to both agents.

Methods: Samples of rat jejunum collected at 6 h post 5-FU treatment underwent microarray analysis. Expression information was generated by the Partek Genomic Suite at the Australian Genome Research Facility. Interrogation of pathways was conducted using KEGG pathway miner, run through Bio-Resource for Array Genes (BioRag). Ranked gene expression and pathway lists were compared to arcHIVe information for irinotecan.

Results: Microarray analysis found a total of 447 probe sets with altered expression following 5FU treatment. These corresponded to 280 genes, involved in a diverse range of cellular functions. Functional classification of regulated genes resulted in cell cycle, transcription, stress response, intracellular modulators and metabolism being the cellular roles most frequently altered. A manual comparison of the gene lists for 5-FU and irinotecan found that a little over 10% of differentially expressed genes overlapped for both drugs. When examined for pathway effects, it was found that MAPK signalling contained the highest number of differentially regulated genes, consistent with irinotecan. Furthermore, a number of MAPK pathway genes found to be altered were unique to 5-FU.

Conclusions: Despite the similar microscopic and clinical presentation of toxicity following treatment with 5FU and irinotecan, the majority of differentially regulated genes were unique to each drug. There was however a significant subset of overlapping genes and pathways highly likely to be critically involved in mucositis pathobiology. These generic pathways and genes should be considered when targeting new anti-mucotoxic treatments.

09-080

Patterns of Sore Mouth In Cancer Patients Receiving Outpatient Chemotherapy

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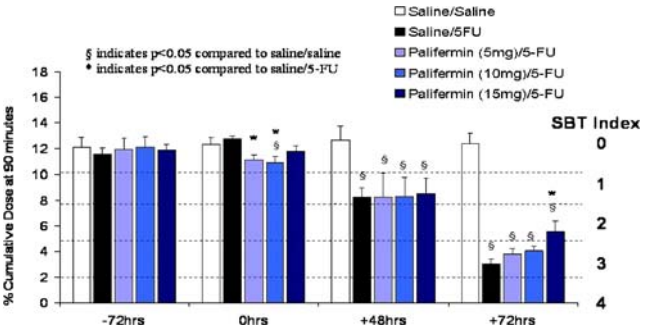
Objectives: There is a need to better understand the clinical risk of developing sore mouth (SM) associated with oral mucositis (OM) in solid tumor patients receiving standard cancer therapies. Visual Graphical Analysis (VGA) is a technique in which longitudinal symptom data are graphed and coded for individual patient profiles. This retrospective study was designed to identify patterns of development, duration, intensity, and resolution of SM severity over two cycles of chemotherapy in cancer outpatients, and to correlate demographic and disease characteristics to specific SM patterns.

Methods: VGA was utilized to identify individual patterns of SM severity in 51 outpatients who provided daily reports of SM. The majority were female (n=41[82%]; mean age 53 years [SD=8.35]) with breast cancer (63%) or non-Hodgkin's lymphoma (9.8%); one-third received AC (adriamycin and cyclophosphamide).

Results: The following SM patterns were identified (scale 1 [most mild]-10 [most severe]): Early Onset (days 1–5), Middle Onset (days 6–9), Late Onset (beginning on/after day 10); Onset Intensity (first response >5); Duration Intensity (SM score >5 and continuing beyond day 15); Late Duration (any SM score continuing after day 15); and Low Intensity (SM score never >4). CMF (cyclophosphamide, methotrexate, flurouracil) was significantly associated with middle onset SM. AC was significantly associated with late onset SM (adjusted residual -2.8), but intensity was not prolonged. In contrast, patients receiving RCHOP (rituxan, cyclophosphamide, adriamycin, oncovin, prednisone) were significantly more likely to experience duration intensity (3.2). A profile of

two episodes of SM separated by at least 2 days of no SM was also identified (n=14) ("dual intermittent pattern").

Conclusions: VGA revealed individual symptom patterns including a subset of patients experiencing a dual intermittent SM pattern. This analytic technology appears to be useful for identifying unique, patient-based variables and their impact on overall trajectories of SM associated with OM.



09-081

Sbt Index For Rapid Detection of New Bioactives In Intestinal Mucositis

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Objectives: The non-invasive measurement of gut damage in rodent models allows longitudinal studies to assess efficacy of bio-actives. This facilitates determination of the time course of the severity of mucosal damage. Delineation of protective and reparative events can be obtained together with dose response data in fewer animals and in a more timely fashion. Thus in different types of chemotherapy-induced mucositis, decisions on dosage and formulations can be readily obtained. To improve this further we have developed a non-invasive index of small intestinal damage using the ^{13}C SBT.

Methods: The current study aimed to apply the information derived from previous work in dark agouti rats, which utilized different types of damaging agents, to a time course study using Palifermin as the anti-mucositis agent. The SBT index as derived (0=normal; 1=mild damage; 2=moderate damage; 3=severe damage; 4=very severe damage) was applied and is shown in figure 1 below.

Results: When applied to the Palifermin study at the 48 hrs time point, it demonstrated a moderate damage to the small intestine compared with the more severe damage seen at 72 hrs. The 48 hr time point did not involve any sacrifice of the animals and it also showed that the prior treatment of Palifermin at three different doses apparently had no differential effect. In contrast, at 72 hrs at the highest dose an effect was seen and this was moderately severe.

Conclusions: The SBT index can be used to rapidly determine the severity of mucosal damage at different times during an experiment. It can be used as the sole marker of efficacy and optimizing of dose. Additionally it can be used to decide whether to sacrifice an animal when and whether to sacrifice an animal for performance of more invasive procedures to elucidate mechanisms. Translation of this to the clinic would be extremely useful.

09-082

Incidence, Symptomology, And Health-Related Quality of Life of Oropharyngeal Mucositis Among Patients Receiving Different Types of Cancer Therapy - Longitudinal Evaluation

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Objectives: The aim of this paper was to determine the incidence, symptoms, and health-related quality of life (HQoL) of oropharyngeal mucositis (OM) among patients receiving different types of cancer therapy.

Methods: A multicentre was used, and a total of 137 subjects treated with different cancer therapies (chemotherapy [CT], 45%; concomitant head/neck irradiation & CT [HNRT+CT], 29.%; HNRT, 15%; high-dose CT±total body irradiation [HSCT±TBI], 12%) completed the OM-specific HQoL measure (OMQoL) weekly or twice weekly over a 4- or 7-week period, along with concurrent measures of OM using WHO 0-4 grading system & its related symptoms using a 10-cm visual analogue scale. The OMQoL is a 31-item patient-reported measure, depicting OM problems with: symptoms, diet, social function, & swallowing. All OMQoL subscale scores are linearly

transformed to a scale of 0-100, with a higher score indicating a better HQoL. In this study, the mean peak & the area-under-the-curve (AUC) scores for the OM-related symptoms & OMQoL were calculated. For symptoms, a higher score indicated worse symptomology. For the OMQoL, a lower score indicated a worse HQoL.

Results: The mean age of the subjects was 49.6 years with 72 (53%) females. 46% (n=63) was diagnosed with HN cancer. The incidence rate of OM was 90% with 11%, 30%, 32% & 18% were WHO grade I, II, III & IV, respectively. The incidence rate of mouth & throat pain, discomfort in chewing, swallowing & speaking, & dry mouth ranged from 75 to 96%. 87% of subjects reported ≥3 simultaneous symptoms. The mean peak & AUC scores of symptoms ranged from 3.0 to 4.5, & 2.1 to 3.7, respectively. The symptoms peak & AUC scores of subjects with WHO grade III or IV OM (peak: 5 to 7.8; AUC: 3.4 to 6) were significantly higher than those with WHO grade 0, I or II (peak: 0 to 2.6; AUC: 0 to 2.2) ($p<0.01$), which suggested that subjects with severe OM were likely to have worse symptomology over time. Subjects treated with HNRT±CT reported significantly higher peak & AUC symptom scores than those receiving CT or HSCT ($p< 0.01$). The mean peak & AUC scores of symptoms, diet, social, & swallowing OMQoL subscales ranged from 66.3 to 78.6, & -26.3 to -15.2, respectively. The diet (peak: 66.3; AUC: -26.3) & swallowing (peak: 71.9; AUC: -20.9) spheres of HQoL were mostly compromised for subjects with OM over time. The OMQoL subscales peak & AUC scores of subjects with WHO grade III or IV OM (peak: 44.3 to 65; AUC: -42.7 to -23.8) were significantly lower than those with WHO grade 0, I or II (peak: 80.3 to 98.9; AUC: -15.9 to -1.2) ($p<0.01$), which suggested that subjects with severe OM were likely to have a poorer HQoL over time. The OMQoL subscales peak & AUC scores of subjects treated with HNRT±CT (peak: 42.1 to 63.2; AUC: -45.4 to -23.2) were significantly lower than those receiving CT or HSCT (peak: 77.1 to 94.5; AUC: -18.9 to -5.1) ($p<0.01$). Significant correlations were shown between symptom peak/AUC & OMQoL subscales peak/AUC scores (peak: $r=0.82 – 0.95$, $p<0.01$; AUC: $r=0.73 – 0.94$, $p<0.01$).

Conclusions: In conclusion, OM & its related symptoms were highly prevalent & negatively impact patients' HQoL over time, in particular for patients with severe OM & treated with HNRT±CT. Comprehensive OM & symptom assessment throughout OM would be a requisite toward optimal OM management.

09-083

Perspectives And Experiences of PaEdiatric Patients And Their Parents Regarding Oral Mucositis: A Phenomenological Study

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Objectives: The aim of this qualitative phenomenological study was to describe children & their parents' lived experiences of OM, & to explore their needs in relation to OM.

Methods: Individual semi-structured interviews were conducted with 22 children & parents who had experienced WHO grade ≥2 OM during chemotherapy within the previous 6 months. Data was analyzed using inductive content analysis.

Results: The mean age of the children & parents were 12 years with 55% boys & 41 years with 91% mothers, respectively. 41% was diagnosed with ALL & 36% was treated with methotrexate. 5 themes, which subsumed a number of categories, were constructed. Consequences of pain. Mouth/throat pain was found to cause a number of severe consequences in daily life. The accompanying pain in OM not only caused significant discomfort & difficulty in eating, swallowing & speaking but also disturbed sleeping & caused emotional distress. Children described that pain was the worst symptom of OM, & inadequately controlled. Negative emotional outcomes. Many children experienced turmoil characterised by panoply of emotions. All parents described emotional distress on various levels. The dilemma of eating. OM can cause malicious dilemma to patients: on one hand children were too painful to chew & swallow food as well as sip water with straw, on the other hand they felt very hungry. Challenges in oral care. Discomfort associated with mouth rinsing & toothbrushing forced children not to adherence with oral care. Parents also described oral care was a stressful event to their children & to them. Unmet needs. Parents indicated the need for more information about the process of OM & food selection. Both children & parents wanted more activities coordinated by the ward to distract OM, & psychological support from health care professionals.

Conclusions: This study identifies the need to view OM as a complex biopsychosocial clinical problem. Optimal OM pain management guideline & holistic supportive care strategies should be developed in conjunction with OM strategies in future.

09-084

The Management of Sorafanib Induced Diarrhea In Neuroendocrine Tumor Patients

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Objectives: Tyrosine kinase inhibitors (TKIs) such as sorafanib and sunitinib are indicated for renal cell, hepatocelluar and gastrointestinal stromal malignancies. Early data suggest these agents are active in neuroendocrine tumors (NETs) such as carcinoid and pancreatic islet cell carcinoma. Predictable adverse effects of this class of agents include mucositis, stomatitis, diarrhea, hand-foot syndrome, fatigue, nausea, anorexia and hypertension. Neuroendocrine neoplasms can induce secretory forms of diarrhea and their multi-modality treatments can result in short gut syndrome, steatorrhea and bile acid colitis. We hypothesized that sorafanib-induced diarrhea could be dose limiting in patients with NETs and limit its usefulness as an anti-tumor agent.

Methods: To determine the impact of sorafanib-induced diarrhea in NETs, patients were monitored in a prospective manner. Fifteen subjects (9 males) met the eligibility criteria of TKI initiation in the setting of progressive NET on somatostatin analog therapy. Ten patients had small bowel carcinoid, 1 thymic carcinoid, 1 lung carcinoid, 1 pancreatic islet cell neoplasm and 2 unknown primaries. Seven patients had carcinoid syndrome (flushing/diarrhea) and all were receiving somatostatin analog therapy. Ten patients remained on sorafanib for more than 30 days and provided follow-up data.

Results: Sorafanib was initiated at 400 mg orally twice daily in all patients except 1 (200 mg BID). Three patients required dose reductions because of adverse events: 200 mg twice daily (N=2) and 200 mg daily. The median age was 65 (range 45-79). Average duration of disease was 10.3 years (range 0.3 – 23.6) from the time of diagnosis. Five patients reported diarrhea at the time sorafanib initiation. Three patients developed sorafanib-induced diarrhea responding to: dose reduction (N=1), anticholinergics (N=1), dietary intervention (N=1).

Conclusions: Sorafanib-induced diarrhea in NET patients is not dose-limiting and is manageable for most patients. Dose reduction, dietary modification and anticholinergics are effective mediators in controlling this predictable side effect.

09-085

A Phase Ii Safety And Efficacy Trial of a Milk Growth Factor Extract For Oral Mucositis

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Objectives: Mucositis is a frequent, painful and costly toxicity of chemotherapy and radiotherapy, for which there is little proven treatment. TGR BioSciences Pty. Ltd. is developing a growth factor extract of milk that is enriched in TGF-beta, IGF-I and other bioactive proteins for the prevention of oral mucositis (OM). This extract (Lactermin®) has been evaluated in a phase I trial which demonstrated safety and encouraging efficacy when compared to historical controls (Prince et al., (2005). Biol. Blood Marrow Transplant. 11: 512-520).

Methods: We performed a phase II study in lymphoma patients undergoing high dose BEAM (Carmustine, Etoposide, Ara-C, Melphalan) chemotherapy and stem cell transplantation. 60 patients were randomized to receive active or placebo as a swallowed mouthwash four times a day for 12 days. OM was assessed daily using the WHO scale and Oral Mucositis Daily Questionnaire (OMQD) until OM had resolved. The primary endpoint was the number of days of severe (Grade 3 or 4) OM. Secondary endpoints were the incidence and duration of all grades of OM, incidence and duration of parenteral feeding, dose and duration of opiate analgesics, and improvement in patient assessed OM and quality of life scores according to the OMDQ.

Results: 31 patients have completed the study to date and the data remained blinded. Analysis of the pooled data showed an incidence of severe OM (Grade 3 or 4) of 67% with a median duration of 2 days (range, 0 to 13). Compliance was satisfactory, with all patients receiving at least 36 of the scheduled 48 doses. There were no serious adverse events related to the study medication. It is anticipated that the trial will be completed and data made available by the MASCC/ISOO 2008 International Symposium.

Conclusions: Lactermin® was well tolerated and safe in this patient population. Efficacy results are awaited.

09-086

Characterisation of Pro-Inflammatory Cytokines In the Development of Radiotherapy-Induced Gastrointestinal Mucositis

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Objectives: Gastrointestinal mucositis is a debilitating effect of cytotoxic cancer treatment which is difficult to prevent and is only treated symptomatically. Proinflammatory cytokines have previously been implicated in the pathophysiology of chemotherapy-induced gastrointestinal mucositis, however, it is unclear whether they play a key role in the development of radiotherapy-induced gastrointestinal mucositis. Therefore, the aim of the present study was to characterise the expression of proinflammatory cytokines in the gastrointestinal tract following fractionated radiotherapy.

Methods: Thirty six female Dark Agouti rats were randomly assigned into groups and received 2.5 Gys abdominal radiotherapy three times a week over six weeks. Real time PCR was conducted to determine the relative change in mRNA expression of IL-1β, IL-6 and TNF in the jejunum and colon over 6 weeks. Protein levels of IL-1β, IL-6 and TNF in the intestinal epithelium were examined using immunohistochemistry.

Results: IL-1β mRNA levels were significantly lower in rats receiving short term radiotherapy than in untreated controls. Long term radiotherapy significantly upregulated IL-1β, IL-6 and TNF mRNA levels in the intestines. At the protein level, the majority of proinflammatory cytokines in the intestinal epithelium were not affected by radiation, with the exception of IL-6 in the jejunum and TNF in the colon.

Conclusions: This study confirmed the role of proinflammatory cytokines in the development of radiotherapy-induced mucositis. However, the small and large intestine are regulated by different cytokines specifically Our results indicate that a threshold of damage needs to be reached before activation of the inflammatory pathway occurs. Before this a net anti-inflammatory environment exists which is likely due to the predominance of apoptosis and protective effects of low dose-radiation.

09-087

Comparative Cytokine Expression In Oral And Gi Mucosa Following Irradiation In Rhesus Macaques

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Objectives: Mucositis is a painful consequence of cancer therapy that affects oral and GI mucosa. Patients receiving radiation for head and neck cancer and those undergoing total body irradiation (TBI) may experience mucositis, but few studies have focused on TBI and oral mucosal injury.

Methods: Saliva was collected at BL (pre-irradiation) and over time and oral and GI mucosa was collected on the day of necroscopy (~day 9) from male Rhesus macaques.

Results: Neutropenia occurred at day 4-5; all except 1 had oral lesions. Salivary IL1 increased over time from BL to day 4 ($p=0.009$), while INFgamma decreased from BL to day 4 ($p=0.03$). Tissue concentrations of IL1 were similar to saliva at the later time points, ranging from 7.7 +/- 4.99 to 11.1 +/- 8.7 pg/mL in buccal and soft palate tissues. Salivary MMP2 also increased over time ($p=0.06$) and was found at similar levels in oral tissues. GMCSF, TNFalpha, and MMP9 measured in saliva varied little between and within animals or over time and were also consistent with tissue concentrations of these mediators. Cytokine concentrations were not related to oral lesion status. Onset of diarrhea occurred between days 3-6. GI cytokines were higher than in oral tissues and highest in the ilieum and lowest in the duodenum. TNFalpha was elevated (duodenum: 30.3 +/- 10.5; ileum: 234.7 +/-151.4) compared to TNFalpha in saliva and oral mucosa. IL1 and MMP2 concentrations were similar throughout the GI tract and consistent with oral mucosal levels.

Conclusions: Cytokine concentrations were similar in saliva and in oral tissues, indicating that saliva samples can provide a dynamic and valid measure of cytokine activity. IL1, IFNgamma, and MMP2 representing a spectrum of cytokine activity were induced by TBI. Type and extent of oral lesions did not contribute to the cytokine levels in this small sample.

09-088

Cytokine-Mediated Mucotoxicity In Vincristine-Treated Rats

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Objectives: Vincristine is associated with peripheral neuropathy and mucositis in humans, and has been demonstrated to cause neurotoxicity and pain behavior in rats.

Methods: We examined mucosal inflammation and pain behavior in male Sprague-Dawley rats by administering vincristine or matching vehicle via intraperitoneal (IP) injection (50 ug/kg) daily for 10 days. Pain behavior was evaluated by testing mechanical allodynia via application of von Frey fibers to the flank and hind paw, and cold allodynia in response to acetone applied to the plantar surface of the hind paw on days 0, 4, 7, and then weekly thereafter until day 49. GI mucosa was collected at day 50 and assayed for an array of cytokines spanning those representing early inflammatory signaling to tissue degradation.

Results: Escape behavior in response to flank and hindpaw probing did not differ between control and vincristine-treated rats. Cold withdrawal response scores increased in vincristine-treated rats at day 4 through the remainder of the observation days, with a trend towards separation between the two groups that did not reach statistical significance. Cytokine concentrations in colonic tissue were not different between control and drug-treated groups, and were below the level of detection in jejunal tissue. The chemokine fractalkine ($P=0.033$) and cytokines IL-6 ($P=0.036$), IL-10 ($P=0.002$), and were significantly elevated in the ileum of vincristine-treated rats compared to controls. There were no differences between the groups in IFN-gamma, IL-1, or TNF-alpha. MMP2 as a measure of protease activity was higher in the drug versus control group, but not statistically significant. No stool changes were noted within or between groups over time, and no animals lost weight.

Conclusions: Differential expression of some inflammatory mediators in rat GI mucosa by drug group suggests mucotoxicity by vincristine is cytokine-mediated.

09-089

Prior Treatment with Recombinant Lectin Atl 104 Facilitates Recovery From Intestinal Damage Caused By 5-Fluorouracil In Rats

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Objectives: Mucositis is a serious dose-limiting side-effect of cancer therapies. The capacity of ATL-104 to aid recovery from intestinal damage caused by 5-fluorouracil (5FU) was investigated.

Methods: Rats (5/group) given ATL-104 orally (100, 200, 300 or 400 mg/kg) or saline once daily for 3d. Bolus of 5FU (150 mg/kg, ip) on day 4. Rats euthanased and intestine collected for histochemical evaluation up to 4d post-5FU.

Results: 5FU caused loss of crypt / villus structure. Crypt depths (19±2 μm) and villus heights (250±9 μm) were reduced [$p\leq0.001$] by 2d post-5FU compared to those in controls not given 5-FU (crypt, 82±15 μm; villus, 523±67 μm) and few dividing cells were detectable. Proliferation re-established by 4d, but there were indications of cell damage / loss from this population. Crypts (113±7 μm) remained disorganised and villi stunted (151±8 μm [$p\leq0.001$ vs control]). ATL-104 ameliorated the effects of 5FU in a dose-dependent manner [maximal effect at 200 – 300 mg / kg d-1]. Crypt depths (63±5 μm [$p\leq0.02$]) and villus heights (368±26 μm [$p\leq0.01$]) in rats given ATL-104 (200 mg/ kg d-1) were reduced at 2d post-5FU compared to controls (no 5FU), but far less than with 5FU alone. Micro-crypts (clusters of dividing, goblet and Paneth cells enclosed in a myofibroblast sheath) were evident throughout the gut. These formed sites of rapid re-growth. By 4 days, highly organised crypts (118±13 μm) and villi (327±27 μm) were evident.

Conclusions: Pre-treatment of rats with ATL-104 aided recovery from intestinal damage caused by 5FU. ATL 104 is thus a possible treatment for mucositis.

09-090

Treatment of Oral Mucositis By Supersaturated Calcium Phosphate Oral Rinse In Patients Receiving Chemotherapy (Ct) And Radiation (Rt)

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Objectives: Oral mucositis (OM) affects 400,000 patients annually, causing significant pain, dysphagia, and a portal for infection. Data from an observational registry was collected to evaluate OM, dysphagia, and pain in patients utilizing a calcium phosphate oral rinse at initiation of therapy.

Methods: After IRB approval, CT and RT patients at high risk of developing OM performed an oral rinse 4-10 times daily with Caphosol® (Cytogen Corporation, Princeton, NJ), an FDA-approved supersaturated calcium phosphate rinse. Patients were mainly caucasian (84%) and female (63%). The most common malignancies were breast (32%), head/neck (28%) and colorectal (16%). Treatment consisted of CT (66%), RT (7%) and combined CT/RT (27%). Patients were assessed weekly for compliance and OM was graded utilizing the NCI-CTC scales.

Results: Of 155 patients enrolled to date, 94 (61%) have completed follow-up. Compliance was high with 96% of patients averaging at least one rinse per day. Mean number of daily rinses was 3.9 with 94% of patients rinsing six or less times daily. Low rates of OM were noted with 67% having no OM, 16% with grade I, and 10% with grade II. Only 5% and 1% developed grades III and IV OM. No pain medication was required in 60% of patients while opiates were used by 32% and NSAIDS alone by 8% of patients. Patient satisfaction was high with 59% very satisfied, 30% satisfied, 10% only slightly satisfied and 1% not satisfied. Physician assessment of efficacy was: excellent (61%), good (20%), satisfactory (12%), not satisfactory (5%), inevaluable (2%). No adverse events were associated with use of Caphosol.

Conclusions: Preliminary data suggest that Caphosol has a significant positive impact on the occurrence and severity of OM in patients receiving CT, RT, and CT/RT. Patients and physicians report low pain medication use and high levels of satisfaction with this agent.

09-091

The Pathobiology of Chemotherapy-Induced Alimentary Tract Mucositis Is Influenced By the Type of Mucotoxic Drug Administered

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Objectives: Alimentary tract (AT) mucositis is a serious problem complicating cancer treatment however its pathobiology remains incompletely understood. Nuclear factor-κB (NF-κB) and pro-inflammatory cytokines are considered to have important roles in its development. This has been previously demonstrated in different sites of the AT following administration of irinotecan in an animal model using the Dark Agouti rat. The aim of the present study was to determine whether the changes that occur in the AT are affected by the type of mucotoxic drug.

Methods: Female DA rats were given a single dose of either methotrexate (1.5 mg/kg intramuscularly) or 5-fluorouracil (150 mg/kg intraperitoneally). Rats were killed at 30, 60, 90 minutes, 2, 6, 12, 24, 48 and 72 hours. Control rats received no treatment. Samples of oral mucosa, jejunum and colon were collected. Haematoxylin and eosin stained sections were examined with respect to histological evidence of damage and standard immunohistochemical techniques were used to demonstrate tissue expression of NF-κB, TNF, IL-1β and IL-6.

Results: Both MTX and 5-FU administration caused histological evidence of tissue damage in the AT as well as changes in tissue expression of NF-κB and specific proinflammatory cytokines. This study however, demonstrated that there were differences in the timing of histological changes as well as the timing and intensity of pro-inflammatory cytokine tissue expression caused by the different drugs.

Conclusions: The results from this study suggest that there are differences in the mucositis pathobiology caused by different drugs. This may have important ramifications for the management of mucositis particularly with respect to the development of treatment regimens for mucositis. Further investigations are required to determine the exact pathways that lead to damage caused by different drugs.

09-092

Serum Levels of Nf-KB And Pro-Inflammatory Cytokines Following Administration of Mucotoxic Drugs

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Objectives: Changes in tissue levels of NF-κB and pro-inflammatory cytokines have been demonstrated previously in the context of mucositis. The aims of this study were to determine whether changes serum levels of NF-κB, TNF, IL-1β and IL-6 occurred following administration of either irinotecan, methotrexate (MTX) or 5-fluorouracil (5FU) and, in addition, to determine whether changes in serum levels corresponded with changes in tissue levels of NF-κB, TNF, IL-1β and IL-6 and histological evidence of damage in the alimentary tract of the DA rat.

Methods: In three separate experiments, female DA rats were given a single dose of either irinotecan (200 mg/kg intraperitoneally), MTX (1.5 mg/kg intramuscularly) or 5-FU (150 mg/kg intraperitoneally). Rats were killed at 30, 60, 90 minutes, 2, 6, 12, 24, 48 or 72 hours. Control rats received no treatment. Blood samples were collected from all rats via cardiac puncture and centrifuged at 5000 rpm to collect serum. Serum levels of NF-κB, TNF, IL-1β and IL-6 were measured using specific ELISA kits.

Results: Changes in serum levels of NF-κB, TNF, IL-1β and IL-6 were observed following administration of irinotecan, MTX and 5-FU. However these changes differed according to each drug. Peaks in serum concentrations tended to occur follow initial evidence of histological changes in the tissues. Tissue levels of NF-κB, TNF, IL-1β and IL-6 coincided at initial time points and then were diverged at later time points, in these instances tissue levels remained elevated compared to baseline.

Conclusions: Based on these results, the measurement of serum levels of specific factors involved in mucositis pathobiology is not useful in predicting or demonstrating mucosal damage. This study highlights the fact that drugs have systemic effects. Further studies are required to determine the relationships between different toxicities and determine how patient management can be improved.

09-093

Cyclooxygenase-2 And Vascular Endothelial Growth Factor Expression On 5-Fluourouracil Induced Oral Mucositis In Hamsters. Evaluation of Two Power of Low-Intensity Laser Protocols

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Objectives: LILT have been reported to be effective for the symptomatic management and reduction of incidence and/or severity of oral mucositis. The aim of this study was to evaluate the COX-2 and VEGF expression
comparing two power of laser (35 mW and 100nW).

Methods: Golden Syrian hamsters were subjected to a standard mucositis-induction protocol with 5-FU. Seventy two hamsters were included this study. The cheek pouch mucosa was superficially irritated on D3 and D4. The excisional biopsies were performed on D4, D7, D11, D15. The expression of COX-2 and VEGF was investigated by immunohistochemistry method. Animals were randomly assigned to groups as follows: **1**. Therapeutic laser (n=24), P=32,8 mW, E=0.56 J, T=16 s. **2**. Therapeutic laser (n=24), P=92,6 mW, E=0.6 J, T=6 s. Laser applications were performed on D3 to D6. **3**. Control group (n=24) received only local irritation. We used an InGaAIP laser, l 660 nm, optic fiber of 600 micras.

Results: COX-2 On D4 differences between experimental and control groups were statistically significant. On D7, the 35 mW group showed less COX-2 expression than the 100 mW and control groups (p=0,018). VEGF: expression was higher in control group than in the experimental groups, although not significant statistically (p=0,805).

Conclusions: Although COX-2 has not the main role in the mucositis establishment it is an important parameter in its development. The 35 mW laser showed to be effective in reduce the inflammation intensity. However, more data is required to elucidate the effects of lasertherapy and biological markers

09-094

Oral Complications And Correlation with Hematological Events Amongst Adult Cancer Patients

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Objectives: Oral mucositis and their correlation with haematological events such as neutropenia, thrombocytopenia and oral infections in haematopoietic stem cell transplantation (HSCT) are multifaceted. Early intervention is very important hence appropriate assessment of these complications and events.

Methods: A cohort of randomly selected adult patients with hematological disorders who underwent HSCT during 2005-07 was screened from the day of admission until discharged at the

Queen Mary Hospital, Hong Kong. Parameters include the type of donor, conditioning regimens, immunosuppressants and opioid analgesics used, disease state, hematological values and, febrile episodes. Oral mucositis scoring system (OMS) was adopted with modifications (WHO). The assessment and sampling of specimens was conducted by oral medicine specialists and/or transplantation specialty nurses. Prior inter-examiner cross validations were performed. Bedside lighting and intra-oral mirrors were used to evaluate the oral conditions.

Results: The cohort include 39 males and 26 females with an age range of 17-65 years with diseases such as myeloma, lymphomas, acute leukaemia and, pre-leukaemia. Conditioning regimen include chemotherapy (48; 74%) and combined chemotherapy and radiation (26%). Donors included autologous (20, 30.7%), allogenic (16, 24.6%) and syngenic/sibling match (29, 44.6%). The total OMS ranged between10 and 25 (normal total score=9) with no significant difference between the variable scores amongst autologous, allogenic and sibling-match. Hospital stay was highest in the allogenic group (mean, 35 days) compared with sibling-match (mean, 30 days) and autologous (mean, 25 days). OMS significanly correlated with neutropenia, high pain score and thrombocytopenia ($p<0.0001$; ANOVA).

Conclusions: There was a positive correlation between the in-patient days and the type of donor cells infused.There was significant correlation between causative events of oral complications such as neutropenia and thrombocytopenia and positive correlation between pain visual analogous score and OMS. Early prediction of high risk individuals for severe oral complications is possible with confounding variables such as the type of donor, haematological values and regular, continuous and close monitoring of the orofacial structures with the help of the current modified OMS system.

09-095

Mucositis Profile In Cancer Patients Underwent High Dose Chemotherapy And Stem Cell Transplantation

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Objectives: Patients underwent high dose chemotherapy (HDC) and autologous peripheral stem cell transplantation (APSCT) or allogeneic bone marrow transplantation(ABMT) experience mucositis frequently. This study is about the frequency and severity of mucositis in the early phase of transplantation and the relation of conditioning regimens with mucositis.

Methods: Patients with haematologic or solid tumors underwent APSCT or ABMT were asked to score mucositis severity daily from the first day to the tenth day of reinfusion. Scoring was performed according to 0: no symptom; 1: mild; 2: moderate; 3: severe; 4: very severe. Daily total mucositis score(DTMS) was defined by the addition of symptom severity of mucositis in 10 days.

Results: A total of 68 (58 APSCT and 10 ABMT) patients, 48 men(71%) and 20 women(29%) were included to the study. Median age of patients was 32,5(range 15-78 years). The most frequent three diagnosis were non-Hodgkin's lymphoma (37%,n=25), Hodgkin's lymphoma(12%,n=8), and Multiple Myeloma(12%,n=8). BEAM(n=27), ICE(n=17), Melphelan 200 mg/m2 (M200)(n=8) and TBI+Cyclophosphamide (TBI+C) (n=16) were used as conditioning regimens. All patients experienced mucositis any grade. The sixth day DTMS was higher than the first day($p<0.05$). DTMS was not effected by disease and gender of patients ($p>0.05$). When BEAM and ICE chemotherapy protocols compared, DTMS in the first 5 days after transplantation was more severe in patients received ICE chemotherapy, DTMS was similar in each treatment groups from day 6 to 10. When BEAM and TBI+C chemotherapy protocols compared, DTMS in the first 3 days after transplantation was not different, but DTMS was more severe from day 4 to 10 in the TBI+C chemotherapy group($p<0.05$). The percentage of patients who scored severe or very severe mucositis was 7.4% in BEAM, 8.9% in ICE, 12.5% in M200 and 31.2% TBI+C treated groups.

Conclusions: All patients underwent HDC faced mucositis. ICE regimen among conditioning regimens caused mucositis earlier and more severe.

09-096

Plasma Citrulline Is a Reliable Marker of Chemotherapy-Induced Small Intestinal Atrophy In Rats Administered Single Or Multiple Cycles of Chemotherapy

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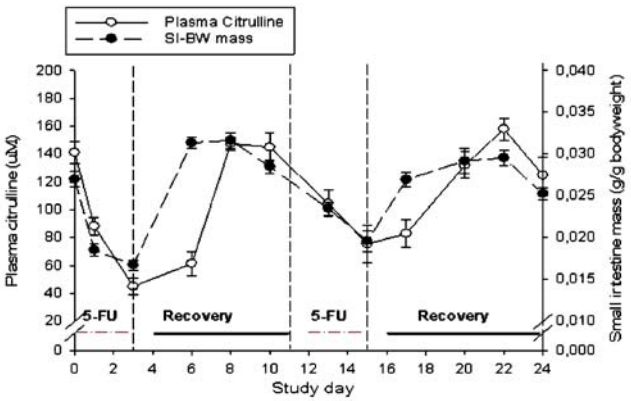
Objectives: Chemotherapy-induced gastrointestinal mucositis is a common dose-limiting side effect in cancer patients undergoing chemotherapy. Zealand Pharma A/S is currently developing a novel drug for the treatment of chemotherapy-induced gastrointestinal mucositis. In this regard, we are searching for a reliable biomarker to evaluate the efficacy of anti-mucositis therapies on the damaged intestine. Citrulline is synthesized primarily in small-bowel enterocytes and has been identified as a physiologic marker for radiation-induced small bowel damage. The specific objectives of the current

study were to examine the relationship between plasma citrulline concentrations and small intestinal mass after the administration of a single or multiple cycles of 5-FU in rats.

Methods: Single 5-FU cycle: Sprague Dawley rats were administered 5-FU (75 mg/kg, i.p.), once daily for four days. Twenty-four hours and six days after the last 5-FU dose had been administered the animals (n=5) were sacrificed, plasma was harvested for future citrulline analysis and small intestinal mass determined. Multiple 5-FU cycle: Sprague Dawley rats were exposed to two cycles of 5-FU. Each 5-FU cycle consisted of four days of 5-FU (30 mg/kg i.p.) administration followed by eight days of recovery. To assess the relationship between plasma citrulline concentrations and small intestinal mass during the 5-FU dosing and the recovery phases, subsets of animals were sacrificed at several time points.

Results: Plasma citrulline concentrations were significantly decreased 24 hrs after the last dose of 5-FU but had returned to baseline levels 6 days later. Similarly, relative small intestinal mass (g/g bodyweight) was significantly reduced (0.022±0.001 vs. 0.027±0.001 saline controls; $p< 0.05$) after 24 hrs and was back to normal 6 days later. A significant positive correlation ($r^2=0.5$; $p=0.001$) was found between plasma citrulline concentrations and absolute small intestinal mass. The results of the multiple cycle study are shown in the figure below.

Conclusions: We suggest plasma citrulline decreases simultaneously with small intestinal mass as 5-FU destroys the intestinal epithelial cells secreting citrulline Furthermore we suggest that the lag time observed between plasma citrulline concentration and small intestine mass, in the recovery phase, may be accounted for by the time period required for the newly proliferated intestinal cells to mature and release citrulline into the circulation.



09-097

Systems Biology of Mucosal Injury In Cancer Patients

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Objectives: Mucosal injury (mucositis) caused by high-dose or targeted cancer therapy can result in significant morbidity and financial cost. Understanding the causative complex molecular pathways of this toxicity will enhance design of new therapies. Computational reaction kinetic biological models represent an important strategic advance in this regard. These simulations are cost- and time-efficient and can identify new hypotheses and projected experimental outcomes. The technology also permits integration of complex models based on animal and human data.

Methods: A mucositis reaction network structure was developed using COX-2 pathway data derived from literature-based animal and human studies as well as pre- and post-transplant oral mucosal biopsies from three hematopoietic cell transplant patients. Virtual Cell software was used to simulate network dynamics.

Results: The nonlinear network mucositis model incorporated feedback loops and accounted for dynamic response of COX-1, COX-2, TNF-α, PGE-2, IL-1β, IL-6, PGI-2, TXA-2 and NF-kappaB with nonlinear correlation coefficients of –0.73, -4.27, -89.1, -7.85, 0.02, -2.79, 0.63, 0.86 and -0.02 respectively. For 7 of 8 molecular species, the model was able to predict final steady-state value within experimental error with exception of TNF-α. The ninth species, TXA-2, did not achieve steady-state within the timeframe monitored.

Conclusions: Using the COX-2 pathway as a prototype, this model successfully incorporated experimental and computational approaches to elucidate mucositis network pathways. The results identify research areas requiring further study such as TNF-α dynamics, thus highlighting benefit of the model. This technology could also facilitate design of new mucositis research protocols including (i) mechanisms of neuropeptide-mediated pain, (ii) identification of tissue-based risk factors and (iii) integration of genetic, cytomorphologic and functional expression of oral and gastrointestinal mucosal injury.Supported by U.S. Public Health Service grants from National Center for Research Resources (P41 RR013186) and NIH Roadmap

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09-098

Faecal Microflora And β-Glucuronidase: Key Elements To Irinotecan-Induced Diarrhoea

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Objectives: Irinotecan (CPT-11) induces DNA damage by trapping topoisomerase I during the regulation of DNA structure. Unfortunately severe diarrhoea is a dose-limiting side effect in 60-80% of patients receiving Irinotecan. Cholinergic, secretory diarrhoea occurs early, although this can be managed by blocking neurons containing acetyl choline in the enteric nervous system with atropine. Delayed diarrhoea also occurs, where toxicities are compounded by the action of β-glucuronidase. Intestinal microflora produce β-glucuronidase and may contribute to the intestinal toxicity of Irinotecan.

Methods: Female DA rats were given a single 200 mg/kg i.p. dose of CPT-11. Rats were killed at various time points. Control rats received no treatment. Jejunum, colon and faecal samples were collected. Standard microbiological culture techniques were used to identify bacteria and real time PCR was used to quantify bacteria in faecal samples. Immunohistochemistry was carried out to determine β-glucuronidase expression.

Results: In the jejunum β-glucuronidase expression increased from levels of untreated rats at 2 h post chemotherapy in the villi, and 24 h post chemotherapy in the crypts. In the colon, β-glucuronidase expression increased considerably from 72-96 h. Interestingly, mild diarrhoea also occurs at 2 h post chemotherapy, with moderate diarrhoea occurring from 12-24 h. Late onset diarrhoea was present at 72-96 h, with 5% of treated rats suffering from severe diarrhoea, 10% suffering moderate and a further 33% having mild diarrhoea. A variety of bacterial changes were seen in the gut over the whole timecourse of treatment, which also coincided with the incidence of diarrhoea.

Conclusions: Irinotecan causes severe diarrhoea, associated increased β-glucuronidase expression, which may be the result of increased intestinal microflora. Increased β-glucuronidase affects the processing of metabolites of irinotecan, resulting in increased toxicity. Maintaining constant levels of intestinal microflora and reducing β-glucuronidase activity may offer future targets for anti-mucositis agents for use with irinotecan.

09-099

Mucositis, Microflora And Mucins: The Effects of 5-Fluorouracil

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Objectives: 5-Fluorouracil (5-FU) is a commonly used chemotherapy agent in clinical oncology practice, associated with side effects of mucositis and diarrhoea. The structure of mucins offers mucosal protection, and allows maintenance of the intestinal flora, by providing attachment sites and preventing bacterial overgrowth and/or penetration. The aim of this study was to investigate the changes in mucin secretion and microflora after treatment with 5-FU.

Methods: Female DA rats were given a single 150 mg/kg i.p. dose of 5-FU. Rats were killed at 30, 60, 90 min, 2, 6, 12, 24, 48 and 72 h after treatment. Control rats received no treatment. Jejunum, colon and faecal samples were collected. Standard microbiological culture techniques were used to identify bacteria and real time PCR was used to quantify bacteria in faecal samples. Goblet cells and cavitated cells (having undergone mucus exocytosis) were also counted. Statistical analysis was carried out using the Peritz F test.

Results: Changes to the gastrointestinal microflora were seen following treatment. 5-FU caused decreases in Clostridium sp., Lactobacillus sp. and Streptococcus sp., and an increase in Escherichia sp. in the jejunum. In the colon, 5-FU caused decreases in Enterococcus sp., Lactobacillus sp. and Streptococcus sp. Real time PCR of faecal samples showed decreasing trends in Lactobacillus sp. and Bacteroides sp., and an increasing trend in E. coli. Significant increases ($p < 0.05$) were seen in Clostridium sp. and Staphylococcus sp. at 24 h. Goblet cell numbers decreased significantly in the jejunum from 24-72 h, with a significant increase in the percentage of cavitated goblet cells.

Conclusions: In conclusion, 5-FU treatment causes significant changes in the intestinal flora and mucin secretion in rats. These changes could result in systemic effects, and in

particular may contribute to the development of chemotherapy-induced mucositis.

09-100

Nuclear Factor-Kappab Expression In Relation To Mucositis In Patients Receiving Radiotherapy For Head/Neck Cancer: Preliminary Report

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Objectives: Oral mucositis is a common acute toxicity of drug and radiation therapy administered for the treatment of head/neck cancer. Radiation and chemotherapy are considered to be potent activators of Nuclear Factor-KappaB (NFKB), a transcription factor that has been implicated in regulating key elements in the sequence that leads to mucositis. The cytoplasmic expression of NFKB before the initiation of radiotherapy and at the time of the highest score of mucositis was examined.

Methods: Nineteen patients receiving radiotherapy (with or without chemotherapy) for head/neck cancer were included in this study. Patients were examined weekly and the scoring of oral mucositis was recorded according to EORTC/RTOG criteria. Cytologic smears were taken with a brush from the oral cavity of the patients. Immunocytochemical staining was performed by the use of cytoplasmic NFKB monoclonal antibody.

Results: Before the initiation of radiotherapy, NFKB was strongly expressed in 4 (21%), moderately in 5 (26,3%) weakly in 9 (47,3%) and not expressed in 1 (5,2%) of 19 patients. At the time when the highest score of mucositis was recorded, NFKB was weakly expressed in 10 of 19 (52,6%) patients and not expressed in the rest of the patients (47,3%). The comparison between pre-RT and highest mucositis score specimens of each patient revealed a reduction in the expression of cytoplasmic NFKB in 14 of 19 patients (73,7%).

Conclusions: After the stimulation from radiotherapy and/or chemotherapy, NFKB moves from the cytoplasm, where it resides when inactive, to the nucleus promoting the expression of several genes and the development of mucositis. Therefore, upon activation of NFKB and the development of mucositis, its cytoplasmic levels are expected to be reduced, as noted in our study. Our findings indicate an induction of NFKB activation, which may play a critical role in oral mucositis in head/neck cancer radiotherapy.

09-101

R-Spondin1 Protects Mice From Chemotherapy Or Radiation-Induced Oral Mucositis By Activating Canonical Wnt/β-Catenin Pathway

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Objectives: R-spondin1 (Rspo1) is a novel secreted protein that acts as a potent activator of the canonical Wnt/β-catenin signaling pathway. Using Wnt reporter TCF-β-gal (TOPGAL) mice, tongue was identified as the target tissue for Rspo1 as demonstrated by LacZ expression and β-catenin nuclear translocation in its stratified squamous mucosa. Injection of Rspo1 into normal mice also resulted in increased basal layer cellularity, thickened mucosa, and elevated epithelial cell proliferation in tongue by antagonizing Wnt inhibitor Dickkopf-1.

Methods: To assess the therapeutic potential of Rspo1 for oral mucositis, we tested the effectiveness of Rspo1 in treating chemotherapy or radiotherapy-induced tongue mucosal damage in several mouse models.

Results: Rspo1 dose-dependently protected mice exposed to whole-body irradiation from reduction of basal layer epithelial cellularity, mucosal thickness, and epithelial cell proliferation in tongue. In mice receiving concomitant 5-FU and X-ray radiation, Rspo1 administration also substantially alleviated tongue mucositis in oral cavity. Furthermore, Rspo1 was shown to significantly reduce, in a dose-dependent manner, the extent of tongue ulceration in mice receiving a single fraction high dose head-only radiation. Moreover, combined use of Rspo1 and keratinocyte growth factor synergistically resulted in complete healing of tongue ulcers in mice subjected to snout-only irradiation.

Conclusions: In conclusion, our preclinical results demonstrate that Rspo1 is a potent regenerative agent in treating oral mucositis by enhancing repopulation of basal layer epithelial cells and accelerating mucosal repair through upregulation of Wnt/β-catenin pathway. (Supported by Nuvelo, Inc.)

10-102

Late Toxicity of Radiotherapy (Rt) And Chemotherapy (Ct) For Haematological Malignancies

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Objectives: To assess the degree of late complications of RT and CT in patients succesfully treated for malignant lymphomas and myeloma.

Methods: Long-term side effects were evaluated in 142 patients with lymphomas and 24 patients with multiple myeloma. They were in a complete remission for 3 years or more (lymphoma patients) and 2 years or more (myeloma patients) after therapy. Myeloma patients were considered to be in a complete remission if ahieving the status of not measurable paraprotein, no Bence Jones paraproteinuria, less than 10% plasma cell infiltration in the bone marrow and without complaint of pain.

Results: Reduced performance status and deteriorated general condition was found in 48% of patients. Lymphoma pateints showed: mediastinal or paramediastinal fibrosis in 72% (severe in 7% and moderate in 39%), slight (20%) and moderate (8%) fibrosis of the apical parts of the lung, ventilation disorder in 64%, mostly of restrictive type, ventricular ventilation disorder in 18%, cardiac insuficiency in 11%, pericarditis in 7%, granulocytopenia in 11%, lymphocytopenia in 33%, slight anemia in 24%, aplasia in 60% and hypoplasia in 27% on sternal marrow cytology (previously irradiated) and hypoplasia in 16% on the iliac crest cytology (not irradiated), clinically manifested hypothyroidism in 2 patients, elevated thyroid-stimulating hormone in 27%. 13% of investigated patients received suportive therapy. In myeloma patients it was found: slight anemia in 56% and severe anemia in 23%, low haemoglobin value in 48%, granulocytopenia in 28%, lymphocytopenia in 42%, trombocytopenia in 17%, renal impairment in 20%, gammaglobulinemia in 34%, and hypoalbuminemia in 26%, hypercalcemia in 23%. 50% of examined myeloma patients received supportive therapy.

Conclusions: The fact that a large proportion of patients showed pathological findings signals the need for further detection of late complications of therapy and the need for administration additional suportive therapy.

10-103

Risk Analysis of Myelotoxicity with Temozolomide In Malignant Glioma Patients

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Objectives: Objectives: Myelotoxicity (TOX) with Temozolomide (TMZ) is uncommon, but may result in treatment delays or death when it occurs. This study was completed to find factors which may predict risk.

Methods: Methods: A retrospective evaluation of clinical factors associated with risk for TOX in 680 malignant glioma patients was completed and a clinical risk model developed. A subset of 187 patients (29 with and 158 without TOX) also had genotyping evaluating a set of polymorphisms in the DNA repair and xenobiotic metabolism pathways to further investigate potential genetic factors related to risk of TOX.

Results: Results: Separate clinical risk formulas were developed based on gender. For males, body surface area (BSA) ≥ 2; white blood count ≤ 6.5; current steroid use; and current bowel medication (MED) or thyroid replacement were significant predictors ($p=0.0001$). For females, final risk factors were: no prior chemotherapy; serum creatinine ≥ 1; platelet count $<270{,}000$; BSA <2; not using anxiety or reflux MED; and using bowel or pain MED ($p<0.0001$). The variables were summed to create a clinical risk score, with associated risk of developing TOX as low as 0% to as high as 33% for males and 80% for females with higher scores. Additionally, presence of the A allele of *NQO1* or the G of GSTP105 polymorphism resulted in a 70% decrease in risk of toxicity (OR=0.30 and 0.28, respectively); the G allele of *MGMT* exhibited a 2.4-fold increase in risk.

Conclusions: Conclusions: TOX with TMZ may be significant for those at risk. Expansion of our clinical risk model with associated genotype data may allow for individualized assessment of risk leading to optimized TMZ dosing. We are currently applying a broader genotype approach to identify the most comprehensive genetic profile responsible for TOX; this will then be validated in a larger sample.

10-104

Predictors of Neutropenia While Receiving First-Line Chemotherapy In Elderly Patients with Advanced Non-Small Cell Lung Cancer (Nsclc)

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Objectives: Neutropenia is a major adverse event often associated with chemotherapy administration. The purpose of this study was to identify risk factors associated with neutropenia in an elderly population with advanced NSCLC any time during first-line chemotherapy.

Methods: Study patients included those aged 65 years and older with a diagnosis of Stage IIIB/IV NSCLC in the SEER-Medicare database from 1998 through 2002. Neutropenia (N) was identified by the presence of a primary or secondary ICD-9-CM 288.x diagnostic code during a period of chemotherapy treatment. Febrile neutropenia (FN) was defined by an inpatient hospitalization for neutropenia or antibiotic administration following the initial neutropenia diagnosis. Multivariate logistic regression models controlling for patient demographics, disease, and treatment characteristics were estimated to identify associations with N and FN. Odds ratios and confidence intervals for measuring the strength of the association with each factor were reported.

Results: Among elderly patients treated first-line for stage IIIB/IV NSCLC, 5,138 were identified who met inclusion criteria. Nearly one-quarter (N=1228) developed N or FN while on first-line therapy. Multivariate logistic regression analyses showed an increased risk of N during first-line chemotherapy among older patients (>75 years) versus younger patients (<75) (OR 1.22; 95% CI 1.04-1.44), and among those receiving radiotherapy and surgery versus chemotherapy alone (OR 2.70; 95% CI 1.07-6.86). Analyses showed an increased risk of FN any time during first-line chemotherapy among older patients (>75 years) versus younger patients (<75) (OR 1.24; 95% CI 1.02-1.51), black non-Hispanic compared to white patients (OR 1.44; 95% CI 1.02-2.03), and among those receiving radiotherapy versus chemotherapy alone (OR 1.42; 95% CI 1.13-1.80).

Conclusions: Advanced age and receipt of combination therapy are factors associated with an increased risk of developing neutropenia and febrile neutropenia any time during first-line chemotherapy. * This study was supported by Eli Lilly and Company.

11-105

Nutritional Counseling In Cancer Patients Participating In a Cancer Nutrition Rehabilitation Program

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Objectives: Malnutrition in cancer patients often remains undiagnosed and untreated, and is associated with a poorer response to treatment, lower quality of life, reduced survival and higher health-care costs. Nutritional assessment and counselling may improve patient outcomes, yet few studies have examined their impact in a prospective study. The aim of this study is to examine the impact of dietary counseling on patients participating in a cancer-nutrition rehabilitation program.

Methods: Patients enrolled in a cancer-nutritional rehabilitation program were asked to complete a nutritional assessment measure before and following participation in an 8-week program that included an individualized nutritional counseling intervention. The Patient-Generated Subjective Global Assessment (PG-SGA), a well validated tool used to screen for malnutrition, was used to examine changes in weight, food intake, functional status, and appetite and gastrointestinal symptoms. Sixty five patients completed assessments at baseline and following the 8-week program.

Results: Of 65 participants, 13 patients were diagnosed with gastro-esophageal, 13 hepatobiliary, 11 breast, 7 lung, 6 hematologic, 3 colorectal and 12 with other cancer types. Wilcoxon tests were used to test changes from patient's scores at baseline versus at end of treatment. Significant improvement was noted in generalized food intake ($Z=-2.844$, $p<.01$) and appetite and gastrointestinal symptoms ($Z=-3.38$, $p<.01$) at the end of the program. Marginal improvement emerged in functional status ($Z=-1.81$, $p<.07$), however there was no significant change in weight.

Conclusions: The PG-SGA appears to be a useful tool to screen and monitor nutrition-related issues in cancer patients. Nutritional counseling within a cancer rehabilitation program appears to be beneficial.

11-106

Can Omega-3 Poly-Unsaturated Fatty Acids (Pufa) Added To Total Parenteral Nutrition (Tpn) Prevent Neutropenic Colitis In Patients with Acute Myelogenous Leukemia (Aml)? A Prospective, Open Label, Single Arm, Single Center Phase Ii Study (Lunch 1 Trial)

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Objectives: AML is a highly malignant clonal disorder of myeloid cells requiring myeloablative cytotoxic chemotherapy. Among the drugs commonly used, particularly cytarabine contributes to a high incidence (40%) of neutropenic colitis. Apart from supportive concepts, there is no standard treatment or prevention strategy, and mortality remains substantial. Experimental and clinical data attribute anti-inflammatory effects to omega-3 PUFA, mediated by their active eicosanoid metabolites. In particular, there is evidence of protective activity in cardiovascular disorders and inflammatory bowel disease. Therefore, we decided to study this effect in AML patients with chemotherapy-induced colitis.

Methods: In an ongoing first part of this phase II study, 13 consecutive adult AML patients requiring TPN after myeloablative chemotherapy are enrolled. An intravenous omega-3 PUFA formulation (Omegaven™, Fresenius Kabi) is administered throughout the entire TPN period at a dosage of 100 mL/d. Abdominal status, documented by a Gastrointestinal Mucositis Score (GIMS, range 0-14), serum albumin, citrullin, and liver enzymes are monitored regularly. Endpoints are incidence and severity of colitis, and safety. Target accrual will be 35 patients.

Results: Between November 2007 and January 2008, 7 subjects have been enrolled (5 males, 2 females, median age 58y, range 25-69y). Four patients were evaluable for safety and efficacy endpoints. Median TPN duration was 13d (range 4-21d). Omegaven™ was well tolerated; as in most TPN recipients, transient liver enzyme elevations occurred. Only one patient developed a brief period of GIMS9, colitis°3, transaminases°4, and sepsis with complete recovery after 7d and with no delay in chemotherapy continuation.

Conclusions: The addition of omega-3 PUFA to TPN seems to be safe and feasible. Both incidence and severity of colitis are low compared to previous cohorts. This novel intervention may thus prove to be a promising strategy against chemotherapy-related mucosal damage. Further data will be presented after an interim analysis of 13 evaluable patients.

11-107

Impact of Nutritional Status On Treatment Toxicity In Concomitant Chemoradiation - An Indian Experience

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Objectives: Nutritional support serves dual objectives for cancer patients. In one end of the spectrum, it is an indispensable component of supportive care and quality of life and at the other, its role as adjunctive therapy in certain cancers continues to exist. Apart from these two, there are sporadic observations of higher incidence of treatment related adverse effects in patients with poor nutrition. Aim of work: Advantage of chemoradiation, the preferred treatment option for many inoperable cancers, is often offset by significant acute toxicity. The study aims to explore the impact of nutritional status on acute and late reactions of concomitant chemoradiation in laryngopharynx, cervix and esophageal cancer.

Methods: Between June 1999 and November 2003 total 643 patients (laryngopharynx=280, cervix=415, esophagus=48) receiving concomitant chemoradiation were studied. Major treatment variables e.g. total dose, fraction size, treatment duration; chemotherapy medicine and dose (Cisplatin 40 mg/ M^2 weekly) were same for each cancer. Patients were categorized as 'under nourished' and 'well nourished' on the basis of assessment criteria including clinical examination, anthropometric measurements (height, weight, wrist & waist circumference, waist: hip ratio, BMI, triceps skin fold thickness), RBC indices, serum proteins, absolute lymphocyte count, DNCB challenge test, Mantoux test and 24 hours urinary excretion of BUN. All patients were assessed for early and late reactions (as per RTOG criteria) during treatment and follow up.

Results: Minimum duration of follow up was 48 months. For laryngopharynx patients grade 3/4 mucositis occurred in 106/186 (56.98%) 'Under nourished' and 6/94 (6.3%) 'Well nourished' (P=<0.001; odds ratio 19.43 with C.L. 7.74 – 52.07). Cervix patients had grade 2/3 proctitis in 57/272 'Under nourished' and in 27/143 'Well nourished' (P= NS; odds ratio 1.14 with C.L. 0.66 – 1.96); grade 3 cystitis in 15.4% 'Under nourished' and 14.7% 'Well nourished' (P= NS). Corresponding data for grade 3 acute esophagitis for

esophagus patients were 13/38 in 'under nourished' and in 1/10 (P=<0.005) in 'well nourished'. Incidence of late toxicity was comparable for both groups of all three cancer sites.

Conclusions: Nutritional status has significant influence on acute radiation reactions (not on late one) in head& neck and esophagus though has no statistically significant impact on pelvic radiotherapy

11-108

Pharmacotherapy And Nutrition Support In Cancer Patients with Anorexia-Cachexia Syndrome

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Objectives: Anorexia-Cachexia syndrome is one among the most frequent symptoms seen in cancer patients and it must be suspected during a weight loss of more than 5% in 6 months. Around 80% of patients with gastro-intestinal tract tumors and 60% of patients with lung cancer have a pronounced weight loss during their diagnosis.

Methods: 20 patients with stage IV disease, receiving chemotherapy in outpatient setting. All the patients were diagnosed with a weight loss of 10 to 12% during the past 6 months, anorexia, fatigue, apathy. In order to evaluate the effectiveness, body mass was evaluated and, with ESAS-cale.Patients were divided in to two groups: 1) combined intake of nutritional support and hydrazine sulphate + glucorticoids; 2) combined intake of nutritional support and glucocorticoids.

Results: In 80% of patients with anorexia-cachexia syndrome from first group, stabilisation in body mass and improvement in parameters of ESAScale were noticed. In the second group, 37% had an stabilization in body mass and improvement in parameters of ESAScale. Data were statistically significant ($p<0.05$, Student's criteria $t=2.16$, number of degrees of freedom $df=18$).

Conclusions: Combined intake of nutritional support and hydrazine sulphate+glucorticoids is the effective method in the treatment of anorexia-cachexia syndrome.

11-109

Nutritional Intervention In Advanced Non Small-Cell Lung Cancer Patients And The Mcgill University Cancer Nutrition And Rehabilitation Program(Cnrp), Jewish General Hospital. How Are We Faring?

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Objectives: We previously showed the need for nutritional intervention in advanced lung cancer patients (pts) is high and the PG-SGA's nutritional triage (NT I - IV) is a screening tool identifying pts in need of nutritional intervention (ASCO abstract 07-AB-30748). According to PG-SGA guidelines, pts in NT III and IV should have nutritional counselling.

Methods: We retrospectively analysed data on pts who completed an initial baseline PG-SGA at time of diagnosis between 6/05 - 9/07 and who were seen by CNRP. We report on waiting time to CNRP and impact of CNRP intervention.

Results: 118 pts, M: F: 63:55, aged 64 (SD 11.3) with advanced NSCLC from the outpatient pulmonary oncology clinic were initially screened with the PG-SGA. 84/118 (71%) were in NT groups III (34) and IV (50) and should have had nutritional intervention. These pts presented with: no appetite (56%), pain (39%), constipation (37%), dry mouth (33%), feeling full (32 %), taste changes (26 %), high CRP (61%) and high LDH (44%). 62/84 (74%) were counselled at least once by CNRP or by dietitian alone. Median time to first CNR visit was 6 days for NT III and 0 days for NT IV. NT III had median of 4 visits and NT IV had median of 1 visit. According to PG-SGA, symptoms increased and food intake decreased as pts waited for CNRP consultation. Only 37/62 (60%) pts returned for a CNRP second visit due to many reasons however, there were no significant changes in PG-SGA symptoms and food intake.

Conclusions: Despite short waiting time to CNRP, NT III and IV had small improvement of PG-SGA symptoms and food intake. CNRP participation of all screened advanced lung cancer pts and longer follow up with repeated PG-

SGA is needed to evaluate the benefit of nutritional intervention in these pts. Lila Sigal Hockey Marathon Fund.

12-110

Effect of Physical Exercises And Range of Motion On Fatigue And Quality of Life of Egyptian Cancer Patients During Chemotherapy

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Objectives: 1-Assess physiological and physical status of adult patients receiving chemotherapy. 2- Develop exercise program to improve physical condition during treatment. 3- Evaluate the effect of exercise on the presence of fatigue. 4- Evaluate the effect of exercises on quality of life.

Methods: Fifty adults with different diagnoses were recruited randomly and assessed pre and post exercises (before starting program, and daily for one week, then at the end of the second and third week). Setting: Medical oncology units at the National Cancer Institute, Cairo university, Egypt. Tools: 1- Questionnaire completed by patients and structured interview completed by the researchers if patient is illiterate 2-Observation checklist for recording activities, fatigue, sleeping condition, pain, appetite, and presence of nausea & vomiting. 3- Review physiological parameters from medical and nursing records.

Results: There were significant differences between results taken before and after the program. A significant improve was shown in activities and sleeping hours, as well as decrease in episodes of nausea. Also patients reported improvement of general condition and feeling of less tiredness.

Conclusions: Daily exercises and range of motion routines have positively affected the physical condition of adult patients during chemotherapy treatment and significantly improved quality of life.

12-111

Monitoring And Managing Chemotherapy Related Toxicity Using Mobile Phone Technology with Young People: The Asyms-Yg Study

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Objectives: This study aims to develop and evaluate an advanced symptom management system (ASyMS) with young people to monitor and manage chemotherapy related toxicity using mobile phone technology. The system involves young people recording and sending symptom reports to the hospital and receiving tailored self care advice. Health professionals can view symptom reports online and are alerted when severe symptoms occur. This is a 4-phase development study that concludes with a randomised controlled trial (RCT).

Methods: This study involves young people with cancer aged 13 to 18 years, parents and health professionals. The first phase of the study involved young people identifying which symptoms should be assessed. The second phase involved assessing the feasibility and acceptability of using this technology. Perceptions about the system were sought using questionnaires and interviews. In phase 3, young people and health professionals were involved in developing self care advice which is automatically generated in response to reported symptoms. The nurse alert system will also be put in place in this pilot testing phase, prior to the main RCT.

Results: Early findings suggest young people and parents find numerous benefits of using the system including: reassurance that they are being monitored at home, and having a record of symptoms showing symptom patterns which facilitates communication with health professionals about symptoms. Health professionals commented on the system's potential to give young people more independence and control over symptoms and help the implementation of timely interventions through early detection of symptoms.

Conclusions: The ASyMS-YG system has the potential to improve the management of symptoms in young people receiving chemotherapy. This paper will present data from phases 1, 2 and 3 with preliminary data from phase 4 to explore young peoples, parents and health professionals'

perceptions of the system and its potential for home monitoring and symptom management.

12-112

Stem Cell Transpmixed Methods: A Rich Way To Understand the Experience of Undergoing Hematopoieticlantation During Hospitalization

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Objectives: To evaluate the effect of 2 variables: 1) optimism/positive expectations and 2) congruence of symptoms expectations with actual symptom experience on these outcomes: a) emotional outcomes, b) functional outcomes, & c) coping. Also to describe symptoms and sensations experienced by adult hematopoietic stem cell transplant (HSCT) patients by mixed methods.

Methods: This was a prospective, longitudinal study of 40 HSCT patients. The study was designed to measure symptoms and outcomes at 4 timepoints (Admission: Time 1 or 0-72 hours, Acute phase: T2 or 3-7 d after infusion, Discharge: T3 or 0-72 hours before leave, and Post-HSCT: T4 or 3-4 weeks after. Used existing quantitative scales to measure optimism, Positive Expectations, emotional outcomes, functional outcomes, and coping. Also use investigator designed quantitative tools to measure functional status and symptom experience. To obtain a clearer understanding of HSCT experience from patient's view the investigator also conducted qualitative interviews at all 4 timepoints, hoping to understand discrepancies b/w quantitative and qualitative differences of symptoms. Means and SD run for all quantitative tools and content analysis used for all qualitative data

Results: HSCT patients felt they understood what was happening to them and that the experience of symptoms was congruent with that they expected. Common types of symptoms experiences during HSCT were: nausea and vomiting, stomatitis, diarrhea,weakness, fatigue, pain. Both quantitatively and qualitatively HSCT patients described different symptoms at each time point. Because of the use of a mixed method design new previously unpublished information regarding symptoms during HSCT were discovered.

Conclusions: Oncology nurse researchers have had a significant impact in advancing the science regarding symptoms for oncology and HSCT patients by using quantitative methods. Based on this study it is possible nurses might have a better understanding of symptoms and sensations from the patients' perspective if quantitative and qualitative methods are combined.

12-113

Cancer Care Training For Health Care Professionals At Moi Teaching & Referral Hospital

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Objectives: Cancer is one of the major causes of morbidity and mortality world wide. About 80% of patients come in advanced stage of the disease but it is known that a third of the cancers are curable if diagnosed at an early stage. This study is highlighting the knowledge, attitude and practice of the Health care professionals towards cancer patients.

Methods: The trainees were drawn from the local teaching hospital, local hospice and private hospitals around to undergo 2 hours of theory once a week for Six weeks and 3 months placement both at the hospice center and the oncology satellite clinics. The training included early indicators of cancer, safe handling of chemotherapy and patients cancer education. The two hour session was divided into 4 by giving a 30 minutes lecture on each topic.

Results: 45 health care professionals have been trained, 25 (55%) are able to provide services directly in the local cancer clinic, 20 (44.5%) are providing these services at various hospitals independently. There is also an increase in the number of cancer patients accessing these services.

Conclusions: There is need for support from the international donors to increase cancer educational to the health care professionals in this facility. There is need for funding to support cancer awareness education within the community. There is a need to put up a cancer training institute locally since this will provide training opportunity to many health care professionals.

12-114

Live Experience of Iranian Parents with Child of CanceR

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Objectives: Childhood cancer has tremendous impact on the family, especially the parents; therefore, it is important

to understand parents' experience. The present study aimed to describe the lived experiences of Iranian parents with children diagnosed as having cancer.

Methods: A phenomenological approach was used. Data were collected by qualitative Interview and analyzed following Dickelman phenomenological methodology. A purposive sample of 12 parents whose children were diagnosed of having childhood cancer was recruited from a university hospital in Isfahan_ Iran.

Results: Five themes emerged describing parents' experiences: acceptance the reality, feeling stymie in predicament of cancer, hope to God's miracle, religious faith, resistance to the oppression of disease. The initial reactions of the parents to the diagnosis were shock, and hopelessness. However, they accepted the reality and regarded their child's illness as their 'fate' that they had to accept and could not be altered, religious beliefs helped the parent's acceptance. Being responsible for the well-being of their children to some extent 'forces' parents to deal with the realities of cancer and keep up the struggle to be good parents. They were committed to the care of the sick child and seek informational and emotional support to face with the situation. This study found that parents actively sought emotional support. An important source of support was the sharing of experiences among the parents in the hospital, they were willing to share their experience with each other because they were 'in the same boat'.

Conclusions: In this study, the parents endured their child's illness. At the same time, they actively employed positive thinking to cope and they established a positive outlook for the future.

13-115
Recurrent Oral Squamous Cell Carcinoma After Mandibular Resection And Implant Rehabilitation. A Report of 5 Cases

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Objectives: Restoration of function following oral tumor resection is the primary goal of therapy. The observation of recurrent squamous cell carcinoma in some patients with postoperative dental implants lead us to search for possible causal factors.

Methods: In our Maxillofacial Clinic 26 patients with primary oral squamous cell carcinoma had undergone functional rehabilitation by endosseous implants. In 5 patients a recurrence was found at a later control visit. The charts of these patients were reviewed for possible causative factors.

Results: The primary cancer had always been located in the floor of the mouth and the adjacent mandibular process. Surgical resection had been performed with healthy margins. The time interval between primary resection and the placement of implants was 18-41 months (mean 27 mos). The recurrence occurred 5-69 months (mean 47 mos) after implantation in a similar area. This area was again resected 23-94 months after the first resection (mean 74 mos). Two patients died within 2 months after the second tumor resection due to tumor spread. The follow-up period of the other 3 patients was 2-29 months (mean 11 mos).

Conclusions: Due to the low number of patients and various carcinogenic factors it is impossible to draw unequivocal conclusions. In our opinion the following factors may be involved: Poor oral hygiene, loss of sensitivity in the mandible after continuity resection, passive smoking, field cancerisation, misinterpretation of cancer as periimplant "granulation tissue" etc. Symptoms of periimplantitis in former cancer patients should be considered as an ominous sign and therefore be examined by biopsy as soon as possible. Short-term controls are mandatory as symptoms may go unnoticed by the patient due to loss of sensitivity.

13-116
Modelling of the Salivary Flow Recovery After Radiotherapy Using Mixed Models: Determination of the Optimal Dose Constraint For Imrt Planning And Elaboration of Convenient Tools To Predict Salivary Recovery

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Objectives: In past studies, sophisticated models have been developed to elucidate the mathematical relationship between the dose to the parotid gland and the salivary flow. Most of them are too complex for routine use. This study aims to elaborate a simple and original model of salivary recovery based on a mixed model.

Methods: From January 2001 to December 2004, 44 patients were included (35 oropharyngeal cancer and 9 nasopharyngeal cancers). Twenty four patients were treated with intensity modulated radiotherapy (IMRT), 17 with 3-dimensional conformal radiotherapy and 2 with 2-dimensional radiotherapy. Stimulated salivary flow was collected before and 3, 6, 9, 12, 18 and 24 months after radiotherapy using the Parafilm® method. Data of salivary flow rate (=FR, expressed in % of initial salivary flow), time and dose to parotid were modelled using a mixed model. Several models were developed to assess the best fitting variable for the dose-level to the parotid gland and were compared using Akaike's Information Criterion.

Results: Mixed models provided proper modelling of the data. Models developed with dose to controlateral parotid fitted better the data than those with dose to both parotids. This result suggested that controlateral and ipsilateral parotids were not functionally equivalent considering the same dose to the glands. The best predictive dose-value variable for salivary flow recovery was the volume of controlateral parotid receiving more than 40 Gy (V40c).

Conclusions: This study allows recommending that the dose constraint for IMRT planning should be established on the controlateral parotid and on theV40c rather than on the mean dose. For a complete salivary flow recovery after 24 months, V40c should be <33%. Based on that model, results permit to establish 2 simple tools to predict the saliva flow recovery function of the dose delivered to controlateral parotid.

13-117

Taste Disorders In Patients Submitted To Allogeneic Hematopoietic Stem Cell Transplantation

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Objectives: The aim of this study was to evaluate taste perception and salivary flow rate in three different groups of adults patients submitted to HSCT at the BMT Unit/ HC/ UNICAMP.

Methods: Patients were classified in three groups considering post-transplant timing. Group I(n=16), up to 150 days after HSCT, Group II(n=18), between 151-1094 days, and Group III(n=22), over 1094 days. Taste acuity was measured by the taste thresholds for the four basic tastes using 5 ml of 4 solutions, in 3 concentrations(mol/L): NaCl (0.01;0.50;1.00), sucrose(0.01;0.50;1.00), citric acid(0.32; 0.0158;0.032), caffeine(1.988×10^{-5};0.644×10^{-2};1.277×10^{-2}). Patients considered flavors as sweet, source, salty, bitter, and without flavor. Intensity was considered high, medium and low. Unstimulated saliva was collected into separate preweight plastic test glass and salivary flow rates were determinate in ml/m.

Results: From those 56 evaluated patients, 30 presented cGVHD(Group I=5; Group II=11 and Group III=14). In general, the salt and sweet perception was not different between the 3 groups. For the sour solution, the high and medium concentrations were a challenging to be determined for those patients on the group I. None patients were sensitive for the low concentration of bitter solution (p= 0.05), in any period of study. The saliva flow rate was diminished in 54/56 patients in all periods (1.36 (0.01-1.35-SD 0.296) and hyposalivation was more intense in the Groups II/III (p=0.007). There was no correlation of taste dysfunction with oral cGVHD lesions. The results indicate that, despite the hyposalivation, taste alterations were only observed for the sour and bitter tastes even in patients up to 3 years post-HSCT.

Conclusions: These results may indicate that taste alterations post-HSCT are not correlated to oral cGVHD and to hyposalivation but may be considered as an individual response of the HSCT.

13-118

Xerostomia And Chronic Oral Complications Among Patients Treated with Hematopoietic Stem Cell Transplantation

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Objectives: Hematopoietic stem cell transplantation (HSCT) is a potentially curative treatment for a variety of life threatening diseases. Since oral complications are common after HSCT, the aim of this study was to assess incidence and severity of xerostomia and its correlation with oral complaints in HSCT-patients.

Methods: We recruited patients with a history of HSCT (n=48, 19 men and 29 women, members of the Dutch HSCT Patient Contact Group, age: 53.0±9.4 yr. mean time since HSCT 5.5±4.9 yr., 77% allogeneic HSCT) and compared them with 41 healthy controls (CON) (n=41, 14 men and 27 women, age: 51.5±9.1 yr). Data were gathered using the Xerostomia Inventory (XI-score, range 11-55) and an oral health questionnaire with 5-point Likert-scales. Statistical

analyses included Chi-square tests, Mann-Whitney tests, independent sample T-tests and Spearman correlation coefficients.

Results: HSCT and CON-groups did not differ with regard to gender and age. HSCT- patients had a significantly increased XI-score (29.8±12.3 vs 16.8±5.4), and increased severity of several oral complaints: painful oral mucosa (2.0±0.2 vs 1.3±0.7), altered taste (2.5±1.4 vs 1.3±0.6), limited opening of the mouth (1.9±1.3 vs 1.0±0.2) and problems with brushing teeth (1.8±1.1 vs 1.2±0.4). HSCT-patients did not report an increased severity of pain during cold stimulation of teeth (2.8±1.3 vs 2.5±0.8), chipped/cracked teeth (2.1±1.5 vs 1.5±0.7) or bleeding gums (2.1±1.2 vs 1.9±0.8). In HSCT-patients, the XI-score correlated significantly with the severity of painful oral mucosa (r=0.689), altered taste (r=0.582), limited opening of the mouth (r=0.456), painful teeth during cold stimuli (r=0.440), chipped/cracked teeth (r=0.407), problems with brushing teeth (r=0.463) and bleeding gums (r=0.349). In the CON-group, no correlations were observed between XI-score and severity of oral problems.

Conclusions: HSCT-survivors have a high level of xerostomia and oral complaints, which need special attention from health care providers.

13-119

Multifocal Oral Cancer In Patients with Oral Chronic Graft-Versus-Host Disease

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Objectives: Patients treated with allogeneic hematopoietic cell transplantation (aHCT) are at significantly increased risk for developing second primary malignancy compared to the general population, with oral squamous cell carcinoma (SCC) being the most frequent solid cancer. History of chronic graft-versus-host disease (cGVHD) further increases this risk. While a small number of individual cases have been published, this is the first report of multifocal oral SCC following aHCT. Our objective is to suggest a tendency for multifocal transformation.

Methods: Report the clinical characteristics and outcomes of two patients with oral cGVHD that developed multifocal oral SCC.

Results: Case 1: A 52 year-old female with acute myelogenous leukemia underwent aHCT and developed oral cGVHD (lichenoid-ulcerative type). Ten years later she developed an erosive lip lesion that was biopsied and diagnosed as SCC. During staging a second biopsy from the tongue was diagnosed as carcinoma in situ. Treatment is ongoing. Case 2: A 48 year-old female with CML underwent aHCT and developed extensive cGVHD with oral involvement (lichenoid-ulcerative type). 14 years later she developed painful erosive erythematous changes to the left buccal mucosa with areas of papillary exophytic nodules, and extensive erythroleukoplakia of the left posterior facial and lingual mandibular mucosa. Biopsies of three sites demonstrated well-differentiated SCC and she was treated successfully with chemoradiation therapy. Five months after the end of therapy she developed a recurrence at the left commisure treated with wide resection; one year after this she developed multifocal recurrence at the left buccal mucosa, posterior left tongue, and anterior and posterior left mandibular mucosa.

Conclusions: Long-term surveillance for mucosal changes suspicious for SCC is critical in patients with oral cGVHD. When SCC is diagnosed, multiple biopsies should be obtained prior to treatment planning. Following therapy, patients must be followed very closely and any suspicious changes must be biopsied.

13-120

Role of Curcuma-Longa In De-Addiction of Tobacco Chewers And Chronic Smokers – A Pilot Study On Pre-Cancerous And Frank Oro-Pharyngeal Cancer Patients

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Objectives: Smoking and tobacco leaf chewing are important predisposing factors of oral cancer. Chronic tobacco users are so much addicted that they are unable to get rid of their habits even after developing frank oral cavity cancers. Personal and psychological counseling, life style modifications have failed to de-addict these individuals. Serum nicotine level falls sharply and provokes them for further use of tobacco to keep sustained level of nicotine in blood. It has been observed that chewing of Indian medicinal plant root curcuma longa (turmeric, haldi) or its active ingredients curcumin is effective to de-addict tobacco users. Present paper is a pilot study to translate these clinical findings into scientifically explained observations.

Methods: Patients with pre-cancerous lesions or oropharyngeal cancers with habits of chronic smoking or tobacco chewing were recruited for the study. The study conducted between September 2003 to August 2005 in collaboration with Department of Biochemistry and Radiotherapy, Medical College, Calcutta. Of total 256 patients (132 in control arm and 124 in study arm);M: F=90:10; 196/256 (75%) were smokers and others were tobacco chewers. Serum nicotine level estimated at monthly interval for three months. Study arm patients were given simultaneously curcuma longa for consecutive three months and serum nicotine level was compared with control arm. Addiction potentiality was recorded by our counselor.

Results: Control arm patients had the same addiction dependency as before but amongst study arm patients (n= 132) 84/132 (63.6%) completely gave up smoking or tobacco chewing. 19 patients (14.3%) dropped smoking less than 10 cigarettes per day and 14 patients (10.6%) tobacco chewing decreased from 10-times to less than 2-times per day. The difference is statistically significant.

Conclusions: Initial result of our ongoing study is very much encouraging. The details of the present study will be discussed at the time of presentation.

13-121

Intensified Oral Care Combined with Lasertherapy Prevents Oral Complications Induced By Head & Neck Cancer Treatment

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Objectives: Radiotherapy on Head & Neck (HN) fields often leads to oral mucositis (OM). The purpose of this study was to assess the effects of an Oral Care Protocol (OCP) including Low Laser Energy (LEL) on the rate of treatment-induced oral complications caused by HN Cancer local treatment.

Methods: Between January 2004 and December 2007 44 patients received Intensity-Modulated Radiation Therapy (IMRT) on HN fields for HN malignancies at Albert Einstein Hospital, Sao Paulo, Brazil, in combination with an experimental OCP: 21 patients were treated by exclusive IMRT (G1) and 23 received IMRT combined with chemotherapy (G2).The total radiation dose ranged from 35 to 70 GY, with mean single daily fractions of 2,02 Gy. All 44 patients were included in our OCP and were prospectively evaluated for OM and patient-reported outcomes. The OCP consisted of routine oral hygiene care and an LEL protocol (prophylactic and curative).Symptom check-list, including measures of pain, saliva quality, dysphagia, and ability to speech, and oral examination were performed weekly. Symptoms were scored from 0 to 10 (10=worst symptom) and OM was graded according WHO. Summary statistics were used to describe the results.

Results: The median radiation dose delivered per patient was 60 Gy (range: 35-70). At the 60 Gy the proportion of patients with any OM was 4(9,09%) and OM of grade 1 – 4 were as follows: 13(29,54 %), 25(56,81%),2 (4,54%),and 0 (0%) respectively. In exploratory analysis, no statistically significant differences were found between groups G1 and G2. Feeding tube was required for OM by only 1 patient. The average of weight loss during treatment was 4, 9%.

Conclusions: Our study showed that a protocol with intensive patient monitoring, using LEL, comprises a promising supportive therapy to reduce acute complications from HN cancer treatment. Randomized trials are warranted to better define its role on patient quality of life.

13-122

Adherence To An Oral Care Regimen Among Head And Neck Cancer Patients: The Roles of Oral Functional Status And Illness Perceptions

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Objectives: Previous research has shown that only 24-35% of dentate head and neck cancer patients adhere to routine dental care before radiation treatment and that this trend continues both during and after treatment.

Methods: This study was a longitudinal examination of the roles of oral functional status and illness perceptions with respect to adherence to an oral care program among head and neck cancer patients. Subjects were 107 patients with oral or oropharyngeal cancer who were receiving radiation therapy as part of their treatment. These patients had been asked to follow a specific oral care regimen to protect their oral health both during and after radiation therapy. Data

were collected just prior to treatment initiation, at the end of treatment, and again 6 weeks after treatment.

Results: Findings support those of previous studies: Depending on the behavior in question adherence rates ranged from 31-80% adherent at baseline, to 23-46% at the end of treatment, and 17-39% at the 6-week follow-up. Baseline oral functional status was found to predict post-treatment intent to adhere; the more complications at baseline, the less the intent to adhere at post-treatment. Interestingly, no predictive relationships were found between oral function and actual oral care at any time point. However, regression analyses revealed that oral functional status moderated the relationship between beliefs about the severity of the cancer and actual oral care at post-treatment. Specifically, when oral functional status was good, beliefs about severity of illness was a good predictor of adherence, whereas when oral functional status was poor, the predictive power of beliefs about severity diminished.

Conclusions: These findings are relevant to understanding and enhancing medical adherence among head and neck cancer patients and the practical implications of the above findings will be discussed as they relate to models of behavior change and health beliefs.

13-123

Collaboration Between the Oncologists And the Dental Team Minimizes the Occurrence of the Osteonecrosis of the Jaw (Onj) In Solid Tumors Patients (Pts) with Bone Metastases Treated with Bisphosphonates (Bps)

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Objectives: Pre-existing oral pathology and surgical interventions are important risk factors for the development of ONJ in bone metastases pts treated with BPs. Ruggiero (*JOMS 2004*) suggested the implementation of dental preventive measures before and during BPs treatment. We investigated the occurrence rate of ONJ before and after implementation of such measures.

Methods: We reviewed retrospectively 813 consecutive cancer patients with bone metastases (group PRE) treated with BPs not undergoing any preventive measures. 153 pts (group POST), underwent a baseline mouth assessment (visit± radiograph) to assess dental pathologies. Regular dental examinations were performed along with BPs treatment. Dental cares before BPs are: Extraction of non-restorable teeth with marked tooth mobility; Correction of periodontal conditions; Oral hygiene treatments. We corrected all conditions requiring a conservative or endodontic treatment. Patients could complete these procedures even during the course of BP treatment. The need to implement dental treatment didn't impact on a prompt initiation of BPs treatment.

Results: Overall pts population: 966 pts; 73% with breast cancer. BPs received were: Zoledronic Acid (ZOL) in 244 pts, Pamidronate (PAM) to 600, PAM followed by ZOL in 79, Clodronate (CLO) or PAM/CLO in 43. Overall ONJ rate was 2.9% (ZOL or PAM+ZOL=19, PAM=9). In group PRE and POST, ONJ cases observed were 27 (3.3%) and 1 (0.6%), respectively ($p=0.048$). In pts exposed to ZOL or PAM+ZOL, the application of dental assessments reduced consistently the ONJ rate (PRE 8.7% vs POST 0.9%, $p=0.002$). IR of ONJ in 966 patients was 0.03/yr for PRE and 0.007/yr for POST (IRD=0.023, 95% CI from 0.0045 to 0.041).

Conclusions: The collaboration between oncologists and dental care specialists is crucial for the optimisation of BPs therapy. In our experience this multidisciplinary approach leads to a significant and clinically meaningful reduction of 75% in the incidence of ONJ.

13-124

Influence of Glutathione S-Transferase And Cyp1A1 Polymorphisms On Head And Neck Cancer Prognosis

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Objectives: The purpose of this study was to evaluate the CYP1A1 genetic polymorphisms and the null genotypes for GSTM1 and GSTT1 genes as a risk factor for head and neck squamous cell carcinoma (HNSCC) in Brazilian patients.

Methods: PCR and restriction enzyme digestion to identify the genetic CYP1A1 polymorphisms and multiplex –PCR to amplify GSTM1 and GSTT1 genes, were used for the genotyping study. Genomic DNA of 142 HNSCC patients and of 142 healthy individuals (control group) was studied in order to determine genotypes of CYP1A1, GSTM1, GSTT1 polymorphisms.

Results: The frequencies of the combined variant genotypes TC+CC of the CYP1A1 T6235C polymorphism were similar in both groups(P=0.85). The combined genotype TC+CC in patients with larynx tumor was lower when compared with other tumors(P=0.03). The frequencies of the combined variant genotypes AG+GG of the CYP1A1 A4889G polymorphism were similar in both groups(P=0.71). There was no difference on the GSTM1 null genotype(P=0.16) neither GSTT1 null genotype(P=0.94) in both groups. The homozygous deletion of the GSTM1 gene in tumors stages I-III was lower than that those stage IV(P=0.002).

Conclusions: There were no isolated or combined homozygous deletion difference in frequencies of GSTM1 and GSTT1genes between patients stratified by tumor location and neither in tumor differentiation. Similar frequencies of the CYP1A1, GSTM1 and GSTT1 genotypes isolated or in combination were observed in both groups.

13-125

Rescue of Radiation-Induced Salivary Gland Dysfunction After Stem Cell Transplantation

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Objectives: Xerostomia is a common side-effect of head and neck radiotherapy. It has a significant impact on patient's quality of life, and may result in long-lasting severe oral discomfort, problems with speech and dysphagia, and increased risk for caries and mucosal infections. As the current treatments and prevention techniques of xerostomia are insufficient and not applicable to all patients, there is need for novel strategies. In this study the clinical relevance of salivary gland stem cell therapy was investigated.

Methods: In a mouse model, we show the restoration of radiation-induced salivary gland dysfunction using salivary gland stem cell transplantation. Stem cells were isolated from submandibular glands and enriched by an in vitro floating sphere culture, followed by flowcytometry. Transplantation of a limited number of c-Kit$^+$ duct cells, obtained from day 3 cultured (sali)spheres, in irradiated submandibular glands resulted in the development of donor-derived ductal and acinar structures and long-term restoration of salivary gland function. Similar to the mouse model, human parotid and submandibular gland cells were cultured as salispheres.

Results: In time, duct cells in the human salispheres differentiated in vitro into acinar cells. Additionally, a small fraction of c-Kit$^+$ cells was present in human spheres. These results suggest that a similar 'putative' stem cell population can be isolated from human salivary glands. Future research will focus on the functional stem cell capacity of the c-Kit$^+$ cells, both using in vitro assays and in vivo transplantation in immunodeficient mice.

Conclusions: In summary, this is the first proof for potential use of stem cell transplantation to functionally rescue solid organ deficiency after radiotherapy. Supported by grants of the Dutch Society for Cancer Research and the EU project KP-6.

13-126

Validation of the National Institute For Health (Nih) Scale For Oral Chronic Graft Versus Host Disease (Cgvhd)

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Objectives: To validate the new NIH scale for oral cGVHD in regard to the patient's report and the clinical manifestations.

Methods: Seventy-five evaluations of 20 patients with oral cGVHD were performed using the NIH scale. The patients reported their oral status and pain score on an 11-step scale (Visual Analogue Scale [VAS]). NIH scores and VAS scores were compared for different GVHD levels. Correlations between NIH score and VAS were performed. Data were stratified according to the type of lesion that determined the cGVHD level.

Results: The average NIH score for mild, moderate and severe GVHD was 2±0.5, 5±2, 8±3, respectively ($p<0.001$). The average VAS for mild, moderate and severe GVHD was 1±3, 4±3 and 6±4, respectively ($p<0.001$). Correlation coefficient for NIH score and VAS was 0.41 ($p<0.001$).

NIH scale: cGVHD level	Major lesion	?NIH scale: Average score	NIH scale: Median score	Score: p-value	Average VAS	Median VAS	VAS: p-value
Mod-erate	Erythema/Ulceration	6±1	6	p<0.001	4±3	5	p=0.274
	Lichanoid	3±1	3		3±2	3	
Severe	Erythema/Ulceration	10±2	10	p<0.001	8±3	9	p=0.025
	Lichanoid	6±2	7		5±4	7	

There was no significant difference between moderate (erythema/ulceration) and severe (lichenoid) subgroups in regard to the NIH score (p=0.276) and VAS (p=0.291).

Conclusions: The cGVHD level according to the NIH scale correlates with the patient VAS for pain. Cases with erythema/ulceration had a higher NIH score than the cases with lichenoid, suggesting that the NIH scale is indicative of the type of cGVHD lesions. The resolution between severe(erythema/ulceration) subgroup and severe(lichenoid) subgroup is missed. The resolution between moderate (erythema/ulceration) subgroup and severe(lichenoid) subgroup is low. Hence, though the scale is indicative, its power to differentiate cGVHD patients according to their severity level needs fine adjustment. This may implicate on the scale ability to reflect response to treatment.

14-127
Metastatic Colorectal Cancer: Toxicity Profiles And Need For Supportive Care

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Objectives: As survival rates for metastatic colorectal cancer (mCRC) increase, patients have more exposure to chemotherapy and greater risk of related toxicity. What are the toxicity patterns and supportive care needs associated with mCRC treatment in usual oncology practice?

Methods: A population-based strategy was used to identify patients from 1 academic and 9 community oncology practices with mCRC diagnosed between 6/03-6/06, and initial mCRC treatment with oxaliplatin- or irinotecan-based chemotherapy. Demographic, disease, treatment, and toxicity data were abstracted by retrospective chart review, double-entered, and verified. Hospitalization, drug discontinuation, and drug reduction events were retrieved from clinician reports.

Results: 743 charts were screened. 110 were eligible. Characteristics were: mean age 58 (SD 12), 13% ≥70 years; 74% Stage IV at diagnosis; 39% male, 53% white, 26% black. At 1st-line chemotherapy, 87% of patients received FOLFOX, 12% received FOLFIRI, 74% received bevacizumab. Gastrointestinal (GI) toxicity was the most common documented adverse event (52%, 57%, 59%, of all treatment regimens (n=172), oxaliplatin-containing regimens (n=114), and irinotecan-containing regimens (n=59) respectively), followed by hematologic (34%, 48%, 24%), neurologic (32%, 50%, 10%), constitutional (e.g. fatigue; 20%, 24%, 17%), dermatologic (13%, 11%, 15%), and pain (11%, 14%, 7%) toxicities. Treatment toxicity led to treatment discontinuation for 20% of all regimens, and 19% of oxaliplatin- and 20% of irinotecan-containing regimens. Supportive care was documented for 72% of all regimens; agents included: additional 5HT3-antagonists (9%, 10%, 11%), other anti-emetics (17%, 18%, 22%), anti-diarrheals (20%, 22%, 20%), granulocyte growth factors (18%, 25%, 11%), erythropoiesis stimulating agents (14%, 19%, 9%), opiates (2%, 3%, 2%), and neuropathic pain medications (2%, 2%, 0%).

Conclusions: GI, hematologic and neurologic toxicities were most common. Supportive care focused on GI and hematologic effects; medications for neuropathic and pain effects were rarely documented. Supportive care should match anticipated toxicities to ensure adherence. (Support: Pfizer, Inc.)

14-128
Indicators of Surgery And Survival In Oncology Patients Requiring Emergent Surgical Evaluation For Palliation

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Objectives: We sought to determine the clinical presentation, management, and outcomes associated with emergent surgical consultation for symptom palliation in oncology patients.

Methods: We reviewed the medical records of patients for which a surgical oncology consultation was requested

(1/00–9/06) at a tertiary referral cancer center. Palliative evaluation was defined as consultation for symptoms attributable to an advanced or incurable malignancy. The Cox proportional hazards model was used to identify prognostic factors associated with overall survival (OS), and logistic regression analyses were performed to identify factors associated with surgical intervention.

Results: Surgical consultation was requested for 1102 patients; 442 (40%) met the criteria for palliative care consultation and formed the study cohort. Abdominal visceral metastases were present in 34%, carcinomatosis/sarcomatosis in 33%, ascites in 18%, and an intact primary/recurrent tumor in 28%. Gastrointestinal obstruction was the most common complaint (43%) while wound complications/infection and gastrointestinal bleeding accounted for 10% and 8%, respectively. Median OS was 3 months for the entire cohort. Adverse prognostic factors for OS included ≥2 radiologically-evident disease sites (hazard ratio [HR]=1.4, 95% CI: 1.1-1.8) and carcinomatosis/sarcomatosis (HR=1.4, 95% CI: 1.1-1.7). Palliative surgical procedures were performed in 119 (27%) patients, with a morbidity rate of 40% and a mortality rate of 7%. OS for the surgery group was 7 months. Younger patients and those with wound complications (odds ratio [OR]=3.3, 95% CI: 1.4-7.6), intestinal obstruction (OR=1.9, 95% CI: 1.1-3.2), and an intact primary/recurrent tumor (OR=3.6, 95% CI: 2.2-6.0) were more likely to undergo surgical intervention. Patients with ascites were less likely to undergo surgery (OR=0.4, 95% CI 0.2-0.8).

Conclusions: Palliative care consultations account for a considerable percentage (40%) of inpatient surgical oncology evaluations. Given that OS in this population is short, non-operative management is desirable. Surgery can be performed safely in highly selected patients with associated morbidity.

14-129
Anemia In Solid Tumor And Lymphoma Patients Receiving Chemotherapy: Impact On Early All-Cause Mortality

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Objectives: Anemia represents a common hematological toxicity associated with cancer chemotherapy associated with increased morbidity and mortality. There are little data, however, on the relationship between anemia and survival in unselected cancer patients with comorbidities.

Methods: A prospective study of nearly 4,500 consecutive adult cancer patients starting a new chemotherapy regimen was conducted at 115 randomly selected oncology practices between 2002 and 2006. Overall survival (OS) within 60 days of chemotherapy and adjusted hazard ratios (HR; 95% CI) were estimated with a Cox regression model incorporating time-dependent covariates.

Results: During a median period of observation of 75 days, 137 (3.1%) patients died including 88 from progressive disease. Causes of death also included infection (13), respiratory failure (6), cardiac (6), thromboembolism (6) and other/unknown causes (18). Patient age ranged from 18-97 years (41% >65), 46% ECOG performance status (PS) >1 and 38% with stage 4 disease. In addition to age, PS, comorbidities, cancer type and stage, predictors of all-cause mortality in univariate analysis included a history of anemia (P<.001), low pretreatment hemoglobin (Hb) (P <.001) and a drop in Hb from baseline (P<.001). Shorter time to tumor progression was associated with low baseline Hb (P=.012) and Hb nadir in cycle 1 (P=.004). The time-dependent occurrence of Hb <10 g/dL was significantly associated with OS [HR=1.60; 1.03-2.44; P=.035] following multivariate adjustment for age, gender, race, ethnicity, ECOG PS, Charlson comorbidity index, cancer type and stage, chemotherapy dose intensity, baseline laboratory abnormalities and year of study stratified by oncology practice. While the use of erythropoietic agents and blood transfusion were associated with a reduction in risk of early mortality in multivariate analysis, these interventions were employed at the discretion of the oncologist.

Conclusions: This study demonstrates that baseline and subsequent anemia are associated with early all-cause mortality in cancer patients receiving chemotherapy.

14-130
Outcomes For Cancer Patients Undergoing Cardiopulmonary Resuscitation In the Emergency Department of a Comprehensive Cancer Center

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Objectives: Cardiopulmonary resuscitation (CPR) after a cardiac arrest is routinely provided unless a specific do-not-resuscitate (DNR) order exists. Cancer patients who undergo in-hospital arrest and CPR have reported rates of survival to discharge of up to 10%. It is unknown whether survival rates differ for cancer patients who undergo CPR after out-of-hospital arrest. Our objective was to describe cancer outpatients who suffered a cardiac arrest and

received CPR in the Emergency Department (ED) of a comprehensive cancer center.

Methods: Every CPR code is documented in an ED log as well in a CPR Committee database. With IRB approval, both sources were reviewed for 1/1/2000-12/31/2002. Patients with pulseless cardiac arrest and CPR in the ED were included in this analysis. Retrospective chart review was conducted, and information entered into an ACCESS database. Results of data extraction were reviewed through a statistical program.

Results: 41 ED patients underwent CPR for cardiac arrest. Eighteen patients (44) % regained spontaneous circulation and were transferred to the ICU. Only 3 patients (7%) survived to hospital discharge. Of these survivors, one died 3 days later at home, and the other two survived 4 and10 months, respectively. 33 patients (80%) had solid tumors; of these, 64% had distant metastases. 20% had hematologic malignancies; of these, 88% had relapsed disease. In the previous 3 months, 63% had received chemotherapy and 32% received radiation therapy. Keywords from clinic notes in the 3 months prior to CPR that may be associated with declining status include "progression" in 56% of patients, "poor prognosis" in 44%, "poor response" in 27%, and "hospice" in 24%. Only 29% of patients had completed advance directives.

Conclusions: Cancer patients with advanced disease have poor survival after out-of-hospital cardiac arrest and CPR. Keywords of poor prognosis should prompt discussions regarding end-of-life decision making and out-of-hospital DNR orders.

14-131

Psychometric Properties of Cancer Symptom Assessment Instruments

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Objectives: Patient reported outcomes (PROs) require valid, reliable and comparable instruments. We compared psychometric properties of multi-symptom cancer symptom assessment instruments for thoroughness and evidence.

Methods: Instruments reporting at least one reliability and/or validity test beyond a test for content validity were included. 43 instruments (15 original and their modifications), including 6 new modifications, and 12 validation studies were reviewed. Psychometric properties were summarized based on scales: e.g. Visual Analogue Scale (VAS); 0-10 Numerical Rating Scale (NRS), or Verbal Rating Scale (VRS). Instruments were ranked by thoroughness (number of reliability/validity tests); and evidence (based upon a results summary). A 3-level scale ("poor, moderate, good") was applied to the results summary and the thoroughness ranking. "Very good" evidence was assigned for consistent good evidence from multiple tests in multiple studies.

Results: Symptoms assessed by an instrument were from 2 to 75 items across 6 domains. Tested dimensions by instruments include: symptom severity (37); frequency (21); distress (21); and duration (4). Internal consistency was universal reliability test. Most VAS were shorter (<15 Items), and tested more often (>50 %) for test-retest and/or inter-rater reliability. All types of validity were tested equally, except factor analysis, and responsiveness to change (tested less in VAS).Thoroughness and evidence ranged between poor/good. Thoroughness for reliability was worse than evidence (68%), whereas they were similar for validity (59%). No instrument provided "very good" evidence. ESAS (original), SDS, MSAS, MDASI showed good reliability. ESAS (0-10 NRS), MSAS, RSCL, Rhodes INV, HADS, RSCL – M, TRSCL, POMS, MDASI, MDASI Russian and MDASI Taiwanese had good validity.

Conclusions: These instruments are valid and reliable in assessing symptom severity. Evidence is greater for reliability than thoroughness and similar for validity. Except for VAS instruments, scale did not influence psychometric thoroughness. Standardization in type, number of tests and results would improve comparability.

14-132

Impact of Baseline Hemoglobin (Hb) Level On Outcomes In Chemotherapy-Treated Managed Care Cancer Patients Initiated On Erythropoiesis-Stimulating Agents (Esas)

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Objectives: Differing guidelines for the treatment of chemotherapy-induced anemia recommend initiation of ESAs at varying Hb levels. The current study was undertaken to investigate the impact of baseline Hb level at ESA treatment initiation on the outcomes of chemotherapy-treated cancer patients in a managed care setting.

Methods: Analysis of medical claims and laboratory data between 1/02-6/07 from the Ingenix Impact National Managed Care database was conducted. Patients included were ≥18 years, newly initiated on ESA, had ≥1 claim for cancer within 90 days prior to ESA initiation, had ≥1 claim of chemotherapy during ESA treatment, and received ≥2 ESA doses. Patients were stratified by baseline Hb≤10 g/dL vs Hb>10 g/dL within 28 days of ESA initiation. Incidence rates (number of events/person-time of observation) of hospitalization, hospital length of stay (LOS, days), and red blood cell (RBC) transfusion requirements during ESA treatment were compared.

Results: 816 patients (ESA initiated at Hb≤10 g/dL n=247, ESA initiated at Hb>10 g/dL n=569) formed the study population. Cohorts were similar with regard to age (Hb≤10 g/dL:62.2, Hb>10 g/dL:60.6 years, p=0.096), gender (%women: Hb≤10 g/dL:57.9%; Hb>10 g/dL:64.2%;p=0.091) and mean treatment duration (Hb≤10 g/dL:67.3 days; Hb>10 g/dL:67.7 days; p=0.948). Patients with ESA initiated at Hb≤10 g/dL demonstrated an increased risk of hospitalization of 47% (95%CI: 18%-84%, p<.001) compared to patients initiated at Hb>10 g/dL. Hospital LOS and blood transfusion rates were also statistically significantly higher in the Hb≤10 g/dL group, [50% increase in hospitalization days (95%CI 36%-66%,p<.001), a 3.7-fold increase in blood transfusion requirements (95%CI 2.71-4.95,p<.001)], compared to the Hb>10 g/dL group.

Conclusions: These results demonstrate ESA initiation at baseline Hb≤10 g/dL increased the risk for hospitalization, hospital LOS, and blood transfusion requirements versus initiation at Hb>10 g/dL. These findings help quantify the impact of initiating ESA treatment at a lower baseline Hb. Further research is warranted to determine other consequences of ESA initiation at various Hb levels. Supported by Centocor Ortho Biotech Services LLC

14-133

Resource Utilization In Non-Small Cell Lung Cancer: Results From the Us Sample of the Randomized, Phase Iii Trial of Pemetrexed/Cisplatin Versus Gemcitabine/Cisplatin

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Objectives: Efficacy results from the multinational phase III trial of pemetrexed/cisplatin (PC) versus gemcitabine/cisplatin (GC) for first-line advanced non-small cell lung cancer (NSCLC) demonstrated non-inferior efficacy in the overall population (Scagliotti et al, Proc IASLC 2007). In general, hematological and non-hematological toxicities favored PC; in addition, some resource utilization also favored PC. Given that delivery of oncology services differs by country, we explore resource utilization results from the US sample.

Methods: At each cycle, concomitant medications, transfusions and adverse event-related hospitalizations were recorded. Resource utilization and drug-related toxicity data were summarized for the overall population and the US sample and compared between arms with Fisher's exact test.

Results: Of 1725 randomized patients, 1669 patients received treatment, of those 111 were from the US. Baseline disease and patient characteristics for the US sample were similar to the overall population. Resource utilization and select grade 3/4 toxicities are summarized in the table.

	All: PC (n=839) vs GC (n=830)	US: PC (n=58) vs GC (n=53)
Neutropenia	15.1% vs 26.7%; p<0.001	15.5% vs 39.6%; p=0.005
Anemia	5.6% vs 9.9%; p = 0.001	3.4% vs 11.3%; p = 0.149
Thrombocytopenia	4.1% vs 12.7%; p<0.001	3.4% vs 28.3%; p<0.001
Transfusions	16.4% vs 28.9%; p<0.001	10.3% vs 35.8%; p=0.001
Erythropoietin	10.4% vs 18.1%; p<0.001	32.2% vs 51.8%; p=0.039
G-CSF	3.1% vs 6.1%; p=0.004	1.7% vs 10.7%; p=0.057
Antibiotics	30.0% vs 32.7%; p=0.254	33.9% vs 48.2%; p=0.133
Antiemetics	86.2% vs 84.6%; p=0.376	83.1% vs 87.5%; p=0.603
Hospitalization	32.3% vs 34.8%; p=0.277	34.5% vs 41.5%; p=0.557

Conclusions: Differences between PC and GC in resource use in the overall population were also seen in the US sample. Resource use in the US sample was generally consistent with the overall population and favored PC, with similar or lower use. The only differences in the US sample

relative to the overall population were higher rates of erythropoietin use and a numerically higher rate of antibiotic use in the GC arm.
Supported by Eli Lilly and Company.

14-134

Longitudinal Oncology Registry of Head And Neck Carcinoma (Lorhan): Initial Supportive Care Findings

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Objectives: LORHAN is a national registry to examine patterns of head and neck cancer (HNC) care within the US. Data is collected on socioeconomic parameters, toxicity and supportive care measures at academic and community sites.

Methods: LORHAN is a prospective, multi-center, longitudinal, observational registry. Eligible patients have newly diagnosed HNC scheduled to receive radiotherapy or drug therapy, are >/= 18 years of age and provide informed consent.

Results: 1277 patients have been enrolled. Patients at academic sites were: younger ($p<0.0001$), had more advanced disease (0.0001), and lower performance status ($p<0.0001$) than those at community sites. There were no differences in education, income or number of household members between academic and community sites. 21% of patients earned less than $20,000 per year. 20% of patients never smoked. 70% of smokers had quit. 20.4% of patients never consumed alcohol. 51% of patients who consumed alcohol now abstain. 56%/40% of patients at academic/community sites received a feeding tube with a median duration of 87 days. Tracheostomy tubes were more frequent (17% vs 10%) and used longer (27 vs 5 days) at academic sites. Reported use of opioids and anti-emetics was higher in academic vs community sites (89%/81 % vs 56%/65% respectively). Amifostine was used infrequently in both settings. Grade 3-4 mucositis was reported more frequently at academic sites. The difference in grade 3-4 mucositis with radiation versus chemoradiation was markedly less than expected. Weight loss averaged 5.0 kg in both goups.

Conclusions: There were differences in patient characteristics between academic and community settings but no differences in socioeconomic parameters. The documented use of supportive care measures was markedly lower in the community. Studies exploring the reason for this observation are warranted. In addition, the documented mucositis rate associated with chemoradiation was lower than anticipated which may reflect lack of adequate assessment or documentation.

14-135

The Change In Colorectal Cancer Risk From Cigarette Smoking Over the Past 5 Decades

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Objectives: Earlier studies (1950s-1960s) examining smoking and colorectal cancer risk failed to find an association. The majority of subsequent, well-designed studies observed an increase in colorectal cancer risk among the heaviest smokers, while a smaller number of studies still did not find an increased risk. The aim of this study was to analyze colorectal cancer risk from smoking over 5 decades.

Methods: This study used 3 separate data analyses to examine the association between smoking and colorectal cancer. Analysis #1 (1957-1965), analysis #2 (1965-1975), and analysis #3 (1982-1997) used a hospital-based case-control design to examine colorectal cancer risk by smoking. Logistic regression was used to calculate colorectal cancer risk by various tobacco smoke exposure measures while controlling for the relevant covariates which were available.

Results: Analysis #1 failed to find an association between smoking and colorectal cancer (>42 Pack-Years: OR=0.92, 95%CI=0.72-1.19). Analysis #2 also did not find a positive association between smoking and colorectal cancer (>41 Pack-Years: OR=0.69, 95%CI=0.45-0.89). Analysis #3 found a small association between smoking and colorectal cancer (>40 Pack-Years: OR=1.23, 95%CI=1.02-1.48), and the risk was greater when those with second-hand smoke exposure were removed (>40 Pack-Years: OR=2.12, 95%CI=1.42-3.15). No significant interaction by gender was noted in any of the analyses.

Conclusions: While the results of the analyses prior to 1975 did not find an association, results from the analysis performed after 1982 found a positive association between long-term cigarette smoking and colorectal cancer. The results of the study are in accord with the previous literature. The increase in colorectal cancer risk from smoking might be due to the increased exposure time

among the population, a change in the product over time, or a combination of the two factors. Clinicians need to educate patients with a history of tobacco exposure in an effort to increase colorectal cancer screening.

14-137

The Effect of Reduced Erythropoiesis Stimulating Agent (Esa) Use On Scarce Transfusion Resources - An Analysis of Resource Utilization Data From a Large Comprehensive Oncology Program Over a Two Year Period (2006-2007)

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Objectives: Risks of ESA use in cancer include a substantial increase in thrombotic events as well as a decrease in overall survival (Bohlius, JNCI 2006, Raftopoulos et al MASCC 2007). Benefits are modest with only a 1-1.5 g/dl hemoglobin rise and a 1-2 unit reduction in study-defined transfusion requirements seen. In 2007, the Food and Drug Administration (FDA) issued a second black box warning for ESA's and subsequently convened an Oncology Drugs Advisory Committee (ODAC) to develop more restrictive guidelines. In addition, in July 2007, the Centers for Medicare and Medicaid Services (CMS) significantly restricted ESA reimbursement for Medicare participants. These events have lead to a marked decrease in ESA use and the consequences of such a decrease would be expected to severely strain transfusion services, given the large volume of ESAs utilized. In a recent US Oncology survey, 73% of physicians polled felt the consequences of the CMS ruling was an increase in avoidable transfusions (www.usoncology.com/CompanyInfo/article.asp?aid=3344).

Methods: We compiled data for 2006 and 2007 by quarter, enumerating total treatment visits, ESA injections and transfusions from our center, a large, comprehensive hematology-oncology program with unrestricted transfusions allowed at physician discretion.

Results: The table below summarizes the results:

Transfusions	ESA -Injections	Total treatment visits	
264	1110	4420	**1Q06**
239	1141	4440	**2Q06**
299	1138	4951	**3Q06**
367	1125	5118	**4Q06**
288	919	5085	**1Q07**
327	840	5130	**2Q07**
331	655	4918	**3Q07**
342	448	5317	**4Q07**

Conclusions: Publication of ESA risks and activities by the FDA and CMS led to a 60% decrease in ESA use at our center. Surprisingly, despite an increase in total patient treatment visits and a liberal, non-restrictive transfusion policy, utilization of transfusions was unaffected. These findings, in addition to dispelling perceptions of overloaded transfusion services with declining ESA use, call into question: (1) the absolute need for transfusions in cancer patients based on an arbitrary Hb level and (2) the actual benefit of ESA's since transfusion utilization appears to be independent of ESA use.

14-138

The Internal Medicine Perioperative Assessment Center (Impac): Improving the Quality of Perioperative Management of Medical Comorbidities At a Comprehensive Cancer Center

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Objectives: The IMPAC clinic was designed to facilitate the medical evaluation of cancer patients undergoing surgery. We describe the goals, development, and structure of the IMPAC Clinic. We also present data on the first three year of operation in regards to patient demographics and disease states.

Methods: The current team consists of two physicians, a nurse practitioner, a nurse, and a patient scheduler. Patients are referred for perioperative risk assessment and medical optimization prior to going to the operating room. Using clinical guidelines, patients are risk stratified and appropriate testing is done. Evidence-based risk-reduction strategies are employed such as perioperative beta-blockade and prophylaxis for post-operative venous thromboembolism. Perioperative anti-coagulation issues are also addressed. Patients requiring close follow up in the post-operative period by the inpatient Internal Medicine service are also identified.

Results: Based on review of billing data, 6660 patient visits were recorded since inception of the program from November 2004 through August 2007. Of these 6660 visits, 4185 were new referrals to the program; the remainder were follow-up visits. Monthly patient volumes increased steadily, from 39 patients in November 2004 to an average of 275 for the last few months of the analysis. An analysis of the types of cancer seen in the IMPAC clinic generally reflected the order in which the clinic was rolled out to the institution: Patients from the Head and Neck Center made up the majority of referrals (31.0%), followed

by Surgical Gastroenterology (14.7%), Urology (13.5%), Gynecology (10.7%), and Breast centers (10.2%). In terms of medical comorbidities, of the 6660 unique visits coded, hypertension accounted for 53.1% of the diagnosis codes, followed by dyslipidemia, coronary artery disease, diabetes, and other cardiovascular conditions, and obesity.

Conclusions: The IMPAC program is an innovative attempt to improve perioperative care at the UT M.D. Anderson Cancer Center.

14-139

Outpatient Use of Hematopoietic Colony Stimulating Factors (Csf) Among Elderly Cancer Patients with Chemotherapy

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Objectives: Recent studies have established aging as a risk factor of chemotherapy-induced neutropenia. Thus, the 2006 ASCO guideline added prophylactic use of CSF in older cancer patients to its recommendations. Our study examined current patterns of CSF use in outpatient settings in this population.

Methods: We selected cancer patients with chemotherapy from the 2001-2004 Medicare MarketScan data, a proprietary dataset collecting Medicare and commercial claims for a group of retirees with Medicare supplemental insurance. We defined the index date as the first date of chemotherapy, followed patients for 60 days, and classified high-risk patients as those whose chemotherapy regimens had a greater than 40% risk of neutropenia. We identified outpatient CSF use using HCPCS codes and conducted logistic regression to examine factors associated with CSF use; factors included age, gender, cancer types, risk class, geographic regions, and the index year. A subgroup analysis of the high-risk patients was also performed.

Results: We found CSF use in 8.71% (5,455 in 62,647) of the patients and 19.8% (754 in 3,812) among high-risk patients. Compared with patients in the age group 65-69, those in 75-79 and 80+ groups were significantly less likely to use CSF (OR=0.83 CI: 0.76-0.90; OR=0.73, CI: 0.66-0.79, respectively). High-risk patients were more likely to use CSF (OR=1.12, CI: 1.02-1.24), so were those treated in more recent years. Compared with lung cancer patients, breast cancer and lymphoma patients were 1.23 (CI: 1.15-1.41) and 1.81 (CI: 1.64-2.00) times more likely to use CSF. Subgroup analysis showed that patients 75 and over were significantly less likely (OR=0.83, CI: 0.70-0.99) to use CSF than those under 75.

Conclusions: The observed lower rate in CSF use in the older age groups points to an unmet supportive care need in a subgroup of patients who are more susceptible to neutropenia due to aging.

14-140

Use Patterns of Erythropoiesis Stimulating Agents In Oncology Patient Diagnosis Related Groups (Drgs): Prescribing Impact of Clinical Warnings

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Objectives: Cancer patients who develop anemia frequently receive erythropoiesis stimulating agents (ESAs), such as epoetin alfa or darbepoetin alfa. During calendar year 2007 (CY07), multiple clinical safety warnings were released for the ESAs. The purpose of this analysis is to compare utilization patterns of the ESAs prior to and following release of the clinical warnings in oncology-specific DRGs.

Methods: ESA product utilization data for oncology DRG patient discharges from a U.S. hospital pharmacy database for a group of 40 hospitals were evaluated. To determine the impact of the clinical warnings, ESA use patterns were evaluated during multiple time frames. Baseline data for calendar year 2006 (CY06) was compared to each quarter (Q) for calendar year 2007 (CY07). Data points evaluated included the total number of oncology DRG discharges and the percentage of DRG discharges administered an ESA.

Results: 13,078 Oncology patient DRG discharges (patient discharges) were evaluated within 37 different oncology DRGs. A total of 1,305 patient discharges (9.9%) utilized an ESA during the cumulative time frame evaluated. In CY06, the baseline mean percentage of patient discharges administered an ESA was 10.46%. For CY07 Q1, Q2, and Q3, the mean percentage of patient discharges administered an ESA was 10.91%, 8.92%, and 6.51%, respectively. ESA utilization in patient discharges during CY07 Q1 was not statistically different as compared to baseline. However, ESA utilization in patient discharges during CY07 Q2 and Q3 represented a statistically significant decrease as compared to baseline ($p=0.044$ and $p=0.00001$, respectively).

Conclusions: Quarterly use of the ESAs in Oncology DRG patient discharges decreased during CY07 as compared to baseline in CY06. This decrease in use was statistically significant for Q2 and Q3 in CY07 as compared to baseline. This decrease in use corresponds to the release of the multiple clinical safety warnings for the agents.

15-141

Management of Cancer-Related Breakthrough Pain - Recommendations of the Task Group of the Association For Palliative Medicine of Great Britain And Ireland

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Objectives: To produce up-to-date, evidence-based, practical, clinical guidelines on the management of cancer-related breakthrough pain in adults.

Methods: A Medline search was performed to identify the literature on breakthrough pain (BTP). An initial face-to-face meeting was arranged to produce an outline of the recommendations. The first draft was then produced and circulated for comments. Subsequently, a second face-to-face meeting was organised to try to finalise the recommendations. The second draft was then produced and circulated for comments. The evidence was graded according to the SIGN system. The final draft was sent for peer review by the Science Committee of the APM, and respected external authorities on cancer-related BTP.

Results: The taskgroup produced a new definition of BTP, a clinical algorithm for diagnosing BTP, and 12 generic recommendations on the management of BTP: 1) Patients with pain should be assessed for the presence of BTP; 2) Patients with BTP should have this pain specifically assessed; 3) The management of BTP should be individualised; 4) Consideration should be given to treatment of the underlying cause of the pain; 5) Considerations should be given to avoidance / treatment of the precipitating factors of the pain; 6) Consideration should be given to modification of the background analgesic regimen / "around the clock" medication; 7) Opioids are the "rescue medication" of choice in the management of BTP episodes; 8) The dose of opioid "rescue medication" should be determined by individual titration; 9) Non-pharmacological methods may be useful in the management of BTP episodes; 10) Non-opioid analgesics may be useful in the management of BTP episodes; 11) Interventional techniques may be useful in the management of BTP episodes; 12) Patients with BTP should have this pain specifically re-assessed.

Conclusions: Many of the recommendations are not evidence-based, and some are contrary to standard clinical practice (although they are evidence-based).

15-142

International Patterns of Practice In Palliative Radiotherapy For Bone Metastases

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Objectives: To survey the patterns of practice worldwide in palliative radiation therapy (RT) for painful bone metastases (BM) in view of randomized controlled trials (RCTs) and meta-analyses demonstrating the equivalence of single fraction (SF) and multi-fraction schedules.

Methods: Radiation Oncologist members of the American Society of Therapeutic Radiology and Oncology, the Canadian Association of Radiation Oncology, and fellows of the Royal Australian and New Zealand College of Radiology were invited to participate. Five case scenarios were presented; respondents were asked whether they would recommend RT, and if so, what dose. Summary statistics were compiled.

Results: 962 eligible responses were received from Oncologists in 47 countries. 50.6% are currently practicing in the US, 13.5% in Canada, 10.1% in Australia/New Zealand, and the rest elsewhere. Principal factors taken into account when determining dose prescription were: prognosis, spinal cord compression, and performance status. Factors considered least were: department policy, wait list, and chance of future retreatment. 101 different RT schedules were cited. Case summaries are described in the Table. For case 1, 26.9% of those reporting a single preferred schedule would use >30 Gy and 11.8% SF. In the setting of multiple BM in prostate cancer (case 2), 32.1% would treat a painful shoulder with SF. In the same patient, 45.5% would offer <30 Gy and 11.4% SF to an asymptomatic femur with uptake on bone scan. 18.0% would use SF to radiate a solitary lytic vertebral lesion (case 3). With L3 neuropathic pain (case 4), 844/876 would offer RT, 6.6% with SF. In case 5, for those who would retreat, 15.4% and 21.7% would recommend SF to a painful spine and hip, respectively.

Conclusions: Patients who fit eligibility criteria of previous RCTs are still commonly treated with multiple fraction schedules, suggesting factors other than published evidence more strongly influence patterns of RT prescription.

Case Summary	Recommend RT?	Median Dose (Range)
Case 1. 64-year-old woman with non–neuropathic pain in the mid-thoracic spine, progressive despite opioids and bisphosphonates. She has bone-only metastatic T6–T9.	Thoracic spine: 95.2% (855/898)	30 Gy/10 (8 Gy/1-50 Gy/25)
Case 2. 65-year-old male wuth metastatic, hormone refractory prostate cancer with a painful right shoulder. Bone scan reveals intense uptake in the right shoulder and proximal left femur, with less intense uptake in multiple other sites. No impending fractures in either site on plain x-ray.	Right shoulder: 96.8% (864/893)	30 Gy/10 (6 Gy/1-50 Gy/25)
	Left femur: 55.1% (491/891)	30 Gy/10 (7 Gy/1-60 Gy/20)
Case 3. 55-year-old male with locally advanced non-small cell lung cancer, treated radically one year ago, now presents with non-neuropathic pain and a positive bone scan at L3. There is mild vertebral collapse, but neurologic exam is negative for cauda equina or spinal cord compression, as is MRI.	Lumbar spine: 98.0% (867/885)	30 Gy/10 (3 Gy/1-55 Gy/22)
Case 4. Same as case 3, only pain is neuropathic.	Lumbar spine: 96.3% (844/876)	30 Gy/10 (3 Gy/1-45 Gy/18)
Case 5. 65-year-old man with metastatic hormone-refractory prostate cancer with a partial response to radiation for painful bone metastases in the thoracic spine and right hip three months ago (20Gy/5 to each site). He now has progressive pain in both areas, a repeat bone scan intensely positive in both areas, and no fracture on x-ray.	Thoracic spine: 51.6% (443/858)	8 Gy/1(4 Gy/1-50 Gy/20)
	Right hip: 60.9% (520/854)	8 Gy/1(4 Gy/1-50 Gy/20)

15-143

Use of Opioids In Advanced Cancer In Medical Oncology Unit

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Objectives: To know the natural history of the use of opioids in far advanced cancer in Medical Oncology Unit (MOU). Of the many symptoms experienced by oncologist patients, pain is one of the most common and most feared. Pain is often undertreated, almost 75% of patients with advanced cancer who are admitted to the hospital report pain upon admission.

Methods: We observed that in patients admitted to our MOU, pain often is the dominant symptom, along with fatigue and dyspnea. Pharmacologic therapies for pain are non-opioids, opioids, adjuvant analgesics, disease-modifying therapies, and interventional techniques. We analysed the retrospective data of consumption of opioids in 2004 and in 2007 in our MOU reported by the registry of Pharmacy Unit to evaluate the differences in the use and choice of therapeutic agent only for inpatients. In this report we excluded codeine and tramadole. In 2004 we used 2.340 morphine viales, 1424 tablets of morphine slow release, 465 transdermal patches of Fentanyl and 10 bottles of morphine solution drops; while in 2007 we prescribed 1620 viales of morphine, 2.200 tablets (morphine slow release 416 T, oxycodone slow release 395 T, oxycodone + acetaminophen 1389 T,) 9 bottles of morphine solution for drops.

Results: During last 4 years we increased the consumption of opioids. All members of oncological equipe participated to educational programs on pain treatment in patients with cancer. We became able to treated our patients with all type of formulation and with different opioid agent . In 2007 pain control was obtained per os in a major number of patient then in 2004

Conclusions: We describe the clinical practice in our oncology unit regarding the consumption of opioid and we have found that both practices and knowledge of single opioid agent is useful to establish a tailor pain therapy.

15-144

Pain In Cancer Patients: Association with Plasma Interleukin-6 And Interleukin-8

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Objectives: Pain is one of the most distressing symptoms among patients with cancer. Although, some effective intervention has been established, some patients remain with persistent pain. Several studies have suggested the role of cytokines in pain in patients with chronic pain conditions, but it has not assessed in cancer patients with chronic cancer pain. In the present study, the potential association between cancer pain and plasma interleukin-6 (IL-6) and IL-8 was examined

Methods: 220 cancer outpatients, who didn`t receive any antineoplastic treatment in the last 30 days, were evaluated by the Brief Pain Inventory (BPI), McGill Pain Questionnaire (MPQ), and Karnofsky Performance Scale (KPS). Plasma cytokine levels were measured using an enzyme-linked immunosorbent assay (ELISA) and were compared among patients with mild (G1, n=76), moderate to severe (G2, n=49) and without pain (G3, n=95) chronic cancer pain, using one-way analysis of variance (ANOVA) or Kruskal-Wallis followed by multiple comparison tests. Patients in G1 and G2 had only cancer pain and were using analgesics. G3 members had cancer but felt no pain and didn`t use analgesics in the last 14 days. Twenty-three healthy volunteers (G4, n=23) were included as controls. Associations between pain and cytokines, adjusted by cancer symptoms and clinical and demographic characteristics were also examined using Classification and Regression Tree (CART) analysis. Correlations were assessed by Spearman's and Pearson's tests.

Results: the IL-6 (mean, SD, 95%CI: 287.14, 796.16, 58.45-515.82 pg/mL, respectively) and IL-8 (mean, SD, 95%CI: 39.98, 56.32, 23.80-56.15 pg/mL, respectively) levels in G2 patients was significantly ($p<0.05$) higher than of those all other groups. Among patients with pain (n= 125), it was observed significant, or almost significant, correlations between: IL-6 with worst pain ($r=0.23$) and with the total score of MPQ (r=0.18); IL-8 with total score of MPQ (r=0.16). CART analysis selected disease stage, IL-8, moderate to severe insomnia, mild to severe fatigue and age ≤48 years as markers for pain. The highest percentage of patients with moderate to severe pain was observed among those with disease stage IV and plasma level of IL-8>5.20 pg/ml.

Conclusions: Pro-inflammatory cytokines IL-6 and IL-8 may play a role in cancer pain. Results suggest that treatment with IL-6 or IL-8 inhibitors/antagonists may provide pain relief in cancer patients.

15-145

Controlled Double Blind Study of Imipramine (Im) And Morphine (M) In Chronic Pain Due To Advanced Cancer

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Objectives: Tricyclic antidepressants are recommended as an adjuvant to treat chronic pain syndromes of benign and malignant origin. This is based on anecdotal evidence which has included reports of opioid sparing effects.

Methods: We used a group comparison design: M + Im / M + Placebo. Patients were randomly assigned to test or placebo according to age, gender, ward, previous drug therapy, and baseline pain and mood scores by a computer aided process of minimization. M was prescribed in individualized doses of oral aqueous M given q4 h; dosage was titrated against the pain. The initial dose of Im was 12.5 mg hs (>65 years) and 25 mg (<65 years) increasing to maximum of 50 mg and 75 mg respectively. Mood, pain, anxiety and sedation were measured by serial visual analogue scales (VAS) supplemented by the McGill Pain Questionnaire.

Results: Sixty nine patients entered the study of whom 47 completed 7 days assessments. The M+Im (N=35) and M+ Placebo (N=34) were comparable at baseline. Staff were unable to distinguish the two groups i.e. the study was truly blinded. By day 7 Pain scores (VAS) were similar in the two groups but there was a larger reduction in the M dosage in the test group. This was statistically significant ($P<0.05$) and clinically important. Mean M dose / 24 h was 60 mg less in the M+IM group. The test group also showed a large reduction in use of co-analgesics supporting an analgesic action for Im. The difference in M doses became evident by day 7 but mood scores were similar in the two groups suggesting the analgesic effects were not mediated by psychological changes.

Conclusions: Im has a strong co-analgesic action when used with M. This effect seems to be independent of an antidepressant action.

15-146

The Role of Methadone In Opioid Rotation - Polish Experience

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Objectives: Open clinical study to assess analgesia, side effects of methadone and calculation of equianalgesic doses of oral morphine and methadone.

Methods: Methadone administered to 21 opioid – tolerant patients with severe cancer bone and neuropathic pain because of inadequate analgesia (NRS>5) on morphine (10 patients), transdermal fentanyl (TF) (4), morphine, ketamine and TF (3), tramadol (1), pethidine (1), intense pain with drowsiness on morphine with ketamine (1), strong pain with nausea on morphine (1). Dose ratios of daily doses of oral morphine (ddom) to daily dose of oral methadone (ddomet): 4 : 1 (ddom to 100 mg), 6 : 1 (ddom 100 – 300 mg), 12 : 1 (ddom 300 – 1000 mg), 20 : 1 (ddom over 1000 mg). Single dose of oral methadone did not exceed 30 mg regardless ddom before switch. After starting methadone previous opioid stopped completely in 19 and 2 patients treated with methadone and other opioids. Mean equivalent ddom before methadone switch was 812± 486 mg. Methadone administered regularly 3 times a day, 20 patients received oral methadone, 1 rectally in suppositories. Breakthrough pain treated with methadone (half of regular dose), morphine, fentanyl, metamizol and ketamine.

Results: Methadone treatment lasted 38.3±27.1 (3 – 95) days, daily doses range 9 – 400 mg, mean 48.1±19.7 at the beginning, maximal 148.5±104.1, at the end of treatment 131.1± 104.3 mg. Good analgesia in 11 (NRS<4), partial in 8 (NRS 4 – 5), unsatisfactory in 2 patients (NRS>5) who stopped methadone. Side effects drowsiness (6 patients), constipation (4), nausea and vomiting (2), one respiratory depression probably due to methadone and alprazolam interaction disappeared after naloxone and methadone cessation.

Conclusions: Results confirmed high analgesic efficacy, acceptable side effects, safety and effectiveness of morphine to methadone dose calculation

15-147

The Experience of Cancer Pain: Further Development of the Richards Assessment of Pain Instrument

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Objectives: Management of cancer-related pain presents a challenge that is at the heart of oncology nursing. There is evidence that prevalence of pain among cancer survivors remains high despite advances in knowledge of disease patterns and pain mechanisms. A plausible solution to improved management of pain related to cancer is an instrument that will guide comprehensive assessment of the cancer pain experience. Therefore, the purpose of this pilot study was to confirm the factor structure of an inductively-derived pain assessment instrument, recently author-developed and validated with patients experiencing a variety of pain problems, in a socioeconomically- and ethnically-disparate sample of cancer survivors reporting pain related to cancer and cancer treatment.

Methods: Data were collected from 106 Hispanic, African-American and non-Hispanic White cancer survivors with pain using the Richards Assessment of Pain (RAP) instrument. Exploratory factor analysis was conducted on half the sample to determine construct validity of the RAP. Structural equation modeling confirmed a 5-factor structure in the remaining half of the sample.

Results: The most parsimonious solution yielded 5 factors: 'the shroud of pain'; 'feelings evoked by pain'; 'limitations imposed by pain'; 'pain as the enemy'; and 'control over pain'. Cronbach's alpha, which measured 0.9 for the global scale and ranged from 0.7-0.9 for individual scales, provided support for initial reliability of the RAP in a cancer population. Substantive interpretation of factors revealed attributes of the pain experience that should be assessed in every cancer survivor. Further, results demonstrated sociodemographic health-related disparities in this sample that suggest a profile of vulnerability to undermanagement of cancer pain in cancer survivors.

Conclusions: Taken together, preliminary results of this pilot study support feasibility of a larger translational study to confirm validity and reliability of the RAP in assessing the experience of cancer-related pain.

15-148

Cancer Pain Management In Developing Countries:a Denied Right!

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Objectives: Breathing is not living. Living is being aware, being able to get around on own, living pain free and enjoying each day. If one can't do that, it just exists and just

existing is not living. Nearly every religion has dealt with problem of pain. Indeed, religion, philosophy, and folklore have "saturated pain with meaning". Today at the dawn of the 21st century, pain and its management have been prisoners of myth, irrationality, ignorance, and cultural bias. There is a major gap between understanding of pain pathophysiology and widespread inadequacy of treatment. In the poorest and most socially dysfunctional developing nations, this gap is for the most part ignored. Myths include notions that pain is necessary, natural and hence beneficial, pain is essential for diagnosis that "good patients" do not complain. These myths are further confounded with concerns about opioids; Opiophobia among health care providers and opioignorance. These entrenched attitudes to pain and its rationalization makes suffering from cancer pain biblically preordained contributing to the myth that if one suffers here, paves his way to heaven. Our society can never recognize pain management as a fundamental human right – because that would be one step away from legitimizing medically-assisted suicide. Medicine has to operate within cultural environment of community it serves. Hence the significance of cancer symptom needs to be understood within the cultural context. Some patients may want to be awake for religious considerations and suffer pain. Delirium may be mistaken for possession of spirits. Pain control is arguably the past, present, and future of oncology. Much work is required to make the transition from asserting that pain management is a fundamental human right, to a future in which appropriate pain management is a global reality and giving the terminally ill people what is rightfully theirs.

15-149

Patient, Provider, And System-Level Barriers To Optimal Cancer Pain Management In 5 Latin American Countries: Argentina, Brazil, Cuba, Mexico, And Peru

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Objectives: To identify the barriers to optimal cancer pain management in Latin American institutions as reported by providers and to compare these findings across nations, practice-settings, and specialties.

Methods: A cross-sectional, convenience sample survey of 777 Latin American advanced-cancer care providers was conducted by MD Anderson's WHO Collaborating Center in Supportive Cancer Care. Surveys were collected through mass mailings, distribution at conferences, collaboration with Latin American institutions/organizations, and the Pan American Health Organization, and online posting.

Results: Overall, the top 4 barriers were: inadequate staff knowledge of pain management (71%); patients' inability to pay for services/analgesics (54%); inadequate pain assessment (52%); and excessive state/legal regulations of prescribing opiates (47%). Stratified analyses revealed important differences. While 87% of Cubans identified "lack of access to a wide-range of analgesics" as a top barrier, only 49% of Mexicans and 38% of Peruvians did. Respondents from Argentina and Brazil were much more likely to report "patients' inability to pay for services or analgesics" than those from the other nations. Approximately two-thirds of Mexican and Peruvian respondents ranked "excessive state or legal regulations" as a top barrier to cancer pain management. While respondents from public hospitals were more likely to select "lack of access to a wide-range of analgesics" as a principal barrier than those from cancer centers or private hospitals, providers from private institutions were more likely to identify "patients' inability to pay for services or analgesics" than others. Differences also emerged across specialties. Anesthesiologists were the least likely to identify "inadequate assessment of pain" as an important barrier when compared to other specialties.

Conclusions: Findings from this study revealed important differences and provide critical information from frontline providers needed for developing targeted programs and policies to improve palliative cancer care in Latin America. Supported in part by The Hawn Foundation and the CDC.

16-150

Hypofractionated Radiotherapy Offers Effective Palliation For Nonmelanoma Skin Cancer

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Objectives: A multidisciplinary nonmelanoma skin cancer clinic is held weekly at the Odette Cancer Center. Palliative radiation may be recommended based on patient factors ie

dementia, and/or tumor factors ie size, which preclude radical treatment. The purpose of this review was to assess the outcomes of palliative hypofractionated radiation (8 Gy/ fraction day 0, 7, 21).

Methods: Retrospective chart review identified patients treated with this palliative regime from August 2003 to December 2007. Tumor histology, site, patient age, presenting symptoms, bidimensional tumor size and radiation treatment factors were recorded at baseline. Tumor size and symptoms were recorded at each fraction and follow-up visit.

Results: 24 patients received 27 courses of palliative radiation for basal cell (n=4) or squamous cell (n=23) carcinoma. Median age was 93 (range 80-101). Presenting symptoms included discharge (n=21), bleeding (n=16), odor (n=7), and pain (n=6). Tumors were located on the head (scalp, forehead, cheek, nose, ear, chin, neck) (n=24), extremities (n=2) and torso (n=1). Median tumor size at presentation was 5 cm (range 0.5-10 cm). 88% (21/24) of patients completed treatment. By day 21 (third fraction) all lesions had decreased in size, by an average of 39%. 67% (16/24) of patients attended follow-up at a median of 6 weeks (range 3-18), and a clinical complete response (CR) was seen in 44% (8/18), and partial response (PR) in 56% (10/18) tumor sites. Nine patients attended at least one further follow-up visit, and at the time of last visit CR was achieved in 6 of 11 tumor sites. No severe (RTOG grade≥3) late toxicities were seen. At the time of last follow-up, presenting symptoms were alleviated in 83% (15/18) tumor sites.

Conclusions: Elderly patients with nonmelanoma skin cancer and poor performance status can derive effective symptom palliation from hypofractionated radiation. While follow-up was limited, a 22% (6/27) CR rate was achieved.

16-151

Electrogastrography In Patients with Advanced Cancer

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Objectives: Electrogastrography (EGG) records gastric myoelectrical activity (GMA) thereby graphically depicting the electrophysiological function of the stomach. Factors such as increased cytokine levels, and stimulation of autonomous nervous system may affect GMA in advanced cancer patients. The disturbed GMA may give rise to distressing gastrointestinal (GI) symptoms. Objective is to describe GI symptoms in patients with disturbed and normal GMA.

Methods: Thirty five patients (22 men) diagnosed with cancer were enrolled prospectively. An EGG was performed 30 min pre-prandial for and 30 min postprandial for after ingestion of 500 ml water. All patients completed the dyspepsia symptom severity index (DSSI). Blood Ghrelin and C - reactive protein (CRP) determinations were included at baseline.

Results: The mean age was 58 years (18 to 82 years).. The CRP were increased in 11 pts, mean=24, Albumin levels were decreased in 11 patients, mean=36. The EGG diagnosis was as follows: 16 mixed dysrhythmia, 9 tachygastria, 3 bradygastria and 5 normal. Two or more patients with mixed diagnosis scored more frequently on (i) unable to finish regular meals, (ii) frequent burping and belching, (iii) bloating, Patients diagnosed with tachygastria noted (i) feeling full after meals, (ii) unable to finish regular meals, (iii) bloating. Patients with bradygastria reported (i) feeling full after meals, (ii) stomach discomfort. Patients with normal diagnosis reported no complain.

Conclusions: Patients with GMA experience a wide spectrum of upper GI symptoms. Further studies are needed to better understand the pathophysiology, the therapeutic implications of gastric dysfunction and the relation to inflammatory markers.

16-152

Symptom Clusters In Patients with Advanced Cancers

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Objectives: It has been observed that certain cancer symptoms such as pain, depression and fatigue frequently occur together. A better understanding of such symptom clusters can facilitate symptom assessments and help develop targeted treatments for these patients. Prior research on symptom clusters has focused on inpatients, early stage cancers, or a single cancer type or metastatic site. Our aim was to explore the presence and pattern of symptom clusters among outpatients with various types of advanced cancers.

Methods: Symptom scores measured by Edmonton Symptom Assessment Scale (ESAS) were collected for patients attending Oncology Palliative Care Clinics at Princess

Margaret Hospital from 2004 to 2007. Principal component analysis (PCA) was performed for the entire patient cohort and within specific disease sites to determine interrelationships of the 9 ESAS symptoms. Regression analyses were used to identify patient characteristics that were associated with symptom clusters and severity of symptom distress.

Results: A total of 1366 patients were included: 50% were male and median age was 64 years (range 18 to 74). The 3 most prevalent symptoms were fatigue, poor general wellbeing and decreased appetite. PCA of symptoms for the entire patient cohort revealed 2 major symptom clusters: cluster 1 (fatigue, drowsiness, nausea and decreased appetite) and cluster 2 (anxiety, depression and poor general wellbeing). There was high internal reliability in the clusters (Cronbach's alpha coefficient 0.80 and total variance 10-47%). Neither patient age nor gender predicted for symptom clusters (both $p>0.05$). Results from PCA of symptoms within the main cancer sites were tabulated (see table).

ESASSymptom	Site of Cancer						
	CNS	H&N	Breast	Lung	GI	GU	Gyne
Pain	0.70*	0.23	0.87*	0.74*	0.73*	0.71*	0.55*
Fatigue	0.77*	0.64*	0.43	0.60	0.56*	0.73*	0.60*
Nausea	0.22	0.10	0.28	0.41*	0.78*	0.15	0.21
Depression	0.33	0.83*	0.47	0.31	0.79*	0.17	0.14
Anxiety	0.25	0.79*	0.20	0.17	0.84*	0.20	0.16
Drowsiness	0.80*	0.24	0.57*	0.33	0.73*	0.45	0.12
Appetite	0.10	0.19	0.28	0.81*	0.03	0.77*	0.76*
Wellbeing	0.33	0.68*	0.32	0.68*	0.39	0.73*	0.78*
Dyspnea	0.65*	0.77*	0.24	0.01	0.27	0.44	0.59*

Values listed represent factor loading in principal component analysis where * indicates possible symptom clustering within the disease site. ESAS: Edmonton Symptom Assessment Scale; CNS: central nervous system; H&N: head and neck; GI: gastrointestinal; GU: genitourinary; Gyne: gynecological.

Conclusions: In patients with advanced cancers, cancer site is associated with distinct symptom clusters which are not influenced by patient age or gender. Further prospective studies of symptom clusters in the advanced cancer population are warranted in order to develop cancer-specific palliative interventions for this group of patients.

16-153
Symptom Distress, Interventions, And Outcomes of Intensive Care Unit (Icu) Cancer Patients Referred To a Palliative Care Consult Team (Pct)

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Objectives: Patients with advanced cancer (pts) admitted to ICU and their family member experience severe distress. Limited data supporting the impact of palliative care team (PCT) in ICU pts. To characterize symptom distress and outcomes in ICU pts referred to a PCT in a cancer center.

Methods: We retrospectively reviewed PCT consults for ICU pts between July-2006 and October-2007. Demographics, comorbidities, PCT findings, interventions, and outcomes were collected.

Results: Among 1,637 PCT consults, 88(5%) were from ICU. Median age: 60 years (range, 22-87), 41(46%) women. Primary cancers: hematologic (19, 22%), gastrointestinal (19, 22%), lung (18, 20%), and others (24, 26%). 67(76%) had metastatic disease. 19 pts were on mechanical ventilation (MV) and 24 on bi-level positive airway pressure (BIPAP). Findings: delirium 71(81%), dyspnea 67(76%), pain 74(84%), fatigue 84(95%), anxiety 57(65%), and family distress 88(100%). Interventions: DNR conversion (62/88, 70%), withdrawal of MV (15/19, 79%), BIPAP (26/26, 100%), and dialysis (10/13, 77%); opioid management(99%), steroids(70%), antipsychotic(76%), and counseling(100%). Improvement in: pain 67(90%), dyspnea 60(90%), anxiety 51(80%), delirium 31(44%), and family distress 88(100%). 35(40%) were transferred to palliative care unit (PCU). 51/88 ICU PCT pts (58%) died during admission vs 130/1549(8%) non ICU PCT pts ($p<0.0001$). 23/35 pts transferred to PCU (66%) died in PCU vs 212/629(34%) admitted to PCU from other services ($p<0.0001$). 37/88 PCT ICU pts (42%) were discharged alive.

Conclusions: ICU referrals to the PCT have severe distress. Interventions provided significant symptom improvement. Integration of PCT and ICU is needed to improve the quality of care of ICU pts.

16-154
Development And Integration of a Formal Supportive Oncology And Palliative Care Program: a Ten Year Genesis

James D'Olimpio

Objectives: To relate the evolution of a mature de-facto combined program in Supportive Oncology, Palliative Care and Hospice Care in a University affiliated large tertiary care hospital.

Methods: Narrative summary, with benchmark data points. Various modeling formats have been suggested, but sustainable funding, resource allocation and reconciling potential conflicts between competitive disciplines remain challenging and idiosynchratic.

Results: Originating in 1997 as a Palliative Care /Cancer Pain Service for the Division of Oncology/Hematology, the program now integrates separate Oncology, Geriatrics, and Critical Care services in a partnership with a sponsored community -based Hospice program .The mature format includes an Administrative Institute, an in-patient /out-patient consult service, and a ten bed dedicated Palliative Care Unit with on-site hospice liason. It is physician driven, all being Board-Certified in Hospice Palliative Medicine, with individual sub-specilaty certification in Oncology, Geriatrics and Crtitical Care. There also exisits a new fellowship training program with 2 active slots.Funding blends targeted philanthropic and institutional salary and material committments. Since formal integration in 2005, 1139 cancer patients have been referred hospital-wide, representing 54 % of all referrals .43 % died in the hospital, 19% were discharged to home and 38% were referred and transferred to hospice care (off site in-patient or home).The referral base includes 794 patients from Internal Medicine, 74 from Surgery and 255 from the various ICU sites. A DNR order is not required prior to referral/transfer, the rate of obtaining this order after consultation exceeds 85%, on average 5.6 days prior to death/discharge, representing significant improvement from pre-integration levels.

Conclusions: Sustainable programs that often include end-of life care/hospice care, supportive care in actively treated cancer patients, and clinically ambiguous situations, can be integrated in many ways.We offer an ad hoc model which reconciles many of these elements.

16-155

Patterns of Invasive Palliative Interventions In Patients with Advanced Hepatobiliary And Pancreatic Cancers

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Objectives: Invasive palliative procedures have been well described, however their frequency and timing near the end of life is not well documented. This study examines the patterns of invasive palliative interventions (IPI) performed for symptom relief after cure is not possible, in patients with advanced pancreatic and hepatobiliary cancers.

Methods: The medical records of 295 patients referred to palliative care (PC) with advanced pancreatic (161), biliary (37), gallbladder (27), and liver (70) cancer between Jan 2001 and Dec 2004, were reviewed for IPIs. IPIs were divided into: open, endoscopic, and interventional radiology (IR).

Results: Of those patients reviewed, 140 (47.5%) required an IPI including 77 pancreatic, 27 biliary, 24 liver and 12 gallbladder cancers. A total of 385 IPIs were recorded; indications included biliary obstruction (180), drainage of ascites (152), bowel obstruction (25), pleural effusion (8), urinary obstruction (3), and pain (3). Of the 385 IPIs, most were performed by IR (268), whereas 61 were endoscopic and 44 were open/laparoscopic. Mean time from IPI to death was 5.6+7.0 months, 58% of IPIs occurred prior to PC referral, and mean time from PC referral to death was 3.0±5.0 months (median=1.0mos). Open and laparoscopic IPIs occurred furthest from the end of life (mean=10.4mos) and endoscopic and IR IPIs occurred 6 and 3 months from end of life, respectively ($p<0.001$). Procedures in liver and gallbladder patients occurred closer to the end of life relative to pancreatic and biliary patients (means=2.3, 3.6 vs. 6.5, 6.6 months, respectively; $p=0.022$).

Conclusions: Recognizing the pattern of common IPIs can optimize the quality of care and is essential to understanding symptomatic disease trajectories at the end of life. Interesting findings include late referral to PC and the various specialists performing these interventions. This exploratory study demonstrates the importance of IPIs in palliation and provides incentive for further study.

16-156

Predictors of Inpatient Mortality In An Acute Palliative Care Unit At a Comprehensive Cancer Center

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Objectives: Predicting inpatient mortality has clinical and financial implications and helps improving the care of advanced cancer patients and their families. Models are available for mortality prediction in intensive care units with excellent validity and reliability. The purpose of this study was to determine factors associated with increased likelihood of mortality in an acute palliative care unit (PCU).

Methods: We reviewed the medical records of 357 patients admitted to the PCU and collected information regarding demographic factors, tumor type, hospital length of stay, source of admission, and insurance type. Symptom inten-

sity, vital signs, relevant laboratory tests and presence/absence of delirium were obtained from the records of the consultation preceding the PCU admission. Univariate and multivariate analysis was conducted to compare patients who died in the PCU vs. discharged alive.

Results: 92 (26%) patients died in the PCU. The results for univariate and multivariate analysis are described in the table. In contrast with other predictor models, no univariate association was found between inpatient death and delirium, lymphocyte percentage, white blood count, and tumor type.

Conclusions: We have observed significant association of certain factors with increased likelihood of PCU death in advanced cancer patients. These findings need to be validated in a larger prospective study to develop a model predicting PCU mortality for advanced cancer patients.

Factor	Univariate analysis		Multivariate analysis	
	OR	p	OR	p
Medicare/Medicaid vs. Private or Self paid	0.59	0.044		
Age >=65 vs. <65	0.49	0.01	0.36	0.001
Consultation team referral vs. Outpatient or Emergency Center	4.03	0.005	3.93	0.009
Low platelets (<140.000)	2.15	0.003		
Low sodium (<135)	1.81	0.021	2.75	0.001
High sodium (>147)	3.67	0.047		
Low CO2 (<23)	2.29	0.004		
High BUN (>20)	1.93	0.014		
High heart rate (>=101)	2.07	0.006		
High respiratory rate (>=21)	1.88	0.01	1.8	0.036
Supplemental O2 use	2.8	<0.001	2.35	0.003
Dyspnea*	1.16	0.002		

*Not included in the multivariate model.

16-157
The Acute Model of Palliative Care Unit In a Comprehensive Cancer Center, Six Years of Success

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Objectives: Palliative Care Units (PCU's) are not available in most United States cancer centers, and even when present, there are significant variations in the types of services provided. Consultation services are the predominant model. Reimbursement is a major barrier to the development of such units. Our PCU is an acute care model with the goal of improving symptom distress and overall quality of life of cancer patients and their families and help with transition to hospice care. The purpose of this study is to define the structure and outcomes of the PCU at M.D. Anderson Cancer Center for the past 6 years.

Methods: We reviewed the structure and operation of our PCU and our computerized database for demographic information, primary cancer diagnosis, disposition, and insurance coverage for all patients admitted to the PCU between 1/15/ 2002 and 6/30/ 2007. Hospital billing database was reviewed for all discharges from the PCU and compared to billings for other Oncology services discharges.

Results: The acute PCU is 12 beds closed unit run by a specialized interdisciplinary team led by a physician. Patients were admitted from other inpatient oncology services or the outpatient Supportive Care Center if they have significant physical and psychosocial distress based on the physician's evaluation. More than 600 patients were admitted annually to the PCU. >50% of the patients were discharged to hospice care. Inpatient mortality rate was 30%. Reimbursement was similar to the average medical oncology patients. The average daily charges for PCU were 66% of the average daily charges for medical oncology.

Conclusions: Our acute care model has been well accepted in our tertiary cancer center. The model is complementary to the services provided by hospice and helps with smoother transition to the community. Services were reimbursable provided that they met acute criteria for hospitalization.

16-158
Barriers To Palliative Care: Does the Service Name Matter?

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Objectives: Palliative Care (PC) has been progressively adopted by American cancer centers, however, referrals to PC continue to occur late in the trajectory of illness. We hypothesize that the perceived association between the name PC and hospice is a barrier to early patient (pt) referral. The objectives of this study were to determine the perception of the impact of the name PC as compared to supportive care (SC) on pt referral and to determine whether there is an association between demographic factors and the perceptions of the two names by medical oncologists (MO) and their midlevel providers (MLP) (Advance Practice Nurses and Physician Assistants) in a comprehensive cancer center.

Methods: We conducted a survey among a random sample of 100 MOs and 100 MLPs. We collected information on demographics, previous experience in palliative care, and attitudes and beliefs towards the impact of the name PC as compared to SC on patient referral.

Results: 140/200 (70%) participants responded (74 MLPs and 66 MOs). Median age was 43 (34.5-50) and there were 83/140 (60%) females. MLPs and MOs agreed in their responses to most of the items. Table 1 summarizes the differences in perception of the two names divided by MO and MLP status. There were no significant associations between the perception of the two names and age (p=0.82), gender (p=0.35), or prior training in PC (p>0.99).

Question	PC (%)			SC (%)			*P
	MLP	MO	ALL*N =140	MLP	MO	ALL*N =140	
I prefer this service name	11(15)	16 (24)	27 (19)	49 (66)	31(47)	80 (57)	<0.0001
I would use this service: *For pts receiving active primary treatment*	32 (45)	29 (44)	61 (45)**	61(84)	50 (76)	111(79)	<0.0001
For pts receiving treatment for advanced cancer	53 (72)	43 (65)	96 (69)**	69 (93)	56 (85)	125(89)	<0.0001
For pts in transition to end of life	63 (88)	64 (97)	127 (92)**	67 (93)	59 (89)	126 (91)	0.8296
This name causes distress to pts/ families	20 (27)	26 (41)	46 (33)	3 (4)	2 (3)	5 (3)	<0.0001
This name is a barrier for me to refer pts	20 (27)	12 (18)	32 (23)	5 (7)	4 (6)	9 (6)	<0.0001
This name can decrease hope in pts/ families	30 (41)	31(48)	61(44)	10 (14)	5 (8)	15 (11)	<0.0001

**p<0.0001

Conclusions: The name PC was perceived by MOs and MLPs as more distressing and reducing hope to pts and families. MOs and MLPs significantly prefer the name SC and are more likely to refer pts on active primary (79 vs. 45%, p<0.0001) and advanced cancer (89 vs. 69%, p< 0.0001) treatments to a service named SC.

16-159

Patients Attending a Cancer Rehabilitation Program Experience Clinically Relevent Symptoms

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Objectives: The McGill Cancer Nutrition and Rehabilitation program (CNR) assesses and treats cancer patients (pts) suffering from weight loss and fatigue. Objective is to compare the symptomatology and the CRP profile between pts diagnosed with different cancer types.

Methods: A retrospective description of pts seen and treated at the CNR was undertaken. The Edmonton Symptom Assessment Scale scores and C-reactive protein (CRP) blood level were prospectively collected. Statistical analyses were performed using ANOVA.

Results: One hundred and twenty six pts were analyzed. The cancer diagnosis distribution was as follows: 30 pts had hepatobiliary; 18, lung cancer, 37, upper GI cancer, 13 colorectal cancer, and 28, breast cancer. The mean scores of symptoms were as follows: strength 5.8, appetite 4.4, quality of life 4.4, distress scale 4.3, sleep 4.1, sleepiness 4.1, depression 3.7, pain 3.6, nervousness 3.6, shortness of breath (SOB) 3.1 and CRP level 19 mg/l (Normal range 0 to 5.0 mg/l). There was no significant difference in CRP levels across groups. There were significant differences in SOB and strength between cancer types. Table 1. Statistically Significant ANOVA of ESAS between Cancer Diagnoses.

ESAS	Cancer comparisons	Difference between means	95% CI	ANOVA p-value
SOB	Lung>Breast	2.50	0.10-4.90	0.02
	Lung>Upper GI	2.59	0.33-4.86	
	Lung>Hepatobiliary	4.08	1.73-6.43	
Strength	Lung>Upper GI	2.02	0.14-3.91	0.003

Pts with cancer experience clinically relevant symptoms even before end of life. Those with lung cancer have more SOB and weakness than those with other cancers even in the early stage of their disease. Our study includes pts at different stages of their illness. This limits the interpretation of the findings as the distribution of disease stages may not be similar. The CRP blood level was not different probably because all pts seen had already signs of cachexia.

Conclusions: Patients with lung cancer experience symptoms requiring interventions, especially SOB and fatigue. A CNR program is important to alleviate the symptoms of this patient population. Studies evaluating such programs should use validated instruments to measure the symptom profile.

16-160

Survey of Clinical Predictions of Survival In Far Advanced Cancer

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Objectives: To explore the factors clinicians use when formulating a prognosis in palliative care.

Methods: Survey of participants at prognosis workshops held during palliative care conferences in Vancouver, Canada and Melbourne, Australia. Respondents gave predictions for a terminal pancreatic cancer scenario (median survival 1 month)(1), indicated the factors they took into account when prognosticating, then rated the prognostic importance of various tumour, physical, laboratory and psychosocial factors.

Results: 150 surveys were completed. 61% respondents were physicians, 35% nurses and 4% other professions. Respondents were experienced, median PGY=20 years, and 40% had qualifications in palliative care. The median predicted survival for the group was 2 months, with a 10% survival time of 6 months. Median probability of surviving 1 month and 6 months was 60% and 5%, respectively. Respondents found it easier (95% vs. 75% response rate) to make probabilistic than temporal predictions. There was a non-significant trend for physicians to be more optimistic than nurses. The main prognostic factors used for the scenario were: cancer type, short disease free interval, failure of chemotherapy, extent of disease, liver failure and weight loss. In general prognostication, tumor-related factors were given the most weight and psychosocial factors the least. C-reactive protein was undervalued as a prognostic factor.

Conclusions: The median survival prediction by these experienced palliative care practitioners over-estimated published median survival by 100%. They put most emphasis on tumor-related factors even though the patient had far-advanced disease,(2) and this may explain some of their over-optimism. Studying clinicians' predictions is important for improving prognostication. References: 1.Loprinzi CL, Johnson ME, Steer G. Doc,how much time do I have? JClinOncol. 2000;18 (3):699-701. 2. Hauser CA, Stockler MR, Tattersall MH. Prognostic factors in patients with recently diagnosed incurable cancer: a systematic review. Support Care Cancer. 2006 Oct;14(10):999-1011. Study supported in part by CIHR-NET.

16-161

An Audit Into the Feasibility Conducting Recommended Mouth Care During the Terminal Phase

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Objectives: To assess the feasibility (and effectiveness) of hourly mouthcare in cancer patients in the terminal phase.

Methods: The audit was carried out within a specialist palliative care setting. An initial criterion was set as to which patients would be eligible; these included (1) that the patients were unconscious, (2) that their mouths be open, and (3) that the assessment be carried out every hour. The total number of patients selected was fifteen, all with varying types of cancer. A set of flow-chart guidelines was devised for nursing staff to follow during assessment. Assessment findings were recorded on data collection sheets. The evidence was collated and analysed by the author, the chief auditor of the study.

Results: Over a 6 month period, 15 patients with cancer in the terminal phase were audited. In total, 263 assessments were performed over a period of 414 audit hours. Approximately 62% of patients were assessed hourly. Interventions performed ranged from one to three hourly. The trend toward using using Oral Balance was a factor in this longer timespan. Positive feedback from colleagues indicated that the audit was successful in profiling mouth care, although frustrations were raised about the lack of time and opportunity in carrying out hourly assessments, coinciding with when the ward was at its busiest.

Conclusions: 1. It was difficult to perform hourly mouthcare assessments (and interventions) due to other nursing

commitments. The implications for practice are: a) increased staffing on palliative care units; b) increased priority for oral care; c) the delegation oral care to health care assistants / family members.2. In the majority of cases, patients required mouth care intervention every hour. The implications for practice are either a) interventions need to be performed regularly (ie. on the hour), or b) more appropriate types of intervention need to be identified (for instance, Oral Balance).

16-162

Development of Assessment Tool For Terminal Cancer Patients

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Objectives: Since the number of patients with advanced cancers is increasing gradually, it is very important to control their various physical and psychological problems. In order to control the symptoms effectively and improve the patients' quality of life, it is essential to find and evaluate precisely the various symptoms of terminal cancer patients. We have developed the symptom assessment tool for terminal cancer patients, and compared the results of the assessment with patient reported outcomes.

Methods: We evaluated 17 common symptoms shown in patients with terminal cancers. Patients' symptoms were scored as none(0), mild(1), moderate(2), or severe(3) with reference to objective criteria. The records of the physical symptoms were carried out on the similar hour every day. Among the patients, who have clear consciousness and can communicate normally, were investigated in order to evaluate the severity of common symptoms by using Memorial Symptom Assessment Scale (MSAS).

Results: The physicians performed evaluation of 121 terminal cancer patients by using the assessment tool and history records of physical examinations as well. Only 54 patients could be investigated to evaluate the symptoms by using MSAS. The physical symptoms have no difference in the evaluation results between the patients and physician. The physicians' evaluations on drowsiness, nervousness and anxiety were significantly different in terms of frequency, severity and distress. ($p=0.0001$, 0.0001, 0.005)

Conclusions: The patients who were reported the outcomes by using MSAS could be obtained from 44% of the patients with terminal cancers. However, the tool used by doctors to evaluate objectively could be applied for all patients including who cannot communicate every day. Compared to the actual reported symptoms, the symptoms evaluated with the tool showed less seriously, especially in psychological symptoms.

16-163

Quality of Care At the End-of-Life For Hospitalized Patients At a Canadian Tertiary Care Cancer Centre

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Objectives: Limited literature is available regarding the last days of life of patients who die while admitted at oncology centres. To explore the quality of care for these patients, and the decision-making process among oncologists, we examined the practice patterns at our institution.

Methods: The charts of all patients who died at the inpatient unit of Vancouver Cancer Centre between January 1, 2005 and December 31, 2006 were reviewed. Information regarding demographics, investigations, cancer treatments, clinical course, and philosophy of care were collected retrospectively.

Results: A total of 118 deceased patients (4.7% of 2533 admissions) was identified with the following characteristics on admission: median age 63, male 42%, ECOG performance status $^{3}3$ 91%, and advanced cancer 100%. The median time from diagnosis to admission was 10 months, while the median duration of the final admission was 10 days. In total, 3218 investigations were performed during a combined 1568 hospital days. Medical oncologists ordered more tests compared to other disciplines (2.8/day vs. 1.8/day, $p=0.05$). While the number of tests decreased over admission ($p<0.001$), 91% had tests done during the last week of life, and 28% during the last day. During the last admission, 25 patients received systemic therapy and 24 received radiation, with 75% of these treatments terminated prematurely. Do-not-resuscitate (DNR) orders, supportive care plans, and diagnosis of dying were documented in 96%, 86% and 76% of patients. The timing of these philosophy of care milestones strongly correlated with the frequency of investigations ($p<0.001$). Cardiopulmonary resuscitation was performed in 7 patients: 5 with no

code status discussion documented, 1 with full code after discussion, and 1 with DNR ordered.

Conclusions: Cancer patients who died at our oncology centre were investigated and treated intensively during their short hospitalization. Early establishment of philosophy of care may help to minimize excessive investigations.

16-164
Living with Malignant Ascites: Do Symptoms Occur In Clusters?

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Objectives: To examine symptom clustering in malignant ascites (MA) patients at paracentesis. Symptom cluster studies are inconsistent possibly due to heterogeneity in population and procedures. MA is a distressing problem usually managed by repeated paracenteses. Paracentesis represents a meaningful time-point in identifying patients with a specific presentation.

Methods: Pre- and post-paracentesis, patients completed the Edmonton Symptom Assessment Scale with abdominal distension and mobility items added (ESAS:AM) and European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTCQLQ-C30). The authors have previously published the validity of these surveys in malignant ascites. To generate the cluster analysis tree, we standardized the variables, computed an average taxonomic distance matrix, clustered the distances with the unweighted pair-group, arithmetic average method.

Results: The following clusters were identified at baseline: anxiety and depression (clust1) being the most stable; followed by fatigue and mobility (clust2); well-being joining clust1; appetite joining clust2; shortness of breath and abdominal distension; pain and drowsiness. The algorithm was checked for validity by a cluster analysis of ESAS:AM with EORTCQLQ-C30 symptom, quality of life (QOL) and functioning scores. Individual symptoms clustered tightly across the surveys, while the global QOL and functioning subscales on the EORTCQLQ-C30 clustered tightly with each other. Changes occurred in single items in symptom distress, abdominal distension and shortness of breath ($p<0.001$, adjusted for multiple comparisons). A cluster analysis of change scores shows improvement after paracentesis occurred in a tightly clustered way in fatigue and abdominal distension (changeclust1), followed in order of decreasing stability of cluster, by changes in well-being and mobility (changeclust2), changes in anxiety joined changeclust1, changes in appetite joined changeclust2.

Conclusions: Using a cluster analysis technique, credible symptom clusters were identified in patients with MA at paracentesis. Paracentesis impacts symptoms individually, as well as in a clustered way. This study develops our analytic and conceptual understanding of symptom clusters.

TABLE 1. Demographic data

Variable	*Baseline* *mean ± s.d. (n; range)*	*Baseline| Follow-up* *mean ± s.d. (n; range)*
Age (years)	59.9±10.7 (57; 38-82)	58.9=10.4 (37; 38-80)
Amount of fluid drained (L)	3.2±1.9 (48; 0.3-8.1)	3.4=1.8 (34; 0.3-7.5)
Frequency of drainage (days)	12.8±6.9 (38; 3.5-28)	13.5=7.2 (29; 3.5-28)
Number of previous procedures	3.3±5.7 (52; 0-30)	4.0=6.6 (37; 0-30)
Days since most recent procedure	14.9±9.5 (38; 2-35)	14.6=9.1 (28; 4-35)
Sex	45 females (78.9%)	33 females (89.2%)
ECOG performance status	*n*=56	*n*=37
0	1 (1.8%)	1 (2.7%)
1	12 (21.4%)	9 (24.3%)
2	14 (25.0%)	8 (21.6%)
3	28 (50.0%)	18 (48.6%)
4	1 (1.8%)	1 (2.7%)
Diagnosis	*n*=57	*n*=37
Ovarian cancer	23 (40.4%)	18 (48.6%)
Colorectal cancer	10 (17.5%)	4 (10.8%)
Breast cancer	7 (12.3%)	4 (10.8%)
Liver cancer	6 (10.5%)	2 (5.4%)
Pancreatic cancer	5 (8.8%)	4 (10.8%)
Unknown primary cancer	3 (5.3%)	3 (8.1%)
Endemetrium	1 (1.8%)	1 (2.7%)
Mesothelioma	1 (1.8%)	1 (2.7%)
Small bowel cancer	1 (1.8%)	0 (0.0%)

TABLE 2. Symptom severity

Symptom	*Baseline mean = s.d. (n)*	*Baseline mean ± s.d. (n)*	*Follow-up mean = s.d. (n)*	*Mean score difference (post-pre)*	*P-value*[a]
ESAS AM	n=57	n=37	n=37		
SDS:AM	51.57=18.8	51.35=19.1	38.65±22.7	-12.70	<0.001
Abdominaldistension	7.26=2.5	7.38=2.6	4.16±3.3	-3.22	<0.001
Fatigue	6.23=2.2	6.35=2.3	5.35±2.6	-1.00	0.018
Mobility	6.11=3.1	5.95=3.4	4.11±3.0	-1.84	0.005
Feeling of well-being	5.53=2.6	5.41=2.5	4.81±2.5	-0.59	0.274
Appetite	5.26=3.2	5.32=3.0	4.24±2.6	-1.08	0.035
Shortness of breath	4.40=3.2	3.95=2.9	2.62±2.7	-1.32	<0.001
Pain	3.91=3.1	4.00=3.0	3.49±3.2	-0.51	0.366
Drowsy	3.81=2.9	3.32=2.9	3.08±3.0	-0.24	0.520
Anxiety	3.30=3.0	3.59=3.1	2.41±2.7	-1.19	0.028
Depression	3.09=2.8	3.38=2.8	2.49±2.5	-0.89	0.019
Nausea	2.68=3.0	2.70=3.1	1.89±2.7	-0.81	0.093
QLQ-C30 functioning scales					
Role	34.52=32.5 (56)	32.39=32.1 (36)	48.14±32.6 (37)	14.78	0.001
Global QOL	36.20=28.1 (56)	39.21=28.9 (37)	17.53±25.1 (37)	8.49	0.111
Social	41.39=33.8 (56)	41.06=34.9 (37)	47.32±33.3 (37)	6.10	0.338
Physical	47.66=27.0 (56)	47.50=28.4 (36)	51.92±26.3 (37)	3.64	0.203
Emotional	62.27=27.8 (55)	60.58=29.6 (36)	48.56±33.9 (36)	-12.03	0.059
Cognitive	68.41=28.4 (56)	71.59=25.4 (37)	48.14±32.6 (37)	-23.46	<0.001
QLQ-C30 symtom scales					
Appetite loss	54.58=39.3 (55)	55.61=40.7 (36)	36.08±30.3 (36)	-17.23	0.034
Sleep disturbance	52.80=38.4 (55)	51.92=37.0 (36)	37.89±32.7 (37)	-13.89	0.004
Dyspnea	46.96=33.0 (56)	43.42=30.8 (36)	26.11±27.5 (37)	-16.58	<0.001
Fatigue	71.96=28.5 (56)	71.92=30.1 (36)	57.30±31.1 (37)	-13.33	0.005
Diarrhea	22.58=31.2 (53)	23.53=34.4 (34)	13.46±24.1 (37)	-10.82	0.046
Nausea and vomiting	24.46=27.9 (56)	25.03=28.9 (36)	16.30±23.8 (37)	-8.28	0.137
Pain	41.36=34.9 (56)	43.03=34.3 (36)	11.00±31.4 (37)	-1.36	0.795
Consupation	25.47=34.6 (55)	27.75=37.0 (36)	36.11±37.9 (37)	-0.92	0.877
Financial impact	23.06=31.4 (52)	22.53=31.5 (34)	28.78±30.7 (37)	3.88	0.297

[a]For ESAS. These values in bold are significant at the 0.001 level of significance. This more stringent criterion for significance (0.05/27) corrects for the multiple testing of the same individuals in this study.

16-165

Is Integration of Comprehensive Care Centres For HIV & AIDS Patients In Palliative Care Units Called For?

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Objectives: Demand for Palliative Care Services has increased due to HIV pandemic. This study explores whether integrating CCCs in Palliative Care Units is justified.

Methods: Case Study

Results: The Nairobi Hospice is currently taking care of 3200 patients. 630 have HIV& AIDS and related cancers. This is about 20% of the total workload. However, out of 400 patients referred in the last 6 months of 2007, 26 were newly diagnosed HIV cases while 120 had related cancers, thus 36.5 % of the total referrals. These are patients who are previously tested or agree to go for tests when requested. Most believe that total care should be provided at the Hospice. We estimate that over 60% of the patients we are managing may be HIV positive. It would be helpful to the patients and their families if total care was received at the Hospice i.e., VCT, adherence counseling, ARVS provision, management of opportunistic infections and Palliative Care. Use of ARVS has produced a decline in the incidence of AIDS defining malignancies. My greatest concern is the types of cancers that these patients with prolonged low immunity will have with time. HIV &AIDS, like cancer, is associated with distressing symptoms, psychosocial, spiritual and financial factors. Therefore, holistic approach to the patient care is necessary and CCCs provide the way and those being tested will increase.

Conclusions: Palliative Care is a reasonable, pragmatic approach for HIV and related cancers and being the final common pathway for HIV patients, the approach need to be integrated and multisectoral.Integrating CCCs is long overdue since eventually, these patients require palliative care and Hospices provide good setup of total care throughout the spectrum of illness. The aim of treating these patients is to reduce mortality, provide comfort and support and relieve symptoms therefore eventually improving quality of life.

16-166

Demographic Influences On Symptom Profiles

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Objectives: Demographics may influence cancer symptom prevalence. We report the simultaneous affect of age, gender, performance status (PS) on 8 symptoms.

Methods:8/38 symptoms (1000 cancer patients admitted to a palliative medicine program) were significantly influenced by >1 demographic factor. A probability model by gender, age (45, 65 ,85 y old), and ECOG PS identified prevalence patterns (magnitude, direction, rate of change) due to of all three factors.

Results: Prevalence depended on symptom, ECOG, age and gender. Both genders (all ages and PS levels) followed similar change patterns, except for: blackout (males affected more by age and PS), and nausea/vomiting (females affected more by age). All symptom prevalence decreased with age. Two probability patters occur within each age group with low PS: 1.) anxiety, pain, and sleep problems prevalence decreased, 2.) blackout, constipation, nausea, sedation, and vomiting increased. The magnitude of PS affect was large (>20%) for sedation; moderate (10 - 20%) for pain, anxiety, constipation, blackout (males), and small (<10%) for sleep problems, blackout (females), nausea, and vomiting. With poor PS, older patients are more likely to have: pain, sedation, blackout, nausea vomiting, equally likely - sleep problems and constipation, and less likely anxiety. With older age, those with poor PS were more likely to have: pain, equally sleep problems and constipation, and less likely anxiety, sedation, blackout, nausea vomiting.

Conclusions: Symptom prevalence decreased with age in cancer patients. PS determined two prevalence probability patterns for anxiety, blackout, constipation, nausea, pain, sedation, sleep problems, vomiting. The magnitude and rate of change were predominantly symptom, PS, and age influenced.

16-167

Attitudes Toward Hospice-Palliative Care of Patients with Terminal Cancer

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Objectives: As the number of patients on terminal cancers' stage has been increased gradually, their quality of life has also become an important issue. Therefore, a hospice-palliative care has been the best medical system for their physical and psychosocial cares. We evaluated the attitudes toward hospice-palliative care of terminal cancer patients who refused hospice cares, comparing them to patients in the hospice center.

Methods: We enrolled the patients with advanced cancer who did not take further anti-cancer therapy (ECOG 3-4). The patients in the general ward who refused to transfer to hospice units were assessed for the questionnaire. It was composed of five categories including the perception and attitude of physical, psychological, social, spiritual aspects and hospice. We also evaluated the patients in the hospice center with the same questionnaire.

Results: Compared to the patients in the hospice center (HC), the patients in the general ward (GW) showed a low satisfaction with their present status. Patients in the GW were also required more anti-cancer chemotherapy and needed more information of new treatments than others in the HC. In the aspect of psycho-sociology, the patients in GW had more feelings of anger. In terms of attitude toward a dying process, the patients in GW rarely talked about death with their family. The patients in GW felt that they rarely need any spiritual help, on the contrary, the patients in HC felt much comfortable with the spiritual supports from hospice teams.

Conclusions: The patients who refused to transfer to the hospice center were less satisfied with their present status, and required more aggressive anti-cancer therapy than those in the HC. However, the patients in HC wanted more supportive cares, and felt much comfortable with physical and psychological symptom controls and spiritual helps.

16-168

Trends In the All Patient Refined-Diagnostic Related Group (Apr-Drg) And Case Mix Index (Cmi) In An Acute Care Palliative Medicine Unit

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Objectives: To evaluate the trends in severity of illness (SOI) by the All Patient Refined-Diagnostic Related Group (APR-DRG) and case mix index (CMI) by the Diagnostic Related Group (DRG) in an acute care palliative medicine unit.

Methods: This is a retrospective study. Discharge data, APR-DRG/SOI, DRG/CMI, length of stay (LOS) were collected from the hospital database for calendar years 2003, 2004, July 2005-June 2006 and July 2006-June 2007. A template for daily physician note was put in place in January 2004 to capture multiple sites of metastases, complications and comorbidities that would have affected the SOI and CMI.

Results: The number of admissions increased by 20% from 748 in 2003 to 899 in 7/06-6/07. Mean age was 60.8 +/- 14.6 in 2003, 61.7 +/- 14 in 7/06-6/07. Length of stay (LOS) showed an increasing trend: 9.31 +/-7.54 days in 2003 to 10.21 +/- 8.85 from 7/06-6/07. ASOI also showed an increasing trend: 1.69 in 2003 and 1.98 in 7/06-6/07 (17% higher). CMI remained the same at 1.50 from 2003 and 7/06-6/07. Most common DRGs and APR-DRGs for all years included respiratory neoplasms, digestive malignancies, pathologic fractures, and hepatobiliary malignancies.

DRG and its corresponding CMI often do not reflect the accurate case mix and disease severity in patient populations. This is particularly true for palliative medicine when individuals have multiple sites of metastases, complications and comorbidities. The APR-DRG classifies patients into 4 subclasses of severity of illness (SOI) and risk of mortality (ROM). Though DRGs and APR-DRGs were the same year over year, the severity of illness was higher and more accurate for the latter demonstrating greater acuity.

Conclusions: The APR-DRG captures the true case mix and severity of illness in an acute care palliative medicine unit than the traditional DRG.

16-169

Preventing Falls In An Acute Care Palliative Medicine Unit

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Objectives: 1) measure the impact of active nursing intervention and change in bed type in the rates of falls in an acute care palliative medicine unit 2) identify effective strategies in reducing falls 3) assess the number of severity of injuries after a fall before and after implementation.

Methods: Strategies to improve patient safety to decrease falls were implemented as follows: 1) all beds were changed to have alarm sounding capability 2) nursing assistants gave report to each other in patient rooms that included patient safety 3) call lights were answered by caregivers near patient rooms 4) report was short and pertinent to patient safety 5) vital signs taken within 30 minutes of change of shift. The incidence of falls was measured 8 months before the intervention and 8 months after the intervention. Demographic data was collected on patients for both study periods. This is a retrospective study.

Results: There were 40 patients who fell before the intervention with median age 64 (range 32-81), 24 males, 29 whites. 11 had lung cancer and 35 had metastatic disease. After the intervention, there 27 patients who fell with median age 63 (range 21-86) with 20 males and 18 whites. 6 had lung cancer and 22 had metastatic disease. The number of falls decreased from 46 before the intervention to 31 (33% decrease). Median number of falls before the intervention was 1 (range 1-4) and after the intervention 1 (range 1-3). Most patients fell within the hours of 2301H-0659 for both periods. 89% of falls were moderately severe in the first group compared to only 56% after the intervention.

Conclusions: By implementing methods such as having caregivers in close proximity to patients increases visibility, allows exchange of information regarding falls risk, having beds with alarm sounding capability promotes overall patient safety.

16-170

Utilization of Nurse Clinician Services In a Comprehensive Palliative Medicine Program

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Objectives: The goal of this retrospective study is to formally audit the number and type of services rendered by these nurse clinicians and the minutes spent for each call. A well established comprehensive and integrated palliative medicine program has utilized the expertise of nurse clinicians from the time of its inception in providing for the holistic and interdisciplinary care of individuals with advanced illness and their families. They provide services in terms of symptom

management, patient updates, arranging ancillary services and appointments, medication refills over the phone. Also, they provide direct contact with patients and families both in the inpatient and outpatient settings.

Methods: Phone calls, Electronic Medical Record (EMR) staff messaging, emails and direct patient contacts during both during on-call and office hours were collected for 3 consecutive months using a data collection sheet. There were 2 nurse clinicians providing coverage for 3 full time physicians. These 2 nurses provided coverage for each other during their days off.

Results: There were a total of 1085 patient contacts. Types of contacts were symptom management 282, patient update 135, laboratory and imaging appointment assistance 66, medication questions and refills 399, miscellaneous 136. Direct contact was 291, pages 145, voice mail/staff messages 595. Total minutes spent for patient contacts were 13,685 minutes, averaging 12.6 minutes per call.

Conclusions: 1) A 24-hour phone triage system allows symptom management and medication questions answered promptly 2) If symptoms are not managed over the phone, arrangements are made to be admitted in a hospital or an inpatient hospice setting 3) Emergency room visits are kept to a minimum and are advised only if indicated 4) Costly emergency room visits are avoided 5) Nurse clinicians provide skilled care and expertise to this population.

16-171
Measuring Physician Productivity: Relative Value Units (Rvus) In Palliative Medicine

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Objectives: 1) analyze the trend in physician productivity (RVUs) over 3 years 2) identify the most common procedural terminology (CPT) services used by palliative medicine practitioners 3) identify the most common Diagnostic Related Groups (DRGs) and All Patient Refined-Diagnostic Related Groups (APR-DRGs) and their corresponding case mix and patient acuity.

Methods: This is a retrospective study. The institution computer data base was used to collect RVUs, CPT codes, DRGs, and APR-DRGs for calendar years 2004, 2005 and 2006.

Results: RVUs was 5663 in 2004, 5525 in 2005 and 5921 in 2006. Subsequent hospital level care III generated the most number of physician visits with 2178 for 2004, 2270 for 2005 and 2251 for 2006. Inpatient consult level IV was 234 for 2004, 195 for 2005 and 202 for 2006. Inpatient admission level III was 360 in 2004, 163 in 2005 and 203 in 2006. In the outpatient setting, established patient level IV was 356 in 2004, 178 in 2005 and 253 in 2006. The 5 most common DRGs and APR-DRGs for all 3 years were digestive malignancies, respiratory neoplasms, malignancy of hepatobiliary system, lymphoma and non-acute leukemia, and pathologic fractures. Palliative medicine is a relatively new specialty and measuring physician work and productivity may be hard to quantify. Relative value units (RVUs) are nonmonetary objective weights assigned to an individual CPT service which assists physicians on their work productivity in the inpatient and outpatient settings. By analyzing the case mix of patients in parallel, the complexity of care for individuals being rendered can justify the time spent on a particular service.

Conclusions: Analyzing the trends in RVUs and CPT services rendered by a palliative medicine physician 1) serves as a measure of productivity 2) identifies areas of resource utilization and 3) allows benchmarking and comparison with other providers.

16-172
Physical Activity Interests, Preferences And Quality of Life Associations In Advanced Cancer Patients

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Objectives: Physical activity has been shown to improve supportive care outcomes in early stage cancer patients, but limited data are available in patients with advanced cancer. The aim of this study was to describe the physical activity patterns and programming preferences of advanced cancer patients, and determine any associations between physical activity and supportive care outcomes.

Methods: Advanced cancer patients aged 18 years or older, with clinician-estimated life expectancy of less than 12 months and palliative performance scale greater than 30%, were recruited from outpatient palliative care clinic and palliative home care. Participants completed a cross-sectional survey interview assessing quality of life (McGill QOL Questionnaire), physical function (Late-Life Function and Disability Instrument), symptoms (Edmonton Symptom Assessment Scale), and physical activity behavior and preferences.

Results: 50 patients were recruited. 76% (38/50) patients have deceased since opening accrual, with a median survival of 104 days from time of survey to time of death. Walking was the most common reported physical activity. A significant ANOVA indicated that participants who reported walking greater than 30 minutes per day had higher existential subscores [0.76 (0.02 to 1.51); p=0.045], support subscores [0.73 (0.09 to 1.37); p=0.027] and total scores [0.45 (0.01 to 0.88); p=0.046] on the McGill QOL Questionnaire. There were no significant associations between participants who reported walking greater than 30 minutes per day and self-reported physical function or symptoms. 78% of the sample indicated interest in participating in a physical activity program, with 84% preferring a home-based program.

Conclusions: There is a significant positive association between physical activity and quality of life scores in this sample of advanced cancer patients. The majority of this sample appears willing to participate in a physical activity program. An intervention trial based on these identified associations and preferences is in progress. Supported by the Canadian Institutes of Health Research.

16-173

Needs Assessment Survey of Supportive Care Among Advanced Disease Patients Attending Federal Medical Centre Abeokuta, Nigeria

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Objectives: Palliative care basically comprises of two major components, Pain cum symptom control and Supportive care. This model of care is presently in its infancy stage in Nigeria. The supply of Opioids is erratic or most times not available whereas the supportive care aspect should be an integral skill of the health care providers. This study was to evaluate the supportive needs requirement of the patients in the hospital. Objectives: (1) To determine the level of perception of Palliative care among the patients. (2) To evaluate the Needs assessment of supportive care among the target patients in an acute care setting.

Methods: Descriptive structured interview guided by questionnaire. A total of 65 advanced disease patients suffering from Cancer and HIV/AIDS earlier consented but only 54 were interviewed on their: 1) Knowledge and awareness of Palliative Care 2) Needs assessment of supportive care among patients.

Results: 70.1% of the respondents never heard of any information about Palliative Care while 85.19% of the respondents experienced discrimination in the hospital, 85.2% claimed the hospital staffs do not keep their company while 66.7% complained about their privacy and confidentiality. More than fifty percent (58.3%) of the respondents confirmed categorically about the non – provision of spiritual care by the hospital.

Conclusions: There is a low level of awareness of Palliative Care among terminally ill patients under study. Although the respondents were satisfied with the disease specific treatment and psychosocial care received from the hospital but the issue of discrimination, bureaucracy, lack of spiritual care, information sharing, privacy and confidentiality raise some concerns. It is therefore recommended that there should be a high level of advocacy for Palliative Care in the country. Integrating Palliative Care in hospitals will foster supportive care services and help to ameliorate some of the frustration being experienced by patients.

16-174

Alcoholism Screening In Advanced Cancer Patients: Impact On Symptom Burden And Opioid Use

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Objectives: Alcoholism is frequently underdiagnosed. Preliminary studies suggest that it is associated with increased symptom expression and opioid dose escalation. The CAGE questionnaire is a widely used screening tool for alcoholism. The purpose of this study was to determine the frequency and characteristics of patients who screen positive for alcoholism in a palliative care outpatient clinic.

Methods: We reviewed 665 consecutive charts of patients referred to the palliative care outpatient clinic and collected data regarding age, gender, and type of cancer. For the first 100 consecutive CAGE positive (CAGE+) and 100 consecutive CAGE negative (CAGE-) patients, time from advanced cancer diagnosis to palliative care referral was calculated, and symptoms (Edmonton Symptom Assessment Scale) and Morphine Equivalent Daily Dose were collected.

Results: CAGE was available for 598/665 (90%) patients. 100/598 (17%) were considered CAGE+. CAGE+ patients were younger (58 versus 60 years, $p<0.05$), more frequently male (68% versus 47%, $p<0.0001$), and with head and neck malignancies (24% versus 9%, $p<0.05$). CAGE+

patients were referred earlier to palliative care (median ± standard deviation, 5±19 versus 13±27 months after advanced cancer diagnosis, $p<0.0001$). At baseline, pain, sleep, dyspnea, wellbeing, and total symptom distress were significantly worse among CAGE+ patients. Both groups showed similar improvement in symptoms. CAGE+ patients were more frequently on opioids upon referral (47/100 versus 29/100, $p<0.05$) and follow up (27/65 versus 16/68, $p<0.05$). At follow up, opioid doses did not show significant changes.

Conclusions: 17% of the patients screened positive for alcoholism. These patients were referred earlier to palliative care, had more symptom expression, and were more frequently on opioids. The palliative care team successfully improved symptom control in both groups without opioid dose escalation.

16-175

Multidisciplinary Team Contributions Within a Rapid Access Palliative Radiotherapy Program

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Objectives: The majority of patients with bone metastases (BM) secondary to cancer experience symptoms such as pain or impaired mobility, and often require multiple medications for analgesia, with attendant side effects. Palliative-intent radiotherapy (RT) is effective in decreasing pain, but in the usual model of RT delivery, additional supportive care interventions can be overlooked. While 'multi-disciplinary' is a catchword used to describe clinical teams in various settings, recommendations from allied health practitioners are rarely included in patients' overall treatment plan. However, provision of such supportive care is one of the goals of the Rapid Access Palliative Radiotherapy Program (RAPRP), along with timely patient assessment and delivery of RT for BM. Our purpose was to determine the feasibility of multidisciplinary team (MDT) assessment in the setting of a rapid access outpatient RT clinic.

Methods: RAPRP disciplines (Pharmacy [RX], Occupational Therapy [OT], Clinical Nutrition [CN], Social Work [SW]) developed screening forms to streamline assessment, performed consultations, and arranged follow-up as necessary. MDT recommendations were included within the final treatment plan. RX and OT participated for the entire pilot (Jan – June 2007), while CN and SW joined in March.

Results: 58 patients with painful BM were assessed over a 25 week pilot period. 40/58 (69%) patients were seen by RX, with medical history performed in 90%. Based on screening tool results, OT reviewed 19/58 (33%) patients, CN reviewed 9/58 (16%) and 6/58 (10%) by SW. The number and types of recommendations are found in the Table. Patient-rated pain after all interventions improved 2.6/10 (on average) and MEDD decreased to 62 mg/24 hrs (range 0-400 mg) at four-week follow-up.

Conclusions: Patient follow-up demonstrates high levels of satisfaction with the RAPRP experience. Assessment by a MDT within a one-day rapid access RT visit is feasible and acceptable.

Multidisciplinary Recommendations	
RX (N=40)	
Change of analgesic (eg side effects)	25 (63%)
Bowel regimen (eg hydration)	23 (58%)
Supportive needs (eg addressing nausea)	23 (58%)
OT (N=19)	
Adaptive equipment (eg custom cushions, canes)	16 (84%)
Energy conservation (eg "Energize" class)	16 (84%)
Safety (eg home adaptation equipment)	6 (26%)
Durable medical equipment (eg raised toilet seat)	1 (5%)
CN (N=9)	
Oral supplement (eg protein supplement)	9 (100%)
Symptom control (eg early satiety)	8 (89%)
Weight concerns (eg anorexia/cachexia)	7 (78%)
SW (N=6)	
Financial support (eg medication insuance plans)	4 (67%)
Care assistance (eg accomodation transporation)	2 (33%)
Personal directive (eg wills)	1 (17%)

16-176

Discharge Planning And Post Acute Care In Palliative Medicine: An Electronic Database To Evaluate Continuity of Care

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Objectives: Effective discharge planning and provision of post acute care (PAC) for palliative medicine (PM) patients requires understanding their care needs and accessing and coordinating resources. We have a 23 bed inpatient acute care palliative medicine unit (ACPMU) with over 800 admissions a year. The objective of this analysis is to understand how PAC services are utilized by PM patients.

Methods: Retrospective review of 2007 ECIN database (Extended Care Information Network: Chicago, ILL) a web-based system that automates and streamlines data exchange for referrals to post acute care (PAC) resources. Analyzed age, gender, marital status, length of stay (LOS), admit source, referral type, referral time.

Results: 486 patients (including 72 readmissions) received PAC services: admit source: 61% clinic, 20% ER and 19 % hospital transfer; 58% married; age mean (SD): 63 (14); LOS mean (SD):12 (9); 42% had Medicare insurance. Discharge dispositions: 29% home health agency (HHA); 61% hospice (HOS); 10 % skilled nursing facility (SNF); 22% received supportive interventions: home infusion pharmacy (HIP), home IV antibiotics (HVA), durable medical equipment (DME), durable medical respiratory (DMR) and 20% required ambulance transportation (TRA) to discharge destination. Time from admission to initial referral varied by referral type: HHA 7 days, HOS 7 days, and SNF 11 days. Younger patients were more likely to utilize SNF services and older HOS ($P<.001$). Married were more likely to utilize HHA and singles SNF($P<0.05$). Those referred to HHA utilized the most services at discharge ($P<0.003$).

Conclusions: Utilization of different PAC services is influenced by age and marital status. HOS utilizes the least resources on discharge. Time from admission to creating a request was longer for those referred to SNF. Further research is still needed to: (1) evaluate patient characteristics (2) assess care planning complexities (3) anticiplate patients' needs and (4) advance efficient resource utilization.

16-177

A Survey On the Role of Religion And Spirituality In Gynecologic Oncolgist

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Objectives: Studies show that Religion and Spirituality (R/S) have a positive benefit on health, helping terminally ill patients deal with their disease and influencing patients' medical decisions. Despite evidence on the importance of R/S to the patient, physicians are hesitant to incorporate R/S into their practice.

Methods: An anonymous, IRB approved survey was sent to 1,972 members of the International Gynecologic Oncologists Society and the Society of Gynecologic Oncologists via SurveyMonkey, an online survey management tool. The survey included demographic and practice questions, non-validated survey items, the Duke University Religion Index, Hoge's Intrinsic Religiosity Scale, and the Locus of Control Scale.

Results: Response rate was only 14%. Christianity was the largest religious group (52%), followed by "other" (11%), and Atheist (9%). Fifty-four percent of respondents believed R/S "rarely" or "never" played a role in their medical decisions, 25% stated it "sometimes" did. Sixty-two percent "agreed" or "somewhat agreed" that spiritual/religious beliefs were a source of comfort to them as an oncologist while 19% "strongly" or "somewhat disagreed." Sixty-eight percent "agreed" or "somewhat agreed" that R/S helped them deal with feelings about death, 71% believed that it did not matter what you believe as long as you lead a moral life. The majority of respondents viewed their "life" situations as highly internal (controlled by themselves). 76% believed they could determine what will happen in their life, 90% believed they could protect their personal interests, and 95% agreed their life was determined by their actions.

Conclusions: Like patients, many physicians utilize R/S to cope. However, physicians may be less likely to incorporate these beliefs into their practice. Physicians in our survey demonstrated a high level of internal control. This tendency to believe in control over one's own situation may partially explain physicians' hesitancy to incorporate R/S into their medical decision making.

16-178

Insomnia In Advanced Cancer

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Objectives: The purpose of this study was to evaluate the prevalence of insomnia in consecutive patients initially seen by a palliative medicine service, severity by categorical scale and interference within severity insomnia index (ISI); describe the clinical characteristics, precipitating, and predisposing factors, and explore the relationship between sleep disturbances, pain, depression, and fatigue.

Methods: Consecutive patients with advanced cancer referred to palliative medicine were screened for insomnia. All eligible participants were verbally informed of the study

and asked to participate. Patients were asked a screening question: Do you have problems: 1) getting to sleep, 2) staying asleep or 3) waking up early? Eligible patients had insomnia by one of the selection criteria. The insomnia severity index (ISI), family history of insomnia and mood/anxiety disorders, sleep habits, and depression, fatigue, and pain were assessed and graded by a categorical scale.

Results: 563 patients were screened, 76 were eligible. The mean age was 61 years. 42 were females. Prevalence was 32%. 14% had severe (score 22-28), 48% - moderate (score 15-21) and 24% mild (score 8-14) insomnia by ISI. All had fatigue (76/76). By univariate analysis insomnia severity by the ISI strongly correlated with fatigue ($P=0.0001$), depression ($P=0.0025$) and pain ($P<0.0051$) severity. In multivariate regression analysis, only fatigue severity correlated with insomnia severity ($P=0.0004$). Precipitating (current medications and treatment) and predisposing factors (family history of insomnia and mood/anxiety disorders) were not associated with insomnia severity.

Conclusions: Insomnia in advanced cancer correlated with fatigue, depression and pain. Severity correlated with the severity of fatigue. Prevalence occurred in approximately 1/3 and 2/3 of patients reported moderate to severe insomnia.

16-179

The Construction of Palliative Prognostic Score For Korean Terminal Cancer Patients: An Interim Report

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Objectives: It is essential to estimate survival time in palliative care. It is needed the development of new palliative prognostic score not influenced by subjective assessments. The aim of this study was to construct a new palliative prognostic score for Korean terminal cancer patients integrating symptoms, signs, and laboratory parameters through multicenter prospective study design.

Methods: The terminal cancer patients of 3 university hospitals and 3 general hospitals in Korea have been followed up from November 2006. The study subjects were the patients diagnosed as terminal cancer and subjects of hospice-palliative care. We construct a new palliative prognostic score through 110 patients of 4 hospitals (training set). The Cox's hazard model was used to analyze the influence of clinical and laboratory variables to the survival. An independent validation on another patient series (testing set) will be performed. The testing set will be about 100 patients from 6 hospitals in Korea.

Results: The median survival of patients was 18 days. We found that the followings were the significant prognostic factors for shorter life expectancy in multivariate analysis: dyspnea, dysphagia, poor performance status, hyperbilirubinemia, elevated serum creatinine, and elevated C reactive protein. The palliative prognostic score was developed from the hazard ratios of the significant prognostic factors. The score ranged from 0 to 7.0. The median of the score was 2.0. With scores ≥ 2.0, 3-week survival was predicted with sensitivity 85.5%, specificity 65.2%, positive predictive value 74.6%, and negative predictive value 78.9%.

Conclusions: We constructed the palliative prognostic score for use in the actual circumstances of Korean palliative care. The score showed acceptable validity to predict 3-week survival in this population (training set). We will validate this score independently on another patient series (testing set) next time.

16-180

Spirituality, Coping And Control In a Palliative Care Setting

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Objectives: Patient's spirituality/religious beliefs have a profound role on coping with disease & on quality of life (QOL). Perceptions of control play an important role in coping not only with stressful experiences, but also in health outcomes. Therefore, the primary objective was to determine whether patients' spirituality/ religiosity correlates with locus of control.

Methods: Patients presenting for initial outpatient evaluation in the Dept of Symptom Control & Palliative Care were enrolled and completed self-report measures: Functional Assessment of Chronic Illness Therapy-General (FACT-G), FACT-Spiritual Well-Being Scale (FACT-Sp), Duke University Religion Index (DUREL), Locus of

Control (LOC), Herth Hope Scale (HHS), Predestination (PDQ), and Hospital Anxiety & Depression Scale (HADS). LOC contains 3 subscales: perceived occurrence of chance, dependence on powerful others, and internal control. Pearson correlation coefficients were calculated to explore relationship between measures. The Mann-Whitney t-test was used to compare pt scores.

Results: One hundred patients (48 men & 52 women) completed the surveys & 90% reported a Christian affiliation. QOL was positively correlated with FACT-Sp ($p=<0.001$, $r=.614$) and the DUREL which measures both external/internal religiosity ($p=<.01$, $r=.291$). Interestingly, there was no gender difference in spirituality as measured by FACT-Sp; however, by the DUREL women engaged more frequently in private religious activity compared to men ($p<0.001$). Men had more perceived internal control with less emphasis on the occurrence of chance events or dependence on powerful others ($p=0.07$) as well as a positive correlation with controlling of one's own fate as measured by the PDQ ($p=0.1$).

Conclusions: As oncologists committed to providing comprehensive care, we need to be receptive to the spiritual needs of our patients since it augments their QOL and to empower them to have a sense of control. Future studies need to further define these complex relationships and to recognize possible gender differences

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How Much Palliative Care In Cancer We Need

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Objectives: Around the country 36 people die from cancer every hour. The city of Nizhny Novgorod is among the 10 regions in Russia with the highest cancer morbidity. Nearly every 46th citizen in the region has got a cancer. The main purpose of the research was to study and analyze demographical trends, cancer morbidity and mortality in the region, estimate the need for palliative care in cancer and propose the available way for a palliative care service establishment.

Methods: Demographical, statistical methods and the official medical data were used. The need for cancer palliative care has been evaluated using the methodology proposed by Prof. Irene Higginson.

Results: In 2006 there were 12340 new cancer cases diagnosed that is 383.5 per 100 000. One forth (22.4%) of all cases was diagnosed in advanced stage of disease. Of these patients who die from cancer, statistically over 6178 will experience pain; 5884 loss of appetite; 3678 sleeplessness, nausea and vomiting; 3457 will have trouble with breathlessness and 2721 will be affected by depression. Most patients will have a combination of these symptoms. For the population of 3.3 million 330 beds are required. Our studies suggest that over 4000 patients will need the skills of a specialist home care team and up to 1800 will need the expertise of a specialist inpatient unit. Many patients will require both services and may need several admissions. About 22500 people may need specialist psychological care; over 15000 family members require psychosocial support during the course of disease and bereavement.

Conclusions: Palliative care services for cancer patients are of vital importance and should be run on the base of existing hospitals and units. Palliative care provision today should become an integral part of regional cancer service. Several specialist palliative care units have been recently started.

16-182

Doctors' Attitudes Toward Giving Bad News To Cancer Patients: Are We Ready To Tell the Truth?

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Objectives: The purpose of the study is to examine the attitudes of doctors to breaking bad news to cancer patients. It is considered that there is a transition from a truth-telling taboo to being more truthful with cancer patients in Russia.

Methods: A questionnaire was administered to a group of physicians who were asked to express their opinion whether it is necessary to tell the truth to cancer patients or not. We examined doctors' points of view "how much we must tell and when.

Results: Most of the doctors consider that it is necessary to tell the truth (91%) but it is a very difficult challenge. It has been suggested that ineffective or insensitive news disclosure can have a long-term adverse impact on the patients, and it can cause difficulties in doctor-patient communication (83%). Truth telling was considered to be helpful to cope with psychological difficulties at the end of live and it gives the

opportunity for spiritual growth (67%). A half (56%) considered that a psychologist's consultation was important but not always it had been available. Most of our respondents underlined that it was important to take into consideration personal psychological peculiarities of the patients when breaking bad news and be well educated in communication.

Conclusions: The research has shown that the attitudes of doctors to telling the truth has been changing and the necessity of telling the truth to cancer patients today is obvious. Taking into account the cultural and historical issues of telling the truth in our country and the socio-economical and health care peculiarities it is still a great dilemma and this question must be solved individually in each clinical case and with intelligence and professional intuition. Doctors, both oncologists and general practitioners, must be well prepared in developing the skill to break bad news.

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Symptom Control And Palliative Radiotherapy Consultations Via Telehealth Technology: A Pilot Project

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Objectives: Cancer represents the leading cause of premature death in Canada. Palliative Care for symptom management is a well-established specialty in urban areas of the province of Alberta, where patients have access to experienced multidisciplinary teams. Initiatives have been developed to increase practitioner knowledge in rural and remote areas, but "live, real-time" expert support for managing complex symptoms and psychosocial issues is not readily available.

Methods: To provide access to a symptom control consultation service for patients with advanced cancer in remote or rural regions, a multidisciplinary team (MDT) proposed the initiation of a 'virtual' clinic. The MDT includes a Palliative Care physician, Radiation Oncologist, clinical pharmacist, nurse practitioner, psychologist, respiratory therapist, physiotherapist, occupational therapist, social worker, chaplain and registered dietitian. A remote clinician/patient dyad is linked via Teleconference. In order to discern changes in attitude/practice, pre- and post-pilot surveys will be completed by the rural clinician, the patient and the MDT.

Results: Expected patient benefits include reduced travel and condensing multiple health care professionals' consultations into one visit, thereby decreasing time invested in medical appointments towards the end of life. Reduced travel decreases costs, discomfort and time away from home communities and support systems. Anticipated benefits for clinicians include improved inter-professional communication, support of community physicians' management of complex palliative care patients, and the potential to decrease hospital admissions for symptom control.

Conclusions: The weekly Virtual Pain and Symptom / Palliative Radiotherapy clinic commenced Jan 22, 2008 with a target of 25 consultations over the 18 month pilot.

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Scope of Cancer In An HIV Treatment Program In Western Kenya

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Objectives: The United States Agency for International Development-Academic Model for prevention and Treatment of HIV (USAID-AMPATH) partnership program cares for more than 55,000 HIV infected patients in 17 clinics in Western Kenya. The program is providing comprehensive health services in a variety of areas including cancer medicine. This abstract summarizes the malignancies seen in oncology clinics among HIV positive patients as documented in the AMPATH Medical Records System (AMRS).

Methods: Between January 2003 to October 2007, there were 291 adult patients within AMPATH being treated for Cancer. 92.44% of these patients had AIDS associated malignancy with the majority (85.9%) being treated for Kaposi Sarcoma. Other cancers recorded include Hodgkin's lymphomas, breast cancers etc. The average age of patients was 37.7 years, 46% of patients were females, 42 (14.43%) had biopsy confirmed diagnosis noted in the AMRS. 20 (6.8%) patients died during follow-up time. Average travel time to the patient's primary AMPATH clinic was 2.5 hours and the median was 2 hours (range 1-4 hrs). 275 patients were on Anti-Retroviral Therapy (ARV), starting a mean of 66 days after enrolment (SD=112 days, median 29 days, range 0-1007 days) and they were on ARV for a mean of 388 days in AMPATH (SD=308 days, median 300 days, range 0-1610 days). Only 37 patients (13.45%, n=275) had electricity in their homes, 57 (20.80%, n=274) had access to piped water and 26 (.52%, n=274) had both. The median

number of people in a house is 5 with a range of 1-15 people.

Results: As HIV care programs expand, malignancies will represent another important component of a comprehensive HIV healthcare.

Conclusions: USAID-AMPATH partnership is currently working to develop more comprehensive cancer services including chemotherapy, radiotherapy and coordinated palliative care services.

16-185

Socio-Demographic Determinants of Quality of Life And Symptom Burden In Patients with Metastatic Cancer

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Objectives: There has been limited research on determinants of HRQL in patients with advanced cancer. This study examines the influence of demographic and disease-related characteristics on HRQL of 172 patients participating in a cluster-randomized trial of early vs. routine palliative care at a comprehensive cancer centre.

Methods: Patients with metastatic gastrointestinal, genito-urinary, breast, lung or gynecological cancer and prognosis >6 months were recruited from outpatient oncology clinics. Baseline measures were completed for HRQL (FACT-G, QUAL-E) and symptom burden (ESAS). The influence of age, gender, living situation, education, family income, performance status and cancer site on mean total and subscale scores was determined using t-tests and ANOVA, with Tukey correction for multiple comparisons. The significance of individual characteristics was explored using multivariate linear regression.

Results: The mean age was 60 years and 60% were female; 75% were married/common-law and 19% lived alone. Median ECOG performance status (PS) was 1; those with better PS had better HRQL (FACT-G, $p<0.0001$; QUAL-E, $p=0.04$), lower symptom burden ($p<0.0001$) and less concern about death preparation (QUAL-E, $p=0.03$). Older patients (>60 years) also had better HRQL (FACT-G, $p=0.003$), less symptom burden ($p=0.01$) and less death preparation concern (QUAL-E, $p<0.0001$) than younger patients. Men had better emotional well-being than women ($p<0.0001$). Those living with others had a higher sense of life completion (QUAL-E, $p=0.001$) and better social well-being (FACT-G, $p=0.03$) than those living alone. No difference in HRQL or symptom burden was found among cancer sites.

Conclusions: Socio-demographic characteristics are important determinants of HRQL for patients with metastatic cancer and should be considered when interpreting findings in this population. Research is needed regarding effectiveness of targeted interventions for specific patient subgroups.

17-186

Appropriate Use of Transdermal Fentanyl: Still a Lot To Explain

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Objectives: Information-giving and explanation is an ipportant part of cancer pain management. Recently (December 21, 2007) FDA has issued a new public health advisory to alert patients, caregivers, and healthcare professionals to important information on the appropriate and safe use of transdermal (TD) fentanyl.

Methods: We present here 20 questions, collected among cancer patients at the IORS, reflecting patient/caregiver misunderstandings about appropriate and safe use of TD fentanyl.

Results: The following misunderstandings were identified: 1) lack of awareness that patch contains strong opioid and is therefore a strong analgesic, 2) confusing local application of TD fentanyl with systemic action, 2) lack of understanding of the delayed onset of action with the first patch, 3) combining patches by putting one above the other, 4) changing the patches too frequently or adding more patches in an attempt to relieve breakthrough pain, 5) using TD fentanyl for acute exacerbations of chronic pain or for short-term pain (ie after chemotherapy), 6) not understanding the need to combine the patch with oral drugs (ie. immediate release morphine). Several patients reported that subsequent patches should be applied on the skin in a clockwise direction in order to get the best results. One patient reported that he managed constipation by removing patch before defecation and returning it back immediately after defecation. In 5 cases inappropriate use of patch resulted in severe adverse effects.

Conclusions: Despite educational efforts, additional education is needed. We are preparing a new TD fentanyl brochure for patients containing common questions and answers. Free phone-line will be introduced to address patients' questions about proper use of analgesic drugs.

17-187

Assessing Health Care Professionals' Attitudes To Palliative Care In Rural Districts of the Republic of Moldova

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Objectives: To assess health care professionals' attitudes to palliative care in 32 rural districts across the whole republic.

Methods: Information collected by the questionnaires from the health care professionals who work in rural areas of the country.

Results: Accordingly to the official data all the general indicators on cancer prevalence, morbidity and mortality are in permanent increase. In the year 2006 in the top of morbidity structure made: breast cancer – 12.6%, lung and skin cancer – by 10.6%, stomach cancer – 6.3%. Among the causes of progressive cancer 51.3% makes late addressing for medical assistance, which already takes place in the 3-rd stage (64.2%) and the 4-th stage (57%) correspondingly. Palliative care is a new field for the Republic of Moldova. This system successfully works in many countries of the world, however currently there are no state services which can provide palliative care to different categories of terminally ill patients, including those with cancer. It is evident that palliative care in rural zones is expected to be provided by the family doctor from the area, who should be trained to have essential knowledge in the field, as well as nurses. Charity Foundation for Public Health "Angelus Moldova" during the period of time 2006-2007 organized 32 one-day seminars aiming at disseminating information on palliative care in rural areas of the country and rising educational level of family doctors and nurses in this domain.

Conclusions: Altogether in the seminars took part 1342 family doctors and nurses from rural regions of the country. Before the seminars all the trainees were asked to fill out the questionnaires on their attitudes towards palliative care. Most of the participants agreed they experience serious lack of knowledge and practical skills in the field and this discipline has to be introduced into the National Health Care structure as well as a separate specialty.

17-188

Utilization of a Patient Medication Knowledge Tool: Implications For Medication Safety

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Objectives: There is no data studying a cancer population's medication knowledge in an outpatient acute care setting. Our objectives are to describe patients' medication knowledge in this environment and to describe factors associated with higher knowledge.

Methods: A Patient Medication Knowledge Tool (PMKT) was developed consisting of a survey assessing six aspects: medication name, frequency, dosage, route, purpose and side effect. Between 8/2005 and 12/2007, 185 cancer patients were enrolled and completed the PMKT. Prescribed medications were validated using pharmacy data and medication knowledge scored. Abstraction of demographic and clinical information was completed by chart review. Descriptive statistics and one-way analysis of variance were performed.

Results: Of 185 patients, the mean age was 57 years (range, 21-89); 54% were male; 70% were married; 64% had > than a high school education and 76% were white. 92% had a primary language of English and 77% were insured. Over half (55%) had a comorbidity. Most (65%) had solid tumors and were undergoing treatment with chemotherapy (81%). Of patients using a help aid, a list was most common. 68% received a pamphlet about their medication from a provider. The majority (56%) had 6 or more prescribed medications (range 1-19). The mean PMKT score was 70% (based on knowledge of the 6 medication aspects). Factors associated with a higher score included a high school education ($P=0.0025$), the use of a medication aid ($P<0.0001$), and previous medication education by a provider ($P=0.030$).

Conclusions: Certain cancer patients have better medication knowledge than others. The use of medication AIDS

and pre-emptive medication education are associated with higher medication knowledge. There may be important opportunities to improve medication knowledge among cancer patients by identifying subgroups with poorer knowledge levels. Future studies should examine whether fewer adverse drug effects and better patient compliance result with improved medication knowledge.

17-189

Mascc Teaching Tool For Patients Receiving Oral Agents For Cancer

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Objectives: Using oral agents for cancer treatment have begun a new era that requires health care professionals to revise their approaches in patient management to achieve the highest quality of patient care. The findings of an earlier survey of 1115 nurses from 15 countries provided the rationale for developing a clinical teaching tool (CTT) that offers consistent and comprehensive teaching of patients receiving oral cancer agents.

Methods: Six nurse experts have developed a CTT to assist health care providers in the assessment and education of patients receiving oral agents for treating their cancer. The goal is to ensure that patients know and understand their treatment and the importance of taking the pills/tablets as prescribed. This CTT includes key assessment questions and special considerations; items that need to be discussed with patient and/or caretaker for generic education, drug specific education; and evaluation questions to ensure that patients/caregivers understand what information they have been given. The tool was audited by an oncology pharmacist.

Results: Lead nurses from 15 countries reviewed the tool for clarity/usefulness in practice by evaluating each statement with a scoring system ("0: not at all to "10": most clear/ useful"). Items scored 5 or below required reasons and comments. Majority of feedbacks were positive. The tool now is being piloted by clinical nurses from Turkey and USA. These lead nurses will attend a train the trainer session and then disseminate the tool with oncology nurses in their home countries.

Conclusions: As oral agents for cancer becomes more prevalent, the number of patients and caregivers who need to be educated will also increase. It is intended that nurses use this tool in the initial patient education phase, thus helping them to teach patients in a consistent and comprehensive way. (Supported by MASCC and grant from Eli Lilly Pharmaceutical Company).

17-190

Survey of Physicians' Need For the Hospice And Palliative Care Education Curriculum In South Korea

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Objectives: Education and training for physicians are important to improve the quality of hospice and palliative care service. This study was performed to assess the physicians' need for education and to develop the education program for physicians who work at hospice and palliative care settings in South Korea.

Methods: After the literature review, a seventy nine-item questionnaire was developed to assess the physicians' need for the contents of the hospice and palliative education curriculum by four-point Likert score (1: not at all ~4: very much). It was distributed to 125 hospice and palliative care organizations via mail.

Results: Thirty seven physicians answered the need assessment questionnaire. The score ranged from 2.76 (cardiopulmonary resuscitation) to 3.76 (understanding and the attitude toward death). In total, ten of seventy nine items were scored above 3.5; understanding and the attitude toward death; assessment of pain; pharmacologic treatment; psychological care; understanding communication; truth telling; the principles of the hospice and palliative care; terminal care; communication with the patient and caregiver; opioid management; the history of the hospice and palliative care.

Conclusions: It is necessary to develop the hospice and palliative education program for Korean physicians based on the need assessment.

17-191

Pain, Symptom Control And Palliative Care Research Group: Educational Strategies For Undergraduate And Postgraduate Brazilian Students

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Objectives: Research development requires groups capable to form researchers, obtain financial support and prepare articles, all complex and demanding tasks, even more in developing countries. The aim is to present the *Pain, Symptom Control and Palliative Care Research Group*, founded in 1994 and recognized by the National Council of Technological and Scientific Development - CNPq, Brazil (www.cnpq.br).

Methods: A brief description of the group organization, activities, research themes and scientific production is presented. Data were collected from CNPq webpage and members' Lattes Curriculum (1994-2007).

Results: Organization: there are 13 members (2 professors, 3 masters and 8 students: 1 post-doctorate, 2 PhD, 1 master and 4 undergraduate). Every two weeks, the group has a 3 hours meeting to discuss research projects in their phases. Professors coordinate all the activities. PhD and post-doctorate students help the professors tutoring other members, give lectures on their areas of expertise, organize scientific events, and enhance their skills through partnerships with national/international research centers. Undergraduate initiate research by developing sub-projects within master and PhD studies; are responsible for the communication with all members and meetings arrangements. All members fill-out applications for financial support and are co-responsible for financial reports. Research themes: Assessment/Management/Epidemiology of Chronic Pain (cancer and non-cancer), Cancer Symptoms Management (cognitive impairment, fatigue and fungating wounds), Beliefs and Cognitive Behavioural Therapy, Evidence-Based Practice in Symptom Management. Postgraduate and undergraduate students have scholarship, which helps them participate for longer periods. Publications: 3 PhD dissertations and 14 Master theses, 5 books, 30 book's chapters, 68 papers and 82 abstracts in national/international proceedings. Some studies received awards and group members received financial support, from governmental and non-governmental organizations, attesting the quality of research.

Conclusions: The knowledge produced by the Group has empowered Brazilian researchers and clinicians. The current plan is to expand international partnerships, to improve and share the produced knowledge.

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The Place of Death of Children with Cancer In the Metropolitan Areas of Mexico

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Objectives: Quality of care for the dying is a public health concern. Understanding the factors associated with the place of death of children with cancer is crucial to improving care.

Methods: We conducted a restrospective study of death certificates registered in Mexico during the years 2002 to 2004. Cases less than 18 years were included if the underlying cause of death was cancer, death occurred in counties belonging to metropolitan areas (Valley of Mexico, Guadalajara or Monterrey), and information was available on sociodemographic characteristics. Outcome measure: place of death (home or medical unit).

Results: Of 1,946 cases meeting the inclusion criteria 85% died at a medical unit. Multivariate analysis indicated patients diagnosed with leukemia or lymphomas were 2.5 times more likely to die in hospitals than patients diagnosed with other cancers ($p<0.001$). Higher family income per county of residence was significantly associated with in-hospital death ($p=0.01$). Patients less than one-year old were 2.9 times more likely to die in hospitals than those older than 15 ($p=0.03$). Compared with patients who died at home, in-hospital deaths were more likely to occurr if cases were non-usual residents of the study areas ($p< 0.001$), and if death occurred in the areas of Monterrey or Guadalajara compared to the Valley of Mexico ($p<0.001$ and $p=0.01$, respectively). Neither hospital bed capacity nor case mix accounted for this difference.

Conclusions: Health planners should take into account clinical and sociodemographic factors influencing the place of death of children with cancer when planning the allocation of local and regional in-hospital and home-based Pediatric Palliative Care services.

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Developing a National 'Low Risk' Febrile Neutropenia Guideline

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Objectives: Febrile neutropenia is the second commonest reason for admission to paediatric oncology wards, and accounts for a considerable part of the morbidity associated with cancer in children and young adults. Reduced intensity therapy has been shown to be safe and effective in a 'low risk' group. However, there remains widespread variation in practice across the UK (from the definitions of 'fever' and 'neutropenia' to the nature and duration of antibiotic therapy). The CCLG/PONF supportive care group are developing national guidelines which can be adapted for local microbiological patterns and resource constraints to enable the consistent treatment of children across the UK.

Methods: The guideline framework is being created by combining systematic literature reviews, audit, survey data and a Dephi questionnaire. An initial guideline containing 22 recommendations and statements was created from a management pathway generated by the CCLG/PONF clinicians, supported by systematic reviews of the relevant literature, combined with a survey of current practice in the 21 national children's cancer centres, and audits from groups with an interest in this field. This was subjected to the first round of a Delphi survey of stakeholding clinicians (nurses, doctors, pharmacists and microbiologists) from each principle treatment centre and a selected shared care hospital.

Results: 141 responses were obtained, with 50% of principle treatment centres and shared care centres returning questionnaires. Of the 22 questions, 20 reached agreement (>80% agreed or strongly agreed) and only one had significant disagreement (>20%). A second round will be completed by March.

Conclusions: This work provides a national guideline framework for building local guidelines to treat the 'low risk' group of patients, undertake national audits of its safety and acceptability. Secondly, this provides an excellent example of how the national multidisciplinary group can coordinate and champion change within the under-investigated area of children's cancer supportive care.

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Evaluation of Gastrointestinal Symptoms And Growth Patterns In Children After Bone Marrow Transplant

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Objectives: After a bone marrow transplant (BMT), children may experience poor oral intake, altered gastrointestinal absorption and increased metabolic demands that can lead to malnutrition; however, little research has been performed to evaluate nutritional issues in children during BMT recovery. The purposes of the study were to identify the growth patterns and gastrointestinal (GI) symptoms in children during the first four months post BMT, and to assess if an association exists between graft-versus-host disease (GVHD) and growth pattern changes or GI symptoms.

Methods: This descriptive study used a prospective, longitudinal cohort design. The University of California San Francisco Symptom Management Model provided a conceptual framework. This model emphasizes the need for a thorough symptom experience assessment to guide management to produce positive outcomes. A convenience sample of 45 children receiving an allogeneic BMT completed the Memorial Symptom Assessment Scale and anthropometric measurements before BMT then 2 months and 4 months post BMT. Data analysis was performed with repeated measure ANOVA to evaluate anthropometric changes, descriptive statistics to analyze GI symptoms and a t-test and chi-square test to evaluate anthropometric measurements and GI symptoms among children with and without GVHD.

Results: All anthropometric measurements showed a significant change over time. The mean height increased over the 4 months while the weight, skinfold triceps and midarm circumference measurements showed a significant decrease. There were common symptoms such as lack of appetite, nausea and diarrhea occurring throughout the repeated measures. No statistical significant difference was noted among anthropometric measurements or GI symptom frequency in children with and without GVHD.

Conclusions: Nurses should be aware of the importance of assessing children's GI symptoms throughout the BMT recovery phase. With a better understanding of the symptom experience, nurses can facilitate more positive nutritional outcomes. Supported by the Oncology Nursing Foundation and Ortho Biotech Products, L.P.

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Long-Term Effects of Cancer Treatment with Stem Cell Transplantation On Dental Development In Children

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Objectives: To assess long-term effects of cancer treatment on the dentition of children after hematopoietic stem cell transplantation (HSCT).

Methods: 40 children who were treated with allogeneic HSCT for a variety of malignancies were evaluated at a minimum of 2 years after transplantation. Panoramic radiographs (PRGs) were exposed and a clinical examination was performed. We recorded oral hygiene, gingivitis, hyposalivation, dental caries and visible developmental disorders. PRGs were scored by 2 calibrated examiners for agenesis and root and/or crown abnormalities. Dental age was assessed according to the method of Demirjian and the root-crown ratio was calculated. Statistical methods included chi square and Fisher's exact tests. We used regression analyses to determine the effects of multiple factors.

Results: Maxillary teeth were more affected than mandibular teeth, particularly the premolars and molars. Young age (<5 years) at the start of cytotoxic treatment affected the severity of developmental disturbances, but was not associated with the other parameters studied. Total body irradiation (TBI) was not significantly related with any of the parameters studied. Hyposalivation appeared not to be associated with TBI or chronic graft versus host disease, but the level of oral hygiene was significantly better in patients who were treated with radiation.

Conclusions: All examined children had disturbances in dental development, including agenesis, short roots and arrested root development following treatment with HSCT. Younger age at the time of cytotoxic treatment and posterior teeth were associated with more severe changes.

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Glycemic Management of Hospitalized Patients Receiving Tube Feeding In a Cancer Center

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Objectives: Patients with abdominal carcinomas often require nutritional support such as tube feeding to meet their caloric needs. Hyperglycemia can occur in patients receiving tube feeding, regardless of diabetes history. In patients who become hyperglycemic while receiving tube feeding, the Endocrinology Department recommends insulin (regular, analog, 70/30 or NPH) every 4-6 hours, at a ratio of 1 unit of insulin for every 10 grams of carbohydrate. This approach allows for steady insulin levels while minimizing the risk of hypoglycemia. The purpose of this retrospective study is to describe the glycemic management of patients receiving tube feeding to determine an improved initial insulin dosing ratio that allows for glycemic control without hypoglycemia.

Methods: Blood glucose values and insulin doses in the 4 days prior to hospital discharge were analyzed for 9 patients.

Results: All patients had abdominal carcinomas; pancreatic (n=5), esophageal (n=2), gastric (n=1), pseudomyxoma peritonei (n=1). Six were men and 3 were women; average age was 65 years (range 43- 83). Four patients had known diabetes and 5 had no prior history of diabetes. Six patients received Peptamen AF formula and 3 patients received Peptamen 1.5. The mean carbohydrate supplied was 142 grams daily (range 99-208). Mean dose of insulin was 27 units/day (range 15-51), equivalent to 0.3 units/kg body weight daily (range 0.2 0.5). The mean ratio of insulin to carbohydrate was 1 unit/6 grams (range 3- 11). The mean glucose level was 167±5 (SEM) mg/dL (n=146). No glucose values less than 70 mg/dL were recorded.

Conclusions: This study indicates that clinicians can safely be more aggressive in their initial insulin dosing in hyperglycemic patients receiving tube feeding without an increased risk for hypoglycemia.

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Retrospective Study Evaluating Weekly Paclitaxel Hypersensitivity Reactions

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Objectives: This is a retrospective, observational study evaluating hypersensitivity reactions captured by an electronic medical record (EMR) system for weekly paclitaxel infusions.

Methods: The study evaluates the demographics, co-morbidities, pre-medications, chemotherapy agents, and post-medications of patients reporting a hypersensitivity reaction to weekly infusions of paclitaxel at a major cancer center, from June, 2006 to December, 2007, as documented in an EMR system. Data was analyzed using descriptive, statistics and logistic regression was utilized to determine if any demographic or co-morbidities predicted the usage patterns of pre-medications. P-values <0.05 were considered significant.

Results: There were a total of 51 hypersensitivity reactions in 36 patients during this time period that were documented in the allergy section of the EMR. Reactions occurred in patients with an average age of 55 years (SD=10.77), 47 (92%) of the reactions occurred in females, and 42 (82%) of the reactions occurred with orders on the breast medical/surgical service. Thirty-two (63%) reactions occurred with either the first or second dose of weekly paclitaxel infusion. The most common pre-medication was dexamethasone (50 infusions), followed by diphenhydramine (17 infusions), and cimetidine (14 infusions). Thirty-four (67%) infusions had only one pre-medication. Post reaction, 41(80%) cases had diphenhydramine and 25 (49%) cases had hydrocortisone administered prior to restarting the infusion. Logistic regression analysis did not indicate any relationship between history of previous allergies, hypertension, coronary disease, or chronic obstructive pulmonary disease and the number of pre-medications.

Conclusions: The results indicate that there is substantial variability in the type and number of premedications utilized in the management of paclitaxel hypersensitivity reactions. Standardization of premedications for the management of hypersensitivity reactions may lead to decreasing the rate of hypersensitivity reactions from weekly paclitaxel infusions.

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Pathfinders: An Integrative Psychosocial Approach To Supportive Care In Cancer

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Objectives: Pathfinders is a whole-person, psychosocial program for cancer patients that combines patient navigation with individualized counseling and support focused on personal recovery. The objective of this pilot study is to determine the (1) extent to which patients find Pathfinders helpful, and (2) a preliminary assessment of Pathfinders for improving symptoms, quality of life (QOL), self-efficacy, and coping.

Methods: This is a prospective, uncontrolled, pilot study involving metastatic breast cancer patients receiving care at Duke. Patients are assigned a Pathfinder, who interacts at least monthly using the manualized "living fully" model. At 5 timepoints over 6 months, patients complete the Patient Care Monitor (PCM, an 86-item review of symptoms), Functional Assessment of Cancer Therapy –Breast (FACT-B), Self-Efficacy Scale (SE); Functional Assessment of Chronic Illness Therapy –Spirituality (FACIT-Sp) and –Fatigue (FACIT-F). Patients also answer: "Has Pathfinders been helpful to you?"

Results: At the 12-month point, participants (n=38) are; 79% white, 16% black; 73% married; 43% less than bachelor's degree. The referred cohort had very advanced metastatic cancer; 18% died within 3 months of enrolling. At 3 months (n=15) and 6 months (n=5), 100% of patients indicated Pathfinders was helpful. Despite the very advanced stage of their cancer, multiple symptoms improved or stayed the same from baseline to 4-8 weeks (n=20) and 4-8 weeks to 3 months (n=17) including fatigue, sadness, insomnia and worry. Similar early patterns of improvement were identified in mean scores on nearly all FACT-B, SE, FACIT-Sp and FACIT-F subscales at the 4-8 week timepoint.

Conclusions: Early data indicate that Pathfinders has significant impact on symptoms, QOL and psychosocial measures in this population of women with metastatic breast cancer, despite being very advanced in their illness. More complete data will be available at the time of presentation. (Sponsor: Duke Comprehensive Cancer Center and Pfizer, Inc.)

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Quality of Sleep And Non-Pharmacologic Strategies Versus Sleep Disturbances of Family Caregivers of Cancer Patients

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Objectives: Quality of sleep of family caregivers is of great importance to establishing a care process for cancer patients without interruptions. Health professionals have a key role in determining and improving sleep problems of individuals.The aim of this research was to determine the quality of sleep, reasons for sleep disturbances, and non-pharmacologic strategies versus sleep disturbances of cancer patients' family caregivers.

Methods: A descriptive, cross-sectional study design was used. The study was carried out in a Turkish oncology education and research hospital. Ninety family caregivers of ninety cancer patients were included. Data were collected with the Pittsburg Sleep Quality Index (PSQI),a demographic data form and a questionnaire. Frequencies, percentages, means, correlation coefficients and Chi-square Test were performed by using SPSS 13,0 for Windows programme.

Results: 44,44% of caregivers were spouses. The median care giving period was five months. The PSQI score of 72,22% of the caregivers was above 5 which indicated poor sleep quality. The most commonly determined reasons for sleep disturbances were "Emotional Distress Because of The Patient's Illness (28,30%), "Financial Problems" (12,45%), "Inadequate Support System" (11,70%). 76,92% of caregivers used at least one non-pharmacologic strategy which included "Watching TV" (27,14%), "Consuming Milk Products" (12,14%), "Taking a Warm Bath" (11,43%), Listening To Music" (%7,14%), "Immersion In Thought In Bed" (7,14%). Total PSQI scores did not differ by sex (X^2=2,619, p=0,454). There were no statistically significant relationships between total PSQI scores and age, education, and care giving period (p>0.0.1).

Conclusions: The sleep quality of caregivers was poor and there were reasons for sleep disturbances with regard to cancer and other issues. They used many strategies against sleep disturbances. This implies that caregivers are in need of support by healthcare professionals in order to provide a positive environment during the care process.

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Psycho-Social Support To Elderly Cancer Patients And Their Families

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Objectives: Older cancer patients tend to be diagnosed later in the disease process, are often subjected to less rigorous cancer staging, undergo less aggressive treatment and experience lower survival rates. Paradoxically, meta-analyses of published psychological and psycho-social studies indicate that older persons respond more positively to cancer due to greater life experience, ability to use more internal resources and coping in the past with other difficult life situations. Old age is a social and cultural construct, as much as a biological reality. In western countries, old age tends to be represented only in terms of decreased productivity, functional impairment, co-morbidity, cognitive limitations and the burden of care placed directly on the family and/or the health care system.

Methods: To investigate these social and cultural notions, we have started a pilot study, to be carried out in two different cultural settings - Graz, Austria and Jerusalem, Israel. We will assess a convenient sample of 100 patients (men and female), in each setting, older than 60 years old, diagnosedwith colorectal cancer, and one to 6 years in remission from the time of ending any active treatment. A three -way (culture, gender and diagnosis) MANCOVA design will be used to compare levels of psychological distress, coping-mechanisms and family-social support between the Israeli and Austrian cultures.

Results: We set out to explore gender differences and the influence of social support and family functioning on coping and adaptation of the patient. In particular, data will be presented on the moderating effect of family and friends on the emotional, cognitive and instrumental support to patients and their partners.

Conclusions: The outcome of the study will have important implications for constructing and tailoring different interventions plans for elderly cancer survivor in long term remission, within different social and cultural settings.

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Citalopram For Hot Flashes: "The Rest of the Story"

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Objectives: Effective alternative treatments for hot flashes that improve health related quality of life are needed. In a completed phase III placebo-controlled trial, evaluating three doses of citalopram for the relief of hot flashes, secondary analyses were completed to clarify how reduction in hot flashes improves daily living, to evaluate pre-study perceptions of benefit, and to investigate the role of expectancy and the number of pills received.

Methods: Women with >13 hot flashes per week were randomized to receive 1, 2 or 3 capsules representing 10, 20, or 30 mg/d of citalopram versus placebo for 6 weeks. Outcomes included a prospective daily hot flash diary, the Hot Flash Related Daily Interference Scale (HFRDIS), and questions about expectancy and perception of benefit. Analyses included Wilcoxon procedures between groups of patients that experienced at least a 10 point reduction on the HFRDIS versus those who did not, frequencies of perception of benefit by treatment arm, and regression analysis for effects of expectancy and number of pills on response.

Results: Improvements of at least 10 points on the HFRDIS total score were associated with hot flash reductions of over 50%, compared to 30 % for those who did not improve at least 10 points. For individual items, improvements of at least 10 points were associated with over a 40% reduction in hot flash frequency. At least a ten point reduction in the HFRDIS was necessary for women to perceive treatment as beneficial. More participants on 10 mg/d (69%) perceived the treatment as beneficial with minimal or no side effects than on other active arms. Neither expectancy nor number of pills impacted on the amount of hot flash reduction.

Conclusions: Women having at least a 40-50% reduction in hot flashes experience clinically significant improvements in the impact of hot flashes on daily life.

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Spirituality/Religiosity Moderates the Effect of Social Support On Pre-Surgical Distress In Urologic Cancer

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Objectives: We examined associations among spirituality/religiosity (S/R), social support, and pre-surgical distress in patients with urological cancer.

Methods: One hundred fourteen men scheduled for surgery for urologic cancer participated. Before surgery, participants completed scales measuring intrinsic, organized, and non-organized S/R (IR, ORA, NORA), social support (MOS-SSS), and distress (perceived stress (PSS) and mood disturbance (POMS)).

Results: The participants' average age was 58, and most were Caucasian (75%), married/living with partner (90%), and had some college (71%). S/R was not associated with social support or distress (PSS and POMS); however, social support was negatively correlated with POMS ($r=-.26$, $p<.02$) and PSS ($r=.18$, $p=.05$). After controlling for age, race, marital/partner status, and education, regression analyses revealed a significant interaction between S/R and social support in predicting PSS ($p<.02$) and POMS ($p<.03$). Based on a median split of combined scores from the S/R measures, participants were classified as S/R or not S/R. Graphical representation indicated that S/R significantly moderated the association between social support and distress. There was a non-significant positive association between social support and distress for men classified as not S/R, whereas, the negative association became stronger for men classified as S/R. Follow up analyses revealed a significant inverse relationship between social support and PSS ($r=-.43$, $p=.002$) and POMS ($r=-.35$, $p=.016$) only in men classified as S/R.

Conclusions: The results suggest that social support helped buffer distress and negative mood, but only in more spiritual/religious participants. Although S/R was not directly related to social support or distress, it moderated the effects of social support in reducing pre-surgical distress. Future studies should investigate mechanisms underlying the influence of S/R on the association between social support and pre-surgical distress and explore the influence of gender in this association.

Study Support: None

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The Association Between Anxiety, Depression, And Frequency And Intensity of Physical Symptoms In Patients with Advanced Cancer

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Objectives: Mood disorders are among the most distressing psychiatric complications in advanced cancer patients (pts). There is inconclusive evidence about the relationship between depression, anxiety, and symptom expression. Purpose: To determine the association between the intensity of pts physical symptoms and depression and anxiety.

Methods: We retrospectively reviewed the intensity of physical symptoms using the Edmonton Symptom Assessment System (ESAS) and the Hospital Anxiety and Depression Scale (HADS-A and HADS-D respectively) data of 216 pts who participate in 3 previous clinical trials conducted by our group.

Results: Median age: 59 years (range 20-91years), 38% female. 76% were white, 15% African American, and 6% Hispanic. 79pts (37%) with depression (HADS-D>/=8). 94pts (44%) had anxiety (HADS-A>/=8). Depressive pts expressed higher intensity (mean +/-SD) of fatigue (6.3 +/-2.3 vs 4.9 +/-2.6, $p<0.0001$), drowsiness (4.3 +/-2.8 vs 2.5 +/-2.7, $p<0.0001$), and worse well-being (5.8 +/-2.1 vs 3.6 +/-2.6, $p<0.0001$). Pts with anxiety expressed higher pain intensity (5.4 +/-2.8 vs 3.7 +/-3, $p<0.0001$), and worse well-being (5.3 +/-2.5 vs 3.7 +/-2.5, $p<0.0001$). 56pts (26%) with both anxiety and depression, expressed higher pain intensity (5.5 +/-2.5 vs 3.5 +/-3.0, $p<0.0001$), fatigue (6.5 +/-2.2 vs 4.7 +/-2.6, $p<0.0001$), drowsiness (4.3 +/-2.9 vs 2.2 +/-2.5, $p<0.0001$), and worse well-being (6 +/-2.3 vs 3.3 +/-2.5, $p<0.0001$). Spearman's correlation between HADS and ESAS-A and D were respectively 0.50 and 0.39 ($p<0.001$).

Conclusions: There is significant relationship between anxiety, depression and physical symptoms. Mood disorders should be suggested in patients with high symptom expression.

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Evaluation of the Clinical Benefit of Beauty Care Provided In the Hospital To Cancer Patients: Focus On Qualitative Aspects

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Objectives: Patients are offered more and more access to beauty care during their stay in the hospital. This encounters a large success among cancer patients. The problem is to really evaluate it and to determine if, beyond comfort and immediate satisfaction, this kind of intervention could improve quality of life. The 1st step, presented here, is a qualitative study.

Methods: 60 patients (58 female, most of them treated for breast cancer, 2 male, mean age 53y) and 11 nurses and physicians, from 4 French cancer centers were included. We used direct observation and semi-structured interviews, conducted by a sociologist and a psychologist; 4 types of care were concerned (Simple beauty care services, Socio-aesthetician services, Personal Image Advice and Consultation on 'image advice and socio-aesthetics').

Results: As expected, all the interviewed patients were satisfied. Beauty care was included in the range of solutions to the cancer- and treatment-related aesthetic, physical, psychological and social functioning changes. Patients appreciated the durable learning experiences, acquiring know-how on how to use make-up and on personal image enhancement. The benefits in terms of repercussions on their psychological and social well-being were also mentioned: patients considered that their experience of beauty care had a positive effect on their relationship with their family and friends. The beauty care was not alleged to be reducing the side effects of the treatments but it had helped them to accept or bear the burden of the treatments and their side effects.

Conclusions: This survey brings interesting clues concerning beauty care benefit for cancer patients. A prospective, randomized trial is ongoing to assess the value of beauty care at improving patients' quality of life.

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Nccn Distress Scale: a Tool To Measure Patient Distress? Assessment In Two Oncology Populations

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Objectives: To compare the use of the NCCN Distress Thermometer with other psychosocial and symptom assess-

ment tools completed by breast cancer (BC) and gastrointestinal cancer (GIC) patients.

Methods: In sequential studies, electronic questionnaires were administered to BC and GIC patients using e/Tablets. During 4 outpatient visits, participants completed: review of systems (Patient Cancer Monitor; PCM); Functional Assessment of Cancer Therapy (FACT); MD Anderson Symptom Inventory (MDASI); NCCN Distress Scale (Distress). Distress is measured on a 0-10 numerical rating scale (NRS), aka "distress thermometer" (DT). A 34 item yes/no problem list is completed with the DT.

Results: BC patients (n=60) were mean age 55 (SD 12); 78% white. At visit 1, Distress thermometer scores were mean 2.5 (SD 2.8) with 30% scoring ≥4. To yes/no questions on the Distress questionnaire, participants reported fatigue (63%), sleep (55%), pain (45%), memory/concentration (42%), and worry (42%). GI patients (n=108) were mean age 57 (SD 12); 66% male; 87% white. At visit 1, DT scores were mean 2.3 (SD 2.5) with 29.6% scoring ≥4. Participants reported fatigue (62%), sleep (30%), pain (40%), nervousness (37%), and worry (46%). DT scores were compared to the FACT subscales (functional, physical, emotional, social, disease specific well-being), MDASI subscales (severity, interference), and PCM subscales (physical symptoms, side effects, distress, despair, performance, ambulation, quality of life). Distress correlated significantly with all subscales ($p<0.01$) for both BC and GIC patients.

Conclusions: In two cancer populations, electronic distress score correlate with all subscales (physical, psychosocial) on other validated measures. This lack of specificity raises the question of what, exactly, the DT measures. The yes/no problem list often does not accompany the DT in clinical settings. The DT's high sensitivity may alert clinicians, but distress scores alone but may not provide the information necessary to assign an appropriate biopsychosocial treatment. Highly distressed patients may need to complete more specific distress questionnaires to find problem areas.

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Socio-Demographic Characteristics, Illness Knowledge, Sources Used For Medical Information, And Perception of Cancer Treatment: A Urcc Ccop Research Base Study

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Objectives: Illness knowledge and sources used for cancer information can influence patients' health behaviors. Despite their importance, however, few studies have examined the effects of these variables on perception of cancer treatment, especially across divergent ethno-cultural groups.

Methods: The present sample included 973 cancer patients (904 whites, 69 non-whites) undergoing treatment at 20 geographically separate Community Clinical Oncology Program sites. Participants provided information about their perception of cancer and its treatment, and the sources used for cancer information: medical/professional, community, and media.

Results: The analyses showed significant relationships between patients' race and utilization of medical/professional sources for cancer information and perception of cancer and its treatment (p-values <0.01). Specifically, nonwhites reported greater desire for information ($p<.0001$), and were less likely to rely on medical/professional sources for cancer-related information. However, the results showed no significant differences in education and occupation between whites and non-whites. A multiple regression analysis revealed a significant model ($p<0.0001$) that explains 82% of the variance in patients' perception of cancer treatment (Adj. $R2=.823$). Illness knowledge and use of medical/professional sources for cancer information were strongly predicted patients' perception of cancer treatment (p-values <0.01).

Conclusions: There are important differences by race in unmet need for cancer information and for the sources used for this information. These findings indicate the need for clinicians working with patients from diverse backgrounds to assess patients understanding of cancer information and desire for more information. Perhaps programs designed to enhance cancer and cancer treatment knowledge are not reaching nonwhite individuals as well as whites. Supported by NCI-PHS grant U10-CA37420.

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Breaking Bad News And Euthanasia - The View of Polish Internists And Medical Students

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Objectives: To explore the attitude toward breaking bad news and euthanasia and the knowledge of the end of life ethics of physicians during internal medicine training and the third year medical and dentistry student.

Methods: A questionnaire survey (with 10 questions) of 217 physicians and 401 students was completed after the theoretical course comprising basic palliative medicine for physicians during internal medicine specialty training and after lectures for students concerning the end of life ethics.

Results: For 24% of physicians and 28% of students the patient should be always informed about an incurable disease and unfavourable prognosis. 80% of physicians and 84% of students want to be fully informed in case of incurable disease, but only 40% and 59% respectively stated that the patient should be fully informed. Over 30% of doctors and students provide appropriate definition of euthanasia. 90% of physicians and 82% of students would not perform euthanasia, 75% physicians and 67% students were against legalization of euthanasia. Regarding the doctrine of double effect 47% doctors and 88% of students gave no respons.

Conclusions: The will of breaking bad news fully to patients is limited in both physicians and students surveyed. They provide information to patients regarding unfavourable diagnosis and prognosis to significantly lesser extent, in contrast to their own wish for themselves and their relatives to be informed. There is a significant lack of knowledge in the end of life ethics particularly in students, a small percentage of respondents would consider practice of euthanasia and a larger group would accept its legalization.

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Unrelieved Pain And Suffering In Patients with Advanced Cancer

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Objectives: To understand how to detect and manage psychosocial distress in terminal cancer patients with complex pain syndromes.

Methods: We present 3 cases of cancer patients with substantial psychosocial distress who were admitted with intractable bone pain due to osseous metastases, and review the literature.

Results: The first case is a 32-year-old male with neuroendocrine carcinoma with significant anxiety and diffuse bone pain refractory to multiple opioid rotations and strontium-89 administration, who insisted on increasing the opioid dose while knowing the risk of sedation and even death as its double effect. The second case is a 57-year-old male with metastatic renal cell carcinoma and a history of methamphetamine use who presented with uncontrolled bone pain. The third case is a 44-year-old female with metastatic non-small cell lung cancer who was admitted with worsening lower back pain due to lumbosacral metastases and L2 vertebral fracture with cauda equine compression. She had a history of cocaine use and chronic lower back pain due to a horse accident. All of them developed opioid-induced neurotoxicity with delirium, and were referred to the Supportive Care Service which detected significant psychosocial suffering in the patient and family. Interdisciplinary approach including opioid rotation, corticosteroid, neuroleptic drugs, radiation therapy, physical therapy, and emotional and spiritual support successfully treated the delirium and relieved their pain expression and total suffering.

Conclusions: Unidimensional approach to complex pain syndromes can cause an unnecessary escalation of opioid dose and opioid-induced neurotoxicity, which in turn lead to more expression of pain. These cases underline the importance of the multidimensional approach as well as the knowledge of risk factors of poor pain control as indicated by the Edmonton Classification System for Cancer Pain, and raise clinically important ethical questions in the management of pain and suffering at the end-of-life.

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The Psychological Impact of Treatment For Cancer As Recorded By Patients Using Unstructured Journals

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Objectives: To obtain patients' experiences to improve practice, 63 patients agreed to keep an unstructured journal of their positive and negative experiences of events at the Cancer Centre.

Methods: Journal entries were submitted by 38 patients (22 female, 16 male), average age 58 (range 29-80). Most were starting chemotherapy for a range of cancers.

Results: Women wrote more and more often than men, and disclosed more. Data entries were transcribed, and entered into the NVIVO software to facilitate analysis. Analysis focused on experiences which negatively impacted upon patient well-being. For most, physical side-effects dominated, comprising 25-75% of diary entries. The most commonly mentioned were fatigue (74%), pain (63%), sleep

disturbances (50%), nausea (45%), and changes in appetite (45%). Less prevalent were pain, discomfort, or swelling post-operatively (37%), neurological disturbances such as parasthesiae, alteration in taste, smell, or vision (34%), dizziness (34%), stomatitis (31%) and skin complaints (31%). Women reported more physical ailments than men (average female: male=9.2:6.6). Collectively, 22 patients reported 261 separate emotional reactions included depression, anger, guilt, shame, grief, panic, and confusion. Several were surprised that they felt depressed or angry, some castigating themselves. Some felt guilty about not doing what they used to (particularly for others), comparing themselves unfavourably to those perceived to be coping better. The treatment environment, including personnel, impacted upon patients' experiences particularly when events did not meet patient expectations. The process and perceived outcomes of treatment appeared overwhelming to many, leading to inability to participate in their normal activities and feelings of isolation. Where survival is unpredictable, evidence of stability, planning, consistency in approach, and expertise of treating staff, attains heightened significance. Correspondingly, perceived mishaps caused disproportionate destabilisation of patients' emotional equilibrium.

Conclusions: Many patients appeared to lack knowledge regarding the availability of beneficial hospital services.

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A Retrospective Analysis In the Management of Lung Cancer Patients with Distress

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Objectives: Distress management guidelines created by the NCCN state "distress, like pain, should be recognized, monitored, documented and promptly treated at all stages." We previously demonstrated at MASCC, 2007 that newly diagnosed lung cancer patients have high distress levels. However, the next step in management of distress is unclear.

Methods: This study is a retrospective chart review of all lung cancer patients seen from May 2006 until January 2008. Data was collected on psychosocial consults and baseline distress scores.

Results: Between May 2006 and January 2008, 157 pts with lung cancer were seen in the Pulmonary Oncology Outpatient Clinic. Of these, 32 (20%) pts were referred to the psychologist, the social worker or both. Clinically significant distress levels ≥4, at baseline, were reported in 17/32 (53%) pts. The mean DT score was 4.0 (SD 2.9), mean age of 59 (SD10.1), most were female (F: M ratio was 20:12), with late stage disease (65%) and a mean CRP of 34.1 (SD 49.9). Of the remaining 125 lung cancer patients who were not referred for additional psychosocial intervention, 59/125 (47%) reported clinically significant distress. All pts were followed by nurse clinicians. Pts referred (32pts) and not referred (125 pts) had similar mean DT score, age, gender, ECOG PS, stage and baseline lab results.

Conclusions: Lung cancer pts have a high level of distress. Despite DT being a recommended screening tool it is not yet employed for triaging patients with distress. This retrospective review highlights the importance of using DT for psychosocial referral, since clinical intuition is not sensitive enough to capture distressed patients. Supported by The Mona Zavalkoff Fund and Unrestricted Grant from Sanofi-Aventis

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Preferences For Side-Effects of Chemoradiation: Focus On Nausea And Vomiting

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Objectives: Patients with abdominal/pelvic malignancies receiving chemoradiation face rigorous treatment schedules and numerous treatment-related side effects (SEs). As part of a larger study of patients with gynecologic and gastrointestinal malignancies undergoing chemoradiation, we assessed baseline preferences of patients and their caregivers for SEs of chemoradiation.

Methods: Face-to-face interviews were conducted with GYN/GI patients scheduled for chemoradiation and their caregivers. Participants were asked to rate SEs on a scale of 0=worst to 100=best using a visual analog scale (VAS). Among the SEs evaluated, 7 included nausea and vomiting (NV) (completely controlled; breakthrough; acute/delayed); nausea (acute; delayed), vomiting (acute; delayed). Reference health states were also assessed. VAS scores were converted to a scale of 0.0=worst possible to 1.0=best possible. Mann-Whitney U tests were used to compare scores between groups.

Results: To date, baseline preferences have been collected from 78 patients and 68 caregivers. 41/78 patients (53%)

have GI primaries; 39/78 pts (50%) are male. Median ages of patients and caregivers were 54 and 53 years, respectively. Completely controlled NV was viewed as most favorable (VAS=1.0), followed in order by acute nausea, acute vomiting, delayed nausea, delayed vomiting, breakthrough NV, and acute/delayed NV as least favorable (VAS =0.15). There were no differences between male and female patients for completely controlled and breakthrough NV. With the exception of acute/delayed NV, males regarded NV SEs less favorably compared to women, however women gave lower scores for current health (p =.02) and mucositis (p=.01). Compared to caregivers, patients gave notably lower VAS scores for current health (p<.001), delayed nausea (0.50 vs 0.40, p=.06) and vomiting (0.45 vs 0.30, p=.04), acute vomiting (0.60 vs 0.50, p=.02) and breakthrough NV (0.30 vs 0.20, p=.15).

Conclusions: Baseline preferences of patients suggest that patients regard NV SEs less favorably than their caregivers. Male patients have less favorable views of NV SEs compared to female patients. Preferences after completion of treatment are currently being assessed and will be available at the MASCC meeting. Supported by Merck & Co. Inc. (Please note that full author list from M. D. Anderson Cancer Center should also include Patricia Eifel, Christopher Crane, Lois Ramondetta and Michael Frumovitz).

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Communication And the Role of Families Along the Illness Trajectory

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Objectives: Every year, an estimated six million people in developing countries die of cancer, but little is known about their end-of-life care. In the United States, 80% of cancer patients die in the hospital. It is estimated that 20% to 70 % of dying patients experience inadequate pain relief, 33% are clinically depressed, and 35% have unmet emotional needs - dying in silence and isolation. In all developed and developing societies, families tend to be the main locus of care giving during the entire course of cancer patients' illness, and especially at the end of their life. Each death is unique, as patients and their families share different values and experiences, which are influenced by different cultural and religious norms of suffering and of providing care. Communication styles within families also vary from denial or covert silence as a way of total acceptance to open discussion of feelings as a way to enhance a sense of control and well being. Are there universal norms for "appropriate" family care for the terminal patient? Is the western cultural paradigm of family communication of care suitable for understanding the complexity of different cultural and religious systems of terminal care?

Methods: To answer these questions, we analyzed a randomized sample of 200 couples over the age of 60 years old. In each couple, one of the spouses was diagnosed with colon-rectum cancer, oneto 6 years after the diagnosis and the end of any medical treatment . The study examined gender differences, influence of social support, psychological distress, and adaptation of both patient and spouses.

Results: Study results carry relevant implications for understanding gender differentiation in the role of caregiver and or patient, within a religious and social settings in a multicultural country such as Israel.**Conclusions:** Results will be used to establish focused intervention plans for patients and spouses.

21-213

Score And Quality of Life: Linear Correlation?

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Objectives: In elderly patients, literature shows that there is a correlation between Hb, dyspnea and reduced motor function. However, anemia isn't predictor of survival rates and WHO considers it an indipendent factor in increasing mortality, except in patients older than 85. Anemia has been associated with fatigue and reduced health-related QoL (HRQOL) in cancer patients undergoing treatment. Abuot fatigue the situation changes in patients with advanced cancer receiving palliative care (PC) (Bruera 2005).

Aim: Understand correlation between Hb levels and dyspnea and/or cognitive dysfunction.

Methods: EMR to extract consecutive cancer patients assisted by a PC service in 2007/08 with dyspnea and/or cognitive dysfunction and blood Hb≤7 g/dl. Average days of care: 60,6. Symptoms and scales: Dyspnea/STAS; Fatigue/VAS score; Karnofsky performance status; MMSE (Folstein, 1975).

Results: 1729 patients assisted in 12 months: patients and age (A-8; B-26; C-31; D-63; E-81). Hb minimum levels were: A-6,4; B-2,5; C-3,5; D-5,4; E-5,5 g/dl. No signs of an altered neurological status during care: MMSE 24-30 (average 28,2). Levels of dyspnea (STAS evaluation): A-2/4; B-1/4; C-3/4; D- 4; E-3/4. Patient C had severe fatigue (NRS=9) during the period of care, the other ones had

NRS=2-4. KPS was 20% for patient A, but rose to 60% in the remaining four ones during the entire period of care.

Conclusions: In palliative care, routine blood tests aren't a standard means of evaluating symptoms and the relative therapeutic approach. In this sample the levels of dyspnea and fatigue were not always directly correlated with Hb levels, and mental status was not always compromised by very low Hb levels. To confirm this qualitative descriptive data it's ongoing a prospective study of a cohort of about 50 patients with cognitive dysfunction and/or dyspnea so as to verify the impact of transfusion support or prophylactic recombinant erythropoietin on the QoL in PC.

21-214

Cancer Patients' Quality of Life At Diagnosis Seen At a Public Brazilian Oncology Service

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Objectives: To assess the patients' quality of life who are seen for the first time in the oncology outpatient unity of our service, with the purpose to develop specific actions from the multiprofissional team involved in their assistance.

Methods: The forty patients who participated in this study were assessed through the socio-demographic data found in the sorting chart of the psycho-oncology service and the Medical Outcomes Study 36-item Short-Form Health Survey.

Results: In the studied sample, the medium age ± SD was 53.6±10.0 years (range: 16-86 years). The average participant was male (70%) and married (72.5%), and the school level was predominantly the incomplete primary school (40%). Most of the patients (35%) were on health license, 32.5 % were retired and 70% were with a companion. Most of the patients were catholic (62.5%). The results obtained through the Medical Outcomes Study 36-item Short-Form Health Survey indicated that our patients presented good functional capacity, general health condition, vitality, social and emotional aspects, and mental health. In contrast, the average of the dimension "physical aspects" (36.2) was considered low. The result was attributed to the unfavorable nutritional status, to difficulties to move from one place to another without help from family members, and to the moderate pain seen or mentioned by the participants.

Conclusions: Global understanding of factors which influence the daily routine and the treatment of patients with cancer, seen in our service, indicates that the multiprofissional team has to give especial attention to our patients' nutritional status as well as to the adequate treatment of their distinct pains in order to improve their physical aspects and consequently their quality of life.

21-215

Predictors To Diminished Quality of Life In Portuguese Patients Receiving Highly And Moderately Emetogenic Chemotherapies

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Objectives: Chemotherapy induced nausea and vomiting (CINV) negatively affects cancer patients' quality of life. The purpose of this study was to assess factors that predict diminished quality of life in patients receiving highly or moderately (HEC or MEC) emetogenic chemotherapies in Portugal.

Methods: We recruited patients at five geographically representative hospitals. Patients who received at least two cycles of chemotherapy during the study, but did not receive chemotherapy one week before or between Day 1 and 6 of each cycle were included. The functional living index of emesis (FLIE) questionnaire was administered at baseline and Day 6 per cycle. Predictors to diminished quality of life were determined using multivariable regression models. Covariates included CINV, baseline FLIE scores, chemotherapy regimen, anti-emetic medication, gender, age, weight, metastases and receipt of previous chemotherapy.

Results: Eighty-one patients were enrolled; 72 in cycle 1 and cycle 2 reported complete FLIE data. Among those with complete data, forty-one (56.9%) were female and the mean age was 49.5 years. The most common cancers were lung (40.3%), breast (29.2%), and Hodgkins lymphoma (22.2%). The majority of patients received a 5-HT3 antagonist and dexamethasone in cycle 1 (59.7%) and 2 (58.3%). In cycle 1, 4.0% of patients reported a negative impact on daily life prior to chemotherapy whereas 41.7% indicated a negative impact post-chemotherapy. In cycle 2, 9.7% reported a negative impact on daily life prior to chemotherapy while 43.1% reported a negative impact post-chemotherapy. The only significant predictor of

negative impact in cycle 1 post-chemotherapy was CINV (p=.01). In cycle 2, CINV (p=.01) and pre-chemotherapy FLIE score (p=.03) significantly predicted negative impact post-chemotherapy. CINV (p<0.01) was the only significant predictor in the model using data from both cycles.

Conclusions: Patients who experience CINV in Portugal experience a diminished quality of life in the five days following chemotherapy treatment. Prevention of CINV from the first cycle of chemotherapy may improve the quality of life in patients with cancer. This study was conducted with support from Merck & Co. Inc.

21-216

Improving Outcomes For Families Facing Cancer: A Four Phase Treatment Approach

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Objectives: Due to increased survival from cancer and other once-terminal illnesses and the general aging of the population, the prevalence of chronic diseases is increasing. In the past 30 years, the number of people surviving cancer has tripled, from 3 million to 10.5 million, and 14% to 96% of cancer survivors experience disabling fatigue. Cancer is a traumatizing, life-changing diagnosis for the entire family. All health professionals providing care to cancer patients, including physicians, nurses, dentists, and counselors, are called upon to help families accept and cope with the reality of being or having a close family member with a frightening, uncertain medical prognosis.

Methods: The Fennell Four Phase Treatment (FFPT™) model is a tool for health care professionals to help patients and families integrate the new realities of chronic illness into cancer survivors' lives. It addresses the complexity of cancer by matching interventions to the Four Phases experienced by individuals with with illness and their families – Crisis, Stabilization, Resolution and Integration.

Results: FFPT is an empirically validated, multi-phased approach that provides a narrative framework and cognitive map for families struggling with cancer, helping them describe, understand and adapt to the illness. It recognizes the influences of cultural, psychosocial, and physical factors in both assessment and treatment.

Conclusions: FFPT offers a transdisciplinary, comprehensive case management approach grounded in clinical practice for health care professionals to help families coping with cancer solve problems and create positive change.

21-217

Are Pro-Inflammatory Cytokines Associated with Health-Related Quality of Life Among Patients with Cancer Pain?

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Objectives: to evaluate the interference of interleukin-6 (IL-6), IL-8, IL-1β and tumor necrosis factor-alpha (TNF-α) in the relationship between pain, health-related quality of life (HRQOL), and performance status (PS).

Methods: 220 cancer outpatients (median survival time=20 months, range: 8-44.5), who didn`t receive any antineoplastic treatment in the last 30 days, were evaluated by the Brief Pain Inventory (BPI), McGill Pain Questionnaire (MPQ), Beck Depression Inventory (BDI), Karnofsky Performance Scale (KPS), and a HRQOL measurement, the EORTC-QLQ-30. Plasma cytokine levels were measured using an enzyme-linked immunosorbent assay (ELISA). PS and HRQOL were compared among patients with mild (G1), moderate to severe (G2) and without pain (G3) using one-way analysis of variance (ANOVA) or Kruskal-Wallis followed by multiple comparison tests. Patients in G1 and G2 had only cancer pain and were using analgesics. G3 members had cancer but felt no pain and didn`t use analgesics in the last 14 days. Multivariate analysis of covariance (ANCOVA) with interaction of pain and IL-8, IL-6, TNF and IL-1 were applied to examine effect of these cytokines on the association of pain and HRQOL and PS.

Results: Pain was found to be associated with HRQOL and PS. Patients with moderate to severe pain had significantly (p<0.05) lower PS and emotional, physical, social and role function HRQOL than those without pain. Patients with mild pain had worse cognitive HRQOL than those without pain (p=0,000). In the symptom scales (nausea and vomiting, fatigue, pain, loss of appetite, constipation, dyspnea, and insomnia), patients with moderate to severe pain had higher scores than those without pain and with mild pain. Among patients with pain (n=125), it was observed significant correlations between: IL-6 with QLQ-c30 pain scale (r=0.21, p=0,02) and with insomnia (r=0.17, p=0,049); IL-8 with fatigue scale (r=0.15, p=0,035); emotional HRQOL domain and IL-8 (p=-0.26, p=0,036) and IL-6 (r=-0.17, p=0,048). ANCOVA analyses showed that the observed variability in all HRQOL domains and in the PS could be accounted for by pain (p<0,01). Thirty-one

percent ($r^2a=0.31$) of observed variability in fatigue scale could be accounted for by pain (p=0,000) and IL-8 (p= 0,004), independently. The interaction between pain and IL-8 (p=0,02) increased loss of appetite among those with moderate to severe pain (from 34,69 [95%CI=22.49 a 46.89; standard error=6,07] to 37.10 [95%CI=27.16 a 47.04; standard error=5.04]).

Conclusions: IL-8 may play a role in the negative impact of pain on HRQOL of patients with cancer. IL-8 is associated with fatigue and emotional HRQOL. IL-6 was associated with pain and insomnia. The interaction between pain and IL-8 was associated with loss of appetite. This was the only interaction observed between pain and cytokines that determined reduction on HRQOL scale.

21-218

Which Issues Are of Greatest Importance For Patients with Lung Cancer: A Web-Based Survey of 660 Patients To Enhance the Content Validity of Quality of Life (Ql) Instruments

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Objectives: Identifying issues of importance for patients with cancer is central to assessing QL and patient reported outcomes (PROs). Such data are necessary to evaluate the effectiveness of treatment programs and to ascertain that appropriate goals are being met. The first aim of this study was to enhance the content validity for the PRO instrument, the LCSS, by enlarging the patient panel (originally 121) with these additional 660 patients. These data could be useful for any QL or symptom scale as well.

Methods: We utilized the established patient base NexCura (a web-based patient information resource) to survey registered patients with lung cancer who elected to participate. Patient characteristics included: stage of disease (metastatic 27%, locally advanced 37%, NED 36%); current treatment; gender (55% women); KPS (>80=46%, 70=28%; 60=16%); median age 62; NSCLC=82%, SCLC=18%. 660 patients completed the anonymous web-conducted survey. Patients ranked 20 issues on a 5-point scale assessing the importance of each item. Issues included general, lung-specific, psychosocial, spiritual and summative items.

Results: The 10 highest (and 2 lowest) ranked items are seen in the table below; results are described by the percent of patients choosing the top category (very important) and the top 2 rating categories of importance:

	Very Important	Very Important + Important
Good QL	80%	98%
Maintaining independence	71%	97%
Being a burden to others	65%	89%
Perform normal activities	64%	96%
Able to sleep	63%	94%
Having pain	59%	86%
Being fatigued	58%	93%
Having shortness of breath	58%	89%
Having blood in the sputum	58%	78%
Being depressed	47%	82%
Difficulty with urination	*27%*	*65%*
Difficulty with sexuality	*20%*	*48%*

Conclusions: Results by disease subsets were generally similar to ratings reported for the whole group, with the exception of the pain item being ranked second in those with stage IV extent. These findings represent the largest survey of patient concerns in lung cancer and support using computer-assisted survey technology to assess such information in all malignancies to obtain patient input rapidly from large patient samples. These results provide strong support for content validity for the LCSS and should be helpful in a variety of assessments in patients with lung cancer.

21-219

Attitudes And Perceptions of Healthcare Workers About Eol/Qol Care Issues

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Objectives: To determine the perceived attitude and behaviors of the Healthcare workers' (HCW) in providing end-of life (EOL) care and Quality of Life (QOL) care to dying patients in a hospital setup of a developing nation.

Methods: A standardized questionnaire comprising of 43 items was used to survey HCW in two tertiary care academic hospitals in a developing nation. Descriptive statistics were calculated for the 30 Likert-type items and 14 demographic items using SPSS version 16.

Results: 207 (response rate 67%) HCW comprising of 130 nurses and 77 physicians were included in the study. 84% of participants were not aware of the "Do-Not-Resuscitate" orders been practiced, 18% were comfortable and 60% unsure discussing EOL options with the patients, 88% strongly disagreed administering medications to deliberately terminating life of patients, 74% strongly agreed about patient's autonomy regarding dignified death, however only 54% considered self autonomy of patients to be more important than distributive justice in medical practice. 70% of the participants considered Euthanasia equivalent to withdrawing or with holding treatment, 64% considered legalization of Euthanasia would give an impetus to organ trade. 6% of participants received training about EOL issues to the patients, 96% strongly agreed to receive educational material and training about EOL care issues. Nurses were more likely to consider treating doctors to decide about the withdrawal of life support ($p<0.04$) and junior doctor breaking the news of death to the family($p=0.18$); while physicians more likely opted for the patients and senior most doctor for deciding about life support withdrawal and breaking the bad news respectively.

Conclusions: Inadequate awareness about EOL/QOL care issues was revealed. A better understanding of EOL perceptions of obstacles and supportive behaviors would promote quality care and improve clinical decision making in the terminal stage of life. There is a need for regular educational and training programmes for HCW that should consider attitudes in conjunction with empirical knowledge.

21-220

Symptom Onset And Quality of Life Decline Reported By Men with Prostate Cancer Receiving Androgen Deprivation Monotherapy

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Objectives: Men with prostate cancer receiving primary androgen deprivation therapy (PADT) experience symptom onset and declines in health-related quality of life (HRQOL). We investigated PADT-related symptoms and HRQOL declines to determine extent of occurrence, inter-relationships, and likelihood of co-occurrence.

Methods: Data were drawn from the CaPSURE™ database, a national observational study of men with prostate cancer. Participants included those who: 1) were diagnosed with localized prostate cancer between 1995 and 2005, 2) received only ADT therapy during observation, and 3) completed HRQOL questionnaires before and during PADT. One hundred forty men met inclusion criteria. Questionnaires included a symptom check-list and general (SF-36) and disease-specific (UCLA Prostate Cancer Index - PCI) HRQOL measures. Hierarchical cluster analysis (HCA) was conducted to group patients by negative experiences during PADT (i.e., symptom onset; general and specific HRQOL declines). Symptoms were considered PADT-related if reported after but not before PADT; 10-point or more decreases in HRQOL domain scores during PADT were considered severe declines. Bivariate chi-square analyses, multivariable multinomial logistic regression, and analysis of variance were conducted to identify socio-demographic and clinical predictors of cluster membership.

Results: Symptoms reported by >5% of patients were: cognitive problems (21%), fatigue (22%), hot flashes (34%), muscle wasting (9%), sleep problems (19%), and weight gain (19%); severe declines were observed across all measured HRQOL domains. Three patient clusters were identified: 1) highest patient rates of symptom onset; 2) highest patient rates of HRQOL decline; 3) lowest patient symptom onset and HRQOL decline rates. No baseline socio-demographic or clinical differences between clusters were found.

Conclusions: Patterns of symptom onset and HRQOL decline occur in men treated with PADT and identify patients with adverse effects. That the highest rates of symptom onset and HRQOL decline do not co-occur within patient clusters suggests a more complex relationship between the two outcomes.

21-221

Nurses' Perceptions of How Neutropenia Affects Qol For Cancer Patients

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Objectives: were to: determine how oncology nurses (ORNs) define neutropenia and quality of life (QOL), assess the training ORNs have had on neutropenia and QOL, and examine ORNs' perceptions of how neutropenia affects QOL.

Methods: The study used a *mixed methods* study. A QOL framework developed by Drs. Ferrell and Grant was used with 4 domains: *physical, psychological, social, and spiritual well-being*. Fifteen ORNs from a local Oncology Nursing Society chapter were invited to participate in a

focus group and survey. The IRB approved, investigator designed focus group questions and survey asked about demographics, how ORNs defined neutropenia and QOL, and training they had on these 2 topics. The ORNs were given a copy of the QOL model with the 4 domains drawn as blank boxes and the word neutropenia in the middle. The ORNs were asked to write words in each of the 4 boxes on well-being describing how neutropenia affects the QOL of cancer patients.

Results: The 15 ORNs easily defined neutropenia and QOL and felt that both were important in their setting, but they had *never* had f*ormal training,* but had learned through other methods (e.g., conferences). They also clearly stated that QOL and neutropenia should be *high priorities for nursing research*. The ORNs could put *words and themes i*n each of the 4 boxes/domains. However, it was easier to fill the physical and psychological domains than the social and spiritual domains of QOL.

Conclusions: ORNs are eager to gain knowledge and skills related to neutropenia and QOL. Unfortunately, we are not making it easy for ORNs to gain this information. Certainly, if the nurses do not have the knowledge and skills to care for patients with neutropenia, then they will not be able to intervene to positively influence the QOL and treatment outcomes of cancer patients.

21-222

Quality of Life And Its Related Factors In Newly Diagnosed Oral Cancer Patients In Taiwan - One Year Approach

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Objectives: To examine the changes of quality of life (QOL) and its related factors across the first year of diagnosis in oral cancer patients in Taiwan.

Methods: This is a prospective longitudinal study. Newly diagnosed oral cancer patients were recruited from 2 medical centers in northern Taiwan. These patients were followed up from 3 days before operation (baseline, T1) through the following 12 months (post-operation 10 days, & 1, 3, 6 12 months / T2, T3, T4, T5, T6, respectively) in assessing QOL, functional status, symptom severity, anxiety, depression and basic disease/treatments related factors. Generalized estimating equations (GEE) analysis was used to examine the changes of and the significant factors related to QOL.

Results: A total of 104 oral cancer patients completed the one-year assessments. The results showed that oral cancer patients generally had moderate level of QOL with the worst QOL at T2 (10 day post-operation). Patients had significantly better QOL from T4 (3 months after operation) while comparing to its baseline assessment (T1). Function status, depression, anxiety, symptom severity and types of treatment modalities were significantly associated with the changes in QOL.

Conclusions: Newly diagnosed oral cancer patients had moderate levels of QOL during the first year of diagnosis. However, QOL during acute post-operative period was poor and should be carefully assessed and cared. Factors related to the changes of QOL are multi-dimensional. These factors should be further treated to enhance oral cancer patients' QOL during the first year of diagnosis.

21-223

Symptoms And Symptom Management Strategies Reported By Men Treated For Localized Prostate Cancer

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Objectives: Treatment-related side-effects can cause substantial decrements in health-related quality of life (HRQOL) for men treated for localized prostate cancer (PCa). As part of the development of a symptom management education program, we wanted to understand what men treated for localized PCa do to manage symptoms.

Methods: We interviewed 98 men treated for localized PCa using a semi-structured data collection technique. Participants were asked about PCa treatments, symptoms related to treatment, as well as the behavioral, medical, and other strategies used to manage those symptoms. Two coders classified the reports into categories by type of symptom and management strategy.

Results: Respondents were primarily white (91%), reported a median age at diagnosis of 61 years, and underwent a range of 1 to 4 PCa treatments. We collected a total of 628 symptom management reports, with a range of 1-22 reports (median: 6) per respondent. 59% of respondents completed treatment 12-24 months prior to the interview, while 14% were still undergoing treatment. The largest number of

symptom incidents were related to urinary (25.6%), and sexual functioning (22.6%), systemic concerns (19.3%), other symptoms (13.7%), mental health (10.0%), and bowel problems (8.8%). The most frequently reported strategies were prescription medications (17.7%), doing nothing (14.8%), diet, lifestyle, and exercise (12.1%), and behavioral strategies (9.9%). In 39% of the incidents where men reported using prescription medications, they reported these medications were not helpful. Similar results were seen where men reported medical device use (42% not helpful) and surgery or radiation to treat side-effects (40% not helpful).

Conclusions: Men reported a variety of symptom management strategies, with many of them reported to be not helpful. Surprisingly, 15% of the incidents resulted in no action taken by the respondent. These data support the need for a psychosocial education program to provide more options for effective symptom management.

21-224

Health-Related Quality of Life (Hrqol) In Patients with Chronic Immune Thrombocytopenic Purpura (Itp): Results From Two Placebo-Controlled Phase 3 Studies of Romiplostim (Amg 531)

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Objectives: The ITP Patient Assessment Questionnaire (ITP-PAQ) is the first disease-specific patient-reported outcome instrument for adult chronic ITP. Romiplostim is an investigational Fc-fusion protein (peptibody) that stimulates thrombopoiesis by the same mechanism as endogenous thrombopoietin. The ITP-PAQ was used to examine HRQoL changes in splenectomized and nonsplenectomized patients from two randomized, double-blind, placebo-controlled phase 3 studies of romiplostim in adult patients with chronic ITP.

Methods: The ITP-PAQ consists of 44 items that comprise 10 scales. Patients were blinded to their platelet counts before completing the ITP-PAQ. Changes in mean scores from baseline to week 24 were calculated for each scale, with positive values indicating improved HRQoL. Specific items within each scale were also analyzed.

Results: Of 125 patients enrolled, 63 were splenectomized (placebo, 21; romiplostim, 42), 62 were nonsplenectomized (placebo, 21; romiplostim, 41). At baseline, patients refractory to splenectomy had lower scores on all ITP-PAQ scales than nonsplenectomized patients, especially Bother (51 vs 67), Fear (69 vs 81), Work (62 vs 78), and Overall Quality of Life (40 vs 57). Improvements in mean scores from baseline to week 24 were significantly greater in romiplostim-treated splenectomized patients in 4 sclaes: Symptoms (placebo vs romiplostim; 0.2 vs 10.8, p=0.02), Bother (4.5 vs 24.6, p=0.009), Social Activity (-2.1 vs 16.9, p=0.017), and Women's Reproductive Health (-11.9 vs 10.1, p=0.027). In contrast, significantly greater improvement was found in romiplostim-treated nonsplenectomized patients only for Activity (-1.8 vs 23.7, p=0.016). Particular improvements in items shown by both splenectomized and nonsplenectomized romiplostim-treated patients included bleeding (Symptoms), bruising (Symptoms), feeling unattractive due to bruising (Bother), and fear of infections (Fear).

Conclusions: Results from these trials in patients with ITP suggest that romiplostim offers an opportunity to improve their HRQoL, particularly patients refractory to splenectomy. Further long-term studies with lager sample sizes should be conducted. Supported by Amgen, Inc.

21-225

Exercise, Quality of Life And Cancer-Related Fatigue Among Cancer Patients Receiving Radiation

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Objectives: Functional (FQOL) and physical (PQOL) quality of life are impaired by cancer-related fatigue (CRF) and may be improved by resistance and aerobic exercise. This study compared the efficacy of a home-based exercise (HBEX) intervention, including resistance and aerobic training, to a no-exercise control condition for improving FQOL, PQOL and CRF in cancer patients.

Methods: Breast and prostate cancer patients (N=38; mean age=60; 71% breast cancer), beginning at least 28 sessions of radiation therapy (RTH) were randomized to a 4wk HBEX (7 days/wk) condition or a no-exercise condition. FQOL, PQOL and CRF (FACIT-F subscales) were assessed at baseline, post-intervention and 3 months later.

Results: FQOL improved more (change score (CS); CS= 1.53, SD=4.38) in the HBEX group than in the control group (CS=0.88, SD=2.68) from baseline to post. PQOL

declined less (CS=-0.96, SD=4.16) in the HBEX group than in the control group (CS=-1.16, SD=3.02) from baseline to post. CRF improved (CS=3.1, SD=8.69) in the HBEX group (N=19) from baseline to post, but not in the control group (CS=-1.05, SD=4.83). FQOL improved in the HBEX group (CS=2.17, SD=4.73) and in the control group (CS=2.24, SD=3.01) from baseline to 3 months. PQOL improved more in the HBEX group (CS=1.67, SD=3.46) than in the control group (CS=0.41, SD=2.94) from baseline to 3 months. CRF improved in the HBEX group (CS=3.89, SD=8.69) and the control group (CS=3.88, SD=6.97) from baseline to 3 months. ANCOVAs, with baseline values as the covariates, indicated statistically significant group differences in FQOL, PQOL and CRF at post and 3-months (all $p<0.05$). Pearson correlations demonstrated positive associations between changes in FQOL and CRF and changes in PQOL and CRF at post and 3 months (all $p<0.05$).

Conclusions: These data suggest that changes in FQOL, PQOL and CRF resulting from HBEX are related and phase III clinical trials are needed. Funded by NCI grant 1R25CA102618.

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Insomnia Is Prevalent In Women with Breast Cancer During Chemotherapy (N=597) A Urcc Ccop Study

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Objectives: Insomnia following the first 2 cycles of chemotherapy was assessed in 597 female patients with a variety of cancer diagnoses as part of a University of Rochester Cancer Center Community Clinical Oncology Program study.

Methods: Women were asked about the presence and severity of insomnia using questions from the Hamilton Depression Inventory (HDI). Median age was 56 (range 25 to 88).

Results: During cycle 1 of chemotherapy, 82% reported some insomnia symptoms, and nearly half of these patients met full criteria for an insomnia diagnosis (defined as difficulty falling asleep, or frequent awakenings and/or early awakenings for at least 3-5 nights a week lasting 1/2 hour per night or more). 67% of the study patients reported trouble falling asleep, and close to 60% reporting waking up in the middle of the night. In addition, nearly 54% woke up earlier than they wanted in the morning. Younger patients (>56) were significantly more likely to experience insomnia ($p=.001$). Significant differences were found in prevalence of insomnia by diagnosis ($p=.001$), with colon cancer patients reporting the lowest number of insomnia complaints (64%). There was a significant positive association between insomnia complaints during cycle 1 and cycle 2 of chemotherapy ($r=.50$, $p<.000$) with an average of 58% of patients reporting that their sleep complaints remained unchanged from cycle 1 to cycle 2. Patients meeting criteria for clinical insomnia had significantly more mood disturbance (POMS), depression (CES-D), and fatigue (FSCL, MAF) than other patients (all, $p<.001$). Compared with rates of insomnia found in the general population, the rates of insomnia in female patients receiving chemotherapy are nearly three times higher.

Conclusions: For the majority of patients, insomnia complaints persist through their second chemotherapy cycle. Female patients with insomnia meeting clinical criteria have significantly more mood and fatigue symptoms than other patients. Younger patients appear to have more insomnia complaints. Insomnia is prevalent and understudied in female cancer patients undergoing chemotherapy.

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The Experience of Men Living with Ileal Conduit

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Objectives: Advanced Bladder Cancer requires a radical cystectomy resulting in an ileal conduit, neobladder or continent reservoir. In Siriraj Hospital, Bladder cancer patient with ileal conduit was found about 80%. For this surgery, changes can have a profound impact on quality of life. The purpose of this phenomenological study was to explore the experience of men living with ileal conduit after radical cystectomy for 3 month.

Methods: Qualitative research drew on the experiences described by 10 informants through a series of unstructured interviews. Data were collected by means of unstructured interviews and transcribed verbatim. Data reduction, using coding and segmentation into categories, led to identification of patterns and themes.

Results: The findings of this study highlight five categories of stressful encounters: *Stoma care* such as: cover ileal conduit with bag, smell of urine, and mucous should made obstruction *Body image* such as: don't want any people know he has conduit, how to dress for looking good and *Uncertainty* such as: how long for survive and self care for diet and exercise.

Conclusions: Research findings suggest that having ileal conduit results in significant changes in the lives of patients. These changes require major adjustments by individuals and necessitate incorporation of individualized coping strategies and support from family members, peers, and health care providers.

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The Experience of Participation In Support Groups For Men with Advanced Prostate Cancer

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Objectives: The treatment for advanced prostate cancer such as hormonal therapy and orchidectomy made side effect such as lose their libido, and bone mass can deteriorate. Long-term complications include outlet disorder, spinal cord compression, bone metastasis and pain. Patients also may be affected by quality-of-life concerns, such as sense of self and well-being, masculinity and dignity, and fear of the unknown. Group interventions can address cancer-related issues to enable patients to gain emotional support from other patients with similar experiences and to use the experiences of others to buffer the fear of the unknown future. Support groups have been shown to meet many psychosocial needs, to provide opportunities to gain mutual support and to introduce others who confirm progress or offer new perspectives on the diagnosis. The aim of this study was to investigate the experience of participation in support groups for men with advanced prostate cancer.

Methods: Fifteen patients who had been diagnosed advanced prostate cancer were invited to take part in the study. All of them accepted and were included in the study after giving informed consent. Qualitative research drew on the experiences described by 15 informants through a series of unstructured interviews. Data were collected by means of unstructured interviews and transcribed verbatim. Data reduction, using coding and segmentation into categories, led to identification of patterns and themes.

Results: Four categories emerged from the data analysis: comparing in symptom distress, sharing experiences and emotions, exchanging informational support, and exchanging emotional support. Trust, openness, and willingness to create space for each other were experienced.

Conclusions: Support groups offer an opportunity to share experiences and emotions as well as exchange information. They are also a possible source of emotional support and therefore can contribute to quality of life of patients with advanced prostate cancer.

21-229

Can Nurses Provide Complementary Indian Medicine To Cancer Patients : Two Year Experiences of Indian N.G.O.

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Objectives: Indian-culture have long-tradition in ayurvedic/herbal-medicines.Standard-chemotherapeutic-agents have high cost & adverse-effect/ poor-compliance.cancer-sufferers always seek alternative-systems of medicines. No specific centers in rural India for cancer-patients treatment/ rehabilitation. our Indian-NGO used locally available-Complementary–Indian-Medicines [CAM] for providing home-based-care of cancer-patients. Nurses provide CAM to poor-patients in collaboration with Traditional-faith-hearers [TFH].We evaluated cost-efficacy of CAM &assessed response of pain/fatigue to CAM.

Methods: from June-2006 to December-2007, 118 patients [n=118] of cancer aged 34-67 years enrolled. 73% males, 27% males. 76% Lung-cancer, 12% colorectal cancer, 9% cervical/uterine-cancers,3% liver cancer.82% returned to villages after prolonged therapy in city-hospitals [Chemotherapy+Radiation+surgery], while38% patients did not afford chemotherapy.self-report-questionnaire distributed to patients attending NGO-clinics for nursing-care. Patients desire to CAM-therapy evaluated on S/S parameters. We incorporated 6 ayurvedic-practitioners/CAM-therapists for devising need-based-approach to relieve pain/fatigue & Improve-QOL. Mud therapy 21%, Bach-flower remedy 40%, Accupressure/Accupuncture 57%, Hydrotherapy 24%, Hypnotherapy 75%, ayurvedic therapy 82%, 26%Unani Medicines, 61% Homeopathic medicines, 72% Herbal-Oil-TFH massage therapy, 58% Aromatherapy.We treated patients in12 CAMsessions/month. feedback-Performa given to subjects/ family-members. Responses evaluated periodically to modify methodology. Our NGO-module in functioning-stages shown graphically to MASCC-2008-Houston-conference-participants. Average pain on scale of 1-10. mean score pain fell from 8.2 (SD 1.4) to 3.8 (SD 2.7), ($p<0.001$).

Results: Group-1 Hypnotherapy+analgesics+Shatavari extract [n=60], Group-2 Bach-flower extract+Acupressure +mud-therapy [n=22], Group-3 Ayurvedic+ Ashawagandha extract+Acupuncture+ vitamins [n=2]. Symptom relief(n=90), Cost of CAM 72% cheaper compared to Allopathic-chemotherapy.CAM available-locally/high-acceptance.

Conclusions: 118 patients used/benefited from CAMs. cheaper, high compliance & better QOL-score.36% patients had sexual-incapacitation due to pain/Depression/fatigue This sexual-inactivity improved in 61% subjects after CAM.11 patients died during study. Community-NGO-nurses like us must take part in decision/policy-making of MASCC/ISOO to evolve newer-concepts in cancer-supportive-care. CAM-therapy needs further evaluation to address financial constraints. At MASCC-2008, We NGO-activists from Resource-poor-nations shall form ACTIVITY groups with researchers from USA/Europe to substantially improve supportive-care policy. This indeed possible by my MASCC-2008-participation

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Psycho Social and Physical Activities in Shaping Quality of Life In Breast Cancer Patients

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Objectives: Background: Quality of Life(QOL) assessment based on psychosocial and physical activities in female breast cancer patients in Indian population is not assessed. Aim: To analyse various activities of female cancer breast patients using an inhouse as well as standard scoring system.

Methods: We have analysed the questionnaire which was sent to 450 operated patients, only 200 completed Two instruments were used to assess the QOL (SF – 36 and an inhouse questionnaire), the impact of event scale – revised (impact) and CES-D, NIMH to assess depression.

Results: The average age 50.1±10.4, 94% married. 88% II or III stage of cancer. Using a simple in house questionnaire 49% felt that their profession was not affected ,48% had little or no pain in the operated area ,90% are able to take care themselves.80% are able to do routine household activities .70 % had their full family support . All of them have faith in God regarding healing. 43% would prefer breast prosthesis. All of them would prefer a screening test for their first relatives. The depression was measured in degrees such as mild (71%), moderate (26%) and severe (3%). The impact of breast carcinoma was as mild (35.8%), moderate (38%), high (22.6%) and very high (3.6%). The QOL as assessed by inhouse instrument yielded low (3%), moderate (34.1%) and high (62.9%), and the QOL as assessed by SF – 36 yielded low (1.3%), moderate (73.1%) and high (25.6%). No significant association was found between stage of cancer.

Conclusions: Indian woman are able to cope up with the disease quite well. The psychological aspects are not affected in majority probably due to strong family support which is through the Family values and the system . In house questionnaire has also provided the necessary information in a simple way which can be used routinely

21-231

Health-Related Quality of Life (Hrqol) In Patients with Chronic Immune Thrombocytopenic Purpura (Itp): Interim Results From An Open-Label Study of Romiplostim (Amg 531)

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Objectives: The ITP Patient Assessment Questionnaire (ITP-PAQ) assesses multiple facets of disease-specific HRQoL in adult patients with chronic ITP. We present interim results from an ongoing, open-label extension study that evaluates the long-term ability of romiplostim to improve HRQoL. Romiplostim is an investigational Fc-peptide fusion protein (peptibody) that stimulates thrombopoiesis by the same mechanism as endogenous thrombopoietin.

Methods: Adult chronic ITP patients receiving romiplostim completed the ITP- PAQ at baseline, week 4, 12, and every 12 weeks thereafter. The ITP-PAQ consists of 44 items that comprise 10 scales. Of 137 patients enrolled, data were assessed through week 48, a time-point with reasonable patient numbers at data cut-off. Mean scores at each assessment, and changes in mean scores from baseline to week 48 were calculated, with positive changes in mean score indicating improvement in HRQoL.

Results: Compliance rates for the ITP-PAQ were 95% at baseline (n=130), 93% at week 4 (n=123), and 83% at week 48 (n=39). Over the 48-week period, results demonstrated an upward trend for each scale score. The greatest improvements were reported in the Symptoms, Bother, Activity, Reproductive Health, and Overall Quality of Life scales, particularly during the first 4 weeks. Changes in mean score (±SD) from baseline to week 48 were significantly increased for 9 of the 10 scales including

Symptoms (6±14, p=0.016), Bother (11±22, p=0.003), Fatigue (7±15, p=0.007), Activity (10±24, p=0.017), Fear (6±16, p=0.024), Psychological Health (7±20, p=0.028), Work (8±15, p=0.038), Social Activity (6±14, p=0.012), and Overall Quality of Life (14±21, p<0.001).

Conclusions: ITP patients receiving romiplostim had initial, yet sustained, improvement in ITP-PAQ scores. Subsequent analyses of results from this ongoing study will be used to substantiate our findings, and the therapeutic benefit of romiplostim on HRQoL in patients with chronic ITP will be provided by correlations with clinical data. Supported by Amgen, Inc.

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Clinical Benefit Response And Quality of Life Data From a Pilot Phase Ii Study with Amt In Patients with Advanced Cervical Cancer (Acc)

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Objectives: Auron Misheil Therapy (AMT) is a mixture of approved pharmaceuticals in low therapeutic doses (human insulin and chlorpheniramine) and herbal components (aqueous camomile extract). Preclinical and phase I data in healthy volunteers showed a favourable safety profile for AMT. This phase II study examines the efficacy and safety of AMT in patients (pts.) with advanced cervical cancer. We present Quality of Life Data of 15 patients of the pilot phase of the trial.

Methods: AMT was administered at 0.066 ml AMT/kg body weight up to a maximum volume of 5 ml as intra muscular injection twice daily to 15 pts. with advanced or relapsed cervical cancer unlikely to respond to or refractory to existing therapy or for which no therapy was available. Primary objective was to assess the Clinical Benefit Response (CBR) of AMT. One secondary objective was to assess the quality of life using the EORTC C-30 QoL questionnaire. The questionnaires were answered at the screening, weekly during the first month and monthly thereafter. They are a validated and well established scoring instrument using 30 questions to measure the quality of life in cancer patients.

Results: A promising rate of patients with advanced cervical cancer responded clinically to the AMT treatment. 8/15 patients showed a CBR after 12 weeks. First analysis of the quality of life data indicated clear improvement. The scores for the questions 1-28 decreased during the treatment, while that for the questions 29-30 increased, both indicating an improvement of the patients status.

Conclusions: These first data show a clear tendency towards positive effects of AMT treatment on the health status and quality of life of the patients with advanced cervical cancer.

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Reduced Dermatology-Related Quality of Life (Qol) Associated with Skin Reactions Induced By Multikinase Inhibitors (Mkis) And Epidermal Growth Factor Receptor Inhibitors (Egfris)

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Objectives: The use of MKIs/EGFRIs is hampered by skin toxicity that affects QoL and leads to dose modification or discontinuation. This study examines the impact on QoL and the factors associated with decreased QoL in patients treated with MKIs/EGFRIs.

Methods: A dermatology-specific QoL self-reported questionnaire, the Skindex-16 (SK-16) has overall scores that vary from 0 (best QoL) to 96 (worst QoL). Scores are reported as percent of total possible score, based on reported domains of symptoms (score range:0-24), emotions (0-42), and functioning (0-30). Severity of MKI-induced Hand Foot Skin Reaction and EGFR induced-rash is assessed using the NCI-CTCAE (v3.0) Grading. Domain scores were compared using two-factor analysis of variance. SK-16 scores were correlated with NCI-CTCAE grade and age using Wilcoxon rank sum test and Spearman correlation coefficient.

Results: 69 subjects (median age 62 years) had an overall median SK-16 score of 29.2. The highest scores were for emotions with an overall median score of 35.7 which was significantly higher than functioning with a median score of 6.7 (p<0.0001) but not different from the median symptoms score of 29.2 (p=0.13). There were significant differences among rash grades in all SK-16 domain and overall scores. There were negative Spearman correlations between age and emotions (p=0.0005), function (p=0.0005) and overall scores (p=0.001), but not symptoms (p=0.09).

Conclusions: Cutaneous reactions associated with MKIs and EGFRIs have significant effects on overall QoL, comparable to, or exceeding, other systemic skin disorders. Emotional symptoms are the most important determinants

of QoL. Younger patients have worse emotional and functional scores despite similar symptom scores. Moreover, a correlation of SK-16 score with rash grade supports it as a tool in symptom assessment. This study highlights the importance of skin toxicity on overall QoL, making the SK-16 a valuable tool for assessment of non-physical morbidity.

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Beyond Oncology Treatment: Health Assessment of Men with a Reported History of Prostate Cancer Using the Behavioral Risk Factor Surveillance System (Brfss) Survey

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Objectives: To identify health care needs of men with a reported history of prostate cancer focused on those younger than age 65.

Methods: From the 2002 population-based BRFSS survey, we compared health information from male respondents aged 40 and older who answered yes to the question "have you ever been told by a doctor, nurse or other health professional that you had prostate cancer?" to other men, controlling for age within 5-year groups. We assessed self-reported general health (SRGH), any days depressed (DEPRESSED), a dental visit in the last year (DENTAL), current treatment for DIABETES and ASTHMA, high cholesterol (HC), history of cardiovascular disease (HXCVD), high blood pressure (HBP) and influenza and pnemococcal immunization (FLU & PNEUMO). We used chi-square analysis of un-weighted data, a statistical significance level of 0.05 and Fisher's exact test if warranted.

Results: Although we report findings from un-weighted responses, the complex weighted sampling survey design of 64,519 respondents represented roughly 58 million men. Nearly 4% reported a history of prostate cancer (HXPC). We observed statistically significant greater proportions in the HXPC group compared to age-matched controls for the following conditions and age-groups: HBP 45-59; HXCVD 40-44 and 60-69; DEPRESSED 60-69. Inferior SRGH was observed in age-groups 40-44 and 50-64. Additionally, findings approaching statistical significance were observed for ASTHMA 50-54 (P=0.06); DIABETES 40-44 (P=0.07) and DEPRESSED 50-54 (P=0.06). Immunizations were less likely for FLU among 55-59 year-olds and although PNUEMO is not routinely recommended prior to age 65 unless medically compromised, HXPC cases aged 50-75 were less likely to have received it.

Conclusions: Our findings suggest that younger men with a history of prostate cancer should be evaluated for FLU and PNEUMO immunizations, diabetes, asthma, HBP, cardiovascular disease and depression. Further analyses controlling for body mass index (BMI) are needed to enhance this study.

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A Multiprofessional Model For Long-Term Follow-Up Clinic In Sao Paulo, Brazil

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Objectives: Long-term survival for children with cancer is often achieved at a considerable price in terms of medical and psychological sequelae. Therefore, life-long follow-up is advocated worldwide. In Brazil, very few centers have a comprehensive and dedicated clinic for long-term follow-up of survivors of childhood cancer. In order to provide the best possible care for off-therapy patients with complex, chronic medical issues, we created a model that provide same-day, same-clinic access to several different professionals including physician, nurse, social worker, nutritionist, psychologist, speech pathologist, OT, PT and school teacher.

Methods: Patients who are at least 2 years off-therapy can be referred to CForT. A volunteer calls beforehand to confirm the appointment and to explain the clinic particularities (4-5 hours' visit duration, multi-professional evaluation). Prior to the visit, CForT members review the charts and complete a standardized summary. Patients' visit start with a nurse who assesses vital signs and provides education regarding cancer prevention and healthy lifestyle. Subsequently, patients are evaluated by all the others professionals in the clinic. At the end of the day, CForT members meet to discuss each case in detail.

Results: Of 255 CForT consults between June 2005 and December 2007, 234 were first visits and 21 were follow-up. Patients' age varied between 3,9 and 33,7 years (median 13,6); 47% were male. The most common diagnoses was leukemia (38%), followed by Wilms tumor (25%) and bone tumors (9%). About 1/3 of patients presented findings associated to the primary cancer or its treatment, including overweight/obesity (25%), hearing loss (7%), short stature (5%). School problems were found in 26% of patients and social issues in 18%.

Conclusions: Our experience highlights the importance to follow long-term cancer survivors in dedicated clinics in a multiprofessional setting.

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Health- Related Quality of Life, Swallowing ,Voice And Speech Function Pre And Post Radiotherapy Treatment In Patients with Head And Neck Cancer

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Objectives: BACKGROUND During 2004-2007 a clinical pathway has been developed at Karolinska University Hospital, Sweden, aiming to improve rehabilitation for patients with head and neck (H&N) cancer receiving radiotherapy (RT). Consecutive patients were invited for participation in a rehabilitation programme including regular visits to a speech language pathologist (SLP) and physiotherapist for assessment and information. The intention was to start a rehabilitation process early, before the initiation of RT and thereby reduce the risk of irradiation-related complications such as dysphagia, trismus and voice and speech impairment. OBJECTIVE To evaluate swallowing and oral motor function, voice and speech pre and post treatment in 181 patients with H&N cancer receiving radiotherapy (RT) or a combination of preoperative RT and surgery. Further to describe the patient's health-related quality of life (HRQL) using patient-rated questionnaires regarding swallowing and chewing capacity, speech- and voice function, dryness of mouth and sensation of taste as well as the global quality of life and level of depression/anxiety.

Methods: All patients with H&N cancer who received radiotherapy with a curative intent at Department of Oncology (unit for radiotherapy, South Hospital), were seen by a SLP before the start of RT and three months after RT. At each visit the patients chewing and swallowing functions of four consistencies were examined by a clinical examination. The tounge motility was examined with oralmotor exercises. The voice and speech functions were assessed perceptually by the SLP. The patients answered a study specific questionnaire about their swallowing and chewing capacity, speech, voice, dryness of mouth and sensation of taste before and three months after RT. In addition EORTC QLQ- C 30, EORTC QLQ- H&N35, and HADS were completed by the patients at baseline and a six-month follow-up.

Results: This is an ongoing study and the results will be presented at the congress.

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Moving Forward After Surviving Cancer: Picking Up The Pieces

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Objectives: The "Picking Up the Pieces" Workshop was designed by Dr. Sherri Magee as an aid for cancer survivors moving forward in the journey of recovery. The objectives of the workshop include: to facilitate a process that assists participants to move through the transition from survivor to living well; to assist in integrating the pre-cancer and post-cancer self; to support the participant in regaining a sense of control; to assist the participant in rebuilding confidence in their choices and hope in the future; to assist the participant in identifying newfound insights and strengths; to encourage the participant to ignite or renew their own healing spirit. Workshops have been offered across Canada in partnership with Ovarian Cancer Canada. At each workshop, participants were asked to evaluate the sessions.

Methods: The evaluation involved a two-step process: 1) participants completed a post-workshop survey; and 2) participants were contacted for an interview 6 month's post-workshop.

Results: Data have been analyzed from the post-workshop surveys and post-workshop interviews of 8 workshops. A total of 183 surveys and 15 interviews have been completed to date.

Conclusions: Participants thought the workshop provided valuable tools and information for survivors on healing and growth. The participants plan to encourage others to take the workshop; use the information to move forward in their own lives; and share the information with others including family, friends and other survivors.

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The Effect of Sitting Meditation On Vagal Tone, Measured By Heart Rate Variability (Hrv)

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Objectives: Recent evidence indicates that cancer patients has decreased vagal tone and increased sympathetic

activities; increasing cholinergic tone may decrease inflammatory pathway, therefore cancer patients' symptom. Spectral analysis of beat-to-beat variability in electrocardiography is a simple, noninvasive method to analyze sympatho-vagal interaction. The objective of this paper was to determine whether a simple form of meditation can improve parasympathetic activity measured by heart rate variability (HRV).

Methods: Heart rate variability was recorded via Holter system during regular sitting, and two separate meditation sessions on one normal subject. Five minutes time domain analysis, which is the standard analysis of the HRV was performed. The pNN>50, representing the proportion of normal r-r intervals that differed from the next interval by more than 50 ms, is used as an indicator for parasympathetic nervous system.

Results: The pNN>50, was 5-9 fold higher during 2 separate meditation sessions, compared to regular sitting period. This preliminary result indicated that meditation affects HRV, shifting the balance of the sympatho-vagal interaction toward an enhanced parasympathetic activity.

Conclusions: We proposed a future study to use time domain analysis in monitoring effect of meditation on parasympathetic system of cancer patients and cancer survivors.

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Fatigue Among Danish Cancer Survivors Before, During And After a 6-Days Rehabilitation Stay

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Objectives: Fatigue is one of the most common side-effects during cancer treatment. Much less information is available about fatigue and its role after treatment. Rehabilitation centre Dallund (RcD) is the first and only centre in Denmark offering rehabilitation to cancer survivors as a residential course. The rehabilitation is a coordinated effort with several specialists. Each week about 20 cancer survivors stay at Dallund manor house in 6 days. The aim was to investigate the frequency and the quality of fatigue among Dallund's patients as measured by the Multidimensional Fatigue Inventory (MFI-20, Danish version) before, during and 3 month after the stay.

Methods: Multidimensional Fatigue Inventory (MFI-20) is a 20-item self-report instrument designed to measure fatigue on a scale from 1 to 5. Coping with fatigue was the theme in three weeks in 2006 and 2007, thus the 56 cancer survivors in this study was especially interested in this theme.

Results: When the survivors at RcD were asked if they felt tied 66 % answered yes. Using MFI–20, we get a much more differentiated picture of the survivors' fatigue. It appears that a great deal of our patients has a general fatigue before the stay; 85 % feel tired (answered 1 or 2) and 91 % tire easily (answered 1 or 2) and that this was diminished during the stay where 47 % and 75 % answered yes (1 or 2) to the two questions respectively. At the conference further analysis and new data 3 month after the stay will be presented. The participants in this small study are not representative of Danish cancer survivors and they were motivated to lean how to cope with their fatigue.

Conclusions: It seems that a 6 days coordinated rehabilitation stay can give the survivors tools to cope with their fatigue.

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Changes In the Six Minute Walk Test Following Participation In a Cancer Rehabilitation Program

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Objectives: Cancer survivors experience dramatic changes in physical performance as a result of their cancer and its treatment. Symptoms such as weight loss, fatigue, pain, shortness of breath, weakness, loss of muscle mass, as well as other symptoms all influence patient's functional capacity. In turn, these changes prevent patients from returning to their daily living activities. Physical exercise and rehabilitation have been showing promising results in helping to address these symptoms so that patients can resume their usual activities. The aim of this study was to examine differences in functional exercise capacity as a result of participation in a cancer rehabilitation program.

Methods: Sixty-five cancer patients were assessed prior to and following an 8-week interdisciplinary cancer rehabilitation program, using the Simmonds Functional Assessment Tool (SFAT) and the 6-Minute Walk Test (6MWT), a measure of functional capacity. Individualized physiotherapy interventions included a strengthening and cardiorespiratory exercise program.

Results: The sample consisted of 33 male and 32 female participants, with ages ranging from 25 to 80, and diagnosis

of one of the following cancers: hepatobiliary (19%), gastro-esophageal (20%), breast (17%), lung (9%), hematologic (12%), colorectal (3%), CNS lymphoma (3%) and other (17%). A paired t-test comparing patients' distance walked during the 6 MWT showed significant improvement after an 8-week cancer rehabilitation program (Mean baseline=439.54 meters, Mean 8-weeks=470.69 meters; $t(64)=3.54$, $p<.01$). In addition, 34% of patients improved their 6MWT distance by 54 meters or more.

Conclusions: Preliminary findings suggest that participation in a cancer rehabilitation program increased cancer patient's functional capacity. An amelioration on the 6-MWT by 54 meters has been suggested in the literature to be a clinically relevant change. In light of these findings, we can conclude that participation in the Cancer Rehabilitation Program is beneficial.

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Cancer Survivors Teaching Students In Healthcare

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Objectives: Survivors Teaching Students is a national program for medical/nursing students designed to: sensitize them to the symptoms of and, risk factors for, ovarian cancer; increase awareness of hereditary aspects of ovarian cancer; present positive ways of breaking bad news; and use statistics in meaningful ways when discussing prognosis. Ovarian cancer survivors share personal experiences with the students in a classroom setting. They are especially trained to give these presentations.

Methods: The evaluation process included the survivors' evaluation of their training and the students' evaluation of the survivor presentations. The survivors completed post-training evaluations and follow-up survivor interviews were conducted following a student presentation. The students were asked to complete pre- and post-presentation surveys and had the option to complete a third online survey in six months.

Results: Survivor study results are based on four training sessions held across Canada. Twenty-nine survivors completed the post-training evaluation. Data for the student presentations were collected from 19 sessions across Canada. 685 students have completed the pre-presentation survey and 726 have completed the post-presentation survey. 67 have completed the online survey.

Conclusions: The survivors viewed the training as a positive experience and this program as an excellent opportunity to influence future healthcare professionals. The students reported the presentation increased their awareness of ovarian cancer and its symptoms, and the stories put a human face to a devastating illness.

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A Latent Class Analysis of Symptom Bother In Adult Survivors of Hematopoietic Stem Cell Transplantation with Chronic Graft-Versus-Host Disease (Cgvhd)

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Objectives: Chronic GVHD is a prevalent late effect in allogeneic hematopoietic stem cell transplant (HSCT) survivors and a major barrier to the wider application of allogeneic HSCT. No previous research has examined the symptom experience of a sample comprised exclusively of transplant survivors with cGVHD. This study characterizes the prevalence and bother associated with cGVHD symptoms and describes latent classes of symptom bother in a cross-sectional sample of 100 adults.

Methods: Participants were evaluated as part of a natural history study of allogeneic transplant survivors with cGVHD and completed the 30-item Lee cGVHD Symptom Scale and the Medical Outcomes Study Short Form-36. Clinical characteristics, medical history and cGVHD severity scores were gathered during a clinician evaluation.

Results: The mean cGVHD symptom bother score, linearly transformed to a scale of 0-100, was 28.36 (S.D. 13.53; range 0.71-68). A median of 16 symptoms (range 0-25) were prevalent in this sample. At least half of the respondents experienced five or more symptoms (range 0-19) as moderately to extremely bothersome. Three symptom clusters were identified using latent class analysis: a group that was low on all symptoms, a group with prominent oral and nutritional symptoms, and a third with eye, muscle/joint, fatigue and mood symptoms. Post-hoc tests indicated that participants in the two subgroups with prominent symptoms had diminished self-reported physical health status ($p<.05$), with those in the group with prominent eye, muscle/joint, fatigue and mood symptom also reporting inferior mental health status ($p<.01$).

Conclusions: Chronic GVHD is associated with a wide range of bothersome symptoms, and with three distinct symptom profiles that affect both physical and mental health status. Research is needed to replicate and extend the findings of this study, to determine if these symptom profiles are associated with distinct biologic pathways, and to develop interventions tailored to cGVHD symptom profile characteristics.

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Self Rated Improvement of a 6-Days Rehabilitation Stay On Several Psychological Issues And Function Level

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Objectives: In Denmark approx. 34,000 individuals are diagnosed with cancer each year and about 70 % of the survivors can benefit from a rehabilitation offer. Rehabilitation centre Dallund (RcD) is the first and only centre in Denmark offering rehabilitation to cancer survivors as a residential course. The rehabilitation is a coordinated effort with several specialists. Each week about 20 cancer survivors stay at Dallund manor house in 6 days. RcD's yearly capacity is about 700 patients. The aim wasto evaluate to what extent cancer survivors experienced an improved coping with psychological issues of cancer and an improved self rated physical, psychological and social function level after a 6-days stay at RcD.

Methods: All participants at RcD receive an evaluation questionnaire with 11 questions, among others, about psychological issues and self rated physical, psychological and social function level on a scale from 0 to 5, where 5 was the best score. The data from 1667 survivors for 2004-2006 are presented.

Results: 84 % stated that the stay at RcD have contributed to a greater recognition and clarification of their situation, 79 % stated a higher degree of happiness, hope and faith on the future, 74 % stated a greater latitude and more possibilities for action, 75 % that the stay helped them with ideas to how they can achieve a better physical function level, 74 % a better psychological function level and 50 % a better social function level. It seems that a 6 days coordinated rehabilitation stay can increase several psychological issues and better physical, psychological and social function level among cancer survivors. The participants are not representative for Danish cancer survivors. Women, breast cancer survivors and high social status are overrepresented.

Conclusions: It seems that cancer survivors can benefit from a 6 days rehabilitation stay.

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Occupational Therapy Experience In a Children's Oncology Hospital

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With The Evolving Successes of Cancer Diagnosis And Treatment, The Importance of Optimizing Patient Outcomes In Quality of Rehabilitation And Survivorship Is Increasingly Appreciated. Rehabilitation Assists The Patient To Improve Physical, Social, Psychological And Vocational Functioning Within The Limits Created By The Disease And Its Treatment. Occupational Therapy (Ot) Works Directly These Patients Daily Activities. Accomplishing These Functioning Improvement Requires An Interdisciplinary Team Approach That Addresses The Rehabilitation Needs of the Individual From the Cancer Diagnosis Onward.

Material And Methods: Patients With Cancer Diagnosis of Referred To the Iop-Graacc / Unifesp's And Rehabilitation Program Were Evaluated By a Physician. Patients Completed a Rehabilitation Evaluation Form (Ref) A Prior To Interview. Eligible Patients Underwent a Program Consisting of Ot Consult Twice a Week And Regular Follow Up By the Rehabilitations Team. Participation In an education Group And Support Session Took Place Once a Week. Patients Unable To Come To the Hospital As Specified, Were Offered An Individualized Program, They Were Seen By a Doctor, An Ot And Physical Therapist (Pt), At Least Once Post Initial Evaluation And Given a Home Exercise Program. Individualized Follow Up By a Nurse, Physician, Pt, Ot, Audiologist, Social Worker And Psychologist Was On An As Needed Basis. Referrals Were Made To Community Services For Home Support And To Palliative Care Programs As Appropriate.

Results: During 10 Years (1998-2007) There Were 209 Patient Referrals. Diagnoses Included Brain Tumor_60% , Bone Tumor 25% ,Retinoblastoma 5%, Leukemias 15%, Other 5%. 20% Patients Were Accepted For the Full And 80% For the Individualized Program. The Most Common Symptoms Seen On Ref Were Loss of Strength, Loss of Movements And Decreased Quality of Life.

Conclusion: An Interdisciplinary Approach Is Feasible And Addresses Crucial Aspects of a Patient's Health. The Role of Occupational Therapy Became More Evident During the Years That the Program Took Place. Evidence That the Patients Benefit From the Program Will Be Presented.

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Objectives: With the evolving successes of cancer diagnosis and treatment, the importance of optimizing patient outcomes in quality of rehabilitation and survivorship is increasingly appreciated. Rehabilitation assists the patient to improve physical, social, psychological and vocational functioning within the limits created by the disease and its treatment. Occupational Therapy (OT) works directly these patients daily activities. Accomplishing these functioning improvement requires an interdisciplinary team approach that addresses the rehabilitation needs.

Methods: Patients with cancer diagnosis of referred to the IOP-GRAACC / UNIFESP's and Rehabilitation program were evaluated by a physician. Patients completed a Rehabilitation evaluation form (REF) a prior to interview. Elegible patients underwent a program consisting of OT consult twice a week and regular follow up by the Rehabilitations team. Participation in aeducation group and support session took place once a week. Patients unable to come to the hospital as specified, were offered an individualized program, they were seen by a doctor, an OT and physical therapist (PT), at least once post initial evaluation and given a home exercise program. Individualized follow up by a nurse, physician, PT, OT, audiologist, social worker and psychologist was on an as needed basis. Referrals were made to community services for home support and to palliative care programs as appropriate.

Results: During 10 years there were 209 patient referrals. Diagnoses included brain tumor_60% ,bone tumor 25% , retinoblastoma 5%, leukemias 15% ,other 5%. 20% patients were accepted for the full and 80% for the individualized program. The most common symptoms seen on REF were loss of strength, loss of movements and decreased quality of life.

Conclusions: An interdisciplinary approach is feasible and addresses crucial aspects of a patient's health.The role of Occupational Therapy became more evident during the years that the program took place. Evidence that the patients benefit from the program will be presented.

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Ruscus Aculeatus As Monotherapy Or In Combination with Ergotamine And Propranolol For Treatment of Lymphedema

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Objectives: Ruscogenins, steroidal saponins from Butcher's broom root (Ruscus Aculeatus), presumably by stimulating postjunctional alpha-adrenergic receptors of the vascular wall, may be the agents that experimentally improved lymphatic flow in the thoracic duct of dogs. This observation has not been tested on lymphedema. Ergotamine and propranolol were previously reported to be useful in lymphedema.

Methods: 20 patients with moderate lymphedema developed after axilary or inguinal lymphadenectomy received for 4 weeks 200 mg dried extract of Ruscus Aculeatus Root 0,5% (containing 10% total Ruscogenins) b.i.d.orally, and an ointment containing 53,7 mg /100 ml dried extract of the same root to be topically applied twice a day on the edematous area. After 4 weeks Ergotamine 0,250-0,5 mg once daily and Propranolol 20-40 mg t.i.d. were added. The edematous limb has been monitored regarding circomference, functionality, and locoregional symptoms (temperature, pain, parestesia, sweating, colour) for a total of 4 months. Patients with veinous thrombosis, tumoral involvement of the supraclavicular, axilla, inguinal, or pelvic regions, and those with cellullitis were excluded.

Results: In the first 4 weeks of treatment we noticed partial remission of limfedema in 10 pts and in another 5 the quality of life was partially improved due to the improvement of the functionality and regression of symptoms. The addition of ergotamine and propranolol further increased the reduction of edema in 11 pts out of the same 15 with previous remission. Discontinuation of treatment has been followed by re-aggravation of lymphedema in 12 pts, in 9 to the previous level.

Conclusions: The extract of Ruscus Aculeatus is useful in the treatment of limphedema. Propranolol and ergotamine have additive effects.

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A Survey of Upper Body Morbidity And Health Related Quality of Life Issues In 268 Patients 2-3 Years Post Breast Cancer Treatment

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Objectives: Upper body morbidity in Breast Cancer Survivors is under reported. This study examined upper body morbidity and health related quality of life in a large number of patients clinically clear from any recurrence. Survival post cancer treatment is fortunately becoming

increasingly common and survivorship is often associated with many issues.

Methods: Upper body morbidity and Quality of Life (QOL) was assessed in 268 patients (72% responded) treated conventionally for breast cancer 2-3 years previously using the Functional Assessment of Cancer Therapy for Breast (FACT-B+4). Pain was assessed using the Short Form McGill Pain Questionnaire (SFMPQ).

Results: Breast cancer survivors had higher QOL scores in the 60-80 year group than the 40-60 year group for FACT-B +4 ($p<.012$). Women who underwent axillary clearance had significantly lower quality of life scores for FACT-B+4 ($p<.026$) and higher pain scores for the SFMPQ ($p<.012$) in comparison to non axillary clearance (sentinel node) group. Associations were observed between pain and quality of life. Pain accounted for a 43% of variance in quality of life scores. Those who underwent radiotherapy reported increased arm symptom on the FACT+4 ($p<.004$) and increased pain symptoms on SFMPQ ($p<.000$).

Conclusions: Although survivors of breast cancer report high levels of satisfaction, significant upper body morbidity has an impact on patient's quality of life. Age, different surgical procedures and type of treatment influence the quantitative characteristics of quality of life and pain. Late effects are not routinely recorded in follow-up and are therefore largely unrecognized but are relevant for patients and also important for health professionals to address. In the future in cancer survivors it will be necessary to record oncologic status, late treatment consequences, health related QOL and patient reported outcomes (PRO). How and who collects this information will need detailed interdisciplinary discussion.

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Survivors of Gynecologic Malignancies (Gyn Ca): Impact of Treatment On Health And Well-Being

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Objectives: While the overall survival from GYN CA has greatly improved over the last 3 decades, the treatments employed can lead to multiple health issues for survivors. Our objective was to determine the health concerns that face GYN CA survivors.

Methods: As part of an ongoing study, a systematic, stratified sample of women with GYN CA seen at our institution from 1997 - 2007 was surveyed for 18 health issues occurring during or after treatment. Women were also asked to rank the issues in order of personal importance. The impact of treatment modality on health issues was assessed through multivariate logistic regression models.

Results: To date, 2,286 survivors received surveys. Of the 781 (34%) completed, median age was 59 yrs; diagnoses included 29% cervical, 25% endometrial, 27% ovarian/primary peritoneal/fallopian tube, 18% vulvar/vaginal, and 1% other GYN CA. Median time from diagnosis was 4.8 yrs (range 0.5 – 57.6). The most frequently-reported health issues included: fatigue (43%), sexual dysfunction (35%), sleep disturbance (33%), neurologic issues (33%), urinary difficulties (32%), bowel complaints (31%), memory problems (30%), and depression (27%). These rankings were consistent when compared to patients' self-reported rankings of "highest impact" personal issues: sexual dysfunction, bowel complaints, urinary difficulties, and fatigue. The table shows odds ratios for top health concerns by treatment modality after controlling for clinical/demographic variables such as diagnosis, treatment phase, and time from diagnosis.

Conclusions: Our study demonstrates that GYN CA survivors experience a high frequency of health conditions and highlights the association between treatment modality and specific health concerns. These data reinforce the importance of identification and discussion of such survivorship issues throughout the continuum of care, as well as development of appropriate interventions to address the needs of GYN CA survivors.

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Variability In the Reporting of Dermatologic Adverse Drug Reactions (Dadrs) To Egfris Cetuximab(C) And Panitumumab (P) In the Treatment of Colorectal Cancer (Mcrc) And Head And Neck Cancers (Hnscc)

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Objectives: Inconsistency in the reporting of dADRs has led to deficient data on incidence and risk factors. This study examines the variability of EGFRI induced dADR reporting in mCRC clinical trials as well as EGRFIs combined with radiation in the treatment of HNSCC.

Methods: Pubmed MEDLINE was searched for "C", "P", "colorectal cancer", "EGFRIs", "radiation", " HNSCC "and was limited to Phase II-III clinical trials. Data obtained included regimen, number of dADRs, and rash-survival correlation.

Results: All dADRs reported were graded according to CTCAE V.3.0. Our search yielded 31 results for C and 7 for P. Of 31 C trials, 11 (35%) reported between 1 and 3 dADRs. One dADR was reported in 6 trials (55%), 2 dADRs in 4 (36%) and 3 dADRs (rash, paronychia, and pruritus) in 1 (9%). Rash was reported in all 11 trials, paronychia in 5, and pruritus in 1. Of 7 P trials, 3 (43%) reported between 2-7 dADRs. Two dADRs were reported in 1 trial (33%), 6 dADRs in 1 (33%), and 7 dADRs (rash, pruritus, dry skin, paronychia, dermatitis acneiform, skin desquamation, skin fissures, and erythema) in 1 (33%). All of the P trials reported rash. However, they were not consistent in the manner in which rash was reported. A positive rash-survival correlation was noted in 45.5% of C trials and 66% of P trials. Our search yielded 10 results for EGFRIs combined with radiation for HNSCC. Of these 8 (80%), reported some form of skin toxicity, while 5 (50%) specified radiation induced dermatitis.

Conclusions: Our results indicate that there is considerable variability in EGFRI-induced dADR reporting in mCRC and HNSCC trials. This deficient reporting impedes the ability of oncologists to provide accurate pre-therapy counseling to patients. To improve data reliability, current dADR reporting standards should be revised to include descriptive skin toxicity.

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Skin Toxicity Management In An International Phase Iii Trial of Adjuvant Erlotinib, An Epidermal Growth Factor Receptor (Egfr) Inhibitor, In Patients with Resected Non-Small Cell Lung Cancer (Nsclc)

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Objectives: Erlotinib, a small molecule inhibitor of the EGFR, demonstrated survival benefit in patients with advanced NSCLC in a phase III trial (Shepherd, 2004). Skin toxicity, particularly papular/pustular rash, is a common side effect associated with anti-EGFR therapy. While few patients experience > grade 3 rash (CTCAE v3.0), skin toxicity can affect patient tolerability and adherence to treatment and thus, affect efficacy.

Methods: Based on erlotinib efficacy in advanced NSCLC, early stage NSCLC patients with completely resected EGFR-positive disease are being enrolled in a multi-site international, double-blind, randomized, Phase III trial of erlotinib or placebo. Planned accrual is 945 patients. Patients will be treated for up to 2 years with erlotinib/placebo and will be monitored for skin toxicity. Given the importance of patient adherence to study treatment, a comprehensive skin toxicity management program was designed for patients and medical professionals to follow while participating in this study. The aim of this program is to ensure patient tolerability of long-term erlotinib administration to ensure successful completion of this clinical trial.

Results: As per protocol, study drug dosing adjustments or discontinuation and adverse events related to skin reactions are being collected. The skin toxicity management educational program includes: training meetings for study sites, newsletters, provision of published literature on rash management, IRB/EC approved-patient brochures, medical professional brochures, and pre-recorded presentations by an expert dermatologist for health care professionals. The information provided emphasizes prophylaxis, early intervention, and utilization of a treatment algorithm. Examples of the educational tools will be presented.

Conclusions: 1) Skin toxicity is a common side effect of EGFR-based therapies. 2) Patient adherence and acceptance of EGFR-based therapy in the adjuvant setting is crucial for the successful completion of this trial. 3) The toxicity management program utilized addresses the importance of both patient and health care professional education in the management of toxicities.

HEALTH ISSUE Treatment Modality n=778 (% sample)	Fatigue	Sexual	Neurologic	Urinary	Bowel	Memory
Surgery Only (33.2%)	—	—	—	—	—	—
Chemo Only (0.9%)	0.8*	1.8*	3.1*	NA	3.2*	2.0*
Rad Only (3.6%)	**2.7 (1.2-6.1)**	**4.2 (1.6-11.3)**	1.22*	1.9*	**5.3 (2.2-12.8)**	0.9*
Surg + Chemo (22.2%)	**4.7 (3.1-7.3)**	1.3*	**5.5 (3.5-8.7)**	0.6*	**3.0 (1.6-5.6)**	**2.6 (1.6-4.1)**
Surg + Rad (13.6%)	**2.1 (1.2- 3.4)**	**3.1 (1.7-5.5)**	**2.0 (1.2-3.5)**	**2.1 (1.2-3.5)**	**7.3 (4.1-13.0)**	1.4*
Chemo + Rad (8.9%)	**3.1 (1.7 - 5.5)**	**2.0 (1.0-3.8)**	**3.0 (1.6-5.5)**	**2.4 (1.3-4.5)**	**5.0 (2.6-9.6)**	1.6*
Surg + Chemo + Rad (17.6%)	**5.5 (3.5-8.8)**	**4.8 (2.9-7.9)**	**8.1 (4.9-13.3)**	**3.0 (1.8-5.0)**	**7.4 (4.3-12.5)**	**3.1 (2.0-5.1)**

All values are OR (95% Confidence Intervals), *=95% CI crosses 1

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Biological And Molecular Analysis of Skin Toxicity Associated with Non-Small Cell Lung Cancer (Nsclc) Patients Treated with the Egfr Tyrosine Kinase Inhibitor Erlotinib

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Objectives: Skin toxicity is frequently observed in patients treated with EGFR inhibitors such as erlotinib. Erlotinib is a potent, small molecule inhibitor of the EGFR tyrosine kinase. Previously reported studies suggest the degree of skin toxicity may be related to the extent of transition of the skin structural change resulting from EGFR inhibition without major disturbances in the skin integrity. An exploratory correlative study was conducted to collect and analyze skin biopsies, hair follicles and sebum from NSCLC patients treated with erlotinib to help understand the biological and molecular basis for the erlotinib-associated skin structural changes, as well as to identify potential biomarkers that could be used to monitor skin toxicity.

Methods: Biopsies were taken from both rash-affected and unaffected areas of skin and compared with baseline biopsies. Hair follicles were analyzed for pEGFR and pERK using membrane transfer technology and Western blot analysis. Skin biopsies were stained by H&E. Sebum, IL1a, IL1RA and IL8 were analyzed from skin samples taken with SEBUTAPE

Results: We observed that effects of EGFR inhibition by erlotinib were reflected in the observed changes in EGFR phosphorylation and ERK activation in individual hair follicles as well as in sebum secretion and cytokine production. In hair follicles, pEGFR and pERK was reduced relative to basal untreated levels and sebum scores were higher in patients for whom a rash was experienced within 7 days of erlotinib treatment. There was no consistent change in cytokine levels of IL1a, IL1RA and IL8 detected.

Conclusions: Although the number of patient samples available in this study were too small to determine the predictiveness of these changes on the skin toxicities of individual patients, as a group, the changes observed in EGFR signaling pathways and sebum levels were consistent with the predicted effect of erlotinib EGFR inhibition in the skin.

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Dolichol As a Risk Group Marker For Cutaneous Reactions To Chemotherapy

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Objectives: The resent results are in favour of the idea that N- glycoprotein synthesis is limited by Dolichyl Phosphate Cycle (DPC), which is a target for chemotherapy and essential in maintaining mucocutaneous resistance and immunity. This dual role is very important in prediction and prevention of chemotherapy-induced skin disorders. With focus on a risk group marker for cutaneous side effects of cancer chemotherapy, the present study was carried out to estimate Dolichol (Dol) metabolism in patients treated with cytostatic agents.

Methods: The samples obtained from 456 patients with breast (n=316), ovarian (n=29) and colon cancer (n=116) before and during treatment with cisplatin, cyclophosphamide, docetaxel, doxorubicin, etoposide and fluorouracil. Dol in urine was assayed by HPLC method (Turpeinen, 1986), dolichol phosphate N-acetyl-glucosamine-1 phosphate transferase (GPT) activity was defined in dermal fibroblasts by metaboling labeling (ML) method with [2-(3) H]-mannose.

Results: The normal amounts of Dol in healthy donors urine (n=250) are 6,0 -10,0 mkg/mmol. During the period of observation 92 (20,2%) of cancer patients were presented with different skin reactions, including flushing, urticaria, dermatitis, erythema, pruritus and acne. From this group of patients 76 (82,6%) have had elevated urinal Dol excretion (>20,8 mkg/mmol) 2 weeks before chemotherapy and 87 (94,6%) during and 2 weeks after chemotherapy. ML of cultured dermal fibroblasts from these patients revealed lowered incorporation of radiolabel into full-length dolichol-linked oligosaccharides and glycoproteins. GPT activity was reduced to approximately 88,6- 99,8% of normal levels.

Conclusions: There is a reason to suggest that reduced GPT activity, lowered N-glycoprotein synthesis and elevated urinary Dol detected in this group of patients may evidence of the disorders of DPC and possible susceptibility to the development of chemotherapy-induced cutaneous reactions. Elevated urinary Dol is one of the first manifestations of this disorder which could be prevented by patients selection and DPC regulation.

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A Randomized Controlled Trial of Systemic And Topical Treatments For Rash Secondary To Erlotinib In Stage Iiib Or Iv Non-Small Cell Lung Cancer

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Objectives: Inhibition of the epidermal growth factor receptor with tyrosine kinase inhibitors have been shown to have a survival advantage in advanced non small cell lung cardinoma. A side effect characterizing this class is skin rash. Retrospective analysis have shown the rash secondary to erlotinib affects 50-70% of patients and usually mild to moderate intensity. No prospective trials have been done to delineate the true incidence, success of prophylaxis or optimal treatment.

Methods: One hundred and fifty patients to start erlotinib will be randomized to three arms. Arm 1 will be treated with prophylactic oral minocycline 100 mg orally twice daily for four weeks. Arm 2 will receive treatment of the rash according to grade. Mild rash (Grade1/2A) not affecting activity of daily living will be treated with a hydrocortisone 1% clindamycin 2% cream applied twice daily. Moderate rash affecting activity of daily living (Grade 2B) will be treated with the cream previously described and four weeks of oral minocycline 100 mg twice daily. Severe rash (Grade 3) will require a dose interruption and treatment as per Grade 2B. Arm 3 will be the control group with no treatment of rash unless Grade 3. Grading of rash will be performed using a revised grading system that takes into account the different aspects and severity of the skin manifestations seen with erlotinib as well as patient's ability to function. Skin manifestations include facial and scalp acneform eruption, truncal rash, dry skin, pruritus and nail changes.

Results: The primary objectives of this ongoing trial are to compare the incidence of rash between the groups.

Conclusions: Skin toxicity and rash secondary to erlotinib is unique. The true incidence, relationship to response rate and survival is unknown. This trial will help us delineate these questions.

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Survey of Practice Guidelines For Management of Anthracycline Extravasation (Ae)

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Objectives: Extravasation of vesicant agents is a rare but serious complication of intravenous chemotherapy occurring in an estimated 1% of treated patients. A large proportion of morbidity from extravasation is attributed to anthracyclines. Few clinical guidelines specifically provide evidence-based recommendations for management of AE; we surveyed existing guidelines.

Methods: We reviewed commonly referenced clinical oncology practice guidelines and resources for their relevance in dealing with AE. Online guidelines reviewed included those issued by the American Society of Clinical Oncology (ASCO), Multinational Association of Supportive Care in Cancer (MASCC), National Comprehensive Cancer Network (NCCN), European Society of Medical Oncology (ESMO), and European Oncology Nursing Society (EONS). Oncology Nursing Society (ONS) publication: Chemotherapy and Biotherapy Guidelines and Recommendations for Practice (second edition) and the online resource UptoDate™ were also reviewed.

Results: Guidelines accessed and reviewed from the following organizations: www.asco.org (1/8/08) www.mascc.org (1/8/08) www.nccn.org (1/8/08) www.esmo.org/resources/clinicalguidelines (1/8/08) and www.cancerworld.org (EONS portal 2/9/08) had extensive content on the supportive care for the more common complications of chemotherapy—emesis, stomatitis, and febrile neutropenia. Only EONS, ONS Chemotherapy and Biotherapy Guidelines (print) and UpToDate™ (Online 15.3) www.uptodate.com (1/8/08) had specific guidelines for management of AE. ONS guidelines were limited to longstanding recommendations for use of aspiration, cold compresses, and surgical consultation. Only the web based reference UpToDate and EONS noted the use of systemic dexrazoxane (Totect™TopoTargetA/S Copenhagen Denmark) as an evidence based treatment for AE reflecting recent prospective trial data (Mouridsen, Ann Oncol 2007) and FDA approval as well as approval in the EU for this indication.

Conclusions: AE represents a complication of chemotherapy for which evidence based treatment has recently been developed for clinical use (dexrazoxane/Totect™) Many frequently referenced supportive care guidelines for the more common complications of chemotherapy could be broadened and updated to include guidelines on management of this rare but serious event.

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Increased Insulin Requirements In Patients with Diabetes Receiving Hyper-Cvad

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Objectives: To assess the insulin requirements for diabetic patients receiving hyper-CVAD at MDACC. Background: Hyper-CVAD is a chemotherapy regimen which contains high dose dexamethasone. Treatment with this chemotherapy includes high doses of dexamethasone which leads to severe hyperglycemia in patients with and without diabetes. Here at MD Anderson Cancer Center 68% of the patients have two glucoses greater than 180 mg/dL and 37% have glucoses greater than 200 mg/dL on two occasions. While only 7% of patients have diabetes. It has been documented that hyperglycemia in hospital has been associated with increased infections, length of stay and mortality.

Methods: A retrospective chart review was conducted on five patients with diabetes receiving high dose dexamethasone as a component of their chemotherapy. The doses and types of insulin (basal/prandial) were recorded for each steroid administration and the units/kg of insulin required for each administration was calculated.

Results: Near-normoglycemia was difficult to achieve. Patients with type 2 diabetes or new hyperglycemia required ~2.0-2.5 units/kg/day and these insulin requirements increased with each subsequent exposure to steroids. Patients with type 1 diabetes had a 4 fold increase in the amount of insulin required; ~1.0 unit/kg/day. Both basal and prandial insulin requirements increased. All patients needed gradually decreasing doses of insulin for 1 to 2 days after stopping of the steroids. More patients are being evaluated currently.

Conclusions: Patients with diabetes require higher amounts of insulin (units/kg/day) when receiving steroids. In our population, it is not unusual for diabetics on high dose steroids to require a tripling of their insulin. Patients who develop hyperglycemia without a history of diabetes require insulin around 2.0 units/kg/day.

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Red Blood Cell Transfusions Among Cancer Patients In Chemotherapy: A Descriptive Epidemiologic Study

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Objectives: Chemotherapy-induced anemia is sometimes treated with red blood cell (RBC) transfusion. The epidemiology of RBC transfusions among cancer patients is not well understood.

Methods: From the Varian Oncology database of electronic medical records, we extracted data for adults with any type of cancer treated with chemotherapy at 4 hospital-affiliated oncology clinics between 2002 and Sept. 2007. Patients with at least one RBC transfusion within 30 days after chemotherapy were identified. Baseline demographic and clinical characteristics on or before the start of chemotherapy, and minimum hemoglobin (Hb) levels during chemotherapy, were compared between patients with and without transfusions during their first chemotherapy episode. Chi-squared and t tests assessed differences between groups.

Results: Of 7726 eligible patients, 1359 (17.6%) received at least one RBC transfusion. Mean age was 56 years for patients with transfusions and 57 for those without. 49.3% of transfusion recipients and 15.7% of non-recipients had a hematologic malignancy, primarily lymphoma, myeloma, or leukemia. Monotherapy with conventional myelosuppresive agents or hormonal treatment was seen in 13.2% and 15.5% of transfusion recipients vs. 9.0% and 7.5% of non-recipients, respectively. The lowest Hb level during the chemotherapy episode is tabulated below.

Lowest Hb During Chemotherapy (g/dL)	Patients Without Transfusion (N=6367)	Patients With Transfusion (N=1359)
	n (%)	n (%)
<7	76 (1.2)	137 (10.1)
7 - <8	228 (3.6)	354 (26.0)
8 - <9	512 (8.0)	568 (41.8)
9 - <10	813 (12.8)	240 (17.7)
10 - <11	1157 (18.2)	40 (2.9)
11+	2936 (46.1)	6 (0.4)
Unknown	645 (10.1)	14 (1.0)

Conclusions: In this sample of 4 hospital-affiliated oncology clinics, 56% (1059/1875) of patients with Hb <9 g/dL were treated with RBC transfusions. Transfusion recipients were more likely than non-recipients to have a hematologic malignancy and to be treated with conventional chemotherapy or hormonal treatments. Supported by Amgen, Inc.
Keywords: Chemotherapy-induced anemia, transfusion