Special Article

Medical malpractice and anesthesiology: literature review and role of the expert witness

[Fautes médicales et anesthésiologie : revue de la littérature et rôle du témoin expert]

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Table of Contents

Abstract

The context of the Canadian legal system

Case study

The doctors are sued and the process begins

The anesthesiologist's narrative report

Expert opinions regarding the case

Why patients sue doctors

The role of the medical/anesthetic record in malpractice litigation

Elements for a successful malpractice claim

Negligent error *vs* patient compensation

The role of the expert witness in medical malpractice litigation

Affirming expert witness status – the courts must rule

The expert at work – reliability of implicit case review

How the experts determine the standard of care

The role of practice guidelines in determining the standard of care

Expert bias in the evaluation of the care provided

Causation – determining if a breach in the standard of care caused the injury

The doctor goes to court

The experts at trial – determining who is right and who is wrong

The judge sets out the ruling

Professional accountability and legal liability of experts

Suing plaintiffs and their lawyers

Conclusions

Appendix – glossary of terms

Purpose: To provide a narrative review of the physician experience of medical malpractice litigation applied to an anesthesiology case with particular emphasis on the role played by medical expert witnesses.

Sources: Literature searches were conducted of English-language medical publications published between 1996 – 2006 using both Medline and Pubmed databases. Key words included: “medical malpractice”; “medical malpractice litigation”; “medical expert witness”; “expert witness liability”; “expert witness bias”; “hindsight bias”; and “outcome bias”.

Principal findings: Patient injury resulting from medical care is common but most injured patients do not sue. Implicit review of medical files is biased to an important degree by the occurrence of severe injury; care is more often deemed substandard when the resulting injury is severe. Expert analysis of medical mal-occurrences is influenced by both hindsight and outcome bias. Compensation for those who do sue is influenced by the severity of injury and the degree of disability. The activity of experts is not commonly subject to review by peers, professional groups or licensing authorities.

Conclusions: The legal process for resolving patient claims against physicians is well delineated and transparent; its operational features are complex and prejudiced by severe outcomes. Bias is pervasive in the analysis of medical occurrences and may result in findings against caregivers which are unfair.

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Objectif : Fournir une revue narrative de l'expérience du médecin face à un litige pour faute médicale appliqué à un cas d'anesthésiologie, en soulignant le rôle joué par les témoins experts médicaux.

Sources : Des recherches de littérature ont été effectuées dans les publications médicales anglophones publiées entre 1996 et 2006 en utilisant les bases de données Medline et Pubmed. Les mots-clés suivants ont été recherchés : « medical malpractice » (faute médicale) ; « medical malpractice litigation » (litige de faute médicale) ; « medical expert witness » (témoin expert médical) ; « expert witness liability » (responsabilité du témoin expert) ; « expert witness bias » (préjugé du témoin expert) ; « hindsight bias » (préjugé en rétrospective) ; et « outcome bias » (préjugé de résultat).

Constatations principales : Les lésions aux patients résultant de soins médicaux sont courantes ; toutefois, la plupart des patients lésés n'engagent pas de poursuites. La révision implicite des dossiers médicaux est biaisée de façon importante par l'incidence de lésions graves ; lorsque la lésion est grave, les soins sont souvent jugés non conformes aux normes. L'analyse experte des incidences de fautes médicales est influencée par les jugements rétrospectifs et par rapport aux résultats. Le dédommagement aux patients qui engagent des poursuites est influencé par la gravité du tort et le degré de handicap. L'activité des experts n'est en général pas sujette à la révision par des pairs, des groupes professionnels ou les autorités réglementaires.

Conclusions : Le processus légal qui gère les revendications des patients contre les médecins est clairement défini et transparent ; ses aspects fonctionnels sont complexes et partiels aux résultats graves. Les préjugés sont omniprésents dans l'analyse des incidences médicales et pourraient avoir pour conséquences des injustices contre certains soignants.

THIS narrative review offers commentary specific to anesthesiologists as to the workings of the Canadian legal and judicial system relating to medical malpractice. The role of the expert witness will be examined in considerable detail, and in particular, the difficulty experienced by even the most objective experts in evaluating care that has ended with an adverse or even catastrophic outcome. The implications of inaccurate or possibly misleading expert testimony and the growing interest in peer assessment of expert activity by professional associations and licensing authorities will also be reviewed.

In order to assemble the literature base upon which this review is based, literature searches were conducted of English-language medical publications published between 1996 – 2006 using both Medline and Pubmed databases. Key words included: “medical malpractice”; “medical malpractice litigation”; “medi-

cal expert witness”; “expert witness liability”; “expert witness bias”; “hindsight bias”; and “outcome bias”. Articles were selected for review if they provided information relevant to the theme of the narrative review and the bibliographies of the relevant articles were searched to expand the base.

To contextualize the background information, the review begins with a case study. This case has been synthesized, and in no manner reflects or identifies a patient or the physician caregiver. Any similarities between this case and a real life event are purely coincidental. The case is designed to illustrate an area of proven liability for anesthesiologists, involving extubation of a patient when the trachea might be difficult to re-intubate by conventional means.¹ The opinions of three fictitious expert witnesses are also included and their related testimonies have also been synthesized to reflect opinions that might be advanced upon review of the case.

The context of the Canadian legal system

In most of Canada, the legal system is one of *common law* with much of the law arising from past judicial decisions. In Quebec a system of *civil law* (*droit civil*) applies, which relies more heavily on codes and legislation than on past judicial decisions. The distinction between the function of common law and civil law is becoming somewhat blurred by the increasing role of jurisprudence in civil law regimes, and the growing role of statutes and codes in common law regimes. For physicians involved in medical malpractice litigation, these distinctions are of little importance, as the overall impact and experience for the physician is likely to be similar despite the differing nature of the systems.

The process of resolving a medical malpractice case in Canada is largely adversarial in nature. A claim is made against a physician and there is both an opportunity and an expectation that they will wish to defend their actions. Although mediation and arbitration have had some limited role in resolution of malpractice claims, the majority of claims in Canada will be resolved by dismissal, settlement, or a decision at trial. Internationally, a number of alternate schemes for addressing the fact of a medically-related injury have arisen. Although these will not be discussed in this paper, they have been reviewed recently in a discussion paper, “*Medical liability practices in Canada: Towards the right balance*”, available to members from the Canadian Medical Protective Association.

CASE STUDY

A 58-yr-old male presented to hospital with an acute abdomen. A diagnosis of an acute small bowel

obstruction was made and the patient was scheduled for urgent laparotomy. He received *iv* fluid resuscitation, and was transferred to the operating room where he was evaluated by the on-call anesthesiologist. His past medical history was unremarkable; he was a moderately obese smoker who led a sedentary lifestyle. The airway assessment was not reassuring and suggested that tracheal intubation using direct laryngoscopy might be difficult. A decision was made to proceed with an awake orotracheal intubation; this was explained to the patient and he consented to the plan. After *iv* sedation and airway topicalization, the trachea was intubated using a flexible fiberoptic bronchoscope and the case was completed uneventfully under general anesthesia. Following completion of the surgery, residual neuromuscular block was reversed, and the patient was transferred to the stretcher and permitted to awaken. During emergence, the patient became agitated and attempted to remove his endotracheal tube. It was felt that he had recovered sufficiently so the cuff was deflated and the tube removed. Immediately thereafter the patient became apneic, and then falling pulse oximetry readings indicated oxygen desaturation. The patient's condition continued to deteriorate and a decision was made to re-intubate the trachea. During the first attempt at direct laryngoscopy it became apparent that the patient had regurgitated gastric contents despite the presence of a nasogastric tube. This attempt at intubation failed although a second attempt at laryngoscopy and intubation was successful, using a gum elastic bougie to guide the endotracheal tube. The patient was transferred to the intensive care unit and his initial course was encouraging. Unfortunately, despite the fact that he made a good recovery from the aspiration, he developed a critical illness myopathy-polyneuropathy and was wheelchair-bound at time of transfer from the hospital to a rehabilitation unit. Eleven months later, both the surgeon and anesthesiologist were served with a statement of claim, alleging negligent medical care and seeking \$2 million in general damages, lost income, and future care costs.

The doctors are sued and the process begins

Possible remedies that may be sought by a patient who feels he/she has experienced an adverse outcome may include a complaint made directly to the physician who is deemed most responsible, to the hospital or clinic where the care was provided, or to the complaints committee of a provincial/territorial regulatory authority (college). Alternatively, a civil lawsuit may be launched against the physician. It is rare in Canada for a physician to be charged criminally for

maloccurrences related to his/her medical practice, although this has occurred with increasing frequency in other jurisdictions.^{2,3}

Once an injury has been sustained, a patient has a limited time (limitation period) to file a claim against a physician.⁴ The limitation period is determined by provincial/territorial legislation, is typically two years from the time that the plaintiff knew, or ought to have known, that an actionable injury has occurred, but may vary with the jurisdiction and the age and mental capacity of the plaintiff. Although it is expected that most patients would be immediately aware that an injury had occurred, the limitation period does not generally start to run until the patient discovers the material facts upon which the action is based.

In Canada, a malpractice action commences with the filing of a statement against the physician in the courts with subsequent notification of the physician that this action has been brought against him/her. The terminology identifying this statement varies across provinces and territories (e.g., a *statement of claim* in Ontario, a *declaration* in Quebec) but the process is similar. Receipt of such a notification is a very stressful event for many physicians; this stress may be heightened by the language contained in the document which is often perceived by the physician to be inflammatory and derogatory. Some physicians have been so upset by the language to consider countersuing plaintiffs and their attorneys when the defendant physicians ultimately and successfully prevail in the claim. The courts have not proved empathetic to that view, pointing out that the allegations in the statement of claim are nothing more than a plea of general negligence in a specific clinical matter.⁵ The language may be inflammatory but, it is at least in the courts' opinion, not defamatory.

The physician would be expected upon receipt of this notice to obtain legal counsel and formally respond to the statement, typically denying and indicating the intention to challenge the allegations. In Canada, most physicians would turn to the Canadian Medical Protective Association at this time for assistance. If the action is advanced, the principals (plaintiffs and defendants) will be asked to provide their recollections of the events in a process of disclosure, termed an *examination for discovery* in many provinces. These statements are made under oath and there is an opportunity for the lawyers representing the involved parties to question the other principals as to their recollections. These statements will typically be introduced into evidence should the case proceed to trial.

The anesthesiologist's narrative report

The anesthesiologist, at the request of his lawyer, provides a narrative report of the clinical event and a copy of the anesthetic record. In his narrative, the anesthesiologist commented that the potential for difficulty at the time of extubation of the trachea was recognized and taken into consideration. It was the anesthesiologist's stated intention, at the completion of surgery, to position the patient semi-sitting, to wait until the patient was fully awake and responding appropriately and then to extubate the trachea. It was his opinion that the patient had reached the desired clinical endpoints and would tolerate extubation uneventfully at the time that the tube was removed from the trachea. When deterioration in the patient's condition became apparent, the clinical interventions resulted in a rapid correction and stabilization of the patient's condition. However, there was no documentation on the anesthetic record detailing the extubation plan.

Expert opinions regarding the case

With respect to the review of the anesthesiologist's care, opinions were solicited from three experts with experience in anesthesiology, one for the plaintiff and two for the defendant. The plaintiff's expert was very critical and offers the opinion that the defendant anesthesiologist failed to meet the standard of care expected from a consultant anesthesiologist. He further states that: the patient should have been ventilated postoperatively in a high-surveillance area such as an intensive care unit; the endotracheal tube should not have been removed without a ventilation catheter in place to facilitate re-intubation in a patient considered at-risk for difficult intubation; the patient's trachea was extubated prematurely; and a surgical airway should have been established immediately after the initial loss of the airway. The plaintiff's expert notes that there is no documentation on the anesthetic record regarding a plan for extubation despite the obvious potential for airway problems in this patient.

The two experts for the defendant anesthesiologist have a different perspective. These experts are of the opinion that the defendant met the standard of care expected from a consultant anesthesiologist and specifically: the defendant recognized that the patient was at high risk and intubated the trachea in a manner that was prudent and safe; there was no clinical indication to ventilate the patient's lungs postoperatively; the plan for tracheal extubation was appropriate; the sudden deterioration in the patient's respiratory status was not anticipated but was dealt with promptly and appropriately. Neither expert expresses concern about the absence of written documentation regarding the

extubation plan; both remark that the actions of the anesthesiologist implied the presence of an acceptable course of action.

Why patients sue doctors

Patients' motivations to press malpractice claims seem quite complex. Several factors in addition to an adverse patient outcome have been linked to these decisions, most notably patient dissatisfaction, and a physicians' lack of communication skills. Vincent *et al.* surveyed 227 patients who were engaged in legal actions against physicians and hospitals.⁶ The decision to take legal action was influenced not only by the occurrence of an injury but also by what patients perceived to be insensitive treatment and poor communication after the injury. This sense of being wronged may also explain why some patients initiate complaints and legal action despite there being little or no evidence of actual injury.^{7,8} The communication behaviours of physicians are often cited as central to patient's decisions to initiate malpractice litigation. Ambady *et al.* investigated the relationship between surgeons' voice tones in conversations with patients and their malpractice claims history.⁹ Surgeons were audio-taped while speaking to their patients during office visits, and very brief samples of the conversations were rated by assessors blinded to the surgeons' malpractice claims status. These assessors were able to distinguish surgeons with previous claims compared to those who had no claims based on variations in voice tones.

Stelfox *et al.* examined the associations among patients' satisfaction survey ratings of physicians' performance and patient complaints, risk management episodes, and rates of malpractice lawsuits.¹⁰ Compared to physicians with the highest patient satisfaction scores, physicians with the lowest scores had malpractice lawsuits rates that were 110% higher. Hickson *et al.* performed a retrospective longitudinal cohort study of 645 general and specialist physicians in a large US medical group to detect a possible association between patient complaints and malpractice risk.¹¹ Once again, lawsuits were related to the total numbers of patient complaints about individual physicians. Finally, physicians who have been sued more frequently in the past are also more often the subjects of current complaints from patients regarding the care that they provide compared to physicians without the same litigation profile.¹²

Despite a commonly held view amongst physicians that patients are increasingly litigious in nature, only a small proportion of patients who have been harmed by medical care ultimately file a legal claim against a physician. Localio *et al.* matched the medical records of a random sample of 31,429 hospitalized patients

with state-wide data on medical malpractice claims in the state of New York.¹³ Of the 280 patients who experienced adverse events associated with medical negligence, only eight (2.85%) filed malpractice claims. Similarly, Studdert *et al.* linked medical malpractice claims data from Utah and Colorado with clinical data from a review of 14,700 medical records.⁸ Of the patients who suffered negligent injury in their study sample, only 3% sued. Under-reporting of patient adverse incidents is common and likely means that the true proportion of injured patients who file claims is even lower than has been reported.¹⁴

Edbril *et al.* reviewed cases involving legal action against a group of anesthesia providers and compared them to deviations from the standard of care by members of the same group that resulted in disabling patient injury.¹⁵ Of the 90 adverse outcomes in which deviations from the standard of care occurred on the part of the anesthesia provider, 13 resulted in a disabling patient injury; none of these 13 cases resulted in a legal action.

There has been no similar published study comparing the incidence of malpractice lawsuits with the occurrence of preventable adverse medical events in Canada. However, Baker *et al.* estimated that about 185,000 annual hospital admissions in Canada are associated with adverse events and that as many as 70,000 are potentially preventable.¹⁶ Although preventable adverse events do not necessarily imply negligent care, the data suggests that the burden of care-related injury is considerable. Concurrent with the time frame of the Baker study, the Canadian Medical Protective Association reported that an average of 1,127 new malpractice lawsuits were filed annually between 2001 and 2005 in Canada.^A Thus it is likely true in Canada as well as the United States, that only a small proportion of patients who suffer unintended injury during the provision of medical care sue the responsible physician.

The role of the medical/anesthetic record in malpractice litigation

It is common for experts to express criticism about the adequacy of medical records when they are analyzed in the context of a complaint or lawsuit. Only about half of the anesthetic records were considered adequate when reviewed by peer experts in closed malpractice claims in the American Society of Anesthesiologists

(ASA) Closed Claims Project.^B There is a tendency among experts to regard the chart as a metaphor for the care provided; an illegible, scantily completed chart infers care that was likely substandard and inattentive, and a poor chart is one factor which may result in an expert opinion which is critical.

Although there is likely considerable variability among anesthesiologists in their opinions about what constitutes a minimum data set on an anesthetic record, there is guidance available regarding the recommended content. The Canadian Anesthesiologists' Society (CAS) Guidelines to a Practice of Anesthesia relating to anesthesia records primarily addresses the recording of physiological variables.^C However, there is also a recommendation that intraoperative care should be recorded and additional guidance that the patient's vital signs and level of consciousness should be documented on the anesthetic record upon arrival in the post anesthesia care unit. Both the ASA and the Royal College of Anaesthetists provide far more detailed and explicit recommendations regarding the documentation of anesthesia care than does the CAS.^{D,E} Within the ASA recommendations there is a stated expectation that the anesthetic plan should be detailed on the anesthetic record.

It is likely that both experts and courts will look to existing recommendations from regulatory bodies and specialty professional organizations when determining whether an acceptable standard was met with regard to the anesthetic record.

Elements for a successful malpractice claim

The following four elements need to be proven by the plaintiff to prevail in a negligence suit: that the defendant physician owed a duty to the patient plaintiff; that the patient plaintiff suffered an injury during the course of care; that the treatment by the defendant physician fell below the standard of care expected; and that the injury to the plaintiff was, at least in part, caused by the conduct of the physician.¹⁷ The degree of proof to prevail is such that the evidence advanced need only be sufficient to prove that the allegations are more likely to be true than not true. Each of these elements will be discussed in turn.

A 2005 Annual Report, Canadian Medical Protective Association, Ottawa.

B Sharar SR. Does anesthetic care for trauma patients present increased risk for patient injury and professional liability? A closed claims analysis. American Society of Anesthesiologists Newsletter volume 66, June 2002.

C Guidelines to the Practice of Anesthesia. Revised edition 2006. Canadian Anesthesiologists' Society.

D American Society of Anesthesiologists Standards, Guidelines, Statements, 2005.

E Adams AP. A revised anaesthetic record set. Royal College of Anaesthetists Newsletter March 1996: 8-9.

In the event of a lawsuit, most often the physician will acknowledge that a duty was owed to the patient and will contest the plaintiff's allegation of negligent practice on the grounds of the other elements. It is also not common that the injury itself will be contested. It is around the last two elements that the bulk of the argument in malpractice litigation will revolve. Whether or not the physician met the standard of care and whether or not his/her actions were a cause of the patient's injury will be the issues upon which the principals, their lawyers and their experts will focus their considerable attention.

The final element in the action relates to whether the injury resulted from the physician's breach of the standard; the focus of this debate is commonly referred to as the "causation argument". There must be some breach of the standard on the part of the physician for this debate to be relevant to the outcome, for if it is determined by the court that no breach occurred, no legal liability would accrue to the physician despite the poor outcome. The physician's breach does not have to be the only cause of the patient's injury, nor even the most important cause. If the court determines that it is probable (more likely than not) that the physician's actions were in any way a cause of the injury, the physician should expect to be found liable for the injury and ordered to compensate the patient. It may also happen that a patient suffered a more extreme injury than would normally be expected because of an underlying predisposition to that injury. These patients have been referred to by the courts as having a "thin skull" and are acknowledged to be more easily and more severely harmed than the average patient; the physician still bears responsibility for the full extent of the harm caused.¹⁸

Negligent error *vs* patient compensation

As has already been discussed, it seems the exception rather than the rule that patients who experience adverse outcomes seek remedy through the courts for their injuries. Once they have chosen this path, some authors have concluded that the tort system fairly compensates plaintiffs who present meritorious claims.^{7,19} However, other studies report fairly indiscriminate patterns of compensation for claim and, in many, the key predictor of payment is often the severity of injury and the plaintiff's degree of disability, rather than a determination that there was a breach in the standard of care.^{16,20,21} In one of the earliest reports from the ASA's closed claims study, Cheney *et al.* reported that more than 40% of patients who were provided appropriate and non-negligent care still collected payments and that the severity of injury seemed to be the factor determining compensation in these cases.²⁰

Studdert *et al.* reviewed a random sample of 1,452 closed malpractice claims to determine whether an injury had occurred and, if so, whether it was due to poor medical care.⁷ Most of the claims that were not associated with errors or injuries did not result in compensation; most of those claims that involved injuries due to error did result in compensation. Taragin *et al.* determined how frequently physicians lose medical malpractice claims despite meeting or exceeding the standard of care and assessed whether the severity of patient injury influenced the frequency of plaintiff payment.¹⁹ They performed a retrospective cohort study of 8,231 closed malpractice claims involving 12,829 physicians. Payment was made in 91% of cases in which the case was considered indefensible, in 59% of cases where the determination was unclear, and in 21% of the cases where physician care was considered defensible. The severity of injury was again associated with the frequency of plaintiff payment.

Brennan *et al.* studied closed malpractice suits to identify factors predicting payment to plaintiffs; 51 litigated claims were followed over a ten-year period to determine whether the malpractice insurer had closed the case.²¹ Forty-six of the 51 cases closed during the study period; ten of 24 originally identified as involving no adverse event were settled for the plaintiffs as were six of 13 cases classified as involving adverse events but no negligence, and five of nine cases in which an adverse event due to negligence was found. In a multivariate analysis, disability was the only significant predictor of payment. The severity of the patient's disability, not the occurrence of an adverse event or an adverse event due to negligence was predictive of payment to the plaintiff.

Malpractice claims may result in financial awards even in the absence of a breach in the standard of care; the award may be influenced largely by the occurrence of an adverse outcome and patient injury.¹⁹⁻²¹ The awarding of compensatory damages and the size of the award are often influenced by the severity of injury and the degree of disability.

The role of the expert witness in medical malpractice litigation

Affirming expert witness status - the courts must rule

When it comes to affirming a witness as an expert, the court will generally look to the witness' credentials, comparing them to the defendant with respect to such criteria as education, training, qualifications and experience, and looking for similarities in this comparison. Before an expert testifies in court, the lawyer presenting the expert will ask the court to affirm expert witness status so that the expert may offer opinion to the

court on different elements of the case. If the court were to deny such an affirmation, the expert would be restricted to testifying on a fact basis and could be prevented from offering opinions. Opposing counsel may object to the affirmation of expert status citing what are felt to be significant differences between the expert and the defendant relating to some of the above criteria. For example, if an expert is from outside Canada, it may be argued that they would not be familiar with the standard of care expected within Canada. However, it would be unusual for a judge to deny expert witness status to an expert presented to the court.

The expert at work - the reliability of implicit case review

The review of the medical care in a malpractice case by an expert is a form of implicit review and inherent in this process are some deficiencies. With implicit review, the criteria for determining judgments are not expressly stated; each expert uses his or her own undefined criteria to assess the quality of care and the physician's actions.²² Few studies have been designed to assess the reliability and quality of the implicit review process. Those that have been published show that physician agreement on the appropriateness of care is generally poor and cast doubt on the validity of the implicit review process.²²

The basic assumption in implicit review is that reviewers are able by their professional training to distinguish appropriate from inappropriate and sub-standard care. The evidence that might be advanced to support this assumption suggests, in fact, that disagreement among experts is common. Thomas *et al.* assessed the reliability of medical records review for estimating adverse event rates and found moderate to poor inter-rater reliability among physicians even in trying to identify adverse events and negligent adverse events through chart review.²³ Put simply, physicians could not always agree and often disagreed as to whether an adverse event had even occurred on the basis of implicit review of the medical record. Posner *et al.* asked 30 pairs of anesthesiologist reviewers to independently and implicitly assess the appropriateness of care in 103 closed anesthesia malpractice claims; the level of agreement in the analysis of the claims was then measured.²⁴ The reviewers agreed on 62% of claims and disagreed on 38%; overall levels of agreement were in the poor to good range.

The results of a structured implicit review are generally considered more reliable than the unstructured review, but even when guidelines are used, the assessments of mal-occurrence can vary. Hayward *et al.*

examined the reliability of reviewer ratings of medical care and the implications of a death described as "preventable by better care" in terms of probability of immediate and short term survival if care had been optimal.²⁵ The study found a low level of inter-rater reliability. The authors concluded that most of the medical errors identified in the implicit chart review appeared to represent reviewer's outlier opinions in cases in which the median reviewer believed either that an error did not occur, or that it had little or no effect on the outcome.

Liang *et al.* surveyed anesthesiologists to determine their agreement when assessing actual malpractice clinical cases, and to examine their assessments compared with the final malpractice verdicts.²⁶ The anesthesiologists were asked to review 12 malpractice case scenarios; there was agreement in the assessment of eight of the 12 cases, but in three of the eight cases the final verdicts rendered by the juries were different. There was also disagreement among anesthesiologists in four of the 12 cases, indicating a lack of consensus regarding the standard of care in these clinical circumstances. The anesthesiologists predicted jury verdicts poorly, with success rates of 50% or less in seven of the 12 case scenarios.

A variety of reasons may explain the high levels of inter-rater disagreement in the implicit review process. There is a tendency for some physicians to be consistently lenient in their judgments of medical care, whereas others are consistently strict.²⁷ There may also be a tendency to judge medical care more harshly if reviewers have knowledge that a patient had a serious adverse outcome or a permanent disability resulting from care. Physician judgments tend to be inversely related to the severity of permanent disability; the worse the permanent disability, the more likely the physicians are to assess the quality of care negatively. In situations in which there is no clearly optimal single treatment, physician reviewer judgments of the appropriateness of care show greater variations.²⁸

Despite the obvious limitations to an implicit review process for evaluation of clinical interventions associated with poor patient outcomes, no alternate strategy is demonstrably of superior reliability in the peer review of clinical care. Suggestions for improving the reliability of peer review include the use of multiple reviewers or the application of formalized guidelines or structure to the review (structured peer review).²⁹ Levine *et al.* have demonstrated that discussion by expert groups will result in agreement within the group regarding peer review and improved inter-rater reliability regarding the assessment of care.²⁹ However, Hofer *et al.* reported that when multiple groups are tasked with

the same discussion, there is greater agreement within the groups than between the groups.³⁰ This finding suggests that if an expert group was tasked by a court to come to a conclusion regarding the standard of care in a given scenario, the individuals would be likely to achieve consensus within the group, but that their determination might well be at odds with that reached by another, similarly structured group of experts.

At the present time, despite its deficiencies, implicit review remains the mechanism relied upon by experts to formulate an opinion regarding the quality of care provided, whether that care met the standard, and the relationship between the care provided and the outcome.

How the experts determine the standard of care

The standard of care is defined as that degree of skill and care that could reasonably be expected of a normal, prudent practitioner of the same experience and standing in similar circumstances.³¹ Although the definition of standard of care seems uncomplicated, the determination of whether or not it was met in a particular instance can be anything but. As the pattern of practice in question is dissected down to its constituent elements, a decision has to be made as to whether or not those elements and that practice conformed to a reasonable and prudent model of care. Implicit in the exercise is the abstract notion that different patterns of practice may well conform to the standard of care in a select scenario. It is around this latter notion that much of the debate between experts attempting to ascertain whether the standard of care was met, becomes focused. For example, all anesthesiologists would likely agree that an evaluation of a patient before surgery would be a necessary pre-requisite to the provision of safe anesthesia care, and this would be the expected routine practice of a normal, prudent anesthesiologist. Most anesthesiologists would also likely agree that different patterns of evaluation would be acceptable, and would therefore constitute an acceptable standard of care. However, some anesthesiologists (and experts) might insist that specific constituent elements of the evaluation would be so integral to a proper evaluation that their absence would represent an unacceptable deviation from the standard of care, and result in a determination that the pattern of practice engaged upon by the anesthesiologist was below the standard of care.

The standard of care is uncommonly determined by consensus among practitioners in advance to the degree necessary to allow its application to the facts at hand in many malpractice cases. Rather, it is often determined at trial primarily through the testimony of

experts in the same field as the defendant, although practice guidelines and standards may also be used by the experts to infer a standard. As might be expected from the above comments, disagreement is common between experts as to what constitutes common knowledge and skills *vs* exceptional attributes and which patterns of practice would meet, exceed or fail to constitute acceptable care. As well, the point at which a simple error in judgment which occurs during provision of otherwise acceptable care crosses over to a breach of the standard is not only ill-defined, but also likely fluctuates on a case by case basis.³²

Physician experts may define the standard of care by outlining what physicians ordinarily do (customary standard) or what they should have done (reasonable standard) when presented with a patient similar to that of the case.³³ Unfortunately, experts may not have any objective or systematic method for determining what is customarily done in specific situations. It is also likely that experts may testify as to what they themselves would have done now with the knowledge of both the outcome and what was actually done at the time of the occurrence in question. There is considerable potential for the injection of bias into the process at this point, and this will be discussed subsequently.

The medical expert witness must be aware of, and apply the standard of care *that existed at the time of the incident giving rise to the claim*. This may be a higher order challenge than it would seem at first glance, as there is evidence for skewed recall of the onset of changes in practice even outside of the adversarial climate of the malpractice case. Literature on memory research suggests that when an individual is asked to recall past experience, the recollections are flawed. Moreover, these recollections are not randomly wrong; rather they tend to be skewed in the direction that in hind-sight would have been preferred. Meadow *et al.* surveyed 500 randomly selected practicing obstetricians.³⁴ The survey described a hypothetical case of a woman who presented in early labour (28 weeks gestation) and the obstetricians were asked two questions regarding the use of corticosteroids in this instance: "What percent of obstetricians do you think were administering corticosteroids in such cases in 1985, 1990, 1995, and 2000?", and: "Was it your personal practice to administer corticosteroids to such patients at these times?" The recollections of 302 practicing obstetricians consistently overestimated the use of corticosteroids during every year in question when contrasted with data describing the actual use reported in the medical literature. In addition, the respondents also consistently ranked their own personal use as even higher than their estimates of the average behaviour at any time in question.

The role of practice guidelines in determining the standard of care

Practice guidelines cannot be introduced to the court as evidence in isolation by either lawyer, in either an inculpatory or exculpatory manner. Rather, they are typically presented to the court by expert witnesses as evidence to support their own testimony as to the accepted and customary standard of care. The expert's citation of the guideline as reflecting the standard of care may be determined by the court to be compelling evidence, and there is evidence that courts are willing to accept that national and authoritative guidelines reflect responsible and reasonable medical practice.^{35,36}

To determine the role of practice guidelines in malpractice litigation, Hyams *et al.* reviewed 259 open and closed malpractice cases and surveyed 578 lawyers who litigate malpractice claims on behalf of plaintiffs.³⁷ Practice guidelines were cited in 17 of the 259 files; in four cases they were exculpatory and exonerated the physician; in 12 cases they were inculpatory and implicated the physician. Lawyers whose practice was largely medical litigation stated that they looked to guidelines to incriminate physicians and support claims, and acknowledged that the existence of guidelines supporting the care would discourage them from filing suits.

There are concerns about the widespread use of practice guidelines to determine the standard of care.³⁸ Many guidelines face degrees of dissent which may be grounded in the existence of conflicting evidence, the absence of compelling evidence, or alternate interpretations of the evidence cited in support of the guidelines. Even the best guidelines specify care that should be considered in the general case only; application to a specific clinical situation will require physician consideration of an individual patient's circumstances. It is often the case that individual patient and clinical scenarios are not covered explicitly by guidelines.³⁹

Grilli *et al.* have expressed concerns about the poor methodological underpinnings of many current guidelines; 431 guidelines propagated by specialty societies were evaluated for their methodological qualities.⁴⁰ Overall, 67% of the reviewed guidelines did not describe details of the search strategy or the nature of the literature review, and 88% provided no grading of the strength of their recommendations. Shaneyfelt *et al.* also performed a structured review of 279 guidelines published from 1985 through 1997 to determine whether practice guidelines in peer-reviewed medical literature adhered to established methodological standards for development.⁴¹ The mean adherence to methodological standards on identification and summary of evidence was 33.6%

and there was no improvement in adherence observed during the period under review.

Critics will rightly point out that there has been little systematic evaluation of the impact of guidelines on patient outcomes. Grimshaw and Russell evaluated 59 published guidelines chosen because they met defined criteria for scientific rigor.⁴² The majority of guideline assessments did not evaluate the impact on patient outcomes, although of the 11 which did, nine demonstrated improvements. There is also evidence that physicians are often not compliant with the guidelines published by national or specialty medical organizations.⁴³⁻⁴⁶ Finally, guidelines evolve and change, driven by new developments in clinical science and practice. Shekelle *et al.* assessed the current validity of 17 clinical practice guidelines propagated by the United States Agency for Healthcare Research and Quality which were still in circulation.⁴⁷ For 41% of the practice guidelines reviewed, new evidence and expert opinion indicated that a major revision was required, 35% required a significant revision, and only 18% were considered still valid.

Where a clinician has not followed a practice guideline, there is no automatic assumption of a breach in the standard of care and, in fact, there may be good reasons for non-adherence. For example, it could be argued that the guideline was wrong or not relevant in a particular case, or that the individual treatment was supported by other good evidence, or that the guideline actually allowed for the provided treatment.⁴⁸ Finally, although the stated purpose of many guidelines is advisory, and although most sponsoring agencies caution that the materials should not be construed as defining a legal standard of care, it would be naive to believe that they would not be entered into evidence in a medical-legal action.⁴⁹ If there is an applicable practice guideline addressing the care that is central to the malpractice claim, it is likely that the physician will be called to answer if the care provided appears to be at significant variance with the specific guideline.

Expert bias in the evaluation of care provided

Once the experts have duly considered whether the standard of care was appropriate to the case under consideration, the next step is to determine whether or not the physician met the applicable standard. The boundary between these two processes is often indistinct. As well, the determination as to whether a physician behaved in an appropriate manner is influenced by a number of biases. The first of these is *outcome bias*. Outcome bias is an error made in evaluating the quality of the decision when the outcome of that

decision is already known.⁵⁰ A decision is then judged by its eventual outcome instead of being based on the quality of the decision at the time that it was made, given what was known at the time. Caplan *et al.* asked 112 practicing anesthesiologists to judge the appropriateness of care in 21 cases involving adverse anesthetic outcomes.⁵¹ The anesthesiologists were provided hypothetical patient case histories which were identical in every respect with the exception that a different but feasible outcome of varying severity was included in each. The reviewing anesthesiologists were asked to rate independently the care in each case as either appropriate or less than appropriate, on the basis of their personal judgment of reasonable and prudent practice. Given the same set of facts, 67% of reviewing anesthesiologists opined that the care was appropriate when the outcome was not severe, but that figure dropped to 36% when the outcome was more debilitating. Similarly, a group of surgeons were asked to review the files of 130 patients with surgical adverse events to determine whether outcome knowledge influenced the reviewers' judgment as to whether the adverse event resulted from physician negligence.⁵² The determination that a breach in the standard of care had occurred was linked directly with the severity of the patient's disability, and the size of the indemnity payment was more likely to be linked to the presence of disability than to the finding of negligence.

A second and related bias which might complicate an objective expert's best efforts is *hindsight bias*. Hindsight bias is the tendency for people with knowledge of the actual outcome of an event to believe falsely that they could have predicted the outcome in advance and they would have acted differently to prevent it.⁵³ Fischhoff coined the term "creeping determinism" for his interpretation that hindsight bias represents a post hoc perception of inevitability, a perception that has crept up on the individual after a pre-outcome view that was much less certain.⁵⁴ The outcome knowledge creeps into the subject's mental representation of past events and there is a projection of new knowledge into the past accompanied by denial that the outcome information has actually influenced judgments.

Hindsight bias is not supposed to exert influence on the determination of medical negligence.^{16,55,56} However, it is well recognized that that determination of negligence is influenced by whether the patient has sustained an injury and in particular, a severe injury. Although our legal system promises not to hold defendants liable if they have conducted themselves reasonably before an injury occurs, hindsight bias ensures that some reasonably acting defendants will be

unfairly subjected to harsh expert opinion and adverse liability judgments when after-injury evaluation has taken place.

As part of hindsight bias, *counter-factual thinking* plays a role in the expert determining what was likely to happen when viewed retrospectively. Counterfactuals (a thought that the outcome in question could have occurred differently than it did) are linked to hindsight bias and may be used to explain an outcome by specifying the outcome's cause.⁵⁷ In retrospect, the expert may conclude that the physician should have anticipated that what did happen not only could happen, but would certainly happen given the actions which were taken. Further, had a different choice been made, the likelihood of a more favourable outcome would have been likely. As well, post hoc analysis of clinical decision-making allows for the incorporation of not only additional facts and information but also the knowledge of the outcome of the original decisions. The courts have recognized that such analysis is unfair to defendants, but it is nearly impossible to prevent experts from engaging in it.

Causation – determining if a breach in the standard of care caused the injury

Of the four elements that must be proven for the plaintiff to succeed in a malpractice lawsuit, causation is the element that links the physician's alleged breach in the standard of care to the patient's injury. The causation argument advances the hypothesis that, in natural or probable sequence, the breach produced or led to the injury suffered by the patient. The legal concept of causation is quite different from the medical concept of the cause of an occurrence, commonly referred to by physicians as etiology.⁵⁸ Etiology is usually considered by physicians to be the most immediate and likely the major cause of a patient injury. Legal cause need not be the only factor, nor even the last, nearest or most important cause, and in fact may occur with some other factors or causes acting at the same time.

The doctor goes to court

Unfortunately for the defendant doctor, the plaintiffs persist with the malpractice claim and a court date is set. The plaintiff offers to settle immediately before the trial with a significant discount on the original damages claimed. The defendant, although upset at the prospect of going to court, is of the opinion that the standard of care was met and wishes to present a defense to the allegations in court. During the trial, the judge affirms the expert status of the three experts and the evidence that is entered is consistent with that

outlined above. One defense expert does concede on cross-examination that perhaps the anesthesiologist made an error in judgment in assessing the readiness of the patient for tracheal extubation, but is of the opinion that this does not fall below the standard of care.

The experts at trial – determining who is right and who is wrong

Physicians accept that there may be a number of approaches to some clinical situations that are equally credible and supported by evidence or experience. In court, the plaintiff experts are likely to argue that the care provided by the defendant represented a breach in the standard of care, and that, had they provided proper care, harm to the plaintiff could have been avoided. The defense expert will counter that the care provided by the defendant physician was proper and would be acceptable to either the majority of peers or at least a significant minority of practitioners. The *respectable minority principle* respects the reality that in medicine, there may be no universally accepted single practice to deal with a specific clinical scenario.⁵⁹ So long as the defendant's practice is followed by at least a respectable minority of competent practitioners in the same field, the practice should be acceptable. The court then faces a dilemma: the opposing experts have differing views of the standard of care. In theory, the respectable minority rule eliminates the need for the court to identify a single professional norm.⁶⁰ In reality, this dilemma allows the court to impose, based on its own independent judgment, the applicable standard of care. The judge may prefer the testimony of one expert or set of experts over the other, and decide that one is more accurately describing the actual standard of care.

The judge sets out the ruling

The judge finds in favour of the defendant. In the ruling, the judge finds the testimony of the defendant doctor both credible and reliable and expresses his opinion that the defendant had a clinical plan that would be deemed prudent and reasonable by his peers and so did meet the standard of care. The judge concurs with the second defense expert and expresses the view that the defendant did make an error in judgment and probably extubated the trachea of the patient prematurely. However, the judge is of the opinion that this was an error in judgment and not negligence and dismisses the case against the defendant. Finally, the judge accepts the opinion of the plaintiff expert that the charting was deficient in not documenting the care plan for the extubation of the patient, but accepts

that there was a plan and that it was appropriate. The deficient charting, though deemed to be below the standard of care, did not in itself result in any injury to the patient, and so does not result in an order for compensation. Finally, the judge awards the defendant the costs of the proceedings and orders the plaintiff to pay the costs.

The defendant physician, though relieved with the ruling, is angry with the plaintiff's expert. It is his view that the expert testified to a standard of care that does not exist and in doing so, acted unprofessionally and unethically. Further, he is of the view that the plaintiff's lawyer acted maliciously in pursuing the malpractice suit supported only by an expert deemed by the defendant to be a "hired gun". The defendant seeks the advice of his lawyer regarding the options for pursuing either a complaint or a lawsuit against both the expert and the plaintiff's lawyer. The defendant's lawyer, though empathetic to his client's feelings, counsels against pursuing such a strategy.

Professional accountability and legal liability of expert witnesses

Although there have been concerns expressed about expert witnesses behaving in a non-professional manner, there has been little systematic study of the magnitude of such behaviours and their impact on the outcome of medical malpractice cases. Experts can disagree; they may look to different evidence and assumptions and they may draw different inferences from the same evidence and assumptions; two experts may draw contradictory inferences that are both reasonable from the same set of facts and assumptions. The fact that experts disagree is not an indication that one of the experts is drawing an unreasonable inference. The mere fact that an expert adopts an alternate or minority view is also no indication that the expert is drawing an unreasonable inference; minority view points can be reasonable and defensible. An expert is unreasonable only when he/she draws an inference that no other expert would draw, given the evidence available and the assumptions made.

With respect to legal liability for expert testimony, expert witnesses are granted a considerable degree of immunity from consequences which might emanate from their testimony. This immunity is a judicially created privilege founded on the belief that the administration of justice requires witnesses in a legal proceeding to be able to discuss their views without fear of a defamation lawsuit. The benefits gained by extending witness immunity are theoretically counterbalanced by safeguards inherent in the judicial system. The courts argue that witness reliability can

be insured by both the threat of criminal prosecution for perjury, and rigorous cross examination. However, these safeguards may not always prove to be effective deterrents to deliberate expert misrepresentation. It is uncommon for a medical expert to be prosecuted for perjury based on courtroom testimony and cross examination may not be an effective deterrent when employed against an experienced litigation expert.

Although there have been limited professional consequences to questionable expert testimony in the past, there is now a potential that both accountability and liability may be increasingly forced upon experts. Gomez advocated that the activity of expert testimony be considered part of the practice of medicine and subject to scrutiny on that basis.⁶¹ Not all licensing authorities have embraced this concept, and Cohen reported that different state licensing authorities have come to different conclusions as to their oversight role in regulating expert activity.⁶² Resnick cautions against the aggressive efforts of licensing boards to punish experts, and suggests that efforts would be better made to educate wayward experts to improve the quality of their expert testimony.⁶³ Feld recommended that professional medical associations develop a code of conduct for experts and some specialty societies in the United States responded with increased interest in peer review of expert testimony.⁶⁴ To determine the prevalence of such activity, Milunsky surveyed 36 United States specialty organizations to determine whether they had established guidelines, position statements, policies, or bylaws to govern the disciplinary management of their members who testify falsely; over 80% had no such guidance policies.⁶⁵ However, one group with a long history of such activity is the American Association of Neurological Surgeons (AANS). The AANS has a 20-year track record of enforcing expert accountability among its members and this responsibility is invested in its Professional Conduct Committee.⁶² In fact, the AANS reports that the most frequent area of focus of this Committee has been the review of the professional testimony by their member surgeons. The disposition of cases brought before the Committee is as follows: 12% resulted in letters of admonition or warning; 35% resulted in a letter of censure; 25% resulted in six months suspensions from the association, and 5% resulted in revocation of membership in the AANS.⁶² Although such sanctions do not prevent physicians from either practicing medicine or functioning as expert witnesses, they presumably would have an impact in court when an expert is forced to acknowledge that they have been disciplined for unprofessional conduct as an expert. The ASA has also developed a process to review the testimony

of anesthesia experts alleged to be operating in an unprofessional manner and has further reported that this process has been activated; no further information has been released at this time.^F No such activity by a professional medical association in Canada has been reported at this point in time.

Suing plaintiffs and their lawyers

Physician suits against either plaintiffs or their lawyers are uncommon, although they have occurred more frequently in the past, particularly in the United States; the enthusiasm for them has largely abated.^{5,66} Countersuits by physicians are most frequently based on allegations of malicious prosecution. To prevail with such a suit, the physician must prove that the original malpractice suit was filed both without justification and with malice, that the suit ultimately terminated in the physician's favour, and that the defendant physician had sustained damages as a result of the litigation.^{5,66} All but a few of these cases were ultimately rejected by the judiciary, including most of those that were initially successful at lower court levels, as the courts ruled that most suits were not truly malicious. Another commonly advanced claim is that the plaintiff's lawyers failed to adequately investigate the medical facts of the case before proceeding with the claim. Again, the courts have not been empathetic to this claim, pointing out that it is the courts' responsibility to determine whether the case has merit, not the plaintiff's lawyer, nor is the lawyer required to pre-judge the client's/plaintiff's claim. Berlin suggests that the probability of a physician prevailing in a countersuit is extremely low, noting that only about one in 20 ever achieved success at any level.⁵

Conclusions

Most patients who are injured as a result of medical care take no action against the physician involved in providing the care; motivations for proceeding with a malpractice claim against a physician are often based on perceptions of disrespectful treatment rather than poor care or an adverse outcome alone.

Implicit review and analysis of medical care may be prejudiced by the occurrence of a poor outcome, especially if the injury is severe and permanent. Disagreement between experts is common both at audit and during legal procedures. There are differences of opinion regarding the standard of care in many medical scenarios, so it would be expected that there may not be consensus among experts when such

F American Society of Anesthesiologists Newsletter, June 2006; 70: 29–30.

scenarios are reviewed in the context of litigation. Bias is an important confounder during expert review of the medical care under question, and both hindsight and outcome bias figure prominently in this regard. Biased analyses are common, and may result as much from an inherent human need to empathize and make sense of tragedy as they do from a desire to pinpoint blame.

Expert witness liability and accountability has been a subject of increasing interest and peer review of expert activity is being advocated. Several professional associations and licensing authorities in the United States have conducted such reviews, with resulting sanctions and suspensions by the professional associations, and far less commonly, license suspension or revocation by the authorities. However, these activities have not been common, are currently the subject of ongoing judicial review, and have yet to occur in Canada.

Finally, the use of practice guidelines to determine a standard of care in malpractice litigation is uncommon, but nevertheless occurs. Most guidelines do not refer to cases with sufficient specificity so as to be useful to either party. Physicians have understandable reservations regarding the application of practice guidelines in the medicolegal context, and issues related to the robustness of many guidelines, or lack thereof, underscore many of these reservations. Despite these reservations, physicians should at least be aware of those guidelines propagated by national authorities and be aware that they may be called to answer to them if their clinical practices are far removed from that advocated by these guidelines.

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APPENDIX – glossary of terms

causation – an essential element in a case for negligence which establishes the link between the substandard behaviour and the patient injury; also referred to as *proximate cause* - it need not be the only cause, nor even the last or nearest cause, and in fact may occur with some other cause or causes acting at the same time.

counter-factual thinking – a process linked to *hindsight bias* and is a thought, idea or hypothesis that the outcome in question could have occurred differently than it did if a different decision had been taken – may play a role in an expert determining what was likely to happen had a different decision been taken when viewed retrospectively.

crumbling skull patient – a patient with a chronic and progressively deteriorating medical condition who may be more readily and severely injured during medical care.

hindsight bias - the tendency for people with knowledge of the actual outcome of an event or a decision to believe falsely that they could have predicted the

outcome, and they would have acted differently to prevent it.

implicit review – a mode of review in which the criteria for determining judgment is not expressly stated; each expert uses his or her own undefined criteria to the evidence; the basic assumption in implicit review is that the reviewers are able by their professional training to distinguish appropriate from inappropriate and substandard care; the evidence is that the reliability and validity of implicit review is poor.

limitation period - once an injury has been sustained, a patient has a limited time to file a claim against a physician; the limitation period is not initiated until the patient discovers the material facts upon which the action is based.

outcome bias - an error made in evaluating the quality of the decision when the outcome of that decision is already known; the decision can be seen in retrospect to have been wrong now that the outcome of the decision is known.

statement of claim – a legal document which is filed in the court to initiate the legal action against the physician; this statement may be later amended to add or remove defendants and to add, remove or modify allegations against the defendants.

respectable minority principle - respects the reality that in medicine, there may be no universally accepted single practice to deal with a specific clinical scenario; as long as the defendant's practice is followed by at least a respectable minority of competent practitioners in the same field, the practice should be acceptable and should meet the standard of care.

standard of care - that degree of skill and care that could reasonably be expected of a normal, prudent practitioner of the same experience and standing in similar circumstances.

thin skull patient – one with a predisposition to be more easily and more severely harmed than the average patient.

tort - refers to the body of law which will allow an injured person to obtain compensation from those who caused the injury.