



# Systematic review of international guidelines for head and neck oncology management in COVID-19 patients

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## Abstract

**Purpose** The coronavirus pandemic has redefined the practice of head and neck surgeons in the management of oncology patients. Several countries have issued practice recommendations in that context. This review is a collaboration of the YO-IFOS (Young Otolaryngologists of the International Federation of Otolaryngological Societies) group in order to summarize, in a systematic way, all available guidelines and provide clear guidelines for the management of head and neck cancer patients in the COVID-19 pandemic.

**Methods** This systematic review was performed according to the PRISMA statements. Inclusion criteria for the systematic review were based on the population, intervention, comparison, and outcomes according to (PICO) framework. The AGREE II (Appraisal of Guidelines for Research and Evaluation II) instrument was used to assess quality of all practice guidelines included in this review.

**Results** Recommendations include adjustments regarding new patients' referral such as performing a pre-appointment triage and working in telemedicine when possible. Surgical prioritization must be adjusted in order to respect pandemic requirements. High-grade malignancies should, however, not be delayed, due to potential serious consequences. Many head and neck interventions being aerosol-generating procedures, COVID-19 testing prior to a surgery and adequate PPE precautions are essential in operating rooms.

**Conclusion** These recommendations for head and neck oncology patients serve as a guide for physicians in the pandemic. Adjustments and updates are necessary as the pandemic evolves.

**Keywords** COVID-19 · Coronavirus · Head and neck cancer · Oncology · Guidelines

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## Introduction

The coronavirus pandemic has forced Otorhinolaryngologists Head and Neck Surgeons (ORL-HNS) to redefine their practice. First, ORL-HNS are faced with an increased risk to be exposed to COVID-19 due to high viral loads in the upper respiratory tract [1]. Second, several hospitals have significantly reduced planned surgeries to avoid overwhelming the healthcare system and to conserve critical resources. However, ORL-HNS have an obligation to ensure that each of their patients can benefit from the most appropriate treatment possible, despite the pandemic. This is even more true for oncologic patients, where the choice of treatment plan can have a direct impact on the patient's survival outcome and quality of life. To guide ORL-HNS navigate in health systems with limited services and to minimize the patients and otolaryngology team's exposure to the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), several countries have issued practice recommendations regarding oncologic patients. The objective of this study is to systematically review all available guidelines and assess their quality.

As an initiative of the “*Young Otolaryngologist Group of the International Federation of Otolaryngologic Societies*” (YO-IFOS), this review aims to summarize in a systematic way the available recommendations for management of H&N cancer in the COVID-19 pandemic era and assess the quality of available guidelines. These recommendations are mostly oriented for otolaryngologists but could be useful for any physician treating and following head and neck oncology patients.

## Materials and methods

This systematic and qualitative review was performed according to the PRISMA template for systematic reviews and meta-analyses [2, 3]. The following clinical databases were consulted to collect information: PUBMED, Google Scholar, Ovid Medline and Scopus. International ORL-HNS societies, and association websites were reviewed to find guidelines and recommendation documents regarding the COVID-19 pandemic. Search terms included “SARS-CoV-2”, “COVID-19”, “guidelines/practice guidelines/clinical guidelines,” “recommendations” “consensus,” “ENT,” “head and Neck surgery”, “oncology surgery”, “head and neck cancer”. Researches were also performed on all the international societies and associations' websites in order to obtain their guidelines and recommendations if available. Research was conducted from January 2020 to May 2020.

Two reviewers (L.G. and I.F.) examined available guidelines and only included those that were relevant to oncology surgery. They both independently performed title and

abstract screening and full text reviews. Citations that did not meet the inclusion criteria were discarded. The most recent version or update of each clinical guideline was included and analyzed. Reviewers resolved disagreements through discussion.

Inclusion criteria for the systematic review were based on the population, intervention, comparison, and outcomes according to (PICO) framework [4].

## Populations

Inclusion criteria consisted of COVID-19 guidelines for otolaryngologist and head and neck surgeons, for head and neck oncology treatment strategies and for oncology surgeries. Guidelines in French, English, Spanish and Portuguese were included.

## Intervention and comparison

Reviewed guidelines and recommendation documents were analyzed and compared, specifically for medical care of head and neck oncology patients. New referrals, investigations, surgery prioritization, personal protection equipment (PPE), COVID testing for surgeries, surgical techniques, team management and postoperative care were compared in each guideline.

## Outcome

The outcome of interest was to provide a set of recommendations based on current evidence, in order to guide otolaryngologists with care of patients suffering from head and neck cancer in the COVID-19 context.

The AGREE II (Appraisal of Guidelines for Research and Evaluation II) instrument was used to assess quality of all practice guidelines included in this review [4]. The evaluation was performed independently by two appraisers (L.G. and I.F.). To measure interobserver agreement across the ordinal categories of the AGREE-II ratings, a weighted kappa was calculated. Degrees of agreement were graded as minor ( $\leq 0.20$ ), fair (0.21–0.40), moderate (0.41–0.60), substantial (0.61–0.80) and almost perfect ( $\geq 0.81$ ).

The ethics committee approval was not required for the study.

## Results

A total of 23 guidelines were included in this systematic review (Table 1). The guidelines came from the following world regions: North America (2 from Canada [5, 6] and 6 from USA [7–13]), South America (1 from Argentina

**Table 1** Guidelines included in this systematic review

	Country	Guideline	Last update
1	Canada	Guidelines for management of Head and Neck Cancer during the COVID-19 pandemic	March 30, 2020
2	Canada (Quebec)	Recommandations pour la priorisation des patients en contexte de pandémie de COVID-19 – Volet Cancers ORL / tête et cou	April 15, 2020
3	United States of America (USA)	COVID 19: Elective Case Triage Guidelines for Surgical Care	March 24, 2020
4	United States of America (USA)	Endocrine surgery in the Coronavirus disease 2019 pandemic	April 16, 2020
5	United States of America (USA)	Safety Recommendations for Evaluation and Surgery of the Head and Neck During the COVID-19 Pandemic	March 31, 2020
6	United States of America (USA)	COVID-19 and the Otolaryngologist: Preliminary Evidence-Based Review	March 26, 2020
7	United States of America (USA)	HN Cancer Care Guidelines during COVID-19 Epidemic	March 22, 2020
8	United States of America (USA)	Guidance for return to practice for Otolaryngology-Head and neck surgery	May 5, 2020
9	Argentina	Protocolo interno COVID-19 para consultas y prácticas del servicio de Otorinolaringología	April 17, 2020
10	Chile	Recomendaciones de la sociedad chilena de otorrinolaringología, medicina y cirugía de Cabeza y cuello para el ejercicio de la especialidad durante pandemia COVID-19 (SARS-CoV-2)	March 22, 2020
11	Brazil	Recomendação da SBCCP sobre atendimento médico na; Especialidade durante epidemia de COVID-19	March 23, 2020
12	United Kingdom	Initial guidance for head and neck cancer management during COVID-19 pandemic in consultation with ENT UK	March 27, 2020
13	United Kingdom	BAETS statement on COVID-19 and Thyroid Cancer Services	March, 2020
14	Ireland	Considerations on H&N during COVID-19	March 20, 2020
15	France	French consensus on management of head and neck cancer surgery during COVID-19 pandemic	April 11, 2020
16	Spain	Estrategias para el manejo del paciente orl durante la fase de control de la pandemia por la COVID-19	April 20, 2020
17	Spain	Recomendaciones secomcyc en relacion con la cirugía y COVID-19	NE
18	Thailand	Statement from The Royal College of Otolaryngologists-Head and Neck Surgeons of Thailand	NE
19	South Africa	COVID-19 Recommendations for the ENT Surgeon	NE
20	Australia	ASOHNS Review of Guidance for PPE for ENT surgeons during the COVID-19 Pandemic	April 2, 2020
21	Australia	Recommendations for PPE for Aerosol Generating Procedures during COVID-19 pandemic	March 24, 2020
22	Australasian (Australia and New Zealand)	RACS guidelines for the management of surgical patients during the COVID-19 pandemic	NE
23	Italy	Piano strategico per la gestione del paziente orl durante il periodo di transizione a seguito della pandemia per il COVID-19—versione 2	NE

NE non specified

[14], 1 from Chile [15] and 1 from Brazil [16]), Europe (2 from United Kingdom [17, 18], 1 from Ireland [19], 1 from France [20], 2 from Spain [21, 22] and 1 from Italy [23]), Asia (from Thailand [24]), Africa (from South Africa [25]) and Oceania (2 from Australia [26, 27] and 1 from the Australasian association [28]).

Data from these guidelines were examined and compared according to the different categories, as presented in Annex 1 (Table 4).

## Appraisal of guidelines

The AGREE domain scores are shown in Table 2.

## Scope and purpose

Overall, the objectives and purpose of the guidelines were very well defined amongst the guidelines. In this domain, 13 guidelines had a perfect score of 100 [6, 8–10, 13–15, 17, 19–21, 23], 8 guidelines had a score > 80 [5, 7, 12, 24–26, 26, 28] and 2 guidelines had a score under 70 [16, 22]. The mean score for this section was 90.8.

**Table 2** Guideline assessment according to the AGREE-II Instrument

Guideline organization or society	Scope and purpose	Stakeholder involvement	Rigour and development	Clarity and presentation	Applicability	Editorial independence	Mean domain scores (%)	Agreement between appraisers (Cohen's Kappa)
Canadian Association of Head and Neck Surgical Oncology (CAHNSO) guidelines	91.7	77.8	56.3	72.2	100	50	74.7	0.93
Initial guidance for head and neck cancer management during COVID-19 pandemic in consultation with ENT UK	91.7	72.2	50.0	100	93.8	50.0	76.3	0.79
Recommandations pour la priorisation des patients en contexte de pandémie de COVID-19—Volet Cancers ORL/tête et cou	100	100	70.8	94.4	95.8	0	76.9	0.91
BAETS—British association of endocrine and thyroid surgeons	100	86.1	54.2	94.4	95.8	0	71.8	0.73
American College of Surgery—COVID 19: Electives case triage guidelines for surgical care	83.3	61.1	51.0	86.1	83.3	4.2	61.5	0.71
Protocolo interno COVID-19 para consultas y prácticas del servicio de Otorrinolaringología	100	100	59.4	100	83.3	0	73.8	0.92
French consensus on management of head and neck cancer surgery during COVID-19 pandemic	100	100	44.8	77.8	95.8	100	86.4	0.76
Statement from The Royal College of Otolaryngologists—Head and Neck Surgeons of Thailand	80.6	44.4	21.9	80.6	60.4	0	48.0	0.61
Royal Australasian College of Surgeons guidelines for the management of surgical patients during the COVID-19 pandemic	94.4	61.1	45.8	100	62.5	0	60.6	0.77
ASOHNS—Review of Guidance for PPE for ENT surgeons during the COVID-19 Pandemic	83.3	72.2	61.5	94.4	70.8	0	63.7	0.39

**Table 2** (continued)

Guideline organization or society	Scope and purpose	Stakeholder involvement	Rigour and development	Clarity and presentation	Applicability	Editorial independence	Mean domain scores (%)	Agreement between appraisers (Cohen's Kappa)
Western Australian ENT Recommendations for PPE for Aerosol Generating Procedures during COVID-19 Pandemic	88.9	75	53.1	100	77.1	0	65.7	0.74
Recommendations compiled by the University of Cape Town Division of Otolaryngology	88.9	58.3	50	100	70.8	0	61.3	0.82
Sociedad Chilena de Otorrinolaringología	100	52.8	52.1	94.4	64.6	0	60.6	0.65
Sociedad Espanola de Otorrinolaringología y Cirugía de Cabeza y Cuello	100	72.2	56.3	100	79.2	16.7	70.7	0.78
Recomendaciones secomcyc en relacion con la cirugia y COVID-19	16.7	16.7	24.0	88.9	56.3	0	33.7	0.71
Endocrine Surgery in the Coronavirus Disease 2019 Pandemic	100	66.7	66.7	100	66.7	75	79.2	0.63
Irish Head and Neck Society Considerations on H&N during COVID-19	100	47.2	57.3	100	75	0	63.3	0.77
JAMA Otolaryngology–Head and Neck Surgery: Safety Recommendations for Evaluation and Surgery of the Head and Neck During the COVID-19 Pandemic	100	88.9	74.0	94.4	70.8	100	88.0	0.57
The American Laryngological, Rhinological and Otological Society, Inc. COVID-19 and the Otolaryngologist: Preliminary Evidence-Based Review	100	77.8	60.4	100	75	100	85.5	0.75
HN Cancer Care Guidelines during COVID-19 Epidemic: Northern California	100	83.3	35.4	100	87.5	0	67.7	0.53

**Table 2** (continued)

Guideline organization or society	Scope and purpose	Stakeholder involvement	Rigour and development	Clarity and presentation	Applicability	Editorial independence	Mean domain scores (%)	Agreement between appraisers (Cohen's Kappa)
American academy of otolaryngology-head and neck surgery: Guidance for Return to Practice for Otolaryngology-Head and Neck Surgery	100	55.6	56.3	100	68.8	0	63.4	0.68
Recomendação da SBCCP sobre atendimento médico na; Especialidade durante epidemia de COVID-19	69.4	61.1	42.7	63.9	75	75	64.5	0.63
Piano strategico per la gestione del paziente orl durante il periodo di transizione a seguito della pandemia per il COVID-19	100	83.3	55.2	75	72,9	50	72,7	0.69
Mean	90.4	66.5	52.1	92.0	77.4	27.0	67.7	0.72
Standard deviation	18.2	24.4	12.6	10.8	12.5	38.3	12.3	0.12

### Stakeholder involvement

This domain ensures that the guidelines report the names of the people involved in the redaction of the document. Most of the guidelines reported a complete list of the author's names or reported at least the society responsible for the document. The target population was commonly clearly identified in the references. However, the view and preferences of the target population is a point that was not frequently reported, which can explain the lower scores in this sub-section. The mean score for this section was 70.2 with 7 guidelines scoring > 80 [6, 8, 11, 14, 18, 20, 23].

### Rigour of development

The results of the different sections in this domain were very mixed. The mean score was 52.1 with two guidelines scoring > 70 [6, 9]. A minority of the guidelines reported the search method or inclusion criteria for the design of their documents and none of them reported the methods used to formulate recommendations. This can be explained by the urgency of the context in which the guidelines were published. However, strengths and limitations of the guidelines, the consideration of benefit and harm as well as the selected strategy to update the documents were generally well cited.

### Clarity and presentation

The majority of the guidelines presented clear recommendations that were easy to identify and demonstrated management options. Few offered checklists and algorithms. In fact, this domain had the highest mean score of 92.0 with 11 guidelines having a perfect 100 score [8, 10, 11, 13, 14, 17, 19, 21, 24, 25, 27].

### Applicability

Applicability was well reported in the guidelines, especially regarding specific facilitators and barriers, which took the COVID context in consideration. Monitoring and auditing criteria were often lacking in the guidelines. The overall score was good, with a mean of 77.4 and with 8 guidelines with a score > 80 [5–7, 11, 14, 17, 18, 20].

### Editorial independence

Funding body and conflicts of interests were either well reported or absent. Only a minority of guidelines cited conflicts of interest. However, this domain is not as relevant in the pandemic context as most of the guidelines were produced by international societies.

## Overall assessment

Twenty [5, 6, 8–11, 13–21, 23, 25–28] out of the 23 guidelines showed an overall appreciation score of 6 and above and all the guidelines were assessed as recommended for the care of patients with head and neck cancer in the COVID-19 context.

The mean scores (range; SD) for the domains were the following: scope and purpose 90.8% (16.7–100%; SD 18.2); stakeholder involvement 70.2% (16.7–100%; SD 19.9); rigour of development 52.1% (21.9–74.0%; SD 12.6); clarity of presentation 92.0% (63.9–100%; SD 10.8); applicability 77.4% (56.3–100%; SD 12.5) and editorial independence 26.9% (0–100%; SD 38.3). The kappa values ranged from 0.39 to very good 0.93. The overall inter-rater agreement was intraclass correlation = 0.72, indicating good strength of agreement.

## Statements

The following statements are a consensus of the guidelines and recommendations available regarding the management of head and neck oncology patients in the COVID-19 context. As the pandemic continues and otolaryngologists see a need to redesign their practice, these statements serve as guidance in their daily clinical activities. They are adapted to the gradual resumption of activities in the new context of COVID-19. Reviews, updates and revisions are expected in this exceptional situation.

### 1. *How to manage new patients and referrals for malignancy suspicions?*

As mandated by the COVID-19 context, social contacts must be limited to minimize virus transmission. Therefore, reorganization of the otolaryngology clinics and management of new patients' referrals to head and neck cancer clinics is needed. Guidelines included in this review recommend performing triage, in order to determine which patients require face-to-face visits, telemedicine consultation or appointment deferral. When possible, first consultation for new referrals should be conducted by telephone or videoconference, to assess the need or urgency to evaluate the patient in person. New patients with high suspicion for malignancy require face-to-face consultations [20, 23]. In the current context, referrals for benign and non-cancer diseases should be delayed, but it is recommended that physicians keep track of delayed patients and reevaluate them frequently. In-clinic follow-ups should be scheduled when the COVID-19 situation improves. New referrals for emergent or time-sensitive pathologies should be evaluated in clinic. These include rapidly evolving neck masses or patients with stridor [17]. Regarding follow-up appoint-

ments for oncology patients, certain conditions are non-deferrable according to the Society of Otolaryngology in Spain. These include patients with signs or symptoms of recurrent diseases, verification of treatment response and neck infections [21].

Some adjustments are recommended for in-clinic visits. Patients at risk of suffering from complications of COVID-19 should be prioritized to minimize time in hospital when phone consultation is not an option [19]. All patients should have a phone screening for symptoms of COVID-19 and for contact with positive cases prior to visiting. Waiting rooms and hallways should allow a two-meter distance between people to respect social distancing guidelines. Patients should also be advised to come to the clinic alone and to wear a mask at all times [13]. As the COVID-19 context keeps evolving, and facing the high probability of a second wave, measures to limit the number of patients in clinic and contact between people should be maintained. Patient prioritization should, however, take place according to the phases of the crisis [11] with a rigorous schedule to keep track of deferred appointments.

### 2. *What workup and investigations can we go forward with for oncological assessment?*

Diagnostic workup and investigations in head and neck oncology patients include imaging, biopsies and repeated examinations, such as flexible laryngoscopy. However, due to the COVID-19 pandemic, the number of patients in the hospital has to be limited. In this context, diagnostic workup for benign pathologies or low-risk malignancies is recommended to be deferred. Also, in an asymptomatic or stable patient, imaging follow-up can be postponed to the next follow-up cycle [11]. Patients whose workup is postponed should be advised to watch for new symptoms and to contact the clinic or nurse for any change in their condition. Biopsies and imaging must be limited to patients with a high risk of malignancies or for symptomatic patients. Diagnostic workup must be reduced to a minimum and should be exclusively for treatment decision making. In order to minimize time spent in the hospital, all investigations should be done the same day [6]. If multiple investigations and treatments are required, they should be performed in a single hospital stay [20].

Flexible laryngoscopy is considered to be an aerosol generating procedure [5, 6, 10–22]. Given the high proportion of infected asymptomatic patients, flexible laryngoscopies should be postponed. However, ORL-HNS can perform flexible laryngoscopies when it is deemed that it will reduce the patient's morbidity in the next 30 days [10, 14]. If the flexible laryngoscopy is mandatory for a life-threatening pathology or essential for decision-making, it should be performed in aerosol-



generating procedure precautions. If the COVID-19 status is negative or unknown in an asymptomatic patient, the examination should be performed by the treating physician with the least amount of people in the room. It is advised to perform flexible laryngoscopy with a video camera and tower and to record the exam to allow another specialist to consult it rather than repeating it. If topical analgesia is necessary, the use of pledgets is recommended over sprays. The personal protective equipment for the procedure should include scrubs, gown, N95 mask, face shield or eye protection and gloves. If the patient is COVID+ or presumed positive with symptoms, the procedure should be performed in a negative pressure room with the addition of a surgical hood, double gloves and a powered air purifying respirators (PAPR) if available.

If a biopsy in the mouth is necessary, guidelines from Spain recommended to mouthwash with oxidizing agents such as 1% hydrogen peroxide or 0.2% providone iodine to reduce the load of microbes in saliva [22].

Finally, regarding thyroid nodules, an observation strategy can be recommended with follow-up in 6 to 12 months unless the nodule is enlarging or unless it falls in the criteria indicated for biopsy [18]. Workup and investigations should therefore be minimized to what is essential for proper patient management. Also, follow-up should be closely maintained if the investigations are delayed.

### 3. *What are the prioritization recommendations for oncological surgeries?*

Surgical planning should take into consideration the impact on patient outcome when delaying surgeries against the inherent risk of contamination from SARS-CoV-2 virus when conducting a surgery. In most guidelines included in this review, the waiting time recommended for oncological surgeries is divided into three groups. The first group is for patients requiring emergent surgeries, which typically includes cancers with airway compromise or with hemorrhage [6, 20, 26]. The second group is composed of surgeries which should not be rescheduled for more than 4 to 6 weeks, such as high stage squamous cell cancers of the aerodigestive tract (oral cavity, oropharynx, larynx, hypopharynx and nasopharynx), cancers with impending airway compromise, high grade or progressive salivary gland cancers, T3 or T4 melanoma, skin cancers with regional disease or with progression, thyroid cancers with aerodigestive invasion or with locoregional metastasis or with progression, anaplastic thyroid cancers and recurrent or persistent cancer which requires a salvage surgery [5, 8, 11, 15, 18, 20, 22, 23, 26, 29]. These are time-sensitive pathologies in whom longer delay can have important consequences on disease progression and comorbidity. The third group

is composed of surgeries that can be postponed for more than 6 weeks, such as low-grade squamous cell cancers of the upper aerodigestive tract, low-grade and non-progressive salivary gland cancers, non-progressive and non-metastatic skin cancers, well-differentiated thyroid cancers (papillary and follicular thyroid cancers), medullary thyroid cancers and superficial lesions of the vocal cords [5, 8, 11, 14, 15, 18, 20, 22, 26].

### 4. *How should COVID-19 status be assessed prior to surgery?*

It is unanimously recommended by all guidelines providing information on COVID-19 status prior to a surgery, to perform a COVID-19 test using viral polymerase chain reaction reverse transcription (PCR-RT) if time allows it. Non-emergent procedures should not be performed until the result is available. It is recommended to proceed with the surgery if the COVID-19 test is negative. Five societies recommend two negative tests with an interval between them [19, 21, 23, 25, 26]. The rest of the guidelines recommend a single test 24 h prior to the surgery [11, 20, 24] or do not specify the number of tests required. Two societies recommend the use of antibody testing if available [23, 25]. Guidelines from France recommend chest CT-scan 24 h before surgery [20]. The surgery should be postponed at least 14 days if the COVID-19 status comes back positive. If the surgery must take place in an urgent setting and the COVID-19 status is positive or cannot be determined, the surgery should take place in full COVID-19 precautions and in a dedicated operating room. All unknown COVID-19 statuses should be considered as positive. It is recommended to contact patients a few days prior to their surgery to investigate for COVID-19 symptoms and risks factors [20]. After the patient COVID-19 testing, the patient should remain self-isolated until the day of the surgery [13].

### 5. *What personal protection equipment (PPE) should be worn for oncological surgeries of the head and neck?*

PPE is essential to minimize exposure of the otolaryngology team to SARS-CoV-2 virus. The otolaryngology team must be familiar with procedures to properly put on and safely dispose PPE [26]. Surgical masks protect against droplets transmission while N95 masks or PAPR protect against aerosol transmission [13]. PAPR offers better protection against aerosols when compared to N95, but is incompatible with the use of a headlamp, microscope, or loupes [7]. Eye protection includes goggles and face shield.

The American Academy of Otolaryngology-Head and Neck Surgery recommends adding the following in the preoperative timeout: patient's COVID-19 testing status, appropriate PPE to use and possible methods of transmission (droplets or aerosols) during surgery [13].



The level of PPE required depends on the patient's COVID-19 testing status, the patient's symptoms and the surgery's ability to produce aerosols. All surgeries that require manipulation of the mucosa of the upper aerodigestive tract is considered an aerosol-generating procedure. If the patient has an unknown or negative COVID-19 status, is asymptomatic and requires an aerosol generating surgery, the surgical team must wear a PAPR or N95 mask, eye protection, an impermeable gown, and gloves [9, 24, 26]. If the patient has an unknown or negative COVID-19 status, is asymptomatic and requires a non-aerosol generating surgery, the surgical team must wear a surgical mask, eye protection, a gown and gloves [9, 24, 26]. If the patient has an unknown COVID-19 status but is presenting symptoms and requires a non-aerosol generating surgery, the surgical team must wear a PAPR or N95 mask, eye protection, a gown, foot and ankle covers and gloves [9]. For all patients who are COVID-19 positive and require an aerosol generating surgery, the surgical team must wear a PAPR or a N95 mask with eye protection, an impervious gown, foot and ankle covers and gloves [8, 24]. The surgery must also be conducted in a designated operating room with negative pressure [25]. If the patient is COVID-19 positive and requires a non-aerosol generating surgery, the surgical team must wear a PPAR or N95 mask, eye protection, a gown and double gloves [9]. PPE information is summarized in Table 3. Guidelines from Cape Town (South Africa) recommend to put a transparent drape over COVID-19 positive patient's head and neck [24]. In an emergency, the patient should always be considered as COVID-19 positive.

#### 6. Who can be in the operating room?

According to all guidelines considered for this review, only essential staff should be in the operating room. ORL-HNS aged of 60 years and older, or with comorbidities are advised not to participate in clinical activi-

ties [15]. Residents can be part of the operating team only if they are required for the surgery. Obviously, the most experienced residents are prioritized. Unless otherwise advised by anesthesiologists, ORL-HNS and their residents should not be in the operating room during intubation, because it is an aerosol-generating procedure [6].

In order to minimize contact and virus transmission, some guidelines suggest dividing the otolaryngology team (surgeons and residents) in two sub-teams. Each sub-team works for a pre-established period and then rotates with the other sub-team. If, unfortunately, one sub-team is exposed to SARS-Cov2 virus and requires quarantine, the other sub-team is available to take over [15, 24, 25].

According to Australian guidelines, surgeries are expected to be longer because of the need for PPE and because of surgical techniques used to reduce aerosols. Thus, a second surgical team should be available if the first surgical team is overworked [28].

#### 7. What surgical techniques modifications are recommended?

In order to limit transmission of SARS-CoV-2 virus, guidelines [6, 23, 26, 28] suggest that medical treatments (radiotherapy, chemotherapy, etc.) should be favored over surgical treatments, when a patient's outcome is not different with either modality. If oncologic surgery is the preferred therapeutic option, it would be important to minimize operating time by promoting primary closure over reconstruction [17]. When reconstruction is absolutely necessary, a pedicled flap should be favored over a free flap if possible [19]. The use of powered electrical instruments such as microdebrider or drill is considered as generating aerosols and have the potential of shedding viral particles from blood [21]. Suctions and electrocautery are also considered as aerosol-generating instruments. Their use should be limited

**Table 3** Personal protective equipment choice according to the surgery, the symptoms of the patient and the COVID-19 status

	Aerosol-generating procedure		Non-aerosol generating surgery	
	Unknown or negative COVID-19 status	Positive COVID-19 status	Unknown or negative COVID-19 status	Positive COVID-19 status
PAPR	x	x		x
N95 mask	x	x		x
Surgical mask			x	
Eye protection	x	x	x	x
Gown	x*	x*	x	x
Gloves	x	x	x	x
Foot and ankle covers		x		
Operating room with negative pressure		x		

\*An impervious gown

during surgery when possible [9, 15, 19, 23, 28]. Instead of powered electrical devices, cold dissection should be practiced [13]. Guidelines from Quebec (Canada) do not recommend the use of transoral robotic surgeries (TORS) during the COVID pandemic because it is an aerosol-generating procedure [5].

Additional local vasoconstriction should be considered during aerosol-generating surgeries [13]. Care must be taken in order to avoid disconnecting suction circuits. *The American Academy of Otolaryngology-Head and Neck Surgery guidelines* recommends a barrier between the surgical and the anesthetic team, which can limit the spread of the virus between the operating room staff [13].

8. *Considering the COVID context, should in-person tumor board meetings still take place?*

Most guidelines included in this review do not recommend maintaining in-person tumor board meetings during the COVID pandemic. Although being very relevant but not urgent to the health of patients, most of these meetings cannot respect social distancing recommendations. However, in order to continue to provide the best treatment to patients, most guidelines recommend maintaining tumor board meetings using virtual technologies (teleconference). The only exception is the United Kingdom's guideline, which recommends maintaining the frequency of in-person tumor board meetings, but to reduce the duration and number of participants [17]. Also, guidelines recommend using electronic applications that ensures confidentiality of exchanges [6].

## Discussion

In the unprecedented and rapidly evolving first wave of COVID-19, recommendations were needed in a timely manner. Therefore, prospective data were not yet available on head and neck oncology management. Also, as identified by AGREE scores in this review, the pandemic and urgent context hinders the possibility of building robust guidelines. Statements provided in this study apply to the first and what appears to be the heaviest wave of COVID for now. This review of the literature does not include the recommendations issued or updated after May 2020.

In regard to the second and third waves, we recommend to continue rigorous screening of patients requiring face-to-face consultations. During the first wave, it was advised to reschedule face-to-face appointments for patients with benign and non-cancer diseases and it was recommended to defer in-clinic follow-up. As the COVID-19 pandemic continues, we must ask ourselves as to when should these

patients be seen. Indeed, during the first wave, postponing patients with benign and non-cancer diseases was a short-term solution to what was believed to be a brief pandemic. Now that we understand that we will have to live with this pandemic for a prolonged period of time, these postponed patients must be seen. Face-to-face consultations could be offered in areas where the infection rates are decreasing. Thus, even non-urgent and non-emergent patients could have access to an otolaryngologist, while reducing the risk of transmitting COVID. On the other hand, if infection rates are peaking, face-to-face consultations should once again be avoided. A telemedicine appointment for the postponed patient is still important and can inform on the delay required for the in person consultation.

During the first wave, it was suggested to postpone imaging for asymptomatic and stable oncologic patients. When the second and third wave ensues, some patients cannot be postponed for a year or two. Patients in need of imaging follow-up for oncology follow-up who have been postponed for a cycle or two should be identified and prioritized. There patients could also visit a hospital with low infection rates for a non-urgent imaging follow-up.

Flexible laryngoscopy, an aerosolizing procedure, was postponed for the majority of patients during the first wave. While adequate when initially proposed, this recommendation does not appear to be valid anymore. Considering that this procedure is part of the physical examination, it is becoming more and more difficult to follow the latter recommendation. Guidelines regarding equipment and the amount of people allowed in the room during a flexible laryngoscopy are still relevant.

Unfortunately, most ORL-HNS do not have access to negative pressure rooms in their clinic. However, some institutions have converted regular consultation rooms into negative pressure rooms and most have already a negative pressure room in the emergency or in the intensive care unit, where flexible laryngoscopy of a symptomatic or COVID+ patient could take place.

Patients with aggressive cancers still need to be operated quickly despite the pandemic. It is our responsibility to make sure that these patients are operated within the expected time. In the context of limited access to the operating room, many ORL-HNS can find this challenging but should reinforce in their institution the importance of proceeding in a timely fashion as delays could change the patients' survival and functional outcomes. The prioritization recommendations for oncological surgeries are still adequate for the second and third waves.

Resident's training is most likely compromised by the COVID-19 pandemic. Indeed, there is a reduction in operating room activity and in ambulatory clinic activity. However, it is possible to increase the amount of virtual teaching lessons and scientific activities such as journal clubs.

Additionally, although residents interact with a reduced number of patients, they can take more time to review cases with their attending. Programs might consider using simulators to improve knowledge and skills, especially for junior residents. The reduced surgical activities in elective cases and procedures require a more focused and objective-oriented teaching in the operating room. Programs might consider modifying rotation schedules to prioritize rotations in hospitals with low COVID-19 infectious rates and hence higher surgical activity.

Transoral robotic surgeries (TORS) are not recommended in guidelines elaborated in Quebec, Canada even though they play a significant role in the management of head and neck cancers. Considering the important role of TORS in the diagnosis of unknown primaries and its role as an alternative to radiation therapy for early-stage oropharynx cancers, we recommend a personalized decision-making process before precluding its use.

Reevaluation and modifications of the guidelines are expected as the pandemic evolves and more evidence becomes available. We recognize that many countries are now in the decreasing part of the curve but present recommendations could be useful in the context of an inherent second and third wave.

### Areas of controversies

As the threat of being contaminated by the COVID-19 becomes inherent to the medical practice, protocols are being integrated to ensure a safe environment and the correct use of PPE becomes established. In this setting the role and level of participation of residents needs to be reassessed as they still have a need to learn and we have a responsibility to teach.

Many guidelines downsize the role of surgery in the pandemic era sometimes recommending non-surgical treatment over surgical treatment as it appears that head and neck cancer surgeries such as transoral laser or robotic surgery are aerosol-generating and as such, are considered unsafe in this pandemic era. This needs to be weighed against the daily back and forth travel from home to the hospital for 6 to 7 weeks of patients receiving radiation therapy which might increase the risk of contamination of the patients and the staff involved in their care. For advanced cancers, the choice of bimodal therapy can also be a dilemma as surgery and radiation therapy have the previously mentioned disadvantages, whereas radiation therapy with concomitant chemotherapy involve a potential decrease in immunity for the patient.

Regarding reconstruction after oncological surgery of the head and neck, most guidelines recommend the use of a pedicled flap over a free flap mostly because

it reduces the surgical time and reduces the personnel in the OR [19]. Some pedicled flaps have shown lower hospitalization rates, shorter operative times and lower revision rates compared to free flaps without compromising function and quality of life when used appropriately [30]. In some instances, it could, therefore, reduce the use of resources and might reduce the risk of exposure to the virus. However, the use of free flaps remains necessary for some defects such as circumferential pharyngeal defects or mandibulectomy involving the symphysis and parasymphysis.

The duration of the pandemic is still unknown and the occurrence of a second and third wave is to be expected. At the beginning of the pandemic, delaying treatments of slowly progressive cancers seemed rational but how long can it be done without a significant impact on patients' survival and quality of life? As the pandemic persists, it is necessary to improve our surgical planning in order to increase the number of surgeries performed and, therefore, continue to operate patients with slowly progressive cancers. ORL-HNS and institutions need to adapt to the pandemic and find ways to maintain the surgical flow rate while maintaining a safe environment for healthcare professionals and patients.

### Conclusion

Head and neck oncology is a service which often requires time-sensitive and emergent procedures that must be addressed during the COVID-19 pandemic. However, ORL-HNS are at great risk of contracting SARS-CoV-2 virus due to the high viral load in the upper airway. Patient appointments and surgical prioritization must be adjusted in order to respect pandemic requirements. High-grade malignancies should, however, not be delayed, due to potential serious consequences. COVID-19 testing and adequate PPE precautions are essential in operating rooms, due to the fact that many head and neck interventions are aerosol-generating procedures. Additional data would be required to fully understand clinical impacts of the pandemic on head and neck oncology patients and safety of the whole otolaryngology team. More robust guidelines and recommendations are to be expected.

### Appendix

See Annex 1—Table 4.

**Table 4** Annex 1: Worldwide guideline comparison

Country/society	Last update	New patients/referral	Workup/investigations	Priorization recommendation	Postponing max 30 days	Postponing 30–90 days
Canada	March 30th 2020	<ul style="list-style-type: none"> <li>- Only urgent or emergent referrals for face to face consult</li> <li>- High risk of malignancy considered as urgent referrals</li> <li>- Virtual or telephone consult for referrals with a risk for cancer</li> <li>- Patients with high risks for complications from COVID-19 should be prioritized to minimize time in hospital</li> </ul>	<ul style="list-style-type: none"> <li>- Screening prior to entering clinic (questionnaire, COVID contact risk and body temperature)</li> <li>- Scoping: if COVID or unknown and asymptomatic: scope only once by treating physician, PPE: scrubs, gown, N95, face shield or eye protection, gloves and use of video tower If COVID + or presumed positive (with symptoms): scope once by treating physician, in a negative pressure room, PPE: scrubs, gown, surgical hood, full face shield, double gloves, N95 or PAPR</li> <li>- Biopsies and imaging limited to high risk of malignancy and reduced to minimal modalities</li> <li>- Work-up for low risk malignancies to be deferred to a later date</li> </ul>	<p>Not to reschedule</p> <ul style="list-style-type: none"> <li>- SCC of oral cavity, oropharynx, larynx and hypopharynx</li> <li>- Cancers with impending airway compromise</li> <li>- Papillary thyroid cancer with airway compromise, rapid evolution, bulky disease</li> <li>- High grade or progressive salivary cancer</li> <li>- T3/T4 melanoma</li> <li>- Rapidly progressing cutaneous SCC</li> <li>- Salvage surgery</li> </ul>	NE	NE

**Table 4** (continued)

Country/society	Last update	New patients/referral	Workup/investigations	Priorization recommendation	Postponing 30–90 days	
				Not to reschedule	Postponing max 30 days	
UK	March 17 2020	<ul style="list-style-type: none"> <li>- Immediate referral for cases highly likely to represent malignancy</li> <li>- Referrals less likely to represent cancer should be delayed</li> <li>- Non-cancer or benign cases should be delayed</li> <li>- Patients aged over 70 years who have an urgent cancer criterion should be prioritized to minimize time in hospital</li> <li>- Patients at high risk from COVID 19 + urgent cancer referral criteria should go to a clinical environment that minimizes exposure risk (e.g. One-stop clinics)</li> </ul>	<ul style="list-style-type: none"> <li>- Limit diagnostic workup for low clinical suspicion of malignancy</li> <li>- Where necessary, limit investigations to those modalities that are necessary for safe treatment decision making</li> </ul>	<p>Emergency:</p> <ul style="list-style-type: none"> <li>- Airway obstruction</li> <li>- Neck trauma</li> </ul> <p>Urgent:</p> <ul style="list-style-type: none"> <li>- Lymph node biopsy—lymphoma where core biopsy inadequate</li> <li>- MDT directed Cancer debulking / biopsy</li> </ul>	<ul style="list-style-type: none"> <li>- Biopsy for malignancy in hypopharynx /larynx</li> <li>- MDT directed laryngeal / oropharyngeal / surgery for malignancy</li> </ul>	<ul style="list-style-type: none"> <li>- Micro-laryngoscopy and papilloma resection</li> <li>- Endoscopic treatment of pharyngeal pouch with severe dysphagia</li> </ul>
Quebec	April 15 2020	<ul style="list-style-type: none"> <li>-Promote first consultation via telemedicine</li> <li>-Patients with high malignancy of H&amp;N malignancy should be evaluated in person</li> <li>-All implicated doctors should be present</li> <li>-Referrals for patients with low risk for malignancy should be postponed with a contact number for any change in symptoms. All attendants should keep track of postponed follow-up and reevaluate frequently</li> </ul>	<ul style="list-style-type: none"> <li>-Patients with postponed treatments must be reevaluated frequently to watch for new symptoms</li> <li>-Flexible laryngoscopy should be performed on video once and photo documented for other specialists implicated in the case</li> <li>-PPE should be worn for flexible laryngoscopy</li> <li>-Limit investigations to essential for treatment</li> <li>-If possible, investigations should be performed on the same day of the consultation</li> <li>-Flexible laryngoscopy for COVID + patients should be performed by one physician and in a negative pressured room</li> </ul>	<ul style="list-style-type: none"> <li>-Airway obstruction</li> <li>-Hemorrhage</li> </ul>	<p>4–6 weeks:</p> <ul style="list-style-type: none"> <li>-Stage III–IVA/B malignancies</li> <li>-Risk of airway obstruction</li> <li>-High grade salivary gland malignancies</li> <li>-Salvage surgery</li> </ul>	<ul style="list-style-type: none"> <li>-T1-T2N0 malignancies</li> <li>-Well-differentiated thyroid cancer with no metastasis</li> <li>-Low-grade salivary malignancies</li> </ul>

Table 4 (continued)

Country/society	Last update	New patients/referral	Workup/investigations	Priorization recommendation		
				Not to reschedule	Postponing max 30 days Postponing 30–90 days	
British Association of Endocrine and Thyroid Surgeons	March 2020	<ul style="list-style-type: none"> <li>-Benign cases should be separated from cancer cases and deferred</li> <li>-Telephone consultations should help triage</li> <li>-Patients at high risk for COVID-19 should be seen in an environment that minimizes risk</li> <li>-Patients with rapidly evolving neck masses or stridor should be seen urgently</li> </ul>	<ul style="list-style-type: none"> <li>-Limit workup when low suspicion for malignancy</li> <li>-Robust catch up plan should be in place</li> <li>-Consider observational strategies for suspicious thyroid nodules:</li> <li>Only sampling BTA U3 nodules if &gt; 2.5 cm in maximal dimension</li> <li>Only sampling BTA U4 if &gt; 1.5 cm in maximal dimension</li> <li>Only sampling BTA U5 if &gt; 1 cm in maximal dimension</li> <li>Follow-up in 6 to 12 months if they do not meet these thresholds, but would usually have been sampled—plan to sample either when services normalize or if enlarging at interval assessment</li> </ul>	<ul style="list-style-type: none"> <li>Thyroid cancer with:               <ul style="list-style-type: none"> <li>-Aerodigestive tract obstruction</li> <li>-RLN palsy</li> <li>-Locoregional metastasis</li> <li>-Large, compressive tumors</li> <li>-Clinical concern (rapid growth)</li> <li>-Poorly differentiated and anaplastic thyroid malignancy</li> <li>-Medullary cancer should be managed as clinically appropriate</li> <li>-MEN2 prophylactic surgery in pediatric patients considered high risk</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Suspected Differentiated cancers (PTC and FTC) without compressive symptoms or signs</li> <li>-No evidence of Nodal Metastasis</li> <li>-No Airway issues</li> <li>-No voice changes</li> </ul>	
American College of Surgeons	March 24, 2020	<ul style="list-style-type: none"> <li>-Provisions of cancer care to be made accordingly to the crisis phases and evolution</li> </ul>	NE	<ul style="list-style-type: none"> <li>Limit activities to time-sensitive, urgent and emergent medical conditions</li> </ul>	NE	
Argentine	March 28, 2020	<ul style="list-style-type: none"> <li>-Only urgent cases (to be taken based on the individual decision made by the responsible doctor)</li> <li>-Teleconsultation first for triage with all patients before they visit the clinic</li> <li>-Patients with H&amp;N oncology are at greater risks of complications from COVID-19: important to minimize contact with patients and time in hospital</li> </ul>	<ul style="list-style-type: none"> <li>-No routine flexible laryngoscopy</li> </ul>	<ul style="list-style-type: none"> <li>-Airway obstruction</li> <li>-Sepsis from a H&amp;N infection</li> </ul>	<ul style="list-style-type: none"> <li>-Biopsy for malignancy suspicion</li> <li>-Oncologic surgery of oropharynx</li> <li>-Oncologic surgery for salivary gland malignancies of high grade or rapidly evolutive</li> <li>-Oncologic surgery for oral cavity and oropharynx malignancy with or without reconstruction</li> <li>-Salvage surgery</li> <li>-Tumors at risk for airway compromise</li> </ul>	<ul style="list-style-type: none"> <li>-Head and neck well-differentiated skin cancer without metastasis</li> <li>-Salivary gland tumors of low grade</li> </ul>



**Table 4** (continued)

Country/society	Last update	New patients/referral	Workup/investigations	Priorization recommendation		
				Not to reschedule	Postponing max 30 days	Postponing 30–90 days
France	NE	- New cases of cancer require face-to-face consultations	<p>Group A: PCR-RT detection of COVID +CT-Scan be done less than 24 h before surgery</p> <p>Group B: All necessary investigations and treatments should be performed during a single hospital stay</p> <p>- Flexible laryngoscopy should be limited as much as possible</p> <p>- Avoid flexible laryngoscopy unless judged essential</p> <p>- Perform ENT examination only in necessity</p> <p>NE</p>	<p>Group A: - Life-threatening emergencies (shortness of breath, hemorrhage)</p> <p>Group B: - Aggressive cancers of the salivary glands - Aggressive skin cancers</p> <p>Group C: - Well-differentiated thyroid cancers - Non-progressive skin cancers (Basocellular cancers) - Slow-growing cancers of the salivary glands - Atypical nodules of the salivary glands - Leukoplakia and superficial lesions of the vocal cords</p> <p>NE</p> <p>NE</p>	<p>Group C: - Well-differentiated thyroid cancers - Non-progressive skin cancers (Basocellular cancers) - Slow-growing cancers of the salivary glands - Atypical nodules of the salivary glands - Leukoplakia and superficial lesions of the vocal cords</p> <p>- All elective surgery including low-grade malignancy</p> <p>All other procedures should be deferred</p>	
Thailand	March 23rd 2020	Head and neck cancer clinic to remain open	<p>- Avoid flexible laryngoscopy unless judged essential</p> <p>- Perform ENT examination only in necessity</p> <p>NE</p>	<p>- Emergency cases, progressive airway lesion, high grade malignancy</p> <p>NE</p>	<p>- All elective surgery including low-grade malignancy</p> <p>All other procedures should be deferred</p>	
Royal Australasian College of Surgeons	April 17, 2020	-All referrals triaged -Appointments deferred whenever possible -Outpatient appointments only for urgent cases -Consultations should be taken as teleconsultations when possible	<p>NE</p>	<p>-Acute, life-threatening, emergency procedures</p> <p>-Urgent operations for patients that will come to harm if delayed for 4–6 weeks</p> <p>NE</p>	<p>All other procedures should be deferred</p>	
The Australian Society of Head and Neck Surgery	April 2, 2020	-Delay visits and use telemedicine	<p>-AGP in office should be only if essential and likely to change management</p> <p>-Only essential people should be present</p> <p>-Examinations should be performed in a negative pressure room if patient is COVID+ or high suspicion</p>	<p>-Release of airway obstruction</p> <p>-Management of hemorrhage in the airway</p>	<p>Elective urgent surgeries: -Diagnostic procedures for cancer -Resection of confirmed mucosal H&amp;N cancer -Resection of complex or metastatic skin malignancy -Resection of salivary gland malignancy -Thyroid cancer with airway invasion/suspected anaplastic cancer -Decompensated chronic airway obstruction</p> <p>Routine elective procedures should be deferred</p>	
Western Australia	March 24, 2020	NE	NE	NE	NE	

Table 4 (continued)

Country/society	Last update	New patients/referral	Workup/investigations	Priorization recommendation	
				Not to reschedule	Postponing max 30 days
University of Cape Town—Division of Otolaryngology	NE	<ul style="list-style-type: none"> <li>-Time-sensitive or emergent clinic-care</li> <li>-See only urgent cases</li> <li>-Reschedule all ambulatory visits</li> <li>-Triage + pre-screening via telephone prior to visit</li> <li>-Referrals via video visit</li> </ul>	<ul style="list-style-type: none"> <li>-Avoid flexible laryngoscopy in all cases</li> <li>-If necessary, consider doing in a dedicated space</li> <li>-Avoid instrumentation in the head and neck cavity</li> <li>-Topical medication using pledgets &gt; spray</li> <li>-After flexible laryngoscopy, no use of room for 3 h</li> </ul>	<ul style="list-style-type: none"> <li>-All head and neck cancer surgeries</li> <li>-Any refractory bleeding, ongoing sepsis or acute obstruction of the head and neck, retro/pharyngeal abscess</li> </ul>	<ul style="list-style-type: none"> <li>-Low-acuity surgery, healthy patient (e.g.: sistrunk, LTBs, adenoamygdallectomies)</li> <li>-Intermediate-acuity surgery: not life-threatening but potential for future morbidity/mortality (benign laryngeal surgery)</li> </ul>
Sociedad Chilena de Otorinolaringología	March 22, 2020	<ul style="list-style-type: none"> <li>-Defer all elective ambulatory consultations</li> <li>-Screen for COVID risk factors by phone before consultations</li> </ul>	NE	<ul style="list-style-type: none"> <li>-Urgent surgeries</li> <li>-Time-sensitive pathologies (suspicion or diagnosis of cancer)</li> </ul>	NE
Sociedad Espanola de Otorinolaringología y Cirugía de Cabeza y Cuello	April 20, 2020	<ul style="list-style-type: none"> <li>-Screening for symptoms or risk factors of COVID-19 before consultation (questionnaire)</li> <li>-Readapt clinic to maintain 2 m of distance</li> <li>-Limit consultations and procedures to essentials</li> <li>-Phone contact prior to consultations and educate on aggravating signs to watch</li> <li>-Non-deferrable consultations: oncological referral (telemedicine first), signs of recurrent disease, verification of response to treatment, infection of the neck, traumas and foreign bodies</li> </ul>	<ul style="list-style-type: none"> <li>-Flexible laryngoscopy and rigid nasal endoscopy only when absolutely needed. If performed, with N95, gloves, gown and ocular protection. The use of camera is recommended</li> </ul>	<ul style="list-style-type: none"> <li>-Emergent cases with full COVID PPE if no test preop</li> <li>-Non-deferrable cancer surgeries, infections, traumas and foreign body</li> </ul>	<ul style="list-style-type: none"> <li>-Oncology surgery for oral cavity, oropharynx, larynx, hypopharynx</li> <li>-This includes TORS and laser CO2 techniques</li> </ul>

Table 4 (continued)

Country/society	Last update	New patients/referral	Workup/investigations	Priorization recommendation	Postponing max 30 days	Postponing 30–90 days
SECOMCYC	NE	<ul style="list-style-type: none"> <li>-Revise all consultations to minimize in patient consultations</li> <li>-Favor telemedicine</li> <li>-Inform patients of results by telephone</li> <li>-When in person consultation inevitable, screen for COVID risks factor prior</li> </ul>	<ul style="list-style-type: none"> <li>-If a biopsy in the mouth is necessary, recommended to mouthwash with oxidant agents such as 1 % hydrogen peroxide or 0.2% providone iodine to reduce the load of microbe in saliva</li> </ul>	<p>Not to reschedule</p> <p>Only procedures that would cause harm if postponed (oncology, trauma, infection)</p> <ul style="list-style-type: none"> <li>-Cancer or precancer</li> <li>-Neck trauma and infection</li> <li>-Salivary gland tumors of uncertain pathology</li> <li>-Intractable pain (osteomyelitis, osteonecrosis)</li> <li>-Reconstruction where postponement includes deterioration in feeding or breathing</li> </ul>	NE	NE
MD Anderson	NE	NE	NE	<p>In Phase III of the pandemic: only thyroid cancer requiring acute airway management</p> <p>In Phase I-II: -Resectable anaplastic or poorly differentiated thyroid cancer</p> <ul style="list-style-type: none"> <li>-Aggressive differentiated or medullary thyroid cancer</li> <li>-Large thyroid malignancy with progression</li> <li>-Large goiters with significant airway compression</li> <li>-Suspected parathyroid adenoma with symptomatic hypercalcemia</li> </ul>	<ul style="list-style-type: none"> <li>-Anaplastic, poorly differentiated, and advanced progressive cancers that require major surgery and/or sternotomy be considered in alignment with available hospital resources</li> </ul>	<ul style="list-style-type: none"> <li>-Differentiated thyroid cancer</li> <li>-Medullary thyroid cancer</li> <li>-Intermediate thyroid nodules without documented progression</li> <li>-Thyroid goiters</li> </ul>
Irish Head and Neck Society	April 17, 2020	<ul style="list-style-type: none"> <li>-Patients with red flags should be seen</li> <li>-Patients vulnerable to COVID-19 should have telephone appointment</li> </ul>	<ul style="list-style-type: none"> <li>-Consider all patients presenting to clinic to have COVID in the nasopharynx</li> <li>-Perform flexible laryngoscopy when there is a good clinical indication</li> <li>-Full PPE should be worn (N95 + eye protection)</li> <li>-Flexible laryngoscopy with camera to maintain distance</li> </ul>	NE	NE	NE

Table 4 (continued)

Country/society	Last update	New patients/referral	Workup/investigations	Priorization recommendation	
				Not to reschedule	Postponing 30–90 days
JAMA Otolaryngology	March 31, 2020	<ul style="list-style-type: none"> <li>-Patients should be queried by telephone for symptoms/contact or new and concerning symptoms</li> <li>-Postpone surveillance visits and benign consultations</li> <li>-Only patients in need of a thorough ENT examination should be seen in clinic</li> </ul>	<ul style="list-style-type: none"> <li>-Endoscopic examinations should be limited to patients with a clear indication and need</li> <li>-Topical analgesia with pledgets &gt; sprays</li> <li>-Display on screen</li> <li>-Disposable endoscope if available</li> </ul>	NE	NE
The Laryngoscope	2020	NE	<ul style="list-style-type: none"> <li>-Endoscopic examinations should be performed with the smallest scope, topical analgesia and avoiding sprays</li> <li>-Consider postponing endoscopies if there is no morbidity in the next 30 days</li> </ul>	NE	NE

**Table 4** (continued)

Country/society	Last update	New patients/referral	Workup/investigations	Priorization recommendation
				Not to reschedule      Postponing max 30 days      Postponing 30–90 days
Northern California	March 22nd 2020	Consider using telephone encounter if appropriate information is present in chart to allow clinical decision making	<ul style="list-style-type: none"> <li>- Defer imaging routine imaging, lab testing in asymptomatic/stable patients to next cycle in follow-up schedule</li> <li>- Proceed with standard imaging for new patients or symptomatic patients under surveillance</li> </ul>	<p>NE</p> <ul style="list-style-type: none"> <li>- SCC of the oral cavity, oropharynx, larynx, hypopharynx</li> <li>- Cancers with impending airway compromise</li> <li>- Papillary thyroid cancer with impending airway compromise, rapidly growing, bulky disease</li> <li>- High-grade or progressive salivary cancer</li> <li>- T3/T4 melanoma (see new recommendations for treatment of melanoma)</li> <li>- Rapidly progressing cutaneous SCC with regional disease</li> <li>- Salvage surgery for recurrent/persistent disease</li> <li>- Graves' disease non-responsive to anti-thyroidal medication</li> <li>- Large or substernal goiter with airway compression less than 1 cm tracheal diameter</li> <li>- Hyperparathyroidism non-responsive to medical treatment</li> </ul> <ul style="list-style-type: none"> <li>- Well-differentiated thyroid cancer without metastases or impending airway involvement</li> <li>- Previously treated well-differentiated thyroid cancer patients with increasing thyroglobulin levels</li> <li>- Low-grade salivary gland neoplasm, including benign and low-grade carcinomas</li> <li>- Most melanomas, melanoma in situ</li> <li>- All benign diseases (nerve tumors, paragangliomas, lipomas, etc.)</li> <li>- Cutaneous squamous cell carcinoma without regional disease</li> <li>- Cutaneous basal cell carcinoma</li> </ul>

Table 4 (continued)

Country/society	Last update	New patients/referral	Workup/investigations	Priorization recommendation		
				Not to reschedule	Postponing max 30 days	Postponing 30–90 days
Guidance for return to practice for Otolaryngology—HINS	May 5 2020	<ul style="list-style-type: none"> <li>- Pre-screening should be considered at the time of booking the appointment</li> <li>- Consider informing patients at the time of scheduling to self-quarantine as much as possible</li> <li>- Consider limiting individuals accompanying the patient</li> <li>- All patients should wear a mask</li> </ul>	NE	NE	NE	
Sociedade Brasileira de Cirurgia de Cabeça e Pescoço	March 23th 2020	Oncological cases should not be delayed during the pandemic	Endoscopic investigation or other procedures involving the airway need to be avoided during the pandemic. In case of emergency consider using adequate PPE	NE	NE	NE
Piano strategico per la gestione del paziente orl durante il periodo di transizione a seguito della pandemia per il COVID-19	NE	<ul style="list-style-type: none"> <li>- Reorganization of the otolaryngology clinics and management of new patients' referrals</li> <li>- Phone triage and priority assessment</li> <li>- De visu evaluation of patients with higher suspicion</li> </ul>	<ul style="list-style-type: none"> <li>- Flexible laryngoscopy with precautions</li> <li>- Neck and chest CT</li> </ul>	NE	<ul style="list-style-type: none"> <li>- Malignancies with N+ amenable for surgery have higher priority (than N-)</li> <li>- Higher T have more priority</li> </ul>	NE



Table 4 (continued)

Country/society	Surgical care					Tumor board	Other
	PPE	COVID status	Number of COVID tests	Team	Postop care		
Canada	if COVID—and manipulation of upper aerodigestive tract: scrubs, gowns, double gloves, face shield, N95 mask or PAPR if COVID+and manipulation of upper aerodigestive tract: PAPR, scrubs, gown, double gloves	- All patients should be tested preop for surgery that includes manipulation of the upper aerodigestive tract: - If COVID + : surgery should be postponed if not emergent - If COVID - : surgery can be booked + appropriate PPE + essential personnel	NE	Only essential team	- Non-urgent follow up should be postponed maximize the utilization of virtual/telephone follow-up - In person patient assessments should be limited to urgent or emergent issues	- Should be converted into visual format	Otolaryngologists are at high risk of infection without proper precautions Appropriate local PPE protocols should be followed
UK	NE	NE	NE	NE	- Minimize all follow up appointments - Postponed appointing for patients beyond the period of highest risk for recurrence - Prioritize patients in immediate post-treatment phase and consider longer intervals between follow ups as soon as suitable - Instigate telephone follow up where possible/ appropriate	-Maintain frequency, but minimize duration -Quorate to minimum	NE

Table 4 (continued)

Country/society	Surgical care					
	PPE	COVID status	Number of COVID tests	Team		
Quebec	NE	If COVID + : perform treatment only if urgent and in a dedicated room	NE	NE		
			<ul style="list-style-type: none"> <li>-Prioritize telemedicine when possible for postop follow-up</li> <li>-Prioritize immediate postoperative follow-up (4 weeks)</li> <li>-Having a designated person in the oncology team to ensure follow-up with postponed treatments and answer patients' questions</li> <li>-If new or recurrent symptoms occur during follow-up, a visit in clinic is essential, especially if salvage treatment is considered</li> </ul>	<ul style="list-style-type: none"> <li>-Prioritize non-surgical techniques when expected oncologic results are similar</li> <li>-TORS/robotic surgery is non-recommended</li> <li>-Surgical plan should go in favor to avoid ICU, limit hospitalization and avoid tracheostomy</li> <li>-Limit reconstruction (use of local flap &gt; free flap)</li> </ul>	<ul style="list-style-type: none"> <li>-Recommended to discuss the treatment and make team decisions in this pandemic time</li> <li>-Should be maintained via videoconference</li> </ul>	Other

Table 4 (continued)

Country/society	Surgical care							
	PPE	COVID status	Number of COVID tests	Team	Postop care	Surgical technique	Tumor board	Other
British Association of Endocrine and Thyroid Surgeons	NE	NE	NE	NE	-Postop flexible laryngoscopy should be used only if clinical concern for vocal cord palsy -Clear discharge instructions to avoid emergency visits -Keep patients with severe hypocalcemia to avoid emergency readmissions -Minimize face to face follow-up using telemedicine -Reduce frequency of follow-up appointments	-Preop flexible laryngoscopy should be used selectively (previous surgery, stridor, voice change)	-Maintain frequency -Minimize number of participants to core members -Use dial-in or electronic discussions -Follow national and international guidelines if no quora is obtained	If surgery was delayed, the nodule should be monitored with ultrasound at 20 weeks and if it either grows substantially or if metastatic nodes are identified, surgical management should be initiated as soon as possible
American college of Surgeons	-PPE recommended for procedure in COVID + patient or high suspicion of infection -N95 when performing or present to an aerosol-generating procedure in a COVID + patient or high suspicion of infection -Negative pressure OR is recommended	NE	NE	-Surgeons and personnel not needed for intubation should remain outside of OR -Minimum number of personnel in the OR -Smoke evacuator recommended for electrocautery	-Surgeons and personnel not needed for intubation should remain outside of OR -Minimum number of personnel -PPE should not be the same as worn in procedure	NE	-Maintain tumor boards virtually -Recommendation for institution to establish triage criteria as a shared decision -Patients should be informed that decisions regarding non-urgent cancer surgery are consensus-based	-Weight risks and benefits of delaying surgeries requiring ICU

Table 4 (continued)

Country/society	Surgical care						
	PPE	COVID status	Number of COVID tests	Team	Postop care		
Argentina	<p>PPE for all surgical procedures in the mucosa, even if patient asymptomatic</p> <p>-N95 mask</p> <p>-Ocular protection</p> <p>-Gloves</p> <p>-face shield</p> <p>-Surgical gown</p> <p>-PAPRs when available for surgeries in the nasal cavity, ear and oral cavity</p>	<p>-Consider all unknown COVID status as +</p> <p>-Determine COVID status prior to OR</p>	NE	<p>-Communication with the team prior to intubation and procedure regarding tools, PPE, procedure time, etc</p>	<p>-Patients non-intubated should be transferred to PACU and ward with a mask</p> <p>-Avoid contact with patients in postop of an urgent case</p>	<p>-Maintain contact by telephone with non-urgent patients</p>	
France	<p>Face-to-face consultation: the ENT specialist should wear an N95 mask, a cap, a gown, protective goggles, and gloves</p>	<p>- Contact patients before their consultation or surgery to check for signs of COVID-19 infection</p> <p>- Work-up for COVID-19 should systematically be performed less than 24 h before surgery (PCR + Chest CT scan)</p> <p>- In COVID+, surgery should be postponed</p>	1	NE	<p>- Post-cancer treatment face-to-face follow-up consultations should be postponed as much as possible</p> <p>- Systematic follow-up, such as imaging, should be postponed</p> <p>- Tele-consultations using phone or preferably video calls are recommended</p>	<p>- Favor non-surgical treatment when possible for the same outcomes</p> <p>- Energy devices considered as aerosol-generating procedures</p> <p>- Minimize airway manipulation</p>	<p>- The final decision to postpone should ideally be taken during a Tumor Board meeting</p> <p>- Set up a phone line or an email address for the patient to contact the surgical team</p>

Table 4 (continued)

Country/society	Surgical care					Other	
	PPE	COVID status	Number of COVID tests	Team	Postop care		
Thailand	<p>For non-airway exposure: N95 mask or surgical mask, Goggles, Face shield, Surgical cap, Long gown</p> <p>- For airway exposure or aerosol generating cases: N95 mask, goggles, face shield, surgical cap,</p> <p>- For ENT examination: Surgical mask, goggles or face shield, gloves, waterproof gown or long gown, Toe and heel covering shoes</p> <p>- For flexible laryngoscopy: surgical caps, surgical mask or n95, eye goggles or face shield, gloves, waterproof gown, toe- and heel-covering shoes</p>	<p>- For patients with COVID-like symptoms or history of exposure to the high-risk areas or to the confirmed COVID-19 cases: swab + postponement for 14 days the surgery</p> <p>- All patients visiting to the ENT clinic should be screened for symptoms and history of exposure to the high-risk areas or to the suspecting COVID-19 cases</p> <p>- Swab test within 48 h before surgery</p> <p>- Chest radiograph within 7 days before surgery</p>	1	Reduce team if COVID + or emergency (unknown COVID test result)	<p>- Telephone is used for following up</p>	<p>Attempt should be made to avoid extensive surgery requiring massive resources (post-op ICU or massive blood loss)</p>	<p>NE</p> <p>- The surgical team was divided into two teams: 7 days on work/7 days work at home</p> <p>- Do not use nasal/throat spray for flexible laryngoscopy, use cotton-soak instead</p>

Table 4 (continued)

Country/society	Surgical care						
	PPE	COVID status	Number of COVID tests	Team	Postop care		
Royal Australasian College of Surgeons	<p>PPE for surgery:</p> <ul style="list-style-type: none"> <li>-Regular surgical mask for low risk operations or</li> <li>-Well-fitting face mask (N95), eye protection (goggles or visor preferred), full hair cover, impervious gown, gloves X2 and impervious foot and ankle cover</li> </ul>	<p>The following patients are regarded as high risk for COVID-19</p> <ol style="list-style-type: none"> <li>Positive test for COVID-19</li> <li>Close contact with a confirmed case of COVID-19</li> <li>International travel within the past 14 days</li> <li>Any of the following symptoms: sore throat, cough, shortness of breath, fever &gt; 38C</li> </ol> <p>At least 15% of patients are asymptomatic</p>	NE	<ul style="list-style-type: none"> <li>-Number of people in the OR kept to a minimum</li> <li>-Conversation kept to a minimum</li> <li>-OR should be consultant led with no or one trainee</li> <li>-Consider a second surgical team/back up for long cases</li> </ul>	NE	<p>After the OR, the surgeon should shower as soon as possible and reaching home, should remove footwear outside, keep footwear separate, take work clothes off, shower and wash clothes separately from family's clothes</p>	
					<p>Surgical technique</p> <ul style="list-style-type: none"> <li>-Non-operative management when possible</li> <li>-Procedures that minimize the risk of resource-consuming complications</li> <li>-Energy-based hemostasis devices; Diathermy, laser or ultrasonic plume. Only use with suction</li> <li>-Bone saws, drills, burrs, and nibblers: Use guards, screens, suction-exhaust systems</li> </ul>	Tumor board	Other



Table 4 (continued)

Country/society	Surgical care							
	PPE	COVID status	Number of COVID tests	Team	Postop care	Surgical technique	Tumor board	Other
Australian Society of Head and Neck surgery	<p>-Hand hygiene practices (double glove ensuring cuff of gown covered)</p> <p>-Long-sleeve fluid-impervious gowns</p> <p>-Eye protection (goggles or visor)</p> <p>-Surgical mask</p> <p>-Correctly fitted N95 mask</p> <p>-PAPR</p>	<p>Acute/Emergent (&lt; 48 hr window)</p> <ul style="list-style-type: none"> <li>• AGP: Treat as if COVID 19 + Full PPE</li> <li>• Non AGP Symptomatic or has definite/suspected Triage risk factors: Treat as if COVID 19 + Full PPE</li> <li>• Non AGP Asymptomatic with no definite/suspected Triage risk factors: Treat as per standard practice</li> </ul> <p>Elective urgent (&gt; 48 hr window)</p> <ul style="list-style-type: none"> <li>• AGP: Asymptomatic patients should be operated on with Full PPE</li> <li>• Non AGP Symptomatic or has definite/suspected triage risk factors: Cancel surgery until either fully recovered (2 weeks asymptomatic) or 2 × negative swab tests, 24hrs apart</li> <li>• Non AGP Asymptomatic with no definite/suspected triage risk factors: Treat as per standard practice</li> </ul>	Possibly 2 separated by at least 24 h	-Divide teams to minimize contact and transmission	-Shared decisions to minimize the use of ICU, ventilators, etc.	NE	All clinical and academic meetings should take place using electronic application	<p>High-risk AGP procedure (flexible laryngoscopy, oropharyngeal examination, drainage of peritonsillar abscess):</p> <p>N95 + Eye protection + Surgical cap + Long-sleeve, fluid-impervious gown + Gloves</p> <p>Low-risk AGPs (oral cavity exam (without instrumentation)): Surgical mask + Eye protection + Long-sleeve, fluid-impervious gown + Gloves</p> <p>Non-AGP (neck palpation, and skin lesion examination): Surgical mask + Eye protection + Gloves</p>

Table 4 (continued)

Country/society	Surgical care					Other
	PPE	COVID status	Number of COVID tests	Team	Postop care	
Western Australia	<p>For AGP:</p> <ol style="list-style-type: none"> <li>1. Hand hygiene practices</li> <li>2. Disposable gown ± plastic apron if required</li> <li>3. Disposable N95 mask</li> <li>4. Hood-type theater hat</li> <li>5. Single-use visor or goggles</li> <li>6. Double gloves ensuring cuff of gown covered</li> </ol>	<p>Testing strongly recommended for elective procedures, especially aerosol-generating procedures</p> <p>If suspected or confirmed COVID, these procedures should take place only if essential</p>	NE	NE	NE	<p>Head and neck oncology procedures considered high risk for aerosol-generating procedures:</p> <ul style="list-style-type: none"> <li>-Tracheostomy</li> <li>-Open suctioning</li> <li>-Surgery in which high-speed devices are used</li> <li>-Any examination or procedure performed on the aerodigestive tract (oral cavity/ oropharynx/hypopharynx/larynx/esophagus)</li> </ul>

Table 4 (continued)

Country/society	Surgical care							
	PPE	COVID status	Number of COVID tests	Team	Postop care	Surgical technique	Tumor board	Other
University of Cape Town-Division of otolaryngology	Non-aerosol generating procedure or consultation/ward with COVID unknown: non-sterile gloves, apron, eye protection, surgical mask Aerosol generating or consultation/ward with COVID + : Non-sterile gloves, N95, gown, face shield. For surgery, add plastic drape over patient's H&N If COVID + and AGP, ideally PAPR + negative pressure OR Consider negative pressure OR for high-risk endoscopy	-Any tracheostomy patient must be tested negative	2	ENT surgeons and team members in small divisions should not work in the front Recommend: 14 days on and 14 days off ENT service where possible to self-quarantine and identify infected staff -Recommend a dedicated OR for COVID ENT and thoracic surgeons	NE	-Avoid panendoscopy prior to primary cancer surgery -Avoid jet ventilation -Avoid nasal intubation	NE	Patients who are over 60 years, are hypertensive, diabetic or with any cardiovascular or chronic lung disease, are at VERY high risk for surgery and are unlikely to survive a COVID-19 infection post-operatively Active discussion of choice between anesthesia and ICU before airway case

Table 4 (continued)

Country/society	Surgical care							
	PPE	COVID status	Number of COVID tests	Team	Postop care	Surgical technique	Tumor board	Other
Sociedad Chilena de Otorrinolaringología	-For AGP: N95, ocular protection, gloves, waterproof gown -Procedure should be in negative pressure room -If possible: all surgeries in the oral cavity, airway and nose with PAPR	If time allows: test every patient for COVID prior to surgery	NE	-Physicians aged 60 years and older or with comorbidities to defer clinical activities until the highly contagious phase has passed -Rotation of ENT team of various days to avoid spread within team -Minimal team members and most experienced members	NE	-Less time-consuming technique	-Discuss cases prior to intervention, especially if AGP	NE
Sociedad Española de Otorrinolaringología y Cirugía de Cabeza y Cuello	-Negative pressure OR for COVID + or suspected cases -For COVID unknown or positive: surgical gown, double surgical gloves, surgical footwear, double surgical cap, glasses, N95 mask if unknown, PAPR if COVID + For COVID -: surgical cap, double surgical gloves, surgical gown, surgical mask, glasses, surgical footwear	-Screening for COVID risk factors preop and PCR for COVID tests. Whenever possible, PCR testing will be accompanied by IgM and IgG studies	2 if antibody study not possible. 24 h prior to surgery	-ENT of advanced age or with comorbidities to avoid contact with patients at risk -Avoid presence of students and observers in the OR -Experienced surgeons to minimize operating time	-Postoperative information to be given to families via telemedicine -Postop patient to go to PACU under anesthesia care	-Avoid electric instruments such as microdebrider, drills and electrical blades as much as possible -Minimize operating time -Using closed aspiration circuits	Decisions regarding treatment in the operating room should be made with a multidisciplinary team	-Purification of the air is mandatory after intubation

Table 4 (continued)

Country/society	Surgical care					Other
	PPE	COVID status	Number of COVID tests	Team	Postop care	
SECOMCYC	-Impermeable gown -N95 mask -Glasses -Face shield -Gloves (1 pair)	If suspected, use precautions as if positive PPE for COVID+ and suspected	Not if urgent	NE	NE	NE
MD Anderson	NE	NE	NE	NE	NE	-Suspend activity or maintain by phone or by videoconference  -Rapid and safe surgery  NE  NE  NE  -Most surgeries for thyroid nodules, goiters and differentiated, medullary thyroid pathologies can be deferred safely -Consider TSH suppression for thyroid cancers -Systemic therapies for targeted mutations for specific thyroid cancers -Medical treatment for hyperfunctioning endocrine tumors

Table 4 (continued)

Country/society	Surgical care				
	PPE	COVID status	Number of COVID tests	Team	Postop care
Irish Head and Neck Society	All procedures in mucosal H&N should be performed in full PPE (with N95 masks and eye protection)	All patients should isolate 2 weeks prior to intervention -COVID testing should be mandatory prior to H&N mucosal surgery -Surgery should not be performed on a COVID+ patient	2 separated by an interval and/or testing combined with chest CT scan 24–48 h prior to OR	NE	NE
JAMA Otolaryngology	-High-risk procedures in a negative patient or any in a COVID+ should take place in a negative pressure room with appropriate PPE for every member	-COVID status should be known before any procedure	NE	NE	NE
The Laryngoscope	NE	NE	NE	NE	NE
					Other
					Considerations regarding open surgery on mucosal H&N cancers during the COVID crisis should thus consider the goals and likely outcomes of surgery; the likelihood of curing the cancer; the realistic reconstructive options available and likely functional outcomes; safety considerations for theater personnel and those delivering postoperative care; the consequences of delaying surgery; and alternative non-surgical modalities of treatment
					-Should be maintained with people with minimal distancing -Videoconference or dialing-in should be encouraged
					-Considerations to reduce length and complexity of surgery: -Primary closure or pedicled flap instead of free flap -Laryngectomy should not undergo primary puncture
					-Powered devices or ultrasonic shears contribute to aerosolization of virus from bloodstream

Table 4 (continued)

Country/society	Surgical care					Other	
	PPE	COVID status	Number of COVID tests	Team	Postop care		
Northern California	Single person performing endoscopic exam in full PPE (n95, goggles/face shield, plastic gown)	NE	Single COVID testing for high-risk procedure 48 h before surgery testing. If testing not available, surgery should not be delayed	- Cases should be attended with minimal number of assistant residents	NE	NE	<ul style="list-style-type: none"> <li>- Patients should be called 48 h prior to surgery to confirm the absence of COVID symptoms</li> <li>- The surgical team should be outside of the OR for 20 min after the intubation</li> <li>- Limit visit to physical exam</li> <li>- Palliative nivolumab may be changed to every 4-week therapy</li> <li>- Some patients who have stable or well-controlled disease may elect to postpone treatment based on discussion with their treating team</li> </ul>

Table 4 (continued)

Country/society	Surgical care						
	PPE	COVID status	Number of COVID tests	Team	Postop care		
Guidance for return to practice for Otolaryngology—HNS	<ul style="list-style-type: none"> <li>- Consider wearing dedicated scrubs or other easily washed clothing for the clinic and changing prior to leaving the facility</li> <li>- COVID +: N95 or higher-rated mask, face shield, gown, and gloves</li> <li>- Hair and shoe covers may be considered based on risk of splashing and droplet formation, eye protection</li> <li>- COVID unknown/negative + intervention in respiratory mucosa = N95 or PAPR; eye protection, gloves</li> <li>- COVID unknown/negative + potential aerosol-generating instrumentation = N95 or PAPR; eye protection, gloves</li> </ul>	<ul style="list-style-type: none"> <li>- Least once with COVID-19 PCR testing (swab) prior to the surgical date unless delay caused by testing will result in harm to the patient</li> <li>- After the patient is tested for COVID-19, the patient should remain self-isolated until the procedure date</li> <li>- We recommend non-emergent procedures not be performed until the results of the test are available</li> <li>- For life-threatening emergencies for which pre-operative COVID-19 testing is not an option, the patient should be presumed to be positive</li> </ul>	NE	<ul style="list-style-type: none"> <li>- Office procedures should be performed with as few staff present as possible</li> <li>- In high-risk patients, procedures may be carried out by the most experienced surgeons to mitigate risk to staff and ensure minimal OR time. Trainees participation should be guided by local policies</li> </ul>	<ul style="list-style-type: none"> <li>- Consider the use of telemedicine or patients in whom the physical exam can be postponed</li> </ul>	<ul style="list-style-type: none"> <li>- Limit atomizer and nebulizer use as much as possible</li> <li>- When possible, attempts should be made to reduce particle distribution radius with surgical field coverage (e.g., draping), air evacuation (e.g., suction), and limiting the use of technology that theoretically may cause aerosolization</li> <li>- A barrier/drape may be placed between the surgical field and anesthesia</li> <li>- Consideration should be given to using additional local vasoconstriction and cold techniques during soft tissue dissection</li> </ul>	<ul style="list-style-type: none"> <li>- “PPE timeout” as part of the standard preoperative and intraoperative checklist in the operating room</li> <li>- The number of patients in the waiting room to be monitored</li> <li>- The number of items on counters should be a bare minimum</li> <li>- Designate a single room, microscope, and audiology booth for COVID-19 positive patients and persons under investigation and use an approved cleaning protocol after each use</li> </ul>



Table 4 (continued)

Country/society	Surgical care							
	PPE	COVID status	Number of COVID tests	Team	Postop care			
Sociedade Brasileira de Cirurgia de Cabeça e Pescoço	In any COVID-19 suspicious case	NE	NE	NE	-Minimize all follow-up appointments - Postponed appointing for patients beyond the period of highest risk for recurrence - Instigate telephone follow up where possible/ appropriate	NE	NE	Otolaryngologists are at high risk of infection and those older than 60 years need to avoid to check COVID-19 patients
Piano strategico per la gestione del paziente orl durante il periodo di transizione a seguito della pandemia per il COVID-19	-Negative PCR test: Two surgical caps, two pairs of surgical gloves, surgical mask, eye protection -Positive PCR test: two surgical caps, two pairs of surgical gloves, two water-resistant surgical gowns, surgical shoes with disposable covers, FFP2/3 and surgical mask, eye protection	-Two nasal swabs + PCR-RT -Determined 4 days and 2 days prior to admission -Antibody IgM + IgG	2	Only essential staff	NE	-Medical treatments favored over surgical treatments when outcome is not different -Limit the use of powered electrical instruments for shedding of viral particles from the blood	-Telemedicine for tumor boards	Telemedicine for multidisciplinary oncological evaluation

PPE personal protective equipment, PAPER powered air purifying respirator, SCC squamous cell carcinoma, NE non-specified, MDT multi-disciplinary team, H&N head and neck, sx symptoms, BTA British Thyroid Association, MEN2 multiple endocrine neoplasia type 2, RLN recurrent laryngeal nerve, PTC papillary thyroid cancer, FTC follicular thyroid cancer, PCR polymerase chain reaction, CT-Scan computed tomography scan, ENT ear, nose and throat, AGP aerosol generating procedure, LTB laryngo-tracheo-bronchoscopy, TORS transoral robotic surgery, BTA-U British Thyroid Association-Ultrasound, N + nodes positive in TNM grading, N- node negative in TNM grading, T tumour in TNM grading, ICU intensive care unit, PACU post-anesthesia care unit, OR operating room, TSH thyroid stimulating hormone

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