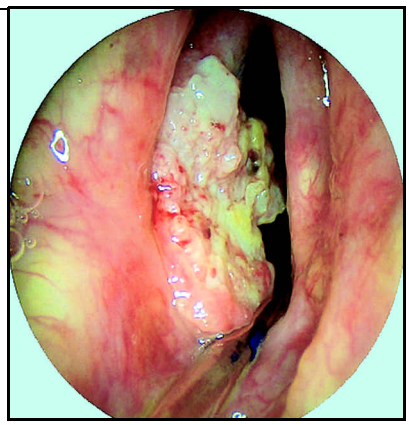
Otolaryngology/head and neck surgery



TODAY, THE SPECIALTY OF OTOLARYNGOLOGY/head and neck surgery encompasses a broad sweep of both medical and surgical diseases, with an emphasis on early diagnosis with the help of the telescope and the microscope. Major advances have been made in otoneurosurgery, rhinology, microlaryngeal and laser surgery, head and neck cancer surgery and paediatric otolaryngology.

Otology. All patients with asymmetric ear symptoms must first have audiometric assessment then a gadolinium-enhanced T1-weighted magnetic resonance imaging scan, which is sufficiently reliable to detect acoustic neuroma. The translabyrinthine (or sometimes middle cranial fossa) approach to acoustic neuromas and other tumours and cysts in the posterior cranial fossa allows preservation of facial nerve function in more than 95% of patients. Recently, skull-base surgeons have found an application for endoscopy of the cerebellopontine angle and have pioneered new approaches to the petroclival region.

The investigation of dizziness, vertigo and imbalance is based on fundamental biological research and the findings from painstaking gross, microscopic and electronmicroscopic studies of the sensorineural elements of the cochlear and vestibular systems. The importance of a rehabilitation regimen and the benefit of vestibular manoeuvres for labyrinthine balance disorders have finally been recognised. Vestibular nerve section has been virtually replaced by controlled injection of gentamicin into the middle ear.

With better understanding of inner-ear pathology, refined assessment of cochlear function, improved implantable devices and structured rehabilitation programs, cochlear implantation has become a routine operation. More predictable outcomes have widened the indications for younger children and for some individuals with marginal benefit from their hearing aid.

Rhinology. In functional endoscopic sinus surgery (FESS) there is currently a more conservative attitude than previously, especially for paediatric patients. Because the ethmoid is such a complex structure, comprehensive computed tomography (CT) imaging is vital. In conjunction with CT scans, computer-controlled image guidance systems are now used in some centres for FESS operations and for transnasal hypophysectomy.

This demanding "keyhole" surgery, performed with rigid telescopes and purpose-designed, slender instruments, requires a sound knowledge of the physiology of the mucociliary mechanism and the anatomy of the nasal cavities and paranasal sinuses. The surgeon must be familiar with the intricate anatomy and many individual variations of the ethmoid air cell system, whose delicate bony structures and lining mucosa require dexterous operative skills. The radical external operations of the past have mostly been replaced by these endoscopic techniques, which follow normal anatomical routes and aim to establish near-normal ventilation and drainage.

Laryngology. Clinical interest in voice problems has been stimulated as research reveals a better understanding of laryngeal physiology in relation to the mass, elasticity, age-related contractility changes,[1] viscoelastic qualities and vibration characteristics of the vocal cords. Our understanding will be enhanced by current investigations into the innervation of the larynx by central motor fibres from brainstem nuclei; cortical, subcortical and brainstem regulation; the relevance of small- and large-diameter axons; and nerve myelination.

The field of neurolaryngology includes investigation of unilateral and bilateral vocal cord paralysis, paradoxical vocal cord movement and voice disorders in other neurological diseases such as multiple sclerosis and Parkinson's disease. Spasmodic dysphonia, previously untreatable, is now managed by botulinum toxin injections into the vocal folds.

For diagnostic evaluation and treatment, the voice specialist and the speech pathologist use videostroboscopy, laryngeal electromyography, voice recording, objective acoustic analysis and aerodynamic assessment methods. Telescopes and special-purpose instruments (such as lasers and laryngeal microdebriders) have led to exciting advances in surgical intervention. The voice can now be restored or improved after endoscopic microsurgery or laser surgery for benign, premalignant or early malignant lesions.

Head and neck surgery. Squamous cell carcinoma affects many thousands of people globally each year, yet currently available treatment with surgery, radiotherapy and chemotherapy is less than satisfactory. The five-year survival rate has shown little improvement over the past 20 years. For the future, we look forward to advances in molecular medicine and gene therapy that may improve the management of head and neck cancer, allowing preservation of function and higher cure rates. Novel molecular markers, such as the p53 gene, angiogenesis-related markers, cyclin D1 and epidermal growth factor receptor, are under intense study for their clinical implications.[2]

Australian otolaryngology/head and neck surgery maintains world-best standards in every respect. For young surgeons it is a popular and attractive specialty that promises an exciting and stimulating future.

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Figure: Digital photograph of a squamous cell carcinoma of the left vocal cord.

1. Ishi K, Yamashita K, Akita M, Hirose H. Age-related development of the arrangement of connective tissue fibres in the lamina propria of the human vocal fold. *Ann Otol Rhinol Laryngol* 2001; 109: 1055-1064.
2. Smith BJ, Haffty BG, Sasaki CT. Molecular markers in head and neck squamous cell carcinoma: their biological function and prognostic significance. *Ann Otol Rhinol Laryngol* 2001; 110: 221-228. ❑