Extracorporeal membrane oxygenation (ECMO) is a temporary heart lung machine that can provide circulatory and respiratory support in the event of heart or lung failure (Figure 1). This technology has evolved over the last decade with improved outcomes and safety. Cannulae are now heparin bonded, and the Qadrox oxygenators and Cardiohelp pumps are easily transportable. Peripheral cannulation is facilitated by ultrasound scanning and guidewire placement is confirmed by transthoracic or transoesophageal echocardiography. Limb perfusion is restored by a 7-9 French arterial backflow cannula (Figure 2). Originally the circuit was utilised to support patients post cardiac surgery in cardiogenic shock, however ECMO is now considered for patients in acute cardiac failure and out-of-hospital cardiac arrest (OHCA). Furthermore, these patients can be placed onto emergency ECMO at hospitals with the technology and then transferred to definitive care at transplant units or high volume ECMO centres (Figure 3).

Cardiac arrest is the leading cause of sudden death in healthy adults. In 2012 there were more than 1300 presentations to NSW public hospital emergency departments. 61% died before or during treatment in the emergency department. Further studies have shown that patients with pulseless electrical activity or no rhythm have poor survival (0–7%). Patient’s survival to discharge is poor (2–11%), 30–60% of survivors have significant neurological deficits.

ECMO can provide circulatory support to the brain and vital organs during cardiac arrest. Recent studies have suggested that ECMO CPR may have a better survival compared to conventional CPR (35% survival to discharge)¹.

Currently Sydney is undertaking a study looking at CPR, hypothermia and ECMO for refractory cardiac arrest². This research, the 2CHEER study, includes patients between 12 and 70 years who suffer an out of hospital cardiac arrest refractory to standard cardiac life support treatment. Active bleeding is an exclusion criteria. These patients must undergo CPR within 10 minutes of witnessed arrest and are retrieved to hospital on a mechanical CPR device (LUCAS). Upon arrival at the hospital the patient is placed on veno-arterial ECMO within 60 minutes. This usually would be achieved percutaneously via the femoral artery and vein. Patients are then transferred to the cardiac catheter laboratory for angiography if indicated. Patients will then be assessed in ICU for cardiac and neurological recovery. The study expects to recruit 25 patients.

ECMO can potentially be life saving for cardiac arrest patients. If inserted promptly the circuit can restore circulation to end organs and enable return of spontaneous circulation by appropriate intervention (angiography, coronary stent, TAVI, urgent heart surgery). Hospitals with this technology offer patients a chance of survival and recovery from catastrophic events.

References available on request.
Low-dose rate brachytherapy in prostate cancer

DR AMY TEH  BSC (MED), MBBS (HONS), FRANZCR

Dr Amy Teh is a consultant radiation oncologist at Radiation Oncology Centres and clinical senior lecturer at the Sydney Adventist Hospital Clinical School, University of Sydney. Dr Teh has headed the prostate brachytherapy program at the Sydney Adventist Hospital since 2010.

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PERMANENT RADIOACTIVE SEED IMPLANT

Whilst the more commonly used form of radiotherapy for prostate cancer, external beam radiotherapy, delivers radiation ‘outside-in’, Low Dose Rate (LDR) Brachytherapy implants radioactive seeds directly into and immediately around the prostate, delivering radiation ‘inside-out’, delivering higher doses directly to the prostate, and lesser dose to surrounding healthy organs.

LDR brachytherapy is less invasive than surgery, less time-intensive than external beam radiotherapy, and achieves excellent outcomes in low/intermediate risk prostate cancer when disease is likely to be confined within the prostate.

In higher risk disease where there is likelihood of extra-prostatic disease, a combination of external beam radiotherapy and LDR brachytherapy has shown superior outcomes compared to external beam radiotherapy alone.

LDR BRACHYTHERAPY – THE PROCEDURE

Prostate LDR brachytherapy is a 3-step procedure:

1. A ‘Pre-implant Volume Study’ captures the measurements and images of the prostate using trans-rectal ultrasound to plan seed placement for the highest possible dose to the prostate (and disease) with least radiation surrounding organs (bladder, urethra, rectum, penile bulb).
2. The ‘Implantation’ of radioactive seeds is performed using a trans-perineal technique under both trans-rectal ultrasound and x-ray image guidance.
3. A ‘Post-implant Dose Verification’ is then performed using CT pelvis.

Stranded Iodine-125 radioactive seeds are commonly used. Seeds are stranded like beads to reduce risk of seed migration. Although significant seed migration is rare, a chest and pelvic x-ray is routinely done one month post-implant to ensure seed migration has not occurred. Patients are advised to take precautions during the first month eg to sieze their urine, use condoms during sexual activity, in case of the unlikely event that seeds are voided or ejaculated. Forceps and lead containers are provided so that any seeds found may be appropriately collected and returned to the radiation oncology department.

PSA OUTCOMES

The 10-year biochemical-progression-free-survival with LDR brachytherapy alone is excellent over 90% in patients with low risk prostate cancer. In high risk disease, the use of LDR brachytherapy boost, in combination with external beam radiotherapy and one year of hormone therapy, has shown superior result. The recently published ASCENDE-RT trial shows a 9-year biochemical-progression-free-survival of 83% with LDR boost versus 62% using external beam dose escalation only.

Of note, PSA ‘bounce’ (a temporary benign rise in PSA) is a common phenomenon seen after LDR brachytherapy. This temporary ‘bounce’ in PSA generally occurs in the second and third year after implant, and can take three years from its first rise to settle.

SIDE EFFECTS AND MANAGEMENT

Within the first month post-implant, common symptoms include:

• Fatigue
• Mild perineum bruising
• Haematuria, dysuria, urgency/frequency
• Reduced urinary flow (temporary)
• Haematospermia
• Mild rectal irritation

At 1-3 months post-implant, urinary symptoms of dysuria and urinary frequency/urgency are most noticeable. Fatigue and rectal irritation may persist during this period. Whilst haematospermia has settled, patients may notice reduced ejaculate.

Many will notice significant improvements in symptoms after the first three months but symptoms can last up to 24 months post-implant.

Risk of significant long term toxicity is low. The most common long term risk is urethral stricture (<10%). This risk may be reduced with appropriate patient selection. Preservation of potency depends on baseline erectile function.

Patients are routinely given prophylactic antibiotics one week following implantation. Urinary alkalinisers, alpha blockers, anti-cholinergics may be used to manage urinary symptoms. Early use of phosphodiesterase inhibitors may be encouraged to restore and preserve erectile function. Rectal toxicities are not common but topical corticosteroids may be used if required. Rectal biopsies and trans-urethral resection of the prostate (TURP) following prostate LDR brachytherapy should be avoided if possible.

RADIATION SAFETY

Radiation exposure to the household members of a patient who has undergone prostate LDR brachytherapy is very low. To minimise exposure, the following are recommended:

• Avoid children sitting on the lap within first 2 months of implantation.
• Avoid prolonged contact with pregnant women within first 2 months of implantation.
• No cremation if within 12 months of implantation in the event of death.
• All patients are provided with a wallet card containing treatment information.

CONTRA-INDICATIONS

Absolute contra-indications:

• Inability to be in lithotomy position under general anaesthetics.
• Inability to stop anti-platelet/anti-coagulant therapy or bleeding disorder.

Relative contra-indications:

• Life expectancy <5 years.
• Significant extra-prostatic disease e.g. seminal vesicles involvement, gross nodal disease, distant metastases.
• Poor anatomy that could lead to sub-optimal implant e.g. large or poorly healed TURP defect, large median lobe, large prostate size >50cc, narrow pubic arch causing interference.
• Features increasing risk of obstruction e.g. pre-existing urethral strictures, poor maximum urinary flow rate <15mL/seconds, significant urinary symptoms with IPSS>15.
• Features increasing risk of toxicities e.g. inflammatory bowel disease, previous pelvic irradiation, multiple pelvic surgeries, severe diabetes and healing problems.

References available on request.
The World Health Organisation (WHO) has estimated the global economic cost of hearing loss to be $750 billion in 2016. The disability adjusted life years for sense organ diseases has also increased to the 7th most burdensome global disease. If hearing loss alone can be so burdensome, it would not be surprising to consider hearing and vestibular diseases together to pose a significant problem in society given patient’s often report vestibular symptoms influencing their quality of life more than hearing loss. Despite this, access to care for inner ear disease remains poor which is compounded by difficulties in examining, diagnosing and treating inner ear conditions.

**CAN TECHNOLOGICAL CHANGES HELP?**

The inner ear is encased deep in the skull base in dense bone. Access to it risks destruction to its function. The cochlea, the hearing organ, works in isolation in the body but the vestibular system works in conjunction with many other systems especially the visual and proprioceptive pathways. Thus symptoms of imbalance can be multifactorial and historically it has been difficult to make definitive diagnosis regarding etiological factors due to limited testing options. However, tremendous advancement in modern vestibular testing has opened up avenues to allow a more scientific approach to manage patients with complex hearing and balance problems.

**ANATOMY**

The vestibular system has 5 end organs, the Utricle, Saccule and 3 semicircular canals. Each of these end organs can be tested separately and certain patterns in these tests demonstrate different diagnosis and treatment progress.

**MODERN VESTIBULAR FUNCTION TESTS**

Video Head Impulse testing (VHIT) relies on an intact vestibulo-ocular reflex (VOR) where the head velocity matches the eye velocity and tests each canal separately. Typically, vestibular defects cause a disruption of the VOR with delayed eye movement respective to head velocity, the ratio of which is expressed as the gain.

Vestibular Evoked Myogenic Potential (VEMP) is an evoked potential to sound or tap stimulus which relies on the vestibulospinal reflex. The cervical and ocular VEMPs (c-VEMP and o-VEMP) detect Saccular and Utricular function respectively. Reduced function on VEMP testing indicates reduced function of the respective otolith but increased reflexes is suspicious of a fistula or a dehiscence of the bone of the otic capsule.

Caloric testing is used judiciously but measures only the function of the lateral semicircular canal. This gives additional information to the VHIT of the lateral canals and is most useful when it is abnormal in response to a normal VHIT ie the two results don’t correlate since this combination is highly suggestive of endolymphatic hydrops. How does the combination of these tests help with the diagnostic picture?

**Acoustic Neuroma:**

In acoustic neuma, if vestibular function is affected, the VHIT would typically show many catch up saccades in red (which detects the delay in eye movement) compared to the head movement (in green) and this is due to an abnormality in the VOR (Figure 1). Following surgery and after rehabilitation, the patient’s saccades will be seen to become more phase locked.

**Meniere’s Disease:**

Meniere’s Disease, a condition associated with endolymph hydrops presenting typically with fluctuating low tone hearing loss, tinnitus, aural fullness and vertigo in its early phases. In advanced phases the disease characteristically ‘burns out’, leaving little residual hearing and balance function. The disease is typically very heterogeneous and can present with auditory symptoms only and no vertigo if the hydrops doesn’t affect the vestibular system.

Vestibular function test will be abnormal if the disease is affecting the part that is being tested. The presence of abnormal caloric test with a normal VHIT in the plane of the lateral canal is suggestive of hydrops. If ablative interventions are applied such as intratympanic gentamicin, VHIT results would show abnormalities which would allow the clinician to correlate effectiveness of the intervention.

**Superior Canal Dehiscence:**

Superior Canal Dehiscence is a condition where due to a lack of bone covering the superior semicircular canal, a patient can experience a spectrum of symptoms from autophony alone to sound or pressure induced vertigo, thus being able to hear their own heartbeats, eye movements etc. If the patient presents just with a blocked ear, diagnosis can be difficult. Balance tests show typical findings of increase reflexes on VEMP testing in the affected side. Sometimes the disorder causes an artificial conductive hearing loss as well.

**CONCLUSION**

Development of testing methods and increased availability of these tools allow systematic assessment of the auditory and vestibular system. These tests are non-invasive and allow objective evidence which is important given that ‘imbalance’ can be caused by many factors. This enables both patients and clinicians to be better informed about their diagnosis and make appropriate treatment plans about their hearing and balance symptoms at the same time.

References available on request.

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**Figure 1: Vestibular Assessment Report – VHIT showing saccades (red) in the right ear (right column) with reduced gain (left column) in all 3 canals.**

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**Development of modern audio vestibular testing**

**DR PAYAL MUKHERJEE MBBS, FRACS (ORLHNS), MS (USYD)**

Dr Payal Mukherjee is an adult and paediatric ENT surgeon with a special interest in hearing and balance disorders. She has subspecialty fellowship training in otology, cochlear implantation and lateral skull base surgery. Dr Mukherjee is an executive member on the NSW committee of RACS, the ENT lead for research at the RPA institute of academic surgery and a board member on the Meniere’s Research Fund and is a senior clinical lecturer at the University of Sydney.

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Some patients are asymptomatic; and more on the size and location of their tumours. Including angiosarcoma/lymphoma etc. Gallbladder cancer, and other rare cancers. Cholangiocarcinoma (cancer of the bile ducts), usually associated with cirrhosis of the liver. A higher rate of hepatitis B infection. HCC is more common in migrants from South East Asia – countries where there is a higher rate of chronic hepatitis B infection. In Australia, HCC is more common in migrants with high rates of chronic hepatitis B infection. In Asia, the Pacific Islands and Africa due to hepatitis B infection. HCC is common in men, and the average age at diagnosis is 67 years. Causes for liver cancer may include fatty liver disease (NASH), genetic disorders (haemochromatosis, alpha-1-antitrypsin deficiency), cirrhosis and associated with Type 2 Diabetes, high alcohol consumption, obesity, smoking tobacco and exposure to certain chemicals. Diagnosis The gold standard in liver cancer diagnosis and management is an MRI of the liver with Primovist. Abdominal ultrasound and triple phase CT scan of the abdomen augment the diagnosis and are usually initially done. Blood tests including tumour markers are helpful – FBC/EUC/LFTs/Coags/CEA, AFP, CA19.9 and CA19.2. Liver surgery has evolved over the last 30 years. Initially surgery was associated with high mortality and morbidity rates but this has now shifted to mortality rates of 1-2% and morbidity rates of 20-30%. Specific risks include mortality, bile leak, infected collections (requiring drainage), liver dysfunction and liver failure. Length of stay is generally between 5-7 days and full recovery is achieved in 1-2 months following surgery. ERAS (enhanced recovery after surgery) programs are in place in most hospitals. It requires consistent and dedicated health professionals to assess the patient in the preoperative period daily, look for deviations from the pathway and reassure patients that they are on track. Liver surgery can be performed with open surgery, laparoscopic or more recently using the robot. Open surgery still remains as the most commonly performed procedure but laparoscopic surgery is almost now indicated for anterior segmental and left lateral segmental resections of the liver. Use of the CUSA, thermal energy devices, staples, and haemostatic agents have all led to improved dissection, less blood loss (with almost ≤5% patients requiring blood transfusions). Regional anaesthesia using single shot intrathecal morphine pain buster catheters with PCA and have helped improve pain control. Prognostic factors such as number of liver lesions, size, time interval to development, tumour marker levels etc have helped shape indications for liver surgery. Bilobar disease (two stage hepatectomy) validated by the French surgeons has been a useful approach for patients with multiple lesions. Redo liver surgery is also another strategy to help patients with liver cancer recurrence. Patients can have multiple operations with liver confined tumours (eg colorectal liver cancer metastases). References available on request.
Biliary pain but no gallstones – what to do?

**DR PHILIP LE PAGE** **MBBS (HONS), FRACS, ANZGOSA**

Dr Philip Le Page is an upper GIT and obesity surgery specialist. He has been in active consultant practice for 4 years after undertaking ANZGOSA accredited upper GIT training in Sydney, Melbourne and at the Royal Infirmary of Edinburgh. He consults and operates for specialist, general surgical and endoscopic problems at the San and Concord Hospitals. Dr Le Page teaches undergraduate and surgical trainees as an adjunct clinical lecturer with the University of Notre Dame, clinical teaching at the San and Concord, and instructing on College of Surgeons courses.


Right upper quadrant pain, radiating around to the right flank, lasting minutes to hours and usually exacerbated by eating: sound familiar? Patients with these symptoms often present to general practice. After a complete patient assessment, an ultrasound of the abdomen is the logical key investigation (along with liver function tests, full blood count and urea/ electrolytes). The expectation is that gallstones may be diagnosed.

**NO GALLSTONES ON ULTRASOUND? WHAT IF THE PAIN CONTINUES?**

This situation is not uncommon. Alternative non-biliary diagnoses should be considered, and these include peptic ulcer disease, other gastric or small bowel disease, liver disease, kidney stones and musculoskeletal problems. If clinical concern remains, consideration should be given to an endoscopy and abdominal CT scan. If these are unremarkable, biliary pathology can still exist when gallstones are not diagnosed. The high incidence of this in the Western world mandates a high level of suspicion.

It is important to appreciate that very early alterations within the gallbladder that can progress to gallstones can in themselves cause significant pathology. Essentially, if cholesterol secreted by the liver is not fully solubilised by bile salts and lecithins in the gallbladder (excess cholesterol or excessive concentration due to fasting states) then it precipitates into cholesterol crystals, ‘sludge’ (viscous dark bile) and microlithiasis.

‘Gallstones’ develop with further progression, and can grow up to the size of a fist. Even the earliest changes can be the most likely to cause problems. This significance may not be borne out in an ultrasound report which does not use the term ‘stone’. Usually, any associated small stones or sludge are responsible for causing symptoms even in the presence of large stones.

**PROBLEMS OF ABNORMAL GALLBLADDER CONTENT WITHOUT ‘STONES’**

‘Sludge’ or microlithiasis, can pass down the cystic duct following gallbladder contraction. This in itself can cause the symptom of biliary colic. Passage into the common bile duct can similarly cause pain (often with transient alterations of LFT’s), or more sinister problems of obstructive jaundice, pancreatitis and cholangitis.

Sludge in the gallbladder can also harbour bacterial colonisation and hence risk of cholecystitis (not always diagnosed by ultrasound). Given bile flow is maintained through the cystic duct, this infection tends to be milder than when cystic duct obstruction occurs by gallstones.

**GALLSTONES**

Pain is initially felt as biliary colic, potentially progressing to more prolonged pain if the gallbladder tries to extrude the stone. Obstruction leads to chemical and often infective inflammation of the gallbladder wall and peritoneum, felt as localised peritonitis or referred to the right back/shoulder. Severe obstructive cholecystitis can lead to an empyema, gangrenous cholecystitis, or gallbladder perforation.

**OTHER ABNORMALITIES ON ULTRASOUND**

Various other abnormalities can be identified which are disease states and can cause symptoms.

Gallbladder polyps are frequently NOT true polyps but cholesterol crystal conglomeration or small stones themselves (ultrasound may not appreciate subtle acoustic shadowing). Adenomyomatosis (hyperplasia and dilated mucosal glands) is sometimes found and potentially symptomatic given its association with gallstones or precursors. Other diseases include inflammatory states of xanthogranulomatous cholecystitis (wall inflammation from bile inspissation), acalculous cholecystitis, and malignancy.

**BILIARY PAIN WITH NORMAL ULTRASOUND**

Persistent biliary pain should potentially lead to a repeat ultrasound, given it is user dependant and images may be vary dependant on patient factors such as obesity. Other tests that have utility include non-invasive tests, like MRCP which mainly looks at ductal abnormalities, or HIDA scan (nuclear medicine excretion study) which can demonstrate symptomatic impaired gallbladder ejection, from inflammation or dysmotility. Biliary dysmotility can also exist as Sphincter of Oddi dysfunction. This is a more complex and less understood condition, requiring diagnosis by combination of clinical symptoms, LFT’s, biliary dilatation and potentially ERCP with biliary manometry.

Endoscopic ultrasound (EUS, similar to a gastroscopy under sedation), which avoids intervening bowel gas or adiposity, is the most sensitive test for microlithiasis and is very useful. It should be remembered too no stones maybe found as a single stone may have already passed into the duodenum (with the gall bladder also potentially harbouring occult sludge, or at risk of forming more stones).

**ROLE OF LAPAROSCOPIC CHOLECYSTECTOMY**

This commonly performed operation now has 30 years of collective experience, with advantages of minimal scarring, overnight stay and low risks of complications.

It is generally accepted that given this profile, even if ultrasound is normal, surgery is recommended for potentially serious problems commonly caused by sludge/gallstones (eg pancreatitis).

**References available on request.**
Parotid tumours can be classified as benign or malignant. Benign tumours are common while malignant tumours of parotid are uncommon occurring in 3-6% of all head and neck tumours. Among malignancies, mucoepidermoid carcinoma is the most common in the world while metastatic spread of cutaneous cancer is the most common aetiology in Australia due to high prevalence of sun-induced cancers. Histology and grade are the two most important factors, which impact on local, regional and distant disease control. Although no clear cause has been identified for primary salivary cancers, radiation is an accepted risk factor.

**PRIMARY PAROTID CANCER**

Mucoepidermoid carcinoma is the most common and can occur in all age groups including children. The outcome depends on the grade and appropriate treatment. They tend to spread to the lymph nodes. Adenoid cystic carcinoma (ACC) is the second most common and although they are indolent they spread via nerves resulting in local recurrence and to lungs via bloodstream. ACC can be present with pain and facial nerve palsy without an obvious mass and should be thought of in the differential diagnosis of Bell’s palsy and an MRI should be ordered. Acinic cell carcinoma, salivary ductal carcinoma and carcinoma ex-pleomorphic adenoma (2% risk at 5 years) are others.

**METASTATIC PAROTID CANCER**

Metastases to the parotid are usually from cutaneous Squamous Cell Carcinoma (SCC) and melanoma and Merkel cell cancer. This usually portends a worse prognosis and requires multimodal management with a combination of surgery and radiotherapy. Chemotherapy has little role in the management in such situations. Such patients are often discussed at a head & neck multi-disciplinary tumour board (MDT) which comprises of surgeons, radiation/medical oncologists, pathologists and radiologists and the most appropriate decision is taken after considering the particular patient’s tumour stage and medical comorbidities. Thus the treatment is tailored to the individual and this gives best oncological results.

**WORK-UP OF A PAROTID MASS**

Asymptomatic lumps in the parotid are the commonest clinical presentation and pertinent history should focus on – previous skin cancers, sudden growth, pain and facial tics/weakness (last two are poor prognostic factors). Clinical examination should include – skin/muscle or bone invasion, complete facial nerve exam and presence of cervical lymphadenopathy.

Imaging plays a crucial role in management of parotid cancers. Ultrasound is usually the baseline investigation but CT and MRI give better anatomical delineation of the tumour. This is vital for surgical planning and involving plastic surgeons early, if reconstruction of the defect/ reanimation of the face (if resection of facial nerve or its branches), is required to achieve a clear margin. CT is good for assessment of cervical nodal involvement or bony invasion and MRI for deep lobe/parapharyngeal space invasion or peri neural spread.

FNAC by an experienced cytopathologist forms the cornerstone in diagnosis of these lesions and perineural spread.

Surgical Planning:

The main aim of parotid cancer surgery is to maximise radiation dose to the tumour, or at risk area, whilst minimising dose to organs at risk. Multimodality imaging is used to facilitate this. A low dose, non-contrast planning CT is used to delineate the anatomy of the region to be treated. This may be fused with a PET scan, or an MRI scan to more accurately delineate the areas of gross tumour, or to delineate at risk areas, in the instance of postoperative radiotherapy.

A high radiation dose is given to areas of macroscopic tumour, an intermediate dose to high risk areas without visible disease, and a low radiation dose to elective lymph node groups. Organs at risk, including the mandible, spinal cord, and contralateral salivary glands are carefully delineated and the radiation dose to these structures is limited to minimise risks of toxicity. A thermoplastic mask is used for immobilisation to maximise accuracy of the radiotherapy treatment.

Malignant parotid tumours are rare and a multidisciplinary approach and appropriate expertise in the field gives the best oncological and functional outcomes for these patients.
CASE STUDY

Mrs RR is a 70-year-old woman who presented with a left parotid mass in 2014 and this was resected and pathology was indeterminate. She had multifocal recurrence in June 2015 and preoperative biopsy suggested a benign pathology. Postoperatively though it proved to be aggressive variant of acinic cell carcinoma with involved margins. She received adjuvant RT to obtain local control. Unfortunately she developed further local recurrence in November 2016, which was again multifocal on the mastoid and behind condyle of the jaw. She had a MRI and PET scan and a core biopsy (which gave her a facial nerve palsy) and the pathology was reviewed at the MDT. Pathology proved to be an aggressive variant of Acinic cell carcinoma and careful preoperative planning for resection and reconstruction was done involving head and neck surgeon, otologist and reconstructive surgeon. Radical parotidectomy was done resecting the facial nerve along with mastoidectomy (to obtain proximal margin on the nerve), neck dissection and free flap reconstruction with slings and tarsorrhaphy. Pathology proved to be acinic cell carcinoma involving the facial nerve and clear margins were achieved. She was again discussed at MDT and is planned for further adjuvant RT to maximise cure.

Re-irradiation

Given that Mrs RR had received prior radiotherapy, further radiotherapy needed to be approached with care. The extent of the resection and reconstructive work removed a substantial portion of the previously irradiated tissue, with the reconstructed tissue being ‘radiation naïve’. The mandible, carotid artery, and spinal cord are therefore the non-reconstructed critical anatomical structures which need to be spared in as much is possible with the second course of radiotherapy. Mrs RR was therefore treated with a hyperfractionated, stereotactic course of radiotherapy. A very low dose of radiation was given twice per day to minimise toxicity to the organs at risk, with a stereotactic technique utilised to maximise accuracy of dose delivery. She was treated at the TomoTherapy unit, which allows for daily CT imaging of the target area prior to treatment delivery, and which also allows for very complex patterns dose delivery, essentially being able to move high dose maximums out of critical areas, and to create low dose areas around organs at risk.

References available on request.
News from Adventist HealthCare

• Vale, after a long illness, to former long serving ENT surgeon Dr Brian Shearman who practiced at the San from 1960 to 1997. Much respected for his expertise and compassion, during his career Dr Shearman held various esteemed professional positions including ENT section head at the San and Hornsby Hospitals, and Chairman NSW section the Otolaryngological Society of Australia. A talented tenor and keen violinist, his family and friends have established the NSW Doctors Orchestra Instrumental Scholarship of the Sydney Eisteddfod. Donations welcome. Account: Sydney Eisteddfod BSB 062 005 Acct Number 2801 5557 Ref: Dr Brian Shearman.


• The Rotary Club of Wahroonga has awarded San volunteers and staff including Enrolled Nurse Helle Hansen and Clinical Nurse Educator Dionne Hird.

• A new easy to access and navigate reception area known as ‘the Hub’ has opened at the San. It links the multi-deck car park and the Clark, Clifford and Tulloch buildings and will include a retail space.

• San Orthopaedic surgeon Dr Lawrie Giutronich and members of the orthopaedic team have celebrated their 1000th unicompartmental knee surgery at the San.

NEWLY ACCREDITED DOCTORS

Dr Bahareh Samiei-Sarir – Obstetrics & Gynaecology MBBS FRANZCOG
Dr. Bahareh Samiei-Sarir is a specialist female obstetrician & gynaecologist with rooms at San Clinic. Dr Samiei has specific interest in normal & high risk pregnancy, urogynaecology (prolapase), minimal invasive surgery (laparoscopy), abnormal uterine bleeding and fibroids, abnormal pap smear and colposcopy. Ph: 9449 3739

Dr Bill Bestic – Anaesthesia BSc BA MBBS FANZCA
Dr Bill Bestic is an anaesthetist and CareFlight physician with a special interest in anaesthesia for complex surgery. He is a simulation instructor for anaesthetic emergencies, instructor in the management of severe trauma and former deputy director of trauma at Royal North Shore Hospital. P: 8901 3654 E: bill@bestic.com.au

Dr Edmund O’Leary – Orthopaedics MRCS (Eng) FRACS
Dr Edmund O’Leary is a fellowship trained orthopaedic surgeon with a sub-speciality interest in foot and ankle surgery, as well as orthopaedic trauma. He consults at the San Clinic, the Mater Clinic and at the Coastal Specialist Suites, West Gosford.

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Dr Thanan Elalingam – Anaesthesia MBBS (UNSW), FANZCA, G Cert Clinical Ultrasound (Melb)
Dr Thanan Elalingam is an anaesthetist and his current practice includes neurosurgery, colorectal and upper GI surgery, endoscopy, obstetric, orthopaedic and ophthalmic anaesthesia. He has a special interest in medical simulation and is course director for the Neuroanaesthesia Simulation Course at Macquarie University.

Phone: 8795 0892
Email: Thanan.elalingam@gmail.com
Website: https://goto.mq/neuroanaesthesiacourse

GRAND ROUND DATES 2017

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Medical Practitioners welcome. Refreshments from 12 noon. Presentation 12:30 to 1:30pm. Level 2 Conference Room Tulloch Building SAH Campus 185 Fox Valley Rd Wahroonga. Enquiries 9480 3660. Lunch sponsored by the San Foundation.

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