Complex Coronary Intervention

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CTO Intervention—Who, Why and What You Need to Know

Case Study: Jo Smith, a 65 year-old landscape gardener came for investigation and management of Canadian class 2 angina. His symptoms has been building up for 6-12 months. Despite maximal medical therapy he had worsening of symptoms. His echocardiography revealed LVEF-45% with inferior wall hypokinesia. Stress MIBI scan confirmed viable myocardium with inducible ischemia in the inferior wall with jeopardised LV myocardium ~10%. Subsequent cardiac catheterisation revealed totally occluded mid RCA with well-developed collaterals from LAD (Grade 3). Minor disease of LAD and LCx noted. He underwent complex CTO PCI to RCA with a retrograde approach and 3 drug-eluting stents were successfully placed with reconstruction of totally occluded RCA—(Fig1). He was discharge from hospital after 24 hours of observation. At 3 months follow-up he was completely asymptomatic without the need for antianginal therapy. Follow-up echocardiogram revealed improved LV function, LVEF 50-55% with resolution of most of inferior wall hypokinesia and he was able to perform 10 minutes on the treadmill on advanced Bruce protocol (15METs) without exertional symptoms and with good LV function augmentation. He remains well after 5 years since initial intervention.

Chronic Total Occlusion: CTO Definition, Incidence, and Presentation

CTOs are high-grade native coronary stenoses with TIMI grade 0 or 1 flow of at least three months’ duration. CTOs occur in all of the coronary arteries and prevalence is anywhere from 15-20%. CTOs occur commonly in the legs and in other arteries besides the heart. Generally, coronary CTOs can be a mix of different components; calcium, soft atherosclerotic plaque and dense fibrous tissue, as well as organized thrombus. (Fig2).

CTOs can occur acutely and go unrecognized, as silent clinical events. In most instances they occur gradually over time. Often the area of the myocardium subtended by the totally occluded vessel is still viable and functional despite having an occluded artery, because over time, collaterals have developed to keep the heart tissue alive. However, the collaterals have not been shown to supply enough blood and oxygen required when the demand of the heart muscle increases hence development of ischemia related symptoms.

Figure 1. Totally occluded RCA from proximal to distal vessel. PDA and PLV branches filling retrogradely via septal collaterals form LAD. After successful PCI of RCA

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The approach to acute pancreatitis has been enhanced following recent developments in imaging and endoscopy. Aetiology remains predominantly that of gallstones and alcohol (approximately in a 2:1 ratio in Australia) and the great majority of patients will experience a mild clinical course with complete recovery. Severe pancreatitis remains a clinical challenge and management of these patients is appropriately carried out in the intensive care setting with a multidisciplinary approach. There have been recent consensus statements with the aim of optimizing management towards best care outcomes.

**DIAGNOSIS & CAUSE**

This is confirmed in the appropriate clinical setting, with an acute onset of epigastric pain, often radiating to the back. A history of alcohol or gallstones may be present. Elevation of amylase/lipase to more than 3 times normal serves as biochemical confirmation, with lipase proving more sensitive and with a longer period of increase following the attack. Abdominal CT scan is required if the diagnosis is uncertain, or if the clinical course does not follow as expected after 3-5 days. Routine use of CT has been shown not to improve clinical follow as expected after 3-5 days. Routine use is uncertain, or if the clinical course does not follow as expected after 3-5 days. Routine use of CT has been shown not to improve clinical outcomes and is not recommended.

Determination of the cause is based on: 1) a detailed history, including medications 2) abdominal ultrasound is used to evaluate for cholelihtasis 3) laboratory tests for liver enzymes, triglyceride levels and serum calcium. Alanine aminotransferase (ALT) levels greater than 150IU/L have a strong positive predictive value in diagnosing gallstone pancreatitis.

Additional causes that need to be considered include post procedural pancreatitis, when the clinical picture will be evident and autoimmune pancreatitis (AIP). AIP is a recognized entity with typical radiological picture of diffuse inflammation of the pancreas; elevated serum immunoglobulin (IgG) in most and clinical response to steroids.

Up to approximately 15% of patients will be considered to suffer from idiopathic pancreatitis. It is in this group, especially in the older patient, that further investigations are needed to exclude underlying neoplastic lesions.

The two predominant modalities are magnetic resonance imaging cholangio pancreatography (MRCP) and endoscopic ultrasound (EUS). MRCP allows evaluation of the biliary and pancreatic ducts with regards to narrowing/strictures caused by tumours. EUS is excellent in evaluation of the pancreatic tissue and definition of stones. Combination of these tests increases the diagnostic accuracy of pancreatitis. If uncertainty remains, it is important to follow up with interval imaging after recovery in 4-6 weeks.

**ASSESSMENT OF SEVERITY & MANAGEMENT**

**Mild acute pancreatitis**
- No organ failure of systemic complications
- Mild and self limiting

**Moderately severe acute pancreatitis**
- Transient organ failure (<48 hrs)
- Local complications (fluid collections)
- Exacerbation of pre-existing disease

Management of above groups is based on early in-hospital aggressive fluid resuscitation and reassessment, which improves clinical outcomes. Gut rest should be implemented until symptoms have improved, with nutritional support unlikely required in these patients. Laparoscopic cholecystectomy should be performed in the index admission in cases of mild biliary pancreatitis to avoid recurrence.

**Severe acute pancreatitis**
- Persistent organ failure

These patients require treatment in the intensive care setting. Principles of care include:
- Early enteral support
- ERCP in presence of cholangitis
- Rational antibiotic use
- Transfer to specialist centres

**SUMMARY**

- Acute pancreatitis (AP) is common and potentially severe
- Recent new consensus guidelines have been published
- Cause should be determined:
  - History
  - Laboratory tests (LFTs, calcium, TGs)
  - Transabdominal ultrasound
  - EUS/MRCP idiopathic cases
- AP should be managed with aggressive fluid resuscitation and fasting, feeding in mild attacks once symptoms settle
- Laparoscopic cholecystectomy in index admission for mild AP
- Severe pancreatitis managed in ICU setting
- Early ERCP reserved for patients with cholangitis
- Follow up with imaging in elderly patients with unknown cause

References available on request.
Degenerative spondylolisthesis (DS) may cause back pain, claudication, radicular pain or neurological impairment. It is principally caused by degenerative disc disease. Other classifications for spondylolisthesis include (i) isthmic where there are associated defects of the pars interarticularis, (ii) acquired following factors such as surgery at the same or an adjacent level, and (iii) dysplastic associated with congenital structural anomalies. Risk factors for DS include age (>50 years), sagittally oriented facet joints, degenerative disc disease, ligamentous laxity, hyperlordosis, and a higher pelvic incidence. It is a common condition in the older general population and most (80%) of patients do not progress under observation. The degree of slip is generally < 25% of the vertebral surface.

Patients may become symptomatic from (i) lateral spinal canal stenosis (affecting the L5 nerves at L4/5) (ii) foraminal stenosis (affecting the L4 nerves) (iii) spinal canal stenosis affecting the sacral nerves or (iv) from segmental instability and degeneration of facet joint and disc. Erect flexion and extension X-rays may show horizontal translation or excessive angulation at the same level but there is no universal definition of instability.

There is good evidence that lumbar cortisone injections are ineffective for spinal stenosis. Conservative treatments do not improve outcome. There is no universal consensus on the indications for surgery for DS but most surgical series only include patients with (i) persistent impairment from back and leg pain from nerve compression after a trial of conservative treatment or (ii) neurological deficit, or (iii) if adequate sympa symtomatology. There is a long history of lumbar laminectomy or posterolateral pedicle screw fusion being used for DS and these operations have dominated the surgical evidence based literature. Surgical evolutions include (i) interbody cages, (ii) minimally invasive interbody fusions, (iii) pedicle screw guidance systems, (iv) minimally invasive focal lumbar decompression, (v) anterior lumbar fusions for DS (vi) lateral lumbar fusion for DS, (vii) implants modified for osteoporotic patients and (viii) the use of adjuvants to enhance fusion.

In the light of these evolutions there is a great deal of variation in surgical approaches to DS based on surgical judgement, individual patient characteristics and a surgeon’s familiarity and training. There is good evidence that surgical approaches are superior to conservative treatment for DS. Older studies showed superiority of fusion compared with laminectomy. There are multiple recent studies showing sustained good clinical results from minimally invasive unilateral laminotomy spinal canal decompression for stable DS with less than 10% likelihood of postoperative spondylolisthesis progression. Surgeons attempt to estimate the likelihood for future slip progression after decompression from patient specific factors such as radiological instability and disc and facet joint anatomy. There is inadequate evidence to recommend a particular fusion method for DS but interbody fusion cages and pedicle screws are now used in the majority of cases. After posterior fusion clinical satisfaction rates are heterogeneous but of the order of 80% to 90% for DS. Complication rates are also heterogeneous but are of the order of 5% to 15%. There are multiple clinical studies of anterior lumbar fusion for DS. These reports describe heterogeneous clinical satisfaction rates of 75% to 95% and complication rates of 5% to 15%. There are no prospective controlled trials comparing anterior and posterior fusion for DS but anterior fusion has a theoretical reduced risk of adjacent segment degeneration, and more reliable correction of lordosis without the need for osteotomy techniques. On the other hand anterior fusion has a risk of venous thrombosis, and revision surgery is hazardous although rarely necessary.

References available on request.

Figure 1. L4/5 degenerative spondylolisthesis in a 80 year old woman evident on erect flexion x-ray. Symptoms were relieved by a microscopic unilateral laminotomy and bilateral decompression.

Figure 2. Plain lateral X-ray of a 78 year old woman after L3/4 anterior lumbar fusion for degenerative spondylolisthesis. She has a past history of lumbar fusion at L4/5 and L5/S1 and intrathecal morphine pump.
The estimated incidence of psoriasis in Australia has been reported anywhere between 2% and 4%. There has been a considerable degree of advancement in understanding and treating this disease.

The theories behind chronic plaque psoriasis have evolved considerably. Genetics do seem to play an important role in predisposing individuals. There are currently nine genes (PSOR genes), which have been identified. The major genetic determinant of psoriasis, PSORS1, accounts for 35 to 50% of the heritability of the disease, and the initial finding has been replicated in multiple genome wide studies. HLA-Cw6 seems to be one of the most important loci. Patients with this HLA subtype are younger with more severe psoriasis.

Environmental factors then seem to start the inflammatory cascade and the patient starts to clinically manifest the disease. These environmental factors include medications (lithium, oral prednisone, antihyperlipidemics, statins etc), stress, alcohol, infections (classically Streptococcal throat infections) and smoking.

Evidence is also emerging of the strong link between psoriatic inflammation and other systemic pathology. It has been known for a number of years the link between psoriasis and psoriatic arthritis. There is now convincing evidence linking cardiac disease and the metabolic syndrome with psoriasis.

Psoriasis show a significantly increased risk of myocardial infarction. The relative risk of myocardial infarction was higher for young psoriasis patients (<30 years old) with hazard ratios (HR) of 1.29 and 3.10 for mild and severe psoriasis, respectively. In contrast, HR of mild and severe psoriasis in patients who were aged 60 years or older were 1.08 and 1.36, respectively.

Hence psoriasis is a chronic inflammatory systemic disease mediated by various inflammatory cytokines including TNFα (Tumor necrosis factor alpha). As will be touched on later, anti-TNF-α agents show remarkable therapeutic effects on psoriasis. Studies are suggesting that anti-TNF-α treatment may prevent cardiovascular disease in psoriatics. Some strongly recommend the use of anti-TNF-α modalities for the treatment of obese psoriatics or those with metabolic syndrome.

Topical therapy is often the first line in the treatment of psoriasis. Agents include calcipotriol, tar, dithranol, topical corticosteroids, and retinoids. Ultraviolet radiation is another very important modality. The main contraindications are any photosensitising conditions or medications and a past history of melanoma.

Systemic therapy is often the next step, if the above fail to achieve adequate control. Acitretin, methotrexate and cyclosporine are often first line. Rarely hydroxyurea, fumaric acid esters and mycophenolate are also used.

Understanding the inflammatory cascade has also increased therapeutic targets and recent advances in biologic therapy. It is now known that psoriasis does not only involve keratinocyte hyperproliferation but also a dysregulation in immune function with shift from TH (T-helper)1 to TH17 pathway. Of specific importance is the IL (interleukin) 23-IL 17 cascade.

Currently there are five biologic agents on the market. Three of these are TNF alpha antagonists. Contraindications to TNF alpha antagonists include any active infection, multiple sclerosis, congestive cardiac failure and current or prior malignancy.

Etanercept (Enbrel), one of earliest TNF alpha antagonist is a recombinant TNF alpha inhibitor composed of the Fc portion of IgG and TNFα receptor protein. It is given as a weekly or twice weekly subcutaneous injection.

Infliximab (Remicade), a chimeric TNF α antagonist antibody, is administered via an intravenous infusion every 8-12 weeks. It is often administered with methotrexate to reduce loss of efficacy due to neutralising antibodies.

Adalimumab (Humira), a fully human TNFα antagonist is a fortnightly subcutaneous injection, after an initial loading dose.

Ustekinumab (Stelara) is the first IL-12/IL-23 injection, administered every 3 months after the initiation schedule. There is perhaps emerging evidence that serious infection risk may be lower with this drug compared to the TNF α antagonists.

The latest addition to the biologic family to be approved for PBS listing is secukinumab (Cosentyx), which is an IL-17A antibody.

Early evidence has shown it to be very effective with around 70% of patients clearing 75% of their psoriasis (PASI 75) as early as 16 weeks.

Prior to starting any patient on biologic treatment, there are essential criteria they will need to fulfil for Medicare because of the expense (usually $25 000 per annum) of the medications. They need to have trialed and failed 3 out of the 4 alternative treatments including acitretin, methotrexate, cyclosporin and ultraviolet phototherapy.

Prior to beginning any patient on biologic therapy, they are tested for Hepatitis B, Human Immunodeficiency Virus and Hepatitis C as well as tuberculosis carriage. Patients should not be given any live vaccinations and carefully and regularly monitored for serious infections and malignancy.

Another newer medication which is currently in not on the PBS listing is apremilast. This is a phosphodiesterase inhibitor, inhibiting cAMP degradation to AMP and hence reducing inflammation via TNF and interleukins. This has shown to reduce PASI 75 by week 16 in approximately 30-40% of patients. It is still in the early stages but may prove to be another pre-biologic treatment in the near future.

These advances present an exciting time in psoriatic treatment. Access to these medications should become easier as cost reduces. Psoriasis is hence becoming a very controllable disease. This will not only help patients become confident because of less skin disease but may theoretically help reduce more serious co-morbidity risk.

References available on request.
UNDESCENDED TESTES – THE CURRENT POSITION

Professor Ralph C. Cohen

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Clinical Professor of Paediatric Surgery and Urology at the University of Sydney, Professor Cohen has worked for the last 20 years in the Department of Surgery at Westmead Children’s Hospital. He has a wide range of research interests which currently include minimally invasive surgical procedures using animal models both for teaching and development of innovative techniques.

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INCIDENCE

An undescended testis occurs in about 3% of full term infants. At one year of age the incidence is about 1%, 10.25% of undescended testes are bilateral and it is more common on the right than the left. After one year of age, if a testis is not in the scrotum it will almost never be in the scrotum.

There is therefore no justification for advising parents that a testis may come down after one year of age. It will only expose the testis to the wrong environment with resultant decrease in fertility and increased risk of malignancy.

CLASSIFICATION

Palpable Testis

A truly undescended testis is one that cannot be manipulated into the scrotum on physical examination. This must be differentiated from normal, retractile testes due to an overactive cremasteric reflex which usually subsides just prior to puberty. These do not usually require treatment.

The ascending testis is an acquired rather than congenital abnormality. In this situation, the testis may have been retractile and still within the scrotum but with a tight cord. With growth of the child, the testis becomes displaced out of its scrotal position and into the groin. This may occur at about three to eight years of age. These testes therefore need to be kept under regular review as they may require orchidopexy to optimise function.

Impalpable Testis

This occurs in about 20% of undescended testes and may be due to intra-abdominal position (10%), ectopic, atrophic testis (vacular compromise from torsion ‘in utero’), an inguinal position of the testis in a chubby child or very rarely agenesis of the testis.

DIAGNOSIS

Careful and appropriate physical examination is the mainstay of diagnosis of an undescended testis. If the testis cannot be manipulated into the scrotum by six months of age it is unlikely to descend spontaneously and will probably require surgery.

If the testis is palpable and retractile, there is no point in performing an ultrasound examination as this will result in retraction of the testes into the inguinal canal and the report will suggest bilateral undescended testes and create unnecessary parental anxiety. Ultrasound may be useful in helping to locate an impalpable testis; it has a sensitivity of 45% and specificity of 78%. However, CT and MRI are rarely used for investigation of impalpable testes in children. Laparoscopy is a more invasive technique to locate an impalpable testis but it is highly reliable and also allows definitive treatment in a one or two stage orchidopexy if indicated orchidectomy under the same general anaesthetic.

IMPLICATIONS OF UNDESCENDED TESTES

1. Fertility Bilateral undescended testes untreated will result in sterility but if treated there is about a 40% fertility rate. Unilateral undescended testes, if treated less than one year of age, have about an 80% normal fertility rate.

2. Malignancy There is about a 3-7 times increase in the malignancy rate in undescended testes over normal testes. There is some evidence that early orchidopexy will decrease this malignancy risk. However, regular self-examination from teenage years is important to detect any early changes that can then be further investigated. The contralateral ‘normal’ testis is also at risk as about 25% of testicular malignancies in patients with an undescended testis occur in the contralateral testis. Boys with an acquired ascending testis diagnosed at a later age are thought to have a much lower risk of testicular cancer than those with an undescended testis diagnosed at birth. Undescended testes are also at increased risk of torsion and parents need to be made aware of this and the signs and symptoms to look for.

TREATMENT

Palpable Testis

The age of orchidopexy has gradually reduced over the years and is currently performed between nine and twelve months of age. There are recent studies involving rats that suggest that early operation at six to nine months of age could potentially improve fertility and reduce risk of malignancy.

Impalpable Testis

The application of laparoscopy for impalpable testes has been a great improvement in the care of these children. More recently, laparoscopy has been applied to the intra-abdominal testis to mobilise and fix it to the contralateral side of the inner abdominal wall in such a way that the vas and vessels are placed on traction over a twelve week period. This results in elongation of the testicular vessels and the vas. After the twelve week traction period, a repeat laparoscopy is performed and the testis is brought down into the scrotum without tension. This has resulted in some success and may offer a satisfactory alternative to the more conventional method of dividing vessels and subsequently bringing the testes down on the alternate blood supply into the scrotum as described by Fowler and Stephens. An algorithm for current laparoscopic treatment of the impalpable undescended testis is shown in Figure 2. In a post pubertal male with an undescended testis orchiectomy is the best option as it will not produce sperm and the risk of malignancy is significant. There is little doubt that the timely treatment of undescended testes in children has resulted in improved fertility and reduced malignancy in later life.

References available on request.
Pain management in patients with pancreatic cancer and chronic pancreatitis is notoriously difficult and patients often require a large dose of opioid analgesia. Over the last 2 decades, endoscopic ultrasound (EUS) guided coeliac plexus intervention has evolved as an effective and safe procedure for the management of pain in these patients.

Coeliac plexus block versus and neurolysis

The coeliac plexus lies within the retroperitoneal space posterior to the stomach and pancreas and innervates the liver, gallbladder, biliary tract, pancreas, spleen, adrenal glands, kidneys, mesentery, and the small and large bowel proximal to the transverse colon (Figure 1). Injection of a neurolytic agent into the coeliac plexus for visceral pain control can be achieved via a percutaneous, surgical or EUS-guided approach. Coeliac plexus neurolysis (CPN) refers to permanent chemical ablation of the celiac plexus by injecting alcohol or phenol into the celiac plexus. On the other hand, coeliac plexus block (CPB) denotes inhibition of pain transmission via the celiac plexus by injecting a corticosteroid and a long acting local anesthetic.

How is EUS-guided coeliac plexus intervention performed?

EUS is a technique that combines endoscopy and ultrasound. In an echoendoscope, a small ultrasound transducer is installed on the tip of the endoscope. By inserting the echoendoscope into the upper gastrointestinal tract, one can obtain high quality ultrasound images of the surrounding organs such as the pancreas, gallbladder, bile ducts and lymph nodes. When an echoendoscope is placed in the proximal stomach, the coeliac plexus (or ganglion) is readily visualised and a fine needle can be safely inserted into the coeliac plexus through the gastric wall under the guidance of ultrasound imaging (Figure 2). The main advantage of this route over a percutaneous one is the ability to avoid vessels with Doppler, in addition to being able to undertake concomitantly at the time of another intervention such as an endoscopic retrograde cholangiopancreatography (ERCP) or fine needle aspiration (FNA) of a mass.

What is the evidence for EUS-guided coeliac plexus intervention?

Since the first report of EUS-CPN in 30 patients with intra-abdominal malignancy (25 with pancreatic cancer) showing significant improvement in pain scores, multiple randomized controlled and meta-analyses have demonstrated that EUS-CPN provided effective pain relief in patients with pancreatic cancer compared with conventional analgesia. There is also evidence that CPN reduces analgesia use. Two meta-analyses showed that CPN (either EUS or percutaneous approach) was associated with a significant reduction in narcotic use. Additionally, a randomized controlled trial involving 96 patients with advanced pancreatic cancer reported that morphine consumption tended toward lower consumption at 3 months in the EUS-CPN group compared with a conventional treatment group. Nonetheless, approximately 15% of patients may see no reduction in their use of narcotics, and in this group, a repeat EUS-CPN has not been shown to be effective. A study of 24 patients with pancreatic cancer undergoing repeat EUS-CPN showed that repeat CPN was not as effective as index procedure in pain control (67% after the initial CPN vs. 29% at 1 month follow-up).

Contraindications & adverse events

Contraindications to coeliac plexus interventions include coagulopathy (international normalized ratio >1.5), thrombocytopenia (platelets <50,000/L), and hemodynamic or respiratory instability prohibiting adequate sedation. Minor adverse events include diarrhea, abdominal pain and hypotension due to the disruption of the autonomic nervous system, which are usually mild and self-limiting. A paradoxical increase in pain may occur in up to 9% of cases but generally resolves over several days. Serious adverse events including paralysis due to anterior spinal cord injury, necrotic gastric perforation, and celiac artery thrombosis with infarction are rare but have been reported.
Reasons to Consider Chronic Total Occlusion Percutaneous Coronary Intervention (CTO PCI)

In patients with LV dysfunction in a viable territory subtended by a CTO, successful CTO PCI does improve overall LV function. Two recent studies using cardiac MRI have shown significant improvements in LV function at 5 months and later after successful CTO PCI. Furthermore, PCI of LAD CTO has proven survival benefit.

Therefore benefits of CTO interventions are relief of angina, reduced ischemic burden, reduced risk of cardiac arrhythmia, improved exercise tolerance, improved tolerance of a future ACS event, reduced need for CABG and improved LV function and overall improved survival.

In addition, more literature has been published to dispel some of the myths of CTO revascularisation; in particular, to demonstrate that CTO PCI can be associated with a significant reduction in angina burden and improvement in quality of life and reduce subsequent ischemic and arrhythmic complications.

Hybrid technique (combined antegrade and retrograde approach) has allowed the skilled interventionalist to perform the complex CTO procedure with increased success rates (up to 90%) in a relatively short period of time with no increase in complication rates.

The EXPERT CTO trial was conducted in US to address some pressing issues surrounding CTO intervention, namely, success rate, performance of DES in CTOs, procedural safety and efficacy. In a multicenter trial representing contemporary technique and DES, the patient population with high lesion complexity had favorable procedural success and long term clinical outcomes supporting complex CTO PCI.

References available on request.

Reasons to consider chronic total occlusion (CTO) PCI

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Treatment Options for Patients with Chronic Total Occlusion - PCI or CABG

The mode of treatment selected for a patient with CTO is individualized. As with any patient with stable CAD, treatment should include antianginal therapy and therapies to promote vascular health. Patients who remain symptomatic despite maximal medical therapy should be considered for revascularisation.

Choosing the better revascularisation modality - PCI or coronary artery bypass grafting surgery (CABG) - is not always simple.

The presence of a CTO has long been recognized as the primary reason for referral to bypass surgery. It is also the most common reason for relegation of patients with significant coronary disease to medical treatment alone. There is an observed treatment paradox and treatment inertia when it comes to CTO intervention. In many instances, 70% right coronary artery stenosis is treated with a stent but it is more likely to choose not to revascularise the right coronary CTO and elect to treat medically. Ironically, as disease burden and complexity increase, clinicians perform less revascularisation. This reluctance to act is largely based on historical misperceptions around the relevance and clinical impact of CTO revascularisation.

Changing Paradigms in CTO PCI - Hybrid technique to overcome limitations and improve outcomes; EXPERT CTO trial

Advances in the use of coronary imaging, interventional devices, and novel techniques have improved the success rates of CTO PCI with reduced complication, improved safety and high success rates.

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Dalcross Adventist Hospital is transferring the major surgical areas of Bariatric, Vascular, Neuro, Spinal and Orthopedic surgery to Sydney Adventist Hospital in August. Dalcross remains as a specialist Ophthalmic, Plastic and Dental Surgical Hospital and provides a new dedicated Rehabilitation facility.

San Radiology recorded a world-first in CT imaging delivering the lowest dose of radiation ever for a Cardiac CT, according to the supplier Siemens, and still produced high quality images. In another world-first, patients are expected to soon access information that helps them track their lifetime cumulative radiation dose from CT scans performed at San Radiology.

San Radiology recently installed 2 new NEW GE High-Resolution (3T), wide bore MRI scanners (100+% increase in capacity) and 2 NEW Ultra-Low Dose CT scanners (384-slice Siemens Force & 128-slice Siemens AS+).

Purchase an Entertainment™ Book or Entertainment™ Digital Membership and 20% of the purchase price is donated to SAH’s humanitarian aid organisation, Open Heart International (OHI). Go to http://bit.ly/ohientertainmentbook.

Participants are invited to join OHI’s fundraiser ‘Ride For Hearts 2015’ and cycle from Vietnam to Cambodia in October in 2015. Participants discover Southeast Asia while fundraising to give children in Cambodia dying of heart disease a second chance at life. Places are limited. Register at www.ohi.org.au

Congratulations Mr John Sanburg and Mrs Marje Batchelor for receiving a Medal of the Order of Australia, announced by Governor-General Sir Peter Cosgrove on the Queen’s Birthday for their humanitarian aid work with OHI.

John and Marje were inaugural members of the ‘Cleft Lip and Palate’ project in 1994. Marje led the theatre team until the project’s conclusion in 2004. John went on to established the ‘Burns Surgery’ project which he led until 2014.

New dedicated Rehabilitation facility at Dalcross Adventist Hospital

A new Intensive Care Unit is opening in the L.W. Clark Tower in August. Expanding on the existing comprehensive 13 bed ICU facility, which treats more than 1,200 patients per year, the new unit will feature 14 dedicated Neurovascular pods and 16 Cardiac/General pods. The $200 million 12-storey L.W. Clark tower opened at the San in September last year. It features a Maternity, Women’s Health and Children’s Unit, an Integrated Cancer Centre and a Healing Garden and up to 24 new operating theatres, and with existing facilities provides total capacity for over 550 inpatient beds, another 300+ day beds. For more information visit sah.org.au/devt

SAH Urologist Associate Professor Henry Woo attended The Urological Society of Australia and New Zealand meeting in April presenting research attributed to the Sydney Adventist Hospital Clinical School of The University of Sydney. He also attended the American Urological Association meeting in May where he received ‘2014 Reviewer of the Year Award’ from the prestigious Journal of Urology and he was also invited to talk in the BAUS/BJUI/USANZ session.

Orthopaedic Surgeon Dr Michelle Atkinson has won one of the five annual ‘Spine Society of Australia’ prizes for research and presentation on the use of a bone graft substitute during surgery to perform bone fusion on patients at SAH.

To celebrate International Midwives Day and Mother’s Day in May hundreds of San Babies and mums gathered on the Hospital Village Green for the San Teddy Bears’ Picnic. The day was an opportunity to celebrate midwives, nursing staff and doctors, and to thank the mums who chose to have their babies at the San.

SAH specialists and staff feature on Sydney radio discussing a range of topical health and medical issues. ‘Health Matters’ airs on Radio 2GB (873) with Steve Price on Monday nights after 9.30pm and ‘Health Checks’ airs on Radio 2UE (954) with Tim Webster on Saturday afternoon at 4:15pm. Podcasts at www.sah.org.au.

Chief Scientist at SAH’s Australian Research Institute, Dr Ross Grant shares health facts about the human body, medical treatment and technology, health and wellbeing on 2GB Radio every Monday, Wednesday and Friday morning. Podcasts at www.sah.org.au/healthfacts

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Purchase an Entertainment™ Book or Entertainment™ Digital Membership and 20% of the purchase price is donated to SAH’s humanitarian aid organisation, Open Heart International (OHI). Go to http://bit.ly/ohientertainmentbook.

Participants are invited to join OHI’s fundraiser ‘Ride For Hearts 2015’ and cycle from Vietnam to Cambodia in October in 2015. Participants discover Southeast Asia while fundraising to give children in Cambodia dying of heart disease a second chance at life. Places are limited. Register at www.ohi.org.au.

Congratulations Mr John Sanburg and Mrs Marje Batchelor for receiving a Medal of the Order of Australia, announced by Governor-General Sir Peter Cosgrove on the Queen’s Birthday for their humanitarian aid work with OHI.

John and Marje were inaugural members of the ‘Cleft Lip and Palate’ project in 1994. Marje led the theatre team until the project’s conclusion in 2004. John went on to established the ‘Burns Surgery’ project which he led until 2014.