Adventist HealthCare

Winter 2023

San Doctor

collaborating with our GPs to provide coordinated community care

Message from Brett Goods, Chief Executive Officer

We are delighted to once again see so many doctors participating in this edition of San Doctor, sharing a range of information from each of their fields that is relevant to GPs. We hope this resource will provide you with insight into treatments and conditions which may present at your clinic.

In this issue, you will read about pioneering advances in spinal cord stimulation, an additional treatment option for prostate cancer and the importance of distinguishing between arthroscopy for meniscus versus arthroscopy for osteoarthritis to ensure the best outcomes for patients.

Other stories showcase a world first study in hernia repair, as well as a minimally invasive procedure that repairs a damaged aortic valve, while removing the need for open heart surgery.

The array of articles in this edition demonstrates how at Sydney Adventist Hospital we continue to provide the best possible care to our community.

Brett Goods, CEO

Chief Executive Officer
Adventist HealthCare Limited

References for articles are available on request.

AN ARTICLE FEATURING **Dr James Alexander**

Relief for women with debilitating pelvic floor conditions

Vaginal prolapse and urinary incontinence can significantly impact a woman's quality of life and may lead to a deterioration in physical, social and psychological health. Fortunately, there are good solutions available.

Vaginal prolapse

Prolapse is the descent of the anterior or posterior walls of the vagina, or descent of the uterus through the vagina. "Prolapse is essentially a hernia that passes through the vagina as tissues and ligaments stretch, and fascial attachments are damaged," said Dr James Alexander, urogynaecologist at the San. "Prolapse can be asymptomatic, but in some cases it can also be debilitating to a women's quality of life."

Prolapse is quite common: 40-50% of women will have some degree of prolapse, but just 10-15% of these women will need surgery. "Symptomatic prolapse that extends to the entrance of the vagina is often ideally treated with pelvic floor muscle therapy and/or vaginal pessaries. Surgical management is often considered for prolapse that protrudes beyond the vagina," said Dr Alexander.

The biggest risk factors for prolapse are childbirth and increasing age. A prolapse that's asymptomatic and not bothering the patient may never have to be treated. "However, prolapse can be incredibly uncomfortable and may cause problematic bladder and bowel symptoms," added Dr Alexander.

Treatment options for vaginal prolapse:

1. If no symptoms and the prolapse is mild and not bothering the patient, observe and monitor.
2. Conservative measures – pelvic-floor exercises ideally under the guidance of a pelvic floor physiotherapist; weight loss, general health optimisation, avoid constipation.
3. Pessaries – these can be an effective conservative option for managing any form of prolapse although they do not work well for all women. They're very useful for those wanting to avoid surgery. Self-management is possible for women confident in removal and insertion of their pessary. Only one-third of women use pessaries for longer than 12 months. There are different types of pessaries, so try a few to find the one that works best.
4. Surgery – for moderate to severe prolapses. Recurrence of some symptoms over 10-15 years is common even after surgery. As a result, operative management is best reserved for women who have moderate to severe prolapse.

"The severity of the prolapse objectively doesn't always correlate with the subjective experience of the patient," noted Dr Alexander. "Some women are more sensitive to objectively mild prolapse, while some have surprisingly few symptoms given the severity of their prolapse. This has to be taken into account when individualising a management plan for the patient."

Urinary Incontinence

There are two main types of urinary incontinence: stress incontinence and urgency incontinence.

Stress incontinence is the involuntary leakage of urine as a result of exertion such as coughing or sneezing.

Treatment options include:

1. Conservative management – this includes losing weight (which can cure stress incontinence in some patients) and fluid management (limiting fluids to 1.5 litres of fluid a day). All patients with stress incontinence should undergo supervised pelvic floor muscle training with a physiotherapist. "There are high improvement and cure rates using physiotherapy to treat stress incontinence, and this approach should be taken before surgery is considered," said Dr Alexander.
2. Pessaries – these can help with stress incontinence to some degree but are not always effective and rarely provide cure. Women may wish to try pessaries if they don't want to have surgery, if they haven't completed their family, or have symptoms only at particular times like high-impact exercise/ sport.
3. Surgery – there are mesh and non-mesh surgical options. Cure rates range from 70-85%. "Some patients are rightly cautious about mesh given a lack of sufficient regulation of vaginal mesh products over the past 20 years, and that's why we offer options," said Dr Alexander. "In my practice (and after extensive counselling), about 60% of women choose a mesh sling, 30% the non-mesh options, and 10% choose to expectantly manage and monitor symptoms. Non-mesh options include the fascial sling, which involves creating a sling using tissue from your own body. Another is a Burch culposuspension – keyhole laparoscopic surgery which aims to support the urethra by elevating the vagina."

Dr Alexander recommends all patients who are considering surgery first undergo urodynamics – a test that is done to investigate the cause of urinary leakage and to assess for voiding dysfunction. This testing is important to match the correct treatment for the patient's unique situation.

Laser treatment is one of the newer approaches being spruiked to treat stress incontinence, but it may not be living up to the hype and Dr Alexander offers some caution. "There had been a lot of hope that laser treatment would be effective for stress incontinence. I was involved with research in the form of a sham-controlled, randomised-controlled study on laser treatment for stress incontinence published in 2022 in the American Journal of Obstetrics and Gynaecology. This study found laser to be of minimal benefit for stress urinary incontinence. Indeed, The International Urogynaecology Association does not recommend vaginal laser for urinary incontinence – or for pelvic organ prolapse either, for that matter."

Urgency urinary incontinence – a term often used interchangeably with overactive bladder (OAB) – is the involuntary leakage of urine immediately preceded by the urge to void. It affects 60% of women over 60 years of age. "While there are some risk factors such as age, obesity, caffeine and a family history of OAB, we still don't fully understand the causes of OAB," said Dr Alexander. "It is likely inflammatory, infective or ischaemic processes cause insult to bladder tissue, or changes at a higher neurological level impair the delicate balance between the emptying and storage phases. Either way, we still need more research to understand the definitive causes of overactive bladder."

Treatment options include:

1. Lifestyle measures such as avoiding caffeine and alcohol, reducing weight, and avoiding constipation can be helpful. It is also worthwhile considering reversible causes of incontinence such as urinary tract infection or medications (eg diuretics). Cognitive decline leading to urinary incontinence should also be considered.
2. Physiotherapy – pelvic-floor exercises and bladder training may not be as effective with overactive bladder as it is in stress continence, but it's still a worthwhile option. Physios can also assist using TENS machines (transcutaneous electrical nerve stimulation) with some effect.
3. Medical treatment – such as Ovestin cream is a gentle treatment for urgency symptoms. "Medications such as anti-cholinergics and beta-3 agonists are a little more effective at treating overactive bladder, but can have more side effects than topical oestrogen," said Dr Alexander.
4. Botox – If none of the above measures work, Botox can be injected into the bladder. "This is probably the most effective treatment but it can only be given (under Medicare requirements) after other medical management has failed to work. Botox often has to be repeated every 10 months. It works well for 2/3 of people with refractory symptoms after medical management," added Dr Alexander.
5. Surgery – Sacral nerve stimulation (SNS) is generally reserved as a final treatment option for overactive bladder. In SNS, an electrode is passed through the sacral foramen and a battery is inserted under the skin of the patient's lower back or buttocks, stimulating nerves in the sacral area that control bladder function.

"One thing we need to keep in mind is that persistent overactive bladder symptoms could be a sign of potentially sinister causes – such as cancer, or kidney stones, or an early sign of cognitive decline," cautioned Dr Alexander.

Dr James Alexander

MBBS FRANZCOG CU

Dr James Alexander is an experienced, Australian-trained Urogynaecolgist, Obstetrician and Gynaecologist, specialising in pelvic floor disorders. Dr Alexander completed his basic obstetrics and gynaecology training at The Royal Hospital for Women and affiliated hospitals in 2017, and went on to complete a year as the Gynaecological Oncology fellow at The Royal Hospital for Women to gain advanced minimally invasive surgical skills. Following this, he commenced accredited urogynaecology training and in 2022 obtained his fellowship in Urogynaecology at Monash Health & The Mercy Hospital for Women in Melbourne.

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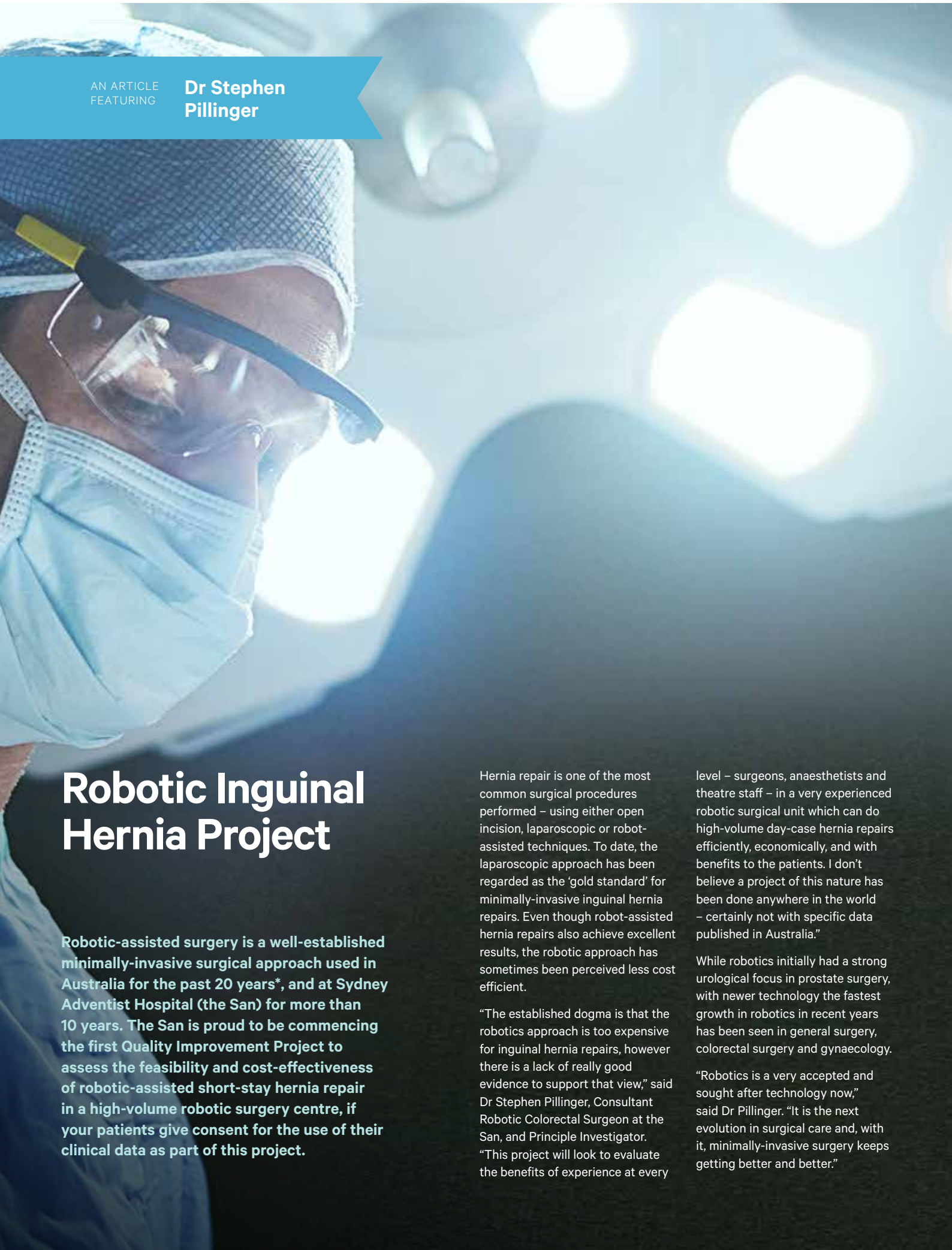

AN ARTICLE FEATURING **Dr Stephen Pillinger**

Robotic Inguinal Hernia Project

Robotic-assisted surgery is a well-established minimally-invasive surgical approach used in Australia for the past 20 years*, and at Sydney Adventist Hospital (the San) for more than 10 years. The San is proud to be commencing the first Quality Improvement Project to assess the feasibility and cost-effectiveness of robotic-assisted short-stay hernia repair in a high-volume robotic surgery centre, if your patients give consent for the use of their clinical data as part of this project.

Hernia repair is one of the most common surgical procedures performed – using either open incision, laparoscopic or robot-assisted techniques. To date, the laparoscopic approach has been regarded as the 'gold standard' for minimally-invasive inguinal hernia repairs. Even though robot-assisted hernia repairs also achieve excellent results, the robotic approach has sometimes been perceived less cost efficient.

"The established dogma is that the robotics approach is too expensive for inguinal hernia repairs, however there is a lack of really good evidence to support that view," said Dr Stephen Pillinger, Consultant Robotic Colorectal Surgeon at the San, and Principle Investigator. "This project will look to evaluate the benefits of experience at every level – surgeons, anaesthetists and theatre staff – in a very experienced robotic surgical unit which can do high-volume day-case hernia repairs efficiently, economically, and with benefits to the patients. I don't believe a project of this nature has been done anywhere in the world – certainly not with specific data published in Australia."

While robotics initially had a strong urological focus in prostate surgery, with newer technology the fastest growth in robotics in recent years has been seen in general surgery, colorectal surgery and gynaecology.

"Robotics is a very accepted and sought after technology now," said Dr Pillinger. "It is the next evolution in surgical care and, with it, minimally-invasive surgery keeps getting better and better."

QUALITY IMPROVEMENT PROJECT OVERVIEW

With robot-assisted hernia repair, patients can generally expect less pain, fewer complications, shorter stay in hospital, and a quicker return to work and normal activities. “These outcomes are well documented,” said Dr Pillinger. “The motivation behind setting up this quality improvement project is to prove we can run a high-volume robotic inguinal hernia service that is beneficial for our patients as well as being efficient and economical.”

The project commenced in late July 2023 at the San, and the aim is to analyse data from up to 200 patients during the project. The first complete review of the data will be done at three months, with interim results expected at six months and published data after 12 months.

PATIENT INVOLVEMENT

Every patient referred to a surgeon at the San will be carefully assessed by their surgeon, and their hernia surgery will be done via the most clinically appropriate approach for their individual needs. If robotic surgery is determined to be the most appropriate approach, patients can then agree to have data routinely collected as part of their surgical intervention analysed in this Quality Improvement Project, with the aim to improve outcomes for our patients.

For the purposes of this project, there are three groups of hernia patients that may be suitable for inclusion:

- Patients who have had no prior lower abdominal surgery, previous repair, recurrence or pelvic radiotherapy
- Patients who have had previous inguinal hernia repair with recurrence
- Patients who have had previous abdominal surgery and have complex or large incisional hernias that require component separation/abdominal wall reconstruction.

Initially, the project will focus on data from patients who have not had previous lower abdominal surgery or treatment. “We’re restricting the project to simple hernias for the first three months, while we standardise protocols and procedures,” said Dr Pillinger. “It is expected that data from other patients will then be incorporated into the project as it progresses.”

“While we expect there will be significant interest from patients, not every patient is suitable for robotic surgery,” said Ms Catherine Murphy, Perioperative Redesign Project Manager at the San. “However every patient will be carefully assessed, and their hernia surgery will be done via the most appropriate approach for their individual needs.”

During this project, the San will allocate dedicated robotic hernia theatre lists, with theatre personnel experienced in robotics. “If you do large numbers of robotic cases one after the other it becomes very efficient, rather than alternating between robotic cases and laparoscopic or open cases,” said Dr Pillinger. “We’re aiming to establish a service that is very efficient and works well for the patient, the theatres and the hospital.”

Six surgeons very experienced in robotic surgery are participating in the Quality Improvement Project: Dr Stephen Pillinger, Dr Walid Barto, A/Prof Craig Lynch, Dr Christos Apostolou, Dr Assad Zahid and Prof Jaswinder Samra.

“The surgeons involved in this project strongly feel that robotics is the best approach for hernia repair for patients,” said Dr Pillinger. “Until now there hasn’t been the hard data to back this up, and that’s one of the things we hope to achieve with this project.”

If you have any questions or would like further information about this project, contact the rooms of Dr Pillinger or Dr Barto.

**https://onlinelibrary.wiley.com/doi/10.1111/ans.17161#:~:text=Robotic%20surgery%20began%20in%20Australia,Hospital%20in%20Melbourne%20in%202003.*

This project was reviewed by the AHCL Research Office and approved by the AHCL Director of Research as a QI project in accordance with the NHMRC Ethical Considerations in Quality Assurance and Evaluation Activities (March 2014) and the Health Privacy Principles #10 and 11. No ethical risks were determined with the project.

Dr Stephen Pillinger

MBChB, FRACS

Dr Pillinger is a Consultant Colon & Rectal Surgeon, having commenced Consultant practice in 2005. The major focus of his practice is benign and malignant colorectal pathology and has particular expertise in minimally invasive Laparoscopic and Robotic Surgery, Transanal Endoscopic Microsurgery, diagnostic and interventional colonoscopy. He has trained in Robotic surgery in the US and South Korea and is one of the busiest Robotic Colorectal Surgeons in NSW.

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AN ARTICLE FEATURING **Dr Saissan Rajendran**

Beware the atypical claudicant!

Atherosclerotic peripheral artery disease (PAD) is common and is estimated to affect 4.3% to 29% of the adult population. PAD is an important syndrome to identify promptly because it is associated with an increased risk of premature myocardial infarction, stroke, and all-cause mortality.

When a younger patient without risk factors for atherosclerosis presents with symptoms of limb ischemia, PAD may not be suspected, leading to misdiagnosis. Nonatherosclerotic PAD of the lower extremities represent a heterogeneous group of uncommon conditions. Such conditions include popliteal artery entrapment syndrome, popliteal artery aneurysm, cystic adventitial disease, persistent sciatic artery, Buerger disease, Takayasu arteritis, arterial thoracic outlet syndrome, and external iliac endofibrosis. Given the severity of symptoms of leg discomfort, these disorders must also be considered in the differential diagnosis of patients who may not have the classic profile of atherosclerosis. Each condition has distinctive pathophysiology, clinical manifestations, treatment, and prognosis. If the condition is left undiagnosed or mismanaged, these conditions may result in seriously adverse outcomes that may otherwise have been avoided or minimized. Here we present a case of cystic adventitial disease.

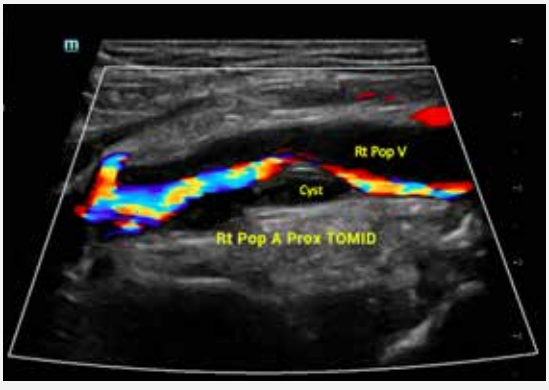

Fig 1: Arterial duplex ultrasound demonstrating hypoechoic cyst within the arterial wall.

CASE

A 48 year-old man presents with worsening right leg pain. The patient had been seen in an outpatient clinic, 1 month prior, with symptoms suggestive of intermittent claudication. Although he had some risk factors for peripheral arterial disease (PAD) including hypertension and hypercholesterolaemia, it was noted that he had atypical features on clinical examination, including pain relieved by elevation and a strong dorsalis pedis pulses. A CT angiogram was initially performed, in which the popliteal artery appeared ectatic with some luminal thrombus resulting in a mild to moderate stenosis. Given the unusual presentation and confounding clinical findings, an arterial duplex ultrasound with dynamic manoeuvres was performed to further evaluate the ectatic popliteal artery and exclude popliteal compressive pathologies.

The arterial duplex was initially performed supine, showing non-atheromatous hypoechoic wall thickening of the popliteal artery without any significant stenosis. However with the patient in prone position, there was marked reduction of the arterial lumen from a hypoechoic structure causing extrinsic compression. This lead to the primary differential of entrapment from cystic adventitial disease (Fig. 1). An MRI was then subsequently performed to confirm this diagnosis (Fig. 2a,b).

The patient underwent a successful right popliteal artery interposition bypass graft with complete resolution of symptoms (Fig. 3a). The histopathology of the resected artery showed multiple dilated cysts in the adventitia lined by a single layer of flattened cells with surrounding myxoid change in some cysts (Fig. 3b).

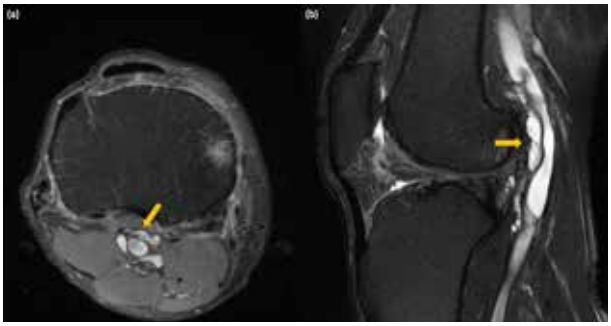

Fig 2: (a) MRI, axial; lobulated cystic structure anterior to the popliteal artery. (b) MRI, sagittal; 7 cm cystic abnormality.

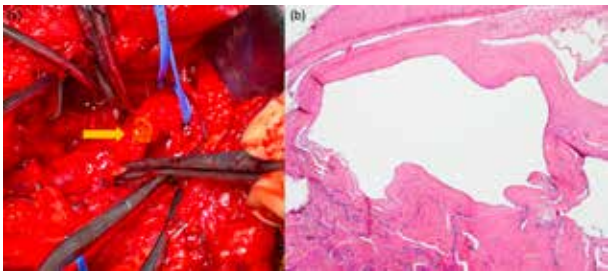

Fig 3: (a) Resection of the diseased part of the popliteal artery containing gelatinous cystic material. (b) H&E staining of the popliteal artery containing cysts in the adventitia.

KEY POINTS

- A high index of suspicion should be maintained to recognize symptoms consistent with limb ischemia in a younger patient in the absence of the usual atherosclerosis risk factors.
- A workup for most conditions includes non invasive vascular ultrasonography with possible dynamic manoeuvres.
- Prompt referral for surgical or endovascular treatment is necessary for optimal limb salvage.

Dr Saissan Rajendran

MBBS, GDAAD, MS (Vasc),
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Dr Saissan Rajendran received his medical degree from the University of New South Wales then undertook his vascular surgical training across Australia and New Zealand at major vascular and trauma centres including Royal Prince Alfred Hospital, Royal Adelaide Hospital and Waikato District Hospital. On completion of his surgical training, he was accepted for two specialised endovascular fellowships. The first was at St. Georges University NHS Hospital in London where he gained expertise in the treatment of complex vascular disease and in performing minimally invasive 'keyhole' vascular procedures. His second fellowship was at Policlinico Abano Terme Hospital in Padua, Italy. Now based in Sydney, he utilises the skills obtained abroad to provide high quality vascular care for his patients.

Dr Rajendran believes in collaborative care, in which a multidisciplinary approach involving strong communication and partnerships between all involved medical professionals will optimise patient outcomes.

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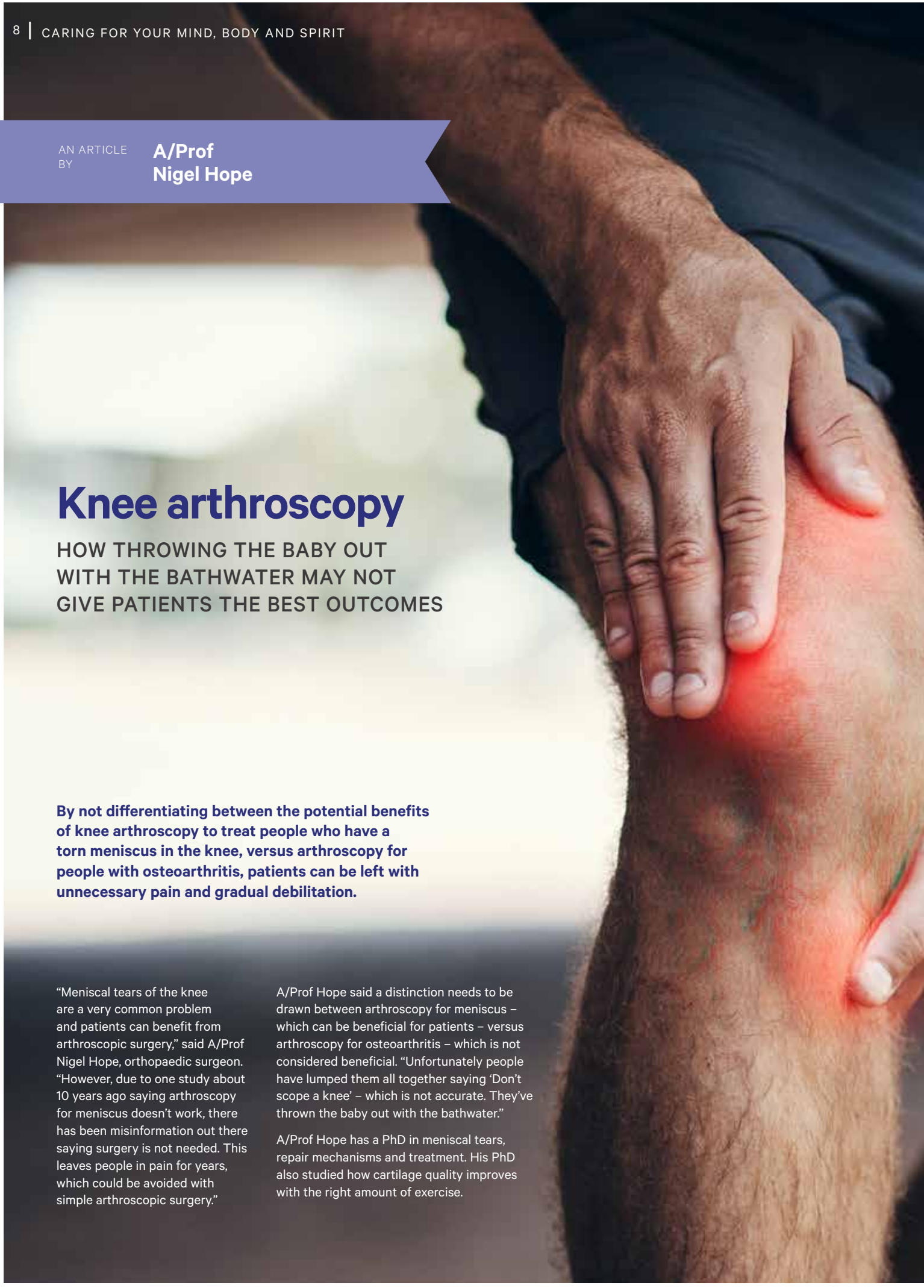
AN ARTICLE BY **A/Prof Nigel Hope**

Knee arthroscopy

HOW THROWING THE BABY OUT WITH THE BATHWATER MAY NOT GIVE PATIENTS THE BEST OUTCOMES



By not differentiating between the potential benefits of knee arthroscopy to treat people who have a torn meniscus in the knee, versus arthroscopy for people with osteoarthritis, patients can be left with unnecessary pain and gradual debilitation.

"Meniscal tears of the knee are a very common problem and patients can benefit from arthroscopic surgery," said A/Prof Nigel Hope, orthopaedic surgeon. "However, due to one study about 10 years ago saying arthroscopy for meniscus doesn't work, there has been misinformation out there saying surgery is not needed. This leaves people in pain for years, which could be avoided with simple arthroscopic surgery."

A/Prof Hope said a distinction needs to be drawn between arthroscopy for meniscus – which can be beneficial for patients – versus arthroscopy for osteoarthritis – which is not considered beneficial. "Unfortunately people have lumped them all together saying 'Don't scope a knee' – which is not accurate. They've thrown the baby out with the bathwater."

A/Prof Hope has a PhD in meniscal tears, repair mechanisms and treatment. His PhD also studied how cartilage quality improves with the right amount of exercise.

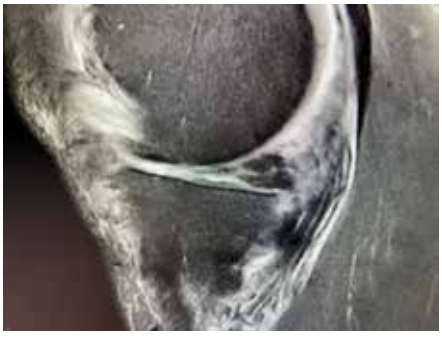
Torn meniscus

Meniscus is a cartilage in the knee which acts as a shock absorber to protect the surface of the knee joint from damage. Normal ageing and high-impact sport can reduce meniscal strength. When the meniscus becomes worn or weakened, people can just twist their knee and it tears.

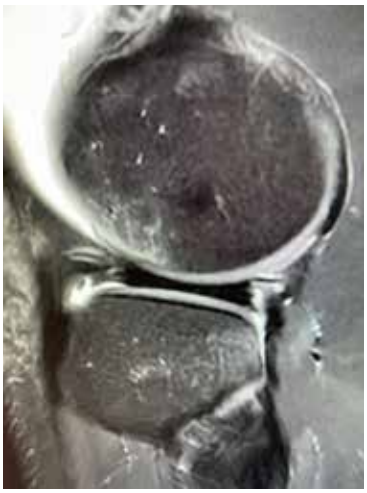
"There are two sorts of tears: (1) acute traumatic tears in young people, which are vertical, and (2) degenerative low-energy tears in older people, which are horizontal," said A/Prof Hope. "A torn meniscus results in loose fragments in the knee. Occasionally you can repair the torn meniscus, but where repair is not possible, the meniscus is trimmed out and the knee can work well again."

"The knee joint is like a super-smooth bearing, and when you have all this gristle [torn meniscus] in there, it wears the joint surface. Eventually the surface of the knee joint wears away. This can cause permanent damage or lead to osteoarthritis, and then people may need a knee replacement sooner than they would have if the torn meniscus had been addressed in the early stages."

A/Prof Hope said it is not unusual to see patients who have put up with pain and instability of their knee joint for a long time, often with detrimental effect. "There can be long-term consequences of ignoring a torn meniscus. A painful unstable joint can mean people don't exercise as much, they gain weight, they limp, they put extra load on the other leg which can make the other knee play up, and then their back starts giving them trouble. It is a cascade effect."



Meniscus with a posterior horn horizontal tear



Normal menicus is a "solid black bow tie"

Treatment

Over the years A/Prof Hope has noted that some people can have a tear in the meniscal cartilage and have no symptoms, while for others it is very painful. "It is recommended that you don't leave a painful knee longer than two months. See your physio for a trial of non-operative treatment for two months, and if pain and instability persists, see your doctor."

Knee arthroscopy for meniscal tears is generally a day-only procedure. "In arthroscopic surgery, we only need to make two x 5mm incisions, it is minimally invasive, and patients can go home the same day. They are allowed to weight bear and walk that same day. They will need physiotherapy twice a week for about a month afterwards."

"A meniscal tear is not just a wear-and-tear condition that effects older people, nor is it an injury that only effects high-impact sports people – it can happen to anyone at anytime," added A/Prof Hope. "A well-performed arthroscopy removes offending meniscal fragments. This reduces the risk of osteoarthritis and can extend the life of the knee joint."

A/Prof Nigel Hope

MBBS, PhD, FRACS, FAOrthA

Associate Professor Nigel Hope is a senior orthopaedic surgeon with over 25 years' experience. He specialises in hip and knee surgery including anterior hip replacement, knee replacement, knee arthroscopy and ACL reconstruction. He uses minimally invasive techniques with state-of-the-art technology to provide the best patient outcomes. He sees patients at the San Clinic and he operates at the Sydney Adventist Hospital.

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AN ARTICLE FEATURING **Dr Elizabeth Shaw**

Better heart health for potentially overlooked patients

TAVI and women's heart disease are two areas of particular interest to the San's Director of Cardiology, Dr Elizabeth Shaw. Dr Shaw was the first female structural interventional cardiologist in Australia and New Zealand, and the first female doctor to be accredited for TAVI (transcatheter aortic valve implantation) in Australia.

TAVI

TAVI is a minimally invasive way to treat severe aortic stenosis without the need for open heart surgery. "With TAVI we don't have to open the chest like we used to, we just do the procedure through a little puncture in the groin," said Dr Shaw. "Aortic stenosis is the calcification and narrowing of the aortic valve and it can be so narrow the heart has trouble pumping blood to the rest of the body. Patients can develop angina, dyspnoea, syncope and heart failure. With the TAVI procedure, we go in and open up that narrowed aortic valve with a balloon, and put in a new valve."

In most cases TAVI is performed under conscious sedation – the patient doesn't need a general anaesthetic. This is good for patients who have high risks associated with general anaesthetics.

TAVI is a quicker procedure than open heart surgery for aortic valve replacement, and generally takes about one hour. It is less invasive, and patients recover much quicker from it. "Sometimes patients can go home the next day or the day after, as opposed to needing to go to ICU and stay in hospital for a week," said Dr Shaw. "TAVI is a good option for the elderly and for patients with lots of comorbidities – providing they have suitable anatomy for the valve."

Who is eligible for TAVI?

In Australia, initially TAVI was approved only for high-risk non-operative patients – patients with severe aortic stenosis but who were considered too frail or not suitable candidates for open heart surgery. "In the past these patients would have developed heart failure, been really unwell or may have died," said Dr Shaw. "The option of TAVI means these patients now have the opportunity to be treated and have a better quality of life."

TAVI has now also been approved for intermediate and low-risk categories – within guidelines – not just the high-risk groups. "The San has a really strong multidisciplinary team who meet to discuss each and every candidate's suitability for TAVI," said Dr Shaw. "Patients are reassured to know that a cardiothoracic surgeon, an interventional cardiologist, a radiologist, perfusionist and other doctors carefully consider each individual case."

The San was at the forefront of patient safety in regards to the use of cerebral protection devices during TAVI. Cerebral protection devices are used to minimise strokes during procedures. "Even before there was Medicare reimbursement for these devices, the San actually funded them of its own accord – before the rest of Australia had funding for them – because the San wanted to put patient safety first and provide the newly available cerebral protection devices," noted Dr Shaw.

The first TAVI case was done in Australia in 2008, however the TAVI procedure only received Medical Benefits Schedule reimbursement in 2018. It has been reported (by PCRonline) that more than 1.5million TAVI cases have been performed worldwide.

Despite these advances and the expanded criteria for eligibility for TAVI, Dr Shaw cautions that there is still a lot of aortic stenosis in the community that is not picked up. "Symptoms of aortic stenosis can include angina, dyspnoea, syncope, congestive cardiac failure and heart murmur. One of the most important things GPs can do for their patients is to have a listen to their chest," said Dr Shaw. "If they hear a new murmur, refer for further tests and to a cardiologist."

WOMEN'S HEART DISEASE

Because of a few unique gender dynamics, women may not present with 'typical' symptoms associated with heart disease. This can put them at risk of heart disease progressing undetected, which can lead to potentially worse outcomes.

"I'm very passionate about women and heart disease," said Dr Shaw. "There are a few things we need to be mindful of with female patients, because women have a slightly different timecourse than males: initially women may benefit from an oestrogen-protective effect, but then they can experience perimenopausal issues with their heart. Women can also suffer more from spontaneous coronary artery dissections (SCAD) and microvascular heart disease."

Microvascular disease
Microvascular disease is where there are blockages in the really small arteries of the heart. "Patients may have symptoms, but microvascular disease may not show up on angiogram and they're left without a formal diagnosis. This can leave them feeling like their symptoms are not acknowledged. Without timely treatment, it could be detrimental to their health long-term," noted Dr Shaw. New developments including the Coroventis system allows blockages in the microvascular system to be detected, which helps with more accurate diagnosis and informed decisions about treatment.

Gestational diabetes and preeclampsia
A past medical history of gestational diabetes and preeclampsia are now recognised as real risk factors for heart disease. "These weren't among the traditional risk factors we were taught in medical school," said Dr Shaw. "But we now know that the vascular dysfunction women can experience during pregnancy puts them at increased risk of developing heart disease later in life. Gestational diabetes and preeclampsia are real risk factors for heart disease in women, just as smoking and hypertension are risk factors for everyone."

Vague symptoms and undertreatment
Women's symptoms can be different to those typically associated with heart attacks such as radiating pain in the left arm or jaw. "Some women can present with overwhelming fatigue, nausea, anxiety, vomiting, palpitations or hot flushes. Historically these symptoms may not have been typically associated with heart attacks," said Dr Shaw.

"A study published a few years ago out of Westmead found that women had worse outcomes compared to their male counterparts even after presenting to a tertiary referral hospital with a STEMI (ST-elevation myocardial infarction). This study also showed that women are also less likely to be offered revascularisation – angiograms, stents, or bypasses," added Dr Shaw. "We're not really sure why this is the case. Some of that may be because they have microvascular disease, or SCAD, or vasospasm, but some women were considered 'just really anxious'. We need to be aware that women do often present differently, and make a conscious effort to treat patients the same – regardless of their gender."

Dr Elizabeth Shaw

MBBS, FRACP, FCSANZ

Dr Elizabeth Shaw is a Structural and Interventional Cardiologist who has a special interest in chest pain, women's heart health and valvular heart disease. She is the first female Cardiologist to be accredited to perform Transcatheter Aortic Valve Implantations (TAVIs) in Australia.

She is Director of Cardiology at Sydney Adventist Hospital. Dr Shaw is a committee member for the Australia and New Zealand Endovascular Therapies (ANZET) meeting and is passionate about encouraging junior doctors to pursue their chose field. She is a founding member of the Women in Interventional Cardiology of Australia and New Zealand group.

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AN ARTICLE BY **Dr Stuart Kirkham**

"Tenoporosis"

Have you heard of the new buzz word "Tenoporosis"? No, of course you haven't! ...because I made it up.

The incidence of age-related tendinopathies is on the relentless rise, placing more burden on our health dollars than ever before. Within the world of Orthopaedics & locomotion, the research into tendons has lagged well behind the research into the more lucrative and fashionable topic of osteoporosis; but I suggest to this audience that they are exceptionally similar.

The average life expectancy has risen sharply in the last 100-300 years – (driven by medical advances beyond the scope and imagination of a mere Orthopod). However, our tendons have not evolved enough to keep pace with all of the new demands that our ever-changing lifestyles now place upon them. Hence the obvious rise being seen in tendon diseases – namely rotator cuff, Achilles, tennis elbow, hamstrings – just to name a few.

We live longer today, and we do things like play complex sports, type a lot and more recently use phones frequently - placing new demands on our ageing tendons.

The normal human or mammalian tendon is composed of type 1 collagen. Collagen is an extra cellular protein made by our fibroblasts and tenocyte cells. It's a complex triple helix shaped molecule with di-sulphide bonds that crosslink these strands to improve its tensile strength. The synthesis relies heavily upon vitamin C (think scurvy, a collagen disorder, common in days gone by), oxygen and Zinc as a co-factor. Collagen is extruded and remains largely extra cellular after its manufacture by the cell. Normal tendons have incredible tensile properties. In addition, they recognise loads and react with both hypertrophy and atrophy.

When our tendons age, they lose several abilities. The ability to withstand that same tensile load that we could withstand in our younger years. Injuries occur more readily, with lower Newtons of force, and at lower repetitions. This is what I call tenoporosis – the sibling of osteoporosis if you like?

Our tendons atrophy as we get older. This means that they lose size, bulk and weight on a macroscopic level. At the cellular level they are less capable of repair than when we were younger. Cracks, splits and delamination are more frequent with every decade after our 30's.

We see 20-year-old NRL athletes having hamstring tears. We see 40-year-olds with tennis elbow. We see 50-year-olds with rotator cuff tendinopathies. This list goes on.

Dr Kirkham is currently conducting research into tendon healing with a view to providing improved healing and improved outcomes for patients.

Dr Stuart Kirkham

MBBS, FRACS, FAOrthA

Dr Kirkham graduated MBBS from University of Sydney in 1990 and obtained FRACS in 1998. He completed the Newcastle AOA training programme, and then undertook a 12-month Hand Surgery Fellowship at Baylor College of Medicine in Houston, Texas, USA between 1999-2000. He also obtained a Diploma of Microvascular Surgery through the Department of Plastic Surgery, St Joseph's Hospital, Houston Texas in 2000. He has been secretary of the NSW Hand Surgery Association and was on the KDMA Committee. Dr Kirkham treats all upper limb disorders and has specific current research interests in carpal tunnel, tennis elbow, rotator cuff, shoulder arthroplasty, tendon disorders and scaphoid bone grafting.

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AN ARTICLE FEATURING **Dr Vahid Mohabbati**

Pioneering Advances in Spinal Cord Stimulation

With chronic pain now affecting up to 20% of Australian adults, viable and cost-effective treatment options have never been more important for both the health and quality of life of our patients and for the economy of our healthcare system.

Chronic, neuropathic pain of any indication can be notoriously difficult to manage and often intractable to many treatment options. Spinal Cord Stimulation (SCS) is fast becoming an effective means of assisting in the treatment and management of these otherwise refractory conditions.

Dr Vahid Mohabbati and his team at the Sydney Pain Management & Sydney Pain Research Centre (SPRC) are participating in numerous clinical trials related to SCS that aim to:

1) Identify superior surgical techniques to decrease the risk of trial SCS failure secondary to lead migration.
2) Improve the patient experience with SCS
3) Develop wearable batteries for SCS devices and
4) Diversify the indications for SCS use.

It is standard of practice for patients to first have a successful trial of SCS, which is defined by achieving a minimum of 50% pain relief with subsequent improvement in physical function and sleep, before they are eligible for a permanent implant. During SCS trials for low back and lower limb pain, percutaneous leads are inserted into the epidural space and placed in line with the T8/T9 intervertebral discs. For neuropathic pain in neck and upper limbs, leads can be placed as high as C1/C2 discs. The leads are anchored to the body using either tape, sutures or a technique called tunnelling, which feeds the leads away from the midline to a more distal exit point.

Lead migration occurs when the leads move in any direction from their original insertion point and, more often than not, result in loss of SCS efficacy. “Lead migration is one of the most common causes of premature SCS trial failure. In some cases, it can ultimately prevent a patient who would have otherwise had a successful trial from accessing a permanent implant”.

In this study, Dr Mohabbati will randomise patients into one of three different surgical techniques and will assess for the incidence of lead migration between groups. The information obtained from this this research will be used to improve surgical procedures, including guiding final placement of the leads intra-operatively and the use of the most secure anchoring technique, to reduce the risk of lead migration and theoretically increase the likelihood of favourable trials.

SPRC are participating in multiple studies looking at improving SCS technology across a range of domains. One of SPRC's current First-in-Human trials, 'Evaluation of Long-term Patient Experience with a Medtronic Closed-Loop SCS System', is pioneering the patient experience with SCS through addressing one of the most pertinent issues, **overstimulation**. "Historically, one of the most significant pitfalls of SCS has been bursts of overstimulation, or any otherwise unpleasant feelings of strong paraesthesia, that occurs when a patient moves in a certain way such as reaching overhead, or during episodes of an increase in intra-abdominal pressure such as strong sneezing or coughing. Clinically, overstimulation is often reported to be highly problematic, decrease patient satisfaction and can ultimately be a cause of disuse or eventual device explantation."

This new closed-loop technology, named NeuroSense, uses evoked compound action potentials (ECAPs) to react to a patient's movements in real-time, decreasing the amplitude of stimulation within milliseconds to prevent overstimulation.

In April 2022, Dr Vahid Mohabbati was the first clinician to implant this First-in-Human device worldwide. He is proud to have implanted the greatest number of participants across all seven Australian sites and continues to present his experience with the technology, SPRC's results and overall study data at numerous international and national conferences.

"This new technology is transforming the SCS experience for patients, leading to greater longer term clinical outcomes and overall satisfaction with treatment. We are pleased to report that all our participants have achieved on average of 80% pain relief with preliminary data showing this effect is carried over to at least twelve months post-implant."

"Not only are patients experiencing significant pain relief, but they are also reporting remarkable improvements in their physical function, mental health and overall quality of life." This study is scheduled for completion in 2025.

In terms of diversifying the indications for SCS use, Dr Mohabbati has recently collaborated with oncologist, Professor Gavin Marx, to address the lack of efficacious treatment for individuals with chemotherapy-induced peripheral neuropathy (CIPN). The new study, *A Prospective Study using High Frequency 10kHz Spinal Cord Stimulation in Patients with Chemotherapy Induced Peripheral Neuropathic Pain*, is the first worldwide testing SCS in this patient population. "CIPN is a debilitating condition affecting the quality of life of persons' who have already experienced and survived extensive treatment for cancer. Whilst CIPN can affect up to 68% of persons' in the month following chemotherapy, up to 30% of these patients then go on to experience symptoms lasting greater than six months."

"Unfortunately, pharmacotherapy management in this group of people is largely limited with most opioids, anti-epileptic drugs and tricyclic antidepressants yielding unsatisfactory relief of pain and other associated symptoms".

"SCS has been proven in large-scale RCTs to reduce pain severity and improve neurological status in other painful neuropathies. It is our hope that we can achieve the same, if not greater, level of success in treating this population". This study has commenced in May 2023 and is open for enrolment.

The dedicated team of specialists and allied health at Sydney Pain Management Centre and researchers at Sydney Pain Research Centre are endeavouring to improve the quality of life of our patients by advancing the science of Pain Medicine, incorporating the most advanced pain therapies and expanding the therapy options within a multidisciplinary team.

For further details of our research projects and our clinical trials please contact us via: research@sydneypaincentre.com or T: 02 9687 9633.

Dr Vahid Mohabbati

FAChPM, FFPMANZCA, FRACGP, MD

Dr Mohabbati is an interventional pain and palliative medicine physician at Sydney Adventist Hospital who treats chronic and complex cancer and non-cancer pain conditions using advanced cutting-edge pain therapies. He is the Director of Sydney Pain Management Centre and Sydney Pain Research Institute.

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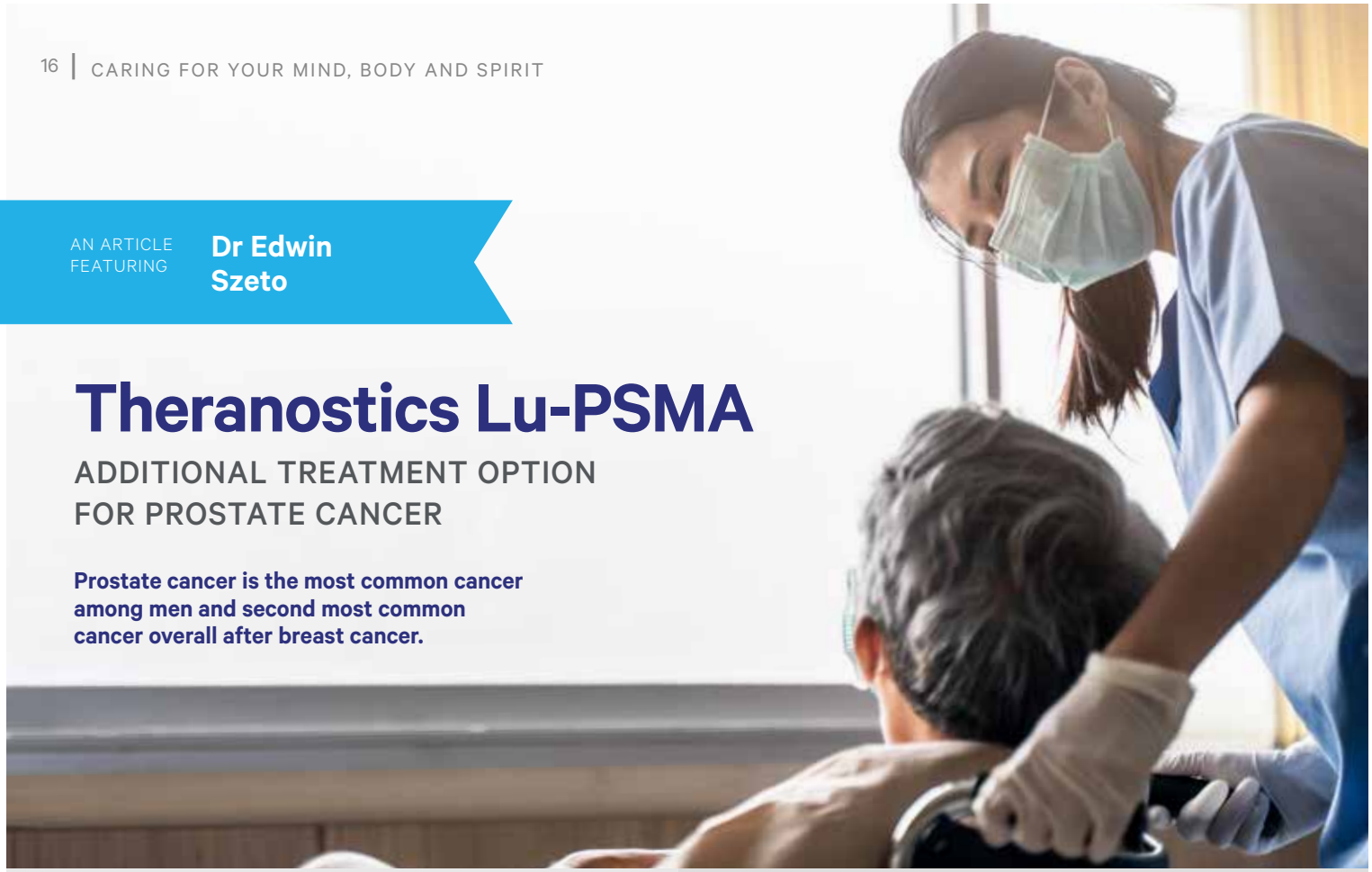

AN ARTICLE FEATURING **Dr Edwin Szeto**

Theranostics Lu-PSMA

ADDITIONAL TREATMENT OPTION FOR PROSTATE CANCER

Prostate cancer is the most common cancer among men and second most common cancer overall after breast cancer.

The treatment path for men diagnosed with prostate cancer has become well-established over the years. However if prostate cancer progresses past the customary treatment path, or those interventions are poorly tolerated, patients can run out of treatment options. The emergence of theranostics provides another option for some patients.

What is theranostics?

The term 'theranostics' is derived from two words – therapy and diagnostics – and is a personalised approach to treating cancer. "The diagnostics side of it is the imaging related to cancer diagnosis, and the therapy side of it is the treatment," said Dr Edwin Szeto, Nuclear Medicine Physician at the San. "While the concept of theranostics has been around since the 1940s in relation to thyroid cancer and radioiodine, theranostics for prostate cancer has only really advanced in the past decade."

Prostate cells have a type of protein called prostate-specific membrane antigen (PSMA) on the surface of the cells. In prostate cancer, there is an over-expression of the PSMA protein on the surface of prostate cancer cells. If prostate cancer spreads to other parts of the body, PSMA will also be evident in those parts of the body.

"With the imaging side of theranostics, the PSMA is attached to a radio-active tracer that is injected into the patient. The patient is then scanned which allows us to image where all the prostate cancers reside throughout the body," explained Dr Szeto. "With the therapeutic side of theranostics, it is exactly the PSMA we use to image, but instead of attaching a radiotracer that's fit for the purpose of visualisation, it is attached to what we call a 'beta emitter' which kills cancer cells. We can both visualise the cancer and treat the cancer by using the same molecule, and monitor the disease concurrently."

The 'beta emitter' is Lutetium-177. "When combined with PSMA to form Lu-PSMA, this radioactive molecule will specifically attach to cells with high amounts of PSMA on the surface of the cells, and deliver radiotherapy to kill those cells."

Who is eligible for Lu-PSMA therapy?

The first trials of Lu-PSMA were in men who were going to die of prostate cancer – because nothing else had worked. When Lu-PSMA was added to prostate cancer treatment as a trial, it was found it could improve patients' survival. Lu-PSMA therapy has also been shown to reduce the size of tumours, stop tumours multiplying, and improve quality of life measurements – including less pain, less toxicity of treatment, and easing of the symptoms caused by prostate cancer.

So far Lu-PSMA has been approved by the Therapeutic Goods Administration (TGA) in Australia for use only in patients where conventional prostate cancer treatments had failed, and for use in clinical trials. Those in the nuclear medicine community believe Lu-PSMA might have a positive impact if used earlier rather than as a 'last resort' therapy.

"There have been trials around the world using Lu-PSMA earlier and earlier in the prostate cancer journey," said Dr Szeto. "Broadly it is now accepted that Lu-PSMA has a role in the treatment of prostate cancer and should be given earlier. However we have to wait for TGA approval. Like all things that are new, we have to show there are benefits compared to what has come before it."

Theranostics Lu-PSMA pilot study at the San

Meanwhile clinical trials continue, including at the San. "There are already trials going on elsewhere in the world using Lu-PSMA earlier and earlier to treat prostate cancer," said Dr Szeto. "Lu-PSMA has been found to perform as well as, or better than, some of the existing treatments used for prostate cancer. At the San we have been approved by the ethics committee for a clinical trial to use Lu-PSMA right up front, in selected patients with biochemical recurrence of prostate cancer. We hope to show that men will have better outcomes if we introduce Lu-PSMA earlier."