VERVE SYMPOSIUM NEWS

5–7 December 2019

in conjunction with LINC Australia

CONTENTS

Welcome to the 2019 VERVE Symposium and LINC Australia

Here we are conducting the 7th annual VERVE Symposium. Every year this meeting grows, and 2019 is no different. We have returned to the International Convention Centre and we've streamlined our programme, throughout two rooms over three full days, to build on the high-level education provided during meetings past.

The programme itself has continued to mature and now takes its place as one of the best examples of a comprehensive, multidisciplinary, vascular discussion forum to be found in this part of the world. We have gathered an extensive faculty from all over the globe to provide cutting-edge education on hot topics, techniques and clinical trial results.

There will be more than 200 rapid-fire presentations on topics which cover the breadth of vascular disease, diagnosis, interventional and open-surgical procedures. There will be discussion forums and dedicated panel interactions to consolidate what is being presented. Twenty-one live cases will be transmitted from the **University Hospital, Leipzig, Auckland City Hospital** and **Sydney's Prince of Wales Private, Mater and North Shore Private Hospitals** to showcase the latest interventional practice and techniques. Our intention is to intersperse these demonstrations with scientific evidence and expert opinion to underscore what you are seeing live.

This year we have enhanced our programme to include a special focus on the paclitaxel controversy. We dive deep into this concerning safety signal and what is now known 12-months after the release of the meta-analysis. We explore the latest data on treatment for the abdominal and thoracic aorta, deep vein disorders, combining the plethora of tools which exist for the treatment of peripheral artery disease, challenging cases and worst-ever "disasters".

At VERVE we continue to strive to complete our mission to become a *premier educator* in the field of vascular medicine and intervention by maintaining *scientific integrity*, promoting *research* and advancing the vascular field with a spirit of *collegiality* and *inclusion*. Once again, this year we will collect all oral presentations and live case recordings to include in our online library. This complementary offering will be accessible to all registered delegates a month after the symposium, so that you can review lectures and cases you attended or catch up on those that you missed.

VERVE isn't just about the education but the social opportunities as well. Join us for a glass of Champagne on the Thursday night following the completion of the final session, and for the much-lauded Symposium Dinner Party at the Sergeants Mess on Sydney Harbour. These are great opportunities to network with colleagues and catch up with friends.

I look forward to seeing you during the meeting.

Ramon Varcoe

Course Co-Director; The VERVE Symposium and LINC Australia

Session 2.10: New Technology with the Potential to Improve Outcomes in PAD Treatment Room 2 **Friday** 4:00 PM

Stem-cell therapy: a hope for no-option CLI?

Marianne Brodmann (Medical University of Graz, Austria) summarises the latest trials in stem-cell therapy for critical limb ischaemia (CLI) on Friday afternoon. The session focuses on a range of new technologies in the treatment of the condition.

Previous reports, such as the Inter-Society Consensus for the Management of Peripheral Arterial Disease, have placed major amputation rates in CLI at 30% within one year of presentation, with a 20% rate of unresolved rest pain and tissue loss, and a 25% mortality rate.[1]

While current therapies, i.e. revascularisation procedures, are focused on opening vessels, use of these techniques does not result in the formation of new vessels down at the wound site, Professor Brodmann explained to *VERVE Symposium News*.

"With current endovascular therapies, you can treat the larger vessels below the knee and below the ankle, but you cannot treat small artery disease, especially in diabetes," she said. "There is no reopening procedure for this small-artery disease. You need new vessels, and this could be stimulated by cell therapy."

> "Robust data are lacking for stem cells."
>
> Marianne Brodmann

Cell therapy is ideally suited to those patients incurable by endovascular or surgical revascularisation – the so called 'no option' cohort of CLI patients. Furthermore, cell therapy excels in comparison to gene or protein therapy: stem cells stimulate paracrine signalling (in secreting a number of biologically active substances), as well as directly promoting vasculogenesis.[2]

Professor Brodmann stressed that studies to date have provided a solid rationale for investigating stem-cell therapies in further detail – evidence which may change the way in which patients with peripheral arterial disease and CLI are treated. "There are current studies ongoing with regard to this," she said, describing how cell therapy may be applied in CLI: "The first option is to use it as an add-on to your revascularisation procedure. The second option is that, if you see that the revascularisation procedure that has been done has not been sufficient, you can add cell therapy as a standalone treatment."

Professor Brodmann will present an overview of sources of stem cells, which include cells from bone marrow, peripheral blood, adipose tissue and umbilical cord blood. "There are a lot of sources of stem cells out there. With regards to the harvesting and production of stem cells you have different approaches, and they differ in terms of difficulty – this is the biggest difference.

"I am discussing the most relevant trials out there. There are so many small trials, but there are a number of larger trials which give you a sense of the kind of thing that is working."

Another key difference between trials to date, continued Professor Brodmann, is the site of injection – subcutaneous, intraarterial or intramuscular – the latter seemingly conferring the greatest benefit. Indeed, JUVENTAS[3] and PROVASA[4], both multicentre randomised placebo-controlled trials of intraarterial injection of bone marrow mononuclear cells, did not demonstrate significant differences in the rate of major amputations (in JUVENTAS) and amputation-free survival (PROVASA). However, Amman et al. (2008), combining intramuscular injection with a more advanced isolation technique, showed a significantly increased $TcPO_2$ and rate of ulcer healing, as well as a decrease in major amputation rate[5].

> "With current endovascular therapies … you cannot treat small artery disease, especially in diabetes."
>
> Marianne Brodmann

Professor Brodmann will discuss these data as well as others pertaining to a range of stem-cell sources, which have recently been reviewed by Osipova et al. (2019)[2].

In her concluding remarks, Professor Brodmann emphasised the important role of angiogenic potential of stem cells in ischaemic disease treatment. She added: "Robust data are lacking for stem cells. We need larger trials, maybe better conducted trials. This is the most important thing."

Session 2.10, 'New Technology with the Potential to Improve Outcomes in PAD Treatment', takes place on Friday from 4:00 PM in Room 2.

VERVE
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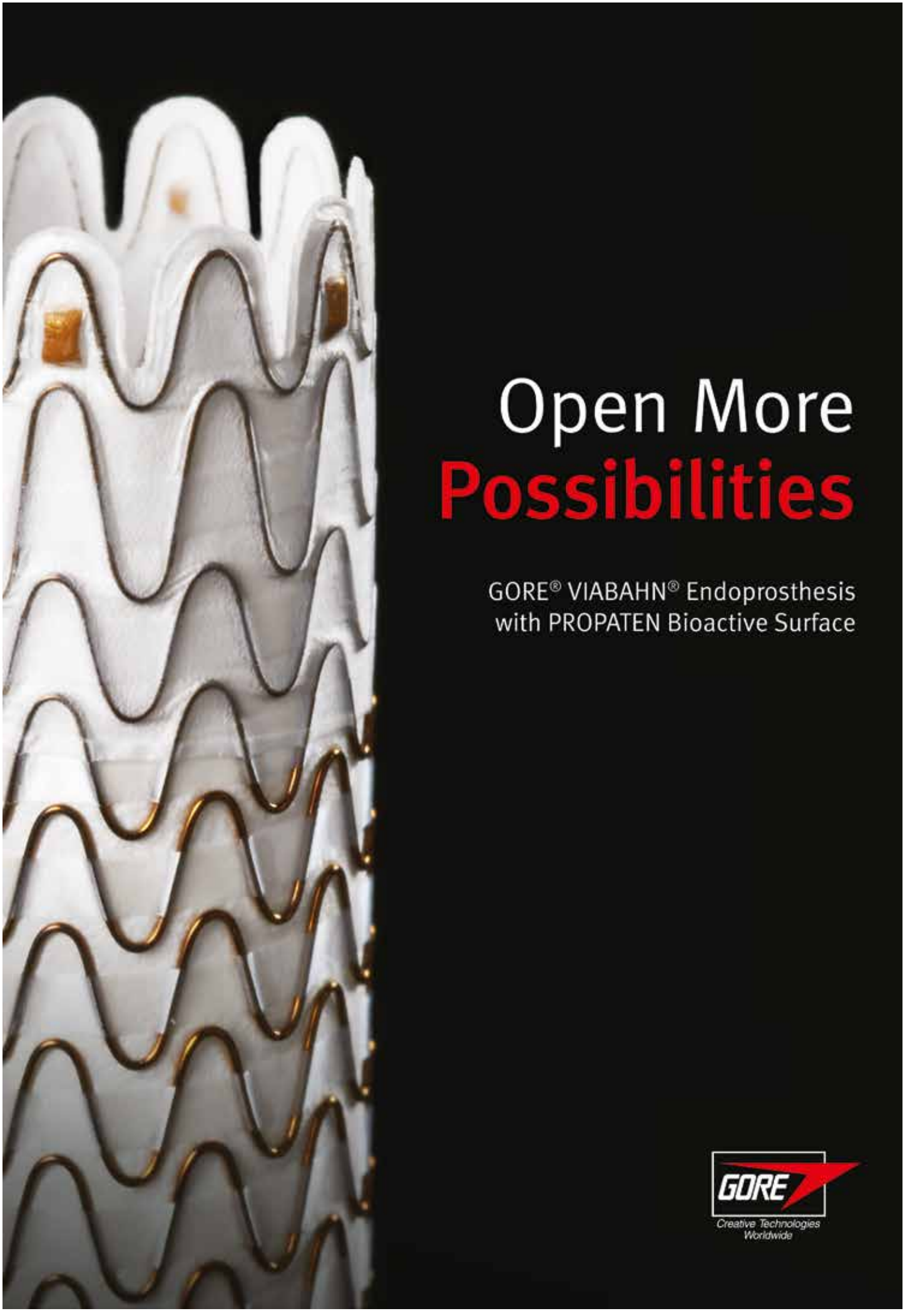

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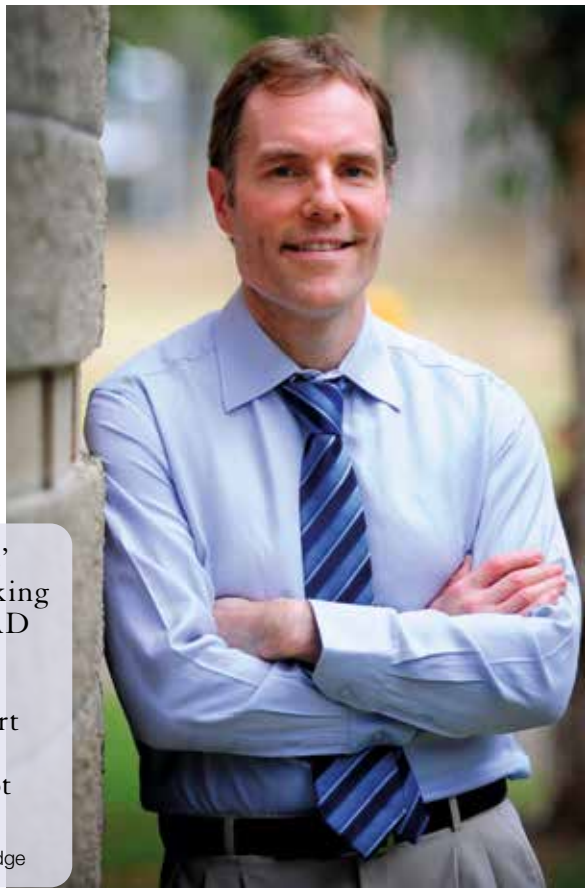
Session 2.5: The Challenges of Limb Salvage in Advanced BTK Disease Room 2 **Thursday** 4:15 PM

Unrealised potential of effective medical management in people with peripheral artery disease

Jonathan Golledge is Head of the Queensland Research Centre for Peripheral Vascular Disease and its pre-clinical arm at the College of Medicine and Dentistry, James Cook University and a vascular surgeon at the Department of Vascular and Endovascular Surgery, The Townsville Hospital, Queensland, Australia. *VERVE Symposium News* caught up with Professor Golledge ahead of Thursday afternoon's session on the challenges of limb salvage in advanced below-the-knee (BTK) disease. In his presentation, challenges the current focus of interventional surgery for managing peripheral arterial disease (PAD).

Professor Golledge began by considering that the current healthcare pathway favoured an interventional approach to the treatment of PAD, citing two particular reasons: firstly, a patient experiencing debilitating leg pain may not understand that surgery alone may not lead to a durable improvement; secondly, the manner in which healthcare is funded and reimbursed makes resources more easily available for interventional treatment than non-interventional long-term approaches.

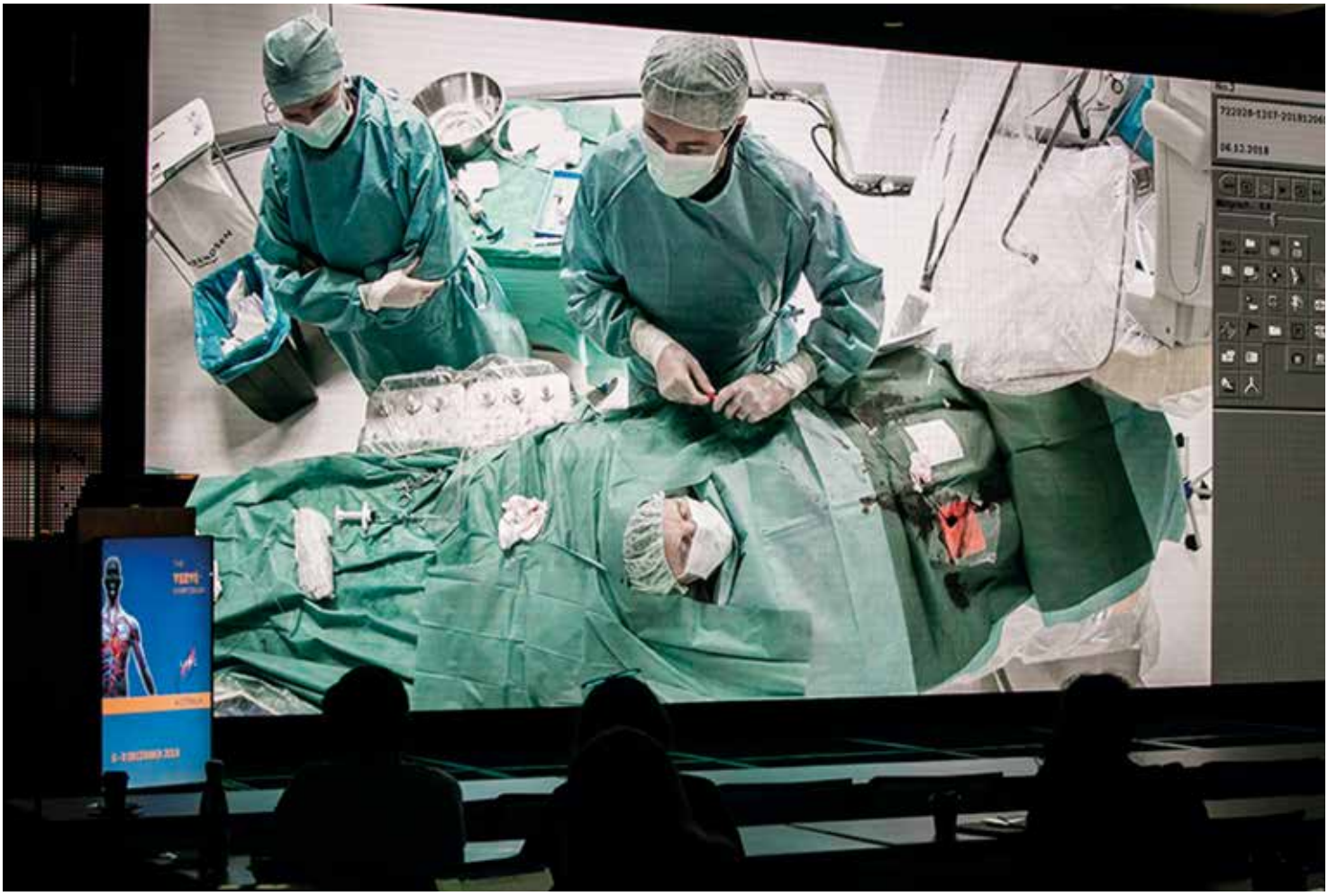
Describing the need for a general shift of focus in the approach to treating atherosclerosis, Professor Golledge said: "Patients presenting with PAD are at high risk of major cardiovascular events and their GPs may refer them to vascular surgeons for intervention, instead of implementing a holistic medical management approach." While interventions are appropriate for patients with limb threatening ischaemia, they are not always durable, he added. The systemic nature of atherosclerosis underpins the requirement for a long-term medical management approach, including tobacco cessation, a regular exercise programme, optimisation of blood pressure and lipids, and anti-platelet and/or anti-thrombotic medications.



> "It's partly the patients' responsibility for making these changes – as PAD is a chronic disease – but unfortunately the help needed to support patients to adhere to lifestyle changes is not there yet."
>
> Jonathan Golledge

Highlighting that education must be a key priority for both physicians and patients, he emphasised that healthcare providers must ensure that patients are aware of the importance of their own health behaviours. "It's partly the patients' responsibility

Continued on page 6



Session 2.5: The Challenges of Limb Salvage in Advanced BTK Disease Room 2 **Thursday** 4:15 PM

for making these changes – as PAD is a chronic disease – but unfortunately the help needed to support patients to adhere to lifestyle changes is not there yet."

Commenting on the unmet need for improved medical management, he underlined the need for more intense education of both health practitioners and patients on vascular medical management. "Some GPs are not comfortable with managing PAD, and refer the patient to a vascular surgeon," said Professor Golledge. "The referral of a patient to a tertiary facility invites a quick fix by an intervention. While such an intervention may improve the patients' symptoms initially, the effects are frequently unenduring, and it doesn't address the underlying cause of the systemic atherosclerosis. While interventions are an important part of managing PAD, a greater focus on the holistic medical management of the patients is needed." e

Professor Golledge highlighted the merging data supporting medical management of PAD: "There is growing evidence for the benefit of medical management, such as lowering levels of LDL cholesterol and the use of anticoagulants[1–3]." Supervised exercise is another evidence-based medical management practice with demonstrated effectiveness[4,5], however, there are no funded exercise programmes for PAD in Australia. "Supervised exercise programmes are challenging to implement as they are not well-received by patients who may need to travel to participate, so home-based exercise programmes may represent a feasible alternative for those unable to take part – but they require more widescale testing."

> "Supervised exercise programmes are challenging to implement as they are not well-received by patients who may need to travel to participate, so home-based exercise programmes may represent a feasible alternative for those unable to take part – but they require more widescale testing."
>
> Jonathan Golledge

Professor Golledge went on to discuss his recently published observational study, in which his team studied blood-pressure management in PAD patients, "Our study showed that people with PAD have lots of cardiovascular events and currently their medical management is not optimal, with about 40% of patients having elevated blood pressure (> 140 mmHg)." Another finding of the study was the association of low blood pressure (< 120 mmHg) with increased cardiovascular events[6]. The findings suggest that intense blood pressure lowering should be implemented with care in PAD patients.

Professor Golledge summarised: "In general, treatment of PAD patients needs to be more focused on medical management, and while new and innovative treatments are on the horizon, there is a need to get the basics right first." He concluded by emphasising the need for additional way in which to implement medical management, as well as the funding of non-interventional therapies for long-lasting treatment of PAD.

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Session 2.3: Issues and Controversy in Major Vein Disorders Room 2 **Thursday** 1:00 PM

Game-changing research pushes venous stenting to the fore

A sea change in clinical approaches to non-dialysis patients with central venous occlusions is within reach, according to Mahmood K Razavi, Medical Director of the Comprehensive Aortic Centre and Director of Clinical Trials at St Joseph Heart & Vascular Centre (California, USA).

Dr Razavi will discuss recent research showing that venous stenting is an effective treatment for such patients. "I've been doing this for 25 years, so I've been relying heavily on my own experience and strategies," he said. "But now we have data to support this."

Until a year ago, the only data available on treating central venous obstructions, especially in the lower extremities, were based on single-centre retrospective analyses. "The quality of the data and the level of evidence was quite low," Dr Razavi explained to *VERVE Symposium News*.

As a result, the general medical community and payers have not been convinced of the efficacy of venous stenting. "Many physicians in Europe, Asia and Australia are performing these procedures, but there are many sceptics in the general medical community," he stated. "So, most of these patients around the world are still not being treated."

> "As well as patency, the trials should show a very critical improvement in patient symptoms and improvement of quality-of-life."
>
> Mahmood K Razavi

The trials Dr Razavi will discuss may change approaches, however. "We are not just saying 'This works, take my word for it' – that is what people did in the past; now we have papers supporting it," he said.

Dr Razavi was the Global co-principal investigator on the VIRTUS trial[1]. This prospective, multi-centre, single-arm, non-randomised study looked at the safety and efficacy of the Veniti Vici Venous Stent System (Boston Scientific, USA) in patients with chronic iliofemoral venous outflow obstruction.

A second prospective study, VERNACULAR, assessed the performance of the Venovo Venous Stent (BD, USA) for the treatment of iliac and femoral vein occlusive disease, including acute or chronic deep vein thrombosis (DVT) and/or May-Thurner Syndrome.

Results from the VIRTUS study show that venous stenting achieved patency of the target venous lesion in patients. Importantly, it also met its primary effectiveness and safety endpoints in re-establishing blood flow at twelve months. The VERNACULAR trial also demonstrated a primary patency benefit compared to a historical control at 12 months while demonstrating significant improvement in both VCSS pain scores and quality of life (CIVIQ-20) compared to baseline.[2]

In other words, said Dr Razavi, the trials confirmed the good outcomes that have been seen before in single-centre studies. "We have all seen this in our practices, but these trials confirm it with high-level data," he said.

Important for payers is that the trials showed clinical improvement in patients, said Dr Razavi. Lack of clarity on whether venous stenting helps patients is what has led to reticence about whether to reimburse for venous stenting around the world. "We can see patency when we put a stent in but what we show using rigorous data is that it helps the patient. That was always an issue," he said.

> "We want to raise awareness that patients who are symptomatic with central venous obstructions do have good options."
>
> Mahmood K Razavi

Two forthcoming studies that evaluate the safety and effectiveness of other venous stents should add to the robust data, said Dr Razavi. Both studies are completed, and results should be announced within the next year. The ABRE study has tested the Abre venous self-expanding stent system (Medtronic, Ireland) for treatment of symptomatic iliofemoral venous outflow obstruction in patients with venous occlusive disease, and the VIVO trial is evaluating the Zilver Vena Venous Self-Expanding Stent (Cook Medical, USA).

The results from these two trials will inevitably be combined with the one-year and full two year data from the VIRTUS and VERNACULAR trials. Dr

Continued on page 8

Session 2.3: Issues and Controversy in Major Vein Disorders Room 2 **Thursday** 1:00 PM

Continued from page 7

Razavi has high hopes for the combined data. "As well as patency, the trials should show a very critical improvement in patient symptoms and improvement of quality-of-life," he said, adding: "The high-quality data will be irrefutable."

Dr Razavi said he will be reviewing and extrapolating the outcome data in order to discuss technical issues and strategies surrounding stenting for central venous occlusions. "Using this data, I can talk about how you size the stent and when and whether intravascular ultrasound is needed versus venography," he said.

> "Does the lesion length and the lesion location matter in the venous arena as much as it does in the arterial arena?"
>
> Mahmood K Razavi

Dr Razavi plans to review the correlations between outcomes and both patient and lesion variables. "We know that outcome is different in patients who have non-thrombotic occlusions versus those who have acute thrombosis versus those have chronic thrombosis," he explained. "But correlation of outcomes to other variables is not as well known."

In other words, the data allows a more detailed look at how to optimise the use of these venous stents, and also raises many questions. "Does the lesion length and the lesion location matter in the venous arena as much as it does in the arterial arena?" said Dr Razavi. "Based on the location of the lesion, does the stent type matter? Does the stent strategy matter?"

But most importantly, Dr Razavi hopes the data will change hearts and minds in the general medical community. "Today, many patients around the world are still not being treated adequately," he said. "We want to raise awareness that patients who are symptomatic with central venous obstructions do have good options."

Secondly Dr Razavi wants to increase awareness within the intravascular community and the vascular community, on how best to approach and treat these patients.

But the effects could be far more profound for future clinical practice, Dr Razavi said in closing. "This will probably swing the needle as far as guidelines and reimbursement are concerned. All of these trials are game changers."

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Session 1.4: Beyond Simple Drug Elution: A Combination of Endovascular Tools to Optimise Outcome
Room 1 **Thursday** 2:40 PM

Atherectomy
The best option to avoid problems?

During Thursday afternoon's session focussing on endovascular tools to optimise outcomes, Andrew Bullen, a vascular and endovascular surgeon from Wollongong in New South Wales, Australia, will be talking about his experiences with atherectomy. "Over the past few years, multiple endovascular techniques have emerged to assist surgeons in dealing with more complex and advanced peripheral arterial disease," Dr Bullen told *VERVE Symposium News*. "These options are less invasive and pose lower risks for the co-morbid vascular patient," he said. "Anecdotally, this has allowed more successful limb salvage in my own practice."

Dr Bullen will talk about the devices available and some complications encountered during this learning curve. "We have all had patients with diffuse circumferential calcification or chronic total occlusions who need revascularisation and are not suitable for bypass surgery," he commented.

Atherectomy is particularly useful for debulking lesions and avoiding more invasive measures, Dr Bullen continued, describing one of the cases he will be presenting. "I performed a directional atherectomy in the common femoral artery under local anaesthesia for a gentleman with both peripheral ischaemia and cardiac disease who required femoral access for transcatheter aortic valve implantation and percutaneous coronary intervention," he said.

Today, there is little in the way of studies looking at this area, noted Dr Bullen, and atherectomy in the peripheral arteries has limited high-level evidence when compared to balloon angioplasty and stenting. "There are several smaller data series and sponsored papers that suggest there may be a patency benefit," he explained. "It remains controversial due to the higher cost involved with the procedure for similar limb-salvage outcomes.

There are also challenges associated with the atherectomy, Dr Bullen went on: "The predominant issues include the need to remain intraluminally rather than subintimal for recanalisation of occlusions."

> "We have all had patients with diffuse circumferential calcification or chronic total occlusions who need revascularisation and are not suitable for bypass surgery."
>
> Andrew Bullen

There is also a risk of distal embolisation, he added: "A number of crossing devices are therefore also used in conjunction with atherectomy compared to plain old balloon angioplasty."

As such, Dr Bullen said he'd like to see far more studies, although there are several challenges associated with them. "Large blinded randomised trials are difficult to perform for atherectomy devices without a number of biases," he said. "Conversely, real-world registries do not offer useful data comparing lesion complexity, morphology or primary/secondary endpoints."

In addition, the technology is progressing at a very rapid rate. "As always, higher-level trials are required but the technology appears to be evolving faster than the science," he noted.

However, overall Dr Bullen is broadly positive of atherectomy going forward: "While atherectomy adds complexity to the procedure, it is a valuable tool in the endovascular management of our patients," he concluded.


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Session 1.13: The Final Word on AAA Room 1 **Saturday** 11:30 AM

Lessons from battlefield trauma care

Saturday morning's session frames "the final word" on abdominal aortic aneurysms (AAAs). It closes with two presentations on the management of trauma in the military setting, with Jim Iliopoulos discussing the evolution in special forces trauma training and trauma care and surgery since the conflicts in Afghanistan and Iraq.

Dr Iliopoulos, a vascular and trauma surgeon, is Area Director of Vascular Surgery for the South West Sydney Local Health District and also works in vascular surgery and trauma surgery at St George Hospital, Sydney.

He has also been in the Australian Army since 2002: "I've been involved with training, surgical support and operations with special forces since 2007," he told *VERVE Symposium News*.

The wars in Iraq and Afghanistan have been the setting of rapid and significant changes in the delivery of trauma care in the military setting. In 2015, Penn-Barwell et al. illustrated how year-on-year survival improved for any given injury severity during periods of these conflicts spanning 2003 to 2012[1]. These changes have been underpinned in part by ongoing evaluation and accompanying implementation of improvements in aspects of care such as rapid haemorrhage control, decision-making and the evolution of deployed transfusion support[2].

> "I've been involved with training, surgical support and operations with special forces since 2007."
>
> Jim Iliopoulos

Aside from trauma journals, explained Dr Iliopoulos, the best knowledge on the topic of prehospital battlefield trauma care comes from the Committee on Tactical Combat Casualty Care (CoTCCC), a component of the Joint Trauma System division of the Defense Health Agency. The CoTCCC publishes the Tactical Combat Casualty Care Guidelines – the standard of care in prehospital battlefield medicine, which focuses on Care Under Fire, Tactical Field Care, and Tactical Evacuation Care. The primary intent of TCCC is to reduce preventable combat death through a means that allows a unit to complete its mission while providing the best possible care for casualties. "The TCCC is the gold standard," said Dr Iliopoulos.[3]

Describing a little of the work that went on during these conflicts in evaluating the nature of preventable mortality and morbidity, as well as training gaps, Dr Iliopoulos continued: "Our group focus in on prehospital battlefield care.

"We adopted best practice at the time. Every time a rotation came back, we debriefed lessons learned, and we used their experience with best practice to improve our training and procedures."

The central aim of his talk, he explained, is to present the changes in prehospital battlefield trauma care that have been made during the conflicts in Afghanistan and Iraq, how such changes are implemented, and how care is evaluated. "[Delegates] can learn about what can be achieved working in austere or stressful environments. They can learn about the value of teamwork, the importance of case review and lessons learned, and also about keeping up with best practice."

He concluded: "Of course, there is also always the possibility of them serving or helping the Australian Defense Force – there is a role they can play there."

Session 1.13, 'The Final Word on AAA' takes place in Room 1 from 11:30 AM on Saturday.

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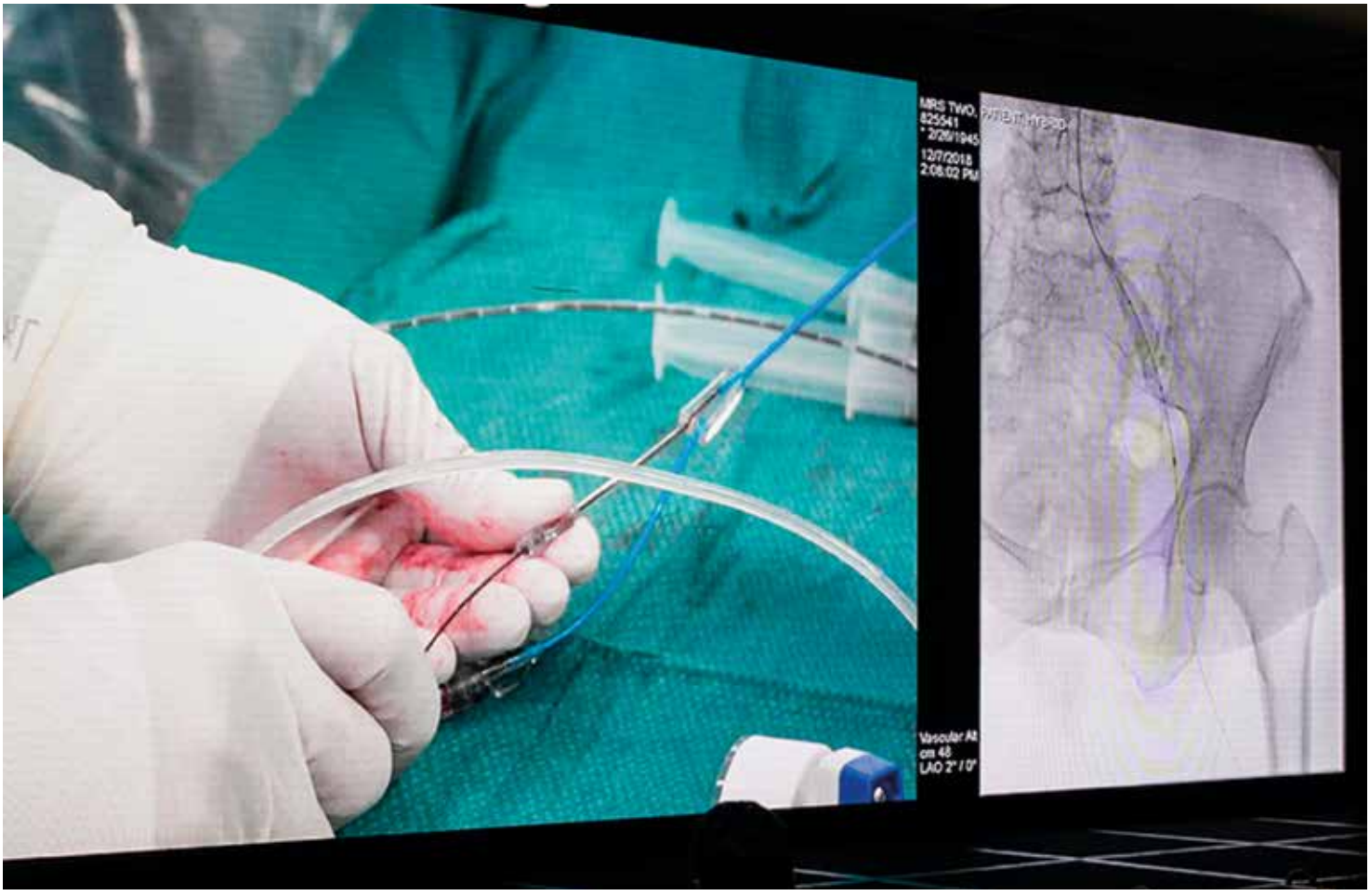

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