

Kerala Journal of PMR



**Regain your speed and elegance
Strong legs that can kill a Lion
With one kick.**

2022

Vol 19 issue 1

FROM THE EDITOR'S DESK

Another challenging issue is here, Vascular and burns rehabilitation. Dr Kiran Jacob a cardiologist has contributed with an article on Peripheral Arterial Disease. Dr Santosh has written about Chronic Venous Insufficiency, and Dr Remya has written about Lymphedema and Physiatry.

Bineesh and I have made some material to fill up the rest of this issue.

The 'Members in action' section is quite lively this time around, likely due to World Disability day and the number of new departments coming up. If only we could get our doctors to write a bit about their adventures, lessons learned, etc. The past two years of issues is ripe with examples anyone can follow. The intention of course is simple. Learn to write for KJPMR, and then move on to bigger targets.

I'm expecting more submissions for the next issue. The theme is Prosthetics and Orthotics.

Dr Ravi Sankaran, Professor, Department of PMR, Amrita Institute of Medical Sciences

TABLE OF CONTENTS

Letter from the Editor	
Clinician	
Peripheral Arterial Disease- Dr Kiran Jacob.....	
Chronic Venous Insufficiency- Dr Santosh Babu.....	
Physiatry in Lymphedema Management- Dr Remya Mathew	
Lifelong learner	
Vascular Quiz- Dr Bineesh Balakrishnan.....	
Burns Quiz- Dr Bineesh Balakrishnan	
DAMOCLES and HBOT- Dr Ravi Sankaran	
Communicator	
Members in action	
Leader and team member	
Journal Scan Vascular- Dr Noufal Ali.....	
Journal Scan Burns- Dr Noufal Ali	
Professional	
A new frontier- Dr Ravi Sankaran	

“Articles are the responsibility of the Authors”

AN OVERVIEW OF PERIPHERAL ARTERY DISEASE

**By Dr. Kiran Jacob, MD,DM (Cardiology);
Consultant Interventional Cardiologist,
Elite Mission Hospital & Thrissur District Co-operative Hospital**

Peripheral vascular disease includes all arterial diseases other than those affecting coronary arteries and the aorta, it includes lower extremity artery disease (LEAD), carotid and vertebral artery disease, artery diseases of the upper extremities, renal and mesenteric artery diseases. Atherosclerosis is the main culprit affecting these arteries and Peripheral artery disease is the third most common manifestation of atherosclerosis after coronary artery disease and stroke. Lower extremity artery disease refers to the disease of major arteries below the aortic bifurcation.

EPIDEMIOLOGY AND RISK FACTORS FOR PAD

It is the major reason for lower limb disability and limb loss. It affects 10 million people in India¹ and >200 million people worldwide^{2,3}. It is a disease of the elderly, uncommon below the age of 50 years and prevalence increases markedly with age. Prevalence of PAD at the age of 65 years or older is 10-15% while the prevalence of PAD at the age of 80 years and older is 20%^{4,5}.

Diabetes mellitus, Smoking and older age are major risk factors for PAD. Diabetes mellitus accounts for 1.9 to 4.0 fold increased risk for PAD compared with age and sex matched nondiabetic subjects⁴. Peripheral artery involvement due diabetes is more severe and diffuse. Diabetes accounts for around 50% of all non-

traumatic amputations in India.

Current smoking accounts for 2.0 -3.4 fold increase in the incidence of PAD compared with non smokers⁴. Smoking cessation reduces the risk for PAD and the risk reverts to that of a non-smoker 10 years after quitting. Hypertension and dyslipidemia are also other risk factors for PAD.

CLINICAL SIGNIFICANCE OF PAD

Atherosclerosis is a chronic progressive disease, peripheral vessels are affected after the involvement of other vascular beds like coronaries and cerebral vessels. Most of the patients with peripheral vascular disease usually have a diffuse and significant coronary artery involvement. Peripheral vascular disease patients have higher incidence of mortality and morbidities. The 10 year all-cause mortality was 56% for asymptomatic PAD, 63% for intermittent claudication (IC), and 75% for severe limb ischemia (SLI). Cardiovascular (CV) causes were the most common main cause of death (45%) among patients with peripheral vascular disease and a CV event was present as either the main or one of the three most common contributing causes of death in 64% of the cases⁶. Peripheral vascular disease results in greater functional impairment, lower physical activities and higher rates of mobility loss.

NATURAL HISTORY OF PAD

The natural history of PAD is notable for progressive atherothrombosis involving multiple arterial vascular beds. Patients with PAD remain asymptomatic in 20-50% with ABI < 0.9. 40-50% of patients with peripheral vascular disease present with atypical leg discomfort, 10-30% patients present with intermittent claudication pain. Critical limb ischemia (CLI), a severe manifestation of PAD, may be present at the time of presentation in 1-2% of patients. One year after diagnosis of CLI, 25% of patients require amputation or die from cardiovascular cause.

At 5 years after diagnosis of PAD 70-80% have stable claudication, 10-20% have worsening of claudication. Lower extremity revascularisation is done in 10-20% of patients with PAD, 1-2% presents with CLI.

In a study of 1244 patients of intermittent claudication the cumulative 10 years risk of ischaemic ulcer and rest pain was found to be 23% and 30% respectively. Amputation rate and mortality is higher in diabetics (41.4% and 57.7% respectively) as compared to non-diabetics (11.5% and 25.6% respectively).

Incidence of myocardial infarction or stroke in a patient with PAD after 5 years of diagnosis will be 20%, and the risk of death will be 15-30% at 5 years of which 75% will be due to cardiovascular cause.

CLINICAL ASSESSEMENT OF A PATIENT WITH PAD

Peripheral vascular disease manifests as intermittent claudication, atypical leg discomfort, coldness and numbness of feet, weakness of lower limb(s), dependent rubor, non-healing ulcer and gangrene. Iliac disease usually presents with gluteal claudication, Femoral and below knee lesions manifests as thigh and calf

claudication. Critical limb ischemia (CLI) is characterised by ischemic pain at rest or tissue loss, such as non-healing ulcers or gangrene, related to peripheral artery disease.

Changes in the skin, including decreased skin temperature or thin, brittle, shiny skin on the legs and feet, hair loss on the legs, atrophic skin and discolouration.

Absence of peripheral pulses with / without bruits is an important finding indicating significant occlusive peripheral vascular disease.

ANKLE-BRACHIAL INDEX (ABI)

ABI is the ratio of blood pressure in the lower limb (Posterior Tibial Artery or Dorsalis Pedis whichever is higher) to the blood pressure in the brachial artery. It is the easiest way for assessing PAD.

For measuring ABI patient is asked to lie in supine position for 5 mins. Brachial and lower limb blood pressure are taken using standard mercury sphygmomanometer. For lower limb blood pressure, cuffs are applied to the calf with the midpoint of the bladder over the posterior tibial artery (PTA), two inches above the medial malleolus. Both ankle and brachial systolic blood pressure are taken with an 8 MHz Doppler pen probe.

PAD is diagnosed with an ABI of less than 0.9 which usually correlates with $\geq 50\%$ angiographic arterial narrowing with 95% sensitivity and around 100% specificity. A resting ABI of 0.4 to 0.9 is considered as mild to moderate PAD and resting ABI less than 0.4 is suggestive of severe PAD. Use of exercise ABI is helpful in equivocal cases. Patient is asked to walk on the treadmill at 1-2 miles per hour speed at 10-12% incline for 5 mins. A decrease of at least 15 mm Hg in the ankle systolic pressure after exercise test is considered as abnormal test.

DUPLEX ULTRASOUND

Duplex ultrasound is a medical non-invasive study which combines the traditional ultrasound and Doppler ultrasound. Duplex ultrasound is the initial investigation for screening and diagnosis of PAD. It helps to detect the lesion, localize the lesion, identify the extent and severity of the lesion and helps in planning the further management.

CT ANGIOGRAPHY

CT angiography is more precise in diagnosing and assessing the PAD with sensitivity of 93% and specificity of 96%. It has an advantage of identifying the aortoiliac lesions more accurately and also assessing the distal vasculature in a totally occluded vessel. It is preferred over MR angiogram in patients with pacemakers, defibrillators, metal clips, stents and prosthesis.

MR ANGIOGRAM

The gadolinium enhanced MR angiogram in assessing the PAD has 90% sensitivity and 100% specificity. Limitation of MRA is that it overestimates the severity of stenosis and produces image artefacts in patients with metallic objects like clips in their body. It also takes more time for image acquisition.

DIGITAL SUBTRACTION ANGIOGRAPHY (DSA)

DSA is considered as the gold standard in the diagnosis of PAD. The advantage of DSA is that it can be used as a diagnostic as well as therapeutic tool during endovascular procedures. DSA can give a better visualisation of the below knee vessels than a CT angiogram or MRA.

TREATMENT APPROACH

The treatment approach can be broadly classified into the measures for preventing the disease progression and measures to

reduce the symptoms. Treatment strategies can be subdivided into lifestyle modifications, medical management, endovascular therapies, and surgical interventions. Lifestyle modifications include cessation of smoking, regular exercise, healthy diet and weight loss. Smoking is the most important modifiable risk factor for development of peripheral arterial disease, hence cessation of smoking is very important in preventing the disease progression.

ANTIPLATELET THERAPY

Platelet activation and adhesion is one of the most important steps in the development of complications of cardiovascular disease and peripheral vascular disease. Antiplatelet therapy plays a pivotal role in preventing the complications as well as disease progression. Aspirin is the most commonly used antiplatelet therapy and is effective in symptomatic PAD. In the CLIPSS study (Critical Leg Ischemia Prevention Study), there was 64% relative risk reduction in major vascular events: Ischemic stroke, MI, and vascular death ($P = 0.022$) with low dose Aspirin (81mg) in symptomatic and asymptomatic PAD⁷. In a post hoc analysis of the Clopidogrel versus Aspirin in Patients at Risk of Ischaemic Events (CAPRIE) trial, at 3 years, Clopidogrel was superior to Aspirin in the subgroup of patients with clinical LEAD ($n = 6452$), with significant reductions in CV mortality [hazard ratio (HR) 0.76 (95% CI 0.64–0.91)] and MACE [HR 0.78 (95% CI 0.65–0.93)], with similar benefit in the subgroup of LEAD patients with diabetes⁸. In the EUCLID trial (Examining Use of Ticagrelor in Peripheral Artery Disease) where Clopidogrel was compared with Ticagrelor in almost 14,000 symptomatic PAD patients found that the primary end point of cardiovascular death,

MI, or ischemic stroke was not significantly different (10.6% versus 10.8%) and Ticagrelor was found to be non inferior to Clopidogrel in symptomatic PAD⁹.

Single antiplatelet therapy is indicated in symptomatic LEAD. According to the 2017 ESC guidelines Clopidogrel is preferred over Aspirin as a single agent (class IIb). Dual antiplatelet is only indicated after a percutaneous intervention with stent implantation and below knee bypass with prosthetic graft. Antiplatelet therapy is not indicated in asymptomatic patients with LEAD.

ANTICOAGULATION

In a study on the pathology of peripheral vascular disease with critical limb ischemia by Narula et al, presence of chronic luminal thrombi was more frequently observed in arteries with insignificant atherosclerosis. This suggests thrombotic luminal occlusion due to atherothromboembolic disease especially in patients with insignificant luminal narrowing as one of the pathologies for critical limb ischemia¹⁰.

The combination of Warfarin and Aspirin in coronary artery disease has already been tried in trials like OASIS and WARIS - II and found to be better than Aspirin alone in preventing the major cardiovascular events. The WAVE trial (Warfarin Antiplatelet Vascular Evaluation) investigated the use of Warfarin anticoagulation in combination with Aspirin for patients with symptomatic PAD (81.8% of the total trial population), subclavian disease, and carotid disease. They found no significant difference in the occurrence of major adverse cardiovascular events between patients receiving combination Aspirin and Warfarin therapy. They also noted a significant increase in the amount of major bleeding events, including intracranial haemorrhage. The subgroup analysis showed a poor

compliance with Warfarin, 30 % discontinuation of the Warfarin during the follow up might be the reason for the lack of efficacy.

The novel anticoagulants or non Vitamin K anticoagulant (NOAC) like FXa inhibitors or Thrombin inhibitors has been used in patients with CAD and PAD in combination with antiplatelet. Low dose Rivaroxaban or the vascular dose of Rivaroxaban (2.5mg BD) with Aspirin is the most studied combination of NOAC in CAD and PAD. In the COMPASS study where low dose Rivaroxaban with Aspirin (ASA) was studied, the subgroup analysis of PAD patients included 7470 patients with chronic PAD. In addition, ≈65% of these patients had CAD and ≈7% had stroke. In the PAD subgroup, very-low-dose Rivaroxaban plus ASA reduced MACE by 28% versus ASA alone (5.0% versus 7.0%; HR, 0.72; P=0.0047), major adverse limb events (MALE) by 46% (1% versus 2%; HR, 0.54; P=0.0054), and MALE plus major amputation by 46% (1.0% versus 2.0%; HR, 0.54; P=0.0037). With respect to safety outcomes, very-low-dose Rivaroxaban plus ASA versus ASA alone was associated with a 61% increase in major bleeding (3.0% versus 2.0%; HR, 1.61; P=0.0089) that was again mainly driven by a significant increase in gastrointestinal bleeding (2.0% versus 1.0%; HR, 2.28; P=0.0027) but no statistically significant increase in fatal bleeding or symptomatic intracranial bleeding between the Rivaroxaban- plus-Aspirin group and the Aspirin-alone group (P=0.40)¹¹.

The dual pathway inhibition (DPI) is a novel concept where antiplatelet and low dose anticoagulant is combined to inhibit both platelet activation and thrombin formation, the most important steps in the formation of thrombus. The COMPASS trial was the first

randomised clinical trial where Aspirin and low dose Factor Xa inhibitor (Rivaroxaban) was used in CAD and PAD. With the strong evidence of reducing the ischemic event with DPI in COMPASS trial, further trials were conducted like VOYAGER PAD where ASA with 2.5 mg Rivaroxaban was used in peripheral vascular disease after revascularization. In VOYAGER PAD Rivaroxaban at a dose of 2.5 mg twice daily plus Aspirin was associated with a significantly lower incidence of the composite outcome of acute limb ischemia, major amputation for vascular causes, myocardial infarction, ischemic stroke, or death from cardiovascular causes than Aspirin alone. Rivaroxaban with ASA was associated with 33% relative risk reduction in acute limb ischemia¹².

LIPID LOWERING DRUGS

Dyslipidaemia is always a major risk factor for atherosclerotic vascular disease. Statin with its lipid lowering and other pleiotropic effects has already proven to be a game changer in preventing the progression of vascular disease and the future ischemic events. The ACC/AHA recommends all patients with symptomatic PAD to be on high-dose statin. In addition, individuals with PAD and another major atherosclerotic cardiovascular disease event (or 2 minor risk factors) should be treated to an LDL-C of <70mg% with a class I recommendation.

In the IMPROVE-IT trial it has proven that in high risk patients where the LDL target of 70mg/dl is not attained even after maximally tolerated statin therapy addition of Ezetimibe has prevented the progression of disease and MACE.

PERIPHERAL VASODILATORS

The supply-demand mismatch due to stenosis results in claudication pain during exertion. Insufficient vasodilatory response

may result in symptoms that are relieved by rest. Peripheral vasodilators are potentially beneficial for relieving claudication.

Cilostazol is an antiplatelet agent and a vasodilator. It is a phosphodiesterase III inhibitor which results in increase in cAMP, which in turn inhibits platelet aggregation; causes homogeneous vasodilation, especially in femoral vascular beds. A systematic Cochrane Review of 15 trials concluded that Cilostazol increases exercise tolerance compared with placebo. Eight of the trials reviewed could be compared on the basis of walking distance before the onset of claudication symptoms with 100 mg twice daily improving the weighted mean walking distance by 31.41 m ([95% CI, 22.38–40.45 m] P<0.00001). No difference in absolute mortality was appreciated in the trials^{13,14}. The ACC/AHA guidelines include a class IA recommendation Cilostazol in the treatment of symptomatic claudication. The US FDA has approved two drugs for the management of intermittent claudication: Pentoxifylline and Cilostazol. The mechanism of action that provides symptom relief with Pentoxifylline is poorly understood but is thought to involve red blood cell deformability as well as a reduction in fibrinogen concentration, platelet adhesiveness and whole blood viscosity. The recommended dose of Pentoxifylline is 400 mg three times daily with meals.

EXERCISE THERAPY

Supervised exercise therapy is the first line of therapy for the management of intermittent claudication and is provided with a class Ia recommendation. Exercise therapy (ExT) is effective in improving symptoms and QOL and increases maximal pain free walking distance. A meta-analysis of 25 randomized trials (1054 participants)

concluded that supervised treadmill exercise was associated with 180 meters of improvement in maximal treadmill walking distance and 128 meters of improvement in pain-free walking distance compared to a control group. The most effective exercise programs for patients with PAD is 3 supervised sessions/week, asked the PAD patients to walk to maximal or near-maximal ischemic pain during exercise, begin at 15 min per session increasing to 45-50 min per session, and lasted for minimum of 12 weeks to 6-months or longer. Home-based exercise has an advantage over supervised exercise therapy in avoiding the time, effort, and cost associated with travel to a medical center. Therefore, home-based walking exercise has the potential to be more accessible and acceptable to patients with PAD than supervised exercise programs.

REVASCULARISATION

In LEAD patients revascularisation is indicated if there is inadequate resolution of lifestyle limiting symptoms with medical management; critical limb ischemia like rest pain or non healing ulcers; and acute limb ischemia. Percutaneous intervention and surgical intervention like bypass grafting are the options for revascularisation. Percutaneous endovascular interventions are the class I recommendations for short segment occlusions in aortoiliac (< 5 cm) and femoro-popliteal lesions (<25 cm) with good long term patency. In patients with high surgical risk and severe co morbidities endovascular interventions can be done in longer lesions. In ilio-femoral occlusive lesions, a hybrid procedure combining iliac stenting and femoral endarterectomy or bypass should be considered. In a large observational study, percutaneous intervention compared with surgical therapy was associated with reduced in-hospital

mortality (2.34% versus 2.73%, $P < 0.001$), length of stay (8.7 days versus 10.7 days, $P < 0.001$), and cost of hospitalization (\$31 679 versus \$32 485, $P < 0.001$) despite similar rates of major amputation (6.5% versus 5.7%, $P = 0.75$)¹⁵.

Surgical revascularisation is indicated in long segment diffuse disease of common iliac artery, external iliac artery, common femoral and superficial femoral arteries. Bypass grafting is preferred in bilateral external iliac artery occlusion.

In infrapopliteal disease stenotic lesions and short occlusions, endovascular therapy can be the first choice. In long occlusions of crural arteries, bypass with an autologous vein gives superior long-term patency and leg survival. If the patient has increased risk for surgery or does not have an autologous vein, endovascular therapy can be attempted.

FUTURE TRENDS

With the newer advances in the technology the role of percutaneous intervention in the management of PAD is expanding. More complex cases of PAD are currently managed through percutaneous intervention and the pure surgical indications are decreasing. By using the latest technologies like the intravascular imaging with Intravascular Ultrasound (IVUS) or Optical Coherence Tomography (OCT) the final result and the long term outcome has improved. Rotablation and Intravascular lithotripsy are the latest modalities used for plaque modification in severely calcified vessels during percutaneous intervention. Drug eluting balloons are used in small calibre vessels especially infrapopliteal vessels...

REFERENCES:

1. Dutta. R; Vascular disease management plagued by lack of awareness & Research, *Express Health Care Management*, 1:2, Jan 1.15, 2003.
2. Benjamin EJ ,Blaha MJ , Chiuve SE , et al. Heart disease and stroke statistics—2017 update: a report from the American Heart Association. *Circulation* .2017 ; 127 (1): 143 - 152.
3. Fowkes FG , Rudan D , Rudan I , et al. Comparison of global estimates of prevalence and risk factors for peripheral artery disease in 2000 and 2010: a systematic review and analysis . *Lancet*.2013 ; 382 (9901): 1329 - 1340.
4. CriquiMH ,Aboyans V . Epidemiology of peripheral artery disease .*CircRes* .2015 ; 116 : 1509 – 1526.
5. McDermott MM . Lower extremity manifestations of peripheral artery disease: the pathophysiologic and functional implications of leg ischemia .*CircRes* .2015 ; 116 (9): 1540 - 1550.
6. Fredrik Sartipy ,BirgittaSigvant , Fredrik Lundin , Eric Wahlberg. Ten Year Mortality in Different Peripheral Arterial Disease Stages: A Population Based Observational Study on Outcome. *Eur J VascEndovasc Surg*. 2018 Apr;55(4):529-536.
7. Catalano M, Born G, Peto R; Critical Leg Ischaemia Prevention Study (CLIPS) Group. Prevention of serious vascular events by aspirin amongst patients with peripheral arterial disease: randomized, double-blind trial. *J Intern Med*. 2007;261:276–284. doi: 10.1111/j.1365-2796.2006.01763.
8. CAPRIE Steering Committee. A randomised, blinded, trial of clopidogrel versus aspirin in patients at risk of ischaemic events (CAPRIE). *Lancet* 1996;348:1329–1339.
9. Hiatt WR, Fowkes FG, Heizer G, Berger JS, Baumgartner I, Held P, Katona BG, Mahaffey KW, Norgren L, Jones WS, et al; EUCLID Trial Steering Committee and Investigators. Ticagrelor versus clopidogrel in symptomatic peripheral artery disease. *N Engl J Med*. 2017;376:32–40. doi: 10.1056/NEJMoa1611688.
10. NavneetNarula, Andrew J Dannenberg , Jeffrey W Olin, Deepak L Bhatt et al; Pathology of Peripheral Artery Disease in Patients With Critical Limb Ischemia. *J Am CollCardiol* . 2018 Oct 30;72(18):2152-2163.
11. John W. Eikelboom, Stuart J. Connolly, Jackie Bosch,Gilles R. Dagenais et al., for the COMPASS Investigators; Rivaroxaban with or without Aspirin in Stable Cardiovascular Disease. *N Engl J Med* 2017; 377:1319-1330 DOI: 10.1056/NEJMoa1709118.
12. Marc P. Bonaca, M, Rupert M. Bauersachs, Sonia S. Anand, Sebastian Debus et al, VOYAGER PAD; *N Engl J Med* 2020;382:1994-2004. DOI: 10.1056/NEJMoa2000052.
13. Robless P, Mikhailidis DP, Stansby GP. Cilostazol for peripheral arterial disease. *Cochrane Database Syst Rev*. 2007:CD003748.
14. Bedenis R, Stewart M, Cleanthis M, Robless P, Mikhailidis DP, Stansby G. Cilostazol for intermittent claudication. *Cochrane Database Syst Rev*. 2014:CD003748.
15. Agarwal S, Sud K, Shishehbor MH. Nationwide trends of hospital admission and outcomes among critical limb ischemia patients: from 2003–2011. *J Am CollCardiol*. 2016;67:1901–1913. doi: 10.1016/j.jacc.2016.02.040

Chronic Venous Insufficiency: A neglected Rehabilitation domain?

**Dr. Santhosh Babu M R,
NIPMR, Thrissur, Kerala**

The varicose vein are commonly seen in adults. Chronic venous disease is defined as long-standing morphological and functional venous abnormalities that may or may not be symptomatic. Chronic Venous Insufficiency (CVI) commonly affects lower limbs with a prevalence ranging between 25–40% and 10–20% in women and men, respectively. The annual incidence is 2–6% in women and 1.9% in men.⁵ The prevalence of venous leg ulcers (VLUs) is increasing, coinciding with an aging population. The condition is attributed to the development of erect posture in humans. Predisposing risk factors implicated are female gender, pregnancy, multipara, prolonged standing vocations, obesity, old age, any chronic rise in intra-abdominal pressure, pelvic pathologies, and sedentary lifestyle. Heredity too plays an important role.

For reasons obvious, an obese female who had at least one pregnancy or delivery is the typical patient. They present with different stages of primary and secondary CVI. Persons with varicose veins or CVI may not come to rehabilitation specialists seeking treatment for the same. More often they present to PM&R Specialists for associated pain syndromes of lower limbs, swelling, or delayed healing ulcers. Unfortunately, standard textbooks and curriculum of PM&R don't seem to give enough significance for the rehabilitation of

chronic venous disorders. A humble attempt is made here to briefly discuss a few clinically useful points in this subject.

Documentation & Classification:

Detailed evaluation and systematic documentation of the condition carry paramount importance. This should be done even when CVI is observed as part of another MSK problem. CEAP classification (Clinical-Etiological-Anatomical-Pathophysiological) is the best available option. CEAP was introduced in 1994 to standardize the diverse manifestations of chronic venous disease. It was further modified in 2004 to refer more broadly to chronic venous disorders. Therefore, it covers the broad spectrum of morphological and functional alterations of the venous system.

CEAP classification of chronic venous disease⁴

Description/Definition	Classification
No visible or palpable signs of venous disease	0
Telangiectasis or reticular veins	1
Varicose veins	2
Edema	3
Pigmentation or eczema	4a
Lipodermatosclerosis or atrophie blanche	4b
Healed venous ulcer	5
Active venous ulcer	6
Symptomatic	S
Asymptomatic	A

Etiological.	
Congenital	Ec
Primary	Ep
Secondary (post-thrombotic, traumatic)	Es
No venous cause identified	En
Anatomy/distribution.	
Superficial	As
Perforators	Ap
Deep	Ad
No venous location identified	An
Pathophysiology.	
Reflux	Pr
Obstruction (acute and chronic)	Po
Combination of both reflux and obstruction	Pr.o
No venous pathophysiology identified	Pn

A simplified version of CEAP is given below.

CEAP classification of the severity of varicose veins

CEAP Clinical Score	Description
C0	No visible or palpable varicose veins
C1	Telangiectasia (Thread veins / Spider veins / Broken veins)
C2	C2A Varicose veins without any symptoms (Asymptomatic)
	C2S Varicose veins with symptoms
C3	Swollen ankle (edema) due to varicose veins or hidden varicose veins (v
C4	Skin damage due to varicose veins or hidden varicose veins (venous ref
C5	Healed venous leg ulcer
C6	Venous leg ulcer

Secondary complications of CVI mainly occur in lower limbs. This includes chronic lympho-venous edema, eczema, hyperpigmentation, lipodermatosclerosis, and chronic venous stasis ulcers. Venous obstruction, valvular insufficiency,

perforator incompetency all lead to venous stasis of more dependent lowerlimbs.

This in turn causes regional venous hypertension. In normal situations muscles of the lower limb especially of the foot, ankle, calf, and thigh form the strongest component of the venous pumping system. Antigravity posture and exercises as part of ADL contribute to the efficiency of the venous return. Malfunction of any of the factors mentioned factors mentioned above leads to the progression of CVI. For these reasons, rehabilitation is gaining more importance in the non-interventional and interventional management of CVI. Protocol-based therapeutic rehabilitation exercise program along with therapeutic compression bandaging forms the main pillars of management of CVI and related disorders.

2. Therapeutic Compression Bandaging in CVI:

Multilayer compression bandage therapy has become a widely accepted and effective treatment in the management of CVI and chronic venous ulcer. It is existent in the last fifteen years. Unfortunately, only very few related specialists are exploiting its possibilities. Four-layer bandaging is a high-compression bandaging system (sub-bandage pressure 35-40mmHg at the ankle) that incorporates elastic layers to achieve a sustained level of compression over time.³ This system is also highly useful in the recurrence of chronic venous ulcers.

Four-layer bandage system: Indications.

- **Primary uses**
 - Treatment of venous ulceration.
 - Prevention of ulcer recurrence if hosiery is not tolerated.
 - Symptomatic relief of superficial

thrombophlebitis.

- **Other uses**

- Traumatic wounds with local oedema, for example, pretibial lacerations.
- Venous/lymphatic disorders.
- Ulceration of mixed aetiology with an oedematous component.

Four-layer bandage system: Recommendations.

Based on current RCN and SIGN guidelines and the International Leg Ulcer Advisory Board recommendations.

- **High compression** - sub-bandage pressure 35-40mmHg.
 - ABPI ≥ 0.8 : four-layer bandaging (4LB - orthopaedic wool, crepe, elastic layer, cohesive layer).
- **Reduced compression** - sub-bandage pressure 17-25mmHg.
 - ABPI 0.7: three-layer bandaging (orthopaedic wool, crepe, cohesive layer).
 - ABPI 0.6: three-layer bandaging (orthopaedic wool, crepe, long- stretch elastic layer).
 - ABPI < 0.5 : avoid compression except with medical supervision.

Contraindications & Precautions:

- Decompensated Congestive Cardiac failure.
- Severe peripheral arterial disease.
- Vasculitis ulcers.

Several types of compression bandages and systems are available. Some bandages if inadvertently applied may produce dangerously high sub bandage pressures. The combination and sequence of layers are also important. The standard option is as follows.

Layer	Type of bandage
1	Orthopaedic cotton wool
2	Crepe support
3	Class 3a compression
4	Class 3b cohesive compression

This YouTube video demonstrates the procedure in a very simple manner. <https://youtu.be/DTYqPU52yRc>

Several studies have shown that Venous leg ulcers (VLUs) heal faster with a four-layer bandage system. Compression stockings are highly effective in improving clinical symptoms and signs of CVI.⁵ Multi-layer bandages scores over a single layer in the healing rate and resolution of oedema. procedures.² All layers are applied from toes to knee. The skill and experience of the bandages is key factor in producing and maintaining optimum desired sub-bandage pressure. They normally require weekly renewal but can be changed more often if necessary. Even though short stretch bandages are reusable, the current recommendation is to discard all layers after a single-use. Antigravity postural advice and therapeutic exercises should be detailed to the patient.

3. Calf muscle pump malfunction.

Venous return from lower limbs is dependent on multiple factors. Patency of veins, the integrity of venous valves, competency of perforators, static as well as dynamic venous pressures, and function of calf muscle pump is most important among them. Even though easily correctable, muscle pump malfunction is least addressed among these. Calf muscle pump failure was present more often in older patients. Insufficiency calf muscle pump is found more in standing, sitting, and supine postures. Quiet standing is more problematic. Persisting calf muscle pump failure is associated with poorer outcomes of venous interventions.¹ Not only calf

muscles, but the entire musculature of the lower limb contributes to dynamic venous return. These form the 'peripheral heart'. Hence a structured rehabilitation exercise program for CVI should include all muscle groups of the lower limb.

General exercises, postural corrections, and obesity management are also part of this program. The normal range of motion of the ankle and subtalar joints are impaired in CVI. Regaining the ROM of these joints is crucial in re-establishing adequate calf muscle pump function.¹

4. Phleboarthrosis: high index of suspicion is required.

As mentioned in the introduction, CVI can present as various musculoskeletal problems. Osteoarthritis of the knee is the commonest of these. Stiffness of ankle joint, OA ankle, collapse midtarsal joints, TA enthesitis, heel pain syndrome has a high incidence in CVI. Both primary and secondary pes planus are also found to be associated with a higher incidence of calf muscle failure. So is pes cavus. Regional osteopenia is also observed in venous disorders of the lower limb. Chronic venous ulcers result in certain changes in the pattern of gait, resultant mal-adaptation, and deformity of joints of lower limbs. There is slight flexion, varus deformity of the knee & equinus, varus at the ankle.

Reduced ROM of these key joints leads to more local venous congestion. Some authors describe this condition as *arthrogenic venous congestion*. Quite often it is an observation that musculoskeletal symptoms of lower limbs don't improve even after the successful intervention of varicose veins. Many vascular surgeons now call these entities '**phleboarthrosis**'. Chronic venous stasis and edema are implied as contributory factors for the

development of regional inflammatory pain syndromes. In general, CVI-associated MSK syndromes have very good rehabilitation outcomes. But careful clinical evaluation is essential to exclude other primary or secondary rheumatological conditions.



References:

1. *Calf Pump Activity Influencing Venous Hemodynamics in the Lower Extremity* by Cestmir Recek, MD, *International Journal of Angiology* 2013 Mar; 22(1): 23–30. Published online 2013 Feb 6. doi: 10.1055/s-0033-1334092.
2. *Four layer bandage compared with short stretch bandage for venous leg ulcers: systematic review and meta-analysis of randomized controlled trials with data from individual patients*: BMJ. 2009; 338: b1344. Published online 2009 Apr 17. DOI: 10.1136/BMJ. b1344 <http://www.worldwidewounds.com/2005/march/Moffatt/Four-Layer-Bandage-System-Part2.LastModified: Wednesday, 05-Oct-2005 15:29:01 BST>.
3. <https://www.veinforum.org/wp-content/uploads/2018/03/Revised-CEAP-Classification-May-2004.pdf>.
4. *Chronic Venous Insufficiency: prevalence and effect of compression stockings*: Int J Health Sci (Qassim). 2014 Jul; 8(3): 231–236

The role of a physiatrist in lymphoedema control

Dr Remya Mathew

Introduction:

Relevance of present study

Lymphedema is a progressive condition in which abnormal levels of fluid accumulate in the body tissues of the upper and lower limbs. Lymphedema is a condition characterised by progressive accumulation of fluid in the subcutaneous tissues of the limbs or trunk. It is seen in about 24 to 49% of patients after mastectomy, 4 to 28% after lumpectomy, 1 to 47% after pelvic surgery or radiation and 2% cases after any infection.

Between 24% and 49% of patients develop lymphedema after a mastectomy, and between 4% and 28% develop the condition after a lumpectomy. After pelvic surgery or radiation treatment, its incidence is between 1% and 47%. Only 2% of cases are due to infection. (Ref:1)

There are several risk factors for lymphedema. These include primary disorders (associated with genetic mutations or age) or secondary causes, which are typically associated with cancer (breast, gynecologic, urologic, melanoma and lymphoma) and/or cancer treatments, such as radiation, mastectomy, lumpectomy or lymph node dissection. Trauma, infection and obesity are other risk factors.

Lymphedema can be classified as primary (associated with genetic causes or age) and secondary (associated with malignancies or their treatments) Trauma, infection and obesity are risk factors for development of this condition.

Most cases of lymphedema result in permanent disability, pain, disfigurement and functional limitations due to which the role of rehabilitation becomes paramount in management of this condition and reduce its morbidity.

A PMR physician will be able to help diagnose and identify appropriate treatment methods for lymphedema as it is a long term / permanent disability. Functional evaluation may also be performed by a PM&R physician to determine limitations to walking and daily activities based on severity and type of lymphedema.

Treatments include therapy to remove lymph fluid from the affected limbs and to reduce swelling. This may involve physical or occupational therapy; compression devices, low-stretch or inelastic compression bandaging or compression garments; skin hygiene to minimize infection risk; and exercises to improve range of motion. Long-term self-management, including proper skin care, compression garments, weight control and exercise, is key to prevent re-accumulation of lymph fluid and complications.

Complications of lymphedema include disfiguration, depression, Joint problems, Spinal issues due to heaviness in limb, skin issues, etc

Limitations/ Issues with current protocols:

Poor patient compliance to MLD technique

Poor awareness regarding this issue reflected in how the few patients, who did report to our OPD had no awareness of this

condition, patient presented to our OP clinic were unaware of the reason of this issue)

This unawareness makes patient compliance poor to existing lymphedema control strategies.

Compliance to the control measures or acceptance of the relevance of continuing the decongestion methods for a long term period is hardly observed in most of the patients

And they present late with fibrotic grade 4 lymphedema with complications or chronic sequelaes.

Here lies the importance of early intervention-lymphedema clinic:

Duties of Lymphedema clinic:

1. As it is a chronic issue, awareness generation regarding the cause of illness is very important
2. Rule out other associated cause of limb edema like DVT
3. Initiation of medications which help in lymphangiogenesis like Daflon.(Ref.8)
4. Counselling regarding decongestion therapy method
5. Arrangement of necessary equipment for patients use for home based decongestion therapy
6. Demonstration and teaching the procedure of BP apparatus based decongestion therapy to perform by themselves
7. Managing follow up

Interim study report of a Lymphedema control study :

Pilot study for Lymphedema management –

A novel structured combination treatment by compression using common BP apparatus along with standard bandaging,

exercise measures and medications, for lymphedema control

Proposed advantages/benefits over MLD technique:

We all know the advantages of decongestion in lymphedema management:

Here “manual pressure is applied” to move the trapped fluid in the swollen limb toward an area with working lymph vessels.

Edema fluid flow augmentation and lymphedema reduction by applying circumferential, segmental pressure using modified BP apparatus and checking the back flow of edema fluid by winding Elasto crepe bandage in figure of eight manner right after the pressure application.

So it's a manual -Sequential pneumatic compression

So compared to an automatic sequential pneumatic compression device it is , manual application of pressure with a cost effective widely available device – the BP apparatus.

Advantages of decongestion therapy with the pressure apparatus:

1. Spontaneous reduction in edema in lesser time and limb volume reduction
2. Patient / caretakers can learn the technique more easily compared to routine MLD technique
3. Routine BP apparatus are easily available at home care set up compared to a cumbersome Lymphedema control squeezer device is too expensive & not available locally.
4. Routine measures advised are felt cumbersome and time consuming
5. Study also aims at educating patients regarding the cause of oedema and method to control it

6. Trial to reduce the time in using multi-layered bandaging which is otherwise shown to have poor patient compliance if advised to use for 24 hours.
7. Intermittent pneumatic compression pump is proven to be beneficial for lymphedema, which is a cumbersome and expensive device in our scenario
8. Expecting an immediate benefit by CDT and maintenance benefit by medication and bandaging
9. More beneficial in stage 1 and stage 2, but can be tried in stage 3 cases also to reduce the heaviness of the limb as much as possible.
10. Prevention of progression to further stage.

Equipments used:

1. Modified BP apparatus : BP cuff with twice the cuff length / Bladder part remains the same.

The bladder of BP cuff shall be tied along the Venous- lymphatic channels

2. Arm sleeve/ Compression stockings – post procedure
3. Elasto crepe bandage

Methodology:

Plan of conduct:

Phase 1: OPD based assessment-investigations – inclusion- awareness building

Phase 2: Trial of method – about 3 times

Phase 3: Home program advice and follow up monthly for 6 months

Recruit the patient with upper / lower limb lymphedema → Assessment- local examination, measurements, staging →

Investigate for CHF with a routine ECHO , DVT screening with a Doppler study →

Awareness -Explain the anatomical reason for the persistent edema with pictures → Introduce the BP apparatus/ crepe bandage and explain the usage → Explain the procedure/ obtain the consent → Perform the method – Keeping the patient supine/sitting with concerned limb in elevation → Tying BP apparatus – Apply pressure of about 100-150mm of Hg – hold for 40- 45 seconds (or lesser if the patient complains of ischemic pain) → Untie it after 2-3minutes and ask for discomfort if any→ Starting the tying from distal- foot end - untie– tie proximally such that previous upper border line of cuff is present lower line-→ if no issues wait for 2-3 minutes then repeat →like that go on repeating the method upto upper arm in upper limb and mid thigh in lower limb→

Post compression wind the crepe bandage from distal end in figure of eight manner keeping the limb in elevation→Lower the limb after fixing the bandage.

Hospital sessions shall be repeated for three times and once there are no issues noted/ once the patient becoming confident home program instructions given

Instructions for the method to get practised at home:

Warm up the limb using moist heat application for 10 minutes

Elevate the limb using one- two pillows

Care taker shall tie BP cuff and apply pressure in the described manner

Pressure release shall be done if the patient complains of ischemic pain

Wind up the crepe bandage (usually 15cm size) in the figure of eight manner

One may perform the range of motion / strengthening exercise post bandaging for 7 minutes. Patient can wear bandage for 4- 5 hours. Patient can move around wearing

bandage/ elastic stockings.

By afternoon remove , aerate the limb, repeat the procedure . Untie bandage at night hours. Night sleep time- patient shall keep the foot end (for lower limb edema and bed side for upper limb edema , of couch in elevation.

Necessary lymphedema control exercises are advised to be continued on daily basis

Rules of therapy:

Morning – after applying moist heat to limb, provide decongestion therapy with pressure apparatus , from distal to proximal , and after that application of arm sleeve or compression stockings,

By evening- remove compression stockings, give good aeration , then after one hour , again repeat decongestion using pressure apparatus, reapply elasto crepe bandage .

The patient may keep limb free at night for comfortable sleep (keep limb in an elevated position with pillow support while asleep)

- In order to prevent the area from swelling constant attention is needed.
- Elastic compression garments that fit like a second skin are worn during the day.
- Exercises are done regularly to keep range and strength of limb joints
- Keep the effected upper limb in self supported position(with other hand) while walking
- Perform exercise for 7minutes wearing elastic stockings any time twice daily.(preferably post decongestion therapy time)
- Patient can move around wearing bandage/ elastic stockings.

Lymphedema control exercises

Upper limb: Range of motion exercises, shoulder ROM , 5-10 minutes

Lower limb: Range of motion exercises, Cycling , 5-10 minutes

Lymphedema management post surgery-

Stage 1: PREVENTION →Education, awareness, MLD , exercises, elastic stockings

Stage 2: MANAGEMENT FOR ESTABLISHED LYMPHEDEMA: → Home program:

Warm up→Phase 1- decongestion by BP apparatus→ Phase2- Multilayer crepe bandaging/ arm sleeve / compression stockings (chance of back flow is more).These sequence of actions twice daily. Incorporate / perform exercise for 7minutes wearing elastic stockings any time (preferably post decongestion wearing the bandage) twice daily.

Patient can move around wearing bandage/ elastic stockings.

Current status of the study:

20 patients have been recruited in the study. 2 were excluded as there was cellulitis, and abdominal mass causing compression of pelvic channels. Outcome measures are mid arm, mid forearm circumference for the upper limb and mid calf and mid thigh circumference for the lower limb.

Decongestion therapy advices given , demonstrated and awareness for the compliance with the decongestion modalities for lymphedema control has been discussed.

FIGURES :

Large adult NIBP cuff



Cuff tied up positions for decongestion therapy

Step 1 Limb kept in elevation compared to chest level

Subsequent steps –Cuff tied distal to proximal segments sequentially



Future scope:

1. This is a 2 person procedure ie. patient requires a helper to use the BP apparatus .So we are proposing the production of novel BP apparatus with more tube length so that the patient can keep the apparatus near to his eye level and see the reading in apparatus and himself can do the procedure with adequate training.

References :

1. Real-Time Direct Evidence of the Superficial Lymphatic Drainage Effect of Intermittent Pneumatic Compression Treatment for Lower Limb Lymphedema. Kitayama S, Maegawa J, Matsubara S, Kobayashi S, Mikami T, Hiroto K,
2. Intermittent pneumatic compression pump for breast cancer-related lymphedema: a systematic review and meta-analysis of randomized controlled trials. Shao Y¹, Qi K, Zhou QH, Zhong DS.
3. Intermittent Pneumatic Compression Enhances Formation of Edema Tissue Fluid Channels in Lymphedema of Lower Limbs, Marzanna Zaleska,^{1,2} Waldemar L. Olszewski,^{1,2} Marta Cakala,^{1,2} Jaroslaw Cwikla,¹ and Tadeusz Budlewski¹
4. Effect of complete decongestive therapy and home program on health-related quality of life in post mastectomy lymphedema patients Ganeswara Rao Melam, SyamalaBuragadda, Adel A. Alhusaini, and Nisha Arora
5. Lymphedema Interventions: Exercise, Surgery, and Compression Devices
6. Systematic review: conservative treatments for secondary lymphedema Mark Oremus, Ian Dayes, Kathryn Walker & Parminder Raina
7. The role of physical and rehabilitation medicine specialist in lymphoedema, V Fialka-Moser, M Korpan, E Varela, A Ward, C Gutenbrunner, J M Casillas, A Delarque, M Berteau, N Christodoulou
8. Efficacy of Daflon 500 mg in the treatment of lymphedema (secondary to conventional therapy of breast cancer) A P Pecking¹, B Février, C Wargon, G Pillion

Quiz

1. The presence of_____ and smoking are independent predictors of vasculitis in patients with rheumatoid arthritis.
(a) HLA-B27 (b) HLA-DR4 (c) HLA-C3 (d) HLA-B52
2. Type I Cryoglobulins consists of monoclonal immunoglobulin, generally immunoglobulin M (IgM) or_____.
(a) IgA (b) IgD (c) IgE (d) IgG
3. The _____ are most often affected in Raynaud syndrome.
(a) Fingers & hands (b) Toes & feet (c) Face & trunk (d) Fingers & toes
4. ABI values greater than 1.4 indicate _____.
(a) Borderline low ABI (b) Noncompressible arteries (c) Abnormally low (d) Collapsed arteries
5. The 5-year mortality rate in patients with an ABI less than 0.85 is _____.
(a) 5% (b) 8% (c) 25% (d) 10%
6. The presence of a significant systolic pressure gradient, greater than_____, between the brachial artery pressure and the upper thigh systolic pressure usually signifies the presence of aortoiliac obstruction.
(a) 2 to 5mm of Hg (b) 10 to 15mm of Hg (c) 4 to 8mm of Hg (d) 5 to 10mm of Hg
7. TcPO₂ values less than ____ suggest inadequate perfusion for healing.
(a) 30-40mm of Hg (b) 40-50mm of Hg (c) 20-30mm of Hg (d) 50-55mm of Hg
8. _____ angiography has been the traditional “gold standard” for lower extremity arterial evaluation.
(a) Catheter (b) CT (c) MR (d) Duplex
9. The Heart Outcomes Prevention Evaluation (HOPE) study showed that ACE inhibitors reduce cardiovascular events by ___ in patients with symptomatic PAD.
(a) 10% (b) 20% (c) 25% (d) 30%
10. A minimum of 30 minutes of moderate activity at least ___times per week is beneficial.
(a) 4 (b) 2 (c) 5 (d) 3

Key

1. (c)

Rheumatoid vasculitis manifests almost exclusively in patients with rheumatoid autoantibodies and often occurs in the context of other extraarticular manifestations. The vasculitis is mediated by the deposition of circulating immune complexes on the blood vessel wall with activation of complement. Proliferation of the vascular intima and media causes an obliterative enteropathy. Leukocytoclastic or small vessel vasculitis produces palpable purpura or cutaneous ulceration. The presence of human leukocyte antigen C3 (HLA-C3) and smoking are independent predictors of vasculitis in patients with rheumatoid arthritis. Smoking, rheumatoid factor, and antinuclear antibodies are all associated with severe extraarticular disease manifestations.

2. (d)

Cryoglobulins are immunoglobulins that reversibly precipitate at reduced temperatures. Type I consists of monoclonal immunoglobulin, generally immunoglobulin M (IgM) or IgG. Type II cryoglobulins are a mixture of monoclonal IgM and polyclonal IgG. Type III cryoglobulins are a mixture of polyclonal IgM and IgG. Cryoglobulinemia is associated with many illnesses, which can be broadly grouped into infections (hepatitis C), autoimmune disorders, and malignancy. More than 90% of cases of cryoglobulinemia have a known underlying cause; treatment is focused on the cause of the disorder rather than merely symptomatic relief.

3. (a)

Raynaud syndrome is characterized by episodic attacks of vasospasm in response to cold or emotional stress. The fingers and hands are most often affected. In certain patients, the toes and feet may be involved. Classic episodes of vasospasm cause an intense pallor of the distal extremity followed in sequence by cyanosis and rubor on rewarming. Most patients do not experience this complete triple color response. Typically, only pallor or cyanosis is noted during attacks. In general, the attacks are over within 30 to 60 minutes, and these episodes are usually bilateral. Attacks may occur infrequently; for example, some may have symptoms only during the winter. However, other patients may have a significant impairment/disability with multiple daily episodes. Digital ulcerations are rare but may occur. Females are affected more commonly than males. Raynaud disease refers to a primary vasospastic disorder where there is no identifiable underlying cause. Raynaud phenomenon refers to vasospasm, secondary to another underlying condition or disease. Predisposing factors include atherosclerosis, arteritis, cancer, collagen vascular disease, thoracic outlet syndrome, embolic occlusion, occupational disease, and certain medications. Secondary Raynaud phenomenon is occasionally unilateral and may produce skin breakdown.

4. (b)

The ABI provides objective data about arterial perfusion of the lower limbs. Pressures are obtained with a blood pressure cuff placed around the patient's lower calves or ankles. A handheld Doppler detects systolic blood pressure in the dorsalis pedis and the posterior tibial arteries. The brachial (arm) pressure is also obtained. In a healthy individual, because of peripheral amplification of the pulse pressure, the ankle pressure should be

higher than the brachial arterial systolic pressure. A normal ankle to arm systolic blood pressure ratio is 1.0 to 1.4. ABI values are considered to be borderline low when they are between 0.91 and 0.99 and abnormally low when less than or equal to 0.90. Values greater than 1.4 indicate noncompressible arteries.

Ankle-Brachial Index

	Resting	Post Exercise	Treadmill Time
Noncompressible	>1.4		
Normal	1-1.4	>0.9	Complete 5 min
Borderline	0.90-0.99	>/0.90 or >/=10% drop from the baseline	Complete 5 min
Mild	0.80-0.89	0.51-0.90	Complete 5 min
Moderate	0.50-0.79	0.15-0.50	Greater than half
Severe	<0.5	<0.15	Less than half

5. (d)

An ABI identifies individuals who are at risk for developing rest pain, ischemic ulcerations, or gangrene, and it is a marker of generalized atherosclerosis. The risk of death, usually from a cardiovascular event, increases dramatically as the ABI decreases. The 5-year mortality rate in patients with an ABI less than 0.85 is 10%. When the ABI is less than 0.40, the 5-year mortality rate approaches 50%.

6. (b)

Segmental pressure analysis is often used to determine the location of arterial stenosis. Arterial pressure can be measured with blood pressure cuffs placed at various levels (upper thigh, lower thigh, upper calf, and lower calf above the ankle) sequentially along the limb. *The presence of a significant systolic pressure gradient (greater than 10 to 15 mm Hg) between the brachial artery pressure and the upper thigh systolic pressure usually signifies the presence of aortoiliac obstruction. A pressure gradient located between the upper and lower thigh cuffs signifies obstruction in the superficial femoral artery. A gradient between the lower thigh and upper calf cuffs indicates distal superficial femoral or popliteal artery obstruction. A gradient between the upper and lower calf cuffs identifies infrapopliteal disease. Gradients of 10 to 15 mm Hg between adjacent sites may represent physiologically important obstruction.*

7. (c)

TcPO₂ values less than 20 to 30 mm Hg suggest inadequate perfusion for healing. A decrease in the TcPO₂ value of 10 mm Hg with leg elevation also suggests tenuous perfusion.

8. (a)

Angiography remains the definitive approach for perioperative evaluation in patients requiring open revascularization if noninvasive axial imaging is inconclusive. Angiography is helpful to evaluate the tibial and pedal arteries, which are difficult to assess on axial imaging. Preprocedure arteriography is an essential part of endovascular procedures.

9. (c)

In addition, treatment with ACE inhibitors improves walking ability in patients with intermittent claudication. This was not associated with any significant improvement in the ABI. Patients with intermittent claudication may benefit from treatment with a high tissue affinity ACE inhibitor for a period of 6 months. The overall treatment effect achieved by ACE inhibitors is more than that of other therapeutic agents for intermittent claudication, such as cilostazol and pentoxifylline, but less than that of a supervised exercise program.

10.(d)

Patients with PAD should be instructed to wear protective footwear at all times (never walk barefoot or in socks) and monitor their extremities carefully for redness or skin breakdown. Temperature extremes should be avoided. The feet should be washed carefully with mild soap and warm water. Drying is best performed by blotting or patting with a soft clean towel (rubbing should be avoided because it may injure the skin). The skin between the toes should be carefully dried to avoid maceration. Emollients without preservatives or perfume should be used to prevent cracking of the skin (avoid between the toes). Proper footwear, which does not produce areas of point pressure, should be used. Whenever new shoes are purchased, the patient should gradually (over a period of a week) wear-in shoes to make sure that there are no areas of point pressure with the new footwear. Warm outer footwear should be used in the winter to protect against thermal injury. Decreased activity secondary to symptomatic lower extremity arterial occlusive disease can result in deconditioning, which further contributes to disease impairment. Deconditioning may also be "iatrogenic" as a result of a prolonged period of limited mobility to avoid trauma to ischemic wounds.

Regular lower extremity exercise in the form of a structured or a supervised walking program is critical for patients with PAD. Ambulation can help to develop collateral blood flow and in time may lead to resolution or improvement of intermittent claudication. A minimum of 30 minutes of moderate activity at least three times per week is beneficial.

Regular training has been shown to improve oxygen extraction from blood, muscle enzyme activity, and hemorheology. Evidence suggests that patients following an exercise regimen improve both their claudication distance and cardiovascular risk profile. Exercise improves maximal walking ability by an average of 150%. Remarkably, increased walking capacity increased further 6 months after supervised exercise training cessation, suggesting an ongoing benefit of the intervention.

Quiz

1. Acute frostbite should be rewarmed in water between ___ and ___ without friction in addition to adequate analgesia and must be done in a setting that prevents refreezing.
(a) 20°C, 30°C (b) 10°C, 15°C (c) 35°C, 40°C (d) 15°C, 20°C
2. The primary goals of acute wound management in burns are.....?
(a) Removal of necrotic material (b) Establishment of a clean, moist wound bed (c) Hydration (c) a &c (d) a & b
3. Immersive wound management may result in lowering of core temperature or serum sodium, may be a source of _____bacteria , and may cause cross-contamination of wounds.
(a) Gram positive (b) Gram negative (c) Acid fast (d) Gram variable
4. _____ remain the mainstay of acute pain management in burn patients.
(a) Opioids (b) NSAIDs (c) Steroids (d) Central Pain Modulators
5. Limbs requiring escharotomies should be elevated and splinted in a neutral position for ___hours, after which time passive range of motion may be initiated.
(a) 12 (b) 24 (c) 48 (d) 96
6. As only the epidermis and superficial dermis are harvested, in split-thickness skin grafting, the donor site is normally expected to heal spontaneously in ___ weeks.
(a) 3 (b) 5 (c) 2 (d) 4
7. The total caloric requirements for adults with burn injuries can be estimated at ___kcal/kg plus 40 kcal/1% TBSA burn/day.
(a) 25 (b) 10 (c) 20 (d) 15
8. In individuals with burn injuries greater than ___% TBSA, there is a risk of development of heterotopic ossification (HO).
(a) 5 (b) 10 (c) 15 (d) 30
9. Hypertrophic scarring is the most common complication after burn injury, with a prevalence of ___%.
(a) 45 (b) 56 (c) 67 (d) 78
10. The _____ has been used to decide who to admit to inpatient rehabilitation and to describe changes during burn rehabilitation.
(a) FIM (b) FAM (c) Barthel Index (d) Nottingham Index

Key

1. (c)

Frostbite may occur from environmental or industrial exposures to cold, and the resultant wounds are more difficult to classify by depth than flame or hot contact burns. Acute frostbite should be rewarmed in water between 35°C and 40°C without friction in addition to adequate analgesia and must be done in a setting that prevents refreezing. There is some early evidence that thrombolytic therapies have some benefit for reduction of amputation after injury.

2. (d)

Removal of necrotic material and the establishment of a clean, moist wound bed are the primary goals of acute wound management. There are a large number of commercially available products that are acceptable to use for management of acute burns. Unfortunately, few high-quality comparative studies have been performed on these products. Silver sulfadiazine is still utilized in many burn centers as it is inexpensive.

Metaanalyses of the literature suggest superior healing outcomes from the use of biosynthetic, silver-based or hydrogel dressings compared with silver sulfadiazine. Cost, caregiver and provider burden, and minimization of pain during dressing changes should be taken into account when choosing a product.

3. (b)

*The use of immersion hydrotherapy is no longer commonly practiced in modern burn centers. Immersive wound management may result in lowering of core temperature or serum sodium, may be a source of gram-negative bacteria such as *Pseudomonas*, and may cause cross-contamination of wounds. The minimization of immersion hydrotherapy in burn care centers has been associated with a reduction in serious skin infections.*

4. (a)

Acute burn pain is typically significant and is magnified by procedural pain associated with dressing changes, mobility, stretching, and surgery. Opioids remain the mainstay of acute pain management. Treatment requires frequent reassessment because an individual's pain may change drastically around events, such as wound closure or participation in therapies. Adjuncts to opioids, such as distraction, hypnosis, or anxiolytics, may be used, particularly for the pediatric burned individual.

5. (b)

In full-thickness burn injuries, the damaged tissues are adherent to underlying structures. Wound edema, stiff eschar, and the fluids required for resuscitation after burn injury increase the risk for development of compartment syndrome. Thick eschar on the trunk may mechanically inhibit respiratory function. Early escharotomy is essential to avoid these complications. Escharotomy sites are left open after the first surgical procedure and will require definitive surgical closure once tissue edema has resolved.

6. (c)

Early excision of necrotic tissue combined with autologous split-thickness skin grafting has greatly improved survival after burn injury. This surgical approach reduces the inflammatory stimulation from burn eschar and other necrotic tissues and limits the risk of infection. Donor skin is removed from an unburned area of skin through the use of a powered dermatome. The donor skin is then prepared and placed on the surgically prepared wound bed. The donor skin is held in place by staples, sutures, or biocompatible adhesives. A compressive postoperative dressing is then applied to the grafted region, and an appropriate dressing is applied to the skin graft donor site. As only the epidermis and superficial dermis are harvested, the donor site is normally expected to heal spontaneously in 2 weeks. Much similarly to other acute wounds, there are a large number of products available to dress the skin graft donor site.

7. (a)

Enteral feeding should be instituted early after injury. This helps maintain gut immunity and motility while providing the necessary calories and nutrients to counter the hypermetabolic response to burn injury. Patients requiring enteral feeding should be provided with adequate nutritional resources through a tube placed distal to the pylorus. Feeds should be provided continuously including during perioperative and intraoperative periods, as routine holding of oral feeds typical of many surgical practices may result in inadequate nutritional support. In addition to the changes in lipid and carbohydrate metabolism seen in individuals with a large burn injury, important changes in protein and amino acid metabolism are also of special importance. The administration of glutamine appears to have benefits in individuals with large burn injuries. Using body weight measurement to assess nutritional status can be difficult because of surgical procedures, dressings, and fluid changes. The serum prealbumin level may be a helpful marker of protein synthesis.

Dysphagia can develop from inhaled irritants, mechanical complications of tube placement, or neurologic injury. Larger TBSA burns, higher number of days on the ventilator, and presence of a tracheostomy are all associated with dysphagia after burn injury. An abnormal bedside swallowing assessment is predictive of abnormal barium swallowing studies, but there is still uncertainty regarding the best protocols for assessing swallowing in burned individuals. Although some very complex cases might have prolonged dysphagia, studies have described between 42% and 90% of individuals with major burns having normal swallowing function by the time of hospital discharge.

8.(d)

In individuals with burn injuries greater than 30% TBSA, there is a risk of development of heterotopic ossification (HO). The most common site of HO in burned individuals is the posterior elbow. HO can develop in an unburned limb but is more common in an affected limb and can be associated with edema and delayed wound closure over the elbow. There may be a role for the use of nitrogen-containing bisphosphonates in managing burn-related HO with a possible second benefit of maintaining bone density. Timing of surgical resection depends on adequacy of soft tissue coverage. Prior studies also suggest that surgery can be safely performed once wound closure has been achieved with a small risk of recurrence.

8. (c)

Hypertrophic scars are raised, red, painful, pruritic, and contractile and stay within the margins of the original injury. Hypertrophic burn scars tend to develop in the first few months of injury, while increasing in volume and erythema. After several months, they can regress, becoming less erythematous and flatter, but the skin never returns to its original state. Although there have been some advances in the prediction of wound healing, there is no accurate predictor of who will develop hypertrophic burn scars. Younger individuals, particularly adolescents, and those with darker skin pigmentation tend to have a higher incidence of hypertrophic scarring. Wounds with a prolonged inflammatory wound healing phase and those that are open longer than 3 weeks are more likely to develop hypertrophic scars. Many treatment options are available for addressing the symptoms associated with hypertrophic burn scars, but none completely remove the scar. The best treatment is to prevent the scar through adequate wound care. When scars are present, early and aggressive treatment is indicated. The first-line treatment for any burn scar is a nonevaporative topical emollient cream, applied four to six times per day, avoidance of mechanical insults, and the minimization of direct sun exposure. Dysfunction in the dermal appendages such as the sweat and sebaceous glands results in hypertrophic scars that are dry and pruritic. Individuals with hypertrophic burn scars may limit ongoing injury by minimizing direct sunlight and heat exposure through the use of clothing and a broad-spectrum, water-resistant sunscreen with sun protection factor of 30 or greater. Pressure garments have been used in burn scar treatment for decades. They are thought to improve the appearance of burn scars by making the scar flatter and less erythematous and by offering some environmental protection. Some evidence exists that pressure aids in remodeling hypertrophic burn scars. The overall clinical effectiveness is controversial, however; in metaanalyses of research into pressure garment use, the overall effect seems small, with minor benefits on scar height but not necessarily on secondary measures of scar. If they are used, pressure garments should be prescribed with monitoring by the rehabilitation physician or therapist, for adequate fit and wear tolerance, because friction in the garment can create or perpetuate superficial wounds in the burn scar. Pressure therapies in burn management should be considered in two phases. Acute pressure can limit wound edema and late pressure for scar management. Pressure garments may not greatly influence the long-term physical properties of scar, but they may be beneficial as a barrier to the environment or as a socially acceptable covering of burn scar. Because of the expense of custom pressure garments, some patients choose to use off-the-shelf pressure garments such as Under Armour.

Silicone gel sheeting can also be used alone or in combination with pressure garments. If worn for 12 to 24 hours/day, silicone is thought to change hypertrophic burn scars through a combination of temperature and perfusion changes. Reviews note, however, that the evidence is weak for the use of silicone sheeting in the treatment or prevention of hypertrophic burn scars.

Intralesional corticosteroid injection can also be of some benefit in the treatment of hypertrophic burn scars. The injections are done with an injection tangential to the skin. The injection is usually painful, particularly when used on the face, and force is necessary to infiltrate the injectate into the fibrotic scar tissue. A combination of triamcinolone with other agents, such as 5-fluorouracil, or the addition of a second modality, such as pulsed

dye laser treatment, may be considered to potentiate the effects of the intralesional steroid.

The use of laser therapies in the treatment of hypertrophic scars continues to evolve. In some studies, the use of laser resulted in the formation of new wounds and little clinically relevant benefit in the scar, whereas other studies have shown benefit with pulsed dye laser for the treatment of burn-related hyperpigmentation. Significant scar recurrence with carbon dioxide laser has been used to excise burn scar. There is evidence to support the use of fractional carbon dioxide laser to improve subjective measurements and influence histologic characteristics in hypertrophic scar. Recent studies also show that laser treatment decreases itch and improves scar pliability.

9. (a)

Some individuals require admission to an inpatient rehabilitation facility (IRF) to maximize function. Individuals who are admitted to IRFs tend to be older and have larger burn injuries (>40% TBSA burned). Overall, early admission to inpatient rehabilitation facilities can reduce length of stay in acute care hospital and improve resource utilization.

The Functional Independence Measure (FIM) has been used to decide who to admit to inpatient rehabilitation and to describe changes during burn rehabilitation. An FIM score in the acute care setting of less than 110 has been associated with admission to an IRF. In other studies using FIM as an outcome measure, however, admission FIM scores have ranged from means of 64.6 to 93.0, discharge FIM scores have ranged from means of 90.8 to 113.0, and mean days' length of stay in rehabilitation has varied between 23.0 and 78.6. Although FIM is used in most IRFs, it has not been shown to correlate with the size of burn injury, and the cognitive subdomain of the instrument might not be sensitive to change in burn injury. Other outcome measures have been developed and refined specific to burn injury, such as the Burn-Specific Health Scale, but there is ongoing development in creating outcome measures for burned individual rehabilitation.

Journal club

**Dr Ravi Sankaran, Professor,
Department of PMR,
Amrita Institute of Medical Sciences**

This is an analysis of an article about HBOT in diabetic ulcers. I've added my comments in italics for each subheading.

Hyperbaric Oxygen Therapy in the Treatment of Ischemic Lower-Extremity Ulcers in Patients With Diabetes: Results of the DAMO₂CLES Multicenter Randomized Clinical Trial

Diabetes Care 2018;41:112–119 | <https://doi.org/10.2337/dc17-0654>

Introduction

Diabetics have a 3–11% annual risk of developing lower-extremity ulcers (1,2). Many have peripheral arterial occlusive disease (3,4). Ischemic diabetic ulcers are notoriously difficult to treat (5). Hyperbaric oxygen therapy (HBOT) is used variably in clinical practice, based on the premise that improving the oxygenation of wounds may expedite their healing and could potentially prevent amputation (11–13).

They've cited relevant articles here.

Background: Previous clinical trials and systematic reviews of HBOT as an adjunct have provided conflicting evidence (14–16). Why is this so? Because there is clinical heterogeneity in terms of vascular status, HBOT regimen, wound characteristics, and outcomes.

They've selectively picked up incongruent studies to make a point, rather than pick up similar studies. There are plenty of articles studying the same populations with uniform results. This is a way to create a non-existent problem for them to solve.

Objective: The aim of this trial was to investigate whether additional HBOT would benefit patients with diabetes and ischemic leg ulcers

Let's see if they do so fairly.

Methodology

Sample size calculation- In a previously published study protocol, the initial sample size calculation was based on an expected increase in limb salvage of 12% (91% from 79%), which would require a total of 226 participants (113 in either group) (18). They were unable to do so. So they did a sample size recalculation. To detect a 29.6% increase in complete wound healing and a 25% increase in limb salvage with 80% power at a 0.05 significance level, 108 patients (54 in either group) were needed. Anticipating a 10% dropout rate due to withdrawal or loss to follow-up, they planned to include 120 patients in the trial.

This is a red flag. They could not get the proper number to power their study so they simply opted for a less powerful range and a tight confidence interval for this.

Inclusion criteria: type 1 or 2 diabetes, an ulcer of the lower extremities, graded as Wagner grades 2–4, and present for at least 4 weeks, limb ischemia, indication for revascularization.

These are reasonable

Exclusion criteria: previous ipsilateral major amputation, any absolute contraindication

for HBOT, current renal replacement therapy, current treatment with chemotherapy etc., unable to complete questionnaires in Dutch.

These are reasonable

Follow-up took place during outpatient visits at 3, 6, and 12 months after recruitment. During follow-up patients were asked to complete questionnaires, report number of completed HBOT sessions, while forefoot normobaric and hyperbaric TcpO2 measurements, and hyperbaric adverse events were recorded.

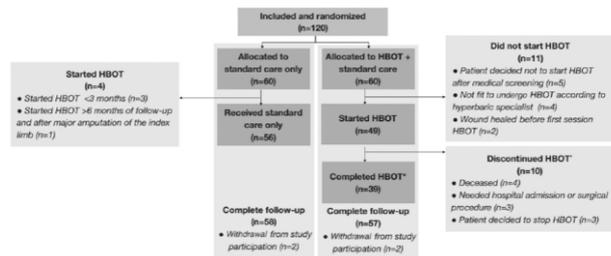
These are reasonable

HBOT included sessions of 90 minutes in a multiplace chamber, pressurized at 2.4 or 2.5 atmospheres absolute during which patients were breathing 100% FiO2 except for three blocks of 5 min during which ambient air was administered to prevent oxygen intoxication. For five days per week until a maximum of 40 sessions was reached or until complete wound healing was achieved. Compared patients undergoing a “full” HBOT treatment course, i.e., if treatment was continued until complete closure of the wound or for at least 30 completed HBOT sessions, with those who did not complete this HBOT regimen and those who received SC.

This is reasonable

They compared all patients who underwent any HBOT treatment with those who did not receive any HBOT. They included those randomized to Standard Care+ HBOT (SC+HBOT) but refused HBOT. Patients in Standard Care (SC) who underwent HBOT at their own request were analyzed in the SC group.

This is a big red flag. They are no longer staying true to their own definitions.



There were two analysis protocols:

Protocol A: Compared patients undergoing a “full” HBOT treatment course, i.e., if treatment was continued until complete closure of the wound or for at least 30 completed HBOT sessions, with those who did not complete this HBOT regimen and those who received SC.

Protocol B: Compared all patients who underwent any HBOT treatment with those who did not receive any HBOT (account for those randomized to SC+HBOT but refused HBOT)

Patients in SC who underwent HBOT at their own request were analyzed in the SC group

Results:

Sixty patients were allocated to SC only. However, four of them received HBOT upon their own demand. Of the 60 patients who were allocated to the SC+HBOT group, 49 (82%) actually started HBOT and only 39 did more than 30 treatments. Of the SC+HBOT, 39 (65%) went until they had complete wound closure.

When we calculate true HBOT vs true standard of care the numbers are 39 vs 56.

At baseline, patients treated with HBOT had higher hemoglobin and were slightly younger. The SC+HBOT group had more Wagner 3 and 4 wounds, these are known to not respond as well.

This is a red flag. We're not comparing

apples to apples in this study

Major amputation of the index limb SC=22% vs. 12% in SC+HBOT group. According to protocol A: 22% SC vs. 5% SC+HBOT group, Protocol B: 20% SC vs. 12% in SC+HBOT group.

Additional Revascularizations- SC group 40% vs 42% in the HBOT group.

Revascularization of the index limb not already planned at study inclusion 28% in the SC group vs. 23% in the HBOT group

Problems with this study:

Sample size and power calculation issues

No significant difference between the two groups in rates of complete wound healing at the end of the follow-up period or in the time to healing. During the study, 29 index wounds healed in the SC group (48%) vs. 33 in the SC+HBOT group (55%).

At the end 28 (47%) wounds healed in the SC group compared with 30 (50%) in the HBOT+SC group.

No statistically significant difference was found in the time to complete ulcer healing of the index ulcer between both groups.

Summary

The good part of this study is it's an RCT

The bad parts are they recalculated sample size for lower power then failed to meet the re-calculated number, Wagner 2-4 mixed together (worse wounds in HBOT group), some analyzed as controls got HBOT

Summarized this study is not comparing HBOT to no HBOT. It's comparing suboptimal HBOT to proper HBOT

Conclusion: *HBOT done properly is better than standard of care with suboptimal or no HBOT*

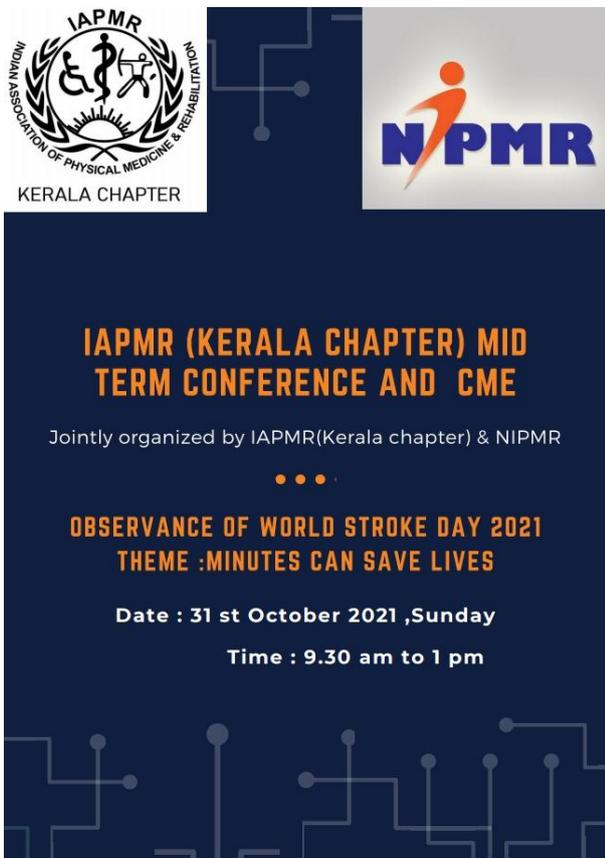
MEMBERS IN ACTION

October 31st was the Kerala Chapter's Midterm conference and CME

Dr Santosh Babu gave the main oration

Dr Sindhu Vijaykumar was the organizing secretary

Other eminent speakers were Dr Amit Dumle, Dr Unnikrishnan Ramachandran, and Dr Bineesh Balakrishnan, Dr Zacharia.



Dr.Santhosh. K.Raghavan, Professor and HOD of PM&R department, MCH Alappuzha

Continues as the Nodal officer for Corona care.

He has presented a paper on " Musculoskeletal complications-assessment and management in Haemophilia " in Believers Church Medical College, Thiruvalla on a virtual platform.

Dr.Sivaram. A, Assistant Professor of PM&R, MCH Alappuzha

Participated in the medical camp for determination of the level infirmity among inmates of an asylum in Punnapra which is dedicated for the upkeep of wandering lunatics.

He has also presented a paper on "recent advances in stroke rehabilitation" during the stroke day celebrations of the hospital and which was conducted in association with the department of Neurology.

Dr.Charvakan.S, MCH Alappuzha has got career advancement promotion as Associate Professor

Dr Vipin Vijayan MD, Junior Consultant in PMR, Taluk Headquarters Hospital Punalur, Kollam

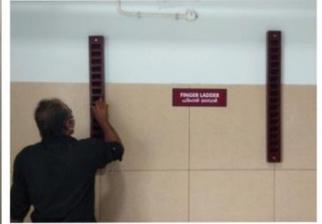
Department of Health Service, Government of Kerala

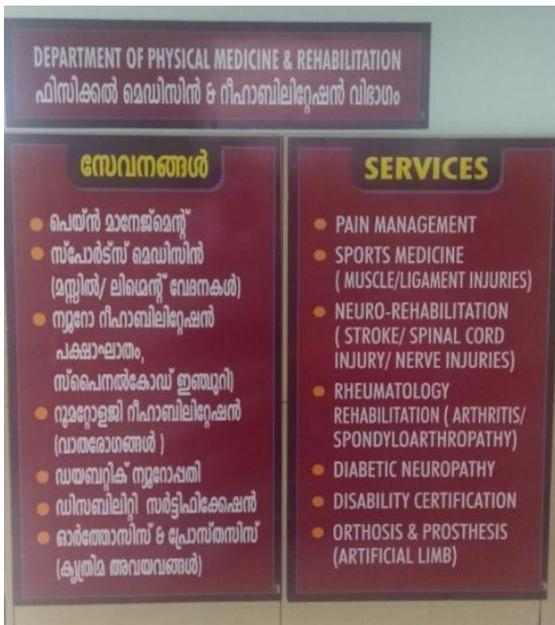
Started working in Taluk Headquarters Hospital, Punalur. Few Taluk Hospitals have a PMR Department, Punalur is one among them.

Artificial Limb Center also started functioning in PMR Department.

Hospital Superintendent Dr. Shahirsha is actively involved in developing infrastructure and very supportive in activities.

He conducted an awareness class about Physical Medicine and Rehabilitation for ASHA workers in Punalur area.





Dr Babeesh Chacko, Consultant, Aster Wynad

Inaugurated the Department of PMR in Aster Wynad

Dr Ann Noble Zacharia, Consultant, Aster Medicity, Kochi

-Organized the first walkathon conducted by PMR doctors in Kochi. This was in celebration with International Day of Persons with Disabilities conducted on December 3rd.

There were fifteen physiatrists from both the government and private sectors who participated in the event. This marks the beginning of Cochin chapter of PMR doctors.





Dr Nittu Devassy Panjikaran, Assistant Professor, Department of PMR, Amrita Institute of Medical Sciences, Cochin

On November 23rd spoke about Geriatric rehabilitation and Risk of falls in the Kerala Orthopedic State Conference in Trissur.

Organized a program on Dec 3rd for World Disability Day in the PMR department in Amrita

Spoke in a workshop on Hemophilia rehabilitation Believers Hospital, which was conducted on December 4th

Hosted an amputee peer group meet, and the same patients came to participate in the disability day celebration



Dr Roshin Mary Varkey, Associate Professor/ HOD, Department of PMR, Believers Church Medical College and Hospital, Thiruvalla, Kerala

Initiated and organized Internship Program for the first batch of Medical Students in PMR Department, BCMCH, Thiruvalla



Topic Presentation on Chronic Pain Management from a Physiatrist's point of view on World Physiotherapy Day



Press Meet and Presentation on Pre and Post Bariatric Surgery Rehabilitation and Obesity Management for a patient admitted under PMR in BCMCH



Organized and conducted a public meeting for the Inauguration of 'Believers Regional Centre for Haemophilia Care and related Disabilities'- REACHED in relation to International Day of Persons with Disabilities on December 3rd, 2021



ബിലീവേഴ്സിൽ ഹീമോഫിലിയ സെന്റർ ഉദ്ഘാടനം ചെയ്തു

ബിലീവേഴ്സ് ഹീമോഫിലിയ ട്രീറ്റ്മെന്റ് സെന്റർ ഉദ്ഘാടനം ചെയ്തപ്പോൾ പങ്കെടുത്തവർ. ഇടതുവശത്ത് നിന്ന് മൂന്നാമത്തെ സ്ഥാനത്ത് കാണാവുന്നവർ.

ഹീമോഫിലിയ എന്ന രോഗം കേരളത്തിൽ ഏറ്റവും കൂടുതൽ കണ്ടുവരുന്ന രക്തരോഗമാണ്. ഇത് കേരളത്തിൽ ഏറ്റവും കൂടുതൽ കണ്ടുവരുന്ന രക്തരോഗമാണ്. ഇത് കേരളത്തിൽ ഏറ്റവും കൂടുതൽ കണ്ടുവരുന്ന രക്തരോഗമാണ്.

കേരളത്തിൽ ഏറ്റവും കൂടുതൽ കണ്ടുവരുന്ന രക്തരോഗമാണ്. ഇത് കേരളത്തിൽ ഏറ്റവും കൂടുതൽ കണ്ടുവരുന്ന രക്തരോഗമാണ്.

Organized a webinar on International Day of Persons with Disabilities, December 3rd and presented on Pathophysiology of Haemophilic Arthropathy

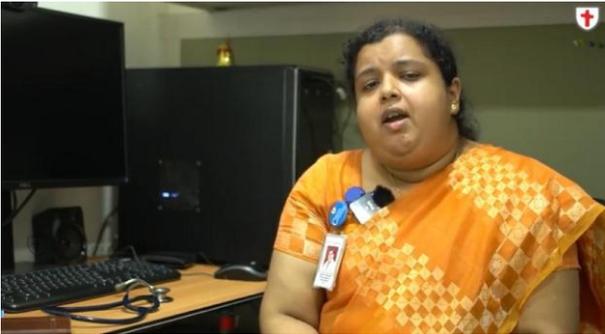
Organized a Seminar on Strategic and Holistic Approach Towards Haemophilia Rehabilitation in BCMCH



Virtual Meet and consultation for Cerebral Palsy Children organized by a special school on Children's Day



Video Presentation on awareness of exercises for dwarfs on World Dwarfism Day



PMR Department, GMC-KOZHIKODE

The team was instrumental to give a medical cover for the events of Kho-Kho(6&7 November) and Rugby Championship(17& 18thNovember) Sporting at Olympian Rehman stadium GMC Kozhikode, November 2021





Department of PMR, General Hospital Trivandrum

Under the auspices of the Physical Medicine and Rehabilitation (PMR) Department, General Hospital, Trivandrum, a special Medical board was conducted on December 3rd in connection with the observance of the International Day of the Persons with Disabilities. The Certification was done through electronic media and printouts of the online certificates were distributed then itself.

Following this, an online awareness seminar was held for the public on 4th December. Hospital Superintendent Dr. S Sheela inaugurated the seminar under the presidency of our HOD Dr. S. Anil Kumar. Dr Arun A John welcomed the participants and gave introductory remarks. Dr Ancy Joseph and Dr. Sindhuja N S detailed the services available to Persons with Disabilities. Dr. A S Sajeena conducted an awareness session on how to apply for a disability certificate. Dr. S. Anilkumar then responded to participant’s queries about the health problems of Persons with Disabilities.

Our HOD and chief consultant Dr. S Anilkumar was invited as a speaker in the CME arranged by Indian Medical Association, Nemom branch in connection with the International Day of the Persons

with Disabilities, where he enlightened the august audience on the topic "Disability - Road ahead."

Apart from our routine activities we have started a continuous academic session for more than hundred junior doctors doing house surgency in our Hospital. Weekly sessions are conducted in which the junior doctors are empowered to present different topics concerned with our speciality. Through our efforts to catch them young, we intend to increase the visibility of our specialty among the medical fraternity.





Dr Ravi Sankaran, Amrita Institute of Medical Sciences, Kochi

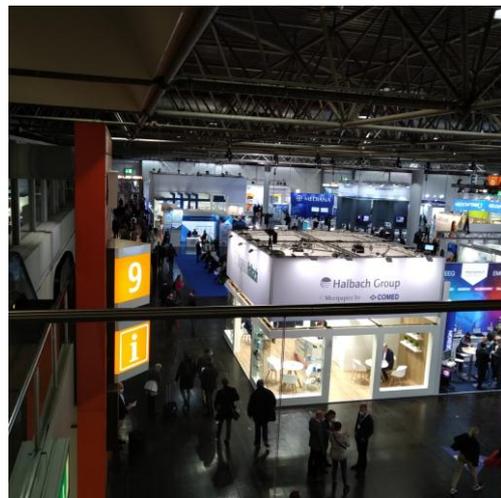
- Was promoted from Associate Professor to Professor in November.
- Had an inauguration program for the Syrebo rehab glove in November



- Attended Medica the world's largest medical exposition in Dusseldorf, Germany in November



The programme consisted of 17 halls like this and larger with about 5,500 international companies representing their products



Attended Formnext 2021, a 3D printing conference in Frankfurt, Germany in November



3d printed insoles

- Spoke in the International Conference Of Neurology 2021 in Paris regarding his research in spasticity
- Began training in Barcelona, Spain in November

Journal scan

Dr Noufal Ali

Consultant Meitra hospital Calicut

Heat therapy vs. supervised exercise therapy for peripheral arterial disease: a 12-wk randomized, controlled trial

Ashley P Akerman , Kate N Thomas , Andre M van Rij , E Dianne Body, Mesfer Alfadhel, James D Cotter

Peripheral arterial disease (PAD) is characterized by lower limb atherosclerosis impairing blood supply and causing walking-induced leg pain or claudication. Adherence to traditional exercise training programs is poor due to these symptoms despite exercise being a mainstay of conservative treatment. Heat therapy improves many cardiovascular health outcomes, so this study tested if this was a viable alternative cardiovascular therapy for PAD patients. Volunteers with PAD were randomized to 12 wk of heat ($n = 11$; mean age 76 ± 8 yr, BMI 28.7 ± 3.5 kg/m², 4 females) or exercise ($n = 11$; 74 ± 10 yr, 28.5 ± 6.8 kg/m², 3 females). Heat involved spa bathing at $\sim 39^\circ\text{C}$, 3-5 days/wk for ≤ 30 min, followed by ≤ 30 min of callisthenics. Exercise involved ≤ 90 min of supervised walking and gym-based exercise, 1-2 days/wk. Following the interventions, total walking distance during a 6-min walk test increased (from ~ 350 m) by 41 m (95% CI: [13, 69], $P = 0.006$) regardless of group, and pain-free walking distance increased (from ~ 170 m) by 43 m ([22, 63], $P < 0.001$). Systolic blood pressure was reduced more following heat (-7 mmHg, [-4, -10], $P < 0.001$) than following exercise (-3 mmHg, [0, -6], $P = 0.078$), and diastolic and mean arterial pressure decreased by 4

mmHg in both groups ($P = 0.002$). There were no significant changes in blood volume, ankle-brachial index, or measures of vascular health. There were no differences in the improvement in functional or blood pressure outcomes between heat and exercise in individuals with PAD. **NEW & NOTEWORTHY** Heat therapy via hot-water immersion and supervised exercise both improved walking distance and resting blood pressure in peripheral arterial disease (PAD) patients over 12 wk. Adherence to heat therapy was excellent, and the heat intervention was well tolerated. The results of the current study indicate that heat therapy can improve functional ability and has potential as an effective cardiovascular conditioning tool for individuals with PAD.

Am J Physiol Heart Circ Physiol. 2019 Jun 1;316(6):H1495-H1506.

Update on peripheral arterial disease and claudication rehabilitation

Maya J Salameh , Elizabeth V Ratchford

The prevalence of peripheral arterial disease is high and will continue to grow with our aging population. It is often under diagnosed and under treated due to a general lack of awareness on the part of the patient and the practitioner. The evidence-base is growing for the optimal medical management of the patient with peripheral arterial disease; in parallel, endovascular revascularization options continue to improve. Exercise training for claudication rehabilitation plays a critical role. Comprehensive care of the peripheral

arterial disease patient focuses on the ultimate goals of improving quality of life and reducing cardiovascular morbidity and mortality.

Phys Med Rehabil Clin N Am. 2009 Nov;20(4):627-56.

Exercise and Peripheral Arteriosclerosis

Demet Ozkaramanli Gur

Adaptation of a healthy lifestyle including adequate daily physical activity is shown to reduce 80% of cardiovascular mortality and 40% of cancer-related deaths. A large body of evidence exists proving that this relationship is dose dependent, and even half of the recommended normal physical activity yields significant risk reduction. There has been no medical therapy that would provide such high percentages of reduction in mortality to date. The World Health Organization, therefore, has started an initiative to implement exercise into daily life as a primary prevention measure. Herein, we will focus on the effects of exercise on the vasculature, mainly the peripheral vasculature, in the context of atherosclerotic disease. Exercise has a fundamental role in the pathogenesis, diagnosis, and treatment of atherosclerotic vascular disease. It exerts a protective effect against the development of atherosclerosis irrespective of other cardiovascular risk factors. Additionally, exercise induces changes in vascular hemodynamics helping us to elucidate the presence of obscure vascular involvement. Once again, exercise is the main treatment modality in peripheral arterial disease with accumulating evidence to reduce symptoms and improve both exercise capacity and cardiovascular symptoms.

AdvExp Med Biol2020;1228:181-193.

Vascular rehabilitation in patients with peripheral arterial disease

Ana de Holanda, Marion Aubourg, ValérieDubus-Bausière, Dominique Eveno, Pierre Abraham

Lower limb peripheral arterial disease (PAD) is a frequent debilitating disease associated with a high morbidity and mortality rate. The benefit of rehabilitation in PAD patients has been largely demonstrated, both for patients that undergo amputation, and for patients with claudication. In these latter patients, rehabilitation programs rely on a variety of additional techniques or tools, among which: stretching, specific muscle proprioception, walking and a variety of other physical activities, exercise or situations adapted to community life, lower limb and respiratory physiotherapy, patient's education, support for smoking cessation and healthy nutrition, social support, etc. Whether rehabilitation is performed in specialised integrated structures or performed on a home-based basis, various clinicians are involved. Despite evidence-based proof of efficacy, rehabilitation of PAD patients with claudication is still under-used.

Presse Med. 2013 Jun;42(6 Pt 1):1032-8.

Clinical impact of exercise in patients with peripheral arterial disease

Marko Novakovic, Borut Jug, Helena Lenasi

Increasing prevalence, high morbidity and mortality, and decreased health-related quality of life are hallmarks of peripheral arterial disease. About one-third of peripheral arterial disease patients have intermittent claudication with deleterious effects on everyday activities, such as walking. Exercise training improves peripheral arterial disease symptoms and is

recommended as first line therapy for peripheral arterial disease. This review examines the effects of exercise training beyond improvements in walking distance, namely on vascular function, parameters of inflammation, activated hemostasis and oxidative stress, and quality of life. Exercise training not only increases walking distance and physiologic parameters in patients with peripheral arterial disease, but also improves the cardiovascular risk profile by helping patients achieve better control of hypertension, hyperglycemia, obesity and dyslipidemia, thus further reducing cardiovascular risk and the prevalence of coexistent atherosclerotic diseases. American guidelines suggest supervised exercise training, performed for a minimum of 30-45 min, at least three times per week, for at least 12 weeks. Walking is the most studied exercise modality and its efficacy in improving cardiovascular parameters in patients with peripheral arterial disease has been extensively proven. As studies have shown that supervised exercise training improves walking performance, cardiovascular parameters and quality of life in patients with peripheral arterial disease, it should be encouraged and more often prescribed.

Vascular. 2017 Aug;25(4):412-422.

Peripheral Arterial Disease: Supervised Exercise Therapy Through Cardiac Rehabilitation

Scott G Thomas, Susan Marzolini, Edward Lin, Cindy H Nguyen, Paul Oh

Peripheral arterial disease (PAD) is frequently underdiagnosed and undertreated. This review identifies specific subgroups within older adults more likely to develop PAD, and describes methods to diagnose PAD and provide evidence in support of systematic referral to cardiac rehabilitation programs to enhance

successful comprehensive management. Clear evidence and guidelines support the routine use of supervised exercise therapy to improve function, reduce risk of cardiovascular morbidity and mortality, and enhance the success of endovascular interventions.

ClinGeriatr Med. 2019 Nov;35(4):527-537.

Vascular rehabilitation in lower-extremity artery disease in 2018

Walking rehabilitation remains the base of the treatment of lower-extremity artery disease. Many walking protocols can be proposed. For a similar efficiency, patients are not obliged to walk until appearance of a pain but only until appearance of a discomfort. Exercises other than walking have been tested and can be used. Heart Rehabilitation Centres will propose more often vascular rehabilitation including hospitalisations for complex patients or out-management for non-complex patients. With a lower cost, the walking rehabilitation could be also realised at home by the patient himself with a certain degree of supervision with good results. Supervision means the use of a pedometer, weekly advices given by phone by a Vascular Physician or a Physiotherapist, one walking session once a week in a rehabilitation centre. Connected devices could be also helpful allowing increasing of the patients' motivation. Simultaneously, it is necessary that the patients observe the recommendations of the World Health Organisation by performing weekly 150 minutes of mild-intensity endurance's activity in order to minimise their long-term vascular risk. Finally, the respective place of the revascularisations and walking rehabilitation remains to be clarify in case of intermittent claudication due to a superficial femoral artery lesion.

Damien Garrigues, Beatrice Ferrari, Nicole Petrisans Ferrando, Thibaut Guiraut

La Presse Médicale, Volume 47, Issue 1, January 2018

Editor's choice--The effect of supervision on walking distance in patients with intermittent claudication: a meta-analysis

A systematic search in the Cochrane Central Register of Controlled Trials, MEDLINE, and EMBASE databases was performed. Only randomized controlled trials (RCTs) evaluating the efficacy of an ET in IC were included. Type of supervision, treadmill protocol, length of ET, total training volume, and change in walking distance were extracted. RCTs were categorised according to type of support: no exercise, walking advice, home-based exercise (HB-ET), and supervised exercise therapy (SET). A standardised mean difference between pre- and post-training maximal walking distance (MWD) and pain-free walking distance (PFWD) was calculated for all subgroups at 6 weeks, and 3 and 6 months of follow up.

Thirty studies involving 1406 patients with IC were included. The overall quality was moderate-to-good, although number of included patients varied widely (20-304). The intensity of supervision was directly related to MWD and PFWD. SET was superior to other conservative treatment regimens with respect to improvement in walking distances at all follow-ups. However, the difference between HB-ET and SET at 6 months of follow up was not significant.

Supervised exercise therapy for intermittent claudication is superior to all other forms of exercise therapy. Intensity of supervision is related to improved walking distance.

L N M Gommans , R Saarloos , M R M Scheltinga , S Houterman , R A de Bie , H J

P Fokkenrood , J A W Tejjink

European Journal of Vascular & Endovascular Surgery, Volume 48, Issue 2, August 1, 2014

Strength and Cardiorespiratory Exercise Rehabilitation for Severely Burned Patients During Intensive Care Units: A Survey of Practice

Minimizing the deconditioning of burn injury through early rehabilitation programs (RP) in the intensive care unit (ICU) is of importance for improving the recovery time. The aim of this study was to assess current standard of care (SOC) for early ICU exercise programs in major burn centers. We designed a survey investigating exercise RP on the ICU for burn patients with >30% total burned surface area. The survey was composed of 23 questions and submitted electronically via SurveyMonkey® to six major (pediatric and adult) burn centers in Texas and California. All centers responded and reported exercise as part of their RP on the ICU. The characteristics of exercises implemented were not uniform. All centers reported to perform resistive and aerobic exercises but only 83% reported isotonic and isometric exercises. Determination of intensity of exercise varied with 50% of centers using patient tolerance and 17% using vital signs. Frequency of isotonic, isometric, aerobic, and resistive exercise was reported as daily by 80%, 80%, 83%, and 50% of centers, respectively. Duration for all types of exercises was extremely variable. Mobilization was used as a form of exercise by 100% of burn centers. Our results demonstrate that although early RP seem to be integral during burn survivor's ICU stay, no SOC exists. Moreover, early RP are inconsistently administered and large variations exist in frequency, intensity, duration, and type of exercise. Thus, future

prospective studies investigating the various components of exercise interventions are needed to establish a SOC and determine how and if early exercise benefits the burn survivor.

Janos Cambiaso-Daniel , Ingrid Parry , Eric Rivas , Jennifer Kemp-Offenberg , Soman

Sen ⁴, Julie A Rizzo , Michael A Serghiou , Karen Kowalske , Steven E Wolf , David N Herndon , Oscar E Suman

Journal of Burn Care & Research, Nov-Dec 2018

Journal scan

Dr Noufal Ali

Consultant Meitra hospital Calicut

The use of exercise in burns rehabilitation: A worldwide survey of practice

Orlando Flores¹, Zephania Tyack², Kellie Stockton³, Jennifer D Paratz⁴

Exercise-based interventions have been used to enhance the recovery of burn patients affected by hypermetabolism, muscle wasting and contractures. Although the benefits of exercise in burn population have been previously reported, the extent of exercise prescription in burn patients worldwide remains unknown. Therefore, the purpose of this study is to identify the extent and characteristics of exercise use in specialised and nonspecialised burn centres worldwide.

A web-based survey was developed in English and translated into Spanish and Chinese languages. Distribution of the surveys was made via email using personal contacts of the authors and through six scientific societies related to burn care in 2018. Data were analysed using descriptive statistics and comparisons between frequency distribution on variables of interest using the Chi-Square test and contingency tables. One hundred and fifty-six surveys were completed (103 from the English version, 20 from the Chinese version, and 33 from the Spanish version). The response rate varied from 36.2% (English version) to 9.3% (Chinese version). Fifty eight percent of the surveyed clinicians worked in cities of 1 million inhabitants or more, and 92.3% worked in hospital-based burn centres. Exercise was used by 64.1% of the participants at the

intensive care unit level, 75% in burn wards prior to complete wound healing, and 80.1% in rehabilitation units after wound healing. The type of exercise offered, parameters assessed, and characteristics of exercise programs varied notably among burn centres and clinicians consulted. The majority of the surveyed clinicians used exercise for rehabilitation of patients following burn injuries. Further investigation is required to elucidate the access to exercise interventions prescribed by health professionals in remote areas, in less developed countries, and the extent of home-based exercise performed by patients.

Burns. 2020 Mar;46(2):322-332.

The role of exercise in the rehabilitation of patients with severe burns

Craig Porter¹-, Justin P Hardee, David N Herndon, Oscar E Suman

Severe burn trauma results in persistent skeletal muscle catabolism and prolonged immobilization. We hypothesize that structured rehabilitative exercise is a safe and efficacious strategy to restore lean body mass and physical function in burn victims. Here, this article reviews the evidence for the utility of rehabilitative exercise training in restoring physiological function in burn survivors.

Exerc Sport Sci Rev. 2015 Jan;43(1):34-40.

Postburn Upper Extremity Occupational Therapy

Tiffany Williams¹, Tanya Berenz²

Upper extremity burns can result in lifelong complications. A comprehensive occupational therapy program is imperative for restoration of arm function. Edema management, splinting, exercise, scar management, and activities of daily living are key treatment elements to achieve optimal postburn outcomes. Proper patient and family education are essential for therapeutic success. Burn recovery requires a commitment to therapeutic techniques that can progress a patient to their maximal independence.

Hand Clin. 2017 May;33(2):293-304.

Resistance training for rehabilitation after burn injury: A systematic literature review & metaanalysis

Paul M Gittings¹, Tiffany L Grisbrook², Dale W Edgar³, Fiona M Wood⁴, Benedict M Wand⁵, Neil E O'Connell⁶

Resistance training is beneficial for rehabilitation in many clinical conditions, though this has not been systematically reviewed in burns. The objective was to determine the effectiveness of resistance training on muscle strength, lean mass, function, quality of life and pain, in children and adults after burn injury. Medline & EMBASE, PubMed, CINAHL and CENTRAL were searched from inception to October 2016. Studies were identified that implemented resistance training in rehabilitation. Data were combined and included in meta-analyses for muscle strength and lean mass. Otherwise, narrative analysis was completed. The quality of evidence for each outcome was summarised and rated using the GRADE framework. Eleven studies matched our inclusion criteria. Primary analysis did not

demonstrate significant improvements for increasing muscle strength (SMD 0.74, 95% CI -0.02 to 1.50, p=0.06). Sensitivity analysis to correct an apparent anomaly in published data suggested a positive effect (SMD 0.37, 95% CI 0.08-0.65, p=0.01). Psychological quality of life demonstrated benefit from training (MD=25.3, 95% CI 3.94-49.7). All studies were rated as having high risk of bias. The quality of the evidence was rated as low or very low. Further research with robust methodology is recommended to assess the potential benefit suggested in this review.

Burns. 2018 Jun;44(4):731-751.

Effects of interactive robotenhanced hand rehabilitation in treatment of paediatric hand-burns:

A randomized, controlled trial with 3-months follow-up

Ahmed F Samhan¹, Nermeen M Abdelhalim², Ragab K Elnaggar³

Study was done to evaluate the effectiveness of the robotic-assisted exercise with virtual gaming on total active range of motion (ROM) of the digits, hand grip strength (HGS), and hand function in children with hand burns. Thirty-three children with burn caused by thermal injury (flame or scald) with the involvement of the wrist and hand, total body surface area (TBSA) <30%, and age between 6-12 years, were included in this study. The patients were randomly allocated to one of the two groups; control group (n = 16; received 60-min of the traditional hand rehabilitation program, three times per week for two successive months) and experimental group (n = 17; engaged in an additional 20 min of interactive robot-enhanced hand rehabilitation besides the traditional rehabilitation). Outcomes measured were the total active ROM of the

digits, HGS, and hand function at three occasions during the study: at the baseline, post-treatment, and 3 months follow-up. In the experimental group, results regarding total active (ROM) of the digits, HGS, and hand function were statistically significant in comparison to the control group either after treatment ($P < .05$, $P = .04$, and $P = .005$) respectively or at the follow-up ($P < .05$, $P = .023$, and $P = .012$) respectively favoring the experimental group. The robot-enhanced exercise with virtual gaming can increase total active ROM of the fingers' digits, improve HGS, and hand function in children with hand burns.

Burns. 2020 Sep;46(6):1347-1355.

Strength and Cardiorespiratory

Exercise Rehabilitation for Severely

Burned Patients During Intensive Care Units: A Survey of Practice

Janos Cambiaso-Daniel¹², Ingrid Parry³, Eric Rivas¹⁴, Jennifer Kemp-Offenberg¹, Soman Sen⁴⁵, Julie A Rizzo⁶⁷, Michael A Serghiou⁸, Karen Kowalske⁹, Steven E Wolf⁹, David N Herndon¹, Oscar E Suman¹

Minimizing the deconditioning of burn injury through early rehabilitation programs (RP) in the intensive care unit (ICU) is of importance for improving the recovery time. The aim of this study was to assess current standard of care (SOC) for early ICU exercise programs in major burn centers. We designed a survey investigating exercise RP on the ICU for burn patients

with >30% total burned surface area. The survey was composed of

23 questions and submitted electronically via SurveyMonkey® to six major (pediatric and adult) burn centers in Texas and California. All centers responded and reported exercise as part of their RP on the ICU. The characteristics of exercises implemented were not uniform. All centers reported to perform resistive and aerobic exercises but only 83% reported isotonic and isometric exercises. Determination of intensity of exercise varied with 50% of centers using patient tolerance and 17% using vital signs. Frequency of isotonic, isometric, aerobic, and resistive exercise was reported as daily by 80%, 80%, 83%, and 50% of centers, respectively. Duration for all types of exercises was extremely variable. Mobilization was used as a form of exercise by 100% of burn centers. Our results demonstrate that although early RP seem to be integral during burn survivor's ICU stay, no SOC exists. Moreover, early RP are inconsistently administered and large variations exist in frequency, intensity, duration, and type of exercise. Thus, future prospective studies investigating the various components of exercise interventions are needed to establish a SOC and determine how and if early exercise benefits the burn survivor.

J Burn Care Res. 2018 Oct 23;39(6):897-901.

To boldly go..... Rising up to Indian Psychiatry's new challenge

**Dr Ravi Sankaran, Professor,
Department of PMR,
Amrita Institute of Medical Sciences**

There once was a golden age of medicine when doctors could freely do everything they could to help patients, then came the age of capitalism. The mad rush to earn money by any means industrialized daily tasks, conquered the tech domains, then began to pursue healthcare like a hungry wolf. Enter corporate hospitals and private medical colleges. Let's take a step back and be realistic here. At every stage of existence there is struggle, it's the hallmark of life. Where there is a challenge we find those who rise to it, and those who run from it. Our field exists today because of our dedicated seniors.

A new problem faces today's Psychiatrist. With the NMC mandate for PMR in MBBS, a new frontier has opened, the corporate-academic stage. Corporate healthcare at its worst is a numbers game, and at its peak is where cutting edge technology blends with healthcare. Medical college at its peak is the hotbed of clinical research and in its lowest is untapped potential. What few realize is this is a great venue for personal and professional growth. It's likely Psychiatrists entering the corporate-academic setting will be starting from the lowest points of both as they lay the foundation for their new department. How does one flourish in this mess? This article is broken into blurbs for ease of reading and it reeks of my bias.

Back from near dead, now what?

In everything considered good there is some bad. Modern medicine has come to dominate healthcare in our era. We all know excellent doctors amongst our non-PMR peers whose drive for excellence inadvertently drives the healthcare industry. This feeds the pig called capitalism, which sees people as numbers not individuals. This leads to suffering. It almost seems our founders had no foresight. Reality is completely different though. About a hundred years ago Dr. Cruzen labeled PMR as the third part of medicine. After the diagnostics and interventions comes treating the person, rather than the disease. This aspect remains under-developed, and this negligence leads to exploitation. The core of healthcare comes down to three facets: patients, procedures, and research. When they are balanced, professional satisfaction is a tenable goal.

Welcome to the Jungle

Residency could not prepare me for work in a corporate/ academic/ charity hybrid setting. In sensible institutions the work load is distributed evenly ensuring uniform growth opportunity. Sensibility is rare to find. In private healthcare patients get shunted to the biggest money-makers/ most popular names. These people get overloaded, and quality of care reduces. Why? The rate limiting factor here is time to

perform. To maintain their status they'll grab at more patients while suppressing the competition. The suppressed departments receive negative reinforcement as their motivator, and end up frustrated. The end result is a vicious cycle in which the client finally loses, be it money, quality of life, or life itself. This was the scene in 2010 when I joined Amrita PMR.

An acquired taste

The situation I entered was strangely flavored. Our senior doctors wanted virgin patients (ones who had no prior workup, etc). Considering both had illustrious careers developed along these lines, this was perfectly logical. Having trained abroad, receiving a fully worked up patient was nothing new for me. PMR is a super-specialty, so there was no need to do the work of a primary care or Orthopod. In India few amongst our own know about or acknowledge our value. Physiatrists setting up centres in hospitals that are more than a decade old may face the same situation. This leads to the question 'How do I get patients?'

Getting patients

'If life gives you lemons, make lemon juice.'

When I joined AIMS our only treatment option was PT services. Regardless there were well-wisher doctors who had no problem sending me patients. Which kind? The kind no one else wanted. I consistently got one message from them. 'We know we aren't doing something, can you do it?' What was being missed was the interface between the nervous and musculoskeletal systems. Having these patients sent to me produced mixed emotions in my co-workers. Regardless being exposed day in and out forced me to think what more could be done, especially when patients came

back not better. After a few OPD days when patients piled up, and the therapists shift ended, I had to do their work too. That's when I realized I didn't need them for everything. Prior to this as instructed every patient went to a therapist. Often PT would contradict what we said or advised. While this was a step towards ending dependency on therapists, it wasn't enough.

Bite the hand that feeds, or stay down on your knees

One won't always get the kind of patients they want from the start. It doesn't mean they should give up though. Caring for others' discarded patients with hands tied didn't appeal to any of us. The worst was when the big referrers made mistakes and we found them. Our senior faculty once found a case of Occipitalized C1 causing cervical myelopathy in a patient referred for knee physio, and spinal TB in a lady referred for neck physio. Why? Some pain practitioners don't know neurology. Another senior repeatedly had to convey missed diagnoses, only to have patients argue with him and demand PT for things it couldn't fix. Sometimes they had to clean up after PGs of other departments when they ordered wrong drugs/ doses/ therapy options. Why? Many pain clinicians don't understand how the complexity of the musculoskeletal system. There were times when patients clearly would benefit from an injection, but were brainwashed to only get exercise and nothing else. All we could do was watch them suffer. Tricky were the cases where an expensive operation had been done and a protracted recovery expected. My ever-sensible colleagues avoided these cases. To alleviate the patient anxiety, the surgeons would chant physio to placate them and escape the pressure. Worst of all were the maintenance therapy/ non-rehab-able

patients. Most of them would go on to live, but not as they wanted.

Dealing with frustrated patients is a challenge few savor. The referring departments would convince them only physio could save them, and they would look to us confused and expectant. Confused because they knew we weren't Physiotherapists, but then expectant that we would meet their wants somehow. When the desired patients were not diverted to us, the blame was passed around, and eventually landed on me. Being an ashram inmate, I apparently had the power to rectify the problem. Again, reality was something else but I tried. Patients were diverted to us and the result was our clinicians were content. They would do the same stuff as everyone else who referred to us, and after that the patient went to PT. After a few months of this patients began to insist on Orthopedics and Neurology, not 'Physio' first. For all our effort, no one knew our value, and as you can see we were to blame. Reality dawned on me finally. It wasn't that we weren't getting patients, rather we were failing the ones who came.

Pull yourself by your bootstraps

It was sad to see our seniors being tortured, just for the sake of raising us. It occurred to me something was being missed, but it took a long time to give that problem a name. Once an OBG Dr came as a patient and reported weakness in her legs. As she was a doctor I accepted her words, but the exam didn't match. I began searching for an answer, and kept finding more of these similar presentations. It took me another two years to learn about trigger point induced weakness, and reciprocal inhibition weakness etc. While trigger point weakness is a well known phenomenon, it was completely new to me. Things I had

seen began to make sense. All the discomfort had a value though. Had I not experience sustained pressure over a long time I likely wouldn't have kept looking for answers. It is beneficial being a piece of coal under pressure.

Isn't it all just Physio?

With chronic pain patients I found inevitably they all had postural problems. Once my referrers realized I was contributing to their care, more patients got sent my way. Were their diagnoses wrong? No. Were they comprehensive enough to help a person? No. On scheduled follow-ups when patients failed to respond, pain procedures became necessary. As more came we slowly had to grow our skill base and bring new services to the department. Our referrers began to realize the depth of our work, and slowly began to stop chanting physio. There were too many treatment options for them to get away with that nonsense now. For the sake of making quick decisions, our colleagues turn all rehab into physio. Their work is to save to lives. Quality of life is an afterthought, if at all considered. This is where rehabilitation physicians shine.

Water, water everywhere, not a drop to drink

Modern medicine is slowly becoming a post-apocalyptic wasteland. The powerful have appropriated the attractive aspects to fuel their legacies. Anyone can do MSK USG. Any clown with a needle can shoot up botox. Physiotherapists are so abundant, some directly liaise with clueless specialists and the unscrupulous promote themselves as a panacea. What's left for us? The options are unlimited. Open your eyes. Be available for your colleagues and read deep into the subjects you are responsible for. Eventually your referrers will have tricky case where nothing has worked and they'll ask for your input. The

faster you can provide them with results the more value you'll gain. To get patients you have to generate value in your services. This comes from research and technology.

Professional growth is fueled by patients. Humility and patience is fertile soil for this. Next you need to develop yourself. This means reading, long hours, bedside emergencies and sleepless nights. After this learn from what you've done, and you'll see the lacunae in care. Technology and or quality of care may be solutions. To meet the price tag of technology you'll have to market yourself. Colleagues will misunderstand your intentions as money grabbing or fame and glory hunting through patient's pockets. The way out is to be judicious in its use, and have science beside you. They can't refuse your service if a patient asks for it. You should market directly to the patient. Many people do this the wrong way, by buying into tech without knowing the when, why's, and how's. They pay off the purchase fast and make money, but either have to go back and learn the hard way, or become a slave to the machine. Quality services are the other hand of the same issue. Many allied senior clinicians remember the patients who did poorly with their care. They may not like to admit or speak about it but these do hurt them. As a result, once they are stable in their career they want to give back quality. This is where rehabilitation physicians shine. Currently the 'big team' model is how Quality care is offered. The International Classification of Function is the perfect tool for these situations. As more new services became available 'virgin' patients starting coming too.

To be yourself is all that you can do

Professional satisfaction can be challenging in the setting I've detailed. Until a person meets their own goals, they can't help

others fully. Money, power, sense of having done something big, fame, learning more, all these things can still be had by a Psychiatrist, but at a cost. You'll have to develop along the lines of rehabilitation. This is the need of the hour not someone who will compete with the existing power players. Having been a part of the team for India's first hand transplants, I was invited to speak at the Leela Palace Hotel in Chennai in 2014 at the Indian Society for Organ Transplant's 26th annual meeting. The audience was held rapt by a video of the rehab process. As a result my Plastic Surgery colleagues asked me what kind of Dr I was (albeit after 2 years of working together), then tried to pronounce Psychiatry. Until then they thought I was doing Physiotherapy. Now they had a reason to know the difference.

You need patients if you want to do procedures. Getting into the care plan from the rehab angle means knowing perceived/ actual/ potential needs and gains of the setting you are in (community, hospital, culture etc). This takes repeat exposure. It's also the reason why PMR is being cut out by many other specialists. After all they know what they are treating better than their own colleagues. In their opinion an MD holder can't compare to them in their area of expertise? When everyone adopts this attitude (with the current trend it is inevitable) we may become redundant if we don't learn to work in part of the big team. There is a joy in knowing your intervention made a difference. Despite specializing in rehabilitation I am forced to develop myself along the intervention pathway because I know more than others about my patient types. Simply put by doing my best with their waste cases I've turned the tables on my colleagues. Psychiatry is the specialty they need, not the reverse. Since then we've become co-dependant and are

stronger together for it. We still disagree and argue, but these are chances to grow our knowledge base further. One of the hand transplant surgeons and I argue frequently over post transplant rehab. He has no idea how rehab goes, but keeps trying to interfere with nonsensical ideas (24 hours electric stimulation, etc). Our disagreements have forced me to learn extensively about electric stimulation, to the extent of contacting international experts on the same. On showing him the science he still wanted to fight. Despite this, now that he's moving to our new campus, he wants me to be there for his cases. Neurology knew tablets have a limited role in pain management. Once they realized injections can help, they began counseling the patients in advance that I will be injecting them. Though we don't directly get the patient, we can still do all the needed to help them as our colleagues support us.

I want to use my hands to heal others

Ask yourself why you are operating. If no one else around you is doing it, you're serving patients. If there are people doing this daily and doing it better than you, this is self-serving at a patient's expense. Of the fourteen Physiatrists I've trained with none taught me surgery, and I still see no need to learn. Of course I work in a hospital with 1400 beds and every possible surgical specialty jockeying for each other's cases. If I entered that arena, rookie that I am, I'd be thrown out. After training in Tokyo I

became fit to assist in the electrophysiology monitoring for my Selective Dorsal Rhizotomy patients, that means being in the theater. Neurosurgery, tired of botox'ing Erb's palsy, dumped it on Neurology, who promptly passed it to me. These kids need GA, so I'm in the OT complex again.

Research

George Sir always insists we have our own diagnosis. Neurology kept sending me patients for vestibular adaptation exercises. What they were missing was Barre-Lieu syndrome. How did I find this out? These patients diagnosed as Meneire's syndrome, didn't have the textbook description. They had false vertigo with neck pain which is not part of it. Some Neurologists embraced the new diagnosis realizing we found what they had missed. Others chose to argue about proteonomics and disease similarities. They couldn't argue the results though. Things like this and the need to validate our new technology though peer-reviewed publications led us to the research path. This is a whole new rabbit-hole of fun.

The above was quite the rambling stream of consciousness. I apologize for that. To summarize the above here's the gist: take whatever you are given, grow it to the best of your ability, and be so good everyone needs you. It's a long road, but in the end you can be confident in yourself and your capabilities as a doctor.