



# Limb Salvage in Diabetic Ischemic Foot

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April 30, 2017



# สมาคมแผลไหม้และสมานแผล (ประเทศไทย) Burn and Wound Healing Association (Thailand)



## Pre-Congress: Advanced Diabetic Foot Course

ห้องสัมมนา 2 อาคารเฉลิมพระบารมี ๕๐ ปี ซอยศูนย์วิจัย ถนนเพชรบุรีตัดใหม่ กรุงเทพฯ  
30 เมษายน 2560

08.00-08.30 ลงทะเบียน

08.30-09.00 เปิดการประชุม

ศ.เกียรติคุณ นพ.จอมจักร จันทรสกุล

ศ.คลินิก นพ.อภิรักษ์ ช่วงสุวนิช

09.00-09.20	Burden and Pitfall in Management of Diabetic Foot Ulcer in Thailand	ศ.นพ.เทพ หิมะทองคำ
09.20-09.40	Practical Guideline in Management Diabetic Foot Ulcer in Thailand	รศ.พญ.ทิพาพร ธารวานิช
09.40-10.00	Summary of the New Diabetic Foot Infection Guidelines (2016 IWGDF DFI guideline)	ศ.นพ.กิตติพันธุ์ ฤกษ์เกษม
10.00-10.20	Surgical Debridement and its Evidence	อ.นพ.เทิดภูมิ เบญญากร
10.20-10.40	Break	
10.40-11.00	Surgical Debridement Using Hydrosurgery	ศ.นพ. พรพรหม เมืองแมน
11.00-11.20	How Much Flow is enough for Healing	ศ.นพ.กิตติพันธุ์ ฤกษ์เกษม
11.20-11.40	Limb Salvage in Diabetic Ischemic Foot	ผศ.นพ. กฤตยา กฤตยาภิรม
11.40-12.00	Off Loading for Diabetic Foot Ulcer	รศ.พญ.กุลภา ศรีสวัสดิ์
12.00-13.00	Lunch	
13.00-13.20	Hyperbaric Oxygen - Myth and Facts	นาวาเอก นพ.ฟิลิธีร์ เจริญยิ่ง
13.20-13.40	Management of Osteomyelitis	รศ.นพ.ก้องเขต เจริญสุวรรณ
13.40-14.00	Choosing the Ideal Dressing	อ.นพ.พรเทพ สิริมหาไชยกูล
14.00-14.20	Silver Dressing for Diabetic Wound	ผศ.นพ.พรเทพ พึ่งรัมย์
14.20-14.40	How the Team Approach has changed the Practice	รศ.พญ.กุลภา ศรีสวัสดิ์
14.40-15.00	Break	





# Case

- Male 67 years old
- Underlying DM, HTN, TVD
- Present with gangrene at right big toe
  - Orthopedic went on amputation early December 2016









# A 67 years old man

non-defibrillating arrest  
ECG S-TISB  
Offensive haemorrhagic gastritis at autopsy  
2.2 cm deep laceration at duodenum

	ECG/HR	HR/HR	HR/HR	HR/HR	HR/HR
Clinical note	Presenting complaint	Presenting complaint	Presenting complaint	Presenting complaint	Presenting complaint
Lab	Presenting complaint	Presenting complaint	Presenting complaint	Presenting complaint	Presenting complaint
Med	Presenting complaint	Presenting complaint	Presenting complaint	Presenting complaint	Presenting complaint





Nurse coordinator

Endocrinologist

Vascular surgeon

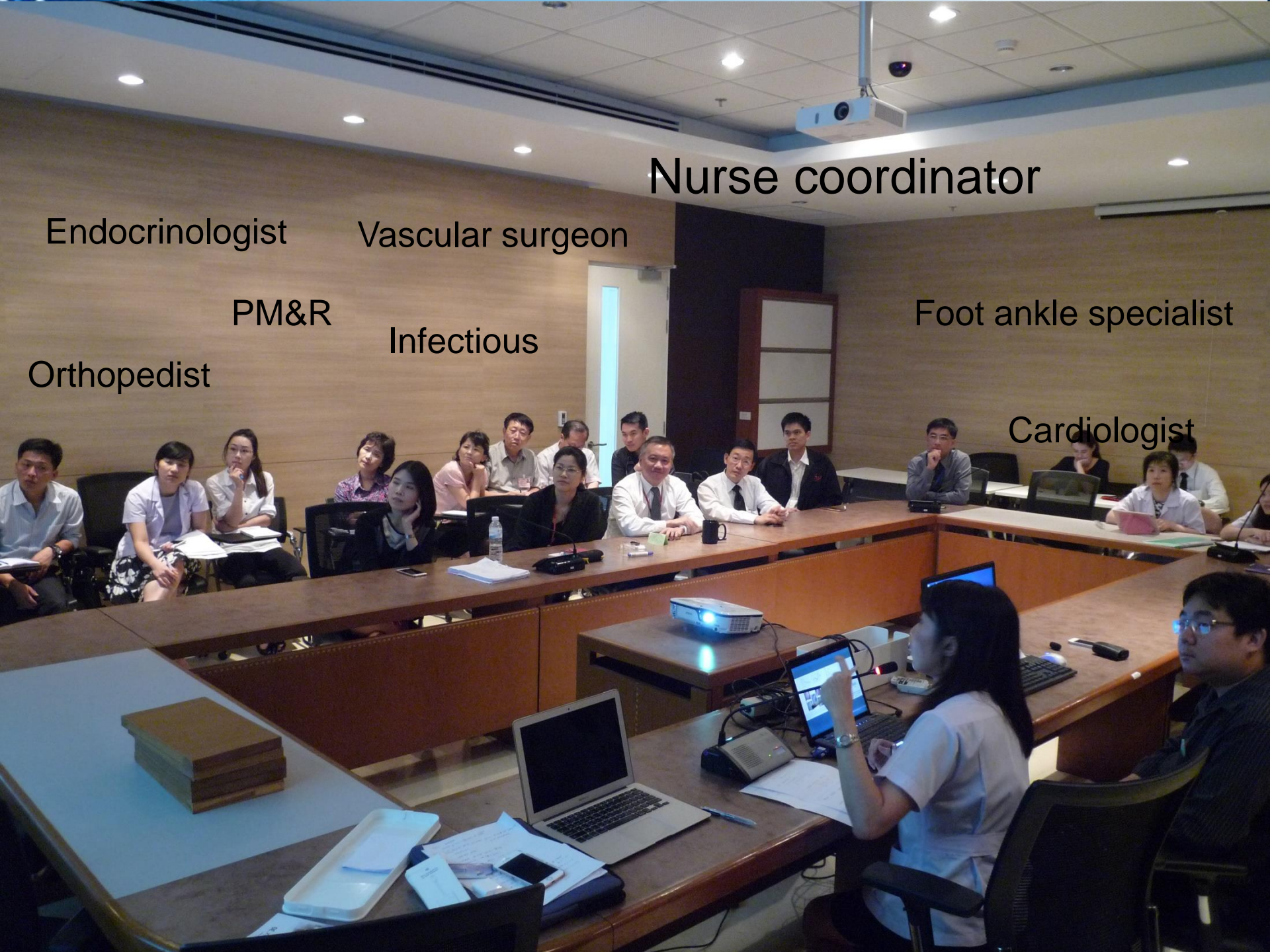
PM&R

Infectious

Foot ankle specialist

Orthopedist

Cardiologist







# KCMH 2016

- BKA 38
- AKA 28



# Diabetic foot Presentations

- Ulceration
- Ankle destruction
- Prevention





# The treatment of diabetic foot ulcers begins with

- A comprehensive assessment of the ulcer
- Patient's overall medical condition.
- Underlying neuropathy
- Bony deformity
- Peripheral artery disease

# The management of diabetic foot: A clinical practice guideline by the Society for Vascular Surgery in collaboration with the American Podiatric Medical Association and the Society for Vascular Medicine

Anil Hingorani, MD,<sup>a</sup> Glenn M. LaMuraglia, MD,<sup>b</sup> Peter Henke, MD,<sup>c</sup> Mark H. Meissner, MD,<sup>d</sup> Lorraine Loretz, DPM, MSN, NP,<sup>e</sup> Kathya M. Zinszer, DPM, MPH, FAPWCA,<sup>f</sup> Vickie R. Driver, DPM, MS, FAFAS,<sup>g</sup> Robert Frykberg, DPM, MPH, MAPWCA,<sup>h</sup> Teresa L. Carman, MD, FSV,<sup>i</sup> William Marston, MD,<sup>j</sup> Joseph L. Mills Sr, MD,<sup>k</sup> and Mohammad Hassan Murad, MD, MPH,<sup>l</sup> *Brooklyn, NY; Boston and Worcester, Mass; Ann Arbor, Mich; Seattle, Wash; Danville, Pa; Providence, RI; Phoenix Ariz; Cleveland, Ohio; Chapel Hill, NC; Houston, Tex; and Rochester, Minn*

**Background:** Diabetes mellitus continues to grow in global prevalence and to consume an increasing amount of health care resources. One of the key areas of morbidity associated with diabetes is the diabetic foot. To improve the care of patients with diabetic foot and to provide an evidence-based multidisciplinary management approach, the Society for Vascular Surgery in collaboration with the American Podiatric Medical Association and the Society for Vascular Medicine developed this clinical practice guideline.

**Methods:** The committee made specific practice recommendations using the Grades of Recommendation Assessment, Development, and Evaluation system. This was based on five systematic reviews of the literature. Specific areas of focus included (1) prevention of diabetic foot ulceration, (2) off-loading, (3) diagnosis of osteomyelitis, (4) wound care, and (5) peripheral arterial disease.

**Results:** Although we identified only limited high-quality evidence for many of the critical questions, we used the best available evidence and considered the patients' values and preferences and the clinical context to develop these guidelines. We include preventive recommendations such as those for adequate glycemic control, periodic foot inspection, and patient and family education. We recommend using custom therapeutic footwear in high-risk diabetic patients, including those with significant neuropathy, foot deformities, or previous amputation. In patients with plantar diabetic foot ulcer (DFU), we recommend off-loading with a total contact cast or irremovable fixed ankle walking boot. In patients with a new DFU, we recommend probe to bone test and plain films to be followed by magnetic resonance imaging if a soft tissue abscess or osteomyelitis is suspected. We provide recommendations on comprehensive wound care and various débridement methods. For DFUs that fail to improve (>50% wound area reduction) after a minimum of 4 weeks of standard wound therapy, we recommend adjunctive wound therapy options. In patients with DFU who have peripheral arterial disease, we recommend revascularization by either surgical bypass or endovascular therapy.

**Conclusions:** Whereas these guidelines have addressed five key areas in the care of DFUs, they do not cover all the aspects of this complex condition. Going forward as future evidence accumulates, we plan to update our recommendations accordingly. (*J Vasc Surg* 2016;63:3S-21S.)

Diabetes is one of the leading causes of chronic disease and limb loss worldwide, currently affecting 382 million people. It is predicted that by 2035, the number of reported diabetes cases will soar to 592 million.<sup>1</sup> This disease affects

the developing countries disproportionately as >80% of diabetes deaths occur in low- and middle-income countries.<sup>2</sup>

As the number of people with diabetes is increasing globally, its consequences are worsening. The World

From the NYU Lutheran Medical Center, Brooklyn<sup>a</sup>; the Massachusetts General Hospital and Harvard Medical School, Boston<sup>b</sup>; the University of Michigan, Ann Arbor<sup>c</sup>; the University of Washington, Seattle<sup>d</sup>; the UMass Memorial, Worcester<sup>e</sup>; the Geisinger Health System, Danville<sup>f</sup>; the Brown University, Alpert Medical School, Providence<sup>g</sup>; the Carl T. Hayden Veterans Affairs Medical Center, Phoenix<sup>h</sup>; the University Hospitals Case Medical Center, Cleveland<sup>i</sup>; the University of North Carolina School of Medicine, Chapel Hill<sup>j</sup>; the Baylor College of Medicine in Houston, Houston<sup>k</sup>; and the Mayo Clinic, Rochester.<sup>l</sup>

Author conflict of interest: none.

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Independent peer review and oversight have been provided by members of the Society for Vascular Surgery Document Oversight Committee: Peter Glovicki, MD (Chair), Michael Conte, MD, Mark Eskandari, MD, Thomas Forbes, MD, Michel Makaroun, MD, Greg Moneta, MD, Russell Samson, MD, Timur Sarac, MD, Piergiorgio Settembrini, MD, and Thomas Wakefield, MD. 0741-5214

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<http://dx.doi.org/10.1016/j.jvs.2015.10.003>

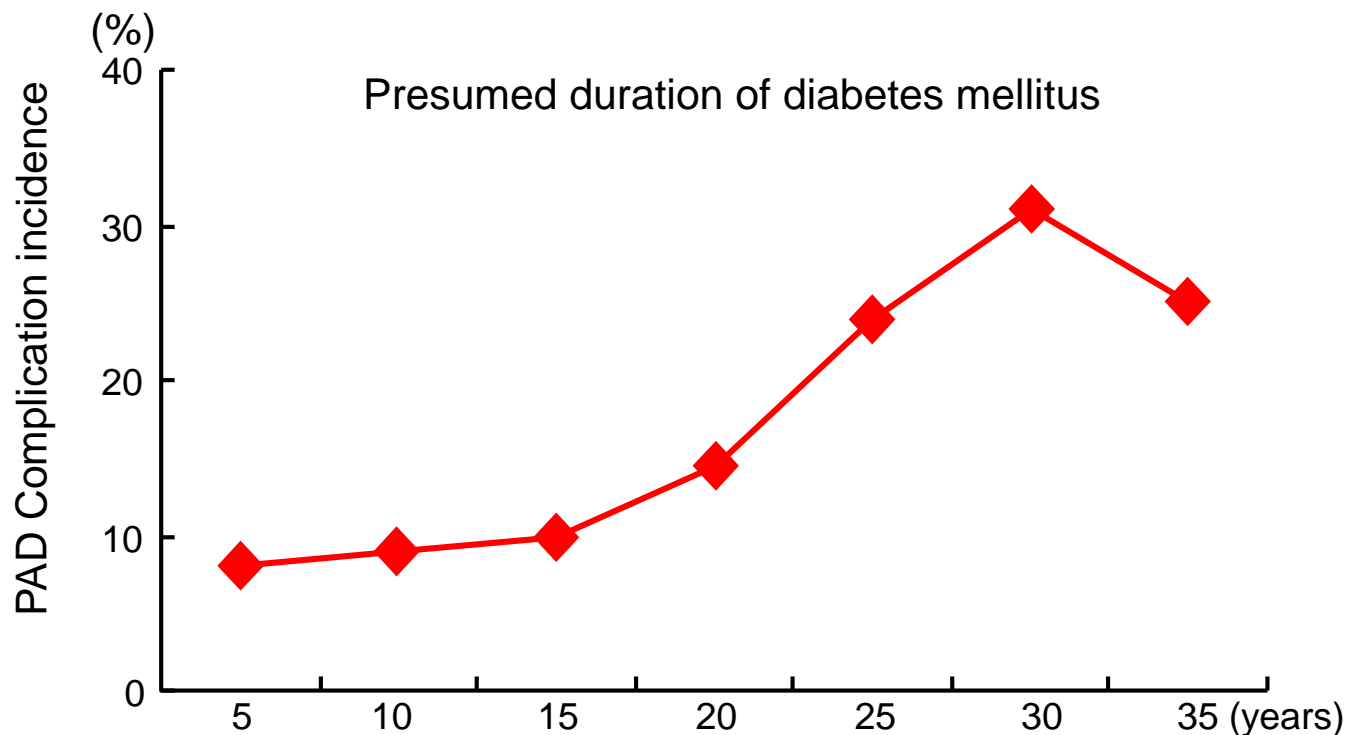




- Risk factor management
  - Smoking cessation
  - BP control  $<140/90$ : if DM  $<130/80$ 
    - ACE inhibitors & beta blockers
  - Cholesterol control LDL $<100$ , HDL  $>35$ ,
  - Diabetes Management
    - Hb A1c  $< 6\%$
  - Pharmacotherapy
    - Vasodilator agents: beraprost
    - Antiplatelets: aspirin, clopidogrel
    - Hemorrheologic agents: cilostazol
  - Graded Exercise Regimen
    - 30 minutes at least every other day

# Duration of Diabetes Mellitus and Incidence of Peripheral Artery Disease (PAD) Complications

**The longer diabetes history extends, the likelihood of the incidence of developing a PAD complication increases.**



[Subjects]

705 diabetic patients (406 male and 299 female patients)

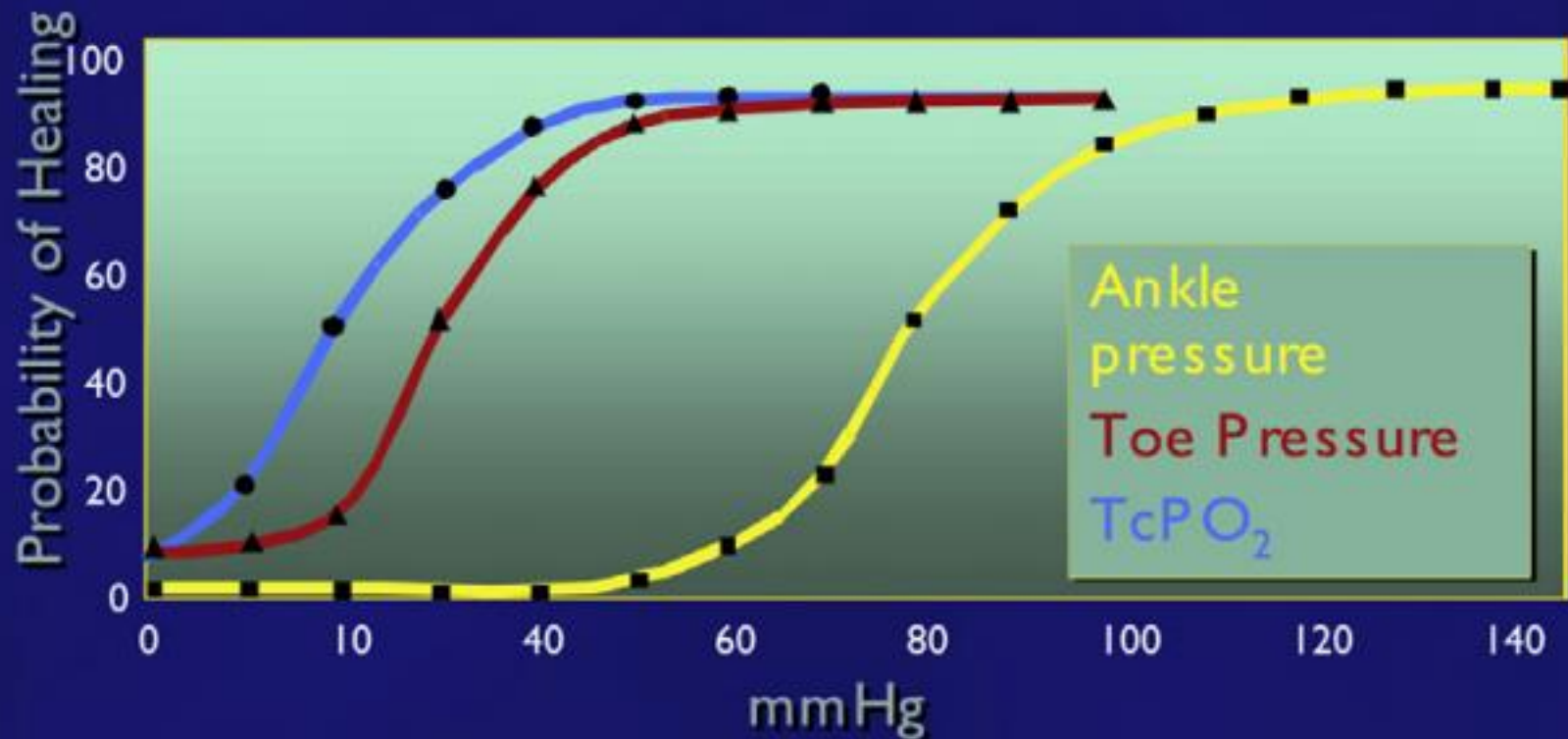
[Methods]

The diagnosis with PAD was made when either of the followings was met:

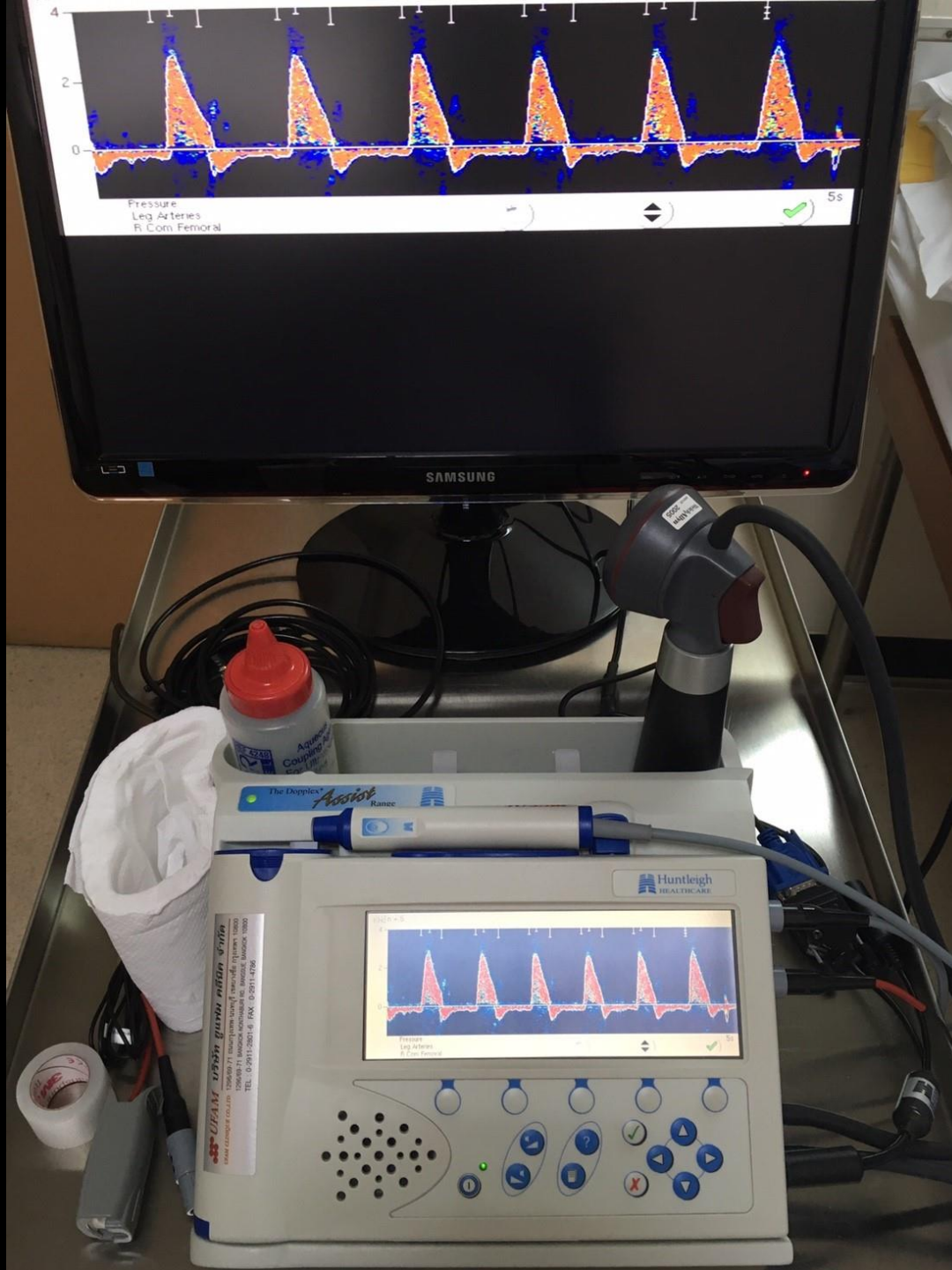
- (1)  $ABI \leq 0.8$
- (2)  $ABI \leq 0.8$  with pulse difference between right/left and confirmed presence of intermittent claudication
- (3) Calcification in the lower extremity with right/left pulse difference
- (4) Calcification in the lower extremity with the presence of intermittent claudication



# Hemodynamics and Probability of Healing of a Diabetic Foot Ulcer

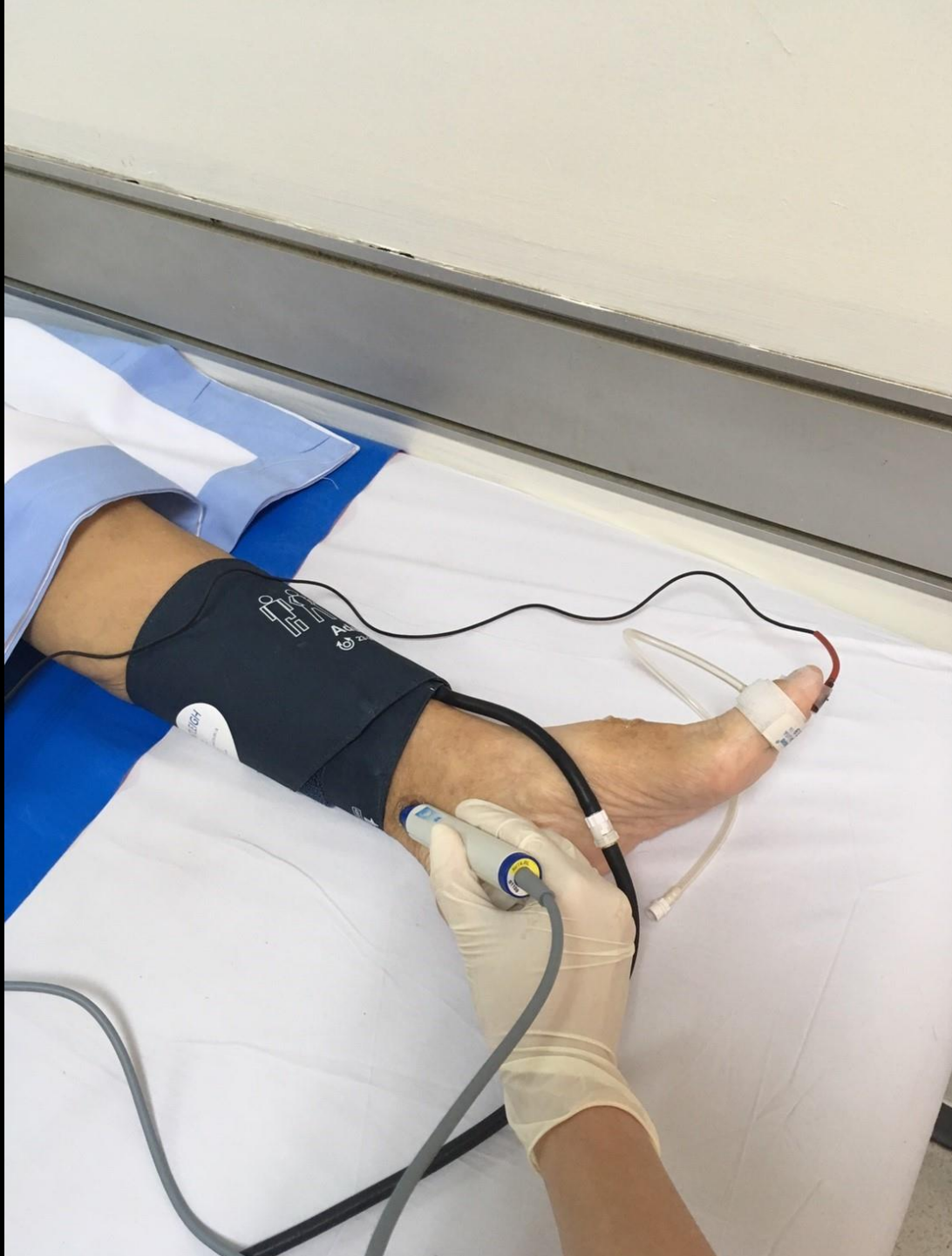


Healing unlikely if toe pressure < 55 mmHg













1 Ref

2

4

5

TCM4 SERIES

RADIOMETER®

14 22 26/04/2017	Measuring		ID: 20042017-0019
1 Ref.	25 tc pO <sub>2</sub> mmHg 1.00 RPI	40 tc pO <sub>2</sub> mmHg 1.63 RPI	4
2	23 tc pO <sub>2</sub> mmHg 0.94 RPI	64 tc pO <sub>2</sub> mmHg 2.62 RPI	5
3	53 tc pO <sub>2</sub> mmHg 2.14 RPI	30 tc pO <sub>2</sub> mmHg 1.20 RPI	6
T1 - 20 min 08:30	Timer	Calibrate	Setup Event













# Wagner wound classification

Grade 0 — No ulcer in a high risk foot

Grade 1 — Superficial ulcer involving the full skin thickness but not underlying tissues

Grade 2 — Deep ulcer, penetrating down to ligaments and muscle, but no bone involvement or abscess formation

Grade 3 — Deep ulcer with cellulitis or abscess formation, often with osteomyelitis

Grade 4 — Localized gangrene

Grade 5 — Extensive gangrene involving the whole foot

Grade 1 Superficial ulcer involving the full skin thickness but not underlying tissues





Grade 2 Deep ulcer, penetrating down to ligaments and muscle, but no bone involvement or abscess formation



Grade 3 Deep ulcer with cellulitis or abscess formation, often with osteomyelitis





# Grade 4 Localized gangrene





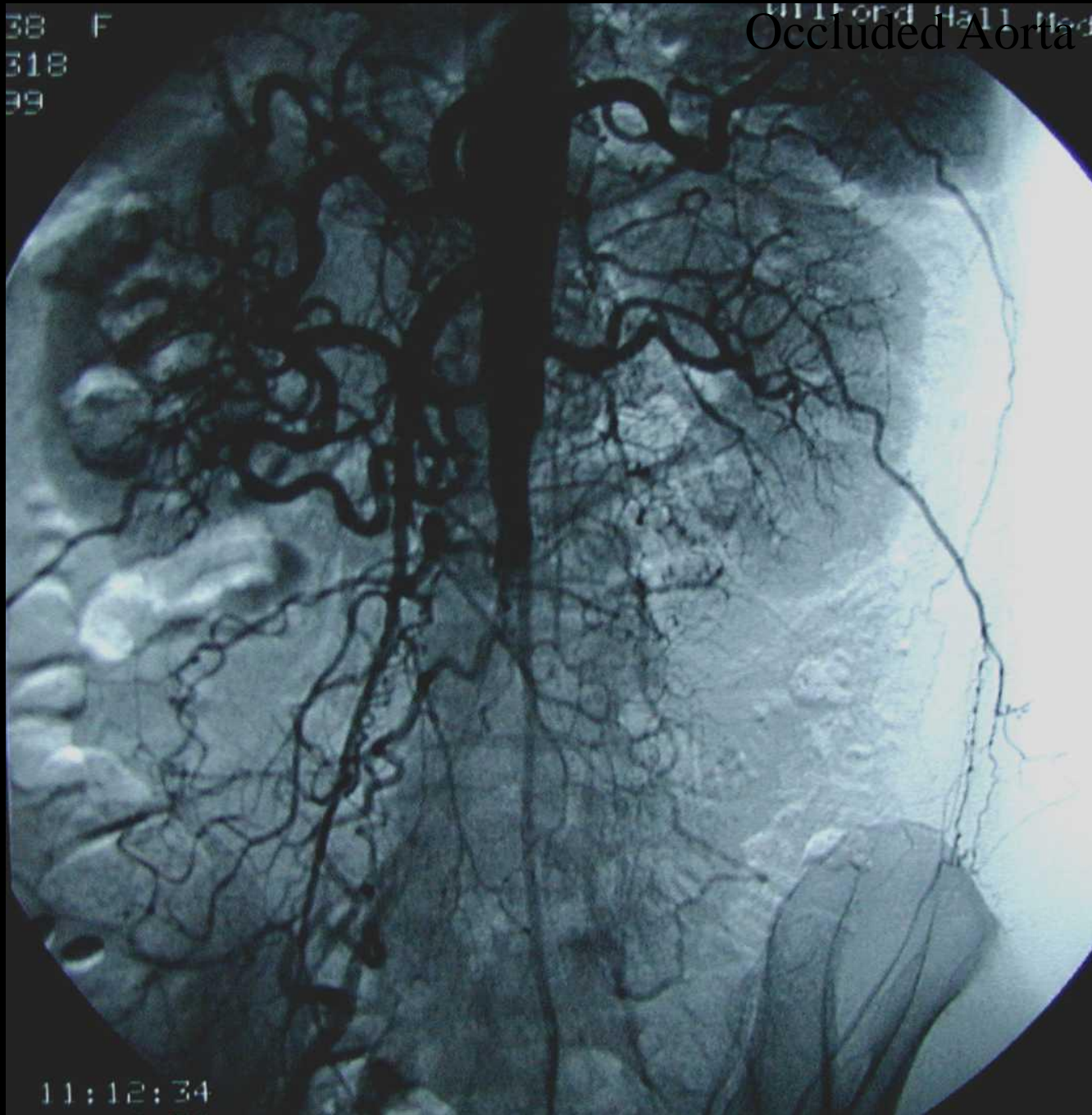
# Surgery

- Indication when fail medical and exercise treatment
- PTA is preferred when possible in patients who are 50 years of age or younger, because they have a higher risk of graft failure after surgical therapy than do older patients

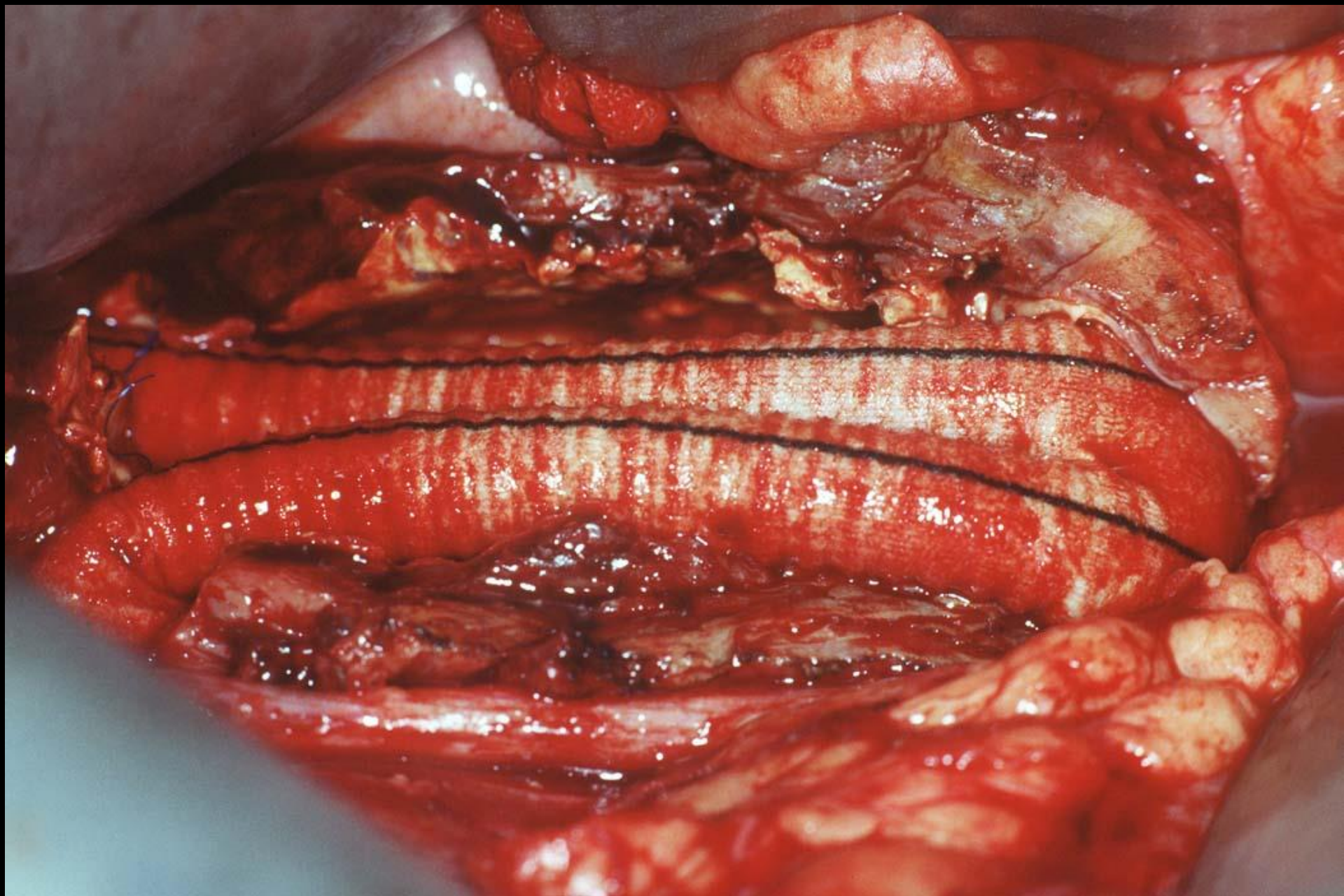


38 F  
318  
99

Willford Hall Med  
Occluded Aorta



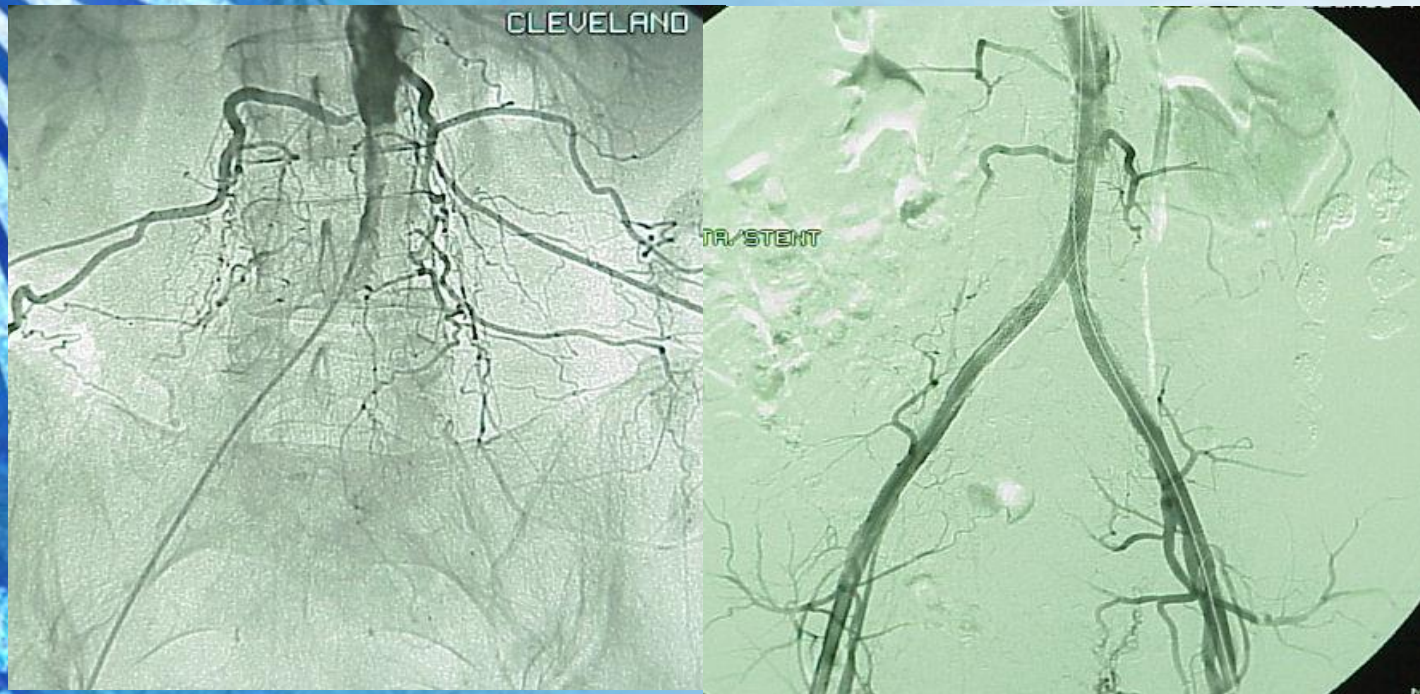
11:12:34







# SMALLER INCISIONS: DECREASED PAIN/ QUICKER RECOVERY





# Trans Atlantic Inter Society Consensus (TASC)



# Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II)

L. Norgren,<sup>a</sup> W.R. Hiatt,<sup>b</sup> J.A. Dormandy, M.R. Nehler, K.A. Harris, and F.G.R. Fowkes on behalf of the TASC II Working Group, Örebro, Sweden and Denver, Colorado

## INTRODUCTION

The Trans-Atlantic Inter-Society Consensus Document on Management of Peripheral Arterial Disease (TASC) was published in January 2000<sup>1-3</sup> as a result of cooperation between fourteen medical and surgical vascular, cardiovascular, vascular radiology and cardiology societies in Europe and North America. This comprehensive document had a major impact on vascular care amongst specialists. In subsequent years, the field has progressed with the publication of the CoCaLis document<sup>4</sup> and the American College of Cardiology/American Heart Association Guidelines for the Management of Peripheral Arterial Disease.<sup>5</sup> Aiming to continue to reach a readership of vascular specialists, but also physicians in primary health care who see patients with peripheral arterial disease (PAD), another consensus process was initiated during 2004. This new consensus document has been developed with a broader international representation, including Europe, North America, Asia, Africa and Australia, and with a much larger distribution and dissemination of the information. The goals of this new consensus are to provide an abbreviated document (compared with the publication in 2000), to focus on key aspects of diagnosis and management, and to update the information based on new publications and the newer guidelines, but not to add an extensive list of references. Unreferenced statements are, therefore, to be found, provided they are recognized as common practice by the authors, with existing evidence. The recommendations are graded according to levels of evidence. It should also be emphasized that good practice is based on a combination of the scientific evidence described below, patients' preferences, and local availability of facilities and trained professionals. Good practice also includes appropriate specialist referral.

## Process

Representatives of sixteen societies from Europe, North America, Australia, South Africa and Japan were elected from their respective society and were called together in 2004 to form the new Working Group. Specialists in health economics, health outcomes and evidence-based medicine were also included to elaborate on the text for the following sections: history, epidemiology and risk factors; management of risk factors; intermittent claudication; critical limb ischemia; acute limb ischemia; and technologies (intervention/revascularization and imaging).

The Working Group reviewed the literature and, after extensive correspondence and meetings, proposed a series of draft documents with clear recommendations for the diagnosis and treatment of PAD. Each participating society reviewed and commented on these draft consensus documents. The liaison member from each society then took these views back to the Working Group, where all of the amendments, additions and alterations suggested by each participating society were discussed, and the final Consensus Document was agreed upon.

The participating societies were then again invited to review the final document and endorse it if they agreed with its contents. If an individual participating society did not accept any specific recommendation, this is clearly indicated in the final document. Therefore, except where such specific exclusions are indicated, this Consensus Document represents the views of all of the participating societies.

Compared with the original TASC, more emphasis has been put on diabetes and PAD. The text is presented in such a way that vascular specialists will still find most of the information they require, while general practitioners and primary health physicians will easily find guidance for diagnosis and diagnostic procedures, referral of patients and expected outcome of various treatment options.

## Grading of recommendations

Recommendations and selected statements are rated according to guidance issued by the former US Agency for Health Care Policy and Research,<sup>6</sup> now renamed the Agency for Healthcare Research and Quality:

From the Department of Surgery, University Hospital,<sup>a</sup> and University of Colorado School of Medicine and Colorado Prevention Center.<sup>b</sup>  
Correspondence: L. Norgren, Department of Surgery, University Hospital, Örebro, Sweden (e-mail: lars.norgren@orebroll.se) and W.R. Hiatt, University of Colorado School of Medicine, Denver, CO (e-mail: will.hiatt@uchsc.edu).  
0741-5214/\$32.00  
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doi:10.1016/j.jvs.2006.12.037

**Table 4.** TransAtlantic Inter-Society Consensus on Classification of Femoral Lesions and Recommended Approaches When Revascularization Is Planned.\*

Lesion Type	Characteristics	Recommended Treatment
A	Single stenosis $\leq 10$ cm long Single occlusion $\leq 5$ cm long	Percutaneous transluminal angioplasty strongly preferred
B	Multiple lesions, each $\leq 5$ cm in length Single lesion $\leq 15$ cm long, not involving the popliteal artery below the knee Single or multiple lesions in the absence of continuous tibial vessels for distal bypass Heavily calcified occlusion $\leq 5$ cm long Single popliteal stenosis	Percutaneous transluminal angioplasty generally preferred
C	Multiple lesions $> 15$ cm long Recurrent lesions after two endovascular interventions	Percutaneous transluminal angioplasty or surgery, depending on risk–benefit ratio
D	Occlusion $> 20$ cm long Occlusion of the popliteal or tibial–peroneal vessels	Surgery generally preferred





The Society for Vascular Surgery Lower Extremity Threatened Limb Classification System: risk stratification based on wound, ischemia, and foot infection (WIfI).

J Vasc Surg. 2014 Jan;59(1)



# SVS Wifi

- Wound
- Ischemia
- Foot Infection

– 0	none	>0.8
– 1	mild	0.6-0.79
– 2	moderate	0.4-0.59
– 3	severe	<0.4

**a, Estimate risk of amputation at 1 year for each combination**

	Ischemia – 0				Ischemia – 1					Ischemia – 2				Ischemia – 3			
W-0	VL	VL	L	M	VL	L	M	H		L	L	M	H	L	M	M	H
W-1	VL	VL	L	M	VL	L	M	H		L	M	H	H	M	M	H	H
W-2	L	L	M	H	M	M	H	H		M	H	H	H	H	H	H	H
W-3	M	M	H	H	H	H	H	H		H	H	H	H	H	H	H	H
	fI-0	fI-1	fI-2	fI-3	fI-0	fI-1	fI-2	fI-3		fI-0	fI-1	fI-2	fI-3	fI-0	fI-1	fI-2	fI-3

**b, Estimate likelihood of benefit of/requirement for revascularization (assuming infection can be controlled first)**

	Ischemia – 0				Ischemia – 1					Ischemia – 2				Ischemia – 3			
W-0	VL	VL	VL	VL	VL	L	L	M		L	L	M	M	M	H	H	H
W-1	VL	VL	VL	VL	L	M	M	M		M	H	H	H	H	H	H	H
W-2	VL	VL	VL	VL	M	M	H	H		H	H	H	H	H	H	H	H
W-3	VL	VL	VL	VL	M	M	M	H		H	H	H	H	H	H	H	H
	f-0	fI-1	fI-2	fI-3	fI-0	fI-1	fI-2	fI-3		fI-0	fI-1	fI-2	fI-3	fI-0	fI-1	fI-2	fI-3



**W:** Wound/clinical category

SVS grades for rest pain and wounds/tissue loss (ulcers and gangrene):

0 (ischemic rest pain, ischemia grade 3; no ulcer) 1 (mild) 2 (moderate) 3 (severe)

<i>Grade</i>	<i>Ulcer</i>	<i>Gangrene</i>
<b>0</b>	No ulcer	No gangrene
Clinical description: ischemic rest pain (requires typical symptoms + ischemia grade 3); no wound.		
<b>1</b>	Small, shallow ulcer(s) on distal leg or foot; no exposed bone, unless limited to distal phalanx	No gangrene
Clinical description: minor tissue loss. Salvageable with simple digital amputation (1 or 2 digits) or skin coverage.		
<b>2</b>	Deeper ulcer with exposed bone, joint or tendon; generally not involving the heel; shallow heel ulcer, without calcaneal involvement	Gangrenous changes limited to digits
Clinical description: major tissue loss salvageable with multiple ( $\geq 3$ ) digital amputations or standard TMA $\pm$ skin coverage.		
<b>3</b>	Extensive, deep ulcer involving forefoot and/or midfoot; deep, full thickness heel ulcer $\pm$ calcaneal involvement	Extensive gangrene involving forefoot and /or midfoot; full thickness heel necrosis $\pm$ calcaneal involvement
Clinical description: extensive tissue loss salvageable only with a complex foot reconstruction or nontraditional TMA (Chopart or Lisfranc); flap coverage or complex wound management needed for large soft tissue defect		

**I: Ischemia**

Hemodynamics/perfusion: Measure TP or TcPO<sub>2</sub> if ABI incompressible (>1.3)

SVS grades 0 (none), 1 (mild), 2 (moderate), and 3 (severe).

<i>Grade</i>	<i>ABI</i>	<i>Ankle systolic pressure</i>	<i>TP, TcPO<sub>2</sub></i>
<b>0</b>	≥0.80	>100 mm Hg	≥60 mm Hg
<b>1</b>	0.6-0.79	70-100 mm Hg	40-59 mm Hg
<b>2</b>	0.4-0.59	50-70 mm Hg	30-39 mm Hg
<b>3</b>	≤0.39	<50 mm Hg	<30 mm Hg

**ff: foot Infection:**

SVS grades 0 (none), 1 (mild), 2 (moderate), and 3 (severe: limb and/or life-threatening)

SVS adaptation of Infectious Diseases Society of America (*IDSA*) and International Working Group on the Diabetic Foot (IWGDF) perfusion, extent/size, depth/tissue loss, infection, sensation (*PEDIS*) classifications of diabetic foot infection

<i>Clinical manifestation of infection</i>	<i>SVS</i>	<i>IDSA/PEDIS infection severity</i>
No symptoms or signs of infection	0	Uninfected
Infection present, as defined by the presence of at least 2 of the following items: <ul style="list-style-type: none"> <li>• Local swelling or induration</li> <li>• Erythema &gt;0.5 to ≤2 cm around the ulcer</li> <li>• Local tenderness or pain</li> <li>• Local warmth</li> <li>• Purulent discharge (thick, opaque to white, or sanguineous secretion)</li> </ul>	1	Mild
Local infection involving only the skin and the subcutaneous tissue (without involvement of deeper tissues and without systemic signs as described below). Exclude other causes of an inflammatory response of the skin (eg, trauma, gout, acute Charcot neuro-osteoarthropathy, fracture, thrombosis, venous stasis)		
Local infection (as described above) with erythema >2 cm, or involving structures deeper than skin and subcutaneous tissues (eg, abscess, osteomyelitis, septic arthritis, fasciitis), and No systemic inflammatory response signs (as described below)	2	Moderate
Local infection (as described above) with the signs of SIRS, as manifested by two or more of the following: <ul style="list-style-type: none"> <li>• Temperature &gt;38° or &lt;36°C</li> <li>• Heart rate &gt;90 beats/min</li> <li>• Respiratory rate &gt;20 breaths/min or PaCO<sub>2</sub> &lt;32 mm Hg</li> <li>• White blood cell count &gt;12,000 or &lt;4000 cu/mm or 10% immature (band) forms</li> </ul>	3	Severe <sup>a</sup>





# Bypass versus angioplasty in severe ischaemia of the leg

- Among 224 patients assigned to PTA, 217 underwent the procedure, immediate technical failure occurring in 43 (20 percent).
- Among 228 assigned to bypass surgery, 196 underwent the procedure.

Adam DJ, Beard JD, Cleveland T, et al.

Bypass versus angioplasty in severe ischaemia of the leg (BASIL): multicentre, randomised controlled trial. Lancet 2005; 366:1925.

2011 WRITING GROUP MEMBERS, 2005  
WRITING COMMITTEE MEMBERS,  
ACCF/AHA TASK FORCE MEMBERS.

2011 ACCF/AHA Focused Update of the  
Guideline for the Management of patients  
with peripheral artery disease (Updating the  
2005 Guideline): a report of the American  
College of Cardiology Foundation/American  
Heart Association Task Force on practice  
guidelines. Circulation 2011; 124:2020.



# ACC/AHA 2011

- For patients that have an estimated life expectancy of two years or less, or those who do not have autogenous vein available as a conduit, balloon angioplasty is reasonable as the initial procedure, in selected patients, to improve distal blood flow.





# ACC/AHA 2011

- For patients with an estimated life expectancy of more than two years, and who have available autogenous vein conduit, a bypass surgery is reasonable to perform as the initial treatment to improve distal blood flow.

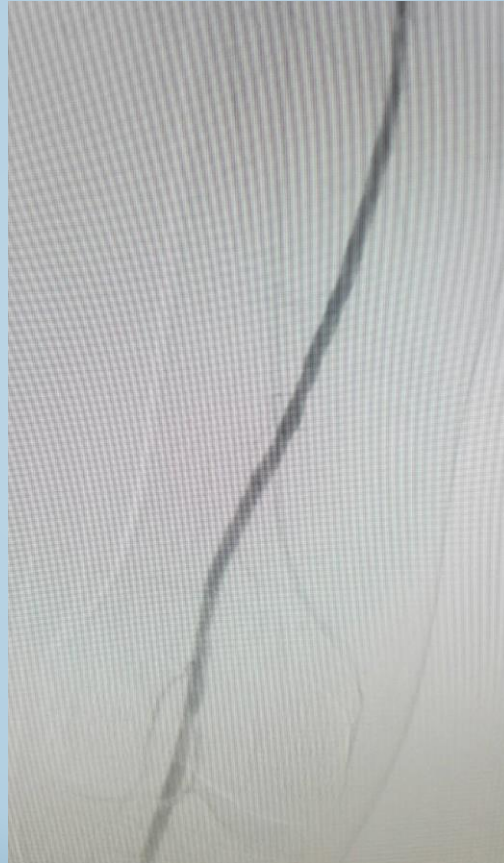
# Vascular Exam

Pulse	Rt	Lt
• Femoral artery	2+	2+
• Popliteal artery	2+	2+
• Dorsalis pedis artery	-ve/mono	1+
• Posterior tibial artery	-ve/mono	1+
• ABI	1.0	1.3



# Angiogram with angioplasty

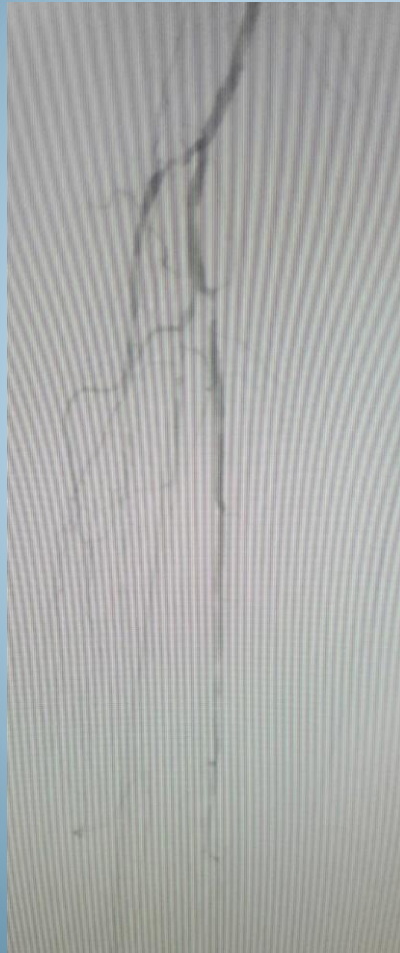
# Angiogram



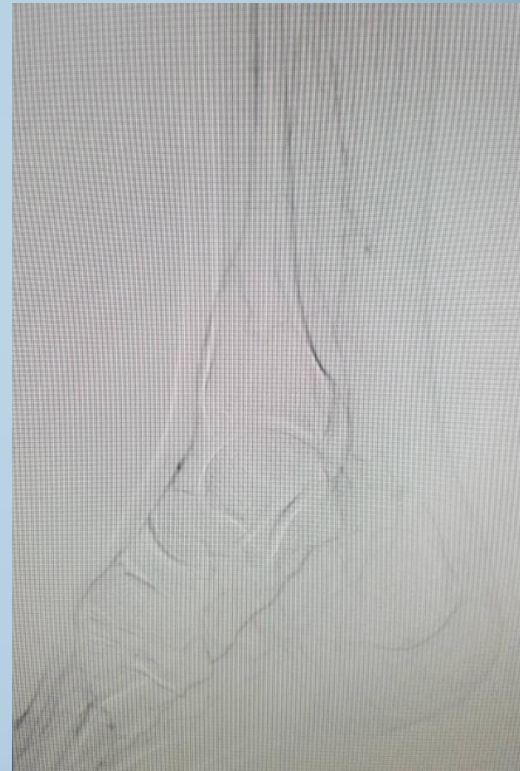
**Femoropopliteal  
Segment**

# Angiogram

**BTK lesion**

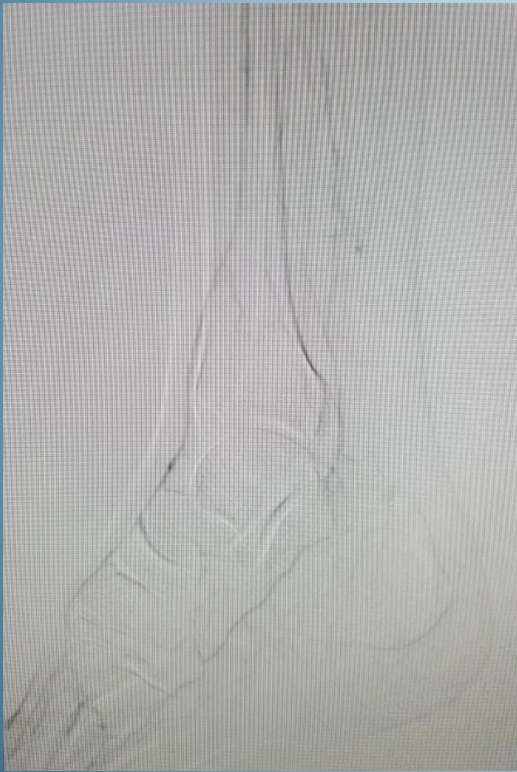


**Arch of foot**

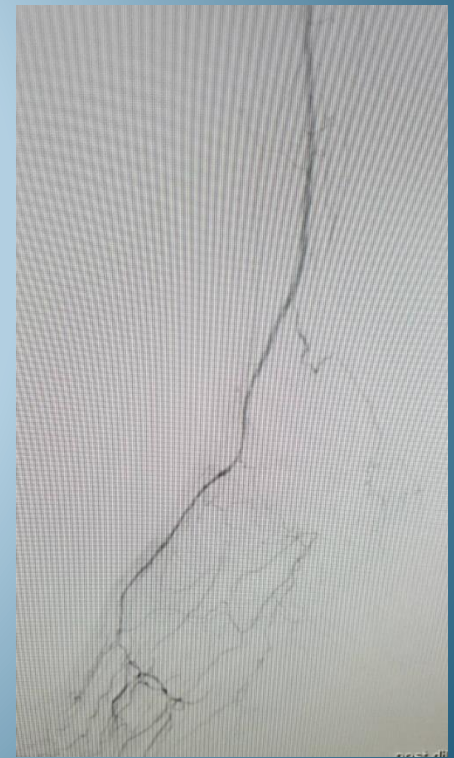




# Balloon Angioplasty



Preballoon



Postballoon



# Vascular Exam

## Pulse

## Rt

- Femoral artery 2+
- Popliteal artery 2+
- Dorsalis pedis artery 1+
- Posterior tibial artery biphasic
- ABI noncompressible



# Wound care



- 18 – 25 Jan 2017
  - Admit for CABG
  - Post operation no complication



# Conclusion

- Multidisciplinary
  - Endocrinologist
  - Cardiologist
  - Nephrologist
  - Orthopedist
  - PM&R
  - Nutritionist
  - Surgeon
- Hyperbaric chamber
- Stem cell
- Etc.





# Limb Salvage in Diabetic Ischemic Foot

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