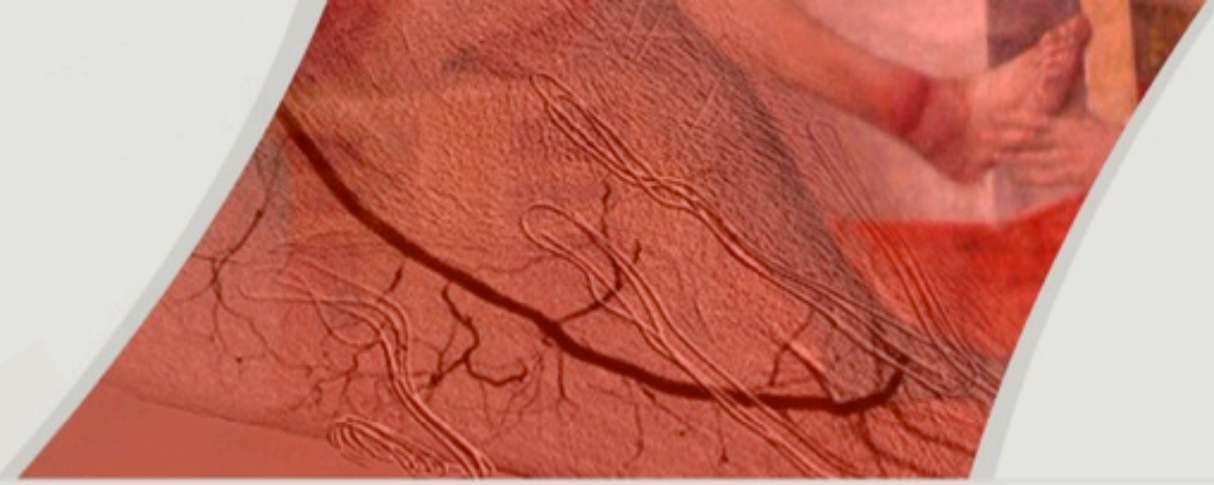
Symptoms of PAD
and Interventional Approach

Roberto Ferraresi
Peripheral Interventional Unit
www.robertoferraresi.it

HUMANITAS GAVAZZENI
Bergamo
Italy

Symptoms of PAD

and Interventional Approach



Fontaine's & Rutherford's classifications

- Claudication
- CLI
- DM & non-DM manifestations of PAD

Interventional Approach In IC and CLI

- When to treat
  - Where to treat
  - Targets for revascularization

Symptoms of PAD

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

L. Norgren,[a] W.R. Hiatt,[b] 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*

Modified from: *Eur J Vasc Endovasc Surg 2007;33(Suppl. 1)*

Symptoms of PAD

TASC
Inter-Society Consensus for the Management of PAD

Table D1. Classification of peripheral arterial disease: Fontaine's stages and Rutherford's categories

Fontaine		*Rutherford*		
Stage	*Clinical*	*Grade*	*Category*	*Clinical*
I	Asymptomatic	0	0	Asymptomatic
IIa	Mild claudication	I	1	Mild claudication
IIb	Moderate to severe claudication	I	2	Moderate claudication
		I	3	Severe claudication
III	Ischemic rest pain	II	4	Ischemic rest pain
IV	Ulceration or gangrene	III	5	Minor tissue loss
		III	6	Major tissue loss

asymptomatic

claudication

rest pain

tissue loss

Claudication

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asymptomatic

claudication

rest pain

tissue loss

Claudication

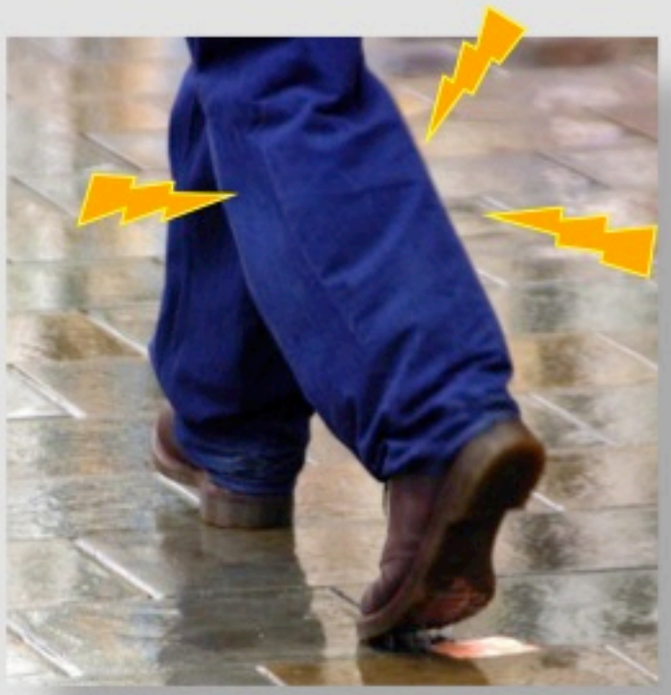
Claudication needs:

1. PAD
2. Ability to walk
   - Desire to walk
   - Good brain
   - Good heart
   - Good lungs
   - Good legs

Claudication

- The patient:

  wants to walk longer distances



asymptomatic

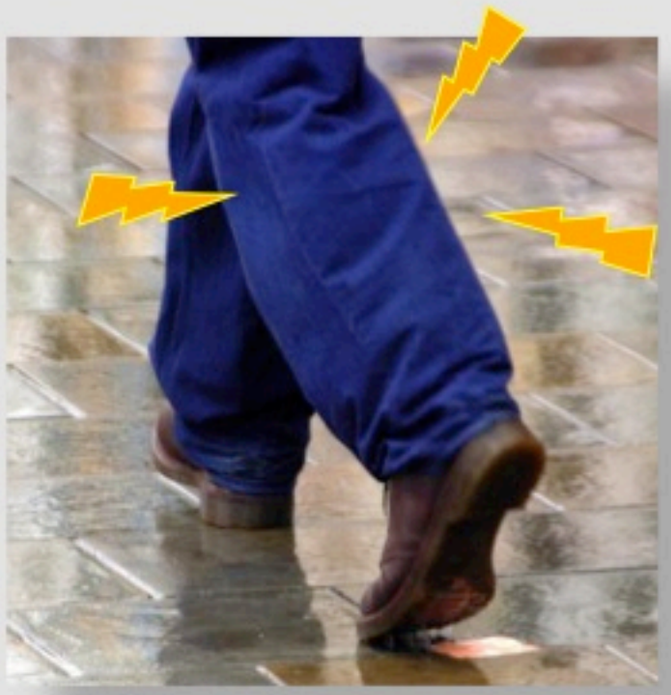
claudication

rest pain

tissue loss

Claudication

Claudication fate?



asymptomatic

claudication

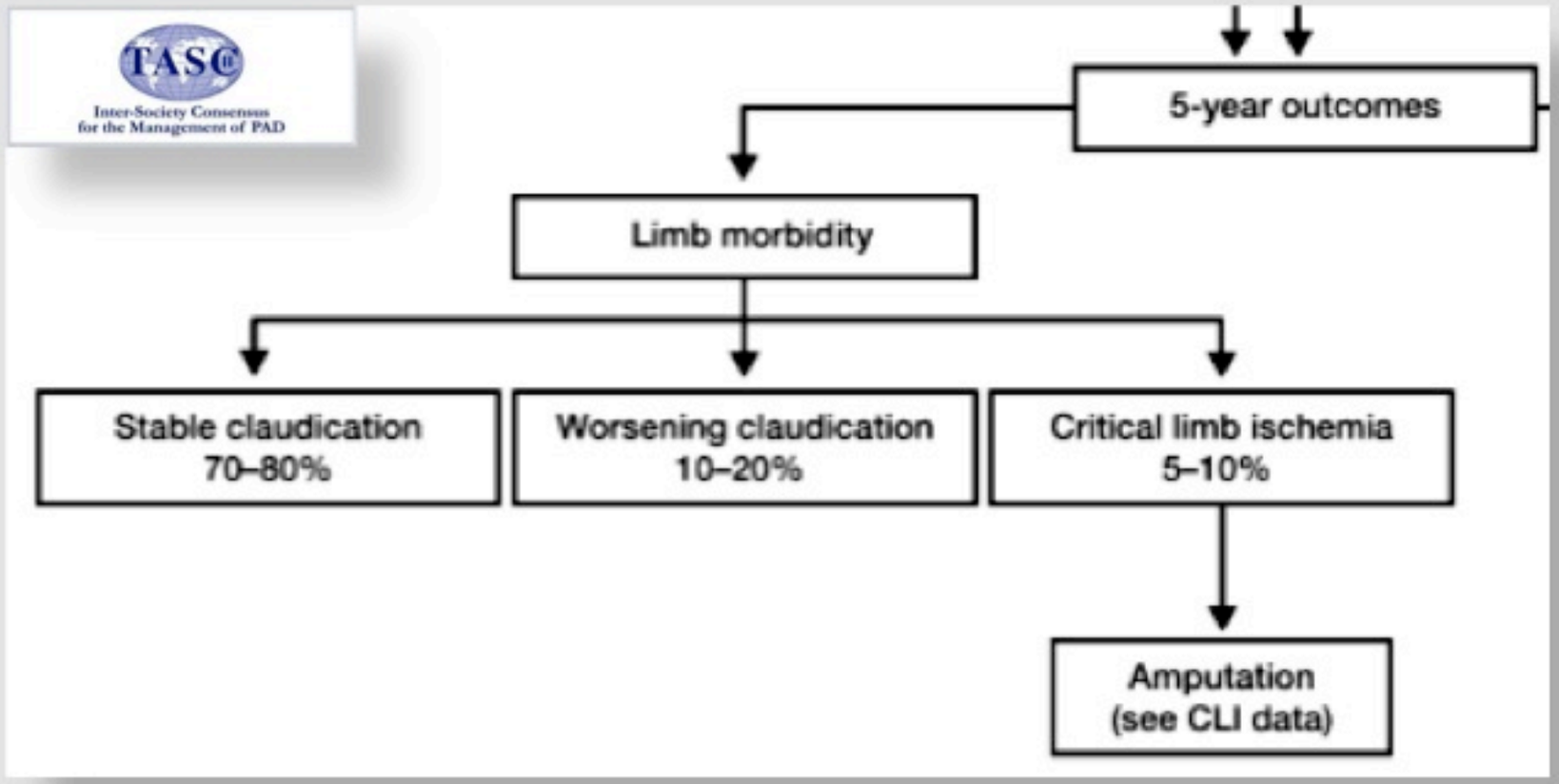
rest pain

tissue loss

Claudication

1. “Limb” point of view

IC is a “benign” disorder, with a very low rate of evolution in CLI (<10% at 5 yrs)



asymptomatic

claudication

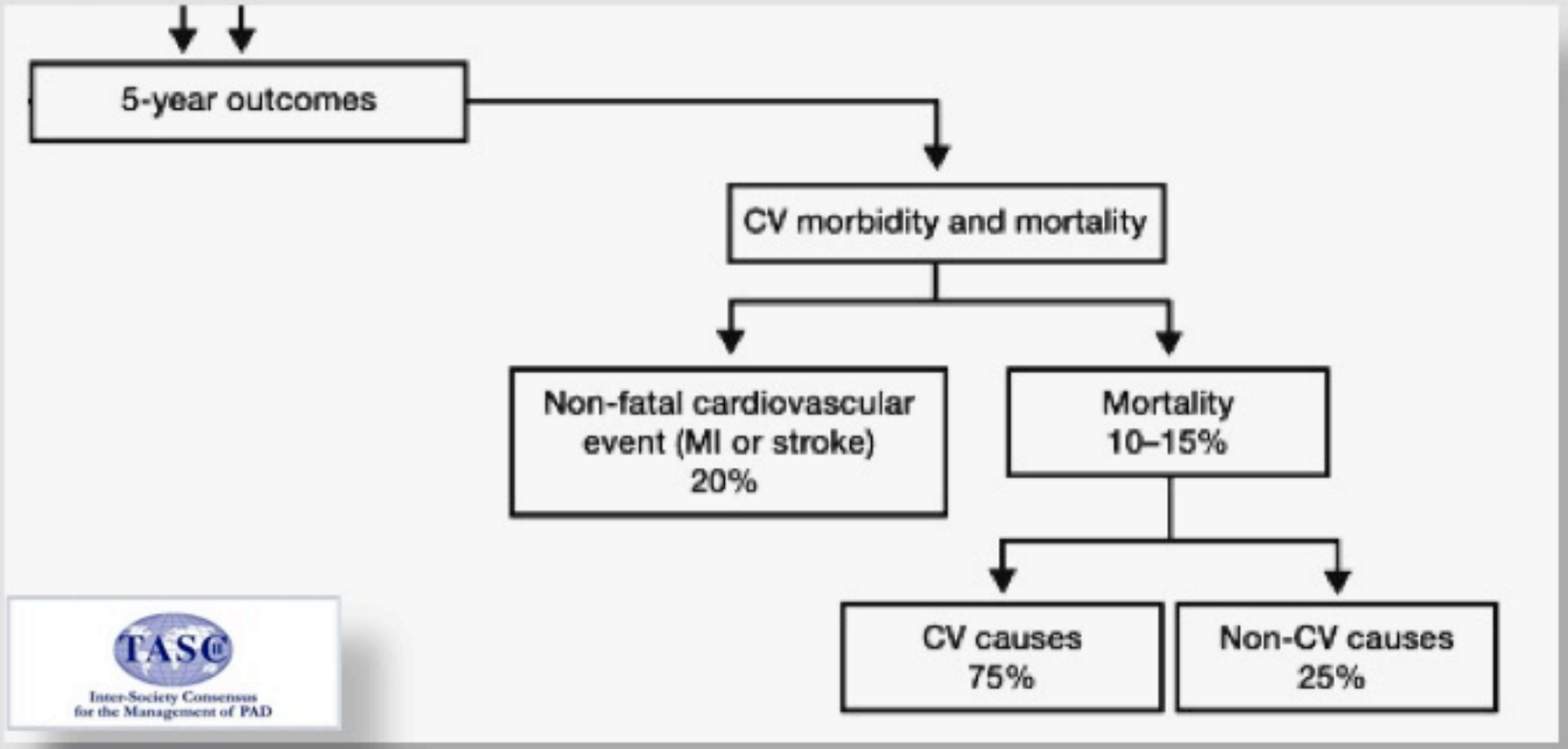
rest pain

tissue loss

Claudication

2. Cardiovascular point of view

IC is a strong marker of future cardiovascular events



asymptomatic

claudication

rest pain

tissue loss

Claudication

2. CV point of view

IC is a strong marker of future cardiovascular events

asymptomatic

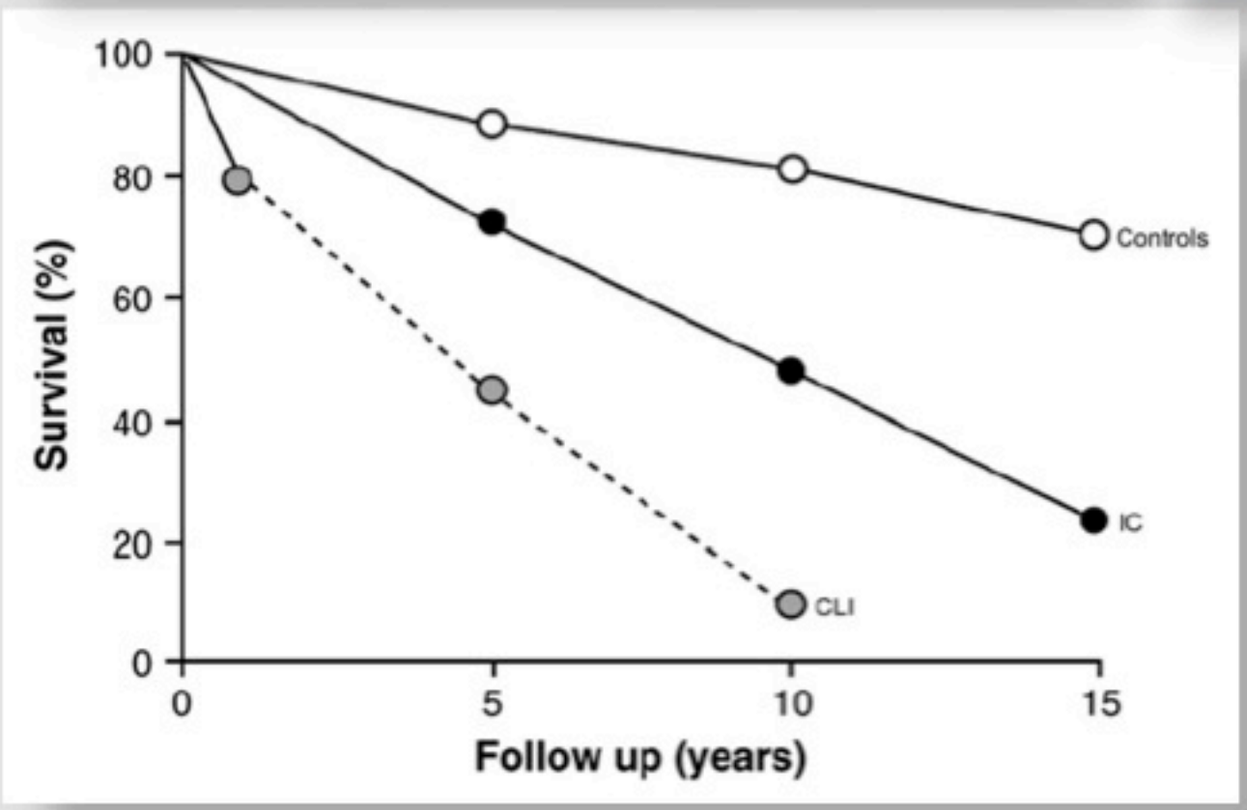
claudication

rest pain

tissue loss

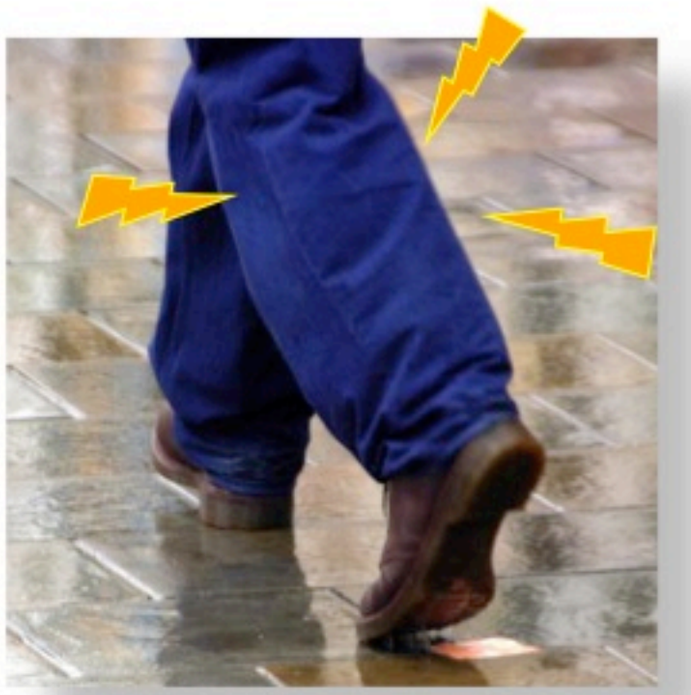
Mortality of Patients with PAD

TASC
Inter-Society Consensus for the Management of PAD



Claudication

- **Claudication**
  - Functional disease
- **Sufferers**
  - Relatively young
  - Few comorbidities
  - Relatively long life expectancy
  - Relatively high QoL expectations



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asymptomatic

claudication

rest pain

tissue loss

Critical Limb Ischemia

- The CLI Patient
  - «I'm desperate!»
  - «Save my leg!»

asymptomatic

claudication

rest pain

tissue loss

Critical Limb Ischemia

CLI outcome?

asymptomatic

claudication

rest pain

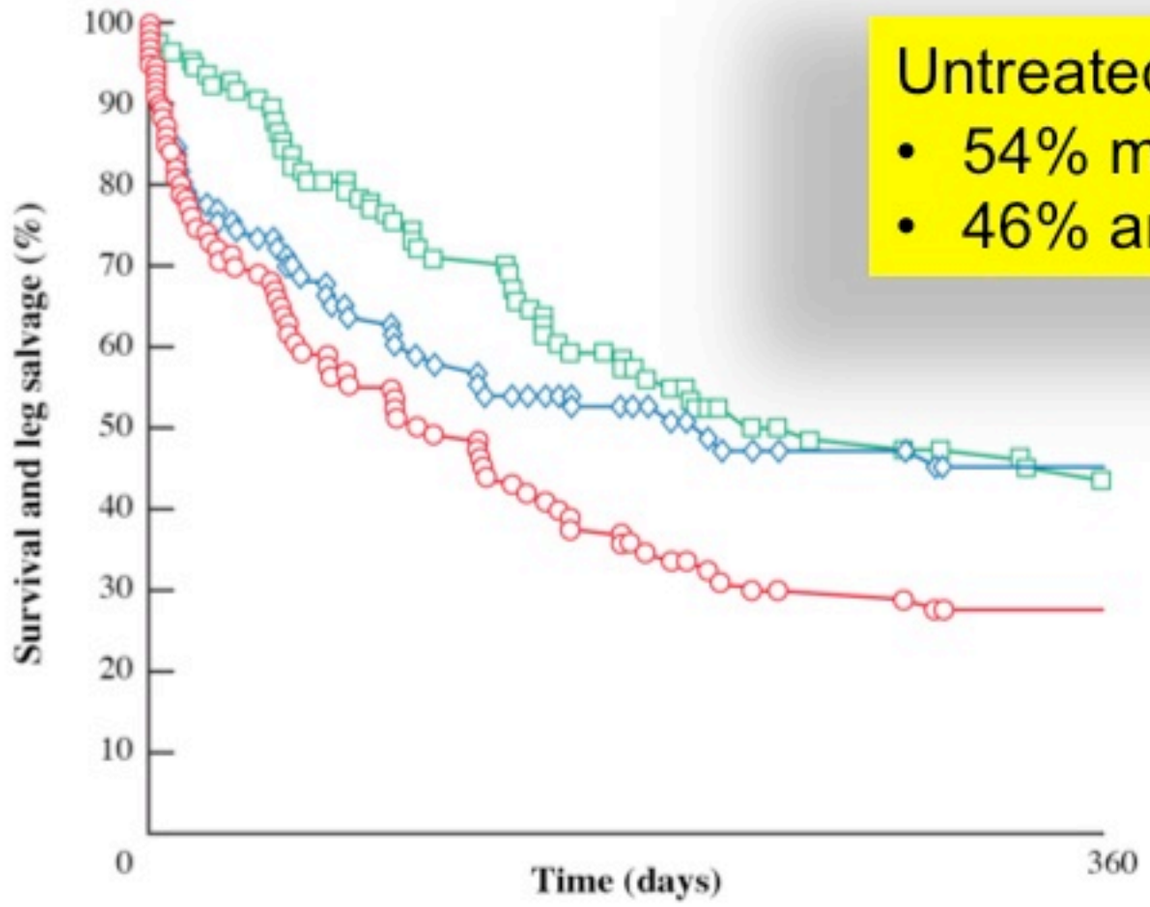
tissue loss

Critical Limb Ischemia

Outcome of Unreconstructed Chronic Critical Leg Ischaemia

Mauri Lepäntalo and Sorjo Mätzke

Division of Vascular Surgery, Fourth Department of Surgery, Helsinki University, Helsinki, Finland



Patientwise survival and leg salvage in patients with unreconstructed chronic critical leg ischaemia.

- *survial*
- *leg salvage*
- *survival and leg salvage*

Untreated CLI: 1-yr follow-up
- 54% mortality,
- 46% amputation

asymptomatic

claudication

rest pain

tissue loss

Modified from: *EJVES 1996;11 (2): 153-157*

Critical Limb Ischemia

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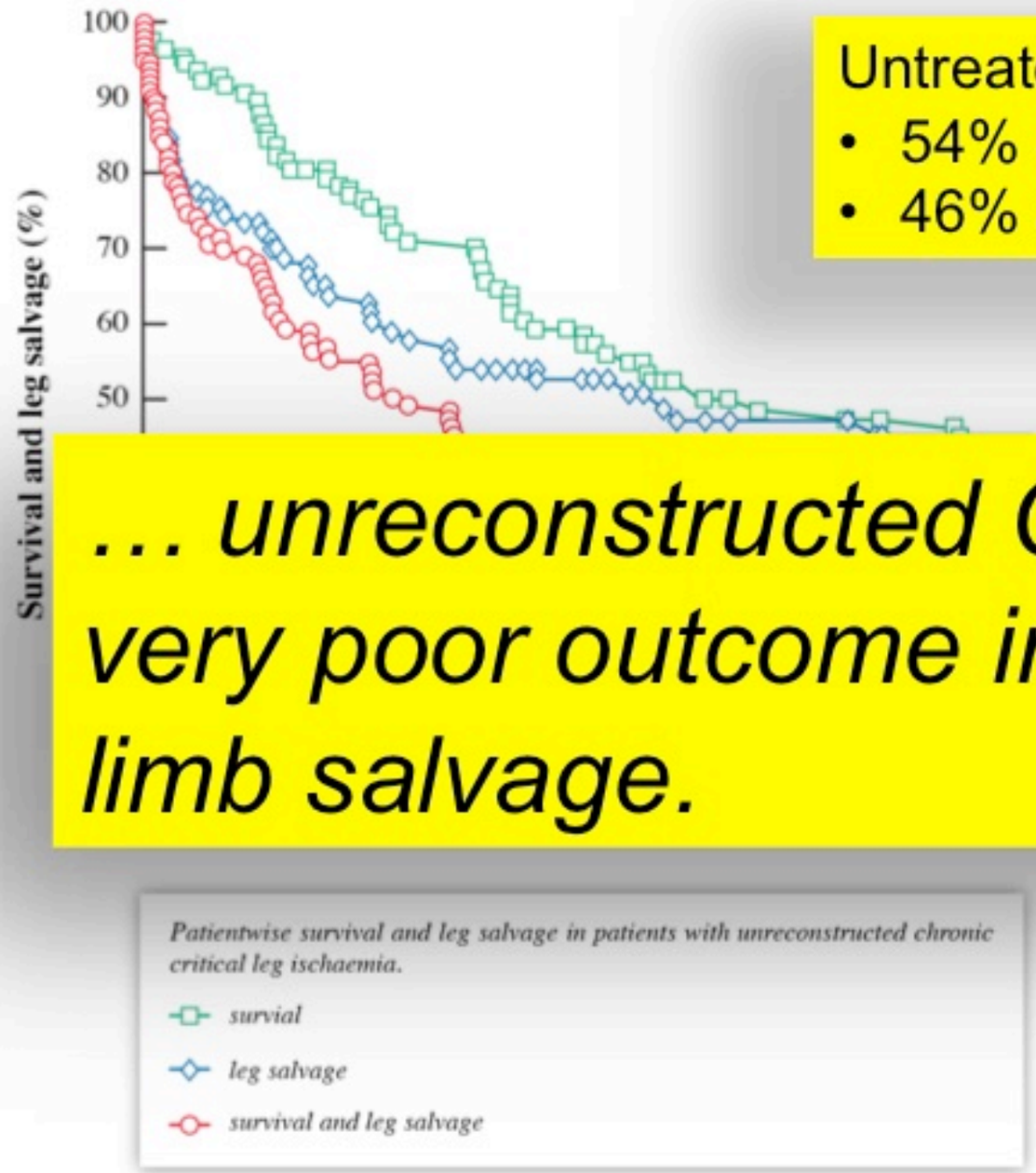


Untreated CLI: 1-yr follow-up
- 54% mortality,
- 46% amputation

… unreconstructed CLI seemed to predict a very poor outcome in terms of survival and limb salvage.

asymptomatic

rest pain

tissue loss

Modified from: *EJVES 1996; 11(2):153-157*

Critical Limb Ischemia

CLI outcome?

asymptomatic

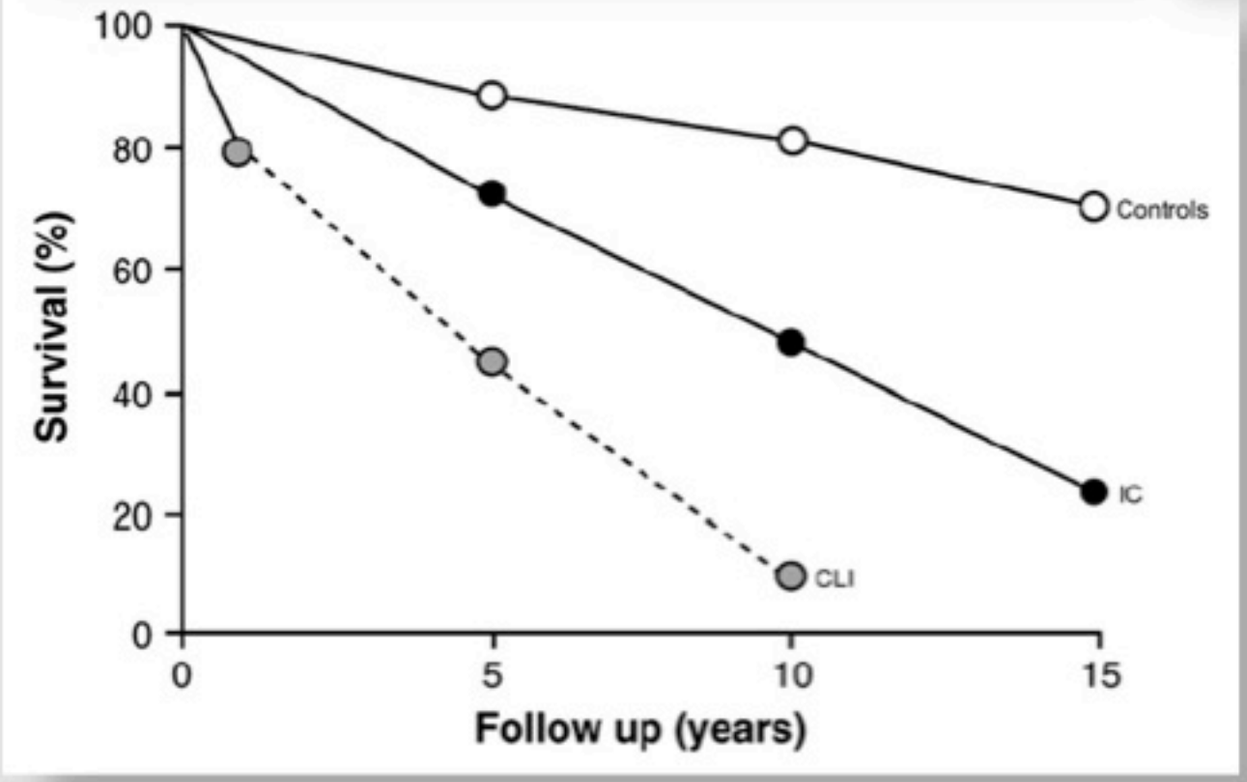
claudication

rest pain

tissue loss

Mortality of Patients with PAD

TASC II
Inter-Society Consensus for the Management of PAD



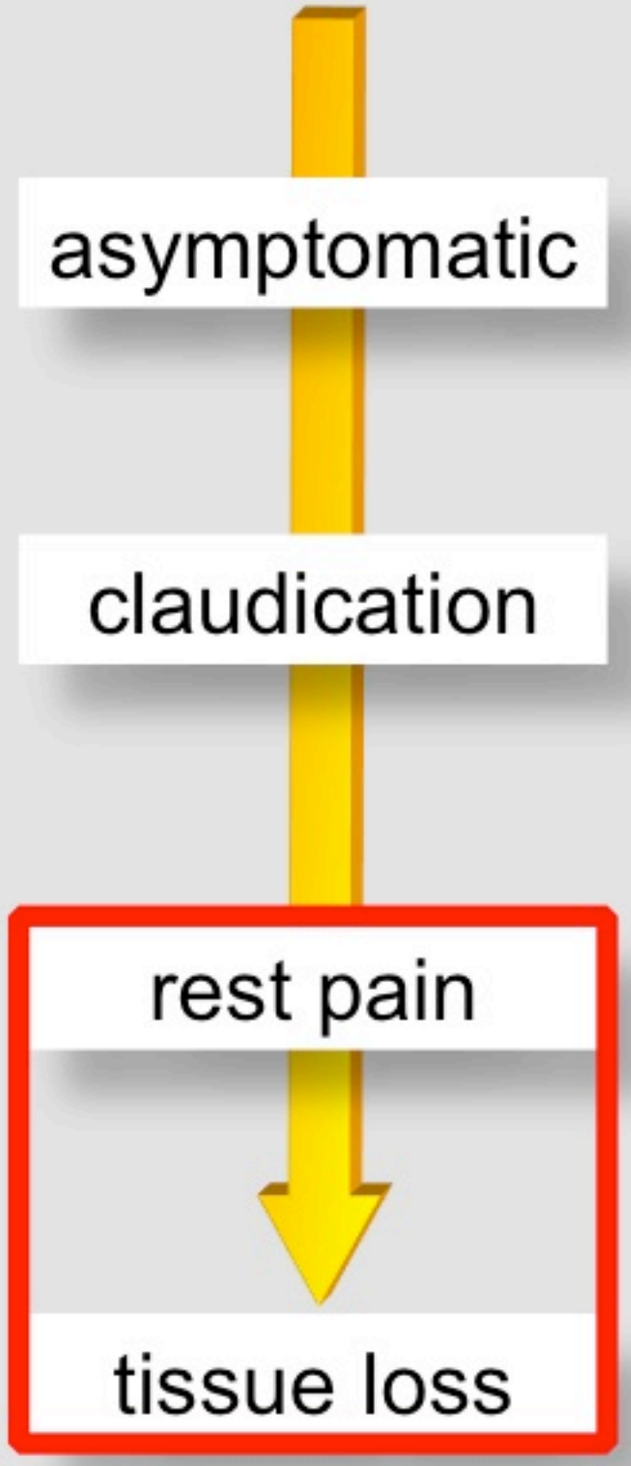
Critical Limb Ischemia

"… their prognosis is in many ways similar to that of some malignant forms of ***cancer***."

TASC 2000, (S171)

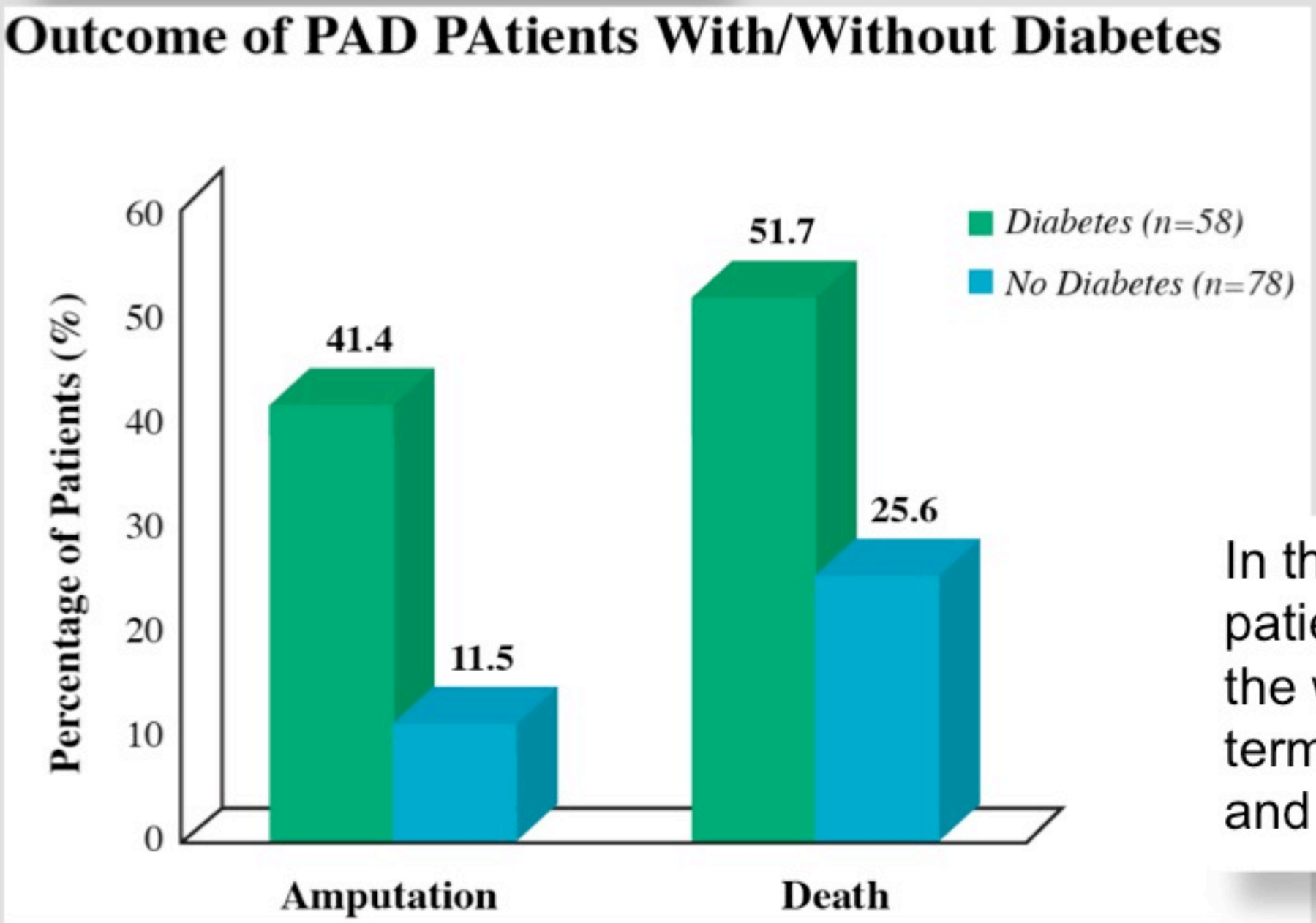
"The best end point for life-table outcomes might be the retention of a salvaged and usable limb at death…"

C.W. Bakal et al., "Infrapopliteal Percutaneous Transluminal Angioplasty: What We Know". Radiology 1996; 200: 36-43



Critical Limb Ischemia

CLI outcome?



In the population of CLI patients diabetics have the worst prognosis in terms of amputation and death!

Modified from: *Jude EB et al. Diabetes Care. 2001;24:1433-1437*

Change our mind !!!

Female, 65 yy:
breast nodule

Death atmosphere !!!

Change our mind !!!

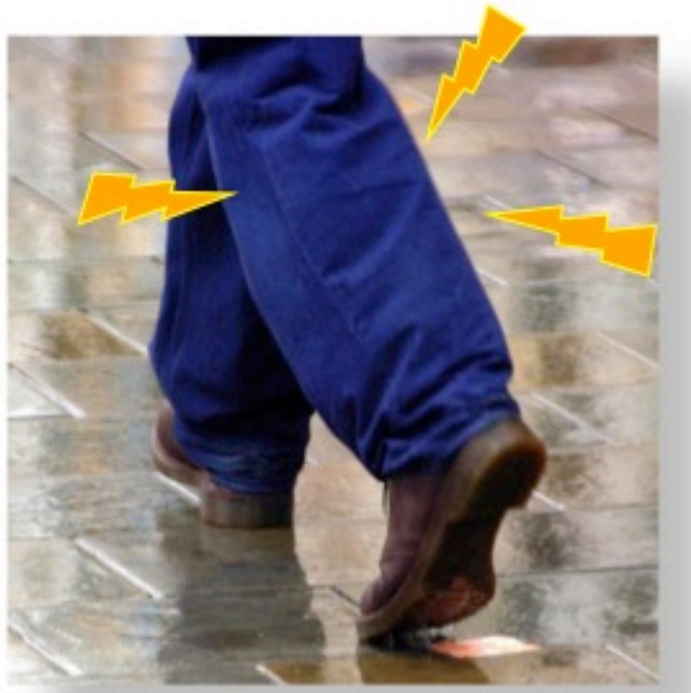
"… diabetes is a state of *premature cardiovascular death* which is associated with chronic hyperglycaemia …"

Fisher M, et al. Practical Diabetes Int 2001;18:183

Symptoms of PAD

- **CLI**
  - Limb/life threatening disease
- **CLI Patients**
  - Frequently old
  - Frequently with diabetes and other comorbidities
  - Natural course of CLI will either kill or cut off a leg in 50% of them within the first year

- **Claudication**
  - Functional disease
- **Sufferers**
  - Relatively young
  - Few comorbidities
  - Relatively long life expectancy
  - Relatively high QoL expectations



Interventional approaches in IC and CLI

- **When to treat**
- **Where to treat**
- **Targets for revascularization**

Interventional approach

1. When to treat it?

CLI

Claudication

?

Interventional approach

1. When to treat it?

CLI

Claudication

Immediately!!
Time is tissue!!!

Interventional approach

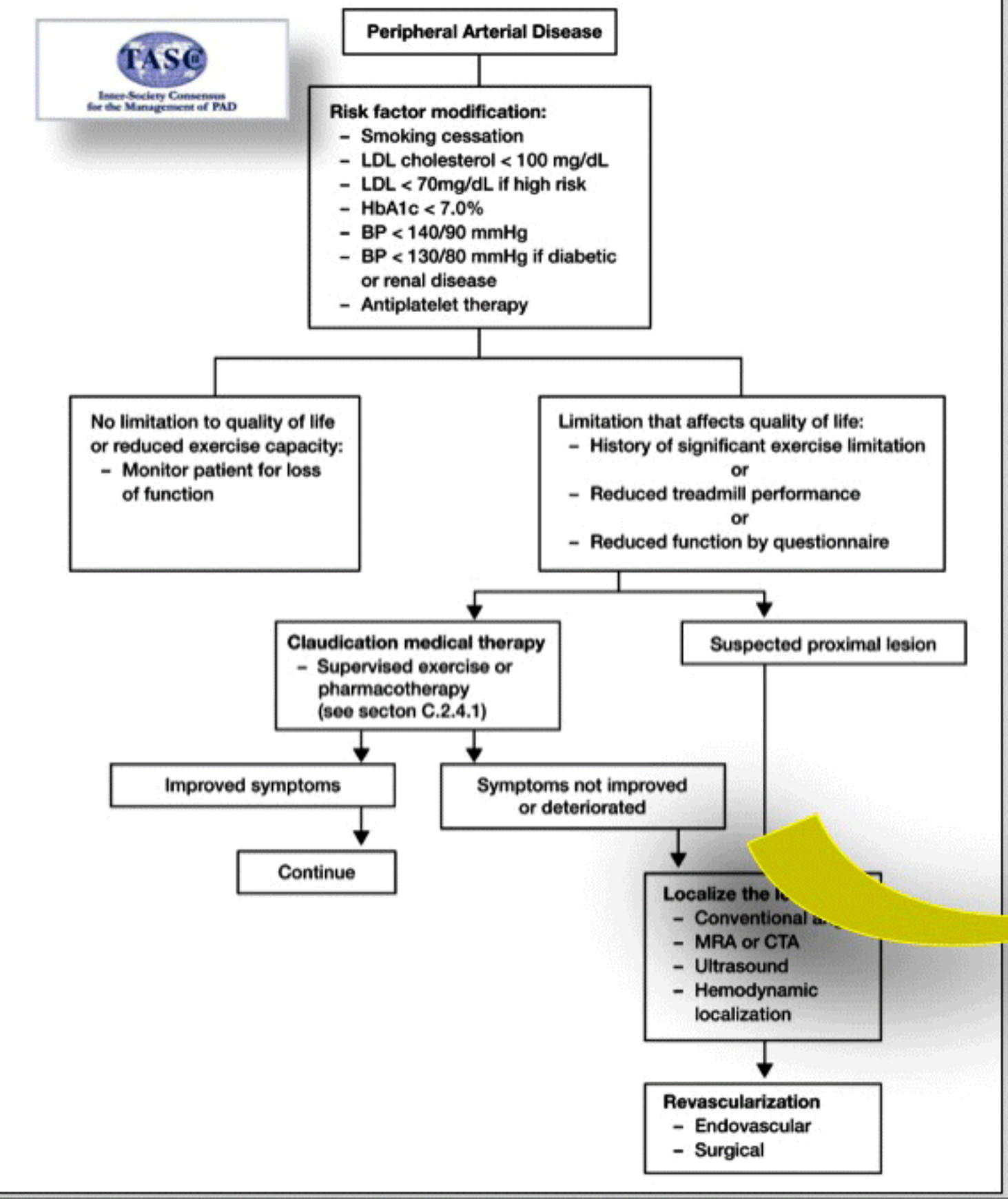
1. When to treat it?

CLI

Immediately!!
Time is tissue!!!

Claudication

?



Revascularization therapy only in case of "Symptoms not improved or deteriorated after SVE & pharmacotherapy"

Fig. C3. Overall treatment strategy for peripheral arterial disease. BP – blood pressure; HbA1c – hemoglobin A1c; LDL – low density lipoprotein; MRA – magnetic resonance angiography; CTA – computed tomographic angiography. Reproduced with permission from Hiatt WR. *N Engl J Med* 2001;344:1608–1621.

Interventional approach

1. When to treat it?

CLI

Immediately!!
Time is tissue!!!

Claudication

Think before treating a claudication! Always consider SVE & pharmacotherapy

Interventional approaches in IC and CLI

- **When to treat**
- **Where to treat**
- **Targets for revascularization**

Interventional approach

2. Where to treat it?

CLI

Claudication

?

1°

INFECTION TREATMENT

- **ULCER DEBRIDEMENT & URGENT SURGERY** (GANGRENE/ABSCESS/ PHLEGMON)
- **IDENTIFICATION OF BACTERIAL STRAINS → APPROPRIATE ANTIMICROBIAL TREATMENT**
- **METABOLIC & CARDIOLOGIC TREATMENT**
- **PRE-MEDICATIONS**

2°

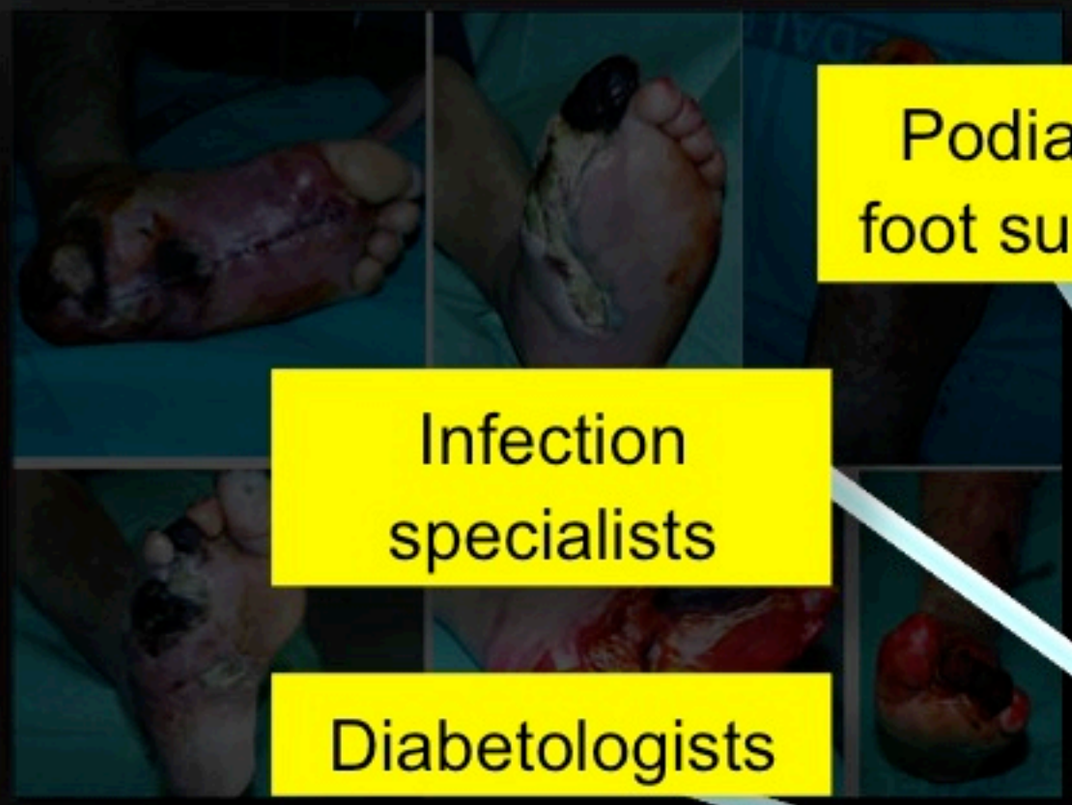
REVASCULARIZATION

PTA/Bypass are not the first line therapy in Texas D wounds (infection+ischemia)

3°

FINAL TREATMENT

- **MEDICAL**
- **SURGICAL**
- **ORTHOPEDIC**
- **PROSTHESIS**
- **REHABILITATION**



Podiatrists/
foot surgeons

Orthopaedists

Plastic
surgeons

Infection
specialists

Diabetologists

Nephrologists/Dialysis

Cardiologists

Vascular surgeon

Interventional radiologists

Interventional cardiologists

Prosthesis

Physiotherapists

Palliative care
specialists

1°

IN FECTION TREATMENT

- ULCER DEBRIDEMENT & URGENT SURGERY (GANGRENE/ABSCESS/ PHLEGMON)
- IDENTIFICATION OF BACTERIAL STRAINS → APPROPRIATE ANTIMICROBIAL TREATMENT
- METABOLIC & CARDIOLOGIC TREATMENT
- PRE-MEDICATIONS

2°

REVASCULARIZATION

PTA/Bypass are not the first line therapy in Texas D wounds (infection+ischemia)

3°

FINAL TREATMENT

- MEDICAL
- SURGICAL
- ORTHOPEDIC
- PROSTHESIS
- REHABILITATION

Interventional approach

2. Where to treat it?

CLI

Multidisciplinary team

Toe team & Flow team

Revascularization is only one ring of the chain: extra-vascular care is a key determinant of hard clinical outcomes

Claudication

Interventional approach

2. Where to treat it?

CLI

Multidisciplinary team

Toe team & Flow team

Revascularization is only one ring of the chain: extra-vascular care key determinant of hard clinical outcomes

Claudication

?

Interventional approach

2. Where to treat it?

CLI

Multidisciplinary team

Toe team & Flow team

Revascularization is only one ring of the chain: extra-vascular care is a key determinant of hard clinical outcomes

Claudication

Single specialist

- *Vascular surgeon*
- *Interventional cardiologist*
- *Interventional radiologist*

Revascularization alone is sufficient

Interventional approaches in IC and CLI

- **When to treat**
- **Where to treat**
- **Targets for revascularization**

Interventional approach

3. Targets for revascularization

CLI

Claudication

?

Revascularization strategies in CLI

1. Complete revascularization

- **1 BTK vessel better than 0**
- **2 to 3 BTK vessels better than 1**
- **Tibials better than peroneal**

DIABETICMedicine

DOI: 10.1111/j.1464-5491.2007.02167.x

When is a technically successful peripheral angioplasty effective in preventing above-the-ankle amputation in diabetic patients with critical limb ischaemia?

Cardiovasc Intervent Radiol (2010) 33:720–725
DOI 10.1007/s00270-010-9881-3

CLINICAL INVESTIGATION

PTA of Infrapopliteal Arteries: Long-term Clinical Follow-up and Analysis of Factors Influencing Clinical Outcome

Jan H. Peregrin · Boris Kožnar · Josef Kováč · Jarmila Laštovičková · Jiří Novotný · Daniel Vedlich · Jelena Skibová

Revascularization strategies in CLI

1. Complete revascularization

- **1 BTK vessel better than 0**
- **2-3 BTK vessels better than 1**
- **Tibials better than peroneal**

2. Wound related artery PTA

Patients treated with angiosome-targeted revascularization had significantly better wound healing and limb preservation

Revascularization of a Specific Angiosome for Limb Salvage: Does the Target Artery Matter?

Richard F. Neville,[1] Christopher E. Attinger,[2] Erwin J.
Michael Thomassen,[2] and Anton N. Sidawy,[3] Washin

A reliable approach to diabetic neuroischemic foot wounds: below-the-knee angiosome-oriented angioplasty.

Alexandrescu V, Vincent G, Azdad K, Hub
Ngongang G, Filimon A

Importance of the Angiosome Concept for Endovascular Therapy in Patients with Critical Limb Ischemia

Osamu Iida,[1] MD, Shinsuke Nanto,[2*] MD, PhD, Masaaki Uematsu,[1] MD, PhD, Kuniyasu Ikeoka,[1] MD, Shin Okamoto,[1] MD, Tomoharu Dohi,[1] MD, Masashi Fujita,[1] MD, PhD, Hiroto Terashi,[3] MD, PhD, and Seiki Nagata,[1] MD, PhD

Interventional approach

3. Targets for revascularization

CLI

Claudication

Aggressive revascularization:

- Complete & WRA
- Use every useful device to restore blood to **the foot!**

Interventional approach

3. Targets for revascularization

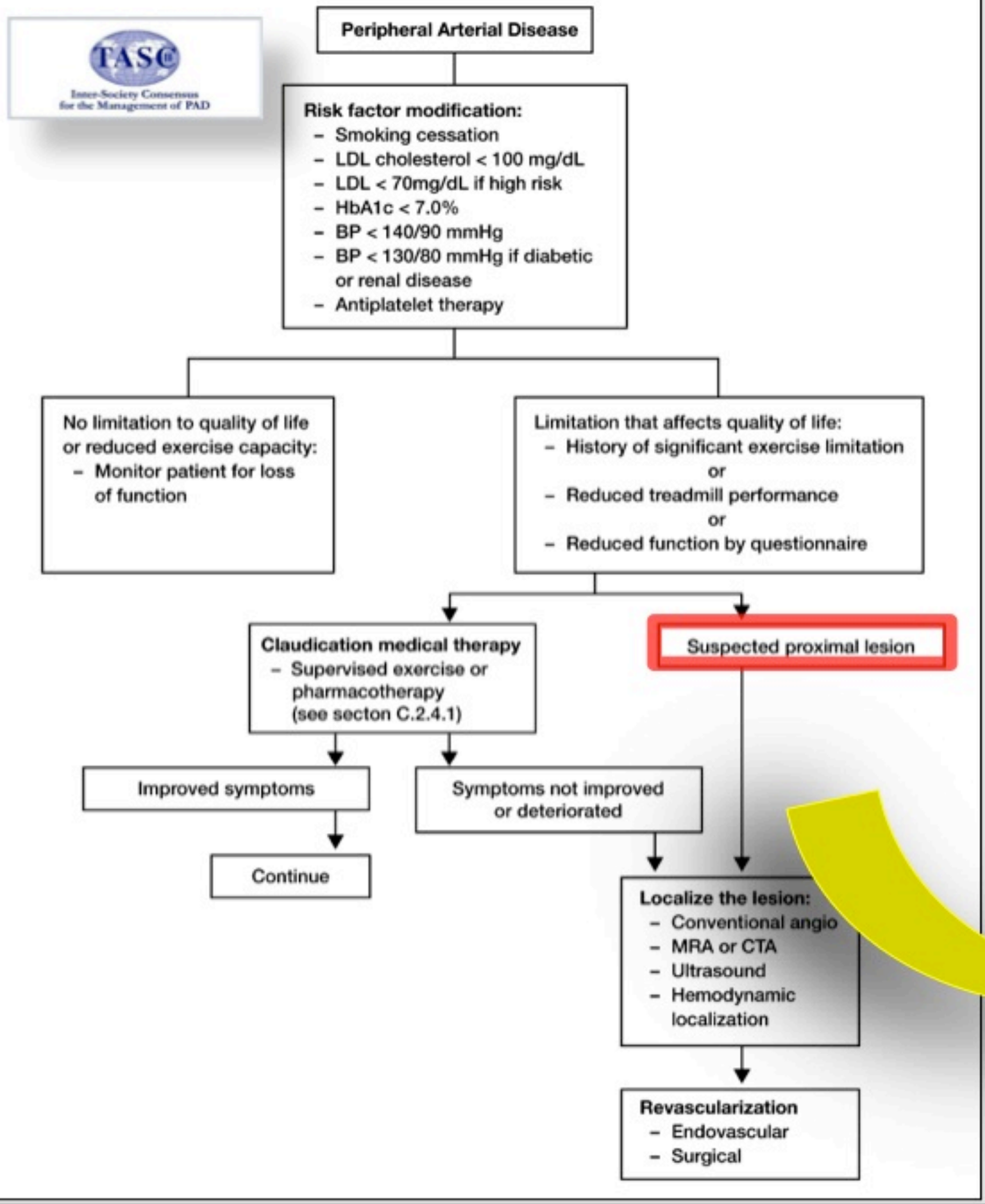
CLI

Aggressive revascularization:

- Complete & WRA
- Use every useful device to restore blood to **the foot!**

Claudication

?



Revascularization therapy only in case of:

1. **"Symptoms not improved or deteriorated after SVE & pharmacotherapy**

3. **Proximal lesion**

Fig. C3. Overall treatment strategy for peripheral arterial disease. BP – blood pressure; HbA1c – hemoglobin A1c; LDL – low density lipoprotein; MRA – magnetic resonance angiography; CTA – computed tomographic angiography. Reproduced with permission from Hiatt WR. *N Engl J Med* 2001;344:1608–1621.

Interventional approach

3. Targets for revascularization

CLI

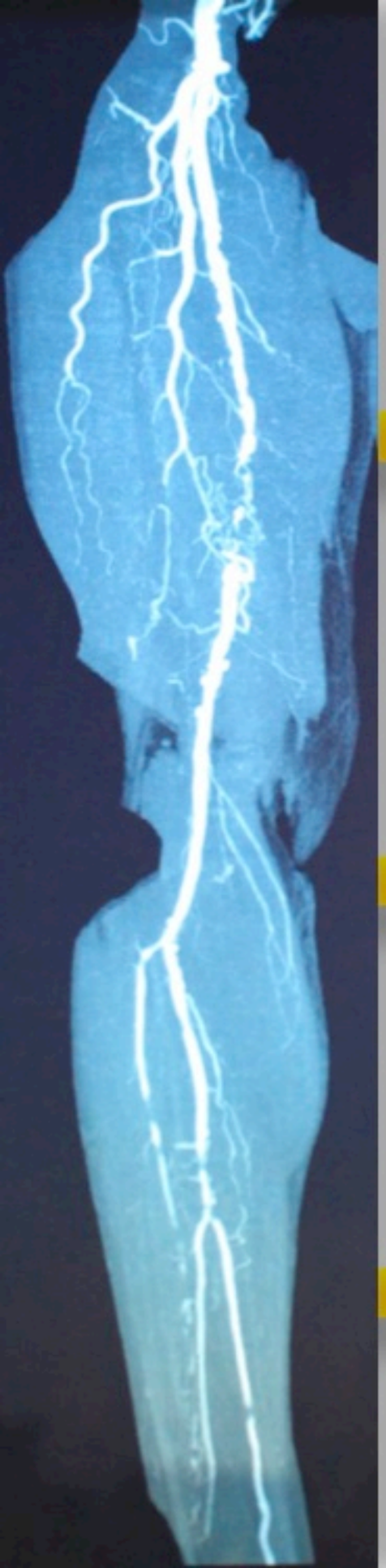
Aggressive revascularization:

- Complete & WRA
- Use every useful device to restore blood to **the foot!**

Claudication

"Focal" revascularization

- Be aware of long-term disease progression
- Concentrate on ATK vessels & short lesions
- Preserve future options: avoid stenting if possible



SYMPTOMS

Asymptomatic

Subclinical critical ischemia

DM → neuropathy

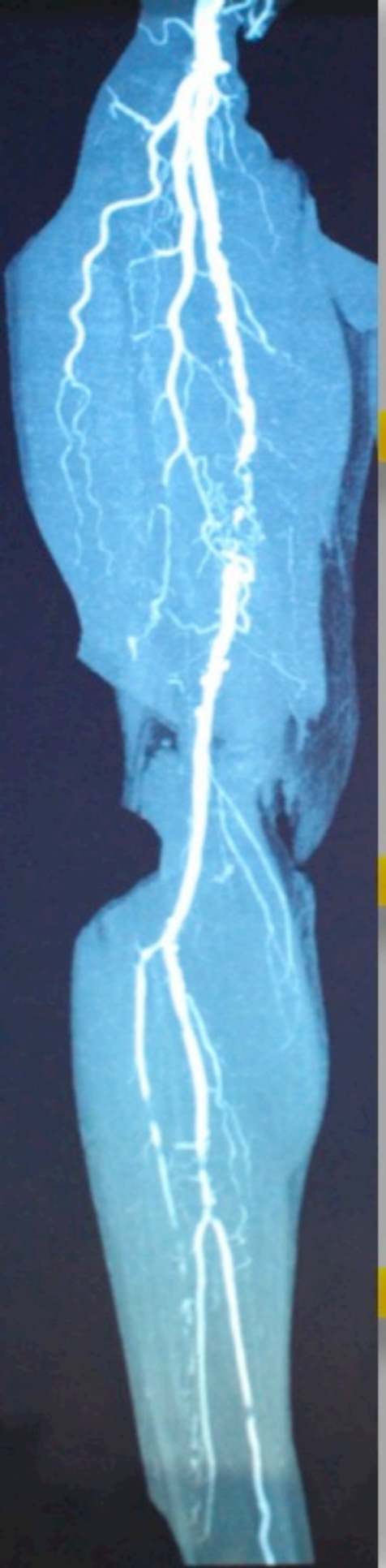
Claudication and/ or rest pain

No neuropathy/No ulcer

CLI with tissue loss

The same angiographic pattern can be associated with different clinical symptoms depending on the history of the patient:

- Age?
- Obesity?
- CAD?
- DM?
- Sedentary lifestyle ?
- Neuropathy ?
- Bone deformity?
- Arthritis?
- Infection?
- Collateral vessels?



SYMPTOMS

TREATMENT

Asymptomatic

Subclinical critical ischemia

DM → neuropathy

?

We have no data regarding the prophylactic treatment of asymptomatic patients

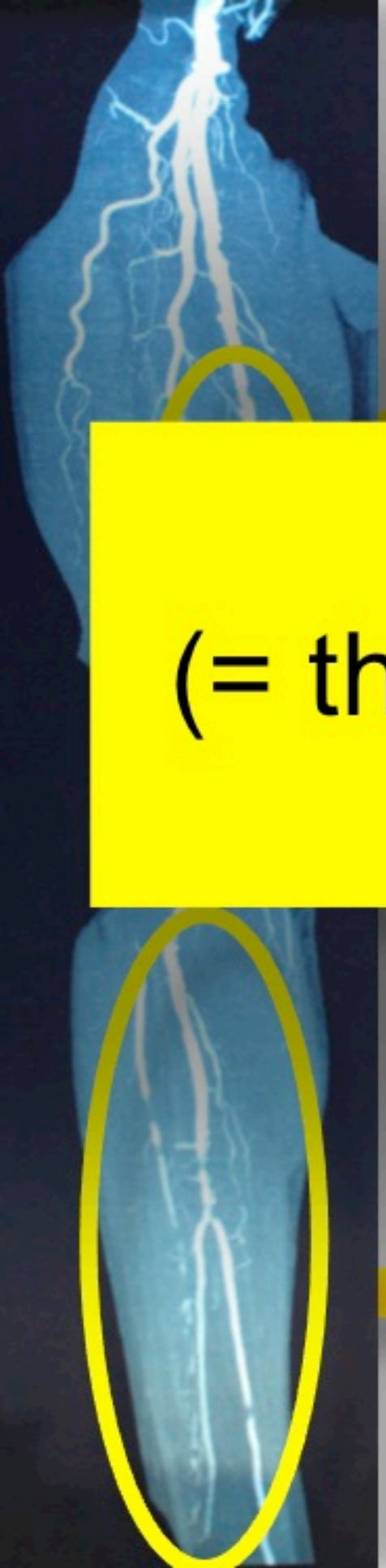
Claudication and/ or rest pain

No neuropathy/No ulcer

CLI with tissue loss

SYMPTOMS	TREATMENT
Asymptomatic Subclinical critical ischemia DM → neuropathy	?
Claudication and/ or rest pain No neuropathy/No ulcer	“FOCAL” REVASC.
CLI with tissue loss	

SYMPTOMS	TREATMENT
Asymptomatic Subclinical critical ischemia DM → neuropathy	?
Claudication and/ or rest pain No neuropathy/No ulcer	“FOCAL” REVASC.
CLI with tissue loss	“COMPLETE” & WRA REVASC.



SYMPTOMS

TREATMENT

Asymptomatic

of rest pain

No neuropathy/No ulcer

REVASC.

Treat the patient
(= the crucial presenting symptom)
and not the ANGIO

CLI with tissue loss

“COMPLETE” & WRA REVASC.