

# Les recommandations thérapeutiques en pathologie artérielle périphérique

Max Amor  
Clinique Louis Pasteur  
Essey-lès-Nancy France  
max.amor2@gmail.com

# Development of guidelines for peripheral artery disease (PAD)

- 2000: **TASC: Trans-Atlantic Inter-Society Consensus**  
*/Dormandy JA et al. J Vasc Surg 2000;31(1 Pt 2):S1-S296/*

- 2005 **ACC/AHA 2005 guidelines for management of PAD**  
*/Hirsch AT et al. J Am Coll Cardiol 2006;47(6):1239-312/*



- 2007: **TASC II: Inter-Society Consensus for Management of PAD**  
*/Norgren L et al. J Vasc Surg 2007;45 Suppl S:S5-67/*



- 2011: **ESC/EAS guidelines on PAD**  
*/Tendera M et al. Eur Heart J 2011;32(22):2851-2906/*



EUROPEAN  
SOCIETY OF  
CARDIOLOGY

- 2011: **ACCF/AHA Focused update of guideline on PAD**  
*/Rooke TW et al. J Am Coll Cardiol 2011;58(19):2020-45/*



**Table I** Classes of recommendations

Classes of recommendations	Definition	Suggested wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended/is indicated
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
<i>Class IIa</i>	<i>Weight of evidence/opinion is in favour of usefulness/efficacy.</i>	Should be considered
<i>Class IIb</i>	<i>Usefulness/efficacy is less well established by evidence/opinion.</i>	May be considered
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended

**Table 2** Levels of evidence

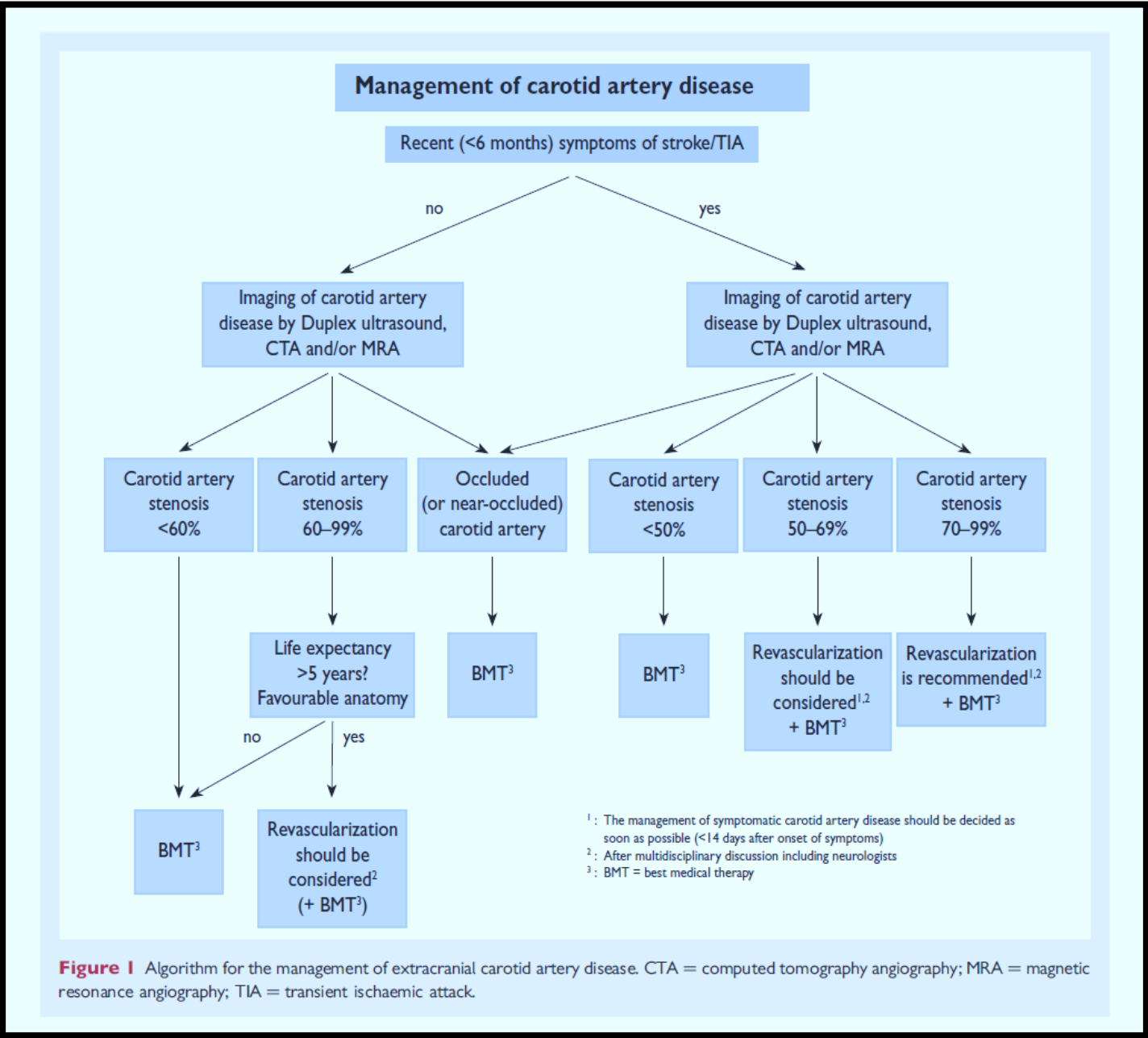
<b>Level of Evidence A</b>	<b>Data derived from multiple randomized clinical trials or meta-analyses.</b>
<b>Level of Evidence B</b>	<b>Data derived from a single randomized clinical trial or large non-randomized studies.</b>
<b>Level of Evidence C</b>	<b>Consensus of opinion of the experts and/or small studies, retrospective studies, registries.</b>

# Le préalable à tout geste thérapeutique

- Évaluation clinique : anamnèse, évaluation des symptômes...
- Évaluation des facteurs de risque et en particulier du tabagisme et du diabète
- Évaluation athéromateuse globale : coronaire, aorte thoracique abdominale, carotide, membres inférieurs.
- Par toute méthode diagnostic : échographique, I.R.M., scanner, échographie de stress...

# Recommandations générales du traitement

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
All patients with PAD who smoke should be advised to stop smoking.	I	B	48
All patients with PAD should have their LDL cholesterol lowered to <2.5 mmol/L (100 mg/dL), and optimally to <1.8 mmol/L (70 mg/dL), or ≥ 50% when the target level cannot be reached.	I	C <sup>d</sup>	-
All patients with PAD should have their blood pressure controlled to ≤140/90 mmHg.	I	A	41
β-Blockers are not contraindicated in patients with LEAD, and should be considered in the case of concomitant coronary artery disease and/or heart failure.	IIa	B	46, 47
Antiplatelet therapy is recommended in patients with symptomatic PAD.	I	C <sup>d</sup>	37
In patients with PAD and diabetes, the HbA1c level should be kept at ≤6.5%.	I	C <sup>d</sup>	-
In patients with PAD, a multidisciplinary approach is recommended to establish a management strategy.	I	C	-



# Carotide et Chirurgie Coronaire

## Carotid artery revascularization in patients scheduled for CABG

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
CEA or CAS should be performed by teams achieving a combined death/stroke rate at 30 days of: <3% in patients without previous neurological symptoms <6% in patients with previous neurological symptoms.	I	A	434
It is recommended to individualize the indication for carotid revascularization after discussion by a multidisciplinary team including a neurologist.	I	C	
The timing of the procedures (synchronous or staged) should be determined by local expertise and clinical presentation, targeting the most symptomatic territory first.	IIa	C	
<b>In patients with a &lt;6-month history of TIA/stroke</b>			
Carotid revascularization is recommended for 70–99% carotid stenosis	I	C	
Carotid revascularization may be considered for 50–69% carotid stenosis depending on patient-specific factors and clinical presentation.	IIb	C	
<b>In patients with no previous TIA/stroke within 6 months</b>			
Carotid revascularization may be considered in men with bilateral 70–99% carotid stenosis or 70–99% carotid stenosis and contralateral occlusion.	IIb	C	
Carotid revascularization may be considered in men with 70–99% carotid stenosis and ipsilateral previous silent cerebral infarction.	IIb	C	

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

<sup>c</sup>References.

CABG = coronary artery bypass grafting; CAS = carotid artery stenting; CEA = carotid endarterectomy; TIA = transient ischaemic attack.

The term carotid artery stenosis refers to a stenosis of the extracranial portion of the internal carotid artery, and the degree of stenosis is according to the North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria.<sup>451</sup>



## Type of carotid artery revascularization

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
Choice of carotid revascularization modality (CEA vs. CAS) in patients undergoing CABG should be based on patient comorbidities, supra-aortic vessel anatomy, urgency for CABG and local expertise.	IIa	B	446,447 449,453
ASA is recommended immediately before and after carotid revascularization.	I	A	454
Dual antiplatelet therapy with ASA and clopidogrel is recommended for patients undergoing CAS for a duration of at least 1 month.	I	B	455,456
CAS should be considered in patients with: <ul style="list-style-type: none"> <li>• post-radiation or post-surgical stenosis</li> <li>• obesity, hostile neck, tracheostomy, laryngeal palsy</li> <li>• stenosis at different carotid levels or upper internal carotid artery stenosis</li> <li>• severe comorbidities contraindicating CEA.</li> </ul>	IIa	C	

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

<sup>c</sup>References.

ASA = acetylsalicylic acid; CABG = coronary artery bypass grafting; CAS = carotid artery stenting; CEA = carotid endarterectomy.

# Artère vertébrale

## Recommendations for revascularization in patients with VA stenosis

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
In patients with symptomatic extracranial VA stenosis, endovascular treatment may be considered for lesions $\geq 50\%$ in the case of recurrent ischaemic events despite optimal medical management.	IIb	C
Revascularization of an asymptomatic VA stenosis is not indicated, irrespective of the degree of severity.	III	C

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

VA = vertebral artery.

# Artère sous clavières et TABC

## Recommendations for the management of upper extremity artery disease

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
Revascularization is indicated in symptomatic patients.	I	C
When revascularization is indicated, an endovascular-first strategy is recommended in patients with atherosclerotic lesions of the upper extremities.	I	C
Surgery should be considered after failed endovascular treatment in low-surgical-risk patients.	IIa	C
Revascularization may be considered in asymptomatic patients with former or future mammary-coronary bypass or to monitor blood pressure in bilateral upper limb occlusions.	IIb	C

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

# Artères digestives et mésentériques

## Recommendations for the management of mesenteric artery disease

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
Mesenteric revascularization should be considered in patients with symptomatic mesenteric artery disease.	<b>IIa</b>	<b>B</b>	120, 143–150
In the case of revascularization, endovascular treatment should be considered as the first-line strategy.	<b>IIa</b>	<b>C</b>	-

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

<sup>c</sup>References.

## Recommendations: treatment strategies for RAS

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
<b>Medical therapy</b>			
ACE inhibitors, angiotensin II receptor blockers, and calcium channel blockers are effective medications for treatment of hypertension associated with unilateral RAS.	I	B	166, 182, 183, 189, 192, 219
ACE inhibitors and angiotensin II receptor blockers are contraindicated in bilateral severe RAS and in the case of RAS in a single functional kidney.	III	B	151, 166, 182, 183, 189, 192

# Sténose Rénale

<b>Endovascular therapy</b>			
Angioplasty, preferably with stenting, may be considered in the case of >60% symptomatic RAS secondary to atherosclerosis.	IIb	A	151, 201-204
In the case of indication for angioplasty, stenting is recommended in ostial atherosclerotic RAS.	I	B	205, 220
Endovascular treatment of RAS may be considered in patients with impaired renal function.	IIb	B	193, 206, 221-223
Treatment of RAS, by balloon angioplasty with or without stenting, may be considered for patients with RAS and unexplained recurrent congestive heart failure or sudden pulmonary oedema and preserved systolic left ventricular function.	IIb	C	-
<b>Surgical therapy</b>			
Surgical revascularization may be considered for patients undergoing surgical repair of the aorta, patients with complex anatomy of the renal arteries, or after a failed endovascular procedure.	IIb	C	-

# Stades cliniques: Classification de Fontaine et de Rutherford

**Table 5** Clinical staging of LEAD

Fontaine classification			Rutherford classification		
Stage	Symptoms	↔	Grade	Category	Symptoms
I	Asymptomatic	↔	0	0	Asymptomatic
II	Intermittent claudication	↔	I	1	Mild claudication
			I	2	Moderate claudication
			I	3	Severe claudication
III	Ischaemic rest pain	↔	II	4	Ischaemic rest pain
IV	Ulceration or gangrene	↔	III	5	Minor tissue loss
			III	6	Major tissue loss

LEAD = lower extremity artery disease.

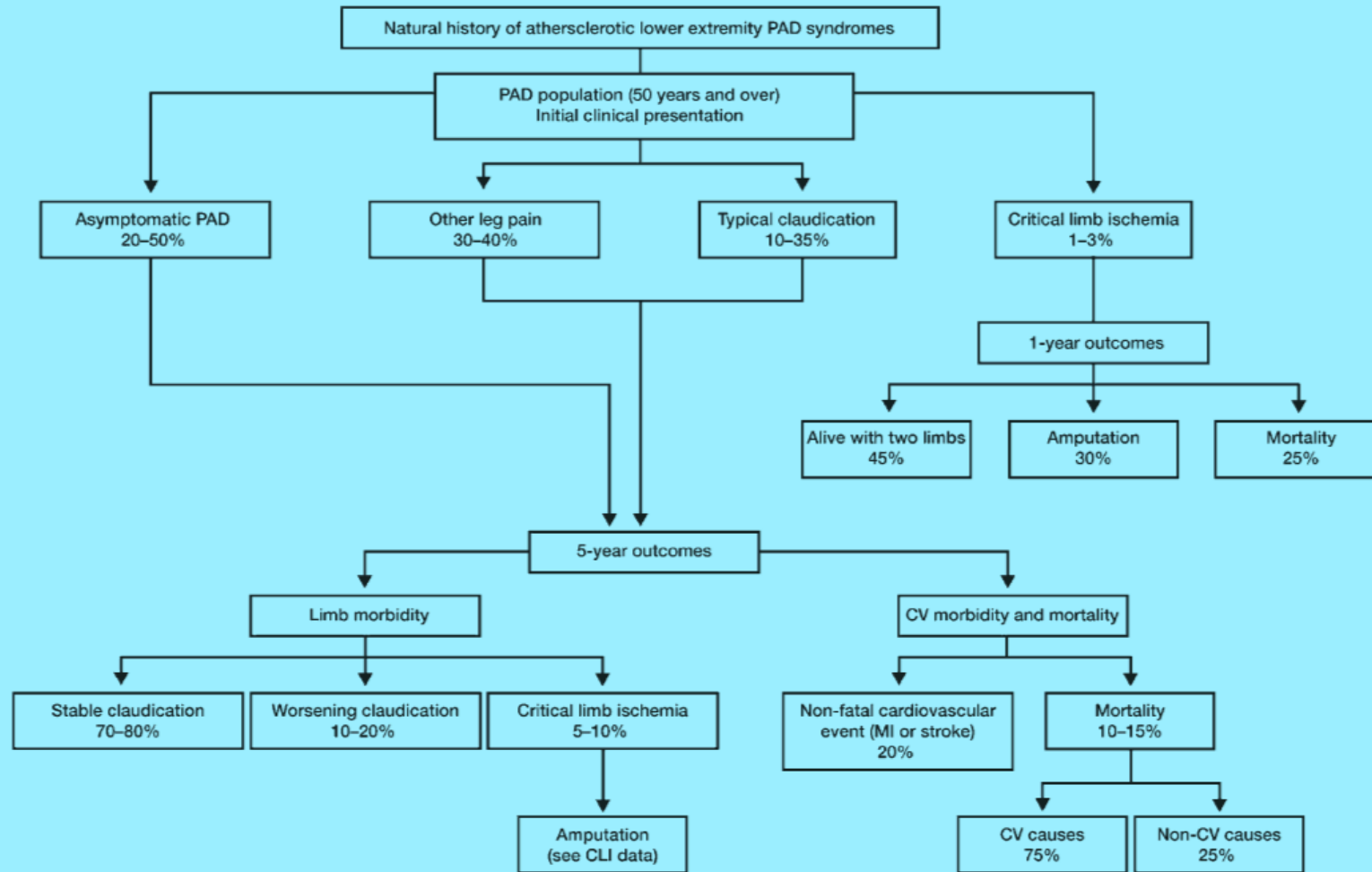


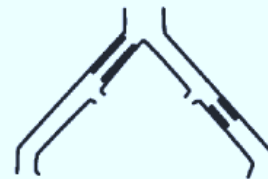
Fig. A3. Fate of the claudicant over 5 years (adapted from ACC/AHA guidelines<sup>5</sup>). PAD – peripheral arterial disease; CLI – critical limb ischemia; CV – cardiovascular; MI – myocardial infarction. Adapted with permission from Hirsch AT et al. *J Am Coll Cardiol* 2006;47:1239–1312.

# Lésions iliaques type A et B

JOURNAL OF VASCULAR SURGERY  
Volume 45, Number 1, Supplement S

## Type A lesions

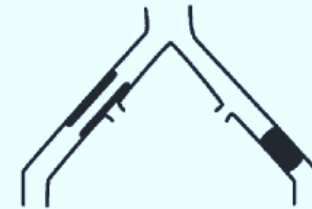
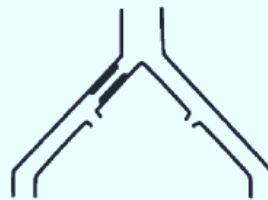
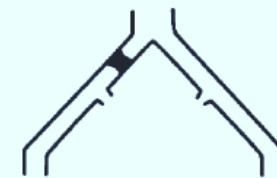
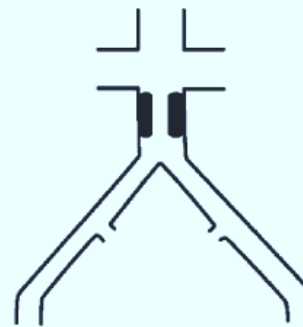
- Unilateral or bilateral stenoses of CIA
- Unilateral or bilateral single short ( $\leq 3$  cm) stenosis of EIA



6

## Type B lesions:

- Short ( $\leq 3$ cm) stenosis of infrarenal aorta
- Unilateral CIA occlusion
- Single or multiple stenosis totaling 3–10 cm involving the EIA not extending into the CFA
- Unilateral EIA occlusion not involving the origins of internal iliac or CFA

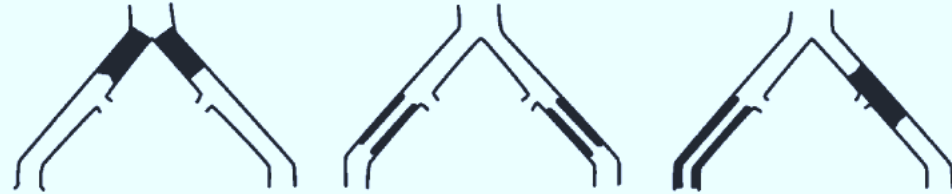




# Lésions iliaques C et D

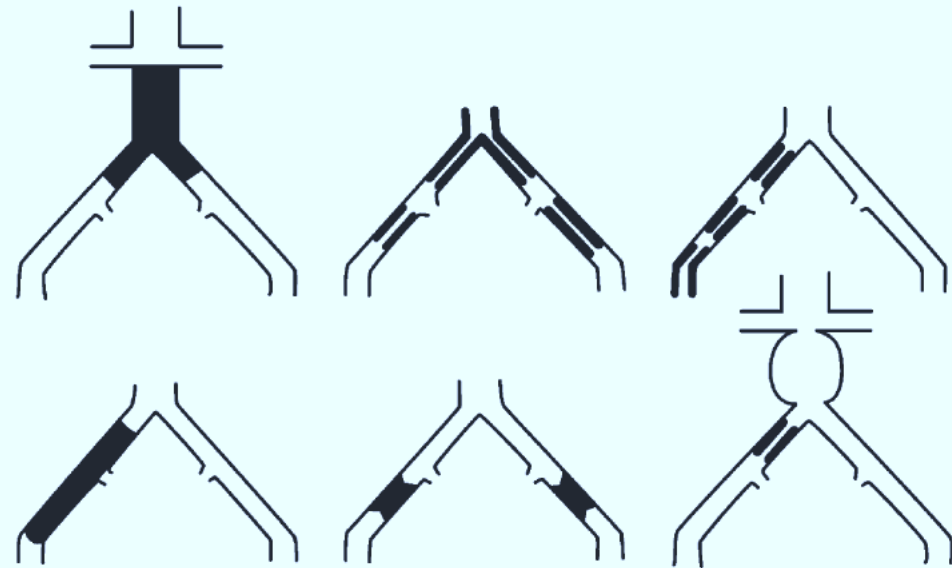
## Type C lesions

- Bilateral CIA occlusions
- Bilateral EIA stenoses 3–10 cm long not extending into the CFA
- Unilateral EIA stenosis extending into the CFA
- Unilateral EIA occlusion that involves the origins of internal iliac and/or CFA
- Heavily calcified unilateral EIA occlusion with or without involvement of origins of internal iliac and/or CFA



## Type D lesions

- Infra-renal aortoiliac occlusion
- Diffuse disease involving the aorta and both iliac arteries requiring treatment
- Diffuse multiple stenoses involving the unilateral CIA, EIA, and CFA
- Unilateral occlusions of both CIA and EIA
- Bilateral occlusions of EIA
- Iliac stenoses in patients with AAA requiring treatment and not amenable to endograft placement or other lesions requiring open aortic or iliac surgery



**Fig. F1.** TASC classification of aorto-iliac lesions. CIA – common iliac artery; EIA – external iliac artery; CFA – common femoral artery; AAA – abdominal aortic aneurysm.

**Table 6** Lesion classification according to the TransAtlantic Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II)

Aorto-iliac lesions	
Lesion type	Description
Type A	<ul style="list-style-type: none"> <li>- Unilateral or bilateral stenosis of CIA</li> <li>- Unilateral or bilateral single short (<math>\leq 3</math> cm) stenosis of EIA</li> </ul>
Type B	<ul style="list-style-type: none"> <li>- Short (<math>\leq 3</math> cm) stenosis of infrarenal aorta</li> <li>- Unilateral CIA occlusion</li> <li>- Single or multiple stenosis totaling 3-10 cm involving the EIA not extending into the CFA</li> <li>- Unilateral EIA occlusion not involving the origins of internal iliac or CFA</li> </ul>
Type C	<ul style="list-style-type: none"> <li>- Bilateral CIA occlusions</li> <li>- Bilateral EIA stenoses 3-10 cm long not extending into the CFA</li> <li>- Unilateral EIA stenosis extending into the CFA</li> <li>- Unilateral EIA occlusion that involves the origins of internal iliac and/or CFA</li> <li>- Heavily calcified unilateral EIA occlusion with or without involvement of origins of internal iliac and/or CFA</li> </ul>
Type D	<ul style="list-style-type: none"> <li>- Infra-renal aorto-iliac occlusion</li> <li>- Diffuse disease involving the aorta and both iliac arteries requiring treatment</li> <li>- Diffuse multiple stenosis involving the unilateral CIA, EIA and CFA</li> <li>- Unilateral occlusions of both CIA and EIA</li> <li>- Bilateral occlusions of EIA</li> <li>- Iliac stenosis in patients with AAA requiring treatment and not amenable to endograft placement or other lesions requiring open aortic or iliac surgery</li> </ul>

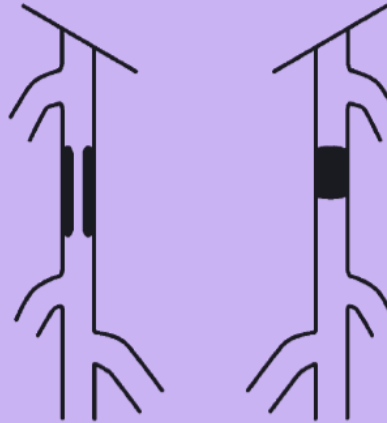
Femoral-popliteal lesions	
Lesion type	Description
Type A	<ul style="list-style-type: none"> <li>- Single stenosis <math>\leq 10</math> cm in length</li> <li>- Single occlusion <math>\leq 5</math> cm in length</li> </ul>
Type B	<ul style="list-style-type: none"> <li>- Multiple lesions (stenoses or occlusions), each <math>\leq 5</math> cm</li> <li>- Single stenosis or occlusion <math>\leq 15</math> cm not involving the infra geniculate popliteal artery</li> <li>- Single or multiple lesions in the absence of continuous tibial vessels to improve inflow for a distal bypass</li> <li>- Heavily calcified occlusion <math>\leq 5</math> cm in length</li> <li>- Single popliteal stenosis</li> </ul>
Type C	<ul style="list-style-type: none"> <li>- Multiple stenoses or occlusions totaling <math>&gt; 15</math> cm with or without heavy calcifications</li> <li>- Recurrent stenoses or occlusions that need treatment after two endovascular interventions</li> </ul>
Type D	<ul style="list-style-type: none"> <li>- Chronic total occlusion of CFA or SFA (<math>&gt; 20</math> cm, involving the popliteal artery)</li> <li>- Chronic total occlusion of popliteal artery and proximal trifurcation vessels</li> </ul>

AAA = abdominal aortic aneurysm; CFA = common femoral artery;  
 CIA = common iliac artery; EIA = external iliac artery; SFA = superficial femoral artery.

After Norgren *et al.*<sup>6</sup> with permission.

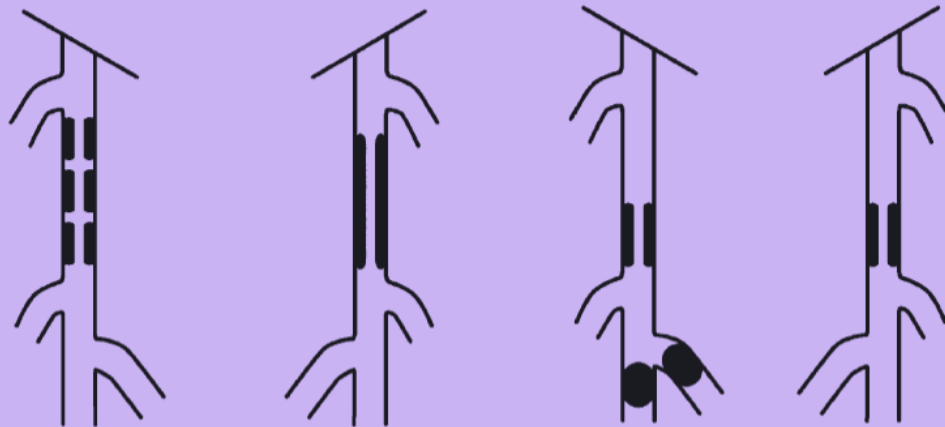
Type A lesions

- Single stenosis  $\leq 10$  cm in length
- Single occlusion  $\leq 5$  cm in length



Type B lesions:

- Multiple lesions (stenoses or occlusions), each  $\leq 5$  cm
- Single stenosis or occlusion  $\leq 15$  cm not involving the infrageniculate popliteal artery
- Single or multiple lesions in the absence of continuous tibial vessels to improve inflow for a distal bypass
- Heavily calcified occlusion  $\leq 5$  cm in length
- Single popliteal stenosis



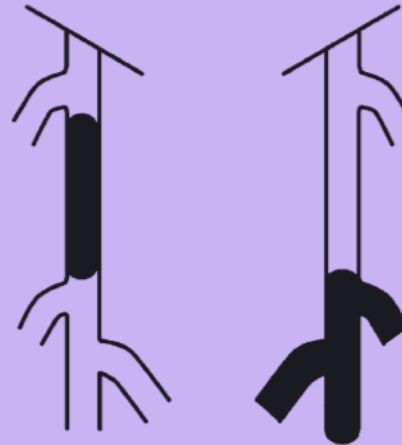
### Type C lesions

- Multiple stenoses or occlusions totaling >15 cm with or without heavy calcification
- Recurrent stenoses or occlusions that need treatment after two endovascular interventions



### Type D lesions

- Chronic total occlusions of CFA or SFA (>20 cm, involving the popliteal artery)
- Chronic total occlusion of popliteal artery and proximal trifurcation vessels



**Fig. F2.** TASC classification of femoral popliteal lesions. CFA – common femoral artery; SFA – superficial femoral artery.

## Recommendations for revascularization in patients with infrapopliteal lesions

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
When revascularization in the infrapopliteal segment is indicated, the endovascular-first strategy should be considered.	<b>IIa</b>	<b>C</b>
For infrapopliteal lesions, angioplasty is the preferred technique, and stent implantation should be considered only in the case of insufficient PTA.	<b>IIa</b>	<b>C</b>

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

PTA = percutaneous transluminal angioplasty.

t  
f  
e  
f  
t  
o  
e  
r  
-  
r  
6  
f  
;  
-  
y  
-  
i  
y  
e  
7

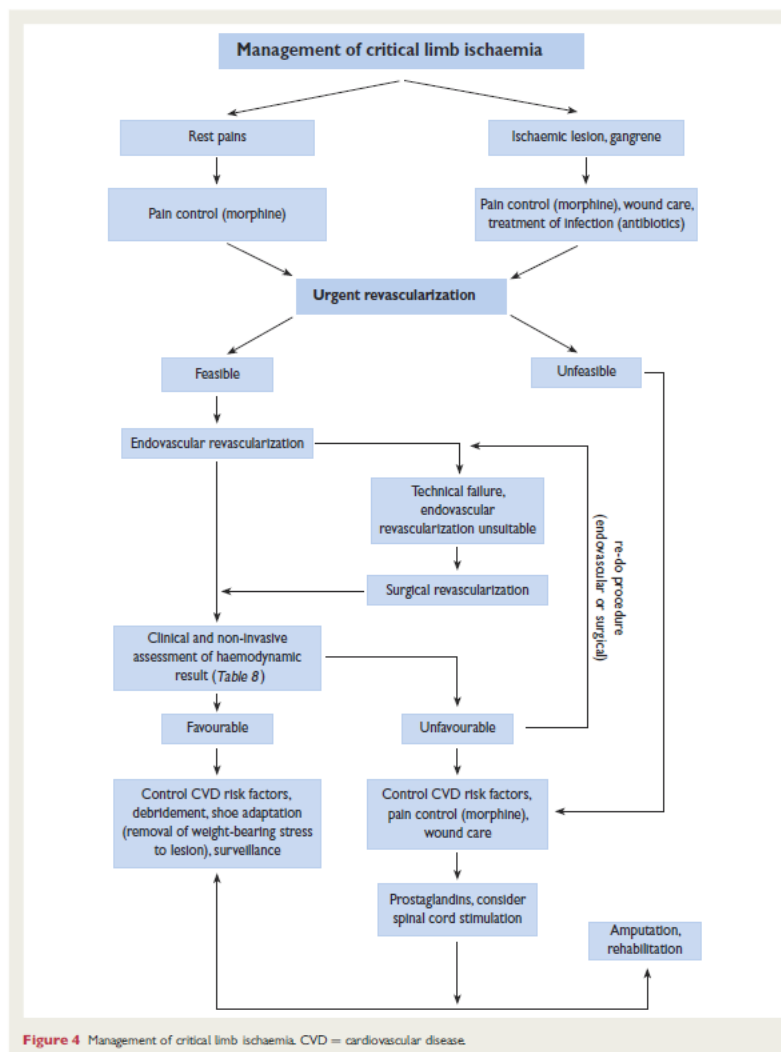
### Recommendations for the management of critical limb ischaemia

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
For limb salvage, revascularization is indicated whenever technically feasible.	I	A	302, 331, 336
When technically feasible, endovascular therapy may be considered as the first-line option.	IIb	B	302, 331
If revascularization is impossible, prostanoids may be considered.	IIb	B	338, 339

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

<sup>c</sup>References.





**Table 2** TASC classification of morphologic stratification of infra-popliteal lesions

---

TASC type A

Single stenoses shorter than 1 cm in the tibial or peroneal vessels

TASC type B

Multiple focal stenoses of the tibial or peroneal vessel, each less than 1 cm in length

One or two focal stenoses, each less than 1 cm long at the tibial trifurcation

Short tibial or peroneal stenosis in conjunction with femoropopliteal PTA

TASC type C

Stenoses 1–4 cm in length

Occlusions 1–2 cm in length of the tibial or peroneal vessels

Extensive stenoses of the tibial trifurcation

TASC type D

Tibial or peroneal occlusions longer than 2 cm

Diffusely diseased tibial or peroneal vessels

---

*TASC* TransAtlantic InterSociety Consensus

# Les recommandations sont en retard dans le cas de l'ischémie critique

- Aujourd'hui le traitement endovasculaire est le premier choix thérapeutique chez les patients avec une ischémie critique
- Cela est le cas même pour les lésions de type C et D d'autant plus quand n' existe pas de conduits veineux