

STANDARD TREATMENT WORKFLOW (STW)

ACUTE LIMB ISCHEMIA

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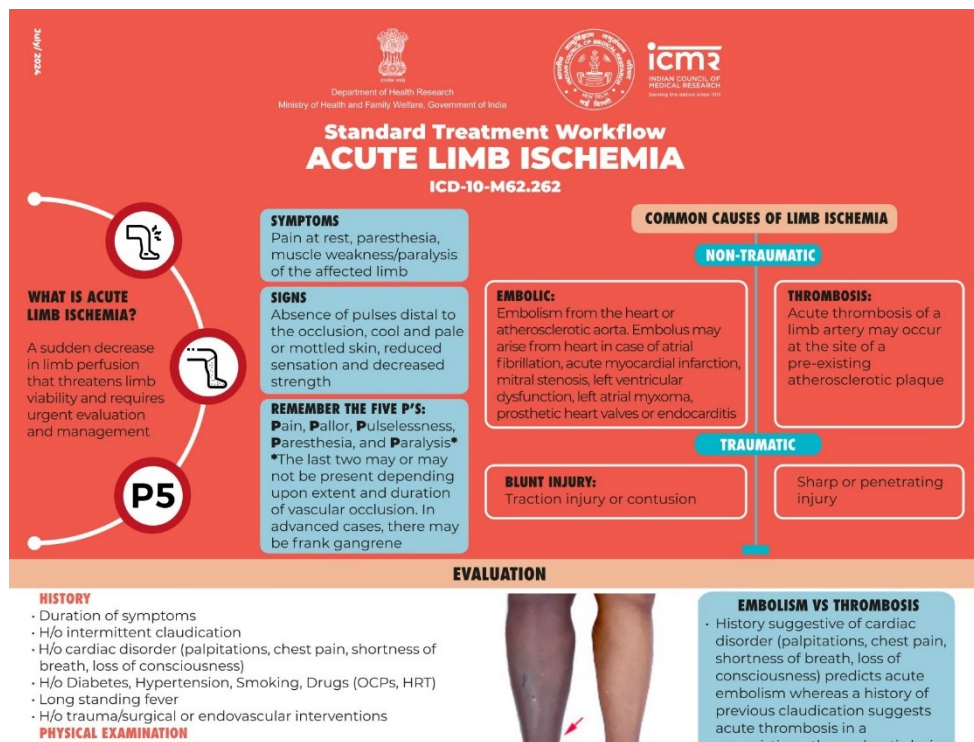
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Standard Treatment Workflow ACUTE LIMB ISCHEMIA

ICD-10-M62.262

WHAT IS ACUTE LIMB ISCHEMIA?

A sudden decrease in limb perfusion that threatens limb viability and requires urgent evaluation and management

P5

SYMPTOMS

Pain at rest, paresthesia, muscle weakness/paralysis of the affected limb

SIGNS

Absence of pulses distal to the occlusion, cool and pale or mottled skin, reduced sensation and decreased strength

REMEMBER THE FIVE P'S:
Pain, Pallor, Pulselessness, Paresthesia, and Paralysis*
*The last two may or may not be present depending upon extent and duration of vascular occlusion. In advanced cases, there may be frank gangrene

COMMON CAUSES OF LIMB ISCHEMIA

NON-TRAUMATIC

EMBOLIC:

Embolism from the heart or atherosclerotic aorta. Embolus may arise from heart in case of atrial fibrillation, acute myocardial infarction, mitral stenosis, left ventricular dysfunction, left atrial myxoma, prosthetic heart valves or endocarditis

THROMBOSIS:

Acute thrombosis of a limb artery may occur at the site of a pre-existing atherosclerotic plaque

TRAUMATIC

BLUNT INJURY:

Traction injury or contusion

Sharp or penetrating injury

EVALUATION

HISTORY


- Duration of symptoms
- H/o intermittent claudication
- H/o cardiac disorder (palpitations, chest pain, shortness of breath, loss of consciousness)
- H/o Diabetes, Hypertension, Smoking, Drugs (OCPs, HRT)
- Long standing fever
- H/o trauma/surgical or endovascular interventions

PHYSICAL EXAMINATION

- Blood Pressure
- All peripheral pulses
- Condition of the limb: temperature, colour, hair loss, nail bed capillary filling, sensation and motor power, gangrene/pre-gangrene
- Cardiac Murmurs
- Wound Inspection
- Bone injury/Nerve injury in case of traumatic ischemia

DUPLEX ULTRASOUND/DOPPLER FOR ARTERIES AND VEINS

Doppler examination is helpful in evaluation of flow in the arteries and veins and condition of arterial wall



**Right Limb Discolouration
Acute Limb Ischaemia**

EMBOLISM VS THROMBOSIS

- History suggestive of cardiac disorder (palpitations, chest pain, shortness of breath, loss of consciousness) predicts acute embolism whereas a history of previous claudication suggests acute thrombosis in a pre-existing atherosclerotic lesion
- Doppler evaluation can differentiate between hypoechoic thrombus in otherwise normal and distended blood vessel (suggestive of acute embolism) and heterogeneous echogenic plaque with multiple areas of calcification (thrombosis in artery with atherosclerotic plaque)

STAGES OF ACUTE LIMB ISCHEMIA					
STAGE	DESCRIPTION AND PROGNOSIS	SENSORY LOSS	MUSCLE WEAKNESS	ARTERIAL DOPPLER	VENOUS DOPPLER
I	Limb viable, not immediately threatened	None	None	Audible	Audible
IIa	Limb marginally threatened, salvageable if promptly treated	Minimal (toes) or none	None	Audible	Audible
IIb	Limb immediately threatened, salvageable with immediate revascularization	More than toes, associated with rest pain	Mild or moderate	Usually inaudible	Audible
III	Limb irreversibly damaged, major tissue loss or permanent nerve damage inevitable	Profound, anaesthetic	Profound, paralysis (rigor)	Inaudible	Inaudible

MANAGEMENT OF TRAUMATIC ACUTE LIMB ISCHEMIA

A. SHARP/PENETRATING INJURY

- Control bleeding by applying pressure bandage over the wound
- Resuscitation
- Vascular repair (Stage I, IIa, IIb ischemia), Amputation (Stage III ischemia)
- Concomitant bone/nerve injury should be managed simultaneously
- Supportive treatment, pain relief/antibiotic prophylaxis/tetanus prophylaxis

B. BLUNT INJURY: TRACTION INJURY OR CONTUSION

- Vascular repair (Stage I, IIa, IIb ischemia), Amputation (Stage III ischemia)
- Concomitant bone/nerve injury should be managed simultaneously
- Supportive treatment, pain relief/antibiotic prophylaxis

MANAGEMENT OF NON-TRAUMATIC ACUTE LIMB ISCHEMIA

Injection Heparin 100 units/Kg Intravenous

EVALUATION

EMBOLISM

Stage I, IIa, IIb

Surgical Embolectomy/Catheter directed Thrombolysis (send retrieved thrombus for microscopic/microbiological /histopathological examination)

Investigate the cause of embolism (cardiac/aortic) and manage accordingly

THROMBOSIS

Stage I, IIa, IIb

Thrombolysis/Heparinization

Radiological imaging (CT angiography, MR angiography, catheter angiography)

Surgical/Endovascular Revascularization

CONTRAINDICATIONS TO THROMBOLYSIS

- Established cerebrovascular event (excluding TIA within previous 2 months)
- Active bleeding diathesis
- Recent gastrointestinal bleeding (within previous 10 days)
- Neurosurgery (intracranial, spinal) within previous 3 months
- Intracranial trauma within previous 3 months

POST REVASCUARIZATION

COMPARTMENT SYNDROME

- Can occur in Stage II ischemia due to revascularization edema
- Symptoms:** Severe pain, hypoesthesia and weakness of the affected limb
- Lab:** Myoglobinuria and elevation of the creatine kinase level
- Four-compartment fasciotomy to be performed when there is even an iota of doubt

REPERFUSION INJURY

- Revascularization in advanced ischemia can also cause hyperkalemia, acidosis, myoglobinuria and cardiopulmonary depression
- Patients require monitoring, proper hydration

ABBREVIATIONS

CT: Computed Tomography HRT: Hormone Replacement Therapy OCPs: Oral Contraceptive Pills TIA: Transient Ischaemic Attack

REFERENCES

- Biswak N, Earmshav JJ, Acosta S, Beates Gonçalves F, Cochenne F, Debus ES, Hinchiffe B, Jongkird V, Koestemay HZW, Merynel G, Svetilovsk AV, Tahomba V, Van Den Berg JC, Easo Guidelines Committee, de Borst GJ, Chahra N, Kakkos SK, Koncar I, Lindholt JS, Tuliani R, Vega de Cienega M, Verstraeten F. Documenta Senologica, Bologna 39; Mori K, Aizumi N, Chohe ETC, Chohan T, Pristiga RA, Forbes TL, Hamada MS, Murad A, Noller-Hülbeck S, Shi K. Editor's Choice - European Society for Vascular Surgery (ESVS) 2020 Clinical Practice Guidelines on the Management of Acute Limb Ischaemia, Eur J Vasc Endovasc Surg. 2020 Feb;59(2):175-206. doi: 10.1016/j.ejvs.2019.09.006. Epub 2019 Dec 31. PMID: 31899209.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES