SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai

DEPARTMENT OF CARDIAC TECHNOLOGY

COURSE NAME : CF & BLS

UNIT : 1

TOPIC : RAYNAUD'S PHENOMENON

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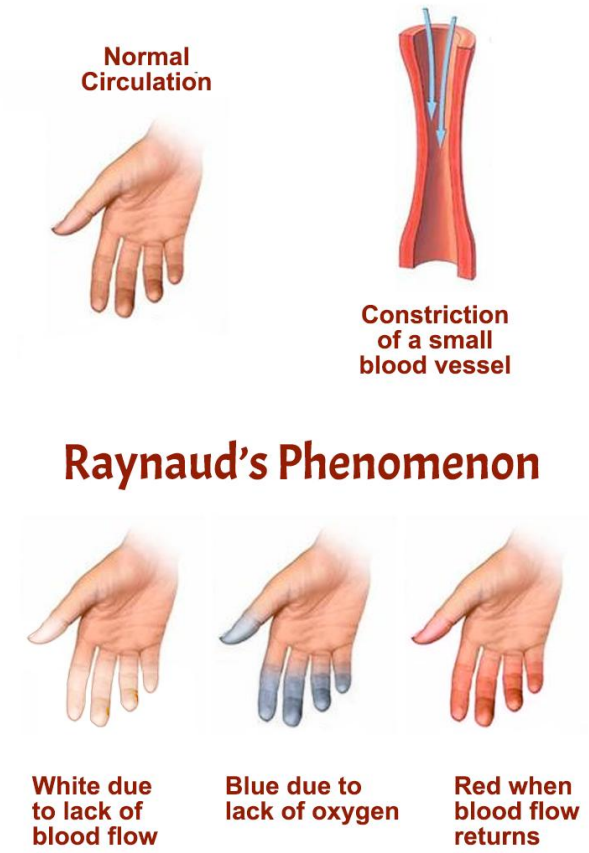
What is Raynaud's Phenomenon?

- Episodic vasospasm of small arteries & arterioles of fingers/toes
- Triggered by cold or emotional stress
- Triphasic color change (not always present):

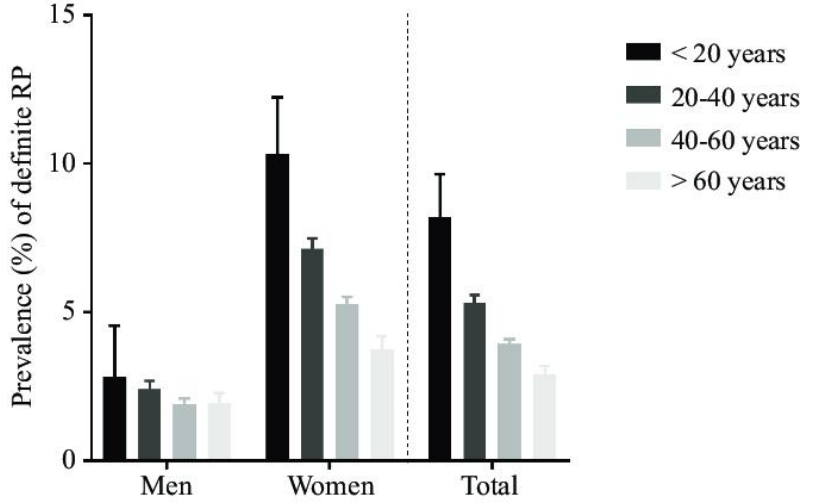
1. Pallor (white) → ischemia
2. Cyanosis (blue) → deoxygenation
3. Rubor (red) → reactive hyperemia

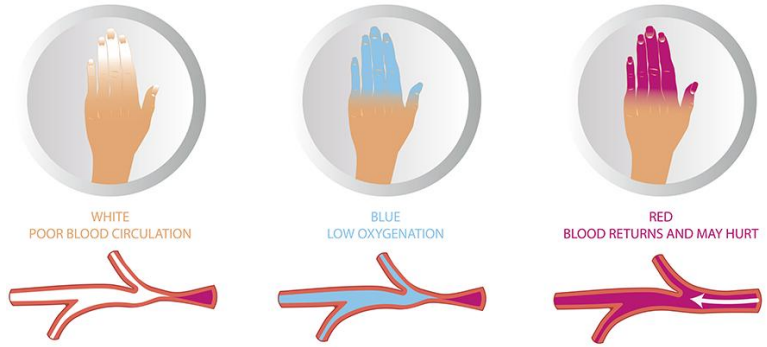
- First described by Maurice Raynaud in 1862



Epidemiology

- Prevalence: 3–20% in general population
- Primary Raynaud's: 80–90% of cases
- Female : Male = 9:1 (primary)
- Onset usually 15–30 years (primary)
- Secondary: older onset, more severe





Classification

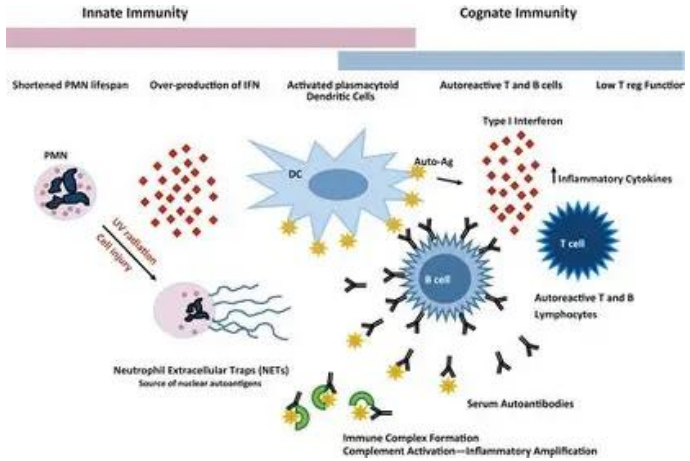
Feature	Primary Raynaud's	Secondary Raynaud's
Age of onset	<30–40 years	>30–40 years
Symmetry	Symmetric	Often asymmetric
Severity	Mild	Severe, digital ulcers, gangrene
Autoantibodies	Negative	Positive (ANA, ENA, etc.)
Capillaroscopy	Normal	Abnormal (SD pattern, scleroderma)
Associated disease	None	Connective tissue diseases, etc.

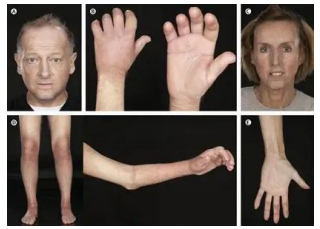
Common Causes of Secondary Raynaud's

- Connective tissue diseases (90% of secondary cases)

1. Systemic sclerosis (SSc) – strongest association
2. SLE, Sjögren's, mixed CTD, dermatomyositis

- Vibration injury (vibration white finger)
- Drugs: β-blockers, ergotamine, amphetamines, vinblastine
- Hypothyroidism, cryoglobulinemia, malignancy

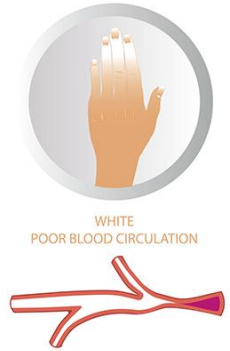


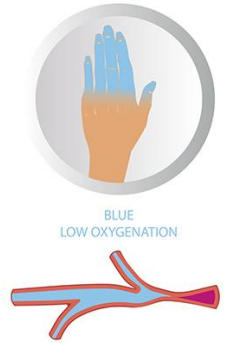


Clinical Features – Classic Triad

1. Pallor (white) → fingers/toes turn dead white
2. Cyanosis (blue) → dusky bluish hue
3. Hyperemia (red) → bright red flushing on rewarming

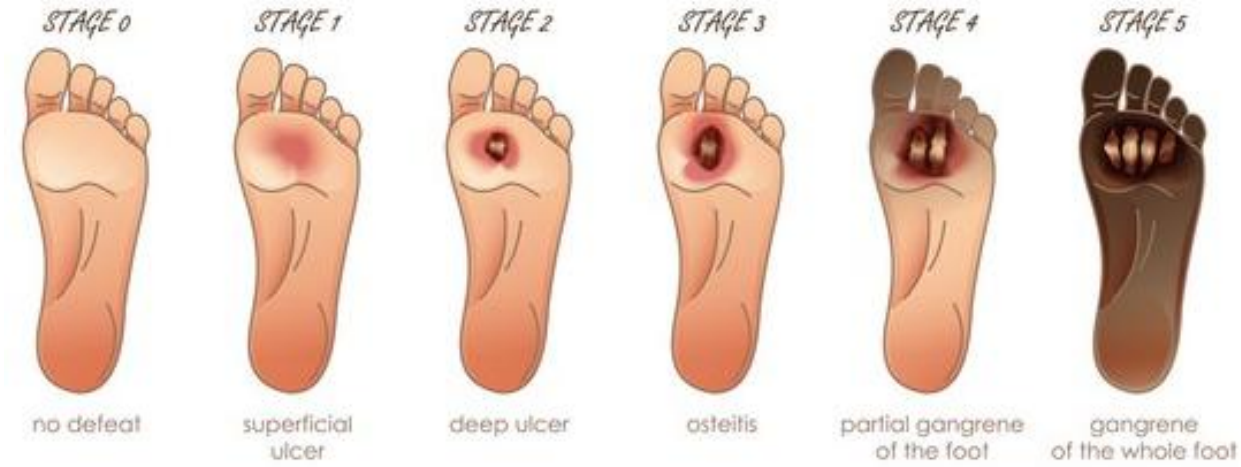
- Attacks last 5–30 minutes
- Numbness, tingling, burning pain on rewarming
- Spares the thumb in early disease



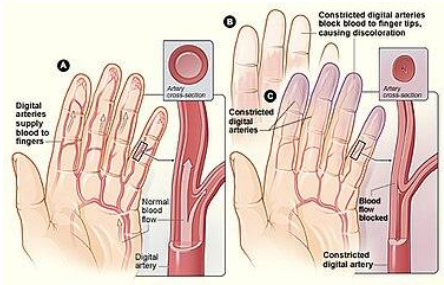


Severe Manifestations (Secondary)

- Critical ischemia
- Digital pitting scars
- Ulceration
- Gangrene & auto-amputation (rare)



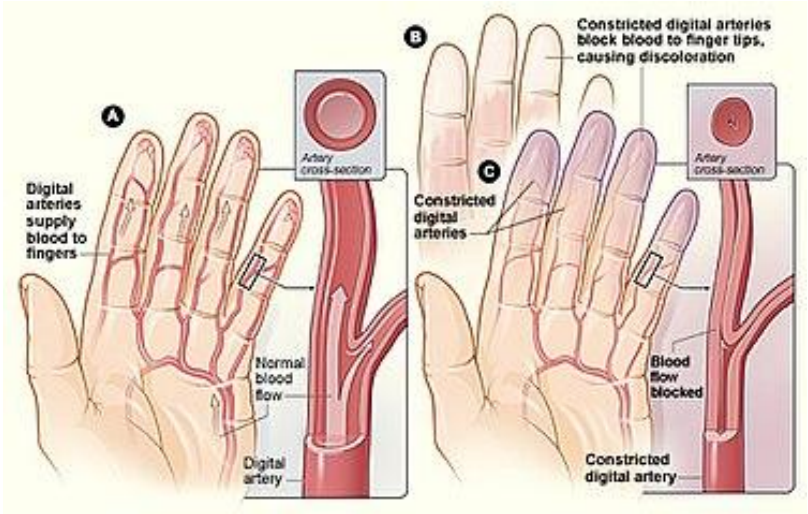
Diagnosis

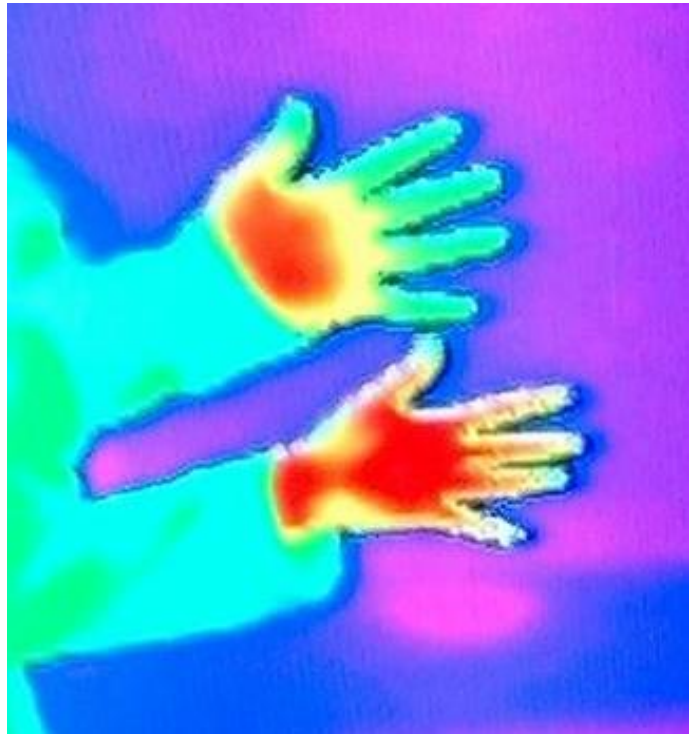


Clinical Criteria (Allen & Brown 1932, updated)

- Primary Raynaud's diagnosis requires ALL:
- Episodic biphasic or triphasic color changes triggered by cold/stress
- Symmetric involvement
- No evidence of tissue necrosis/ulceration
- No secondary cause on history/exam
- Normal nailfold capillaroscopy
- Negative or low-titer autoantibodies

Diagnosis





Three-step approach to diagnosis of Raynaud's Phenonmenon

Step 1: Ask screening Question

Are your fingers unusually sensitive to cold?

Yes, proceed to step 2

Step 2: Assess color changes

Occurence of biphasic color changes during the vasospastic episodes (white and blue)

Yes, proceed to step 3

Step 3: Calculate disease score

a) Episodes are triggered by things other than cold (i.e. emotional stressors)

b) Episodes involve both hands, even if the involvement is asynchronous and/or asymmetric

c) Episodes are accompanied by numbness and/or paresthesias

d) Observed color changes are often characterized by a well-demarcated border between affected and un-affected skin.

e) Patient provided photograph(s) strongly support a diagnosis of RP.

f) Episodes sometimes occur at other body sites (e.g. nose, ears, feet, and areolas).

g) Occurence of triphasic color changes during the vasospastic episodes (white, blue, red)

If 3 or more criteria met from Step 3 (a - g), then the patient has RP

Key Investigations

Test	Purpose	Typical Finding in Secondary
Full blood count	Anaemia, thrombocytopenia	May be abnormal
ESR/CRP	Inflammation	Raised
ANA (IF)	Screening for CTD	Positive ≥1:160 (SSc pattern)
ENA (anti-centromere, Scl-70, etc.)	Specific CTDs	Positive
Nailfold capillaroscopy	Gold standard for distinguishing primary vs secondary	Giant capillaries, avascular areas in SSc
Thermography	Objective documentation of attacks	Prolonged rewarming time

Management – Non-Pharmacological (First Line)

Patient education & lifestyle modification (cornerstone)

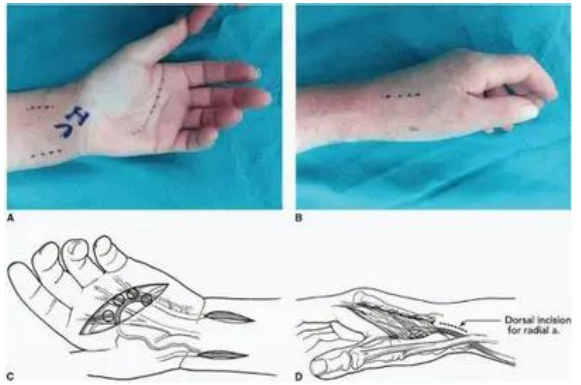
- Keep core body & extremities warm (gloves, hats, heated clothing)
- Avoid sudden cold exposure
- Stop smoking (vasoconstrictor)
- Minimize stress (biofeedback, relaxation techniques)
- Avoid trigger drugs (β-blockers, clonidine)

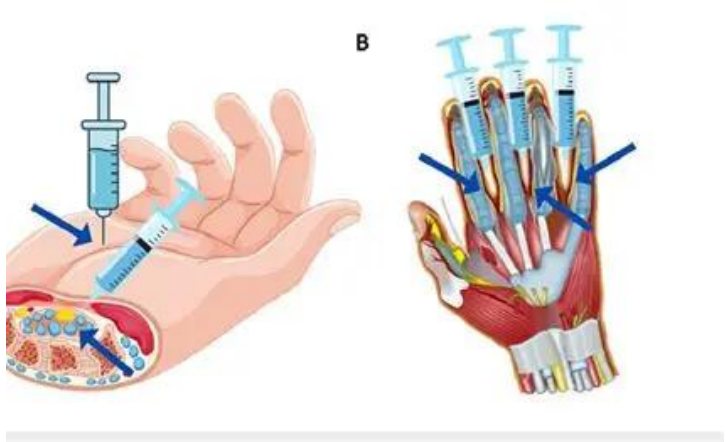
Pharmacological Treatment

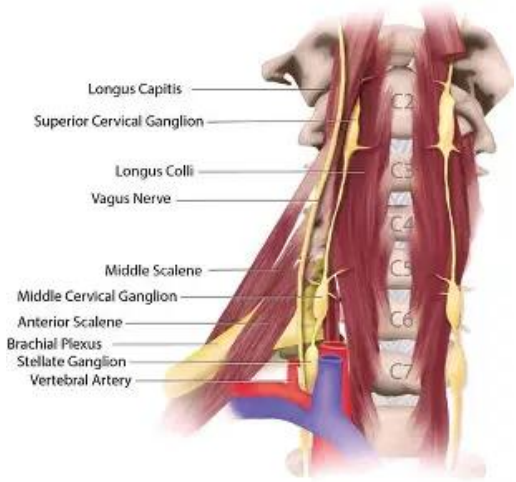
Indication	Drug of Choice	Dose	Notes
Mild–moderate (primary)	Calcium channel blockers	Nifedipine XL 30–90 mg/day	First-line, 70% response
Alternative/adjunct	Losartan (ARB)	50–100 mg/day	Better tolerated than CCBs
Refractory	PDE-5 inhibitors	Sildenafil 25–50 mg TDS	Especially in SSc with ulcers
Severe/refractory	IV Iloprost (prostacyclin)	0.5–2 ng/kg/min × 3–5 days	Gold standard for critical ischemia/ulcers
Refractory (rare)	Bosentan (endothelin antagonist)	62.5–125 mg BD	Prevents new digital ulcers in SSc

Surgical & Advanced Options

- Digital sympathectomy (last resort)
- Botulinum toxin injection into affected digits
- Cervical/thoracic sympathectomy (temporary benefit)
- Stem cell therapy (experimental)





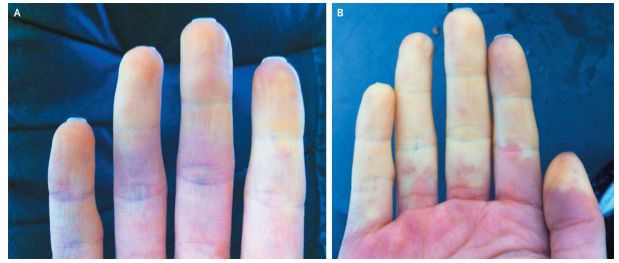


Prognosis

- Primary Raynaud's: benign, rarely progresses
- Secondary Raynaud's:

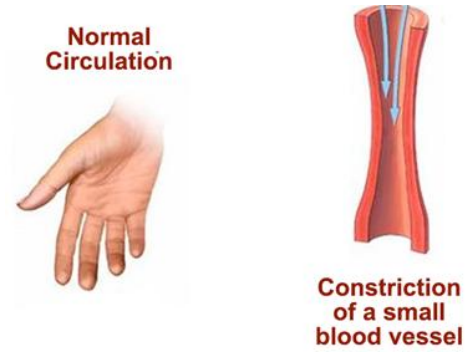
1. SSc patients: 50% develop ulcers within 10 yrs
2. 10-year risk of gangrene ~5–10% in severe SSc

- Early diagnosis + aggressive treatment of underlying CTD improves outcomes



Summary

- Raynaud's is common; most cases are primary & benign
- Asymmetric, severe, late-onset → investigate for secondary cause
- Nailfold capillaroscopy + ANA are the two most useful tests
- Lifestyle measures are first-line; CCBs are first drug
- Iloprost is the most effective therapy for critical ischemia/digital ulcers
- Treat the underlying disease in secondary Raynaud's



Reference

1. "What Is Raynaud's?". nhlbi.nih.gov. US: National Heart, Lung, and Blood Institute, National Institutes of Health. 21 March 2014. Archived from the original on 4 October 2016. Retrieved 1 October 2016.
2. "What Are the Signs and Symptoms of Raynaud's?". nhlbi.nih.gov. US: National Heart, Lung, and Blood Institute, National Institutes of Health. 21 March 2014. Archived from the original on 5 October 2016. Retrieved 1 October 2016.

THANK YOU