

Primary, secondary Raynaud's phenomenon and vibration induced white fingers: Are they all the same ?



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Raynaud's phenomenon

Its prevalence in the general population is difficult to estimate because the diagnostic criteria have not yet been standardized

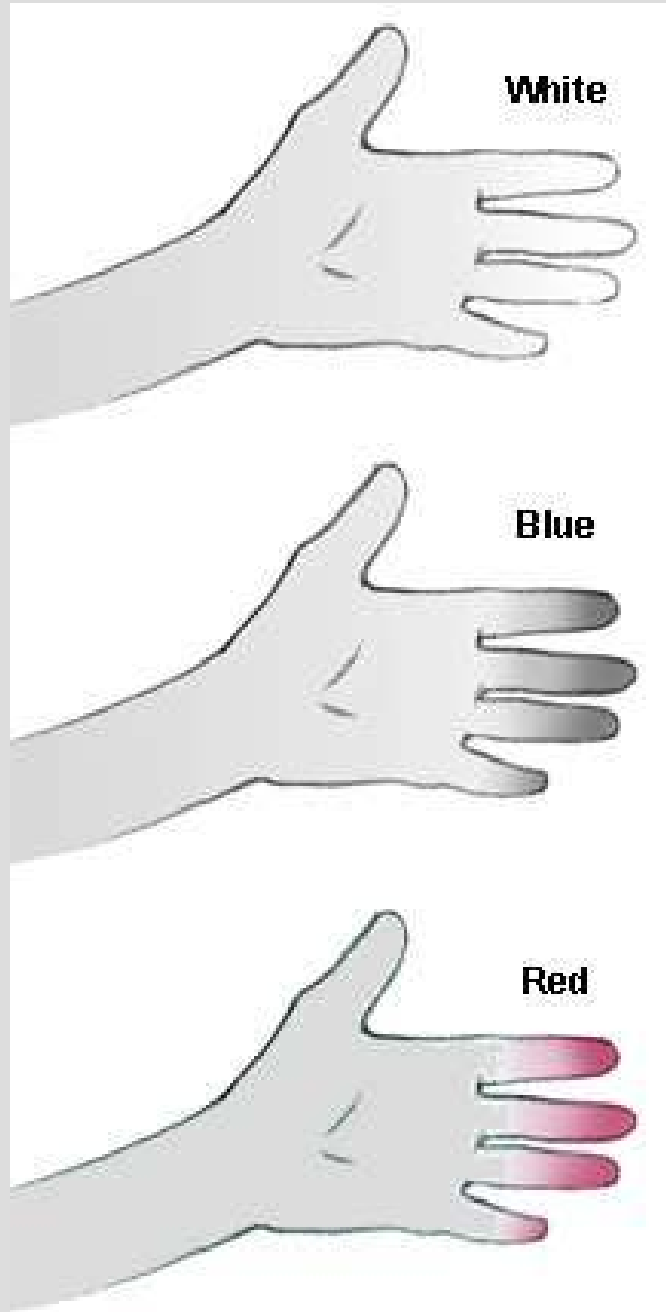
Generalized findings in Raynaud's syndrome

Coffman J. 1989. Raynaud's Phenomenon. Oxford University Press, New York

Colour changes

- 4 – 65% triphasic
- 14 – 40% biphasic
- 10 – 44% pallor or cyanosis only





- **Pallor**
arterial vasoconstriction

- **Cynosis**
venous congestion

- **Rubor**
reactive hyperemia



- Pallor
arterial vasoconstriction



- Cyanosis
venous congestion

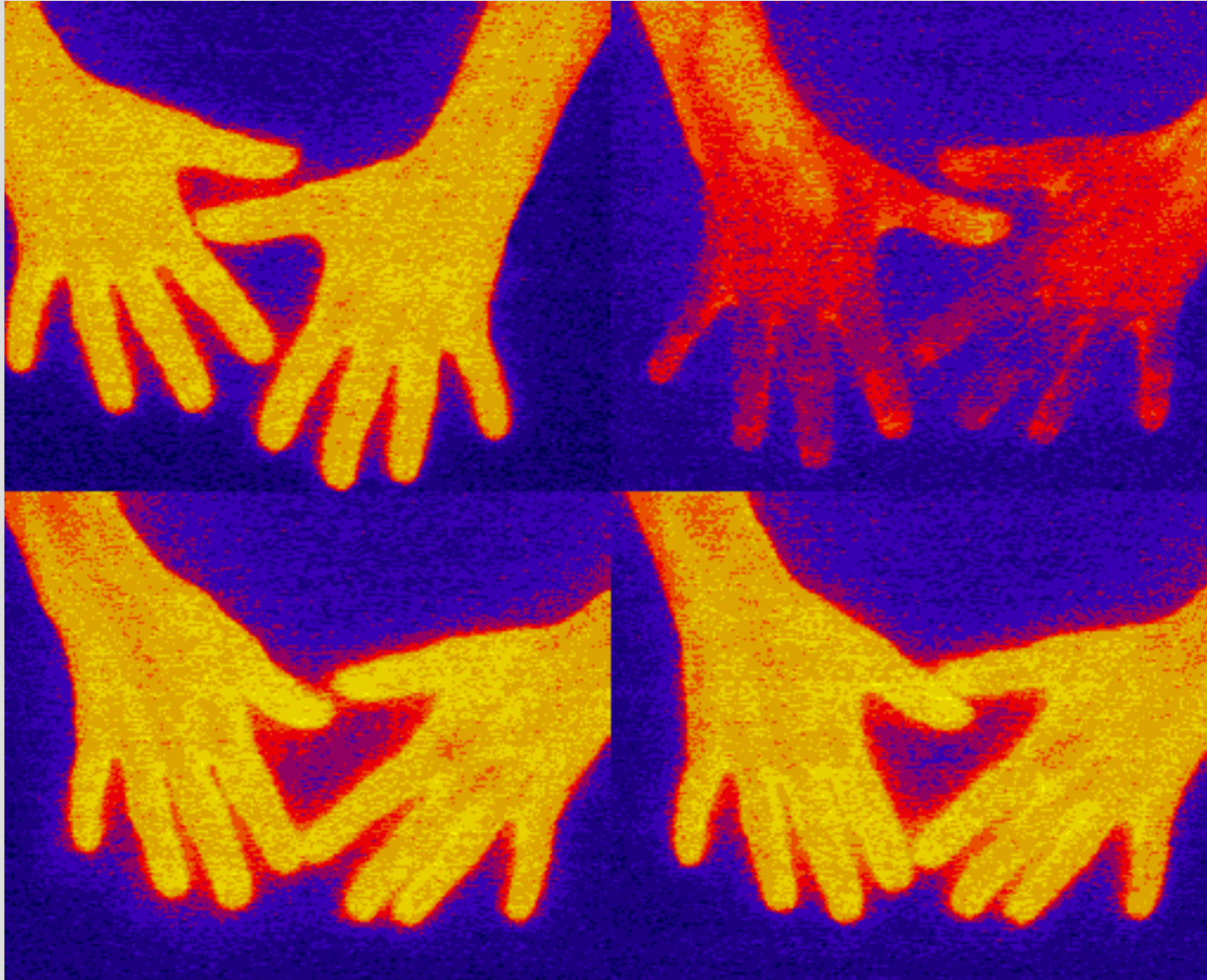


- Rubor
reactive hyperemia

Cold water challenge

- **Room temperature 24°C**
- **Acclimatization for 15 minutes with bare arms**
- **Immersion in 20°C water for 1 minute (wearing plastic gloves)**

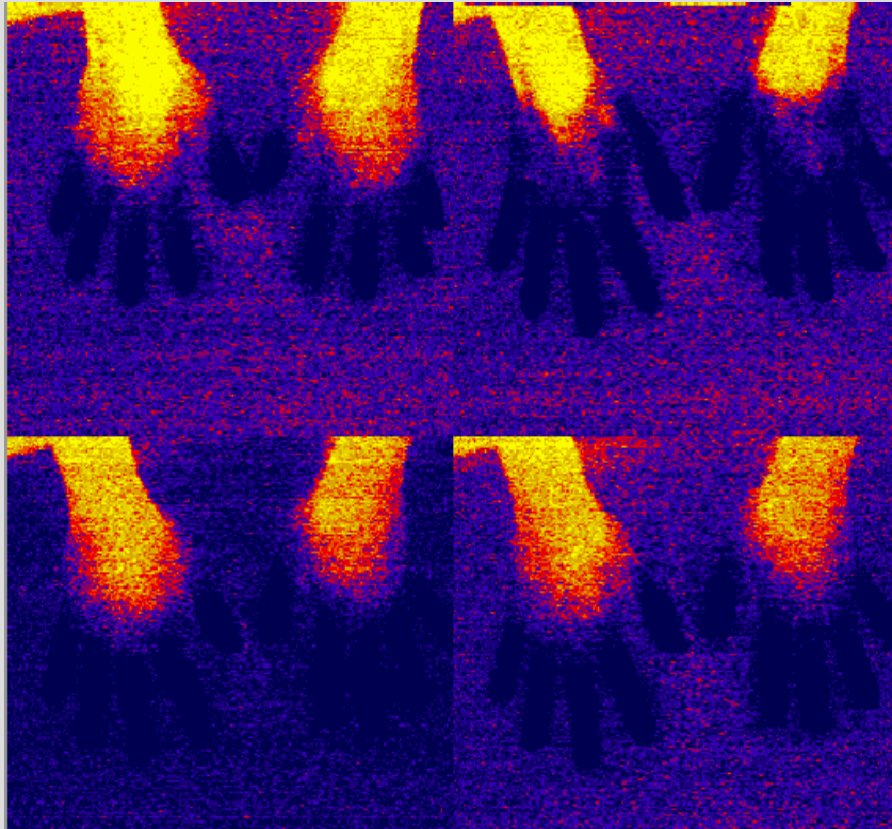
Normal temperature recovery



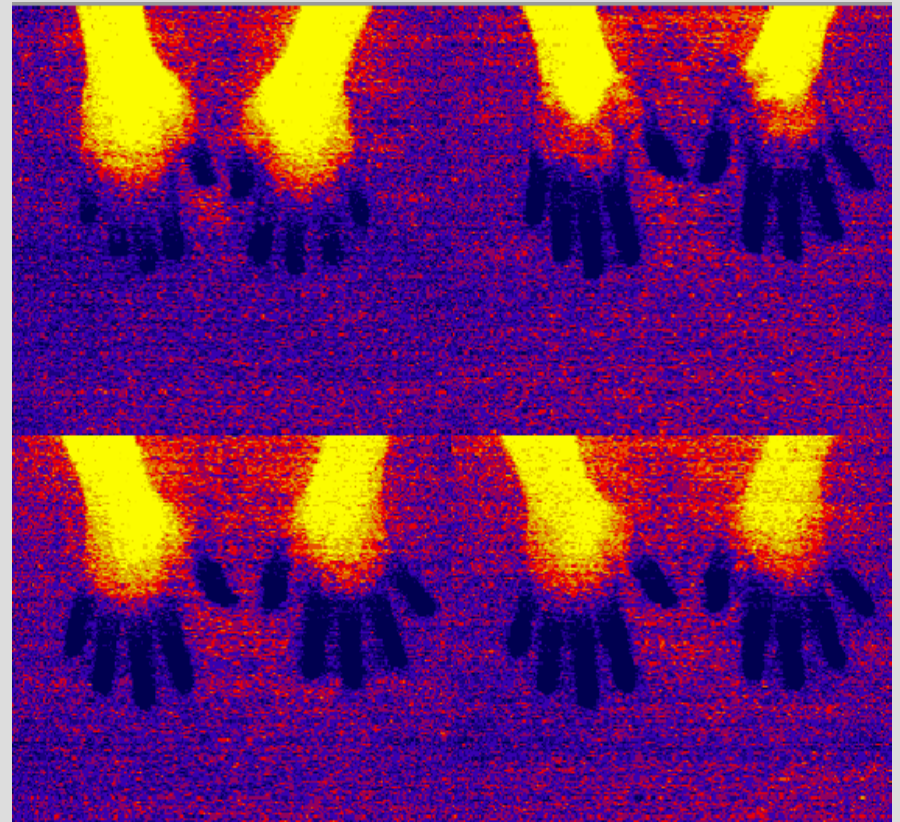
Primary Raynaud's (Allen & Brown 1932)

1. Vasospastic attacks precipitated by cold exposure or emotional stimuli
2. Bilateral involvement of the extremities
3. Absence of gangrene. If present, gangrene is limited to skin on the tips of fingers or toes
4. No evidence of underlying disease states that could be responsible for vasospastic attacks
5. History of symptoms for a minimum of 2 years

38 years, healthy subject, occasionally cold fingers
and cyanosis

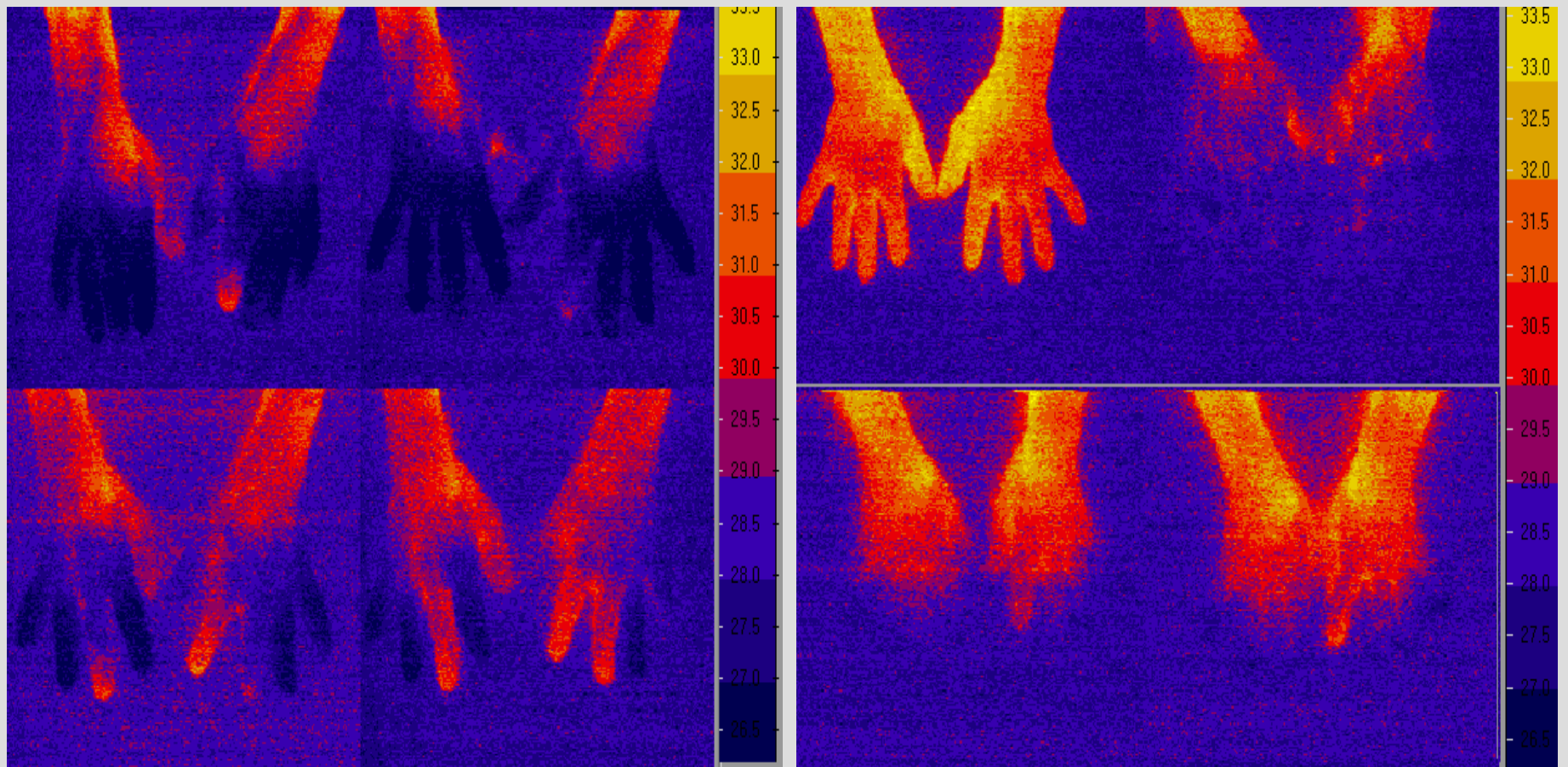


First image



1 week later

75 years, primary Raynaud's phenomenon



First image

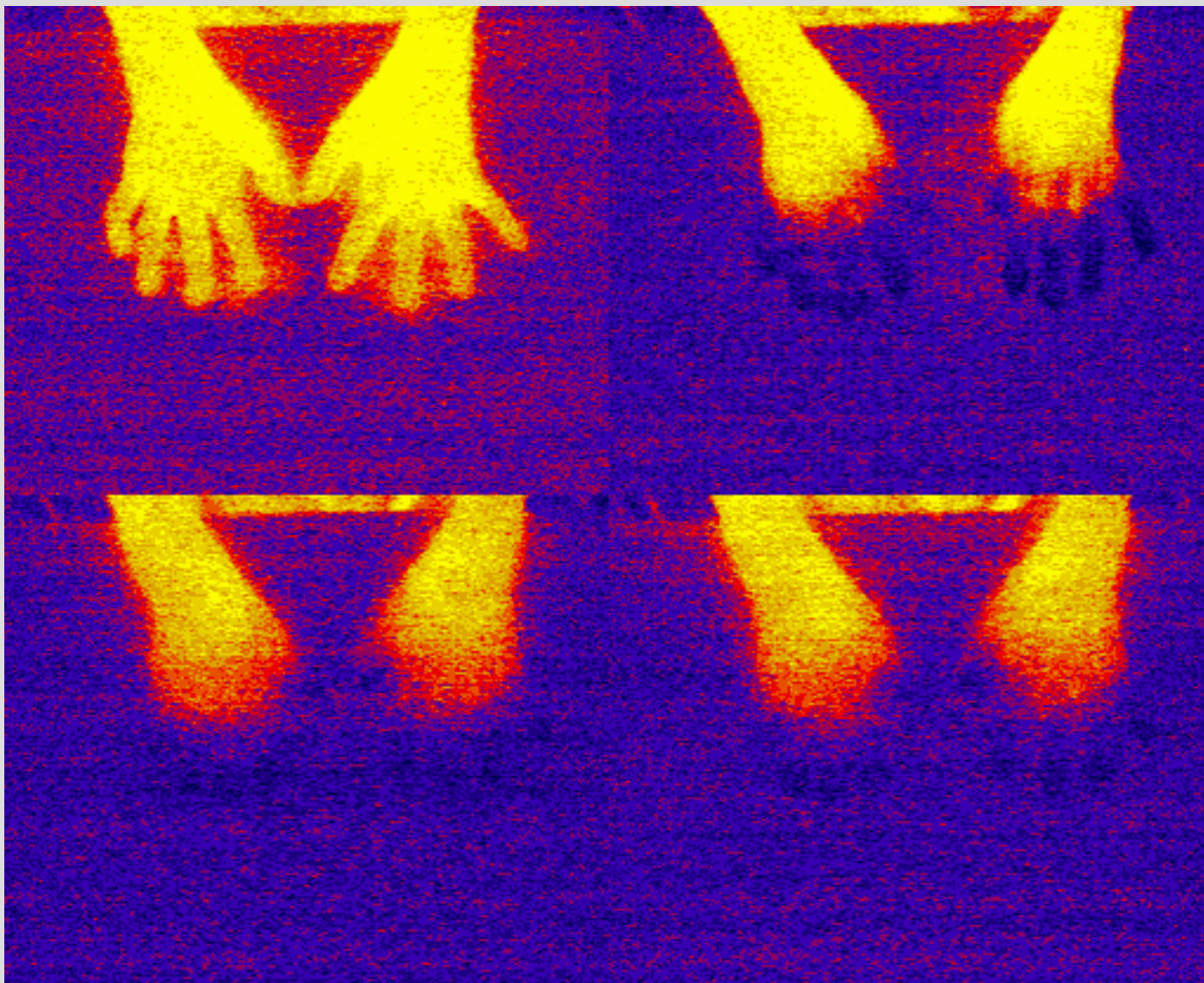
3 weeks later

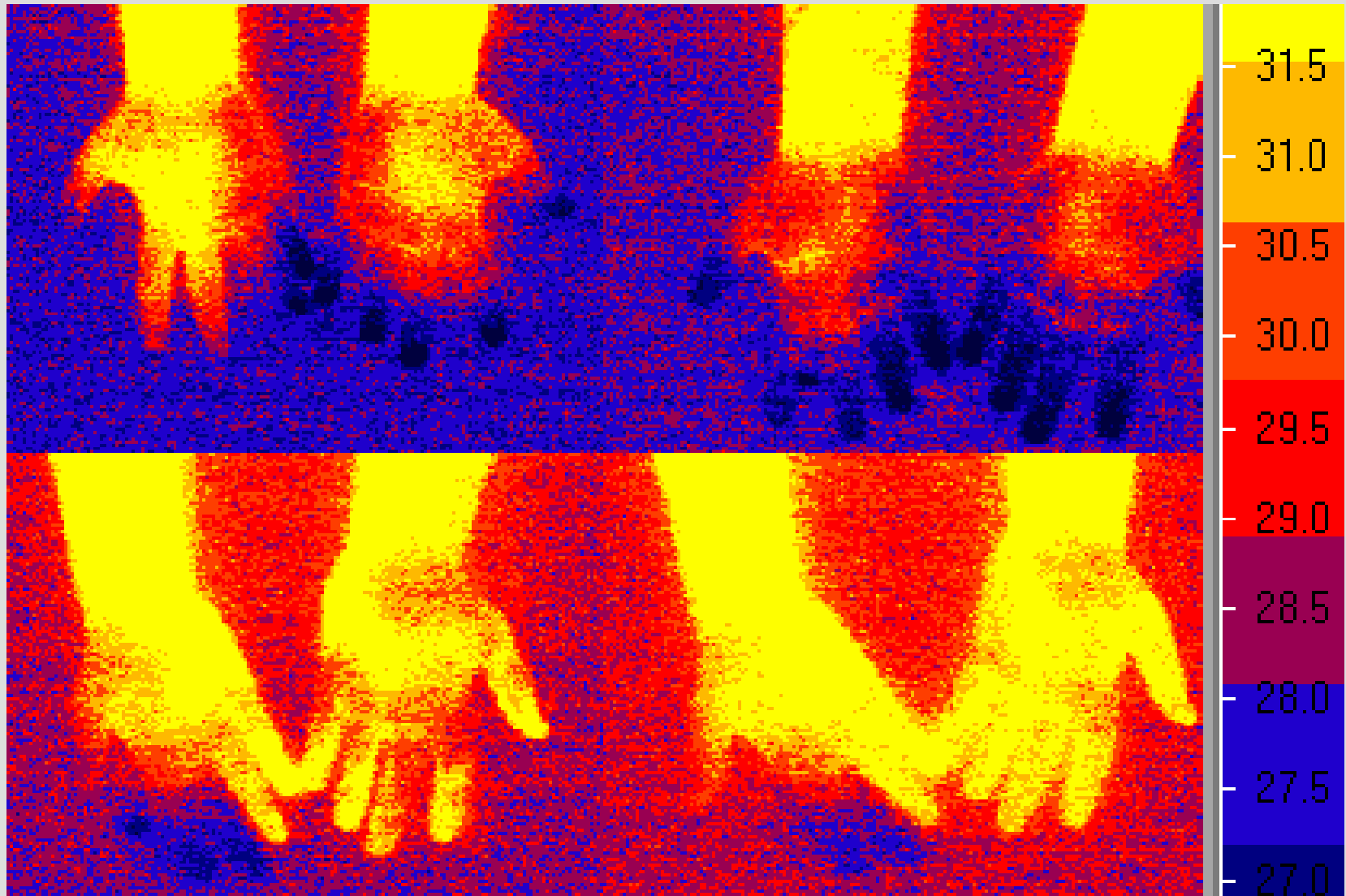
Secondary Raynaud's phenomenon

- **Periodic vasospastic attacks of pallor and cyanosis**
- **May be limited to single fingers**

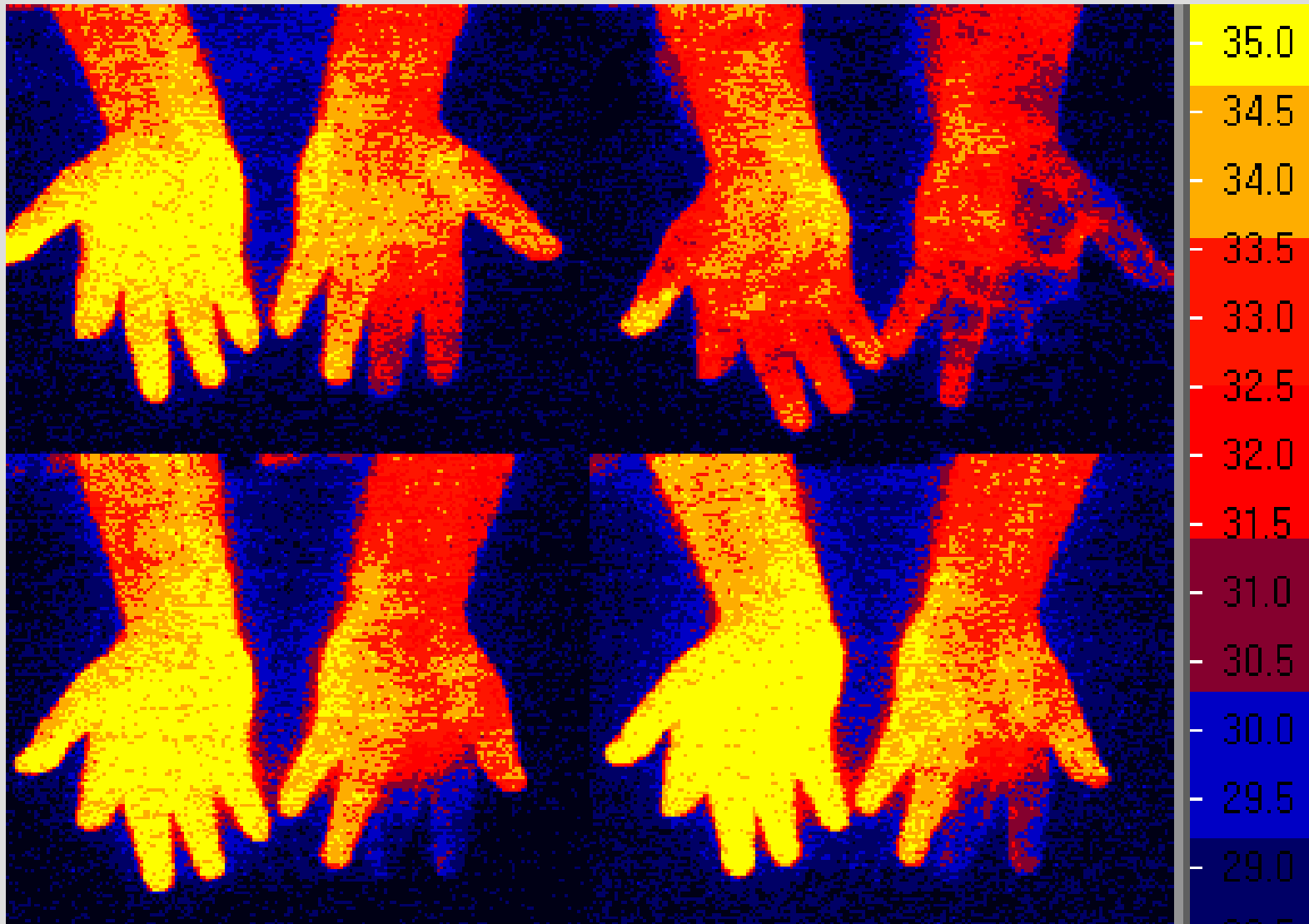
- **Abnormal nailfold capillary pattern**
- **Positive antinuclear antibody test**
- **Abnormal erythrocyte sedimentation rate**
- **Presence of pitting scars or ulcers of the skin, or gangrene in the fingers or toes**

Secondary Raynaud's (cold agglutinin)





Secondary Raynaud's ?
(traumatic lesion of the median nerve)

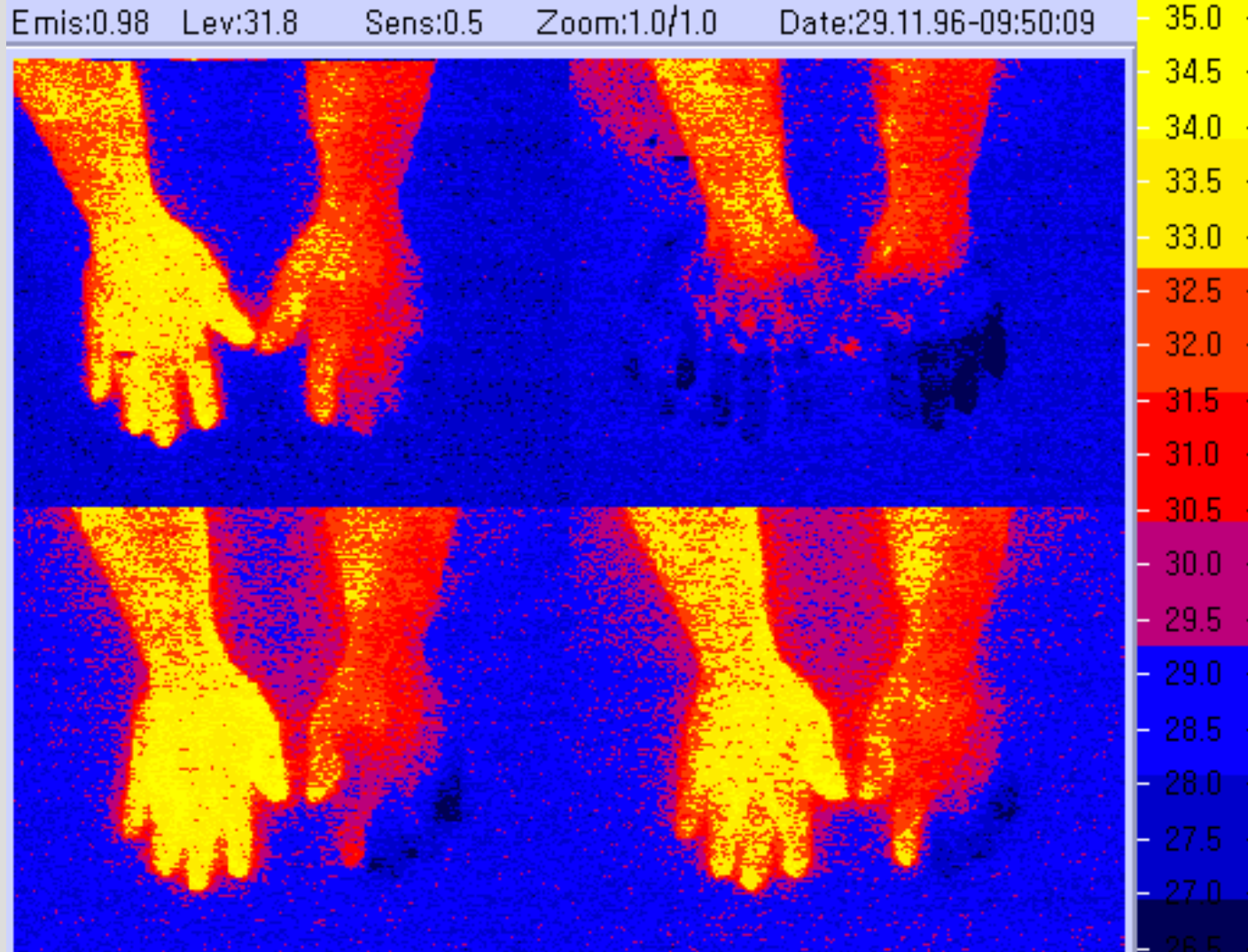


Secondary Raynaud's ?

(traumatic lesion of the median nerve)

Secondary Raynaud's ?

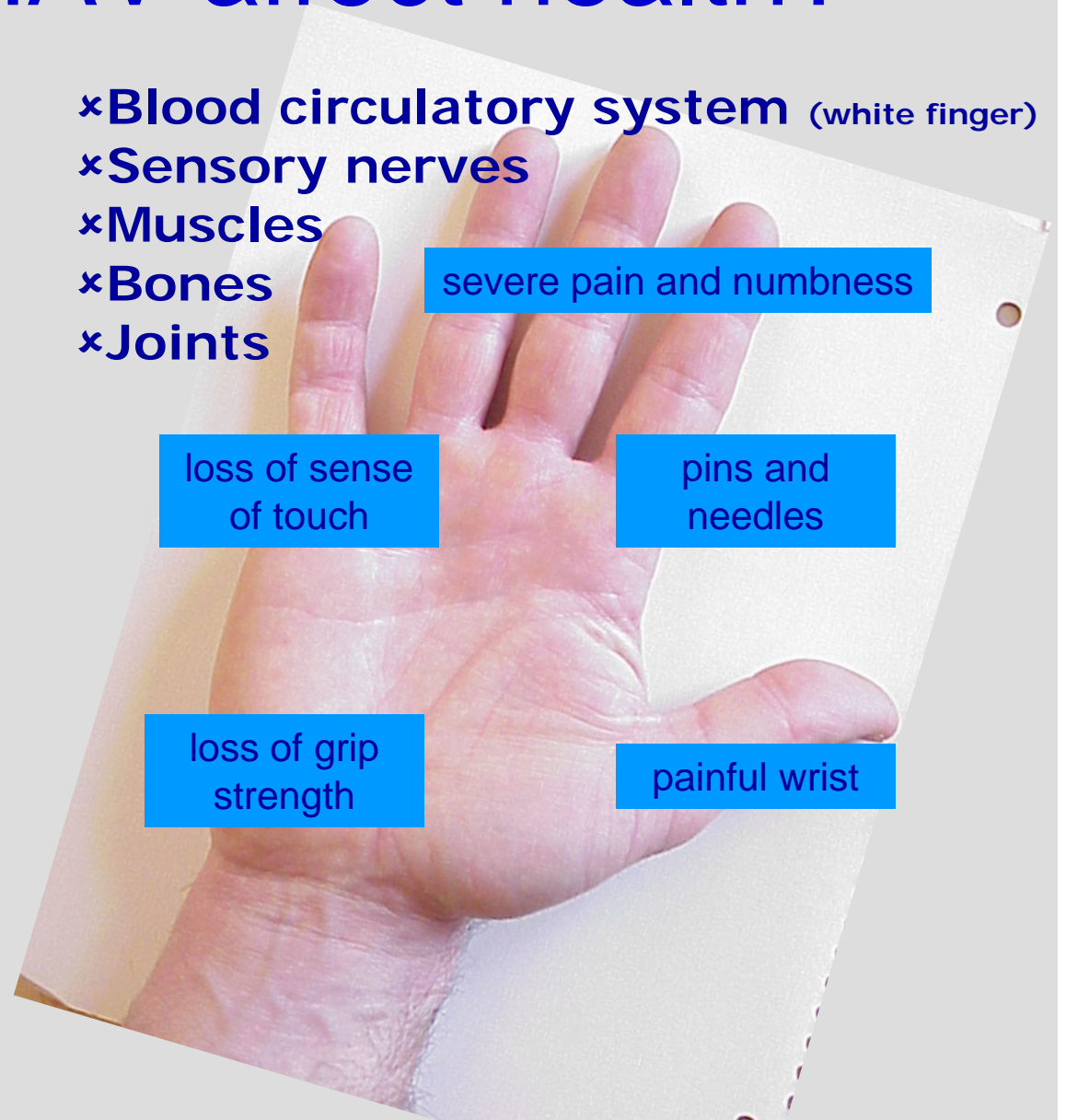
(Combination of thoracic outlet syndrome and obstruction of the finger arteries 3 to 5 left hand side)



How can HAV affect health?

Regular exposure to HAV can cause a range of permanent injuries to hands and arms which are known as hand-arm vibration syndrome (HAVS). The injuries you could suffer include damage to

- ×Blood circulatory system (white finger)
- ×Sensory nerves
- ×Muscles
- ×Bones
- ×Joints

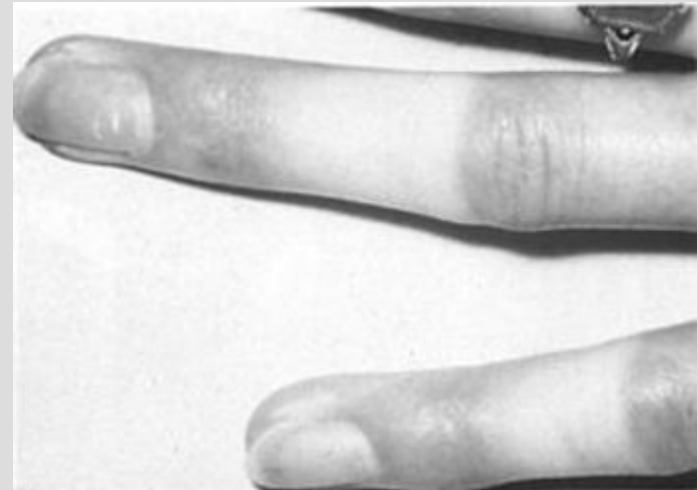


Stages of Vibration White Finger (Taylor-Pelmear System)

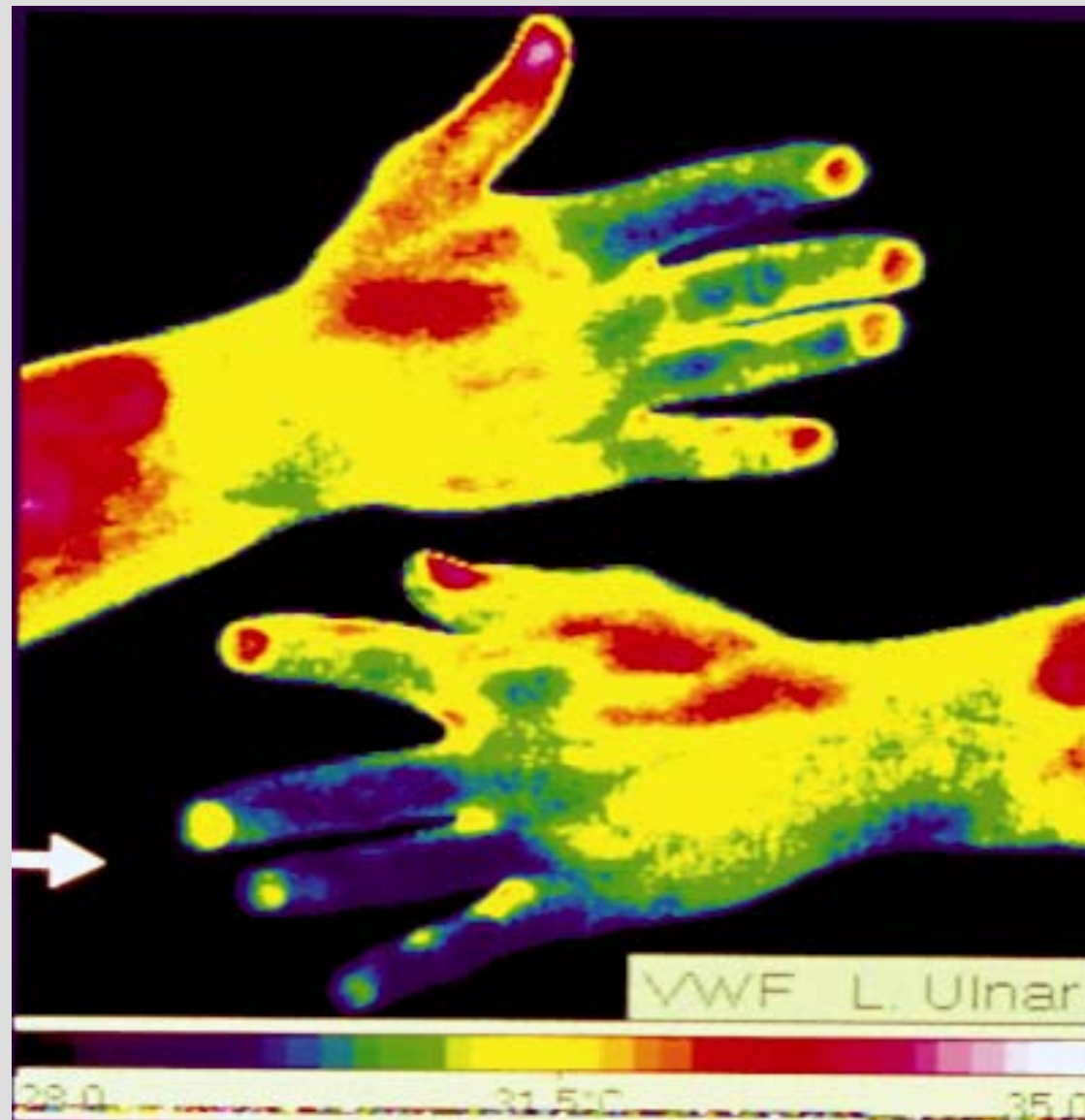
Stage	Condition of Fingers	Work & Social Interference
00	No tingling, numbness or blanching of fingers	No complaints
OT	Intermittent tingling	No interference with activities
ON	Intermittent numbness	No interference with activities
TN	Intermittent tingling and numbness	No interference with activities
1	Blanching of a fingertip with or without tingling and/or numbness	No interference with activities
2	Blanching of one or more fingers beyond tips, usually during winter	Possible interference with activities outside work, no interference at work
3	Extensive blanching of fingers; frequent episodes in both summer and winter	Definite interference at work, at home, and with social activities; restriction of hobbies
4	Extensive blanching of most fingers; frequent episodes in both summer and winter	Occupation usually changed because of severity of signs and symptoms

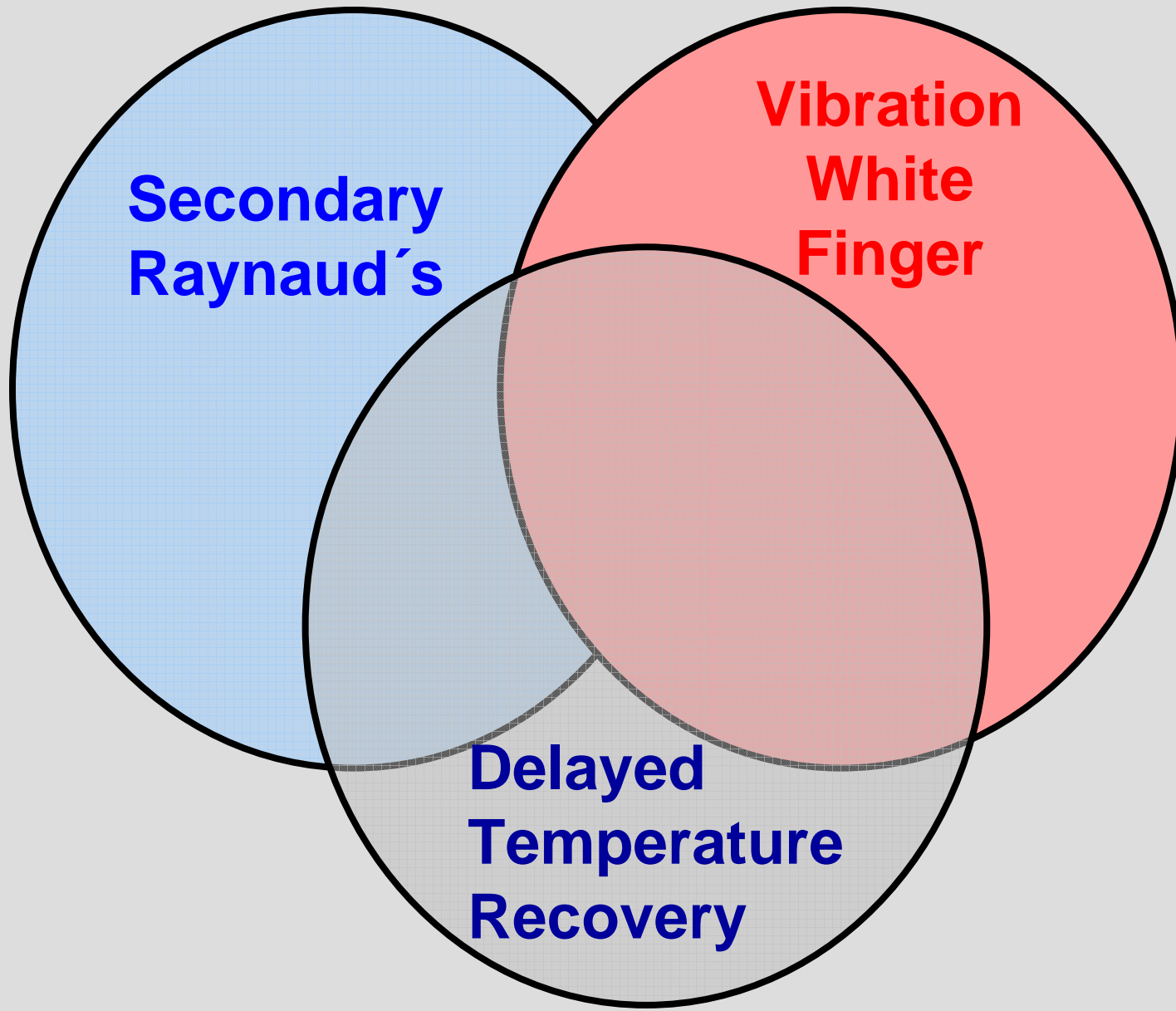
The Stockholm Workshop scale of cold-induced Raynaud's phenomenon

- 0 No attacks.
- 1 Mild. Occasional attacks affecting tips of fingers.
- 2 Moderate. Occasional attack affecting distal/middle phalanges of one/more fingers.
- 3 Severe. Frequent attacks affecting all phalanges of most fingers.
- 4 Very severe. As 3 with trophic skin changes.



Vibration white finger after exposure to 22 KHz/1min





**Secondary
Raynaud's**

**Vibration
White
Finger**

**Delayed
Temperature
Recovery**

Conclusion

- **Definitions of primary and secondary Raynaud's Phenomenon are partly contradictory**
- **Different sequences of colour changes are mandatory in Raynaud's Phenomenon and in Vibration White Finger**

Clear criteria for the clinical diagnosis of Raynaud's phenomenon are needed.

Using the clinical diagnosis as gold standard will enable us to assess the diagnostic value of technique such as thermal imaging, laser Doppler flowmetry, laser Doppler imaging, photoplethysmography and capillary microscopy.