- Approaching 10% population
- Around 50% develop neuropathy
- 15% will develop and ulcer
- Amputation in the world every 30 seconds
- Mortality post amputation 5yrs > prostate and Breast Ca
- 32% of Type I and 15% Type II had no foot examination

Some risk factors – smoking, high blood pressure, abnormal blood lipids – are reversible. Others, such as diabetic neuropathy and foot deformity, can be detected early and mitigated

Kong MF & Gregory R 2016, Preventing foot complications in diabetes: The St Vincent Declaration 26 Years On; Practical Diabetes Vol. 33 No. 5 pp154-156a 2016

Some risk factors – smoking, high blood pressure, abnormal blood lipids – are reversible. Others, such as diabetic neuropathy and foot deformity, can be detected early and mitigated

Systematic and regular foot care has been shown to reduce the risk of chronic ulceration and amputation in the lower limb by 50% or more.

Kong MF & Gregory R 2016, Preventing foot complications in diabetes: The St Vincent Declaration 26 Years On; Practical Diabetes Vol. 33 No. 5 pp154-156a 2016

Michigan Screening Instrument

Patient Version

MICHIGAN NEUROPATHY SCREENING INSTRUMENT

A. History (To be completed by the person with diabetes)

Please take a few minutes to answer the following questions about the feeling in your legs and feet. Check yes or no based on how you usually feel. Thank you.

1.	Are you legs and/or feet numb?	☐ Yes ☐ No
2.	Do you ever have any burning pain in your legs and/or feet?	☐ Yes ☐ No
3.	Are your feet too sensitive to touch?	☐ Yes ☐ No
4.	Do you get muscle cramps in your legs and/or feet?	☐ Yes ☐ No
5.	Do you ever have any prickling feelings in your legs or feet?	☐ Yes ☐ No
6.	Does it hurt when the bed covers touch your skin?	☐ Yes ☐ No
7.	When you get into the tub or shower, are you able to tell the hot water from the cold water?	☐ Yes ☐ No
8.	Have you ever had an open sore on your foot?	☐ Yes ☐ No
9.	Has your doctor ever told you that you have diabetic neuropathy?	☐ Yes ☐ No
10.	Do you feel weak all over most of the time?	☐ Yes ☐ No
11.	Are your symptoms worse at night?	☐ Yes ☐ No
12.	Do your legs hurt when you walk?	☐ Yes ☐ No
13.	Are you able to sense your feet when you walk?	☐ Yes ☐ No
14.	Is the skin on your feet so dry that it cracks open?	☐ Yes ☐ No
15.	Have you ever had an amputation?	☐ Yes ☐ No

Total: _____

MICHIGAN NEUROPATHY SCREENING INSTRUMENT

B. Physical Assessment (To be completed by health professional)

1. Appearance of Feet

	Right	Left
a. Normal	☐ 0 Yes ☐ 1 No	Normal ☐ 0 Yes ☐ 1 No
b. If no, check all that apply:		If no, check all that apply:
Deformities	☐	Deformities ☐
Dry skin, callus	☐	Dry skin, callus ☐
Infection	☐	Infection ☐
Fissure	☐	Fissure ☐
Other	☐	Other ☐
specify:	_____	specify: _____

	Right		Left	
	Absent	Present	Absent	Present
2. Ulceration	☐ 0	☐ 1	☐ 0	☐ 1

	Right			Left		
	Present	Present/ Reinforcement	Absent	Present	Present/ Reinforcement	Absent
3. Ankle Reflexes	☐ 0	☐ 0.5	☐ 1	☐ 0	☐ 0.5	☐ 1

	Right			Left		
	Present	Decreased	Absent	Present	Decreased	Absent
4. Vibration perception at great toe	☐ 0	☐ 0.5	☐ 1	☐ 0	☐ 0.5	☐ 1

	Right			Left		
	Normal	Reduced	Absent	Normal	Reduced	Absent
5. Monofilament	☐ 0	☐ 0.5	☐ 1	☐ 0	☐ 0.5	☐ 1

Signature: _____ Total Score _____ /10 Points

History

- Ask about autonomic change
- Ask about pain in the feet ankles
- Ask about sensation
- Ask about power
- Ask about vascular

THE JOURNAL OF FAMILY PRACTICE

John D. Miller, BS; Elizabeth Carter, BS; Jonathan Shih, BS; Nicholas A. Giovinco, DPM; Andrew J.M. Boulton, MD; Joseph L. Mills, MD; David G. Armstrong, DPM, MD, PhD

The Southern Arizona Limb Salvage Alliance (SALSA), University of Arizona College of Medicine, Tucson (Mr. Miller and Shih, Ms. Carter, and Drs. Giovinco, Mills, and Armstrong); Center for Endocrinology and Diabetes, Faculty of Health Sciences, University of Manchester, United Kingdom (Dr. Boulton)

How to do a 3-minute diabetic foot exam

This brief exam will help you to quickly detect major risks and prompt you to refer patients to appropriate specialists.

THE JOURNAL OF FAMILY PRACTICE | NOVEMBER 2014 | VOL 63, NO 11

THE JOURNAL OF FAMILY PRACTICE

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PRACTICE RECOMMENDATIONS

› *Screen for lower extremity complications at every visit for all patients with a suspected or confirmed diagnosis of diabetes.* (A)

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THE JOURNAL OF FAMILY PRACTICE

TABLE 1

What to ask (1 minute)[5,12]

Does the patient have a history of:

- previous leg/foot ulcer or lower limb amputation/surgery?
- prior angioplasty, stent, or leg bypass surgery?
- foot wound requiring more than 3 weeks to heal?
- smoking or nicotine use?
- diabetes? (If yes, what are the patient's current control measures?)

Does the patient have:

- burning or tingling in legs or feet?
- leg or foot pain with activity or at rest?
- changes in skin color, or skin lesions?
- loss of lower extremity sensation?

Has the patient established regular podiatric care?

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TABLE 2

What to look for (1 minute)[5,15,16]

Dermatologic exam:

- Does the patient have discolored, ingrown, or elongated nails?
- Are there signs of fungal infection?
- Does the patient have discolored and/or hypertrophic skin lesions, calluses, or corns?
- Does the patient have open wounds or fissures?
- Does the patient have interdigital maceration?

Neurologic exam:

- Is the patient responsive to the Ipswich Touch Test?

Musculoskeletal exam:

- Does the patient have full range of motion of the joints?
- Does the patient have obvious deformities? If yes, for how long?
- Is the midfoot hot, red, or inflamed?

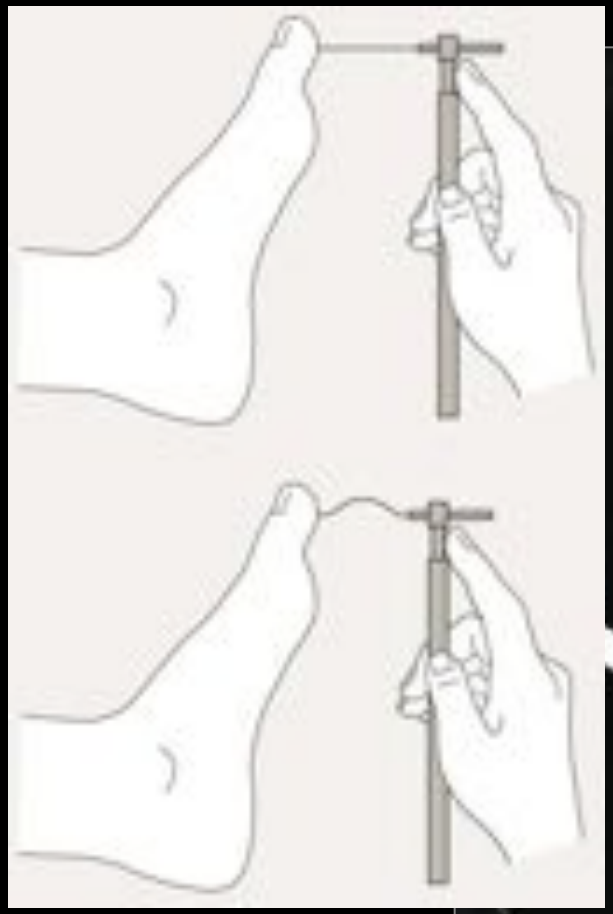
THE JOURNAL OF FAMILY PRACTICE

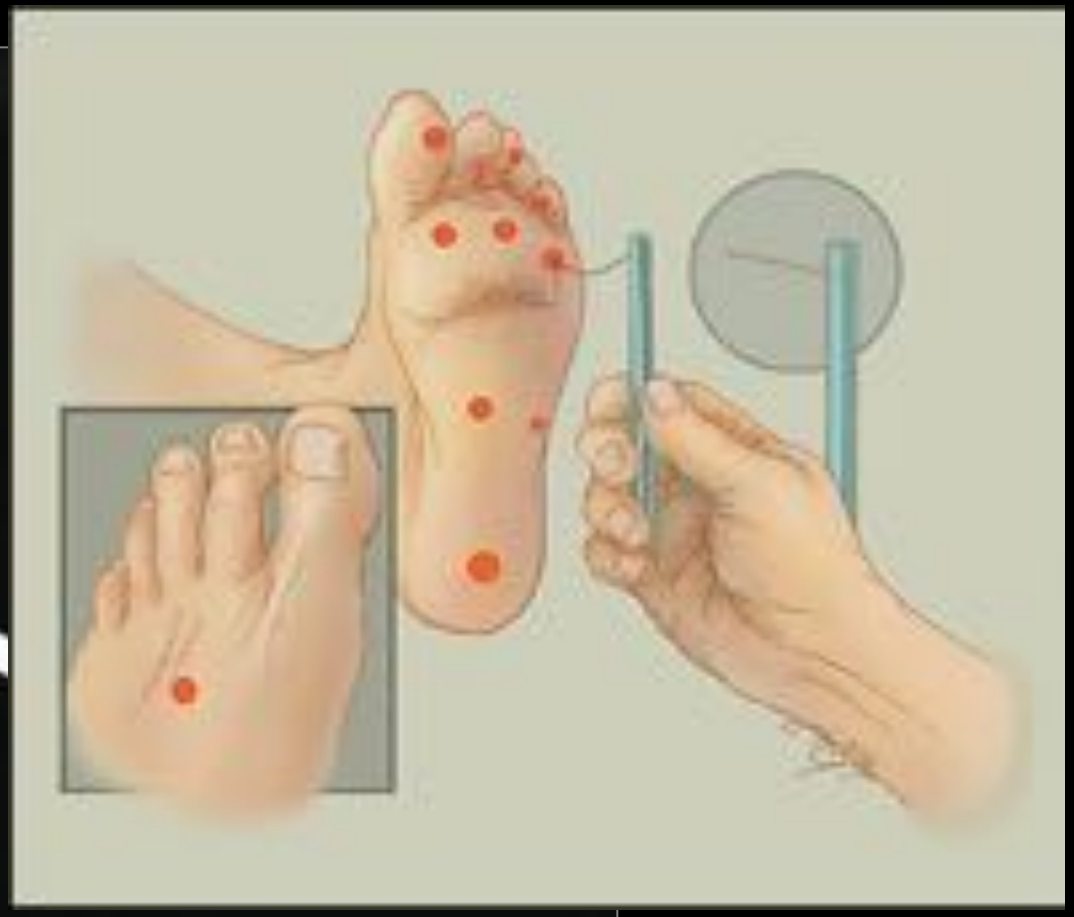
TABLE 2

What to look for (1 minute)[5,15,16]

Vascular exam:

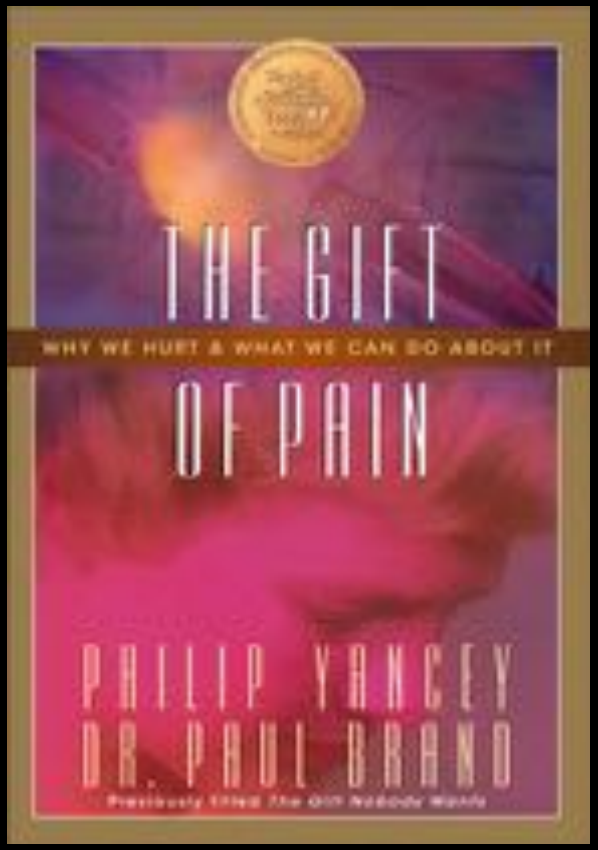
- Is the hair growth on the foot dorsum or lower limb decreased?
- Are the dorsalis pedis and posterior tibial pulses palpable?
- Is there a temperature difference between the calves and feet, or between the left and right foot?





Semmes-Weinstein Monofilament

Provocative Sensation



Protective Sensation

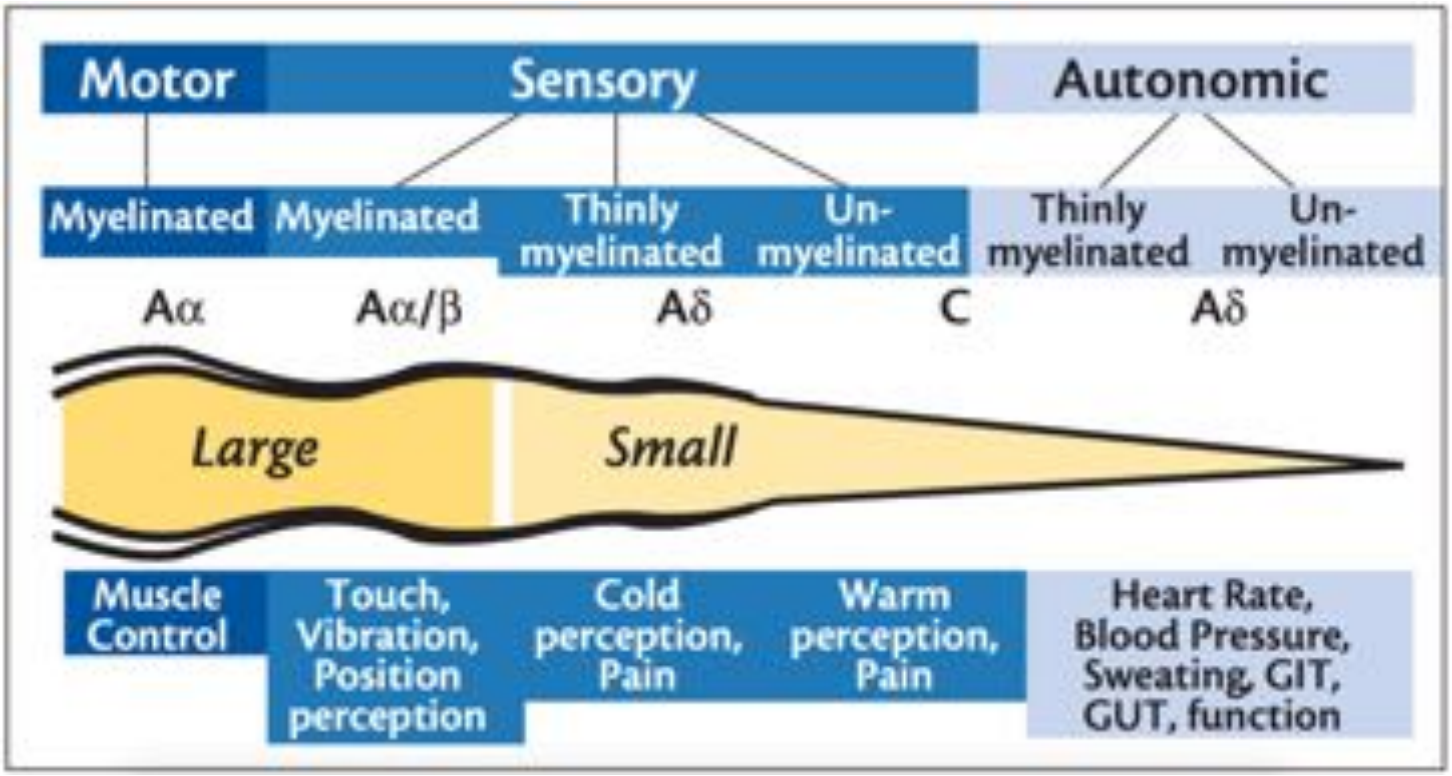
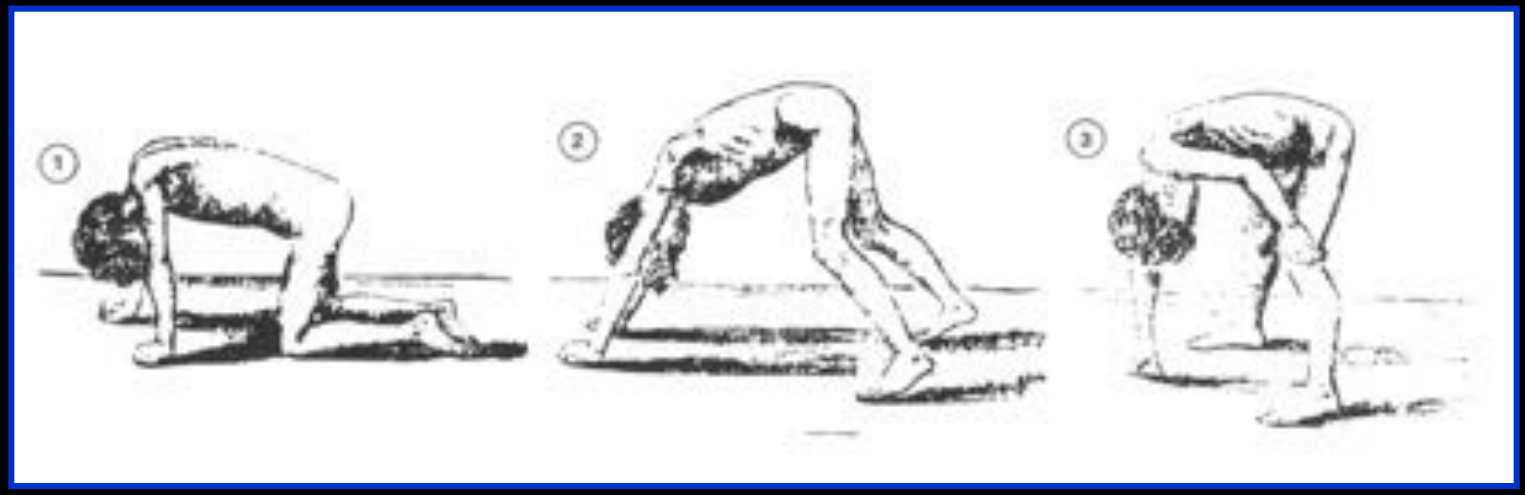


Figure 1. A simplifed view of the peripheral nervous system. (Adapted from Vinik AI. Presented at the APMA 2004 Annual Scientific Meeting, Aug 25, 2004. Available at www.cahe.com/apma2004.webcast_pres.cfm.)

Jacobs BL. Logical application of cutaneous pinprick sensibility as a screening device for diabetic peripheral neuropathy: overlooked, undervalued and critical in redefining a clinically significant threshold for protective sensation May/june 2006 I Diabetic Microvascular Complications Today

The North-West Diabetes Foot Care Study: incidence of, and risk factors for, new diabetic foot ulceration in a community-based patient cohort.
Abbott CA et al; Diabet Med. 2002;19:377-384


Medipin



Gowers’ Sign

William Richard Gowers

"In examining the tactile sensibility, it is important to ascertain, not only whether the patient can feel, but whether he is able to recognize the place touched - whether he can correctly localize the sensation".

A Manual of Diseases of the Nervous System, 1886-8

" For this he must be asked not only whether he feels the touch, but to say or point out where he feels it. The part touched should be frequently varied, and the eyes, of course, kept closed".

A Manual of Diseases of the Nervous System, 1886-8

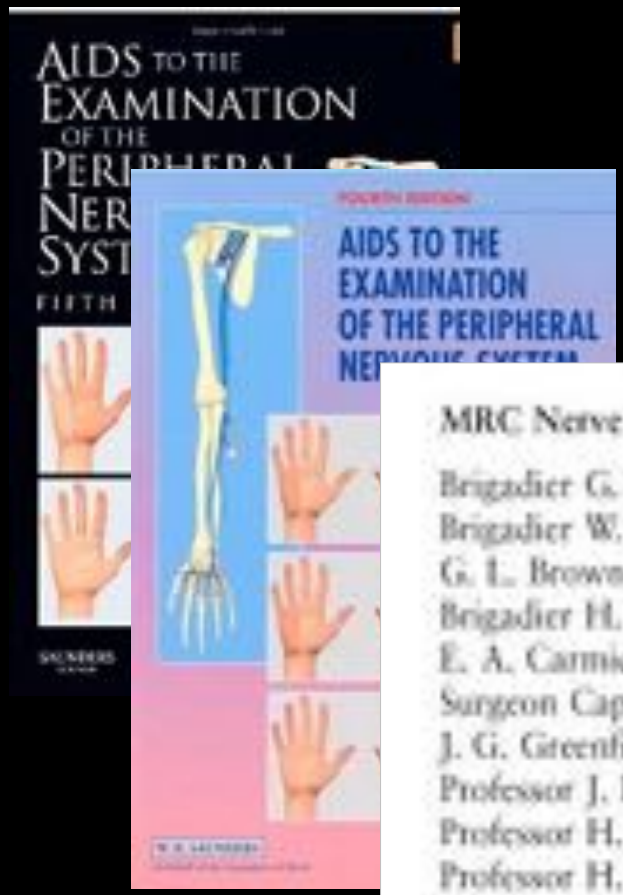
- Otfrid Foerster and Henry Head Dermatome experiments.
  Tremendous influence on how the pinprick examination was performed.

- Since a new map of the human dermatomes was created, pinprick tests could be performed on specific nerve levels and dysfunction traced to **a single dorsal root**.
  This made the test more effective and specific in **regional** diagnosis.

- Emphasized by Gordon Holmes who utilized the pinprick test proximally and distally finding it useful for localization.

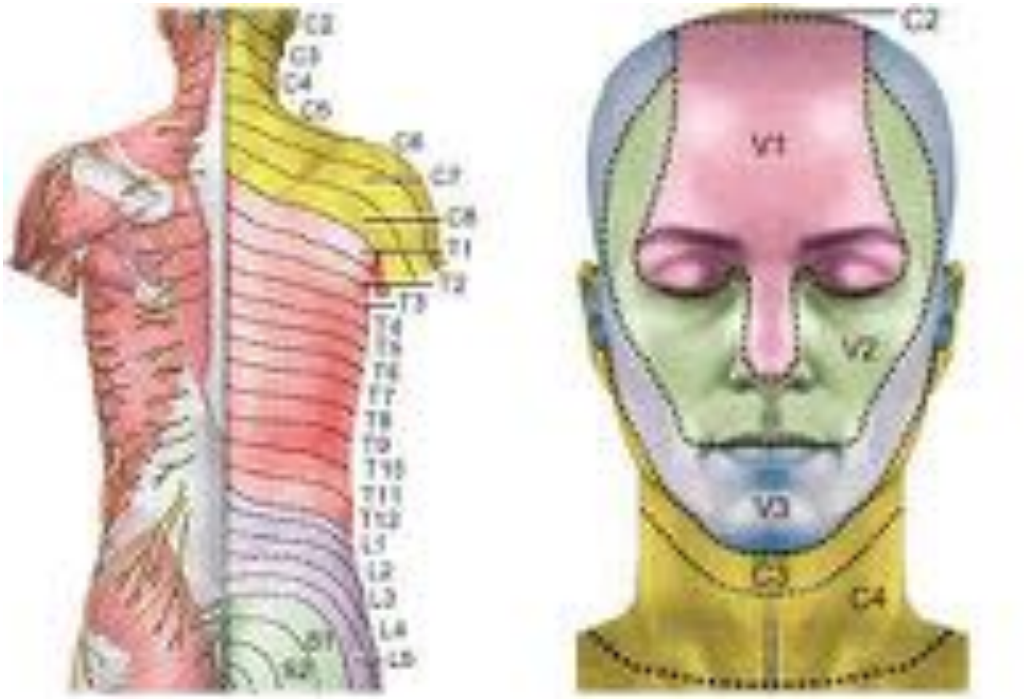
The Nobel Prize in Physiology or Medicine 1944 was awarded jointly to Joseph Erlanger and Herbert Spencer Gasser *"for their discoveries relating to the highly differentiated functions of single nerve fibers"*

- 1944 discovered the Ad and C fibres.
- Much of the research gleaned from nerve blocking contributed to the development of local anesthesia.



MRC Nerve injuries committee 1942–1943

Brigadier G. Riddoch, MD, FRCP (*Chairman*)
Brigadier W. Rowley Bristow, MB, FRCS
G. L. Brown, MSc, MB (*1942*)
Brigadier H. W. B. Cairns, DM, FRCS
E. A. Carmichael, CBE, MB, FRCP
Surgeon Captain M. Critchley, MD, FRCP, RNVR
J. G. Greenfield, MD, FRCP
Professor J. R. Learmonth, CBE, ChM, FRCSE
Professor H. Platt, MD, FRCS
Professor H. J. Seddon, DM, FRCS (*1942*)
Air Commodore C. P. Symonds, MD, FRCP
J. Z. Young, MA
F. J. C. Herrald, MB, MRCPE (*Secretary*)


C2
C3
C4
C5
C6
C7
C8
T1
T2
T3
V1
V2
V3
C3
C4

Gowers also warned his readers that the practical value of the tests may be less than anticipated, as interpretation of findings on the sensory examination was difficult.

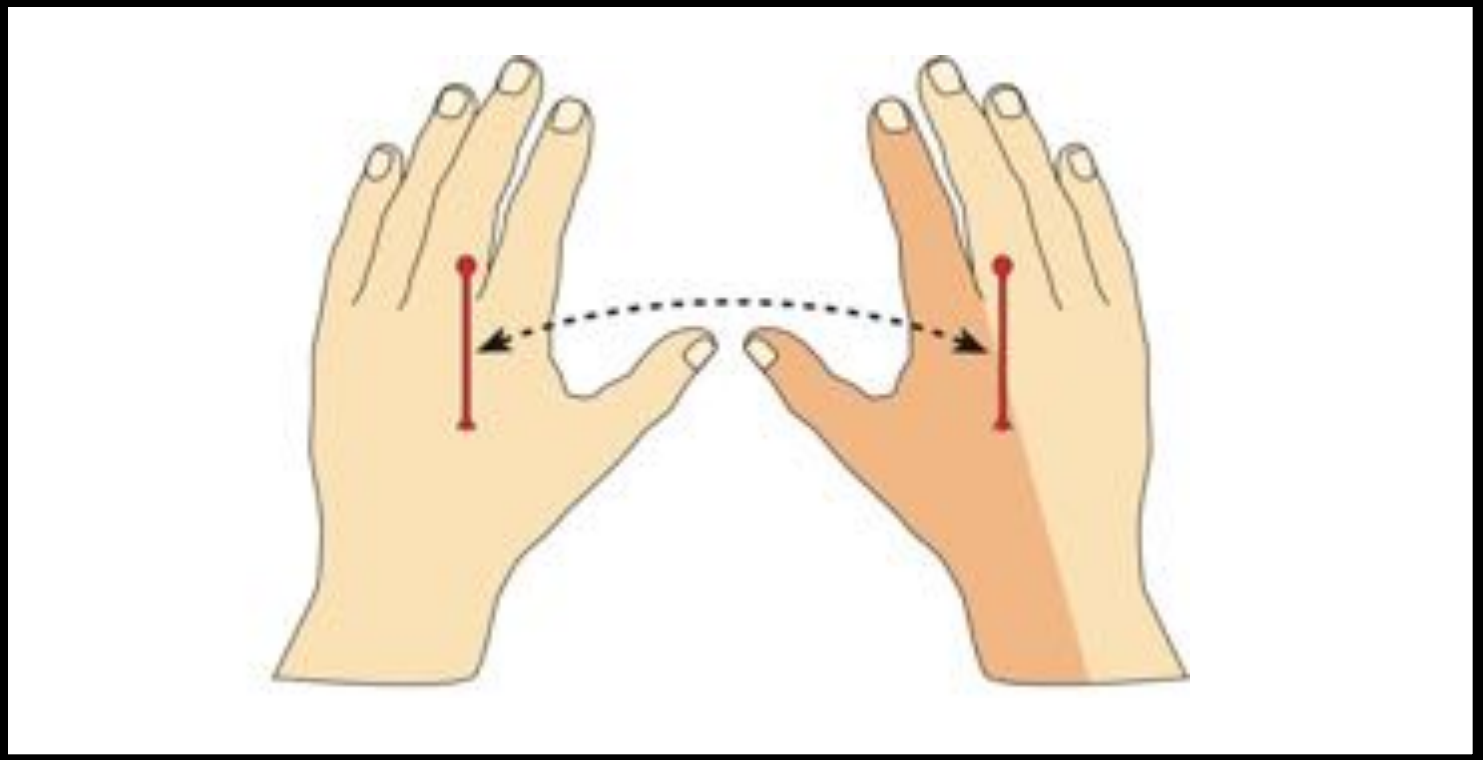
Accuracy and acuity

Sharp/Blunt Testing
is binary

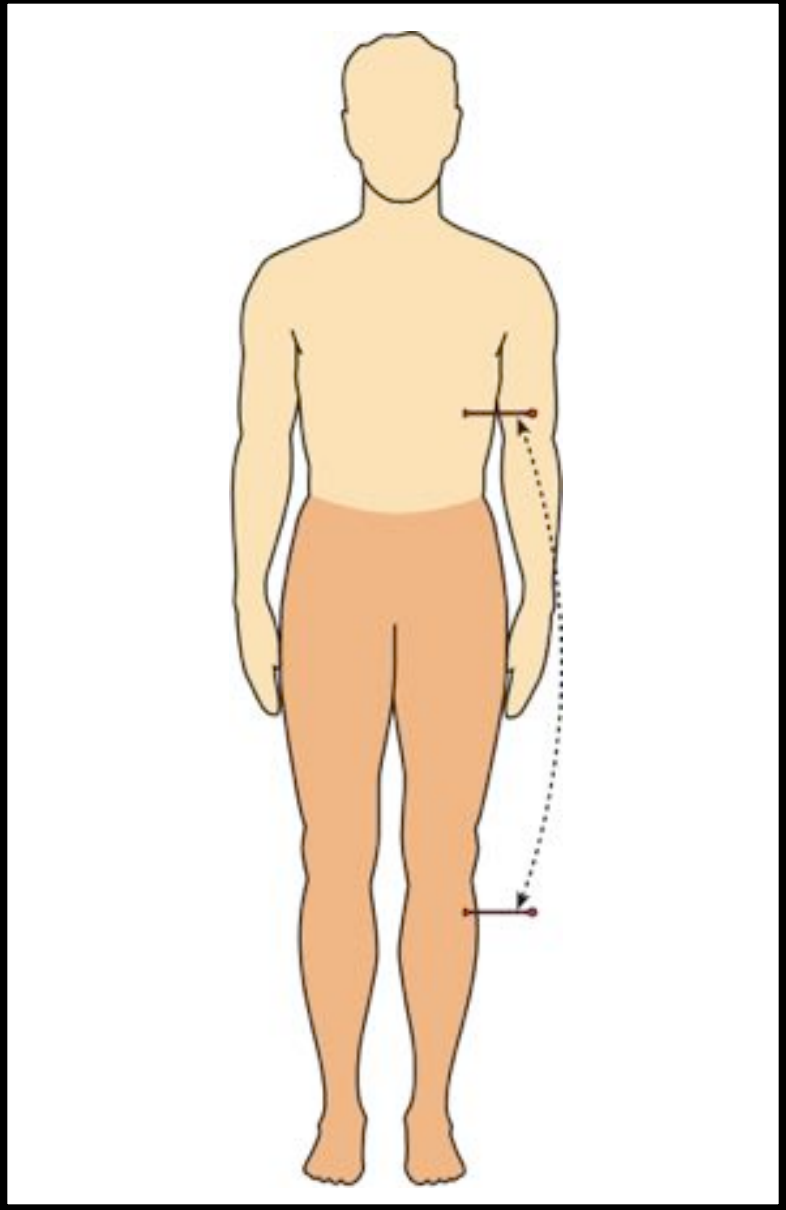
Qualitative Testing

This doesn’t tell you how much

Comparison
Patient Becomes Their Own Control



Like -to-Like
Quantitative Testing



Human Error
Acuity

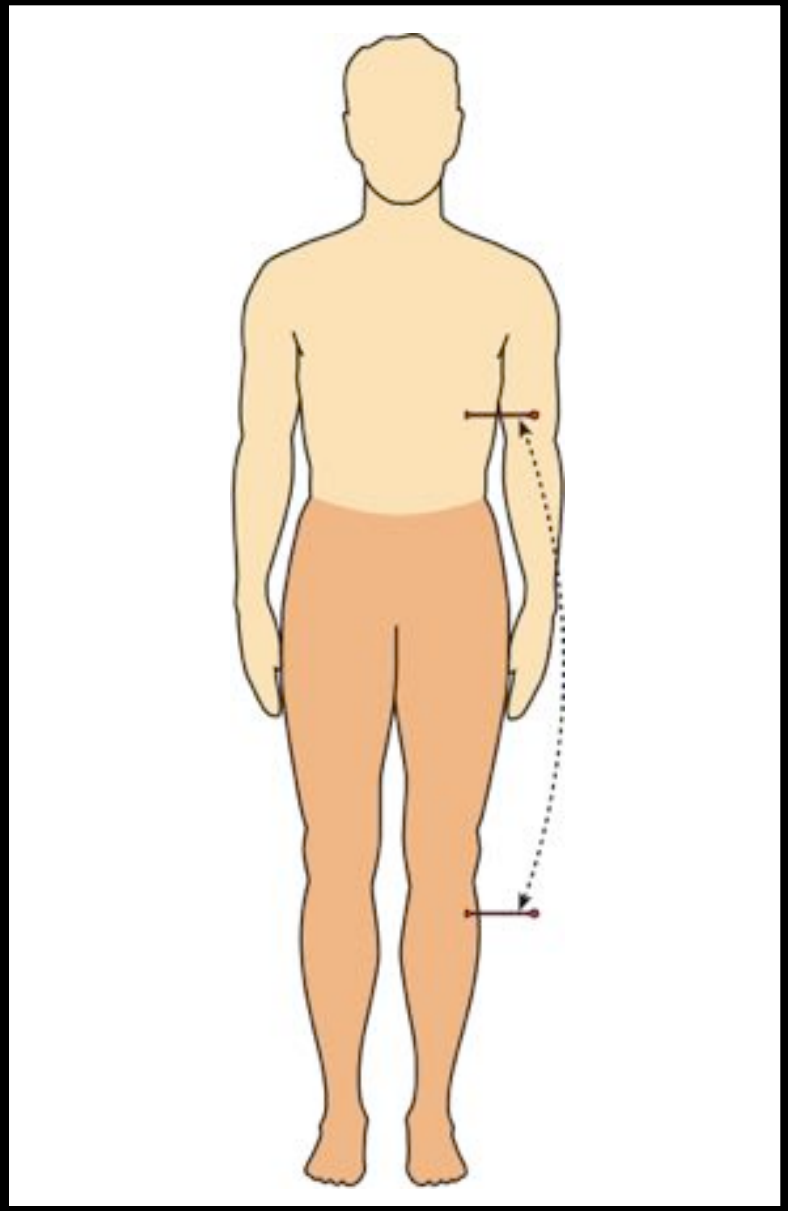
Patient Perception

Operator Error

Human Error

- **Patient receptors**
- **Practitioner application**

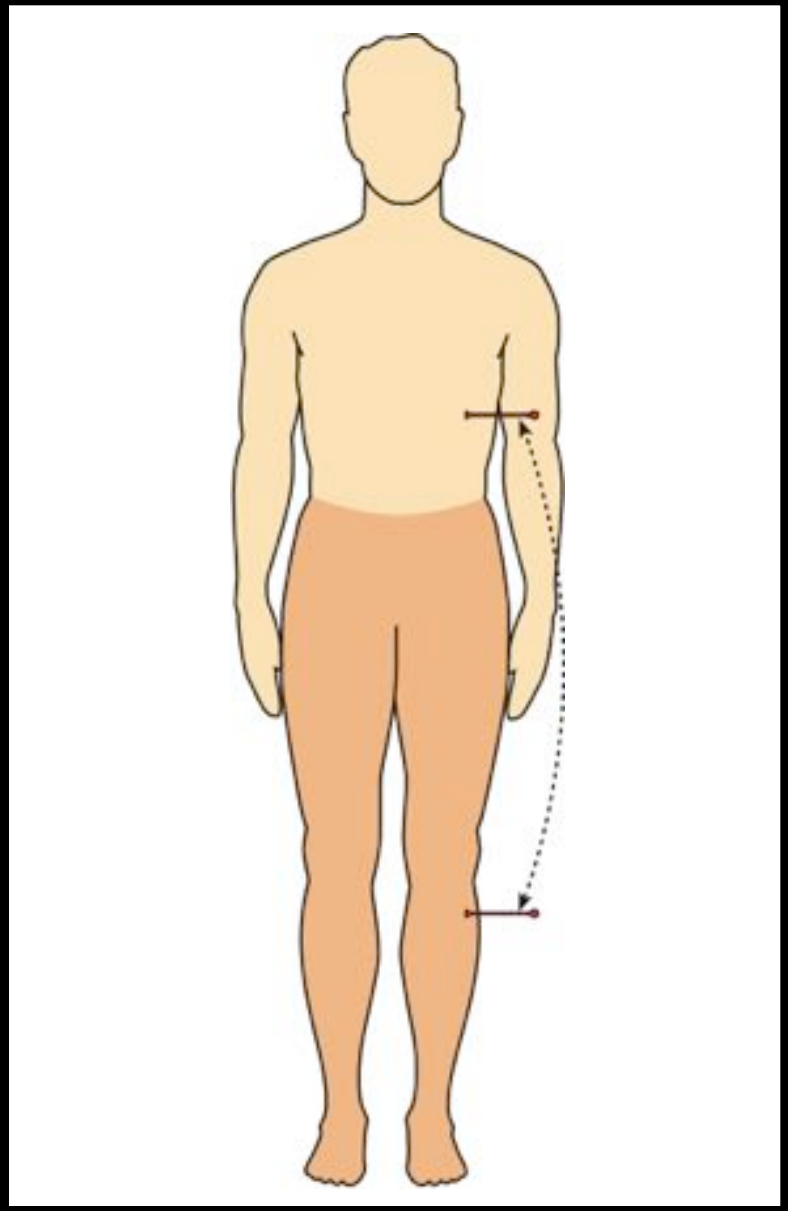
Narrow the Standard Deviation



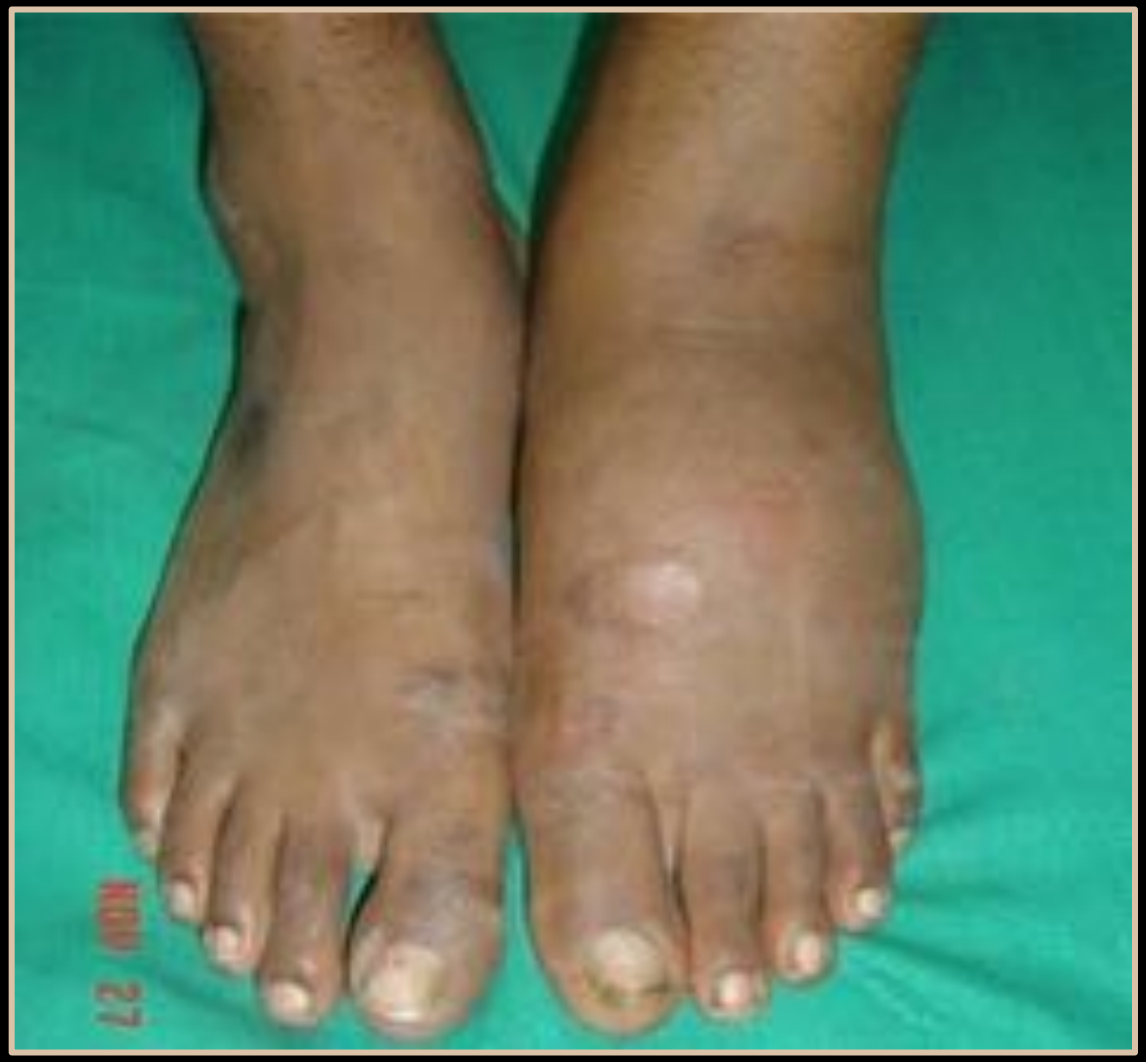
Human Error

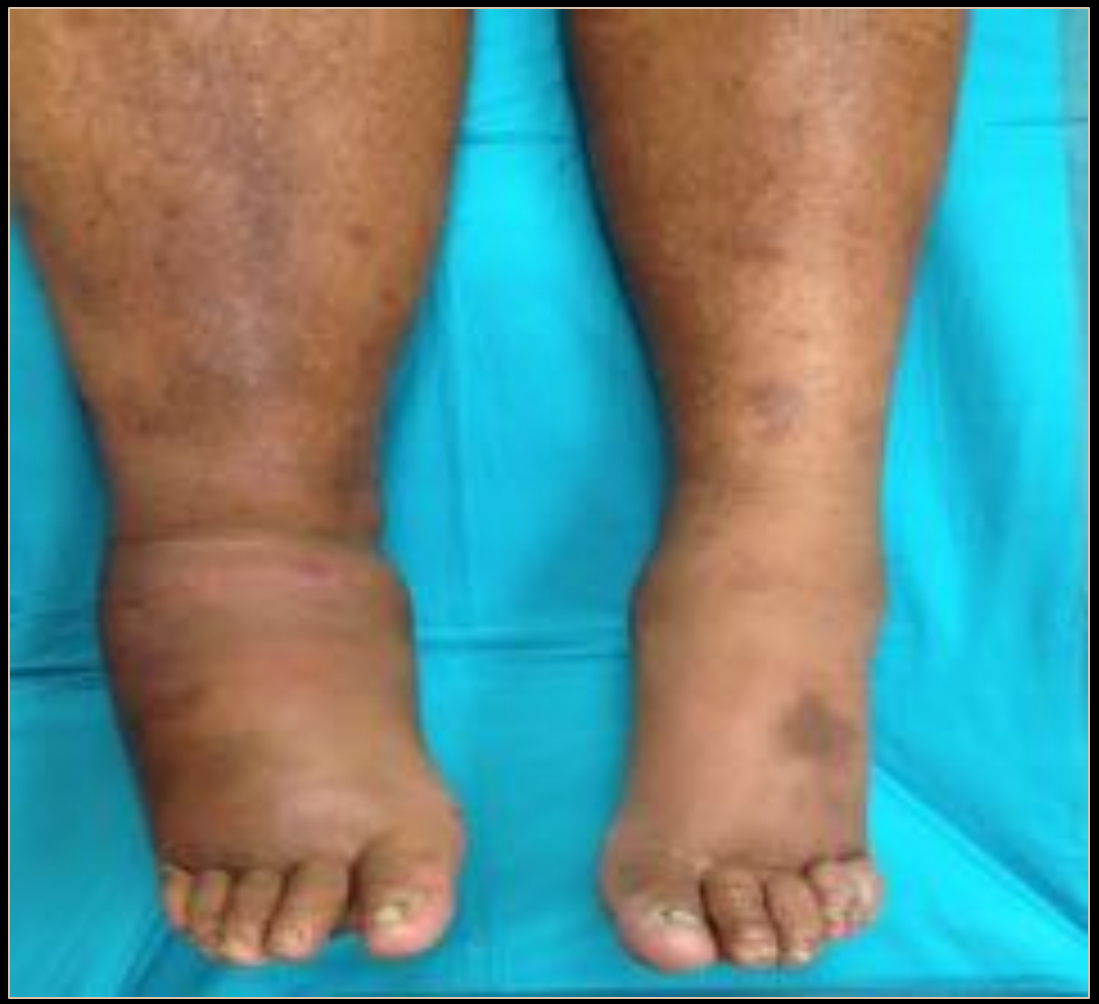
- **Establish an average ‘Normal’**
- **Wind Up**

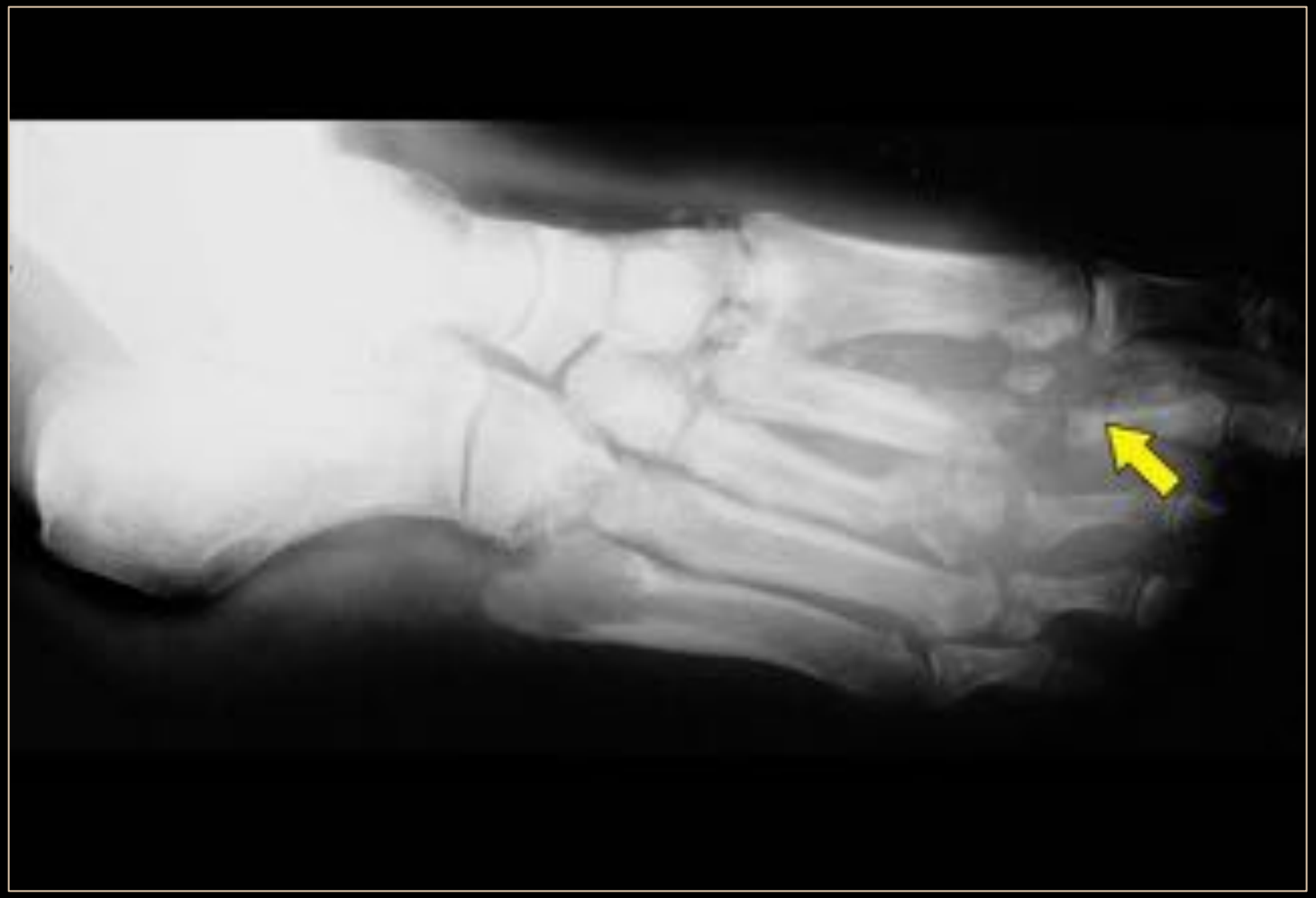
Narrow the Standard Deviation



Charcot







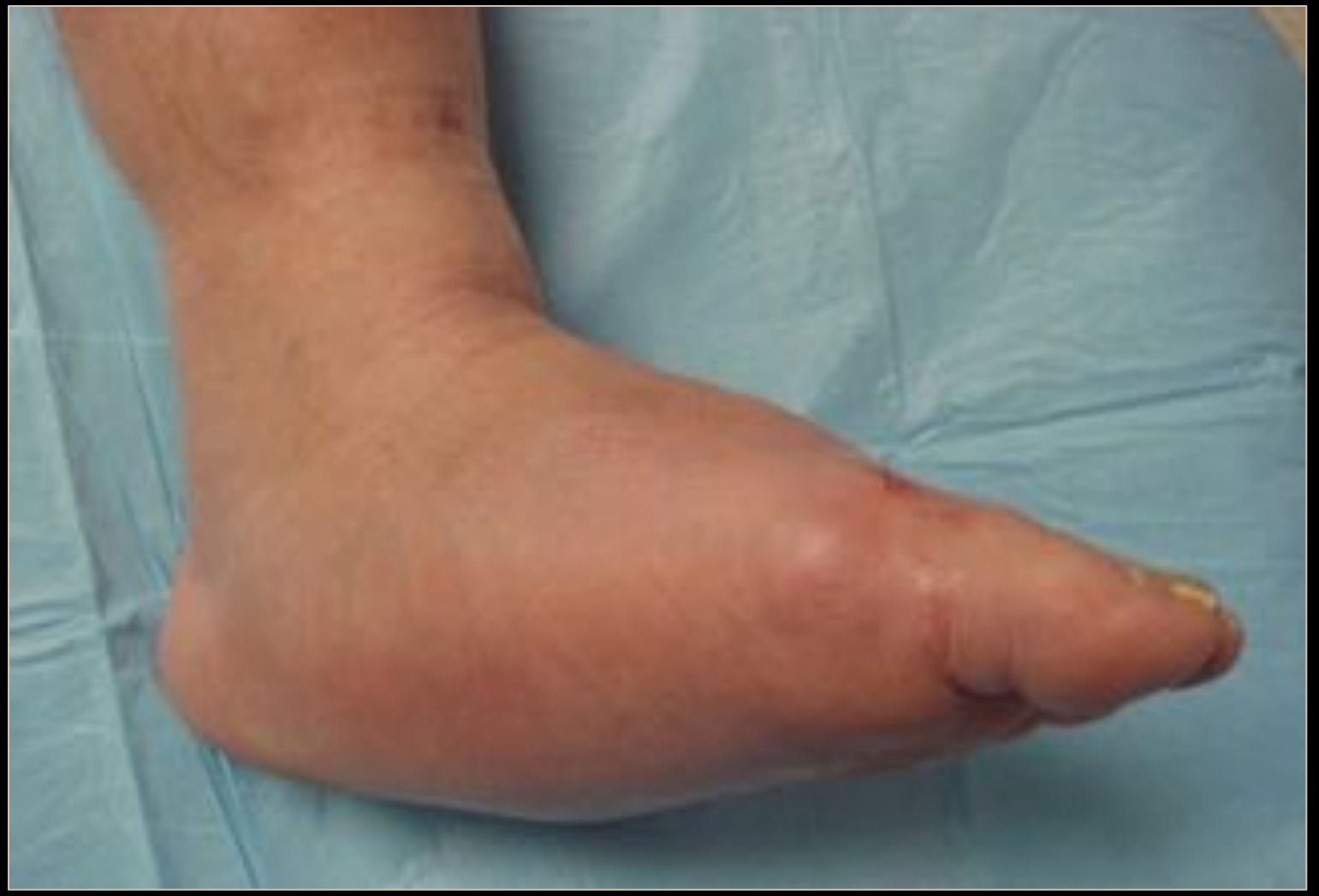


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TABLE 3

What to teach (1 minute)[5,15,45]

Recommendations for daily foot care:

- Visually examine both feet, including soles and between toes. If the patient can't do this, have a family member do it.
- Keep feet dry by regularly changing shoes and socks; dry feet after baths or exercise.
- Report any new lesions, discolorations, or swelling to a health care professional.

Education regarding shoes:

- Educate the patient on the risks of walking barefoot, even when indoors.
- Recommend appropriate footwear and advise against shoes that are too small, tight, or rub against a particular area of the foot.
- Suggest yearly replacement of shoes—more frequently if they exhibit high wear.

Overall health risk management:

- Recommend smoking cessation (if applicable).
- Recommend appropriate glycemic control.