MU PT 6620 - Case Management

**Lower Extremity Vascular Tests & Measures**

**A. History:** DM, HTN, DVT, PE, PVD (arterial insufficiency or venous insufficiency), CHF, smoker, pain, past wound

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**B. Deformities:** Hallux Rigidus (1st MTP < 75-85d of DF); Hallux Valgus, Claw: **/ |** Hammer: **/ \\_\_**

**C. Observation:** calluses, skin color and quality, hemosiderin stains (venous insufficiency), hair loss on digits, callus, nail condition. Check between the toes for skin integrity, commonly the site of early skin breakdown or fungal growth. Wash hands or use gloves!

**D. Temperature**: bilateral comparison of toes, dorsum of foot, medial/lateral ankle (use the back of your hand)

**E. Ankle ROM:** (supine)PF: R\_\_\_ L \_\_\_ DF: R\_\_\_\_L\_\_\_\_ (DF may be reduced with chronic venous disease)

**F. Sensation** Tip: for persons without diabetes, screen using Ipswich; then if needed perform SWM.

**F.1: Ipswich Touch Test**: See syllabus p.\_\_\_\_\_\_ for full instructions (also posted in online Exam Tool Kit)

Follow steps #1, and #2 from the SWM instructions

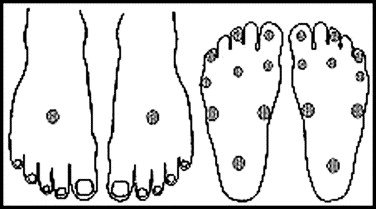
Lightly touch the tips of the 1st, 3rd, and 5th toes

6/6 (counting both feet) is perfect score. High score is good.

Two or more insensate responses yield a score of < 4/6 which indicates neuropathy.

**F.2: SWM** - **Semmes Weinstein monofilament** Protective sensation is 5.07 (10 gr) SWM

1. First, demonstrate on the patient’s hand.   
   Tell them to say “Now” when they feel it - first with their eyes open, then with their eyes closed.
2. Feet are tested in supine in a quiet room without distractions. Patient’s eyes closed.
3. Avoid sliding or bouncing the filament. Keep it perpendicular to the skin.
4. Deform / bow the filament to a near semi-circle and hold about 1.5 seconds
5. Vary the timing to assure accurate responses. Don’t stimulate at regular, predictable time intervals.
6. Vary the pattern. Don’t test in a pattern/sequence that would be predictable or recognizable to the patient.
7. If a site is not perceived, go on to the next site. When finished with the first series, repeat one time for any site not perceived. If > 1 touch of the filament at a given site is not perceived mark it as insensate. The foot is considered to be at risk if one of more sites are insensate. Thick callus over site? Test to the side of it.  
   Note: some sources do not count absent heel sensation to 5.07 as an indicator, since skin is normally thicker.
8. 10 sites: heel, med/lat arches, MTP: 1,3,5, Toe tips: 1,3,5, also dorsum of foot. Score out of 10.   
   High score is good.

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**Alternate SWM method**:   
For the person who may be perceiving “artifact” sensation due to (diabetic) neuropathy, consider testing both feet at the same time and have the person respond by saying “Right” or “Left” when they perceive a touch.

**G. Edema:**

|  |  |  |  |
| --- | --- | --- | --- |
| **a. Edema** | Circumferential Measurements | Right | Left |
| Malleolus |  |  |
| \_\_\_\_\_\_Inches proximal to malleolus |  |  |
| \_\_\_\_\_\_Inches proximal to malleolus |  |  |

**b. Pitting Edema?** Palpate ankle and medial aspect of tibia to detect

**1+** barely perceptible **2+** pitting rebounds in <15 sec **3+** rebounds in 15-30 sec **4+** rebounds >30 sec

**c. Figure of Eight Method** for ankle edema: (see video on course website, Wound Obj. #5)

Landmarks:

1. start midway between the tendon of the tibialis anterior and the lateral malleolus.
2. wrap distal to navicular tuberosity
3. wrap proximal to the base of the 5th MT
4. wrap distal to the medial malleolus [alternative method: around the heel]
5. wrap distal to the lateral malleolus. Read measurement.

**H. Circulation:**

**Orthostatic Hypotension screen:** BP & HR in supine. Stand. Positive if drop of SBP >20mm, or diastolic >10mm.

**Pedal Pulses:**  **0** = absent, **1+** = barely palpable, **2+** = diminished, **3+** = normal, **4+** = bounding

(Note: pulse scales using 0-3+ are also in common use. That’s a good reason to include a denominator)

|  |  |  |
| --- | --- | --- |
|  | Right | Left |
| Dorsalis Pedis |  |  |
| Posterior Tibial |  |  |

**Capillary Refill Time**: Squeeze plantar toe surface and time Toenails may be too thickened or opaque for observation.

Also check pads of fingers.

Median values: Child: 0.7 sec; Adult 1.1 sec; elderly: 1.7 sec

Arterial compromise may be indicated for: Adult male > 2.0 sec; Adult female >2.9 sec; Elderly >4.5 sec.

*Schriger DL, Baraff L. 1988 Ann Emerg Med. Sep;17(9):932-5. PMID: 3415066*

**Venous Filling Time**:

Sitting: observe dorsal veins on both feet. Supine: elevate one leg for 60 sec (observe dorsal veins collapse).

Return to sitting with legs dangling and immediately begin timing how long it takes the veins on the foot that was elevated to match the veins on the foot that was not elevated.

***a.****\_\_\_* ***<15 sec*** *= venous reflux/incompetent valves* ***b.*** *\_\_\_* ***~15 sec*** *= normal* ***c.*** *\_\_\_****>15 sec*** *= arterial compromise*

**Rubor of Dependency:**

Observe color of both feet in supine (or in sitting). In supine, elevate one leg for 60 sec. Observe foot color: light pink is normal; chalky white or painful means arterial insufficiency.

Then lower to dependent position and time the color return compared to the color of the non-elevated foot.

***a.****\_Normal = pink in < 15 sec.* ***b.****\_ Abnormal > 20-30 sec + bright red (histamine response) =Arterial compromise*

**Intermittent (vascular/arterial) Claudication:** Objective: minutes to onset \_\_\_\_\_\_ distance to onset \_\_\_\_\_\_\_

Subjective ACSM scale: 1 = min. discomfort, 2 = mod. discomfort, still distractible,

3 = intense pain, not distractible, 4 = unbearable pain (Hillegass 4th ed p.64)

**Ankle Brachial Index (ABI)**: requires a Doppler US for pedal SBP (and UE too). Rest 10 min in supine first.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Systolic BP | R | L | Use the higher value: | ABI = Ankle / Brachial | |
| Dorsalis Pedis (cuff at ankle) |  |  | R (DP or PT) =  L (DP or PT) = | Right A/B = | Left A/B = |
| Post. Tibialis (cuff at ankle) |  |  |
| Brachial (or Radial) |  |  | Arm (R or L) = |

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|  |
| --- |
| ABI values: Paz 5th ed. p.175, Table 7.5 |
| * > 1.2 arteriosclerosis, DM * 0.95-1.2 normal * 0.75-0.95 mild arterial disease * .05-0.75 mod. arterial disease * < 0.5 severe arterial disease |

**I. Stemmer’s Sign**: if skin at base of 2nd toe (and 2nd finger) cannot be pinched and picked up = **lymphedema** sign

**J. Venous Thromboembolism** (VTE) **- DVT screen** (swollen, warm, red, tender calf) vs. musculoskeletal pain.

See online Exam Toolkit > CVP > DVT … Online calculator <https://geriatrictoolkit.missouri.edu/cv/DVT/index.html>

# Well’s Clinical Prediction Rule for DVT

Wells PS, Anderson DR, Bormanis J, et al: Value of assessment of pretest probability of deep-vein thrombosis in clinical management, *Lancet* 350:1795-1798, 1997.

Do NOT rely on **Homan’s Sign** (squeezing calf with passive DF). Sensitivity is only 50%.

|  |  |  |
| --- | --- | --- |
| **Clinical Presentation** | **Possible Score** | **Client’s Score** |
| Active cancer (within 6 months of diagnosis or receiving palliative care) | 1 |  |
| Paralysis, paresis, or recent immobilization of lower extremity | 1 |  |
| Bedridden for more than 3 days or major surgery in the last 4 weeks | 1 |  |
| Localized tenderness in the center of the posterior calf, the popliteal space, or along the femoral vein in the anterior thigh/groin | 1 |  |
| Entire lower extremity swelling | 1 |  |
| Unilateral calf swelling (more than 3 cm larger than uninvolved side) | 1 |  |
| Unilateral pitting edema | 1 |  |
| Collateral superficial veins (nonvaricose) | 1 |  |
| An alternative diagnosis is as likely (or more likely) than DVT (e.g., cellulitis, postoperative swelling, calf strain) | -2 |  |
| **Total Points** |  |  |

**Key**

* -2 to 0 Low probability of DVT 3% (95% confidence interval [CI] 1.7%–5.9%)
* 1 to 2 Moderate probability of DVT 17% (95% confidence interval [CI] 12%–23%)
* 3 or more High probability of DVT 75% (95% confidence interval [CI] 63%–84%)

**Medical consultation** advised in the presence of low probability

**Medical referral** required with moderate or high score.

**K. Venous Thromboembolism** (VTE) **- PE screen**

Wells Clinical Prediction Rule for pulmonary embolism (PE)

See online Exam Toolkit > CVP > DVT … online calculator: <https://geriatrictoolkit.missouri.edu/cv/DVT/index.html>

Slovis B. Well's Criteria for Pulmonary Embolism. Accessed 11-22-19

Torbicki A, Perrier A, Konstantinides S, et al. Guidelines on the diagnosis and management of acute pulmonary embolism: the Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC). Eur Heart J. 2008;29(18):2276-2315. (see p.8, Table 7)