



# Scandinavia goes St. Gallen

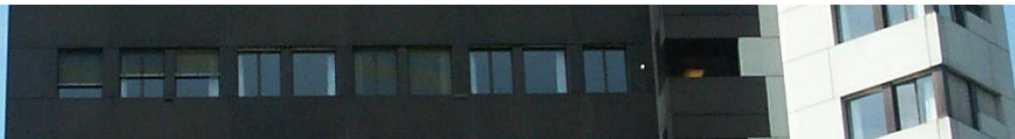
## Special neurography techniques

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**Muskelzentrum/ALS Clinic**



**St. Gallen, 23<sup>rd</sup> March 2024**

**Kantonsspital**  
**St.Gallen**



## Less common nerve conduction studies

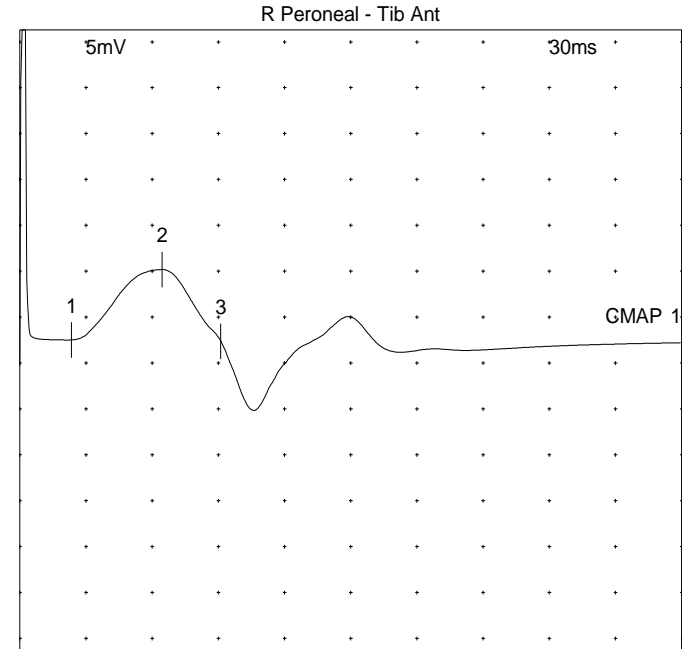
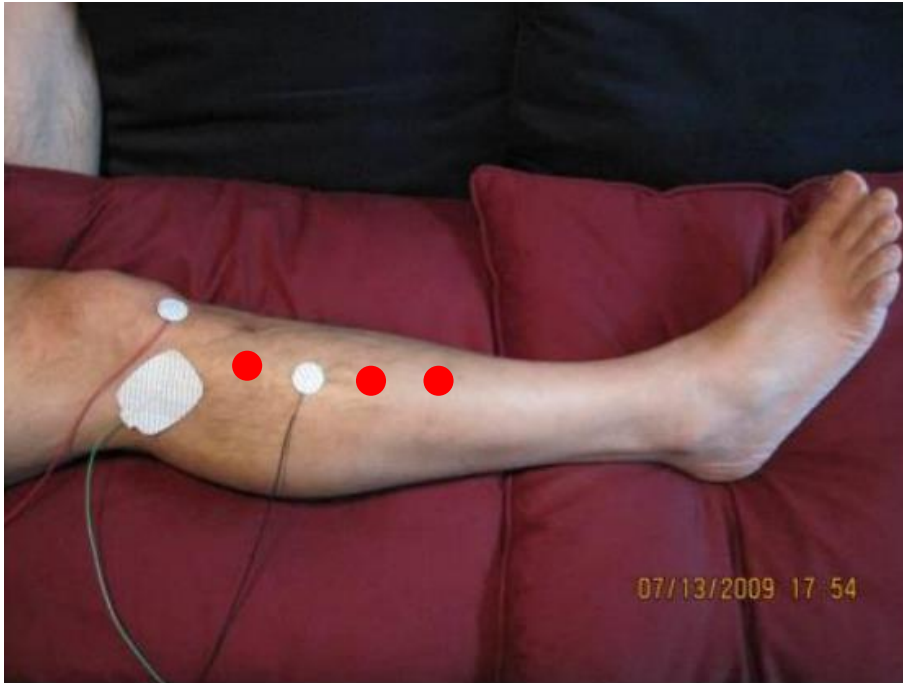
- Motor part of N. peroneus superficialis to tibial ant. muscle
- Sensory part of the superficial peroneal branch
- Sensory part of the deep peroneal branch
- N. cutaneus antebrachii dorsalis
- N. musculocutaneus → M. biceps brachii

# Uncommon nerve conduction studies: deep peroneal nerve to TA



- Can be used as an additional NCS if EDB is wasted
  - sometimes EDB is wasted as a single incidental finding
- Can be used for follow-up monitoring in length-dependent neuropathies if EDB is wasted
- Consider volume conduction from Mm. peronei longus+brevis (bimodal signal of CMAP)
- Consider the 4 to 5 motor points in the length of TA

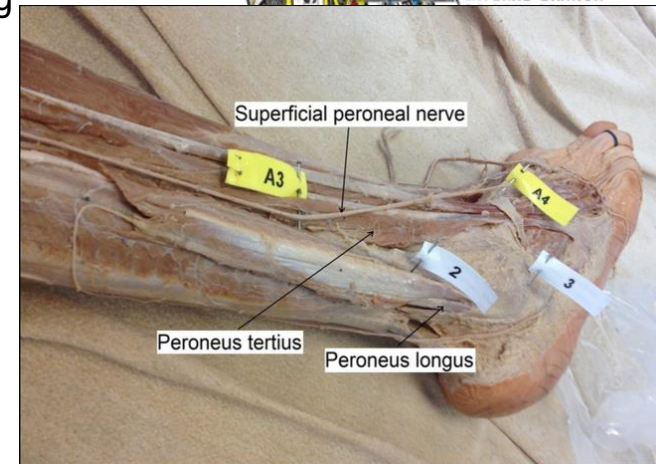
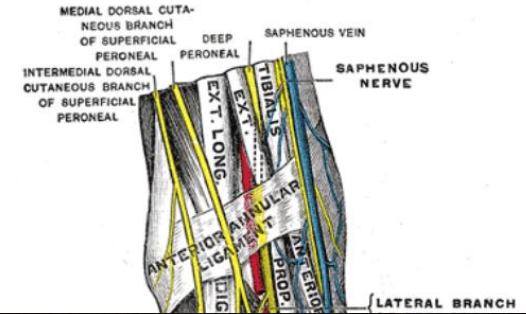
# Uncommon nerve conduction studies: deep peroneal nerve to TA



# Nerve conduction studies: sensory superficial peroneal nerve (antidromic)

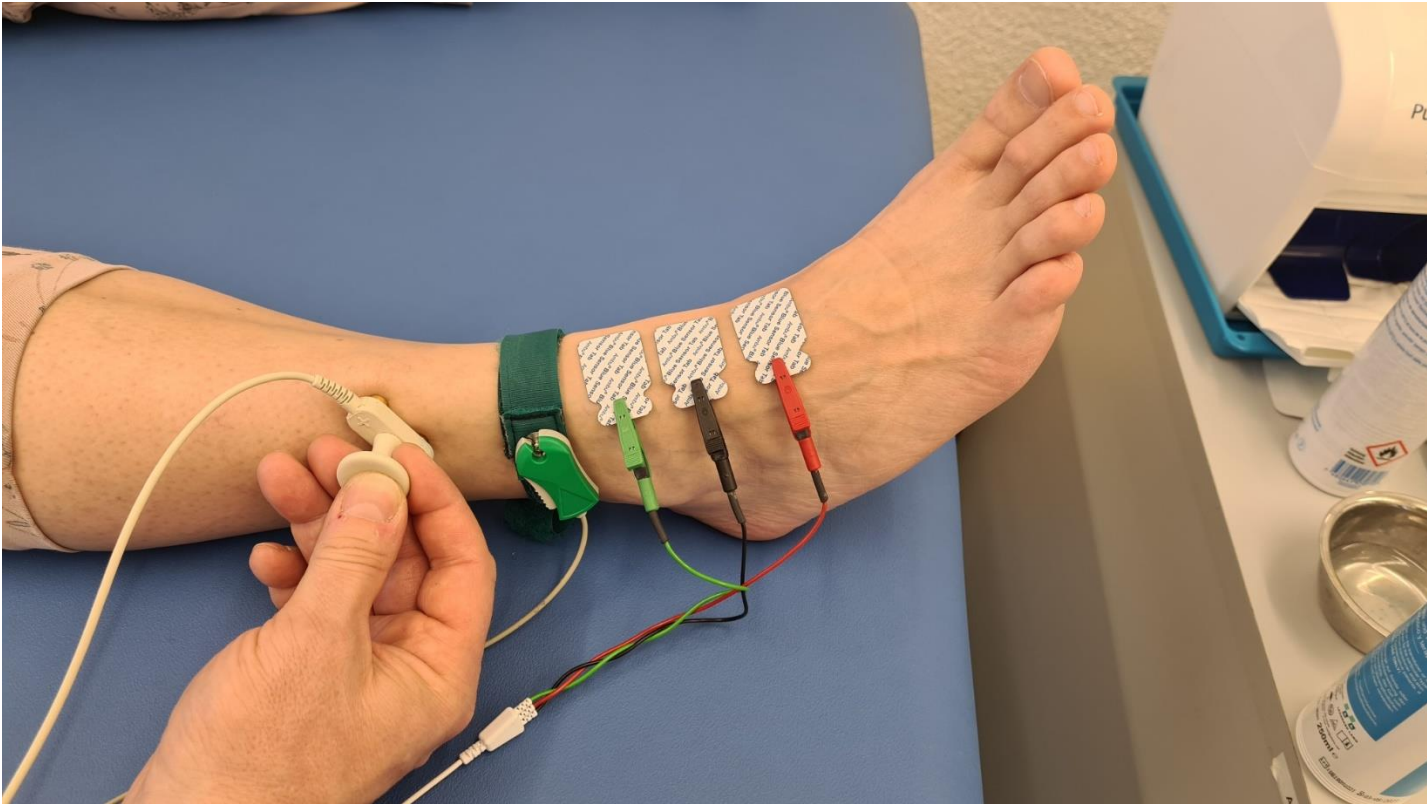


- Sensory part of the superficial peroneal nerve is easily done
  - Motor innervation M. peronei longus and brevis
  - Sensory 2 branches: cutaneous dorsalis med. and intermedius
    - N. cutaneus dorsalis lateralis → sural nerve
  - Becomes superficial in the lower third of the lateral lower leg
- Can be used as a PNP screening nerve
- Can be used eg. to distinguish in unclear clinical symptoms like foot drop or L5 syndrome
- Place electrodes below the malleoli to dig II and III
- Stimulate distal lateral lower leg 10 cm above mall. lat.
  - Ask the subject if he/she feels tingling dorsum of the foot

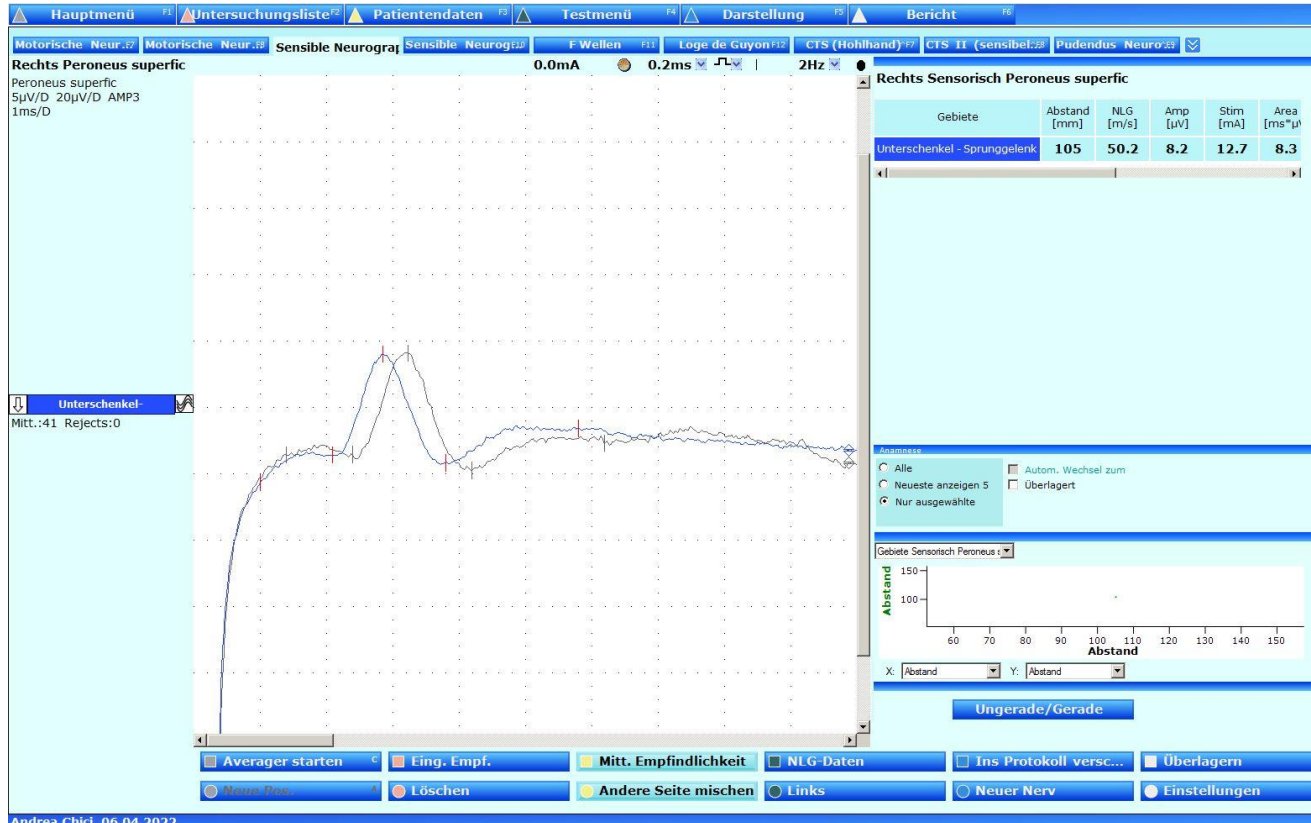


EXTERNAL PLANTAR NERVE  
BRANCHES OF INTERNAL PLANTAR NERVE

# Less common nerve conduction studies: sensory superficial peroneal nerve (antidromic)



# Uncommon nerve conduction studies: sensory superficial peroneal nerve (antidromic): example

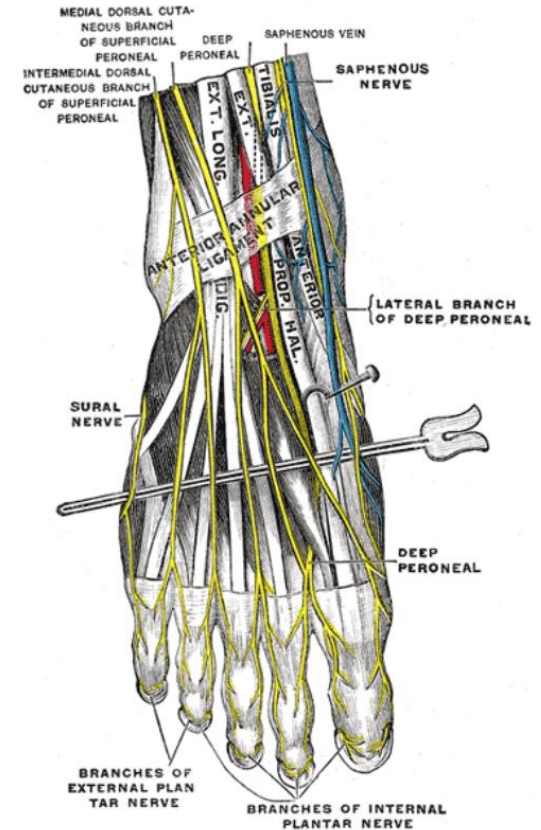




# Uncommon nerve conduction studies: sensory deep peroneal nerve (antidromic)



- Deep peroneal nerve innervates M. tib. ant, ext hallucis and dig. longus and EDB
  - A wasted EDB as a single finding does not necessarily mean fibular comm. nerve or deep peroneal nerve damage
- Inervates small sensory region Dig I + II
- Motor stim. point → EDB activity/volume conduction/artifact
- Stimulation at proximal dorsum of the foot → no motor activity
- Ask the subject about tingling, stim. superficial peroneal nerve
- Cut self-adhesive electrodes for appropriate size

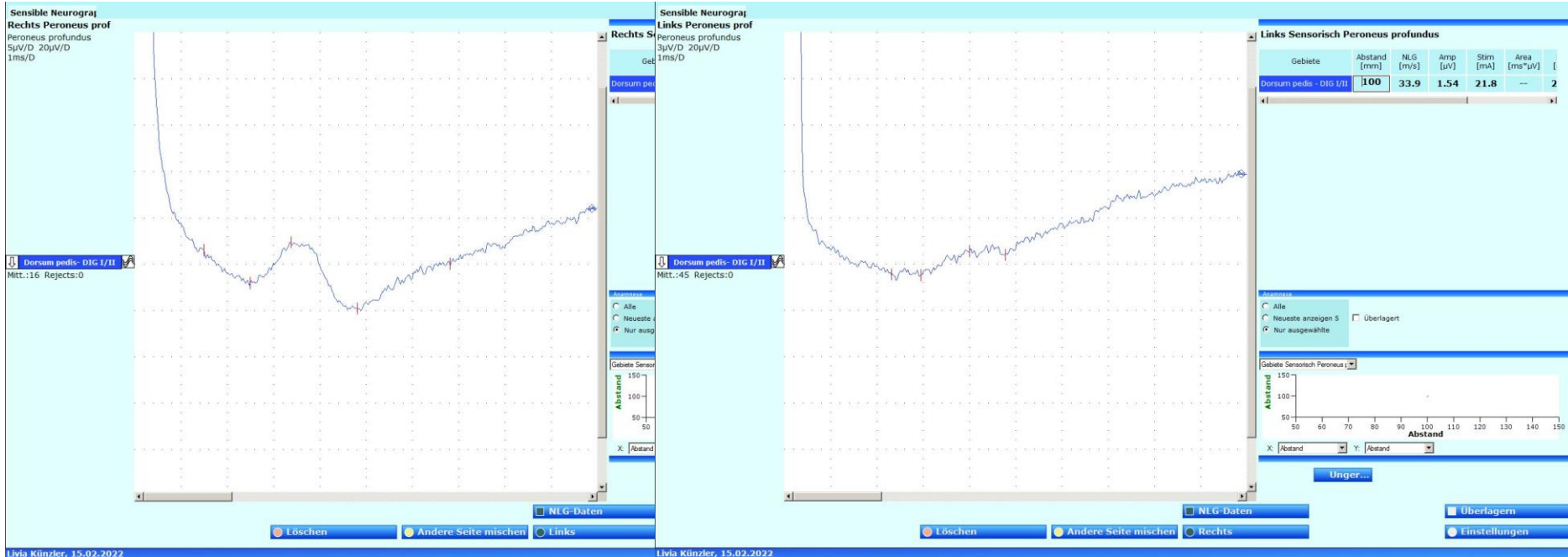




# Uncommon nerve conduction studies: sensory deep peroneal nerve (antidromic) example



# Uncommon nerve conduction studies: sensory deep peroneal nerve (antidromic) example

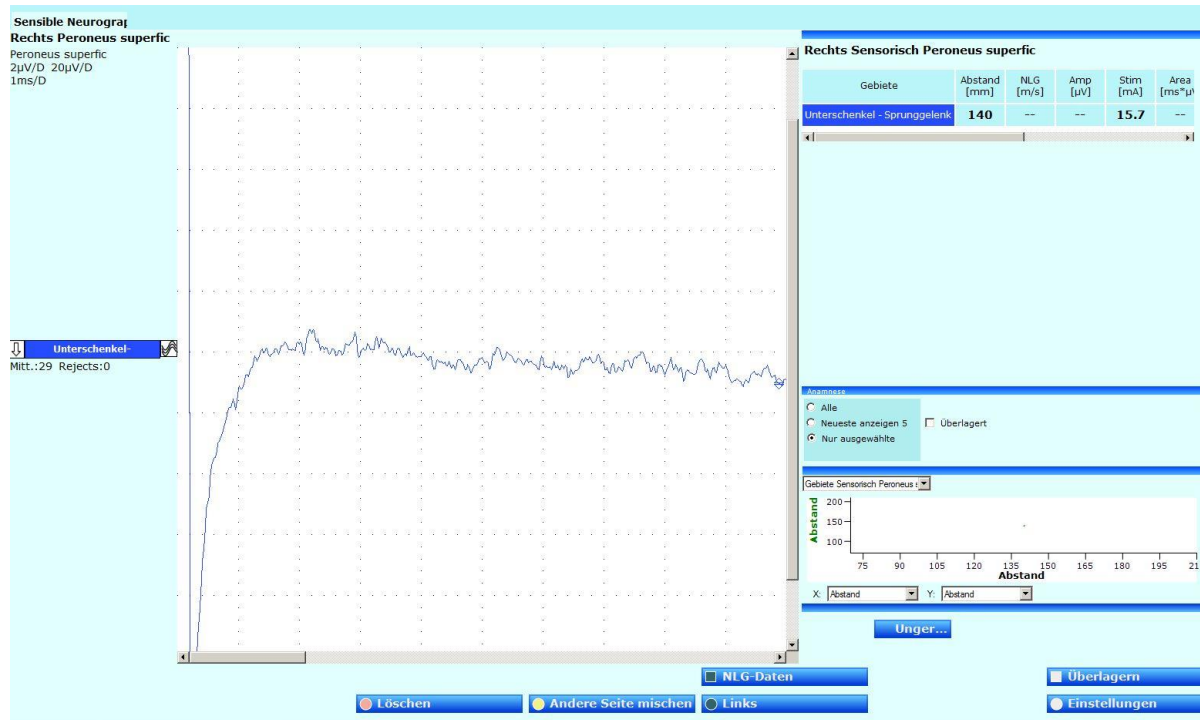


Livia Künzler, 15.02.2022

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# Uncommon nerve conduction studies: sensory deep peroneal nerve (antidromic) example

## Stimulation superficial peroneal nerve → no signal



# Uncommon nerve conduction studies: sensory deep peroneal nerve (antidromic) example

## Stimulation superficial peroneal nerve → no signal

| Nerv                             | Distanz mm | Latenz ms | NLG m/s | Amplitude mV | Stimulus mA | F-Latenz ms | Temp. °C |
|----------------------------------|------------|-----------|---------|--------------|-------------|-------------|----------|
| <b>Peroneus Motorisch Links</b>  |            |           |         |              |             |             |          |
| OSG - EDB                        |            | 29.9      |         | --           | 39.0        |             |          |
| Dist. Cap. fib.-OSG              |            | 6.31      | --      | 0.024        | 40.6        |             |          |
| <b>Peroneus Motorisch Rechts</b> |            |           |         |              |             |             |          |
| OSG - EDB                        | 70.0       | 4.35      |         | 12.2         | 34.4        |             |          |

| Nerv  | Distanz mm | Latenz ms | NLG m/s | Amplitude uV | Stimulus mA | Temp. °C |
|---|------------|-----------|---------|--------------|-------------|----------|
| <b>Peroneus profundus Sensorisch Links</b>  |            |           |         |              |             |          |
| Dorsum pedis - DIG I/II                     | 100        | 2.95      | 33.9    | 1.54         | 21.8        |          |
| <b>Peroneus profundus Sensorisch Rechts</b> |            |           |         |              |             |          |
| Dorsum pedis - DIG I/II                     | 100        | 2.50      | 40.0    | 7.2          | 11.3        |          |
| <b>Peroneus superfic Sensorisch Rechts</b>  |            |           |         |              |             |          |
| Unterschenkel - DIG I/II                    | 140        | --        |         | --           | 15.7        |          |

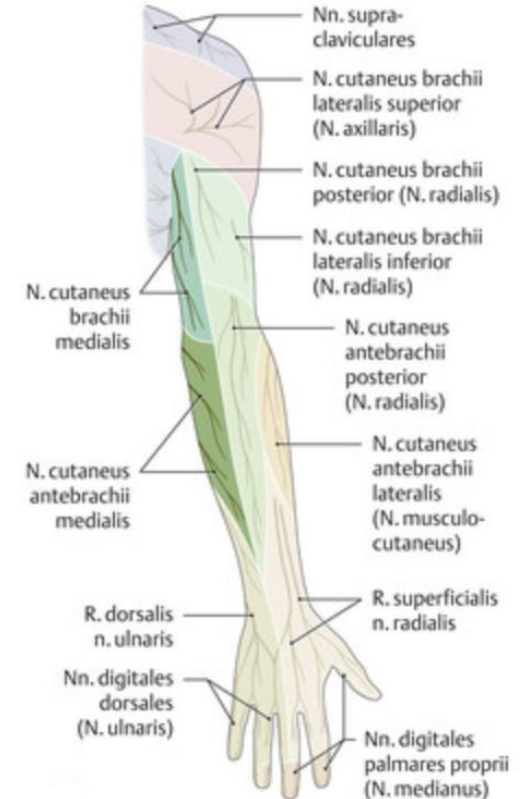
No change of recording electrodes



# Nerve conduction studies: Nervus cutaneus antebrachii dorsalis (posterior)

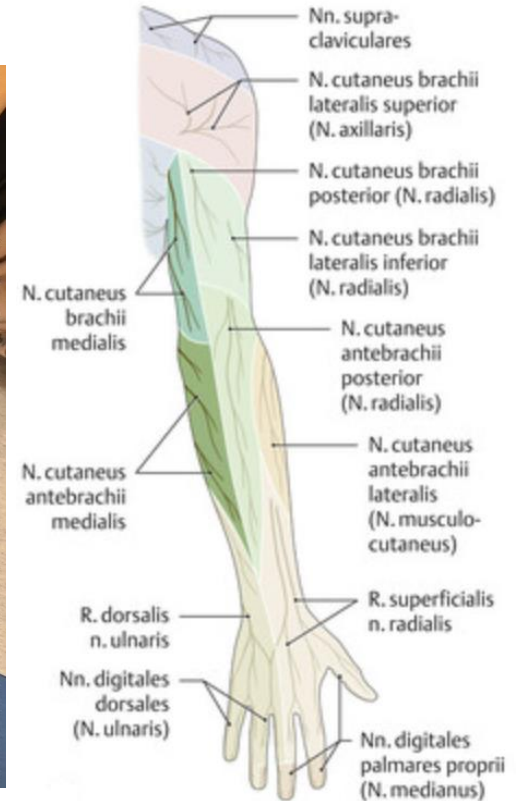
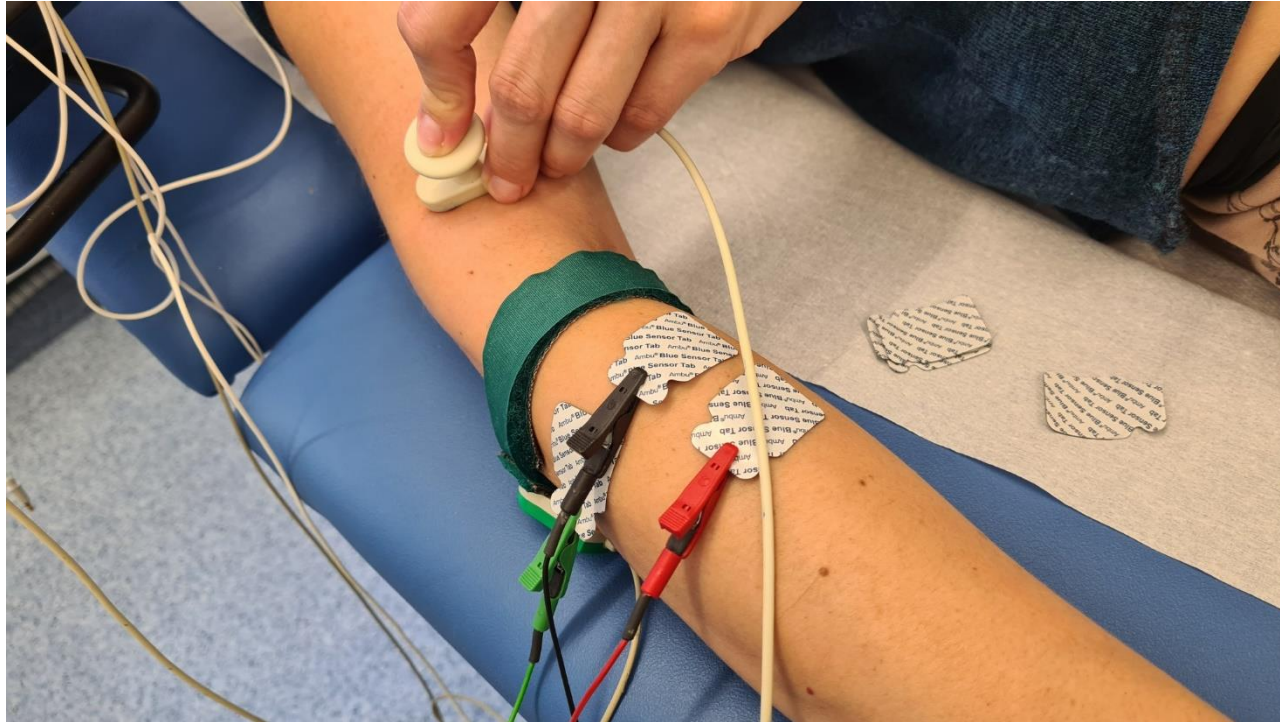


- Sensory branch of the radial nerve
- Supplies dorsum of the forearm (ramus superficiales → dorsum hand)
- Can be evaluated e.g. to confirm CRPS type 2
- Always compare with contralateral side
- Recommendation: leave surface electrodes or mark position to adjust similar placing according to contralateral side
- Hint: stimulate your own nerve to find adequate stimulation point

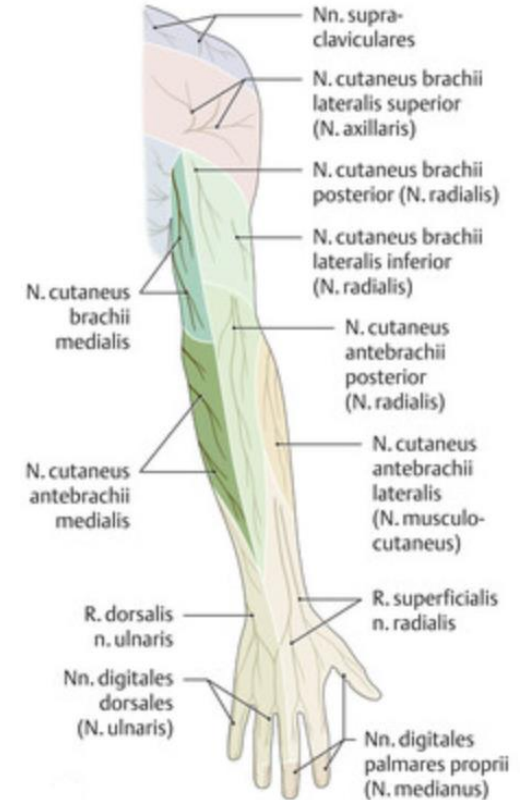
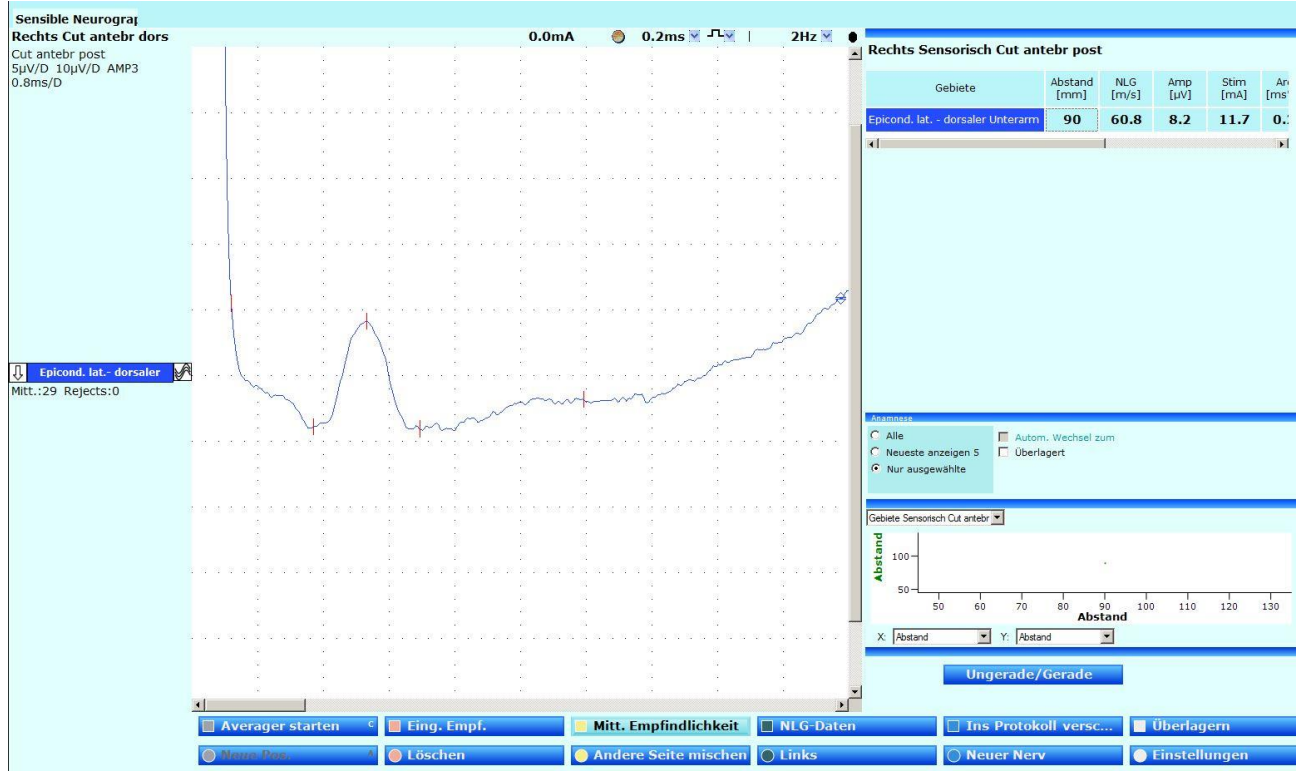




# Nervus cutaneus antebrachii dorsalis (posterior) electrode placement



# Nervus cutaneus antebrachii dorsalis (posterior) normal result

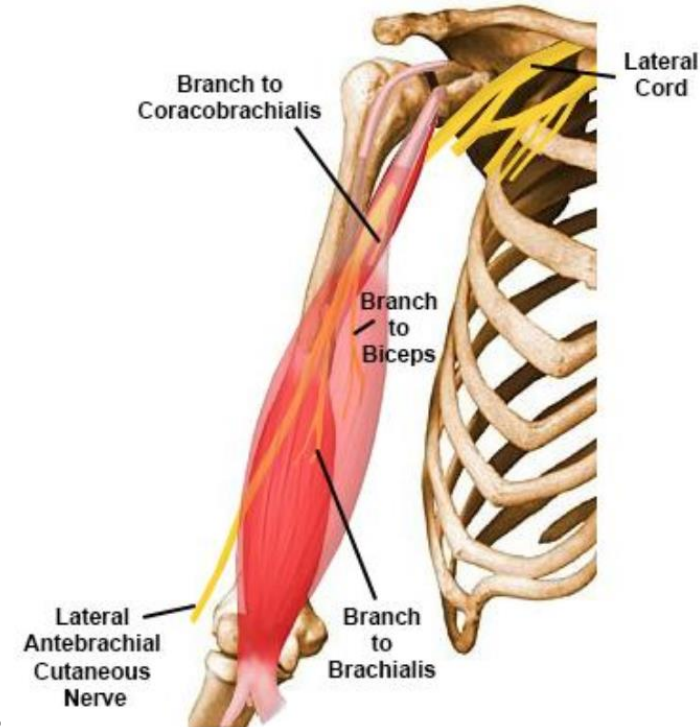




# Uncommon nerve conduction studies: motor musculocutaneous nerve



- Innervates M. biceps brachii and brachialis (coracobrachialis)
- Sensory → N. cutaneus antebrachii lateralis
- Often stimulated at Erb's point → «whole-am-CMAP»
- Stimulation at axillar region tricky but mater of practice
- Stimulation not painful, only tingling at forearm (not hand!)
- Pure biceps CMAP show typical features
- Hint: stimulate your own nerve to find adequate stimulation point and proper CMAP, look at finger/wrists movements
- Sometimes arm abductions or rotation helps to get better access for stimulation of the musculocutaneous nerve



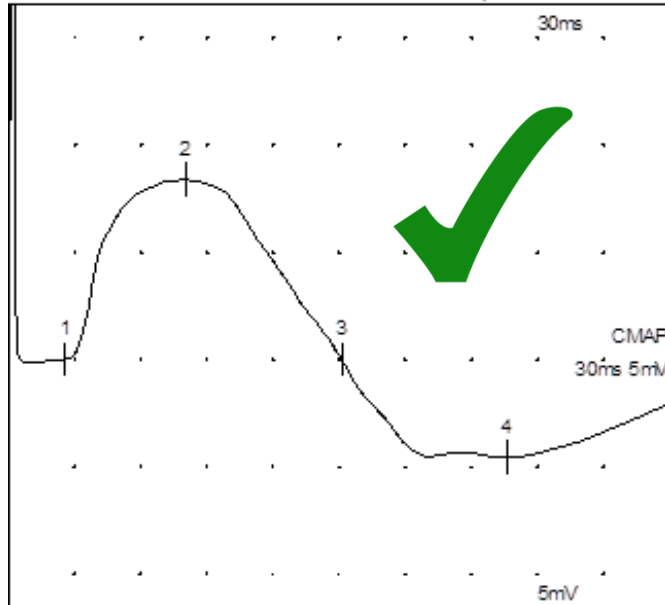
# Uncommon nerve conduction studies: motor musculocutaneous nerve



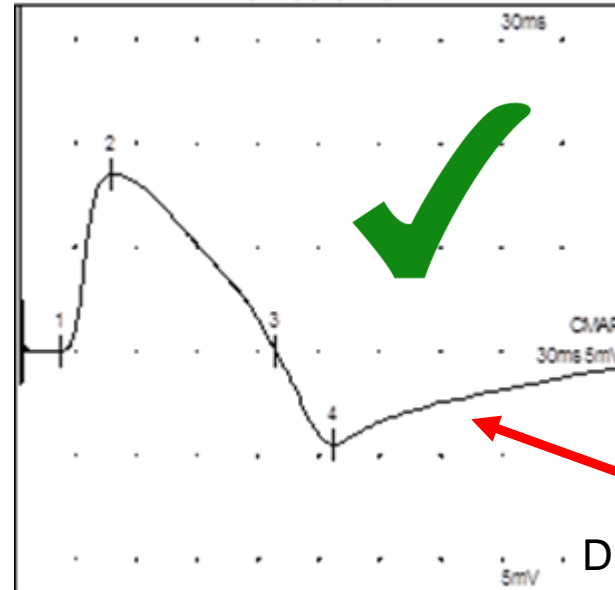
# Musculocutaneous nerve: correct CMAP



MUNIX R Musculocutaneous - Biceps

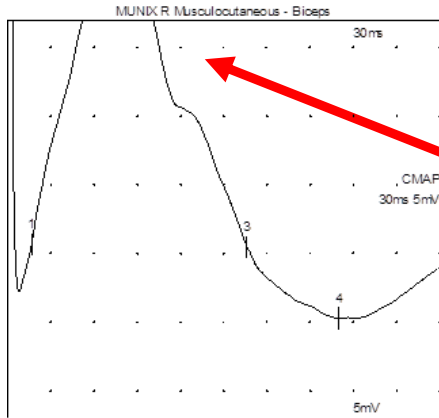


MUNIX L Ulnar - ADM



Different E1 position

# Musculocutaneous nerve: incorrect CMAP (data received)

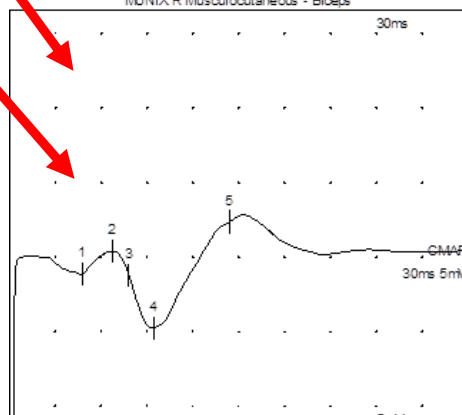
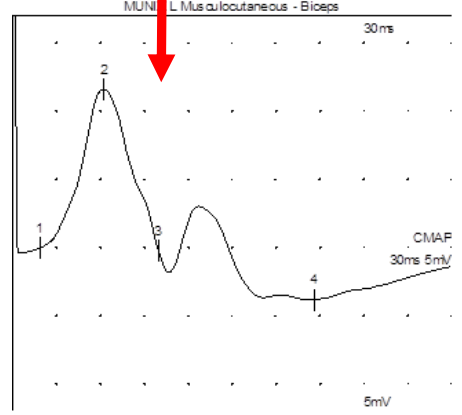
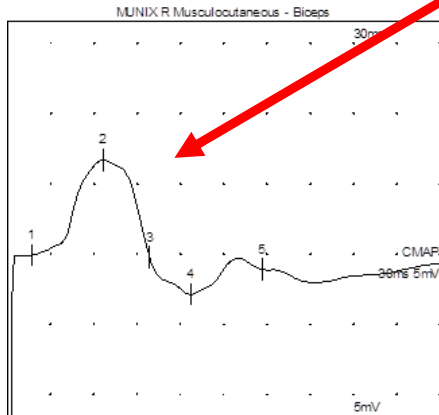
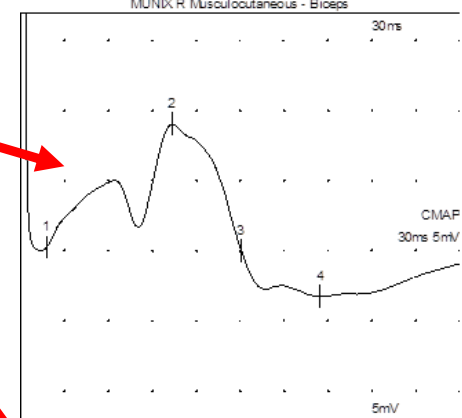


I have no idea..

wrist flexors

finger flexors

Tricipes?



**Comments? Suggestions? Questions...  
before going to practice...)**

