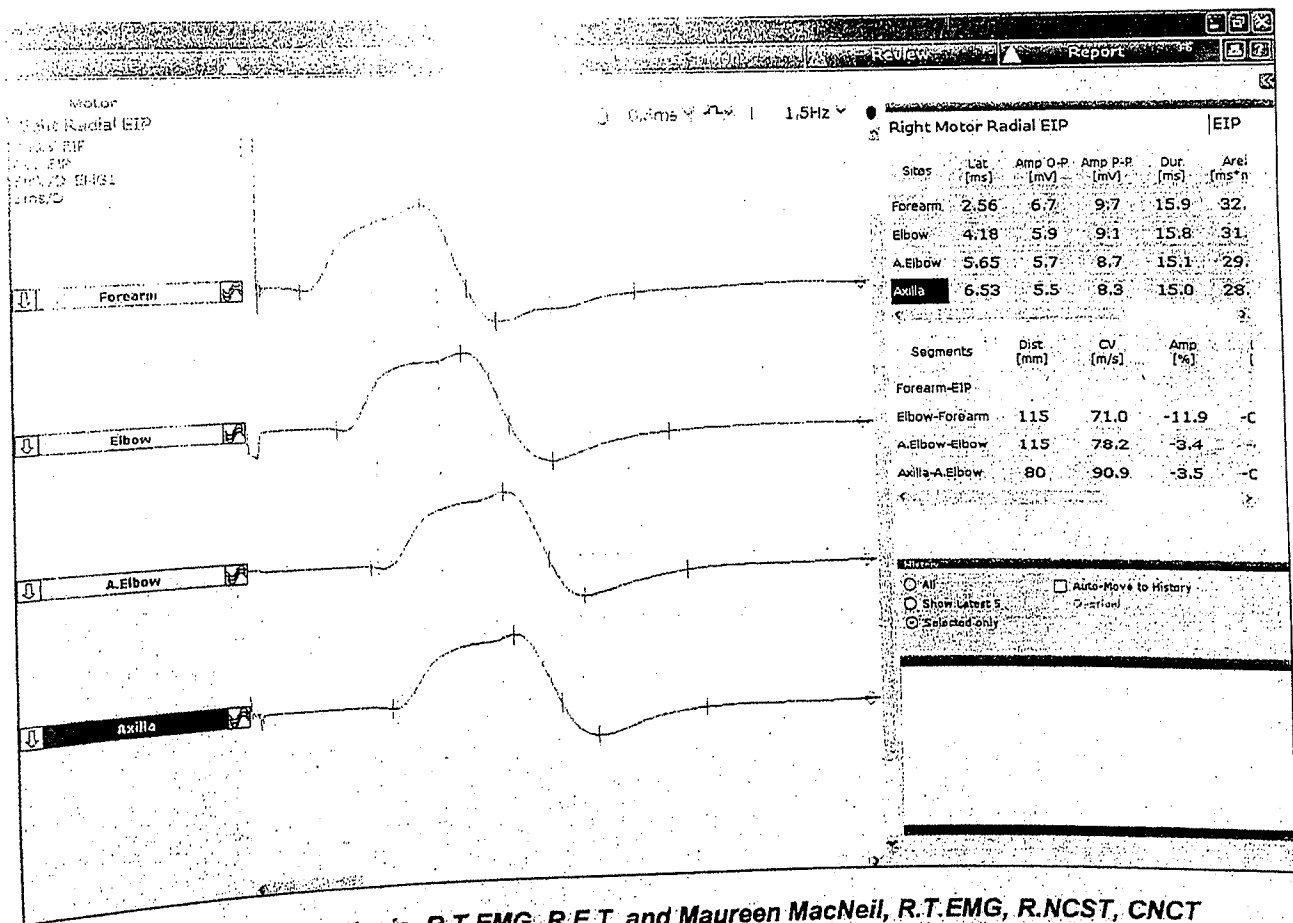
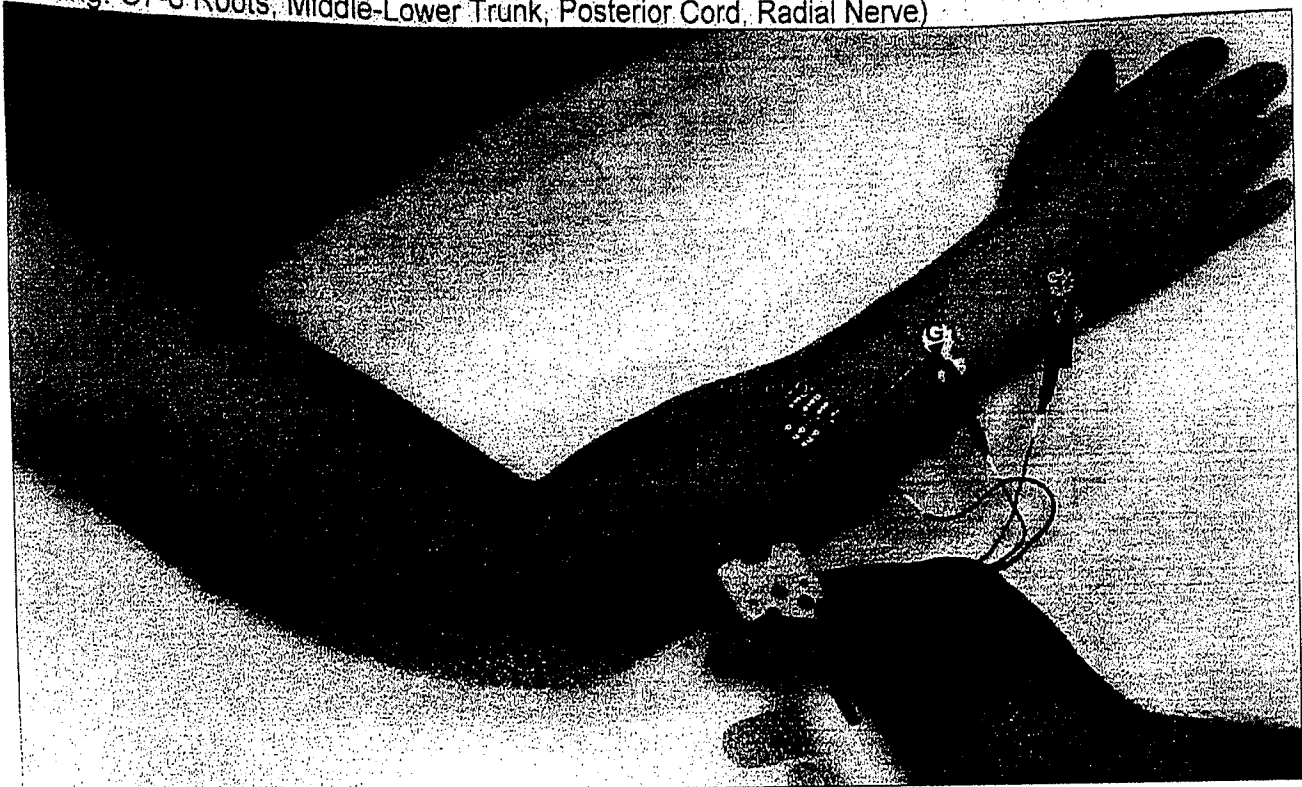


Radial Motor - Extensor Indicis Proprius (EIP) Recording
 Testing: C7-8 Roots, Middle-Lower Trunk, Posterior Cord, Radial Nerve)



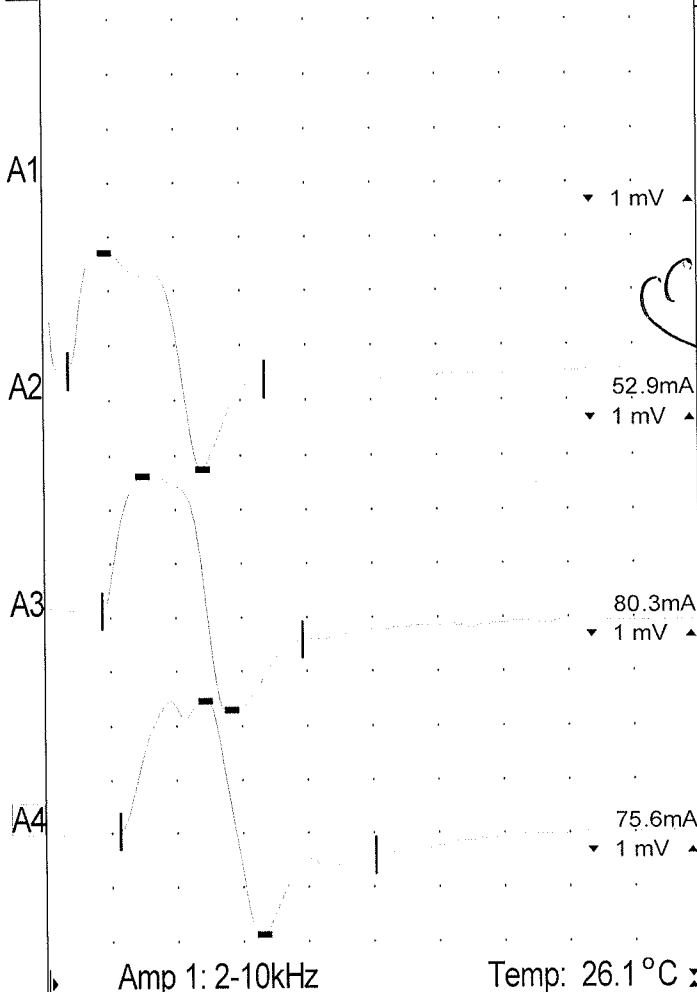
POMERLEAU, Judith
 Rec: EDC Stim: Forearm

Right Radial

MNC
 Record

4
 11:39:07 AM

Switch: N-R Stimulator: 1 Rate: [] Level: 75.6 mA [] 0.1 ms Single Step: 4 Average: Off Sig. Enhancer: Off

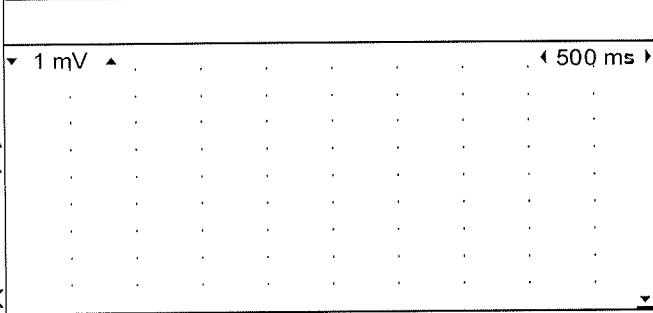


Recording Site: **EIP**
 6cm above EDC

Stimulus Site	Lat1 ms	Dur ms	Amp mV	Area mVms
A1: Forearm				
A2: Lateral antebrachial	1.8	15.0	4.0	19.0
A3: Spiral groove	4.3	15.3	4.4	23.3
A4: Axilla	5.6	19.5	4.4	24.3

5.6cm Above Lateral Epicondyle.
 used calipers.

Segment	Dist mm	Diff ms	CV m/s
EIP-Forearm			
Forearm-Lateral antebrachial	60		
Lateral antebrac-Spiral groove	140	2.5	56
Spiral groove-Axilla	80	1.3	62



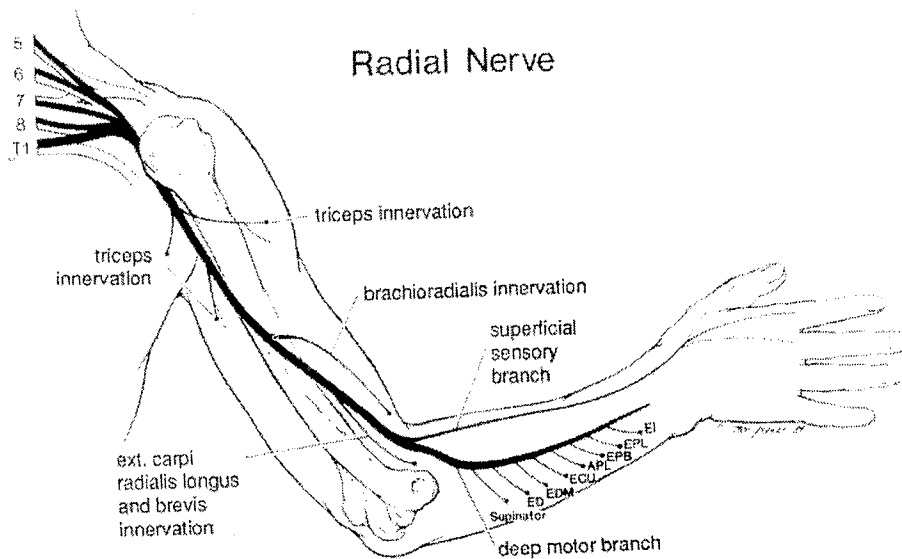


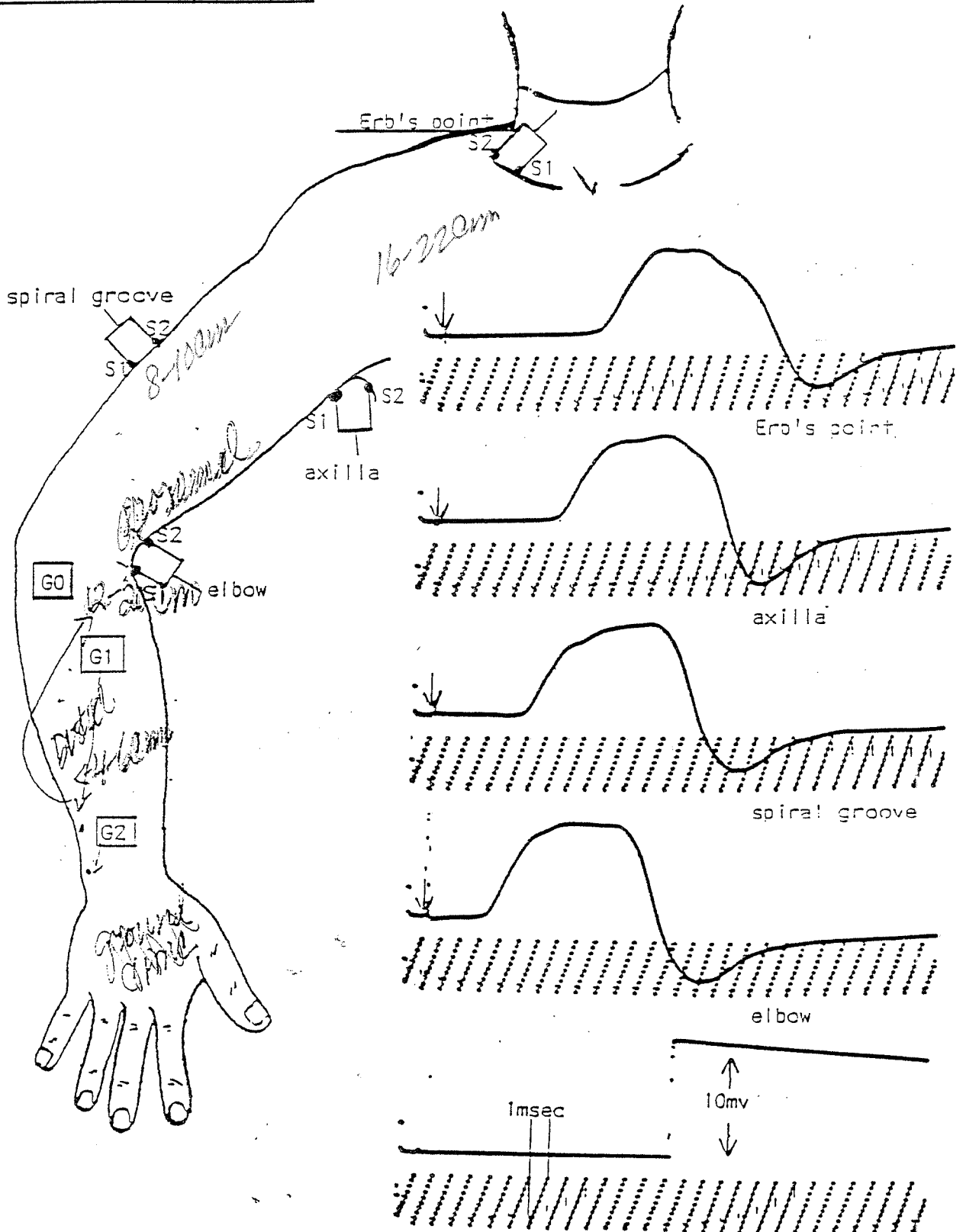
FIGURE 1. Anatomy of the radial nerve showing the levels of muscle innervation.

RADIAL (motor) / extensor digitorum communis

age = 32

Stimulation Site	Amp. mv	Latency msec
Erb's point	7.0	7.5
axilla	7.0	5.8
spiral groove	8.0	4.4
elbow	8.0	3.0

A conduction velocity may be calculated and compared to the contralateral uninvolved limb if the distance, method of measurement, and position of the arm are exactly the same.



Radial (motor)/extensor digitorum communis (10, 48, 50)

- I. Position of Patient
 - A. Patient is supine with upper extremity pronated (palm down) and elbow slightly flexed.
 - B. Upper extremity is supported by the bed at all times.
- II. Equipment
 - A. 2 large disc electrodes or small grounds (G1 active, G2 reference)
 - B. 1 ground (G0)
 - C. Bipolar stimulator (S1 cathode, S2 anode)
- III. Machine Settings
 - A. Sweep speed (msec/div)—2 to 5
 - B. Gain (usually mv)—1 to 10
 - C. Filters—1.6(Hz), 8(KHz)
- IV. Electrode Placement
 - A. G0 (ground)—between G1 and distal S1 *axilla*
 - B. G1 (recording)—posterior portion of the arm over the belly of the extensor digitorum communis muscle.
 - C. G2 (reference)—posterior portion of the arm about 5 cm proximal to the wrist.
- V. Stimulation Sites and Measurements
 - A. Elbow (distal):
 1. Stimulate—S1, over the radial portion of the elbow lateral to the insertion of the biceps tendon.
 2. Measure—distance from S1 to G1 in a straight line.
 - B. Spiral Groove:
 1. Stimulate—S1, on the lateral portion of the arm between the medial and lateral heads of the triceps muscles.
 2. Measure—distance from spiral groove-S1 to elbow-S1 following contour of arm.
 - C. Axilla:
 1. Stimulate—S1 in the posterior portion of the axilla.
 2. Measure—distance from axilla-S1 to spiral groove-S1 and add the distance from spiral groove-S1 to elbow-S1.
 - D. Erb's point:
 1. Stimulate—S1, just behind the *clavicle* ~~clavical~~ bone, 8 to 10 cm from the head of the clavical.
 2. Measure—distance from Erb's point-S1 to spiral groove-S1 and add the distance from spiral groove-S1 to elbow-S1.
- VI. Calculations
 - A. Distal Latency—Calculated from the shock artifact to the takeoff of the negative deflection.
 - B. Amplitude—Calculated from the baseline to the peak of the negative deflection.

- C. Conduction Velocity—Using latencies measured to the takeoff, subtract the distal from the proximal latency, divide the difference into the distance between proximal-S1 and distal-S1, and multiply by 10.

VII. Variations and Pitfalls

- A. Amplitude and configuration of response may vary depending on the placement of G1.
- B. Recording from more than one muscle may cause a configuration or amplitude change especially with axilla and Erb's point stimulation.
- C. Because short distances are being used and the course of the nerve cannot be accurately measured, the conduction velocity may be spuriously fast.
- D. Distance measurements from axilla to spiral groove, and from Erb's point to spiral groove, will differ greatly depending on whether a tape measure or calipers are used. Calipers will give a more accurate anatomic measurement of the nerve but are harder to use and therefore more subject to measurement errors. A tape measure is easier to use but will cause greater variation in the conduction velocities obtained. The validity of side-to-side comparison of conductive velocities obtained using a tape measure will depend on the symmetry of the limbs.

VIII. Normal Values (10, 48)

- A. The distal latency, amplitude, and conduction velocity are based on a side-to-side comparison.
- B. Careful measurements should be made to insure accurate comparison from side to side.

Radial (sensory-antidromic)/dorsum of hand (10, 15, 50)

- I. Position of Patient
 - A. Patient is supine with the hand on its side, the thumb up, and the elbow flexed with the shoulder slightly abducted.
 - B. Upper extremity is supported by the bed at all times.
- II. Equipment
 - A. 2 disc electrodes (G1 active, G2 reference)
 - B. 1 grounds (G0)
 - C. 1 bipolar stimulator (S1 cathode, S2 anode)
- III. Machine Settings
 - A. Sweep speed (ms/div)—1 to 2
 - B. Gain (μv)—5 to 20
 - C. Filters—32(Hz), 1.6(KHz)
- IV. Electrode Placement
 - A. G0 (ground)—between G1 and S1

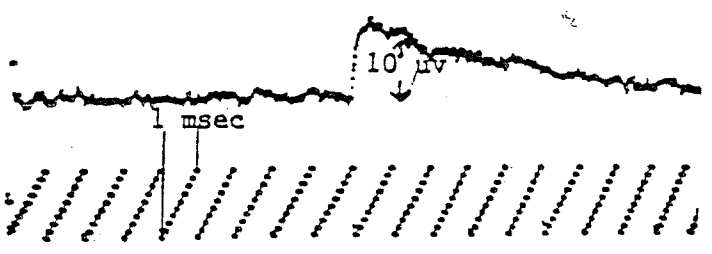
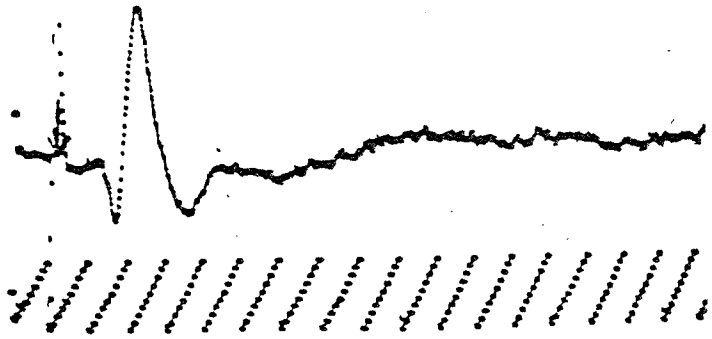
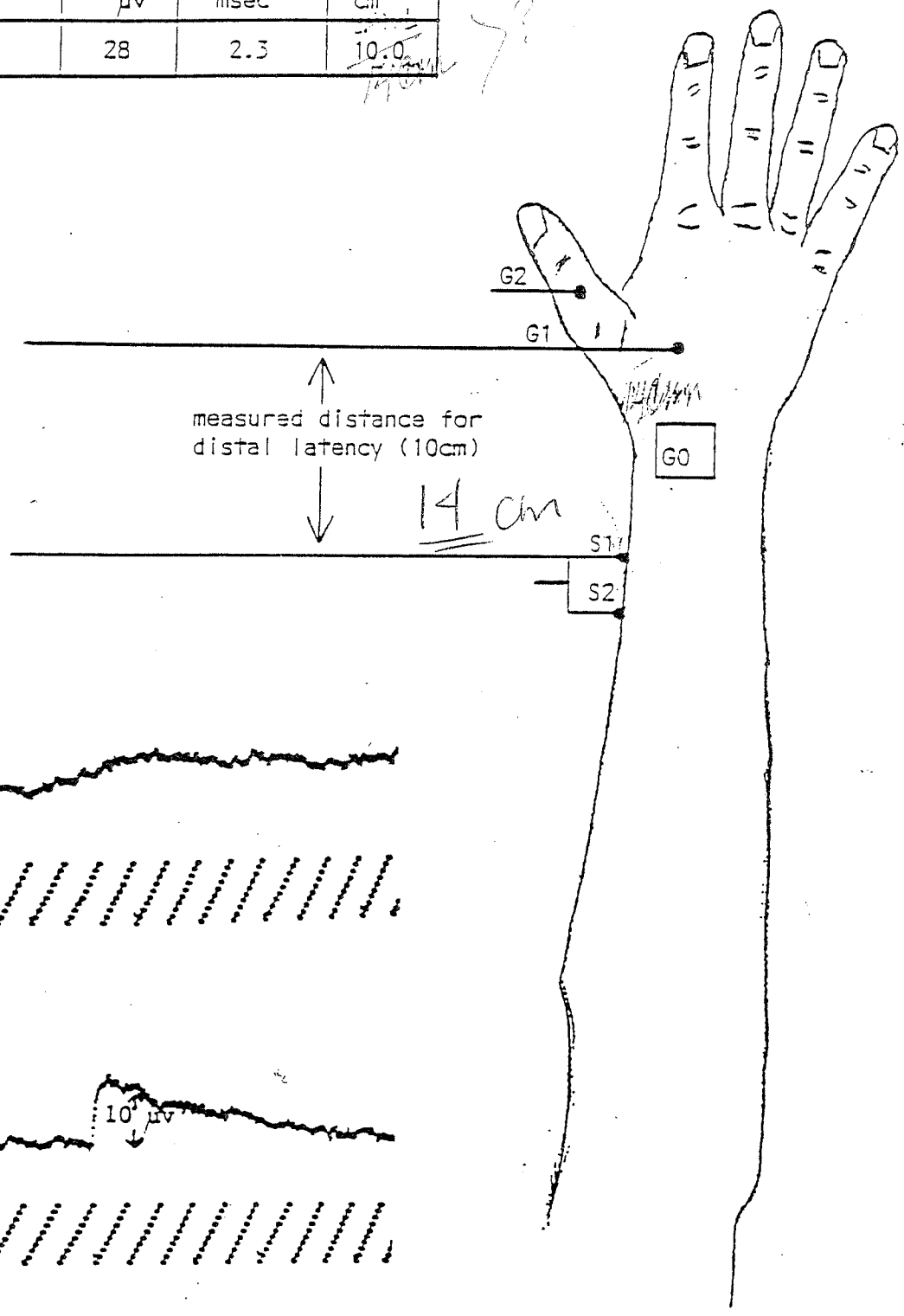
RADIAL (sensory- antidromic) / dorsum of hand

age = 32

Stimulation Site	Amp. μ v	Latency msec	Dist. cm
pt. A	28	2.3	10.0

10 cm antidromic

7?



- B. G1 (active)—on the dorsal surface of the hand at the base of the anatomic "V" formed by the first and second metacarpal bones, approximately 2 cm distal to the anatomic "snuff box."
- C. G2 (reference)—midportion of the proximal phalanx of the thumb.

V. Stimulation Sites and Measurements

- A. Pt. A (distal):
 1. Stimulate—S1, over the radius bone 10 cm proximal to G1.
 2. Measure—distance from S1 to G1 in a straight line. On adults use distance of 10 cm if possible.
- B. Pt. B (not shown):
 1. Stimulate—S1, over the radial portion of the elbow lateral to the insertion of the biceps tendon.
 2. Measure—distance from pt. A-S1 to pt. B-S1 in a straight line.

VI. Calculations

- A. Distal Latency—Calculate from the shock artifact to the peak of the negative deflection of the distal response.
- B. Amplitude—Calculate from the peak of the initial positive deflection to the peak of the negative deflection.
- C. Conduction Velocity—Using latencies measured to the takeoff, subtract the distal from the proximal latency, divide the difference into the distance between proximal-S1 and distal-S1, and multiply by 10.

VII. Variations and Pitfalls

- A. If distance other than 10 cm is used, add or subtract 0.2 msec for each cm difference.
- B. Cold may cause a prolonged distal latency with a normal amplitude.
- C. Because the recording electrode is very near the first dorsal interosseous muscle, frequent increase of motor units and muscle artifact is seen, especially with proximal (pt. B) stimulation.

VIII. Normal Values (Cleveland Clinic Foundation EMG Laboratory)

AGE	AMPLITUDE	DISTAL LATENCY
	μv	msec
0-9	22-42 (28)	1.9-2.5 (2.2)
10-19	18-50 (30)	1.8-2.7 (2.2)
20-29	18-50 (34)	1.7-2.7 (2.2)
30-39	18-60 (32)	1.9-2.7 (2.2)
40-49	18-56 (30)	1.9-2.5 (2.2)
50-59	14-56 (30)	1.8-2.7 (2.3)
60-69	10-42 (24)	1.8-2.7 (2.4)
70-	10-30 (18)	2.0-2.8 (2.4)