

LEVEL II MUSCLE CHART

NB: Needle length varies with tissue depth, this chart acts as a guide only

LUMBAR SPINE

| Muscle/ Innervation | Comments | Position | Needle Size Gauge(width) Length (mm) | Angle of Needle | Sign Off |
|--|---|-------------------|--|-------------------|----------|
| Quadratus Lumborum <small>T12-L3/4 segmentally</small> | Safest to crest of ilium, care with rib/kidney | Side lye or prone | .25 x 30-50mm | Inferior to ilium | |

THE HAND

| Muscle/ Innervation | Comments | Positioning | Needle Size Gauge(width) Length (mm) | Angle of Needle | Sign Off |
|---|---|-----------------|--|-----------------|----------|
| PAD:DAB | | | | | |
| First Dorsal Interosseous <small>Deep BR, Ulnar Nerve, C8/T1</small> | Dorsal aspect of 1 st web space | Seated / Supine | .20-.25 x 30mm | Perp | |
| 2-4 Dorsal Interosseous <small>C8 / T1</small> | Dorsum of hand | Seated / Supine | .20-.25 x 30mm | Perp | |
| Adductor Pollicis <small>C8 / T1</small> | Dorsum thru 1 st web space or palmar approach | Seated / Supine | .20-.25 x 30mm | Perp or thread | |
| Abductor Pollicis Brevis <small>C8 / T1 Median N</small> | From radial side of 1 st M/C | Seated / Supine | .20-.25 x 30mm | Perp or thread | |
| Flexor Pollicis Brevis <small>C8 / T1 Median N</small> | From radial side of 1 st M/C, or dorsal approach thru 1 st web space | Seated / Supine | .20-.25 x 30mm | Perp or thread | |
| Opponens Pollicis <small>C8 / T1 Median N</small> | Dorsal or palmar approach | Seated / Supine | .20-.25 x 30mm | Perp or thread | |
| Abductor Digiti Minimi <small>C8/T1 D Br Ulna N</small> | Needle from dorsal, palmar or lateral aspect | Seated / Supine | .20-.25 x 30mm | Perp or thread | |
| Flexor Digiti Minimi <small>C8/T1 D Br Ulna N</small> | Similar to previous. Also dorsal between 4 th and 5 th MC's | Seated / Supine | .20-.25 x 30mm | Perp or thread | |

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|--|---|-----------------|----------------|----------------|--|
| Opponens Digiti Minimi C8/T1 D Br Ulna N | Similar to previous. Also dorsal between 4 th and 5 th MC's | Seated / Supine | .20-.25 x 30mm | Perp or thread | |
|--|---|-----------------|----------------|----------------|--|

THE FOOT

| Muscle/ Innervation | Comments | Positioning | Needle Size Gauge(width) Length (mm) | Angle of Needle | Sign Off |
|--|---|------------------------------|--|-------------------|----------|
| Extensor Digitorum Brevis L5/S1 Deep Peroneal | Obvious muscle bulk supero-lat foot | Supine or crook | .20-.25 x 30mm | Perp | |
| Extensor Hallucis Brevis L5/S1 Deep Peroneal | Sits just medial to above | Supine or crook | .20-.25 x 30mm | Perp | |
| Abductor Hallucis S1/2 Med Plantar N | Enter over navicular to avoid N's | Side lye, prone or supine | .25 x 30-40mm | Thread | |
| Flexor Digitorum Brevis S1/2 Med Plantar N | Similar to previous, consider depth | Side lye, prone or supine | .25 x 30-50mm | Thread | |
| Abductor Digiti Minimi S1-S3 Lat plantar N | Approach from lateral foot | Supine, side or crook | .25 x 30mm | Thread | |
| Flexor Digiti Minimi Brevis S2/3 Lat Plantar N | In dorsal approach and reflect tissue laterally | Supine, side, prone or crook | .25 x 30mm | Perp | |
| Quadratus Plantae S1-S3 Lat Plantar N | Bony backdrop or muscle direct | Side lye or prone | .25 x 40- 50mm | Perp or thread | |
| Dorsal Interosseous S2/3 Lat Plantar N | Care with doralis pedis Artery. Needle close to 2 nd M/T | Supine or crook | .20-.25 x 30mm | Perp | |
| Adductor Hallucis S2 /S3 lat Plantar N | Plantar approach: just medial and proximal to 1 st MTP Dorsal approach: between M/T's | Prone, Supine or side lye | .25 x 30- 50mm | Perp | |
| Flexor Hallucis Brevis S1/2 Medial Plantar N | Avoid sole of foot, approach from above/medial and needle just proximal to 1 st MTP | Prone, Supine or side lye | .25 x 40- 50mm | Medial angulation | |

THE HIP

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|--|--|---------------------------|----------------------|--|--|
| Piriformis sacral plexus,L5 S1,S2 | Sciatic nerve runs 1/3-1/2 way between the ischial tuberosity and the greater trochanter Needle medial aspect of muscle | Prone/ side lying | .25-.30mm x 40-110mm | Perpendicular | |
| Superior Gemelli L5, S1-2 N to Obt Int | Onto upper and medial facet on greater trochanter | Prone/side lying-hip fl | .25-30 x 40-60mm | Perp/lat | |
| Obturator Internus L5, S1-2 N to Obt Int | Onto upper and medial facet on greater trochanter | Prone/side lying-hip fl | .25-30 x 40-60mm | Perp/lat | |
| Inferior Gemelli L5, S1-2 N to Quad fem | Onto upper and medial facet on greater trochanter | Prone/side lying-hip fl | .25-30 x 40-60mm | Perp/lat | |
| Obturator Externus L2-4 Obt N | Needle more deeply posterior to greater trochanter | Prone/side lying-hip fl | .25-30 x 40-60mm | Perp/lat | |
| Quadratus Femoris L5, S1-2 N to Quad fem | Needle in lateral 1/3 to avoid sciatic N | Prone/side lying-hip fl | .25-30 x 30-50mm | Perp/lat | |
| Pectineus L2,3, Fem N & Obt N | Entry point medial to Femoral A. Caution femoral NAV | Supine/ side lying | .25-.30 x 30-50mm | Perp/med | |
| Adductor Brevis L2-4, Obt N | Medial to Pectineus and lateral to Longus. Caution femoral NAV | Supine with hip abd/er/fl | .25-.30 x 30-50mm | Perp/lat | |
| Iliacus (ant hip) L2,3 Fem N | Entry point lateral to Femoral A. Caution femoral NAV | Supine/Crook | .25-.30 x 30-50mm | Perp/lat. Medial to ASIS and Sartorius | |
| Psoas (ant hip) L2,3 | Entry point lateral to Femoral A. Caution femoral NAV | Supine/Crook | .25-.30 x 30-50mm | Perp/lat. Postero-lateral | |

THORACIC SPINE

| Muscle/ Innervation | Comments | Positioning | Needle Size Gauge(width) Length (mm) | Angle of Needle | Sign Off |
|---|--|-------------|--|-----------------|----------|
| Multifidus Segmentally by dorsal rami | Locate landmarks of SP, articular pillars, rib angles Insertion point: ½ -1 Fgr breadth from SP | Prone | .25 x 30-50mm Plunger | Caudal & Medial | |
| Spinalis Segmentally by dorsal rami | Most medial Erector Spinae | Prone | .25 x 30-40mm Plunger | Towards SP's | |
| Longissimus Segmentally by dorsal rami | Intermediate mass | Prone | .25 x 30-40mm Plunger | Towards SP's | |
| Iliocostalis Segmentally by dorsal rami | Lateral mass | Prone | .25 x 30-40mm Plunger | Towards SP's | |

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|---|---|-----------------------|-------------------------------------|--|--|
| Serratus Posterior Superior 2nd-5 th I/ Costal N's | Only needle if confident Ribs 2-5 have been identified. Can needle at C/T | Side lye or prone | .25 x 30mm only | Perp | |
| Middle Trapezius Spinal accessory (XI), sensory C3/4 | Grab and LIFT fibers off chest wall | Prone –support ant Sh | .25 x 30mm only | Thread above down or lift off chest wall and needle P-A | |
| Lower Trapezius Spinal accessory (XI), sensory C3/4 | Grab and LIFT fibers off chest wall | Prone –support ant Sh | .25 x 30mm only | Thread above down or lift off chest wall and needle P-A | |
| Rhomboids C4/5 Dorsal Scap N | Grab and LIFT fibers off chest wall | Prone –support ant Sh | .25 x 30mm only | Thread above down or lift off chest wall and needle P-A | |
| Serratus Anterior C5-7 Long Thoracic | Along and ONTO rib-only if 100% confident | Side lye or supine | .25 x 30mm only | Medial approach onto winged scap, or laterally over ribs | |
| Serratus Posterior Inferior T9-12 Ventral rami | Safest at LTJ. Over rib if confident. | Prone | .25 x 30-50 at LTJ 30mm over rib | Perp | |

TRUNK

| Muscle/ Innervation | Comments | Positioning | Needle Size Gauge(width) Length (mm) | Angle of Needle | Sign Off |
|--|---|--------------------|--|--------------------------|----------|
| Rectus Abdominus T 7-12 Ventral rami | Safest in side-lye. If confident over ribs. | Side lye or supine | .25 x 30-50mm | Thread or Perp over ribs | |

CERVICAL SPINE

| Muscle/ Innervation | Comments | Positioning | Needle Size Gauge(width) Length (mm) | Angle of Needle | Sign Off |
|---|--|-----------------|--|-----------------|----------|
| Sternocleidomastoid Spinal accessory (XI), proprio C2/3 | Grasp and lift muscle off anterior neck | Supine | .20-25 x 30mm | Perp or thread | |
| Splenius Capitis Post primary rami | Caution for depth and VA as it loops above the C2/3 facet jnt. | Seated or Prone | .25 x 30-40mm | Perp/medial | |
| Inferior Obliquus Capitus C1-post primary rami | Angle towards root of C2 spinous process. Caution for VA. | Prone or seated | .25 x 30-40mm | Perp/medial | |

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|---|--|-----------------|---------------|-------------------------------------|--|
| Rectus Capitus Posterior Major C1-post primary rami | Aim to needle lamina of C2 just superior to IOC. Or at Inferior nuchal line. | Prone or seated | .25 x 30-40mm | Medial onto SP, superior to occiput | |
|---|--|-----------------|---------------|-------------------------------------|--|

Superficial to Deep C2-C5 Maintain mild caudal line

FACE/TMJ

| Muscle/ Innervation | Comments | Positioning | Needle Size Gauge(width) Length (mm) | Angle of Needle | Sign Off |
|--|---|-------------|--|-----------------|----------|
| Temporalis Ant Div Mandibular CN (V) | Needle above Z.arch. Care with N. and A. anterior to ear. | Supine | .20-.25 x 30mm | Perp or thread | |
| Masseter Ant Div Mandibular CN (V) | Onto ramus of mandible. Care with parotid gland. | Supine | .20-.25 x 30mm | Perp or thread | |

UPPER EXTREMITY

| Muscle/ Innervation | Comments | Positioning | Needle Size Gauge(width) Length (mm) | Angle of Needle | SignOff |
|---|--|-----------------------|---|---|---------|
| Pectoralis Minor C6,7,8 Medial Pectoral N | 1. Off coracoid 2. Lift muscle off chest wall 3. Directly off ribs 3-5 | Supine | .25 x 30-50mm | 1. Towards CP 2. A-P, M-L 3. Perp | |
| Subclavius C5,6 N to Subclavius | Directly off clavicle | Supine | .20-.25 x 30mm | Superior onto clavicle | |
| Levator scapulae C3-4 Dorsal scap C4-5 | Side-lying/ prone, consider hammerlock | .25-.30mm 30-40mm | Angle to the medial bone border of the scapular (not behind the scapular) | Should needle periosteum of superomedial angle of scapulae | |
| Supraspinatus (Suprascapular C4,C5,C6) | Prone, consider hammerlock | .25-.30 mm 20-50mm | Angle inferior and posterior towards the spine of the scapulae | Needle medial 1/3 Avoid lateral aspect. Look to bump scap spine before rolling into fossa | |
| Rhomboid major (Dorsal scapular, | Prone with hammerlock or side-lying on affected side to wing | .25 mm 20-40mm | Angle to the medial bone border of the | Common to bump periosteum | |

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|---|---|-------------------------------------|--|-----------------------------------|--|
| C4,C5) | scapular | | scapular (NOT behind the scapular) | | |
| Rhomboid minor (Dorsal scapular, C4,C5) | Prone with hammerlock or side-lying on affected side to wing scapular | .25 mm 20-40mm | Angle to the medial bone border of the scapular (NOT behind the scapular) | Bump periosteum | |
| Subscapularis C5,6,7 Upper and lower subscapular N's | Anterior and posterior approaches | Supine with HBB. Side lye or prone. | .25 x 30-60mm Plunger in Supine | Towards costal surface of scapula | |
| Coracobrachialis C6,7 Musculocutaneous | Caution for median N, brachial A and N inferiorly | Supine with arm abducted & ER | .25 x 30-40mm | Perp | |
| Biceps-Short Head C5,6 Musculocutaneous | Sits just superior to previous | Supine with arm abducted & ER | .25 x 30-40mm | Perp | |

LOWER EXTREMITY

| Muscle/ Innervation | Comments | Positioning | Needle Size Gauge(width) Length (mm) | Angle of Needle | Sign Off |
|---|--|------------------------------------|--------------------------------------|--------------------|----------|
| Popliteus L4,5, S1 Tibial N | Avoid midline-needle upper medial tibia Or thru lat gastroc | Prone with knee flexed | .25 x 30-40mm | Perp | |
| Tibialis Posterior L4,5 Tibial N | Needle at lower 1/3 of medial tibia or upper 1/3 thru gastroc | Prone with knee flexed or side lye | .25 x 30-40mm | Variety | |
| Flexor Digitorum Longus S1,2 Tibial N | Needle in mid-upper 1/3 of medial tibia | Prone or side lye | .25 x 30-40mm | Variety | |
| Flexor Hallucis Longus S1,2 Tibial N | Needle off postero-medial fibular border | Prone | .25 x 30-40mm | Perp and/or medial | |
| Extensor Hallucis Longus L4,5 Deep Peroneal | Lies immediately lateral to Tib Ant | Supine or crook lye | .25 x 30-40mm | | |

TENDON LIGAMENT

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|--------------------------------|--------------------|-------------------|---------------|----------------|--|
| Achilles Tendon | Caution with depth | Prone | .25 x 30-40mm | Perp | |
| Patella Tendon | Caution with depth | Supine | .25 x 30-40mm | Perp or thread | |
| Lateral Epicondyle | | Supine or sitting | .25 x 30-40mm | Perp | |
| PSIS | LDL-ES-T/L fascia | Prone | .25 x 30-40mm | Perp | |
| Lateral Collateral-knee | Caution with depth | Supine | .25 x 30-40mm | Perp | |
| Medial Collateral-knee | Caution with depth | Supine | .25 x 30-40mm | Perp | |

Summary of Muscles Supplied By Spinal Segments

Cervical Spine (C4-T1)

| SEGMENT | MUSCLES SUPPLIED |
|-----------|--|
| C4 | Supraspinatus, infraspinatus, rhomboids, trapezius, levator scapulae |
| C5 | Supraspinatus, infraspinatus, teres minor, teres major, deltoid, pectoralis major, rhomboids, levator scapulae, subclavius, subscapularis, serratus anterior, biceps, wrist extensors |
| C6 | Supraspinatus, infraspinatus, teres minor, teres major, latissimus dorsi, deltoid, pectoralis major/minor, subclavius, subscapularis, serratus anterior, coracobrachialis, biceps, triceps, wrist extensors, wrist flexors |
| C7 | Teres major, latissimus dorsi, pectoralis major/minor, subscapularis, serratus anterior, coracobrachialis, triceps, wrist extensors, wrist flexors |

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|-----------|---|
| C8 | Latissimus dorsi, pectoralis major/minor, triceps, wrist extensors, wrist flexors, Muscles of Hand |
| T1 | Muscles of hand |

Lumbar Spine (L2-S3)

| SEGMENT | MUSCLES SUPPLIED |
|----------------|--|
| L2 | Quads, adductors, Iliacus, psoas, obt externus, pectineus |
| L3 | Quadriceps, sartorius, gracilis, pectineus, iliacus, psoas, adductor longus, brevis and magnus, obt externus |
| L4 | Gluteus medius and minimus, TFL, quadriceps, sartorius, gracilis, adductor longus, brevis and magnus, semimembranosus, semitendinosus, tibialis anterior/posterior, extensor digitorum longus, obt externus, popliteus, extensor hallucis longus |
| L5 | Gluteus maximus, medius and minimus, piriformis, gemelli, obturator Int, TFL, adductor magnus, hamstrings, popliteus, tibialis anterior/posterior, extensor digitorum longus/brevis, peroneals, muscles of foot, ext hallucis and digitorum brevis, quadratus femoris, ext hallucis longus |
| S1 | Gluteus maximus, medius and minimus, piriformis, gemelli, obturator Int, quadratus femoris, TFL, hamstrings, popliteus, gastrocnemius, soleus, peroneals, flexor digitorum/hallucis longus, muscles of foot, ext hallucis and digitorum brevis, abd hallucis, flexor digitorum, flexor hallucis brevis, quadratus plantae, abd digiti minimi |
| S2 | Piriformis, gemelli, obturators, quadratus femoris, abd/FI Dig minimi, quad plantae, interossei, add and abd hallucis, flexor digitorum brevis, flexor hallucis brevis, quadratus plantae |
| S3 | Add hallucis, abd digiti minimi, flexor digiti minimi brevis, quadratus plantae, interossei |