

MUSCLE CHART - Introductory Course

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

Muscle/ Innervation	Positioning	Needle Size Gauge(width) Length (mm)	Angle of Needle	Comments
Gluteus Maximus (Inf. Glut L5,S1,S2)	Prone/ side lying	.30mm 30-60mm	Angle perpendicular to muscle	Superficial muscle, watch depth to avoid sciatic N.
Gluteus Medius (Sup Glut, L4,L5,S1)	Prone/ side lying	.30mm 40-110mm	Visualize contour of ilium to needle perpendicular, motor bands very palpable and fibrous	Bump periosteum
Gluteus Minimus (Sup Glut, L4,L5,S1)	Prone/ side lying	.30mm 40-110mm	Visualize contour of ilium to needle perpendicular	Bump periosteum
Piriformis (sacral plexus,L5 S1,S2)	Prone/ side lying	.30mm 40-75mm	Angle perpendicular to muscle in lateral 1/3 , also needle at insertion on greater trochanter	Sciatic nerve runs 1/3 – 1/2 way between the ischial tuberosity and the greater trochanter
TFL (Sup Glut, L4,L5,S1)	Supine Side lying	.30mm 30-60mm	Angle perpendicular to ilium in sidelying or A/P lateral to ASIS in supine	
Comments:				

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LUMBAR REGION

Muscle/ Innervation	Positioning	Needle Size Gauge(width) Length (mm)	Angle of Needle Caudal in spine	Comments
Longissimus lumborum (seg. T1-L5)	Prone	.30mm 30-50mm	Angle approx 60-90 degrees 	L3 and below (avoid lung field), muscle belly and at iliac crest
Iliocostalis thoracis/lumborum (Seg.T11-L5)	Prone	.30mm 30-50mm	Angle approx 45-60 degrees 	L3 and below (avoid lung field) Enter laterally and angle medially towards spinous processes. Muscle belly and at Iliac crest
Multifidus (segmentally)	Prone	.30mm 40-75mm	P/A 1/2- 1 finger/thumb breadth from SP	Periosteal bumping of laminae.
Comments:				

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THIGH REGION

Muscle/ Innervation	Positioning	Needle Size Gauge(width) Length (mm)	Angle of Needle	Comments
VL (Fem, L2,L3,L4)	Supine and side-lying	.30mm 30-75mm	Insert needle perpendicular and then angle to deactivate assessed TP's	Muscle can be palpated both ant and post to ITB may hit femur, caution not to needle posterior to femur
Vastus Intermedius (Fem, L2,L3,L4)	Supine	.30mm 30-75mm	Depending on muscle size needle angle perpendicular to femur over VI	Bump periosteum
VMO (Fem, L2,L3,L4)	Supine	.30mm 30-60mm	Needle angle perpendicular to VMO	Caution with adductor canal Deactivate proximal and distal TP's
Rectus femoris (Fem, L2,L3,L4)	Supine	.30mm 30-50mm	Needle angle perpendicular to the femur	Stay superficial to specifically treat RF
Sartorius (Fem, L2,L3,L4)	Supine Fabers	.30mm 30-50mm	Inferior to the ASIS angle needle perpendicular, staying away from femoral triangle	Stay superficial
Gracilis (Obt, L2,L3,L4)	Supine Fabers	.30mm 30-50mm	Lumbrical grip the pes anserine bundle proximal to the distal insertion and angle needle perpendicular to medial femoral condyle	Needle pes group as one from ant-post direction
Adductor Longus (Obt, L2,L3,L4)	Supine Fabers	.30mm 30-60mm	Lumbrical grip the muscle if possible. Insert needle perpendicular and then angle needle	Landmark in area. Femoral artery. Remember 'NAVAL' Caution with adductor canal in distal 1/3 of femur. Needle in upper 1/2 Expect large twitch response
Adductor Magnus (Obt, L2,L3, Tibial L4, L5)	Supine Fabers	.30mm 30-60mm	Lumbrical grip the muscle if possible. Insert needle perpendicular and then angle needle	Important with hamstring injuries and chronic pubic dysfunction
Semimembranosus (sciatic /Tibial L4,L5,S1,S2)	Prone Supine	.30mm 30-60mm	Angle across the muscle belly in medial direction and avoid the midline of the thigh	Most TP's in lower part of muscle, very vascular so expect some bruising
Semitendinosus (sciatic/tibial L4,L5,S1,S2)	Prone Supine	.30mm 30-60mm	Angle in perpendicular to muscle and avoid the midline of the thigh	Most TP's in lower part of muscle, very vascular so expect some bruising
Biceps Femoris (sciatic tibial/CPN L4,L5,S1,S2,S3)	Prone Supine- Just below ITB	.30mm 30-60mm	Angle across the muscle belly in an anterolateral direction and avoid the midline of the thigh	Most TP's in lower part of muscle, very vascular so expect some bruising

Comments: NB: Femoral Artery enters thigh at mid point B/W ASIS and PS. Disappears beneath Sartorius and crosses lateral border of add. Longus.

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SHOULDER GIRDLE

Muscle/ Innervation	Positioning	Needle Size Gauge(width) Length (mm)	Angle of Needle	Comments
Infraspinatus (Suprascapular C5, C6)	Prone, consider hammerlock	.30mm 30-50mm	Angle perpendicular to scapula	Consider depth and bony anomalies of infraspinous fossa in lower 1/2 in aged population
Teres Minor (Axillary C5,C6)	Prone, consider hammerlock	.30mm 30-50mm	Grasp muscle and needle away from thorax towards your fingers	
Teres Major (Lower subscapular, C6, C7)	Prone, consider hammerlock	30mm 30-50mm	Grasp muscle and needle away from thorax	
Latissimus Dorsi (Thoracodorsal C6,C7,C8)	Supine Prone	.30mm 30-50mm	grasp firmly lats and skin from inf. angle and needle away from chest	NB- it's cervical innervation and link with shoulder, Cx and Lx issues
Deltoid (Axillary C5)	Supine Sidelying Prone	.30mm 30-50mm	Angle perpendicular to the anterior/ middle and posterior fibres. Can thread needle thru multiple motor bands	Needle below surgical neck to avoid circumflex vessels Grasp and pull muscle when needling TP's between fingers Care: cephalic vein
Pectoralis major (Lat and medial pectoral C5,C6,C7,C8)	Supine, arm slightly abducted	.30mm 30-60mm	grasp muscle, pull out from the chest wall and needle posterolateral towards your fingers (never needle over the chest wall)	NB-Cephalic vein runs between anterior Deltoid and clavicular head of pectoralis and runs medial to biceps
Comments:				

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CERVICAL SPINE

Muscle/ Innervation	Positioning	Needle Size Gauge(width) Length (mm)	Angle of Needle	Comments
SUPERFICIAL MUSCLES				SEE LAST PAGE FOR COURSE OF VERTEBRAL ARTERY
Trapezius (ventral rami of C3- C4 and accessory nerve XI)	Supine or prone	.30mm 30-40mm	Needle angle is away (superior or cephalad) from the supraclavicular fossa.	Grab the muscle belly with fingers and needle above your fingers Do not angle towards lung field
INTERMEDIATE MUSCLES				NB: Read comments on Vertebral artery below
Splenius capitus (post rami of C4-C8)	Prone or sitting with head on forearms	.30mm 30-40mm	Needle in prone and needle over Cx laminae at C5-T1, 1 finger breadth from C5 spinous process	Treat in prone at or below C5-T1
DEEPEST MUSCLES				
Semispinalis Capitus (segmentally by post primary rami C4-C8)	Prone or sitting, head on forearms	.30mm 20-40mm	Needle in prone and needle over Cx laminae at C5-T1, 1 finger breadth from C5 spinous process	Treat in prone at or below C5- T1 only
Multifidi and semi-spinalis cervicis (segmentally by post. Primary rami)	Prone	.30mm 40-60mm	Needle over C5 laminae and continue until laminae is tapped	Only needle between C5 and T1
Comments:				

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NB: Intermediate and Deep Cervical muscle layers will be taught as a group, as will the forearm flexors and extensors

UPPER EXTREMITY

Muscle/ Innervation	Positioning	Needle Size Gauge(width) Length (mm)	Angle of Needle	Comments
Biceps (C5,C6)	Supine or seated	.30mm 30-50mm	Perpendicular to the muscle belly or thread	Avoid median nerve. and brachial artery.
Triceps (Rad, C6,C7,C8,T1)	Prone side- lying or supine	.30mm 30-50mm	Angle perpendicular to the muscle belly or grasp muscle between fingers and needle identified trigger points	Long head- medial of midline in upper 2/3 Lateral head- avoid midline. Avoid lower 1/3 of medial aspect due to passage of ulnar and median nerves and brachial artery. Profunda brachii atery and radial nerve cross midline of post humerus 1/3-1/2 way down arm
Brachioradialis (rad, C5,C6)	Supine or seated	.30mm 30-40mm	Palpate and needle between fingers	Can grasp muscle to needle
ECRL (Radial, C6,C7)	Supine or seated	.30mm 20-40mm	Identify TP's with referral pattern and treat	Resist index finger
ECRB (Rad/post int C6,C7)	Supine or seated	.30mm 20-40mm	Identify TP's with referral pattern and treat	Resist middle finger
Supinator (Rad/PI, C5,C6,C7))	Supine or seated	.30mm 30-40mm	Identify TP's with referral pattern and treat	Resist action of muscle to help identify. Treat off ulna or radius.
Pronator Teres (Median C6)	Supine or seated	.30mm 30-40mm	Needle cautiously to avoid median nerve.	Resist action of muscle to help identify
Comments:				

Signed Off:

LOWER EXTREMITY

Muscle/ Innervation	Positioning	Needle Size Gauge(width) Length (mm)	Angle of Needle	Comments
Gastrocnemius (Tibial, S1,S2)	Prone/ Crook lying	.30mm 30-60mm	Grasp and roll muscle belly and insert needle into muscle, ant approach	Sit on patient's foot, or rest their leg on your thigh in prone. Avoid mid line of post leg
Soleus (Tibial, S1, S2)	Prone/ Crook lying	.30mm 30-60mm	Grasp muscle belly and insert needle into muscle	Do not needle towards post. aspect of tibia
Tibialis Anterior (Deep peroneal L4,L5,)	Supine/ Crook lying	.30mm 30-40mm	Angle perpendicular to the mid belly of the muscle	Consider needling medial to lateral towards fibula
Peroneus Longus/brevis (Superficial peroneal L5,S1)	Supine/ Crook lying	.30mm 30-50mm	Angle perpendicular to the muscle belly	1/3 to 1/2 way down leg both muscles are obtained. Tap fibula
Extensor digitorum longus (Deep peroneal L4,L5,)	Supine/ side-lying	.30mm 30-50mm	Angle perpendicular to the mid belly of the muscle	Resist toe extension to identify and needle along fibula

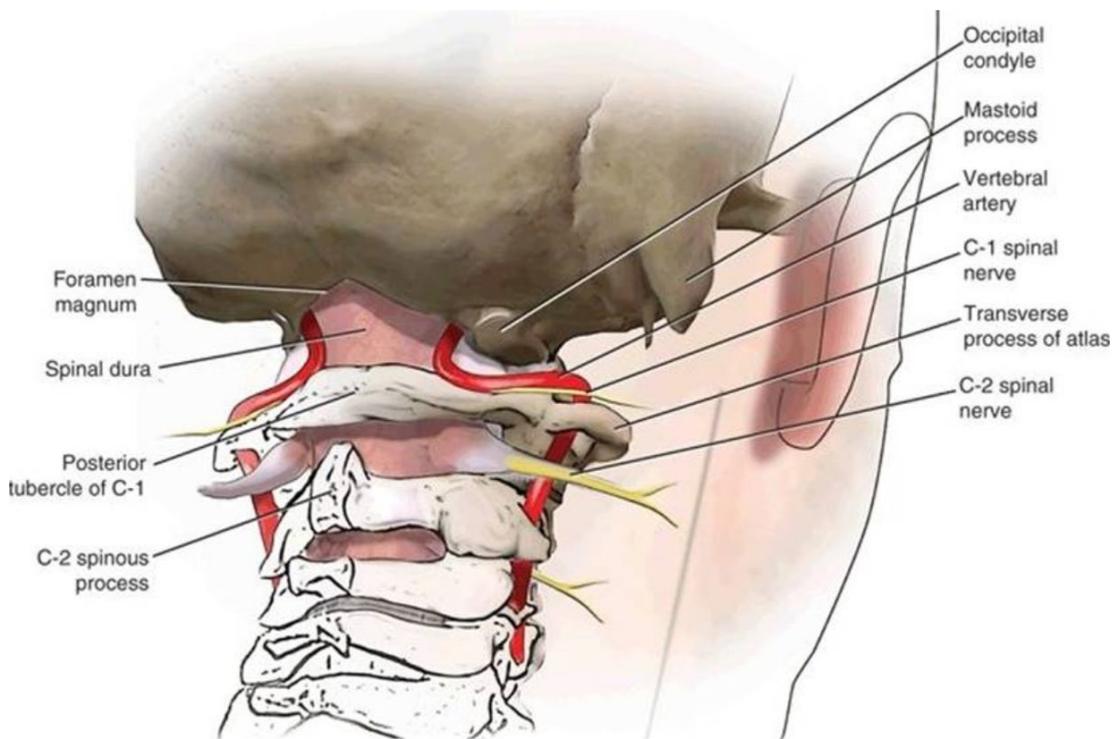
Comments:

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The course of the Vertebral Artery:

After a relatively linear ascent of the vertebral artery in the foramen transversarium of C6-to C3, the artery makes a loop medially towards an anteriorly placed superior articular facet of the C2 vertebra, making a deep groove on its inferior surface. The distance of the artery from the midline of the vertebral body of C2 is approximately 10-15mm. The Vertebral artery loops away from the midline underneath the superior articular facet of the C2.

The vertebral artery takes a loop after its exit from the foramen transversarium of C1 vertebra. It then occupies a vertebral artery groove over the superior surface of the posterior arch of the Atlas. The Vertebral artery remains vulnerable in its location over the lateral aspect of the posterior arch of the Atlas.



Summary Of Muscles Supplied By Spinal Segments

Cervical Spine (C4-8)

SEGMENT	MUSCLES SUPPLIED
C4	Supraspinatus, infraspinatus, rhomboids, trapezius, levator scapulae
C5	Supraspinatus, infraspinatus, teres minor, teres major, deltoid, pectoralis major, rhomboids, levator scapulae, biceps, wrist extensors
C6	Supraspinatus, infraspinatus, teres minor, teres major, latissimus dorsi, deltoid, pectoralis major, biceps, triceps, wrist extensors, wrist flexors
C7	Teres major, latissimus dorsi, pectoralis major, triceps, wrist extensors, wrist flexors
C8	Latissimus dorsi, pectoralis major, triceps, wrist extensors, wrist flexors

Lumbar Spine (L3-S1)

SEGMENT	MUSCLES SUPPLIED
L3	Quadriceps, sartorius, gracilis, adductor longus and magnus
L4	Gluteus medius and minimus, TFL, quadriceps, sartorius, gracilis, adductor longus and magnus, semimembranosis, semitendinosis, tibialis anterior, extensor digitorum longus
L5	Gluteus maximus, medius and minimus, piriformis, TFL, adductor magnus, hamstrings, tibialis anterior, extensor digitorum longus, peroneals
S1	Gluteus maximus, medius and minimus, piriformis, TFL, hamstrings, gastrocnemius, soleus, peroneals