

Sinew Channel Needling

Nadine Crocker

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NADINE CROCKER

MACEWAN OPEN BOOKS
EDMONTON

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Introduction

Sinew channel needling, first discussed in chapter 13 of the Lin Shu (the Spiritual Pivot) has been translated by various authors (Deadman, Maciocia, Pokert, Legge), possibly leading to some misinterpretations of the original text. Traditionally thought of as conduits for the superficial Wei Qi, needling of the sinew channels has often been described with superficial techniques. However, most often used to treat musculoskeletal pathology, current research suggests that deeper needling evoking a local twitch results in better outcomes in terms of reducing pain, improving ROM, strength and ultimately function. As such, the following text provides a musculoskeletal approach to needling the sinew channels. This needling manual was developed to supplement Acupuncture 111 at MacEwan University and is in no way intended to be used in isolation and must only be used by those who are already licensed to perform needling or in supplement to an in-person instructional course.

Abbreviations & Acronyms

Innervation: Bolded nerve roots indicate the nerves most involved in supplying that muscle.

C – denotates a cervical vertebrae (typically followed by a number to identify which specific one)

Csp – Cervical Spine

L- denotates a lumbar vertebrae (typically followed by a number to identify which specific one)

Lsp – Lumbar Spine

PSIS – Posterior Superior Iliac Spine

SP – Spinus Process

T- denotates a thoracic vertebrae (typically followed by a number to identify which specific one)

Tsp- Thoracic Spine

TVP – Transverse Process

CHAPTER 1: BLADDER SINEW CHANNEL (LEG TAIYANG)

Overview: Bladder Sinew Channel (Leg Taiyang)

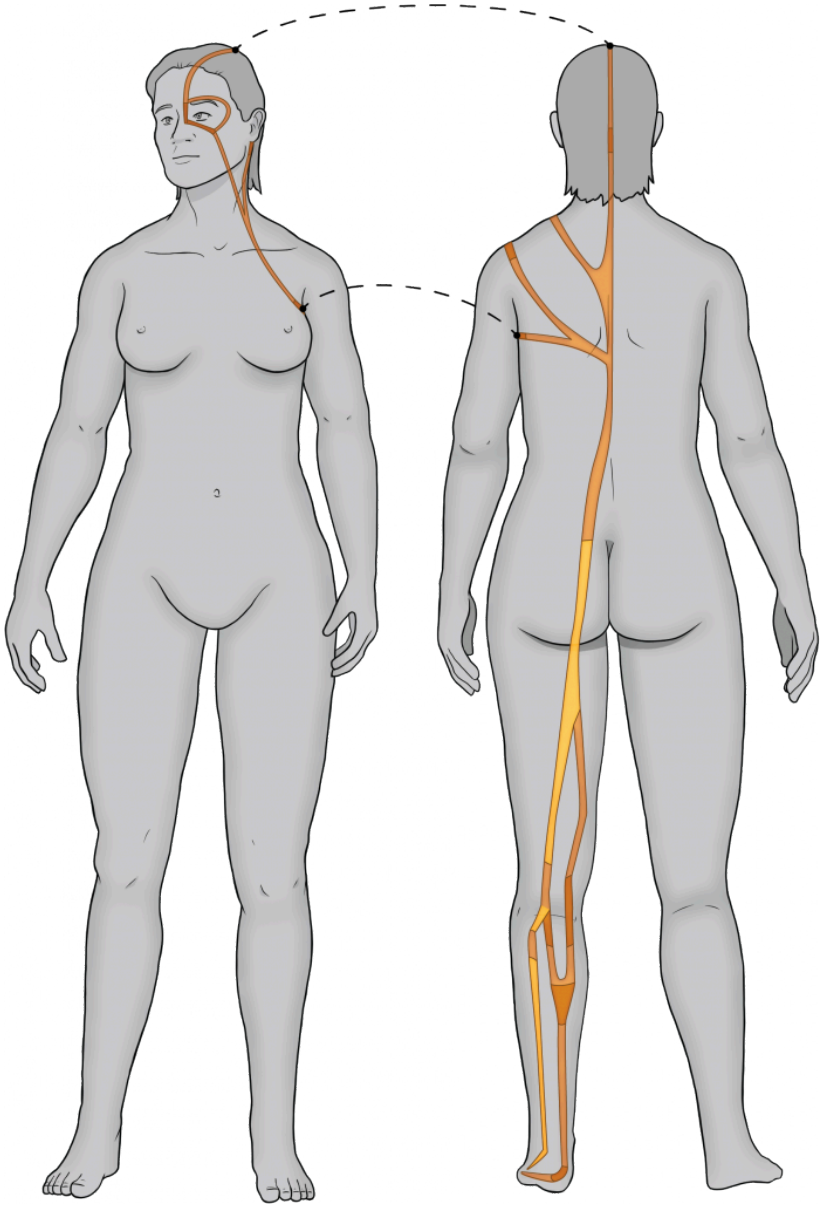


Figure 1.1 Bladder sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Bladder Sinew Channel: Trajectory and associated anatomy

1. Beginning at the heads of the metatarsals, it travels across the plantar aspect of the foot to bind at the calcaneus. **(Anatomy: Plantar fascia)**
2. The plantar fascia is continuous with the Achilles tendon. Thus, the bladder sinew channel continues up

the back of the leg via the Achilles tendon into the gastrocnemius, soleus, plantaris and joins the popliteus at the back of the knee. It binds at the back of the knee on the posterior aspect of the tibia and fibula. **(Anatomy: Gastrocnemius, Soleus, Plantaris, Popliteus)**

3. The hamstrings cross the back of the knee and have fascial communication with the muscles of the posterior lower leg. The Bladder sinew channel will follow the hamstrings up the back of the thigh and binds on the ischial tuberosity. **(Anatomy: Semitendinosus, Semimembranosus, Biceps femoris)**
4. The Bladder sinew channel then connects to the back of the sacrum and all the posterior sacral ligaments via the sacrotuberous ligament. **(Anatomy: Sacroiliac joint)**
5. It then traverses the length of the spine by traveling up the transversospinales muscle group and the erector spinalis muscle group and binds to the back of the occiput **(Anatomy: Erector Spinalis group (iliocostalis, longissimus, spinalis), Transversospinalis group (multifidus, rotatores, levator costarum) Interspinalis group (intertransversarii, interspinalis)**
6. From the occiput, it will travel through the occipitalis along the galea aponeurotica to the frontalis to attach on the front of the skull. **(Anatomy: Occipitalis, Frontalis, Procerus, Nasalis, Orbicularis occuli, Corrugator supercilii)**
7. A secondary branch will diverge from the back before it reaches the occiput and travel along the latissimus dorsi to bind in the axilla. **(Anatomy: Latissimus dorsi)**

1. Gastrocnemius

Origin: Just proximal to the articular surface of the posterior femoral condyles

Insertion: Posterior aspect of the calcaneus via the Achilles tendon

Action:

- Plantar flexion of the ankle/foot
- Knee flexion on a fixed limb

Innervation: Tibial nerve (S1/2)



Figure 1.2 Gastrocnemius, by Dr. Johannes Sobotta (Public domain).

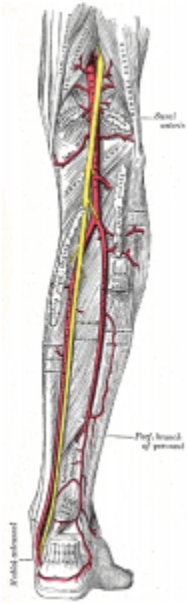


Figure 1.3 Neurovascular bundle of the calf, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: The gastrocnemius is easily palpated on the posterior aspect of the calf

Technique:

1. Needle perpendicular to the calf either medial or lateral to midline
2. Needle at a slight oblique angle away from midline
3. The medial aspect of the muscle is easily picked up by the therapist

Caution: **Low – avoid midline to avoid the tibial nerve, posterior tibial artery and vein**



Figure 1.4 Needling medial belly of gastrocnemius away from the neurovascular bundle located in midline, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 1.1 Needling gastrocnemius, original video by Nadine Crocker, CC BY-NC 4.0.

2. Soleus

Origin: Posterior aspect of the tibia along the soleal line, posterior aspect of the superior 1/3 of fibula and the interosseous membrane

Insertion: Posterior aspect of the calcaneus via the Achilles tendon

Action: Plantar flexion of the ankle/foot

Innervation: Tibial nerve (S1/2)

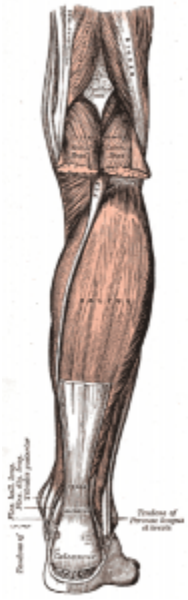


Figure 1.5 Soleus, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: This muscle can be palpated through the gastrocnemius more laterally on the calf

Technique:

1. Needle perpendicular to the calf either medial or lateral to midline
2. Needle in a slight oblique direction away from midline

Caution: **Low – avoid midline to avoid the tibial nerve, posterior tibial artery and vein**



Figure 1.6 Needling soleus perpendicularly just off midline, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 1.2 Needling soleus, original video by Nadine Crocker, CC BY-NC 4.0.

3. Plantaris

Origin: Lateral supracondylar ridge of the femur

Insertion: Posterior aspect of the calcaneus via the Achilles tendon

Action:

- Weak plantar flexor of the foot/ankle
- Weak plantar flexor of the knee on a stationary lower leg

Innervation: Tibial nerve (S1/2)

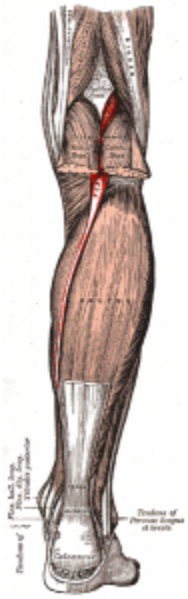


Figure 1.7 Plantaris, by Henry Gray and Henry Vandyke Carter (Public domain).

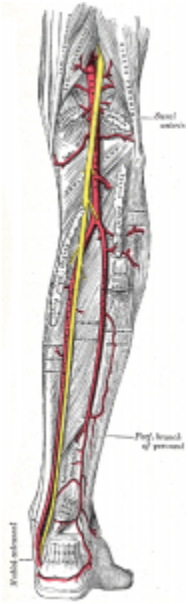


Figure 1.8
Neurovascular bundle of the calf
, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Not palpable

Technique: Needle perpendicular towards the posterior aspect of the femur at the lateral supracondylar ridge

Caution: **Moderate – avoid midline to avoid popliteal artery and vein**



Figure 1.9 Pretending to needling plantaris – lateral to midline, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 1.3 Needling plantaris, original video by Nadine Crocker, CC BY-NC 4.0.

4. Popliteus

Origin: The lateral posterior aspect of the lateral femoral condyle and lateral meniscus

Insertion: The posterior surface of the tibia just superior to the soleal line

Action: Initiates knee flexion from a fully extended knee

Innervation: Tibial nerve (L4/5/S1)



Figure 1.10 Popliteus, by Henry Gray and Henry Vandyke Carter (Public domain).

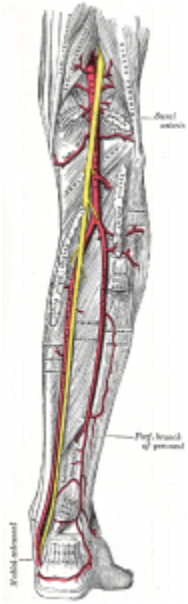


Figure 1.11
Neurovascular bundle of the calf
, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: This muscle is best palpated in a sitting position with the knee bent; however, this is not how we needle it

Technique:

1. Prone:
    - Needle perpendicular towards the posterior surface of the tibia just below the joint line of the knee and medial to the popliteal artery and vein. – Palpate for a popliteal pulse and needle medial to it.
1. Supine:
    - Position the knee in approximately 30 degrees of flexion over a bolster or the therapist's knee
    - Needle perpendicular towards the posterior aspect of the medial tibia just above the soleal line

- Direction of the needle is posterior to anterior using the posterior aspect of the tibia as a bony backdrop

Caution: **Moderate – do not needle midline of this muscle as the popliteal artery and vein lie directly overtop of it**

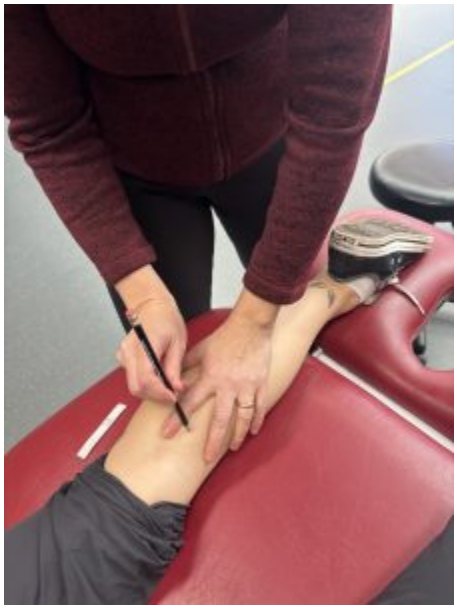


Figure 1.12 Needling popliteus posteriorly just off midline, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 1.4 Needling popliteus posteriorly, original video by Nadine Crocker, CC BY-NC 4.0.



Figure 1.13 Needling popliteus medial to lateral, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 1.5 Needling popliteus medial to lateral, original video by Nadine Crocker, CC BY-NC 4.0.

5. Semitendinosus

Origin: Ischial tuberosity

Insertion: Anteromedial aspect of the superior tibia (part of the pes anserine group)

Action:

- Flexes the knee
- Internal rotation of the knee
- Extends the hip on a stable lower leg

Innervation: Tibial division of the sciatic nerve (**L5/S1**/S2)

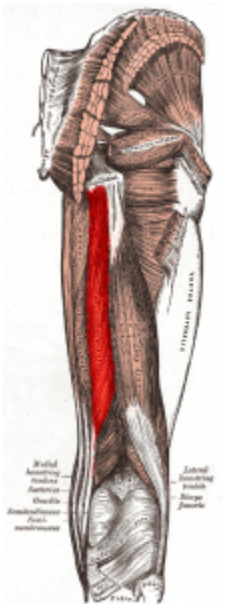


Figure 1.14 Semitendinosus, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the medial hamstrings by asking the patient to resist knee flexion in prone

Technique: Therapist stands on the ipsilateral side of the semitendinosus to be needled

1. Needle perpendicular towards the semitendinosus or at a slight lateral to medial angle
2. Alternatively, the therapist can also pick up the bulk of the medial hamstrings to needle

Caution: **Low – avoid the sciatic nerve in the midline of the posterior thigh**



Figure 1.15 Needling semitendinosus, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 1.6 Needling semitendinosus, original video by Nadine Crocker, CC BY-NC 4.0.

6. Semimembranosus

Origin: Ischial tuberosity

Insertion: Posterior surface of medial tibial condyle

Action:

- Flexes the knee
- Internal rotation of the knee

Innervation: Tibial division of the Sciatic nerve (L5**/S1**/S2)

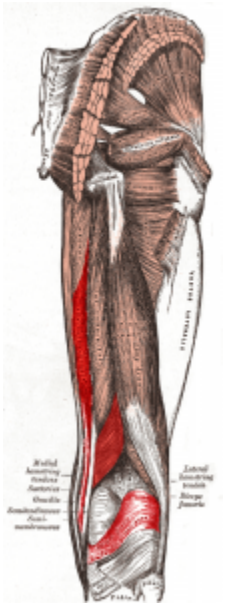


Figure 1.16 Semimembranosus, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the medial hamstrings by asking the patient to resist knee flexion in prone

Technique: Therapist stands on the ipsilateral side of the semimembranosus to be needled – Needle perpendicular towards the semimembranosus or at a slight lateral to medial angle

Caution: **Low – avoid the sciatic nerve in the midline of the posterior thigh**



Figure 1.17 Needling semimembranosus, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 1.7 Needling semimembranosus, original video by Nadine Crocker, CC BY-NC 4.0.

7. Biceps Femoris

Origin:

- Long head: Ischial tuberosity
- Short head: Linea aspera and lateral supracondylar line of the femur

Insertion: Lateral aspect of the fibular head (split by the lateral collateral ligament)

Action:

- Flexion of the knee
- Lateral rotation of the knee
- Extension of the hip on a stable lower leg

Innervation:

- Long head: Tibial division of the sciatic nerve (L5/S1/S2)
- Short head: Peroneal division of the sciatic nerve (L5/S1/S2)

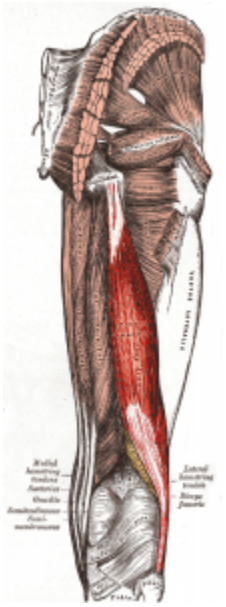


Figure 1.18
Biceps femoris, adapted by Fredrik x nilsson, from the original image by Henry Gray and Henry Vandyke Carter, CC BY-SA 4.0
.

Needling

Position: Prone

Palpation: Palpate the biceps femoris lateral to midline on the posterior aspect of the femur – The short head can be palpated up from its insertion point to the lateral supracondylar ridge of the femur

Technique:

1. Needle perpendicular to the femur lateral to midline
2. Needle in a slight oblique direction medial to lateral avoiding the midline of the posterior thigh
3. To needle the short head of biceps femoris, needle more distal along the lateral supracondylar ridge of the femur – Needle perpendicularly using the lateral aspect of the femur as a backdrop

Caution: **Low – the sciatic nerve lies directly in the midline of the posterior thigh**



Figure 1.19 Needling biceps femoris, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 1.8 Needling biceps femoris, original video by Nadine Crocker, CC BY-NC 4.0.

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Video 1.9 Needling biceps femoris (short head), original video by Nadine Crocker, CC BY-NC 4.0.

8. Erector Spinalis Group

Erector Spinalis Group

- Iliocostalis
- Longissimus
- Spinalis

Origin:

Common origin – posterior sacrum, iliac crest, sacrotuberous ligament, dorsal sacroiliac ligaments, spinus process (SP) and transverse process (TVP) of T11-L5, supraspinous ligament

- Iliocostalis lumborum: as per common origin
- Iliocostalis thoracis: + angles of ribs 6-12
- Iliocostalis cervicis: + angles of ribs 3-6
- Longissimus thoracis: + TVPs and accessory processes of L1-5 and middle layer of thoracolumbar fascia
- Longissimus cervicis: + TVPs of T1-T5
- Longissimus capitis: + TVPs of T1-T5 and articular process of C4-7
- Spinalis thoracis: + SPs of T11-L2
- Spinalis cervicis (often absent): Inferior part of the nuchal ligament, SPs of C7-T2
- Spinalis capitis (blends with semispinalis capitis): Articular process of C4-C6, TVPs of C7-T6/7

Insertion:

- Iliocostalis: Fibers run superiorly to angles of the lower ribs and TVPs of the cervical spine (Csp)
- Longissimus: Fibers run superiorly to the ribs between the tubercles and angles of the ribs, to the TVPs in the thoracic spine (Tsp) and Csp, and to the mastoid process of the temporal bone
- Spinalis: Fibers run superiorly to the SPs of the upper thoracic spine and to the cranium

Action:

- Bilaterally extends the vertebral column and controls vertebral flexion
- Unilaterally side bends the vertebral column

Innervation: Posterior rami of segmental spinal nerves

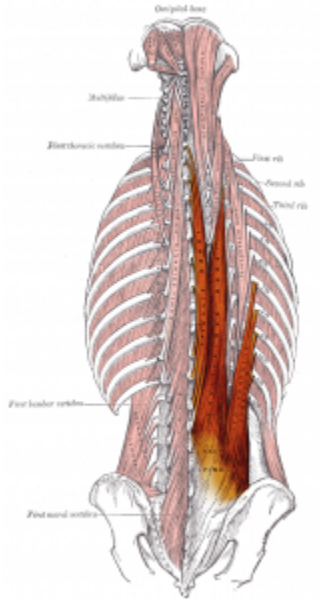


Figure 1.20 Erector spinae, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the erector group just lateral to the spine

Technique:

1. Make a shelf by pulling the erectors towards the midline and make a bracket with your fingers – Needle between your fingers in a lateral to medial direction staying within the shelf of the erector muscle group

    Note: This is safest to needle in the lumbar region – It is possible to needle in this fashion in the thorax on some patients, but it is more difficult and is often not possible

    2. Needle directly perpendicular to the spinous process staying withing one finger breath of the spinous process – Use the lamina as a bony backdrop

Caution: **Moderate: abdominal content, kidney, and the lung fields are located anterior to these muscles – The lungs extend as far down as L2 with deep inspiration – Do not needle under or completely through this muscle group**



Figure 1.21 Transverse needling of erector spinae, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 1.10 Transverse needling of lumbar erector spinae, original video by Nadine Crocker, CC BY-NC 4.0.

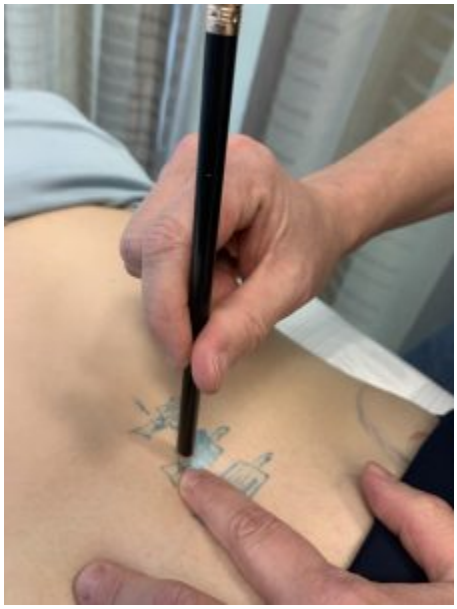


Figure 1.22 Perpendicular needling of erector spinae, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1476#oembed-2

Video 1.11 Perpendicular needling of lumbar erector spinae, original video by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1476#oembed-3

Video 1.12 Perpendicular needling of thoracic spine, original video by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1476#oembed-4

Video 1.13 Perpendicular needling of thoracic spine, original video by Nadine Crocker, CC BY-NC 4.0.

9. Transversospinalis Group

Transversospinalis Group

- Semispinalis
- Multifidus
- Rotatores

***Note: Although we may be needling the entire transversospinalis group at once, we typically only speak of needling the multifidus.**

Multifidus

Origin: Posterior sacrum, posterior ilium including the posterior superior iliac spine (PSIS), mamillary process of the lumbar spine (Lsp), TVPs of T1-T3 and articular process of C4-7

Insertion: Fibers pass supero-medially to SPs of the vertebrae above, spanning 2-4 segments

Action:

- Assists with stabilization of the vertebrae
- Assists with extension of the spine segmentally
- May act as organs of proprioception (true for all muscles in this group)

Innervation: Dorsal rami of segmental spinal nerve

Table 1.1 Deep Back Muscles: Semispinalis and Rotatores

Muscle	Origin	Insertion	Action	Innervation
Semispinalis	TVPs of C4-T12	Fibers run superomedially to occipital bone and SPs of Tsp and Csp spanning 4-6 segments	Extends the head, thoracic and cervical spine and rotates them contralaterally	Dorsal rami of the segmental spinal nerve
Rotatores	TVPs of all vertebrae, most robust in the Tsp	Fibers run supero-medially to attach to the junction of lamina and TVP or the SP of the vertebrae above spanning 1-2 segments	• Assists with vertebral stabilization • Assists with segmental extension and rotation	Dorsal rami of the segmental spinal nerve

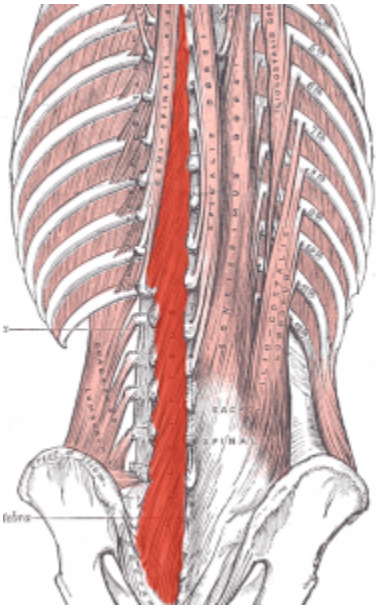


Figure 1.23 Multifidus, adapted by Uwe Gille, from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Palpation: Palpate within the lamina groove of the vertebrae in the lumbar and sacral regions – Actual palpation of these muscles is only possible in the sacral region and occasionally L4/5 vertebral levels

Technique: Needle perpendicularly posterior to anterior using the lamina as a bony backdrop – Stay within one finger's breadth of the spinous process

Caution: **Moderate-High: depending on which part of the spine – Lamina groove narrows around the thoracic-lumbar junction – Lung field is directly lateral to the lamina groove in the thoracic and upper lumbar spine**

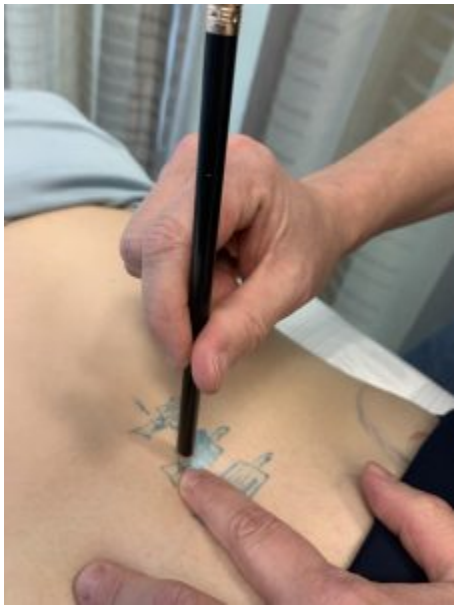


Figure 1.24 Needling multifidus perpendicularly within one finger width of the spinous process, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1775#oembed-1

Video 1.14 Needling multifidus, original video by Nadine Crocker, CC BY-NC 4.0.

Interspinalis muscle group: Not needled

- **Interspinales**: Paired muscles that run between the SPs of each vertebrae, occasionally absent in the thoracic spine – Act as stabilizers and most likely proprioceptors
- **Intertransversarii**: Paired muscles that run between the TVPs of each vertebrae, occasionally absent in the thoracic spine – Act as stabilizers and most likely proprioceptors
- **Levator costarum**: Originate on the TVP of C7-T11 and run inferior to attach to the rib directly below it – Assist in elevating the ribs in inspiration

10. Occipitalis

Origin: Superior nuchal line of the occiput and mastoid process of the temporal bone

Insertion: Galea aponeurotica

Action: Retracts the scalp

Innervation: Occipital nerves (C2/3)

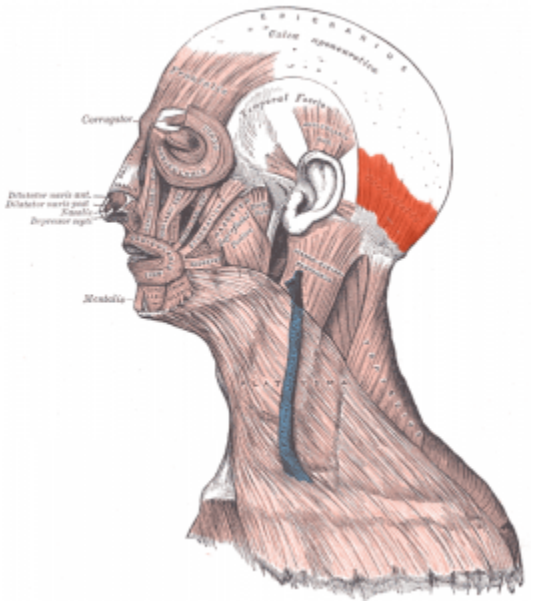


Figure 1.25 Occipitalis, adapted by Uwe Gille, from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the posterior nuchal lines (superior and inferior)

Technique: Needle around the superior nuchal line directly perpendicular to the occiput using the occiput as a bony backdrop

Caution:**High – brain stem is vulnerable as it exits the foramen magnum. Caution not to needle inferior to the occiput**



Figure 1.26 Needling occipitalis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1784#oembed-1

Video 1.15 Needling occipitalis, original video by Nadine Crocker, CC BY-NC 4.0.

11. Latissimus Dorsi

Origin: Spinous process of lower 6 thoracic vertebrae and related interspinous ligaments, inferior 3-4 ribs, thoracolumbar fascia and iliac crest

Insertion: Floor of the intertubercular groove of the humerus

Action:

- Shoulder extension
- Shoulder medial rotation
- Shoulder adduction
- Raises the torso during climbing
- Role in lumbar stabilization

Innervation: Thoracodorsal nerve (C6/7/8)

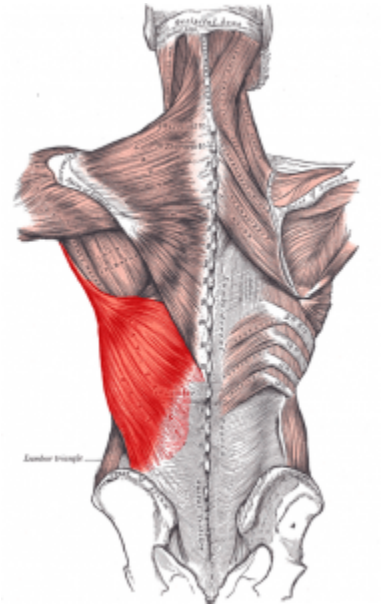


Figure 1.27 Latissimus dorsi, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone or supine

Palpation: Palpate the bulk of this muscle in the subaxilla space when the arm is abducted

Technique: Pick up the bulk of this muscle and pull it away from the ribcage – Needle in an anterolateral direction when in prone and a posterior lateral direction when in supine

Caution: **Moderate – never needle in a medial direction due to the position of the lung field**



Figure 1.28 Needling latissimus dors, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1786#oembed-1

Video 1.16 Needling latissimus dorsi, original video by Nadine Crocker, CC BY-NC 4.0.

CHAPTER 2: GALL BLADDER SINEW CHANNEL (LEG SHAOYANG)

Overview: Gall Bladder Sinew Channel (Leg Shaoyang)

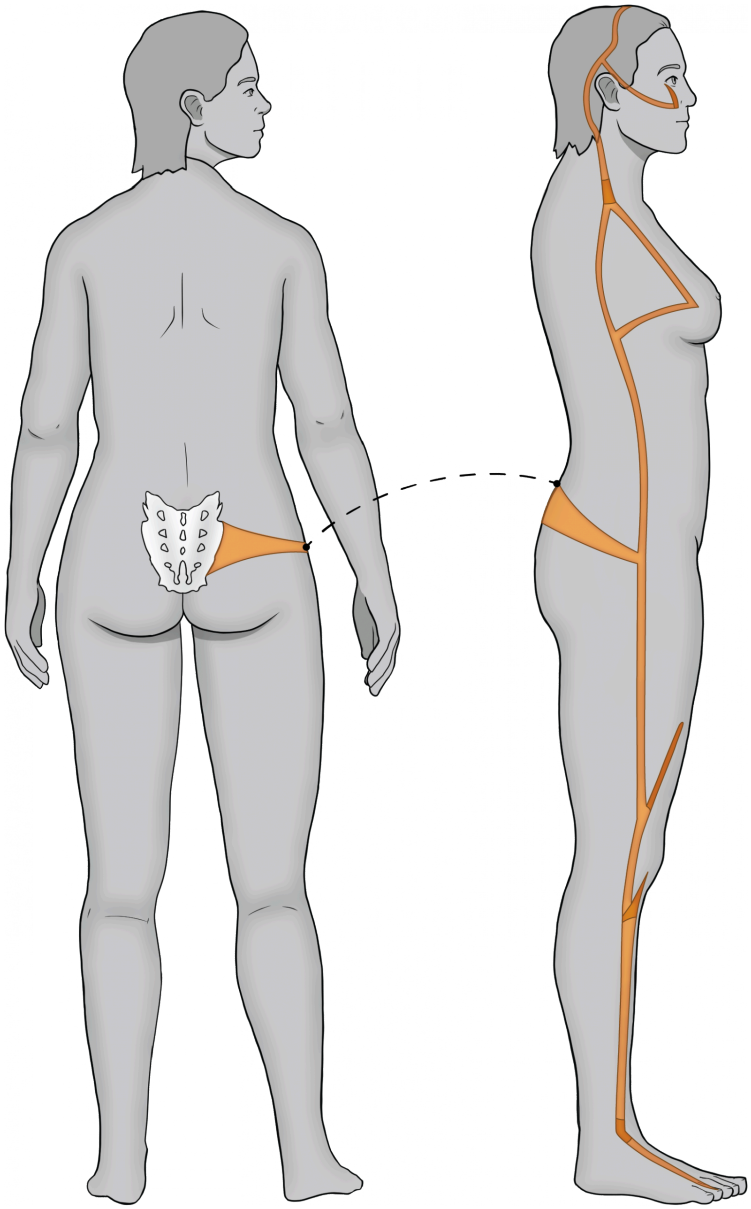


Figure 2.1 The gall bladder sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Gall Bladder Sinew Channel: Trajectory and associated anatomy

1. Begins on the lateral aspect of the foot on the fifth digit and travels posterior to the lateral malleolus following the peroneals to bind on the lateral aspect of the fibular head. **(Anatomy: Abductor digiti minimi, Peroneus longus, and Peroneus brevis)**

2. a. anterior along with the tensor fascia latae (which is enveloped in the fascia of the Iliotibial band) to bind to the anterior superior iliac spine
   b. superiorly to the iliac crest
   c. posteriorly with the gluteus maximus and the deep lateral rotators to attach to the posterior aspect of the innominate and to the lateral aspect of the sacrumThe Gall Bladder sinew channel then continues up the lateral aspect of the thigh via the iliotibial band to the greater trochanter. From here it travels in three slightly different directions: **(Anatomy: Iliotibial band, Tensor fascia latae, Gluteus maximus, Gluteus medius, Gluteus minimus, Piriformis, Deep lateral rotators (Quadratus femoris, Gemellus superior, Gemellus inferior, Obturator internus, Obturator externus))**
3. The main branch of the Gall Bladder sinew channel travels from its insertion on the Iliotibial band on the outer crest of the innominate to the attachment of the quadratus lumborum (QL) on the inner crest of the same bone. It travels up one side of the lumbar spine via the QL to attach to the inferior border of the 12th rib. **(Anatomy: Quadratus lumborum)**
4. It then continues up the same side of the thorax via the intercostal muscles to connect to the sternocleidomastoid and bind at the mastoid process. **(Anatomy: Intercostals and Sternocleidomastoid (SCM))**
5. The Gall Bladder sinew channel then continues around the posterior aspect of the ear to the corner of the forehead. From here, it travels downward to bind to the jaw via the temporalis and then to the cheekbone via the masseter. **(Anatomy: Temporalis and Masseter)**

1. Abductor Digiti Minimi

Origin: Medial and lateral tubercle of the calcaneal tuberosity

Insertion: Lateral side of the base of proximal phalanx of the fifth digit

Action: Abducts digit number 5

Innervation: Lateral plantar nerve (S2/3)

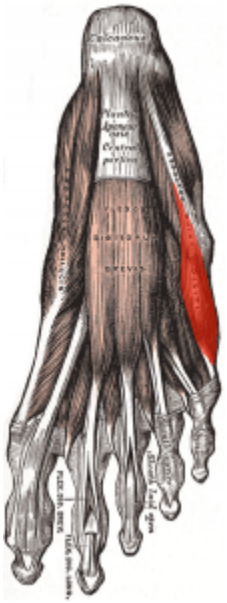


Figure 2.2 Abductor digiti minimi, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the lateral aspect of the foot

Technique: Needle on the lateral aspect of the foot using the 5th metatarsal as a backdrop

Caution: Low



Figure 2.3 Needling of abductor digiti minimi, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1794#oembed-1

Video 2.1 Needling of abductor digiti minimi, original video by Nadine Crocker, CC BY-NC 4.0.

2. Peroneus Longus

Origin: Head and superior two thirds of the lateral surface of the fibula

Insertion: Base of the 1st metatarsal and medial cuneiform

Action:

- Eversion
- Plantar flexion

Innervation: Superficial peroneal nerve (**L5/S1**/S2)

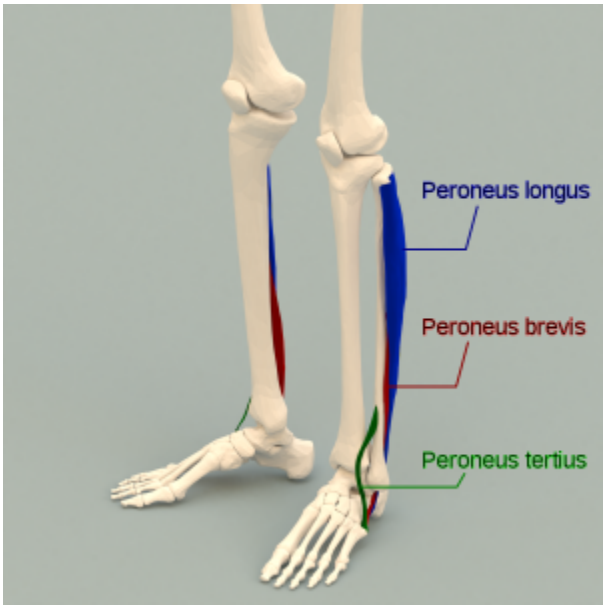


Figure 2.4 Peroneus muscles, by Database Centre for Life Science, CC-BY-SA 2.1 JP.

Needling

Position: Supine

Palpation: Palpate the lateral aspect of the shin, resist eversion to help isolate this muscle

Technique: Needle directly perpendicular to this muscle using the fibula as a bony backdrop

Caution: **Low – the superficial peroneal nerve lies directly under the head of the fibula**



Figure 2.5 Needling of peroneus longus/brevis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1796#oembed-1

Video 2.2 Needling of peroneus longus/brevis, original video by Nadine Crocker, CC BY-NC 4.0.

3. Peroneus Brevis

Origin: Inferior two thirds of the lateral surface of the fibula

Insertion: Dorsal surface of the tuberosity of the 5th metatarsal base

Action:

- Eversion
- Weak plantar flexor

Innervation: Superficial peroneal nerve (**L5/S1**/S2)

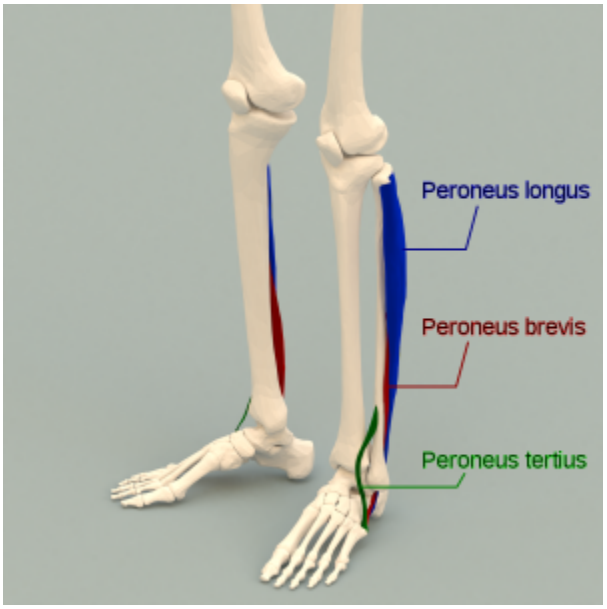


Figure 2.6 Peroneus muscles, by Database Centre for Life Science, CC-BY-SA 2.1 JP.

Needling

Position: Supine

Palpation: Palpate the lateral aspect of the shin, resist eversion to help isolate this muscle

Technique: Needle directly perpendicular to the peroneal muscles using the fibula as a bony backdrop

Caution: **Low – the superficial peroneal nerve lies directly inferior to the fibular head**



Figure 2.7 Needling of peroneus longus/brevis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1798#oembed-1

Video 2.3 Needling of peroneus longus/brevis, original video by Nadine Crocker, CC BY-NC 4.0.

4. Iliotibial Band

Origin: Gluteus maximus, Tensor Fascia Latae, and lateral aspect of the iliac crest

Insertion: Gerdy's tubercle on the proximal lateral tibia, linea aspera of the femur and to the patella via the lateral patellar retinaculum

Action:

- Stabilizes the hip and knee

Innervation: not relevant



Figure 2.8 Iliotibial band, by fickleandfreckled, CC BY 2.0. Photo cropped.

Needling

Position: Side lying

Palpation: Palpate the gluteus maximus, tensor fascia latae, and vastus lateralis

Technique: Needle into the gluteus maximus (using the ilium or greater trochanter as a backdrop), tensor fascia latae and vastus lateralis

Caution: **Moderate – when needling the glute max, ensure to avoid the middle 1/3 of the muscle to avoid the sciatic nerve**



Figure 2.9 Needling vastus lateralis to help address the iliotibial band, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 2.4 Needling of iliotibial band over vastus lateralis, original video by Nadine Crocker, CC BY-NC 4.0.

5. Tensor Fascia Latae

Origin: Anterior superior iliac spine and anterior part of the iliac crest

Insertion: Iliotibial band

Action:

- Abducts the hip
- Flexes the hip
- Internal rotation of the hip

Innervation: Superior gluteal nerve (L4/5)

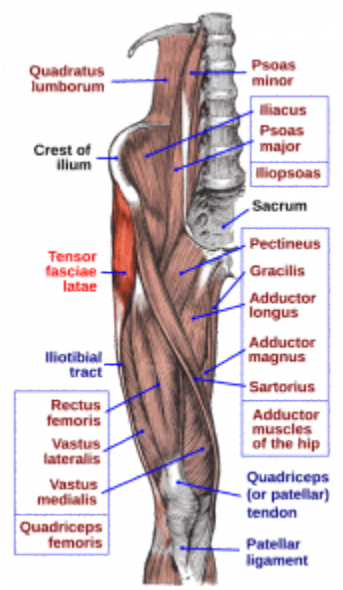


Figure 2.10 Tensor fascia latae, adapted by Jmarchn from the original image by Henry Gray and Henry Vandyke Carter, CC BY-SA 3.0.

Needling

Position: Side lying or supine

Palpation: Palpate the tensor fascia latae just inferior and lateral to the anterior superior iliac spine.

Technique: Needle perpendicular to the tensor fascia latae using the innominate as a bony backdrop

Caution: Low



Figure 2.11 Needling of tensor fascia latae, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1802#oembed-1

Video 2.5 Needling of tensor fascia latae, original video by Nadine Crocker, CC BY-NC 4.0.

6. Gluteus Maximus

Origin: Ilium posterior to the posterior gluteal line, dorsal surface of the sacrum, coccyx, and sacrotuberous ligament

Insertion: Iliotibial band and gluteal tuberosity

Action:

- Hip extension
- Assists with hip lateral rotation

Innervation: Inferior gluteal nerve (L5/**S1/S2**)

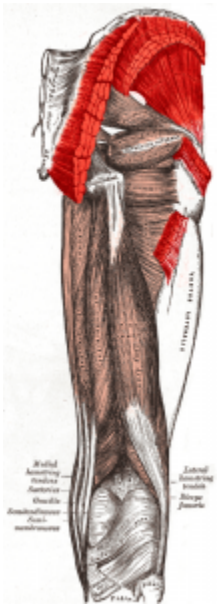


Figure 2.12
Gluteus maximus, medius, and minimus
, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the gluteus maximus, can resist hip extension if needed to help isolate

Technique: Directly perpendicular to the muscle avoiding the mid 1/3 of the muscle to avoid the sciatic nerve

Caution: **Moderate – avoid the middle 1/3 of this muscle due to the sciatic nerve location**



Figure 2.13 Needling of gluteus maximus, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 2.14 Needling of gluteus maximus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1804#oembed-1

Video 2.6 Needling of gluteus maximus, original video by Nadine Crocker, CC BY-NC 4.0.

7. Gluteus Medius

Origin: External surface of ilium between the anterior and posterior gluteal lines

Insertion: Lateral surface of the greater trochanter

Action:

- Abducts the hip
- Medial rotates the thigh
- Stabilizes the pelvis when the other leg is lifted (Trendelenburg)

Innervation: Superior gluteal nerve (L**5/**S1)

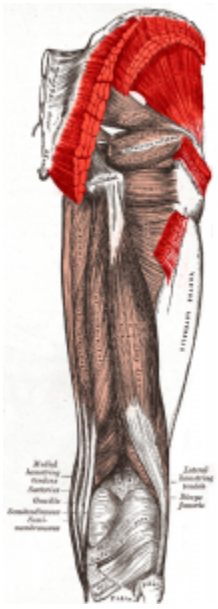


Figure 2.15
Gluteus maximus, medius, and minimus
, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone or side lying

Palpation: Palpate above the gluteus medius along and just inferior to the posterior iliac crest

Technique:

1. Needle perpendicular to the gluteus medius muscle using the ilium as a bony backdrop
2. Needle this muscle at its insertion at the greater trochanter

Caution: **Low – the lower edge of the gluteus medius borders the piriformis muscle – The sciatic nerve runs under the piriformis muscles at approximately halfway through this muscle**

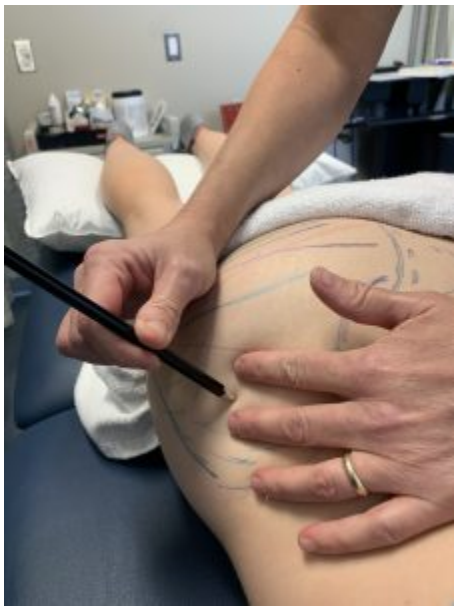


Figure 2.16 Needling of gluteus medius, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 2.17 Needling of gluteus medius, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1806#oembed-1

Video 2.7 Needling of gluteus medius, original video by Nadine Crocker, CC BY-NC 4.0.

8. Gluteus Minimus

Origin: External surface of the ilium between the anterior and inferior gluteal line

Insertion: Anterior surface of the greater trochanter of the femur

Action:

- Abducts the thigh
- Medially rotates the thigh

Innervation: Superior gluteal nerve (**L5**/S1)

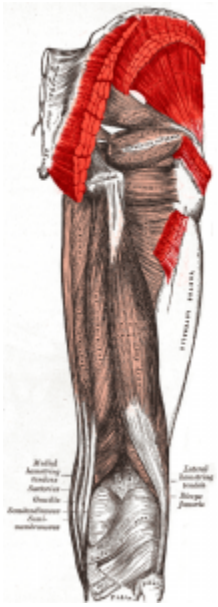


Figure 2.18
Gluteus maximus, medius, and minimus
, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone or side lying

Palpation: Cannot palpate this muscle

Technique: Needle perpendicularly through the gluteus medius to get to gluteus minimus – Needle as per medius.

Caution: **Low – as per medius**

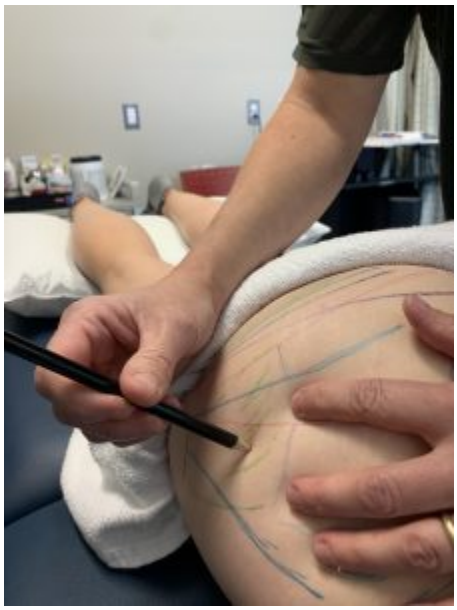


Figure 2.19 Needling of gluteus minimus, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 2.20 Needling of gluteus minimus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1808#oembed-1

Video 2.8 Needling of gluteus minimus, original video by Nadine Crocker, CC BY-NC 4.0.

9. Piriformis

Origin: Anterior surface of the sacrum (approximately S2-S4) and sacrotuberous ligament

Insertion: Superior border of the greater trochanter of the femur

Action:

- Lateral rotation of the hip when the leg is straight
- Abduction of the leg when the hip is flexed

Innervation: Anterior rami of **S1**/S2

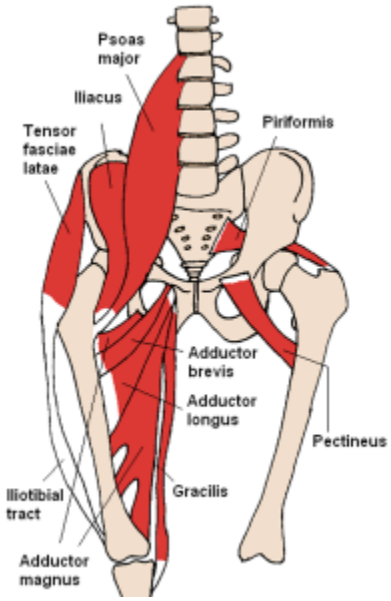


Figure 2.21 Piriformis, adapted by Mikael Häggström from the original image by Beth Ohara, CC-BY-SA 3.0.

Needling

Position: Prone

Palpation: Palpate the lateral aspect of the sacrum and the greater trochanter

Technique:

1. Needle towards the lateral aspect of the sacrum
2. Needle towards the greater trochanter

Caution: **Moderate: Avoid the middle 1/3rd of this muscle as the sciatic nerve travels under this portion of the piriformis**



Figure 2.22 Needling of piriformis, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 2.23 Needling of piriformis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1810#oembed-1

Video 2.9 Needling of piriformis, original video by Nadine Crocker, CC BY-NC 4.0.

10. Deep Lateral Rotators

Table 2.1 Deep Lateral Rotators

Muscle	Origin	Insertion	Action	Innervation
Superior gemellus	Ischial spine	Medial aspect of the greater trochanter of the femur	Lateral rotation of the leg, Abducts a flexed thigh, and helps stabilizes the hip.	Nerve to obturator internus (L5/S1)
Obturator internus	Pelvic surface of obturator membrane and surrounding bone	As above	As above	As above
Inferior gemellus	Ischial tuberosity and lower aspect of sciatic notch	As above	As above	Nerve to quadratus femoris (L5/S1)

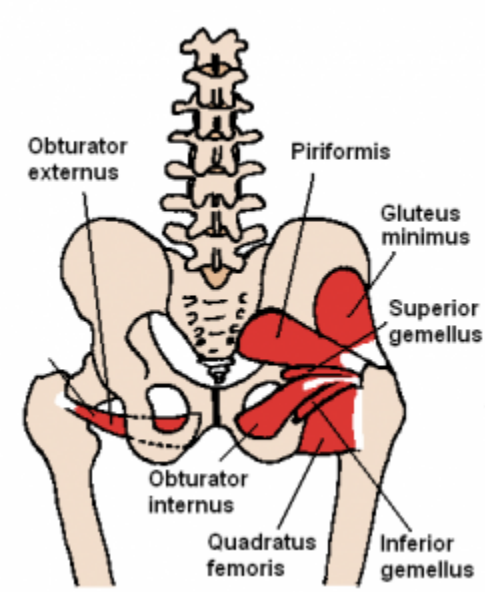


Figure 2.24 Deep lateral rotators by Beth ohara~commonswiki, CC BY-SA 3.0.

Needling

Position: prone or side lying

Palpation: Attempt to palpate these muscles around their insertion onto the greater trochanter of the femur

Technique: Needle at the attachment on the greater trochanter of the femur

Caution: **Moderate – Do not needle in the middle 1/3 of these muscles as the sciatic nerve**

travels directly over these muscles. It is safer to needle along their attachment to the greater trochanter.



Figure 2.25 Needling the deep lateral rotators of the hip, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1812#oembed-1

Video 2.10 Needling of deep lateral rotators, original video by Nadine Crocker, CC BY-NC 4.0.

11. Quadratus Femoris

Origin: Lateral border of the ischial tuberosity

Insertion: Quadrate tubercle on the intertrochanteric crest of the femur and just inferior to it

Action:

- Laterally rotates the femur
- Assists with stabilization of the hip

Innervation: Nerve to Quadratus femoris (L5/S1)

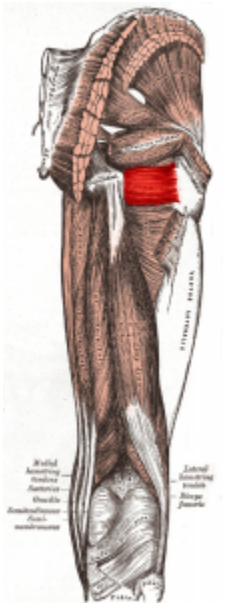


Figure 2.26 Quadratus femoris, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone or side lying with the hip flexed

Palpation: Difficult to palpate this muscle – try to palpate it just under or at the gluteal fold

Technique: Needle in a inferior to superior direction laterally just off midline at the gluteal fold

Caution: **Moderate – the sciatic nerve lies directly overtop of this muscle in midline**



Figure 2.27 Needling of quadratus femoris, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1815#oembed-1

Video 2.11 Needling of quadratus femoris, original video by Nadine Crocker, CC BY-NC 4.0.

12. Quadratus Lumborum

Origin: Anterior lip of the iliac crest and the iliolumbar ligament

Insertion: Medial half of the lower border of the 12th rib and the tips of the lumbar TVPs

Action:

- Unilaterally: Lateral flexion of the vertebral column or elevates the same innominate
- Bilaterally: Assists in lumbar stabilization and depresses 12th rib

Innervation: Subcostal nerve (T12) and ventral rami of L1-4

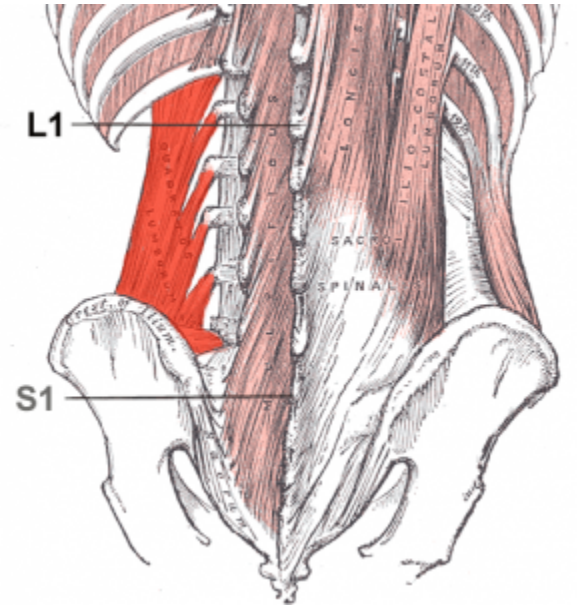


Figure 2.28 Quadratus lumborum, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone or side lying

Palpation: Can palpate this muscle just lateral to the erector spinae group

Technique:

- Prone: Needle in a cranial to caudal direction aiming towards the superior aspect of the iliac crest
- Side Lie: Ensure you can palpate the quadratus lumborum and bracket it with your fingers – Needle in lateral to medial direction

Caution:**High – the abdominal viscera and kidney lie directly anterior to this muscle – Ensure you do not needle in an anterior direction**



Figure 2.29 Needling of quadratus lumborum, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1817#oembed-1

Video 2.12 Needling of quadratus lumborum, original video by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1817

Video 2.13 Needling of quadratus lumborum, original video by Nadine Crocker, CC BY-NC 4.0.

13. Sternocleidomastoid

Origin: Mastoid process of the temporal bone and lateral half of the superior nuchal line

Insertion:

- Sternal head: anterior surface of the manubrium
- Clavicular head: Superior surface of the medial 1/3 of the clavicle

Action:

- Unilaterally: Ipsilateral side bend of the head
- Unilaterally: Contralateral rotation of the head
- Bilaterally: Csp flexion

Innervation: Spinal accessory nerve (CN XI) and C2/3

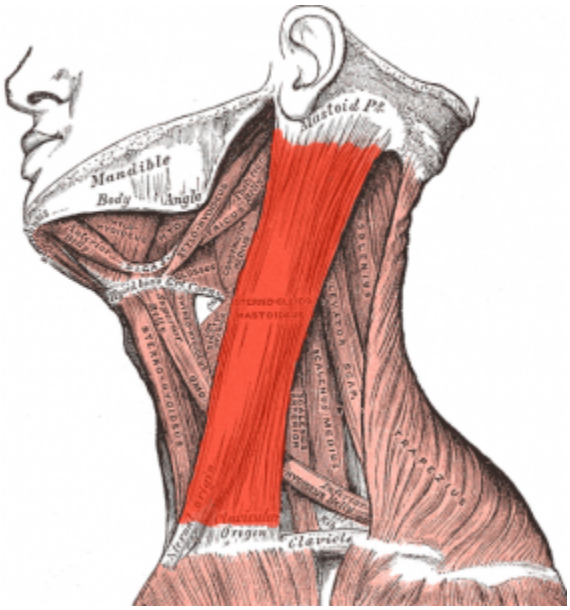


Figure 2.30 Sternocleidomastoid, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine with head rotated to the opposite side

Palpation: Resist Csp side bend with the head rotated to the opposite side to help isolate this muscle

- If you can pick up this muscle, needle medial to lateral or lateral to medial through the midportion of the muscle, avoiding the external jugular vein
- If the muscle is not able to be picked up, thread the needle superficially superior to inferior or inferior to superior through this muscle

Caution:**High – This muscle lies directly overtop of the common carotid artery and roots of the brachial plexus (among other structures) – Caution must be taken not to needle behind this muscle**



Figure 2.31 Needling of sternocleidomastoid, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 2.32 Needling of sternocleidomastoid, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1819#oembed-1

Video 2.14 Needling of sternocleidomastoid, original video by Nadine Crocker, CC BY-NC 4.0.

14. Temporalis

Origin: Temporal lines on the parietal bone and the superior temporal surface of the sphenoid bone

Insertion: Coronoid process of the mandible

Action:

- Elevation of the mandible
- Retraction of the mandible

Innervation: Deep temporal nerve – a branch of the anterior division of the mandibular nerve – a branch of the trigeminal nerve (CN V3)

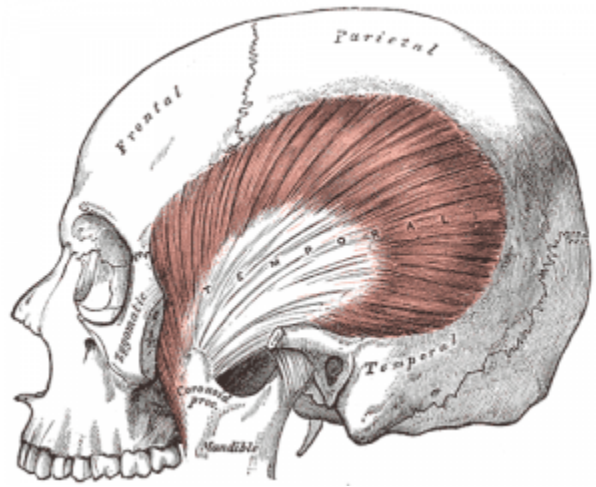


Figure 2.33 Temporalis, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine (often with head rotated to opposite side)

Palpation: Palpate this muscle in the temporal fossa

Technique:

1. Thread the needle through temporalis

2. Needle perpendicular to the temporal bone using it as a bony backdrop

Caution: **Low – there is a superficial temporal artery and vein that travel with the auriculotemporal nerve superficial to this muscle**



Figure 2.34 Needling of temporalis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1821#oembed-1

Video 2.15 Needling of temporalis, original video by Nadine Crocker, CC BY-NC 4.0.

15. Masseter

Origin: Zygomatic arch and maxillary process of the zygomatic bone

Insertion: Ramus of the mandible and coronoid process

Action:

- Elevation of the mandible
- Protrusion of the mandible

Innervation: Mandibular nerve – a branch of the trigeminal nerve (CN V3)

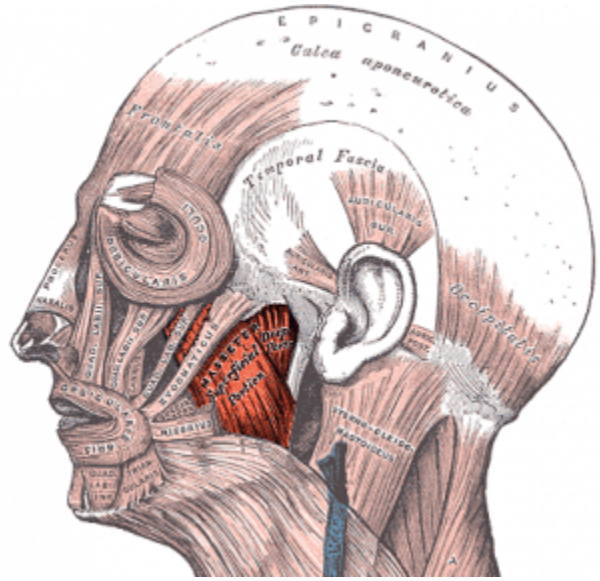


Figure 2.35 Masseter, adapted by Kevjonesin from the original image by Henry Gray and Henry Vandyke Carter, CC BY-SA 3.0.

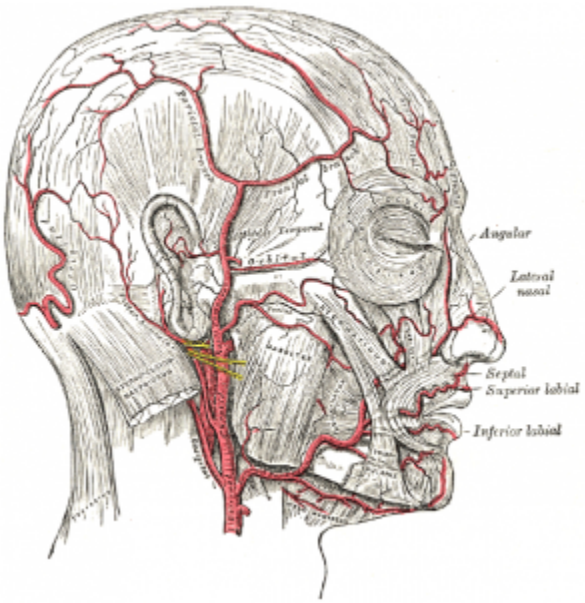


Figure 2.36 Masseter with facial artery, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine, often with head rotated contralaterally

Palpation: Ask the patient to clench their jaw to help isolate this muscle

Technique: Needle perpendicular along the ramus of the mandible

Caution: **Low – avoid going too deep in the mid-portion of the masseter above the ramus**

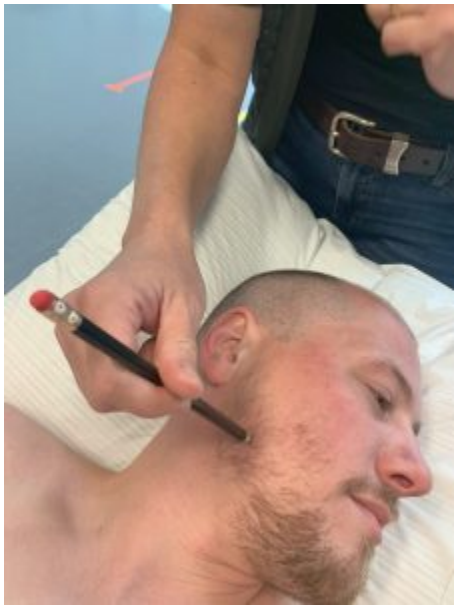


Figure 2.37 Needling of masseter, original image by Nadine Crocker, CC BY-NC 4.0.

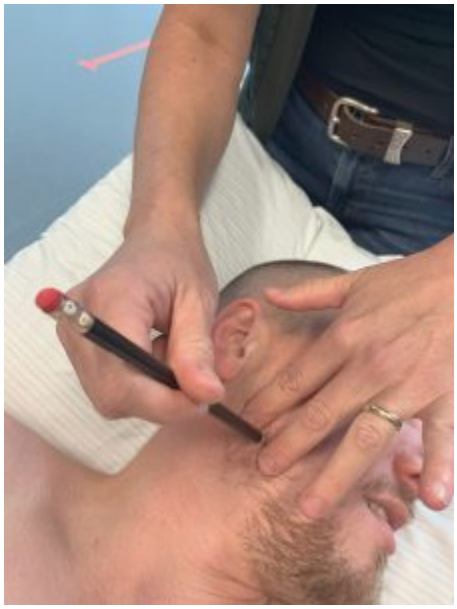


Figure 2.38 Needling of masseter, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1823#oembed-1

Video 2.16 Needling of masseter, original video by Nadine Crocker, CC BY-NC 4.0.

CHAPTER 3: STOMACH SINEW CHANNEL (LEG YANGMING)

Overview: Stomach Sinew Channel (Leg Yangming)

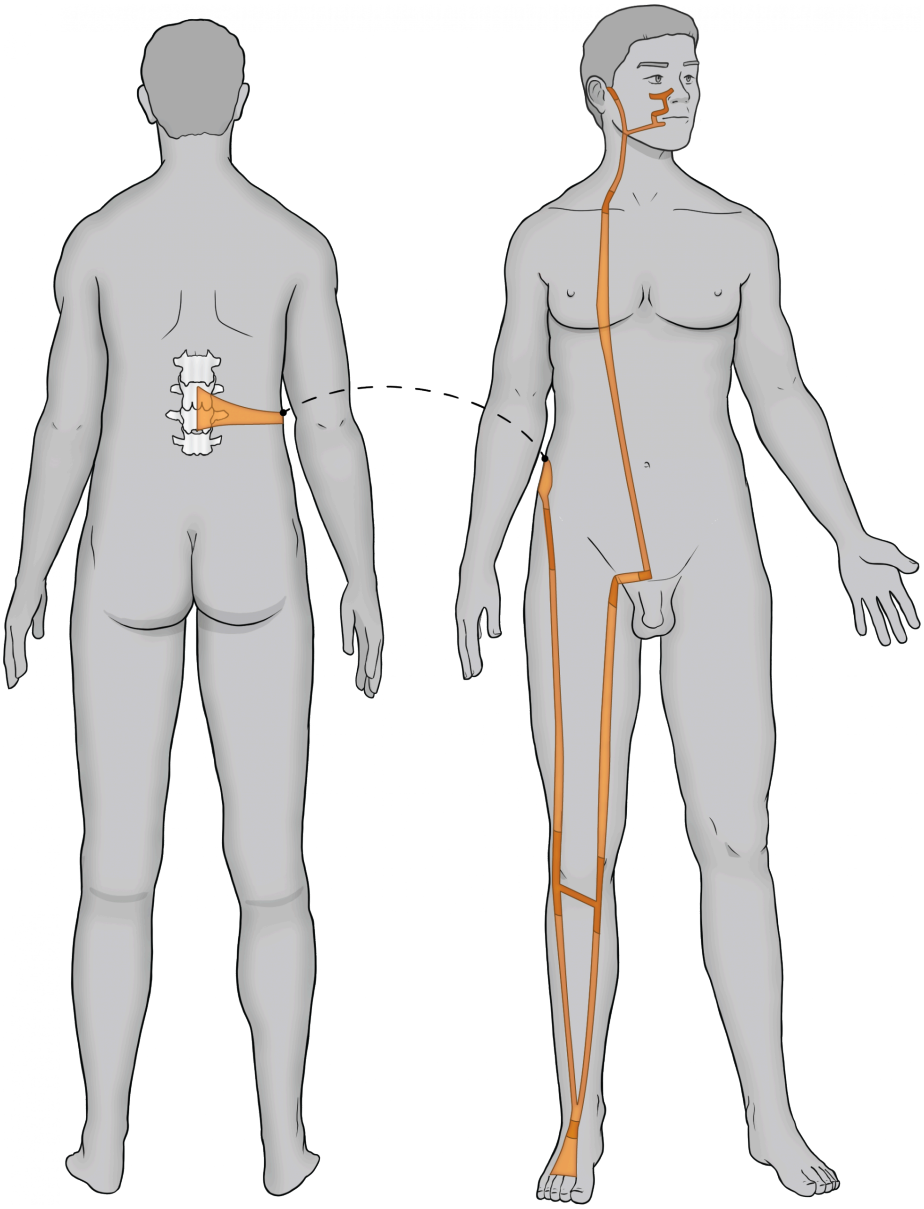


Figure 3.1 The stomach sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Stomach Sinew Channel: Trajectory and associated anatomy

1. The Stomach sinew channel begins on the dorsum of the toes and travels up the foot and continues up the anterior compartment of the lower leg to bind just inferior to the knee on the anterolateral aspect. There is also another divergent beginning at the insertion of the tibialis anterior on the medial

aspect of the foot, which will blend with the anterior compartment of the lower leg as well. **(Anatomy: Dorsal interossei, Extensor digitorum brevis, Tibialis anterior, Extensor hallucis longus, Extensor digitorum longus, Peroneus tertius)**

2. a. One branch will bind at the anterior inferior iliac spine (AIIS) via most of the quadriceps.
   b. The other branch will bind at the anterior superior iliac spine (ASIS) via the rectus femoris and the sartorius. From here, this channel will branch. Both branches will take a similar trajectory through the patella tendon to the anterior thigh. **(Anatomy: A) Vastus lateralis, Vastus medialis, Vastus intermedius B) Rectus femoris, Sartorius)**
3. The stomach Sinew Channel will then travel to the pubis via the inguinal ligament and then up the abdomen via the rectus abdominis. All the lateral abdominal muscles also bind to the inguinal ligament and travel up to bind to the lower rib cage. **(Anatomy: Inguinal ligament, Rectus abdominis, External oblique, Internal oblique, Transverse abdominis)**
4. The stomach Sinew Channel will continue up the midline of the body via the sternalis (if present) and continue up the neck via the voluntary muscles of swallowing. It continues through the voluntary muscles of the soft (lower) palate binding on the mandible (including the tongue). **(Anatomy: Sternalis, Omnohyoid, Sternothyroid, Sternohyoid, Digastric, Mylohyoid)**
5. From inside the mandible, the channel emerges to join the muscles of the chin and lower lip, continuing around the mouth to attach to the cheek and nose including the muscles of the lower eyelid. **(Anatomy: Mentalis, Depressor labii inferioris, Depressor anguli oris, Levator anguli oris, Orbicularis oris, Levator labii superioris alaeque nasi, Risorius, Zygomaticus minor and major, Orbiuclaris oculi)**

1. Dorsal Interossei

Origin: Adjacent sides of metatarsals number 1-5

Insertion: Medial side of the proximal phalanx of digit 2, lateral sides of digit 2-4 proximal phalanx

Action:

- Abducts digit 2-4
- Assists in metatarsophalangeal joint flexion

Innervation: Lateral plantar nerve (S2/**3**)

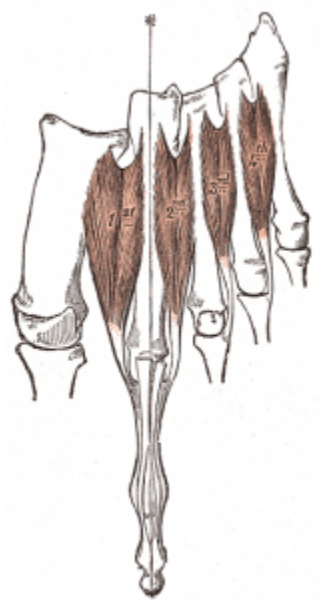


Figure 3.2 Dorsal interossei, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate between the metatarsals

Technique: Needle directly between the metatarsals aiming for the sides of the metatarsals as a bony backdrop

Caution: **Low – interdigital nerves are vulnerable between the metatarsals**



Figure 3.3 Needling dorsal interossei between the metatarsals, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1839

Video 3.1 Needling of dorsal interossei, original video by Nadine Crocker, CC BY-NC 4.0.

2. Extensor Digitorum Brevis

Origin: Superior lateral aspect of the calcaneus, the floor of the tarsal sinus, the talocalcaneal ligament and the inferior extensor retinaculum

Insertion: Base of digit 1, middle phalanx of digit 2-4 via the tendons of extensor digitorum longus

Action: Assists in extension of digit 1-5

Innervation: Deep fibular nerve (S1/2)

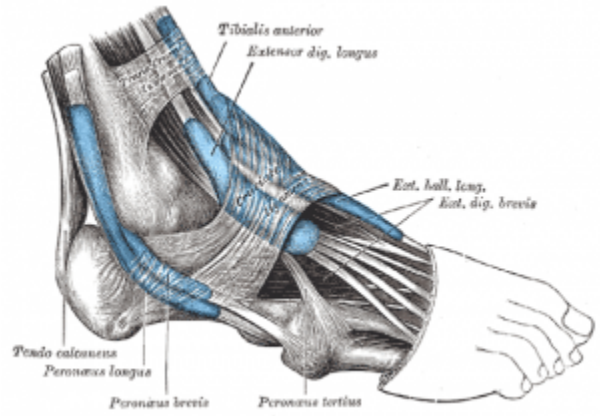


Figure 3.4 Extensor digitorum brevis, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the lateral aspect of the dorsum of the foot – Resist toe extension to help isolate this muscle

Technique: Needle directly perpendicular to this muscle on the dorsum of the foot

Caution: Low



Figure 3.5 Needling extensor digitorum brevis on lateral aspect of the foot, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1841#oembed-1

Video 3.2 Needling of extensor digitorum brevis, original video by Nadine Crocker, CC BY-NC 4.0.

3. Tibialis Anterior

Origin: Lateral Tibial condyle, superior half of the lateral tibial surface and interosseous membrane

Insertion: Dorsal base of the first metatarsal and medial aspect of medial cuneiform

Action:

- Dorsiflexion of ankle
- Supination of foot

Innervation: Deep peroneal nerve (**L4**/5)



Figure 3.6 Anterior leg muscles (tibialis anterior), adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).



Figure 3.7
Neurovascular bundle (tibialis anterior artery and vein, deep peroneal nerve)
, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate this muscle on the anterior aspect of the lower leg, resist supination to help isolate this muscle

Technique: Needle perpendicular to the tibialis anterior

Caution: **Low – deep peroneal nerve lies just deep to this muscle**



Figure 3.8 Needling tibialis anterior, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1843#oembed-1

Video 3.3 Needling tibialis anterior, original video by Nadine Crocker, CC BY-NC 4.0.

4. Extensor Hallucis Longus

Origin: Middle part of the anterior fibula and interosseous membrane

Insertion: Dorsal aspect of base of the of digit 1 phalanx

Action:

- Extension of digit 1
- Assists with dorsiflexion of the ankle

Innervation: Deep fibular nerve (L5/S1)



Figure 3.9
Anterior leg muscles (extensor hallucis longus)
, by Dr. Johannes Sobotta (Public domain).



Figure 3.10
Extensor hallucis longus
, by Dr. Johannes Sobotta (Public domain).



Figure 3.11
Neurovascular bundle (tibialis anterior artery and vein, deep peroneal nerve)
, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate the anterior shin and resist extension of digit 1 to help isolate this muscle

Technique: Needle perpendicular to this muscle

Caution: **Low – deep peroneal nerve is located just deep to this muscle**



Figure 3.12 Needling extensor hallucis longus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1845#oembed-1

Video 3.4 Needling of extensor hallucis longus, original video by Nadine Crocker, CC BY-NC 4.0.

5. Extensor Digitorum Longus

Origin: Lateral tibial condyle and superior 3/4 of the anterior surface of the tibia and interosseous membrane

Insertion: Middle and distal phalanges of digit 2-5

Action:

- Toe extension
- Ankle dorsiflexion

Innervation: Deep peroneal nerve (L5/S1)



Figure 3.13
Anterior leg muscles (extensor hallucis longus)
, by Dr. Johannes Sobotta (Public domain).

Needling

Position: Supine

Palpation: Palpate the anterior aspect of the shin and resist toe extension to help isolate this muscle

Technique: Needle perpendicular to this muscle

Caution: **Low – The deep peroneal nerve lies just medial to this muscle**



Figure 3.14 Needling extensor digitorum longus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1847#oembed-1

Video 3.5 Needling of extensor digitorum longus, original video by Nadine Crocker, CC BY-NC 4.0.

6. Peroneus Tertius

Origin: Inferior 1/3 of the anterior fibula and interosseous membrane

Insertion: Dorsum of base of 5th metatarsal

Action:

- Dorsiflexes ankle
- Assists in ankle eversion

Innervation: Deep peroneal nerve (L5/S1)



Figure 3.15 Peroneus tertius, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate this muscle on the inferior lateral aspect of the anterior shin

Technique: Needle perpendicular to the muscle using the fibula as a bony backdrop

Caution: Low



Figure 3.16 Needling peroneus tertius at the lower 1/4 for the fibula, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1849#oembed-1

Video 3.6 Needling of peroneus tertius, original video by Nadine Crocker, CC BY-NC 4.0.

7. Vastus Lateralis

Origin: Greater trochanter and lateral lip of the linea aspera of the femur

Insertion: Tibial tuberosity via the patella tendon

Action: Extends lower leg

Innervation: Femoral nerve (L2/**3/4**)

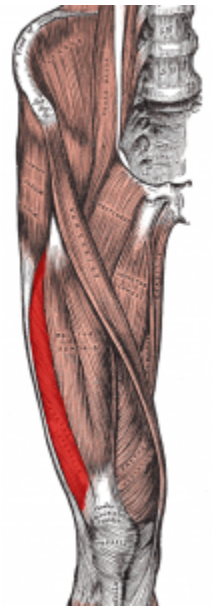


Figure 3.17 Peroneus tertius, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

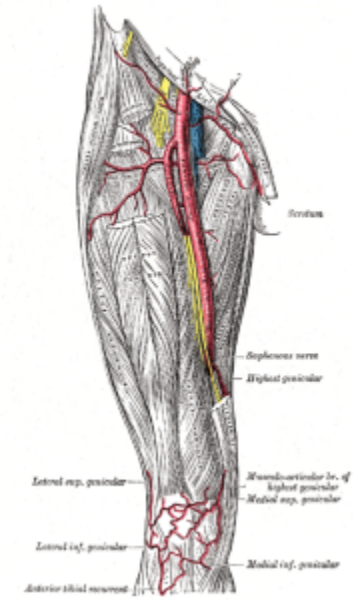


Figure 3.18
Femoral neurovascular bundle (femoral artery, nerve and vein)
, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate the lateral aspect of the anterior thigh

Technique: Needle perpendicular to this muscle using the femur as a lateral backdrop

Caution: Low



Figure 3.19 Needling of vastus lateralis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1851#oembed-1

Video 3.7 Needling of vastus lateralis, original video by Nadine Crocker, CC BY-NC 4.0.

8. Vastus Medialis

Origin: Intertrochanteric line and medial lip of the linea aspera of the femur

Insertion: Tibial tuberosity via the patella tendon

Action: Extension of the lower leg

Innervation: Femoral nerve (L2/3/4)

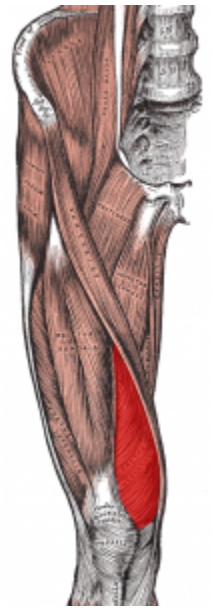


Figure 3.20 Vastus medialis, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

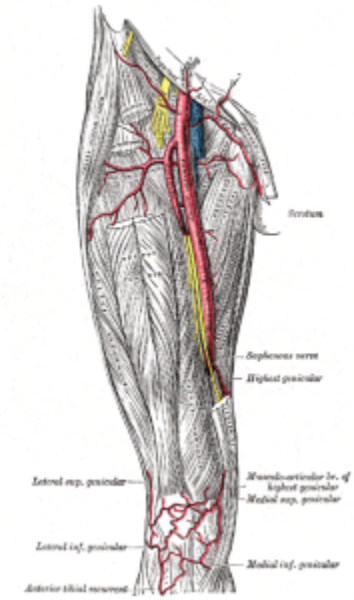


Figure 3.21
Femoral neurovascular bundle (femoral artery, nerve, and vein), by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate medial aspect of the upper thigh – can be most easily palpated closer to the patella

Technique: Needle in a medial to lateral direction through this muscle using the femur as a bony backdrop

Caution: Low



Figure 3.22 Needling of vastus medialis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1853#oembed-1

Video 3.8 Needling of vastus medialis, original video by Nadine Crocker, CC BY-NC 4.0.

9. Vastus Intermedius

Origin: Anterior and lateral surface of the femoral shaft

Insertion: Tibial tuberosity via the patella tendon

Action: Extension of the lower leg

Innervation: Femoral nerve (L2/**3/4**)

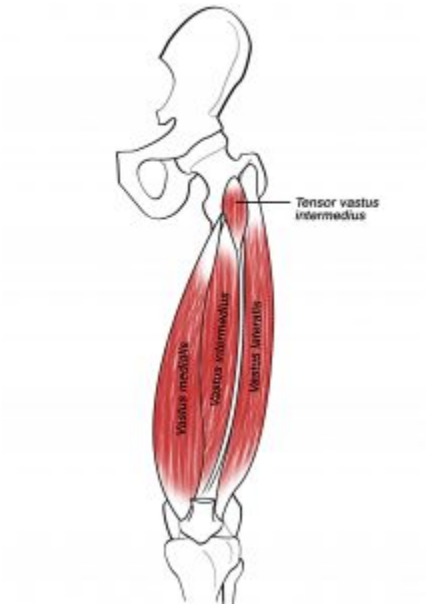


Figure 3.23 Vastus intermedius, by Athikhun.suw, CC BY-SA 4.0.

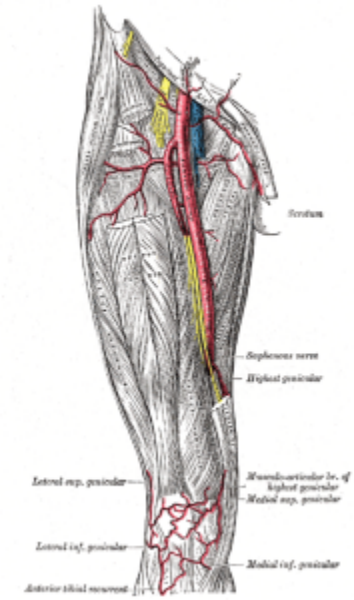


Figure 3.24
Femoral neurovascular bundle (femoral artery, nerve and vein), by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate the front of the thigh

Technique: Needle perpendicular to this muscle using the femur as a bony backdrop

Caution: **Low (as long as you are below the femoral triangle)**



Figure 3.25 Needling vastus intermedius, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1855#oembed-1

Video 3.9 Needling of vastus intermedius, original video by Nadine Crocker, CC BY-NC 4.0.

10. Rectus Femoris

Origin: Anterior superior iliac spine and ilium superior to acetabulum

Insertion: Tibial tuberosity via the patella tendon

Action: Extension of the lower leg

Innervation: Femoral nerve (L2/**3/4**)

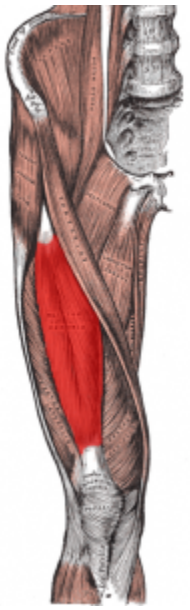


Figure 3.26 Rectus femoris, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

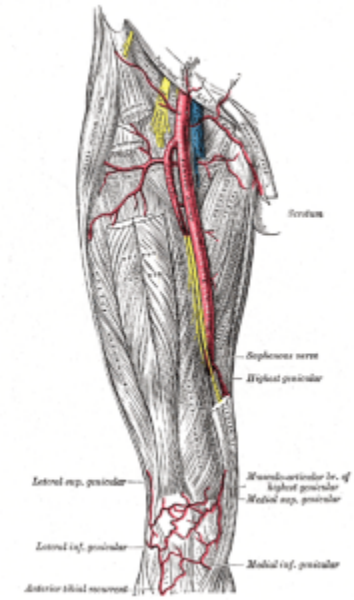


Figure 3.27
Femoral neurovascular bundle (femoral artery, nerve and vein), by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate in midline of the thigh

Technique: Needle perpendicular to this muscle using the femur as a bony backdrop

Caution: **Low – moderate: femoral artery is located just medial to this muscle near its origin**



Figure 3.28 Needling rectus femoris, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1857#oembed-1

Video 3.10 Needling rectus femoris, original video by Nadine Crocker, CC BY-NC 4.0.

11. Sartorius

Origin: Anterior superior iliac spine

Insertion: Medial superior surface of the tibia (part of the pes anserine group)

Action:

- Flexes the hip
- Abducts the hip
- Lateral rotation of the hip
- Flexes the knee

Innervation: Femoral nerve (L2/3)

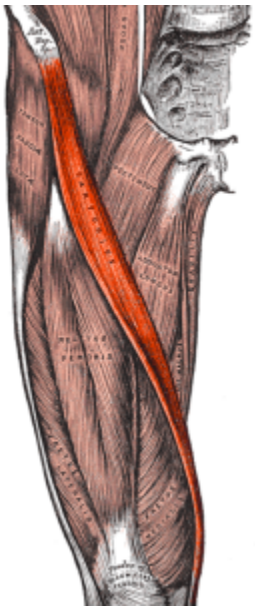


Figure 3.29 Sartorius, adapted by Michael Gasperl from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

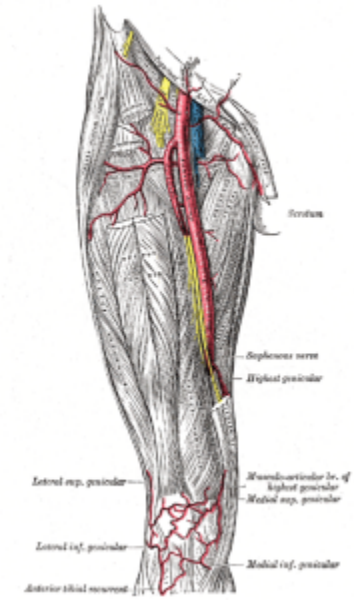


Figure 3.30
Femoral neurovascular bundle (femoral artery, nerve and vein), by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Resist hip flexion, abduction, and lateral rotation as well as knee flexion to isolate this muscle – Palpate along the front of the thigh in a diagonal direction from the anterior superior iliac spine to the medial aspect of the knee

Technique: Needle perpendicular to this muscle using the femur as a bony backdrop

Caution: **Moderate – this muscle crosses the femoral artery as it enters the adductor cannel (specifically the middle 1/3 of this muscle)**



Figure 3.31 Needling sartorius, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1859#oembed-1

Video 3.11 Needling sartorius, original video by Nadine Crocker, CC BY-NC 4.0.

12. Rectus Abdominis

Origin: Crest of the pubic

Insertion: Costal cartilages of ribs 5-7 and xiphoid process of the sternum

Action: Flexion of lumbar spine

Innervation: Thoracoabdominal nerves T7-T11 and subcostal nerve T12

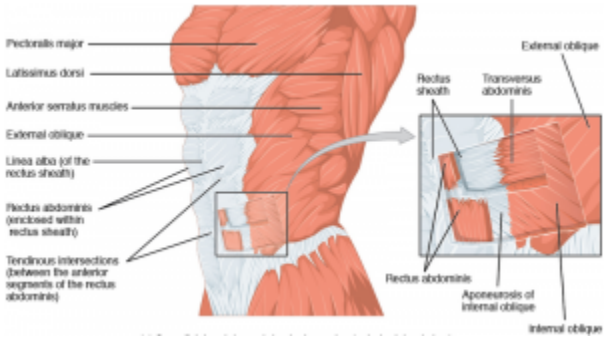


Figure 3.32 Rectus abdominis, by OpenStax College, CC BY 3.0.

Needling

Position: Supine

Palpation: Palpate along near the xiphoid process and down the midline of the abdominal wall

Technique:

- Needle in an inferior to superior direction towards costal margin in the midline – Use the costal margin as a backdrop
- Needle shallowly in midline of abdomen, approximately 1 cun in depth

Caution: **High – do not needle too deeply as the abdominal viscera lies directly beneath this**

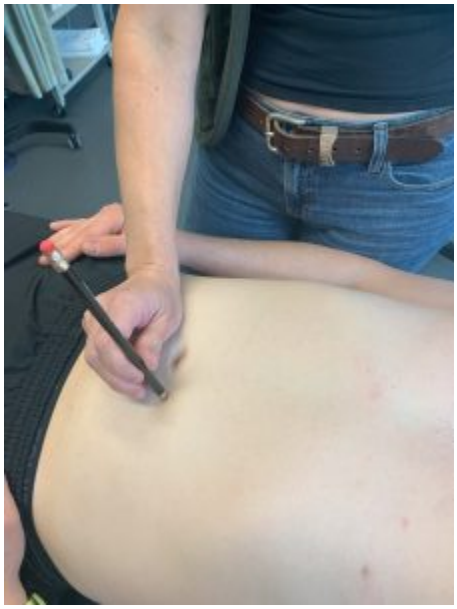


Figure 3.33 Needling rectus abdominis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1861#oembed-1

Video 3.12 Needling of rectus abdominis, original video by Nadine Crocker, CC BY-NC 4.0.

13. External Oblique

Origin: Ribs 5-12

Insertion: Xiphoid process, outer lip of iliac crest, pubic crest, and pubic tubercle, linea alba, inguinal ligament, and anterior superior iliac spine

Action:

- Flexion of the torso
- Contralateral rotation of the torso

Innervation: Thoracoabdominal nerves (T7-11) and subcostal nerve (T12)

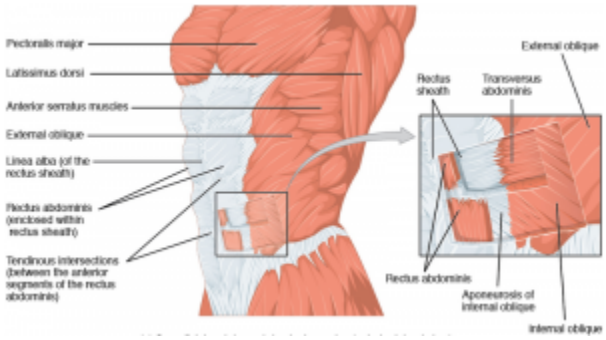


Figure 3.34 External oblique, by OpenStax College, CC BY 3.0.

Needling

Position: Supine

Palpation: Palpate along the lateral aspect of the iliac crest and lateral abdomen

Technique: Needle along the lateral iliac crest using it as a bony backdrop

Caution: **High – abdominal visceral lie just inferior and medial to this muscle**

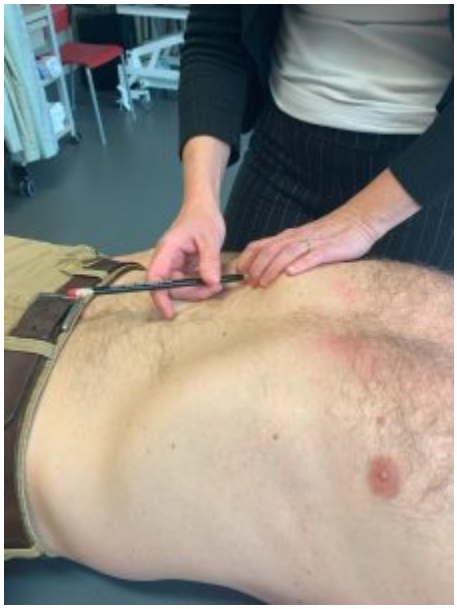


Figure 3.35 Needling external obliques, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1863#oembed-1

Video 3.13 Needling of external obliques, original video by Nadine Crocker, CC BY-NC 4.0.

14. Internal Oblique

Origin: Inguinal ligament, iliac crest, and lumbodorsal fascia

Insertion: Linea alba, pectineal line of the pubis, and ribs 10-12

Action:

- Bilaterally compresses abdominal content
- Unilaterally produces ipsilateral trunk rotation

Innervation: Thoracoabdominal nerves (T7-11), subcostal nerve (T12), iliohypogastric nerve (L1) and ilioinguinal nerve (L1)

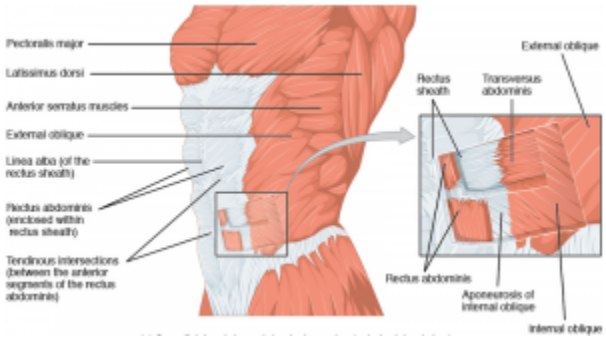


Figure 3.36 Internal obliques, by OpenStax College, CC BY 3.0.

Needling

Position: Supine

Palpation: Palpate along the iliac crest

Technique: Needle along the iliac crest using it as a bony backdrop

Caution:**High – abdominal contents lie directly below and medial to this muscle**

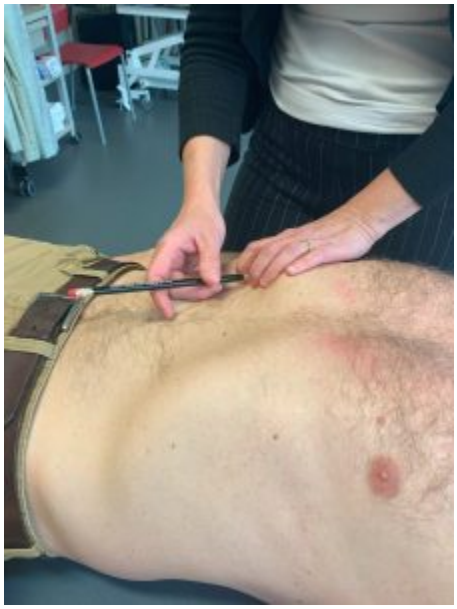


Figure 3.37 Needling internal obliques, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1865#oembed-1

Video 3.14 Needling of internal obliques, original video by Nadine Crocker, CC BY-NC 4.0.

15. Transverse Abdominis

Origin: Lateral 1/3 of the inguinal ligament, anterior 2/3 of the iliac crest, thoracolumbar fascia, and inner surface of lower 6 costal cartilages and their ribs (7-12)

Insertion: Linea alba, aponeurosis of internal oblique, pubic crest and pectineal line of the pubis

Action:

- Increases intraabdominal pressure
- Assists in supporting the lumbar spine
- Unilaterally ipsilateral trunk rotation

Innervation: Lower 5 intercostal nerves, subcostal nerve (T12), ilioinguinal (L1), and iliohypogastric (L1) nerve

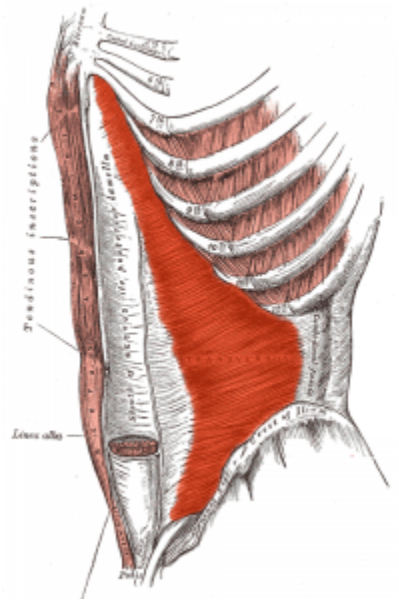


Figure 3.38 Transverse abdominis, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Typically, this muscle is not considered when needling as it is too deep.

16. Sternalis

Present in approximately 7.8% of the population, more common in females.

Origin: Variable – Manubrium of sternum or clavicle

Insertion: Variable – xiphoid process, costal cartilages, pectoral fascia, lower ribs, and/or rectus sheath

Action: Theorized as...

- A proprioceptive muscle
- Assists in movement of the shoulder joint
- Residual muscle from when we used our upper limb more

Innervation: Variable: dorsal or ventral rami of thoracic nerves, intercostal nerves

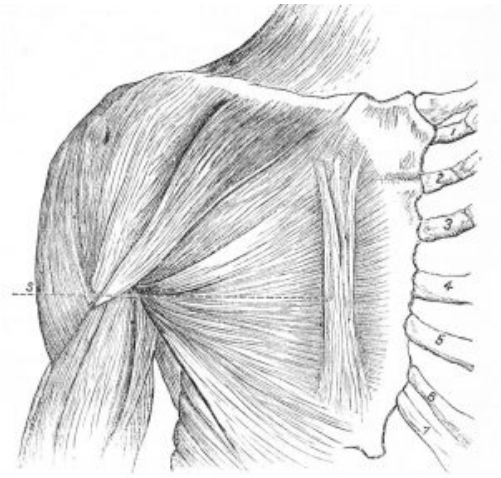


Figure 3.39 Sternalis, by unknown author (Public domain).

Needling

This muscle is not considered with needling. Of note, it is estimated that 5-8% of the population have sternal foramina at the level of the 4th intercostal plate (CV 17) (Leigh McCutcheon & Michael Yelland, 2011). Iatrogenic pneumothorax: safety concerns when using acupuncture or dry needling in the thoracic region, *Physical Therapy Reviews*, *16*(2), 126–132, https://doi.org/10.1179/1743288X11Y.0000000012.

CHAPTER 4: SPLEEN SINEW CHANNEL (LEG TAIYIN)

Overview: Spleen Sinew Channel (Leg Taiyin)

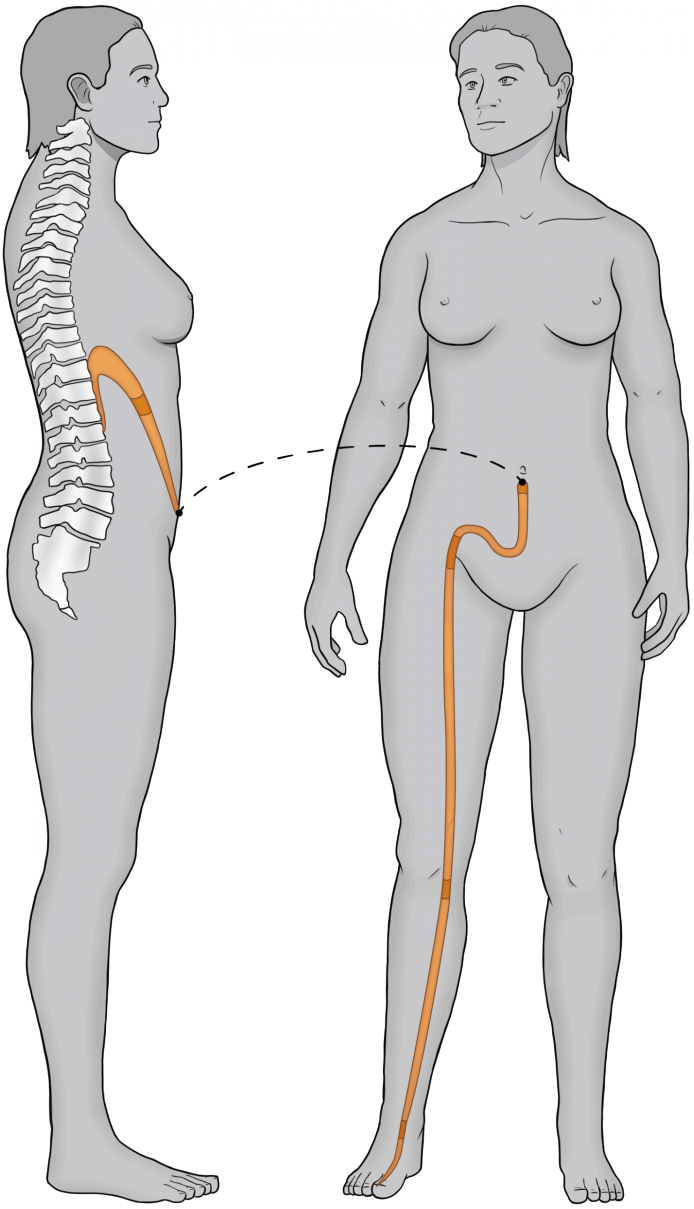


Figure 4.1 The spleen sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Spleen Sinew Channel: Trajectory and associated anatomy

1. The Spleen Sinew channel begins on the medial plantar aspect of the great toe and continues up the medial side of the foot wrapping around the medial malleolus. It continues up the deep aspect of the

lower leg by following tibialis posterior. **(Anatomy: Abductor hallucis, Tibialis posterior)**

2. From the deep attachment of the tibialis posterior muscle, the Spleen sinew channel will travel with the popliteal artery and vein into the popliteal fossa and through the adductor hiatus to enter the anterior medial aspect of the upper leg. It will travel up the medial aspect of the linea aspera and pectineal ridge of the femur to the lesser trochanter. From here, it will travel up adductor longus and pectineus to connect to the hip flexors (iliacus and psoas major and minor), finally coming to rest at the diaphragm. **(Anatomy: Adductor longus, Pectineus, Iliacus, Psoas major and minor, Diaphragm)**

1. Abductor Hallucis

Origin: Medial tubercle of calcaneal tuberosity and plantar aponeurosis

Insertion: Medial aspect of the base of the proximal phalanx of D1

Action:

- Abducts the great toe (D1)
- Flexes the great toe (D1)

Innervation: Medial plantar nerve (S2/**3**)

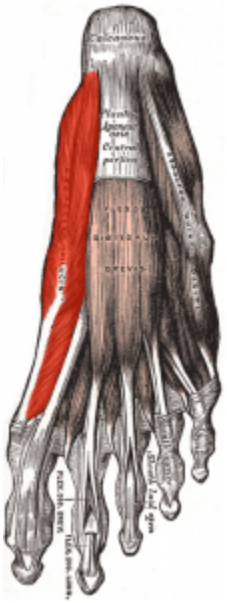


Figure 4.2 Abductor hallucis, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the medial side of the great toe on the plantar surface

Technique: Needle perpendicularly towards the first metatarsal

Caution: Low



Figure 4.3 Needling of abductor hallucis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1875#oembed-1

Video 4.1 Needling of abductor hallucis longus, original video by Nadine Crocker, CC BY-NC 4.0.

2. Tibialis Posterior

Origin: Posterior surface of tibia inferior to soleal line, interosseous membrane, and posterior surface of fibula

Insertion: Navicular tuberosity, cuneiforms, cuboid and bases of 2nd-4th metatarsal

Action:

- Plantar flexion
- Inversion

Innervation: Tibial nerve (L4/5)



Figure 4.4 Tibialis posterior, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

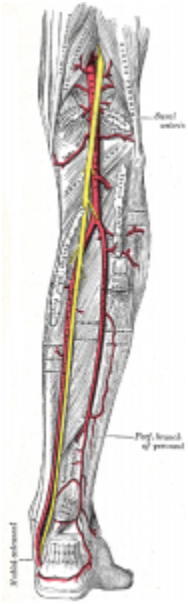


Figure 4.5
Neurovascular bundle of the calf (posterior tibial artery and vein and tibial nerve)
, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position:

- Supine with knee over bolster or therapist's own knee
- Prone

Palpation:

- Supine: palpate the tender spots along the medial tibial border

Technique:

1. Supine: Needle directly towards the medial posterior border of the tibia using the tibia as a backdrop – The muscle belly of tibialis posterior can be accessed around the middle 2/3 of the post/medial tibia
2. Prone: Will need to needle perpendicularly through the medial aspect of the gastrocnemius and soleus using the tibia as a backdrop

Caution: Low



Figure 4.6 Needling tibialis posterior from an anterior medial to lateral direction, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 4.7 Needling tibialis posterior from a posterior direction just medial to midline, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 4.2 Needling tibialis posterior from supine, original video by Nadine Crocker, CC BY-NC 4.0.

3. Adductor Longus

Origin: Body of the pubis inferior to the pubic crest

Insertion: Middle 1/3 of the linea aspera of the femur

Action: Adducts the thigh

Innervation: Obturator nerve (L2/**3**/4)

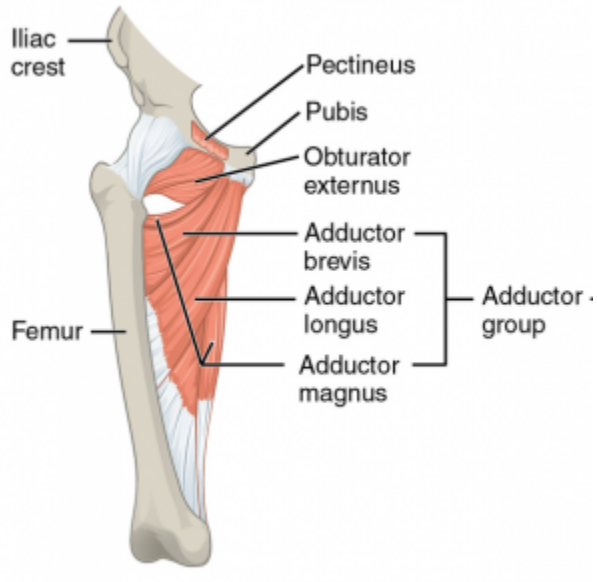


Figure 4.8 Adductor longus, OpenStax College, CC BY 3.0.

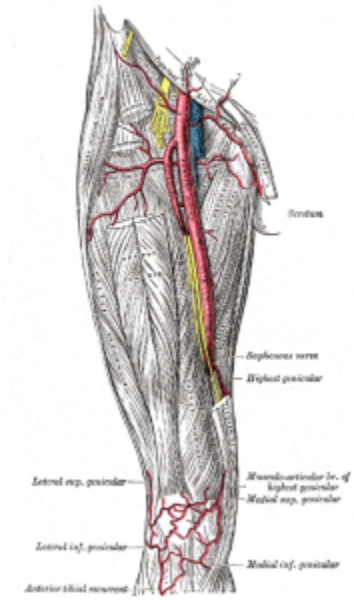


Figure 4.9
Neurovascular bundle (femoral artery, vein and nerve)
, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine with the patients leg externally rotated and their knee over yours or over a bolster

Palpation: Palpate along the medial aspect of the thigh and ask the patient to adduct their thigh gently to make this muscle more prominent – Pick up this muscle more towards the origin

Technique: Needle in an anterior-to-posterior direction – Ensure there is no femoral pulse medial to your thumb or under your fingers – Consider needling only the superior 1/3 of this muscle

Caution:**High – the femoral artery lies directly on top of the middle aspect this muscle as it passes posteriorly to enter the adductor hiatus**



Figure 4.10 Needling adductor longus, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 4.11 Needling adductor longus, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 4.3 Needling adductor longus, original video by Nadine Crocker, CC BY-NC 4.0.

4. Pectineus

Origin: Superior ramus of the pubis

Insertion: Pectineal line of femur (just inferior to the lesser trochanter)

Action:

- Adducts the thigh
- Flexes the thigh
- Weak internal rotator of the thigh

Innervation: Femoral nerve (L**2**/3), Occasionally may receive a branch from the obturator nerve

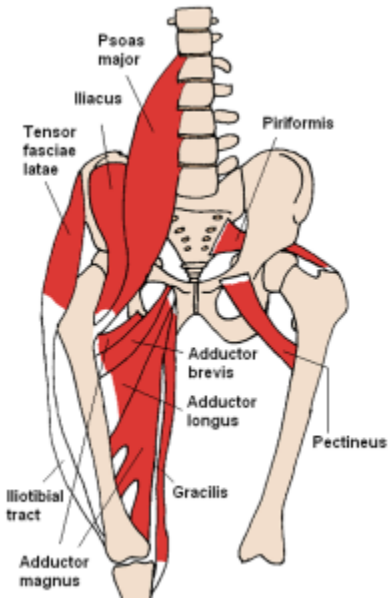


Figure 4.12 Pectineus, adapted by Mikael Häggström from the original image by Beth Ohara, CC-BY-SA 3.0.

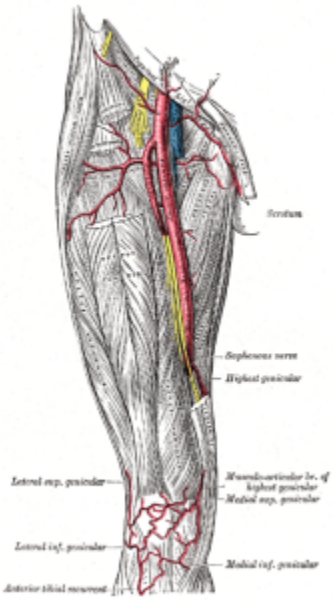


Figure 4.13
Neurovascular bundle (femoral artery, vein and nerve)
, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate for the femoral artery

Technique: Needle lateral from the femoral artery towards the pectineal line

Caution:**High – femoral artery lies directly on top of this muscle**



Figure 4.14 Needling pectineus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1881#oembed-1

Video 4.4 Needling pectineus, original video by Nadine Crocker, CC BY-NC 4.0.

5. Iliacus

Origin: Iliac crest, iliac fossa, ala of the sacrum, and anterior sacroiliac ligaments

Insertion: Lesser trochanter of the femur (via a common tendon with psoas major and minor)

Action:

- Flexes the thigh
- Assists in flexing the body on a stable lower leg

Innervation: Femoral nerve (L**2**/3)

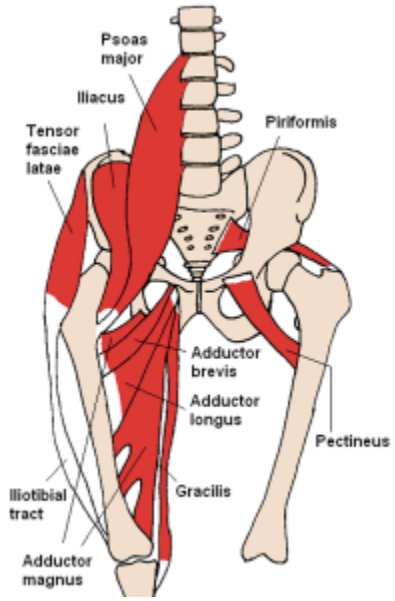


Figure 4.15 Iliacus, adapted by Mikael Häggström from the original image by Beth Ohara, CC-BY-SA 3.0.

Needling

Position: Supine or side lying

Note: side-lying position allows the abdominal viscera to fall to one side

Palpation: Palpate the iliac crest and make a bracket by hooking your fingers over it

Technique: Standing on the ipsilateral side of the patient, needle between your finger bracket towards the medial aspect of the iliac crest

Caution:**High – abdominal contents**



Figure 4.16 Needling iliacus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1883#oembed-1

Video 4.5 Needling iliacus, original video by Nadine Crocker, CC BY-NC 4.0.

6. Psoas Major & Minor

Origin: Lateral aspect of the T12-L5 vertebral bodies and their discs along with the TVP of L1-L5

Insertion: Lesser trochanter

Action:

- Hip flexion
- Flexes the body on a stable lower leg

Innervation: Femoral nerve (L1/2/3)

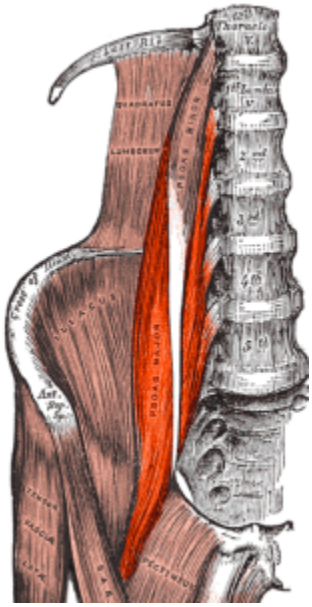


Figure 4.17 Psoas major, adapted by Michael Gasperl from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

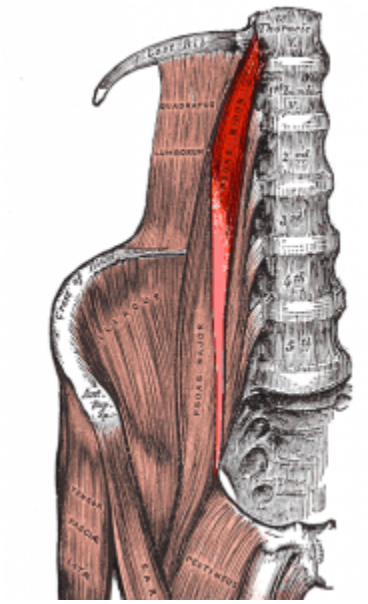


Figure 4.18 Psoas minor, adapted by Bemoeial from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate for the femoral artery

Technique: Needle laterally to the femoral artery aiming for the lesser trochanter

Caution:**High – the femoral nerve lies directly medial to this muscle**



Figure 4.19 Needling psoas major and minor, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1885#oembed-1

Video 4.6 Needling psoas major and minor, original video by Nadine Crocker, CC BY-NC 4.0.

CHAPTER 5: KIDNEY SINEW CHANNEL (LEG SHAOYIN)

Overview: Kidney Sinew Channel (Leg Shaoyin)

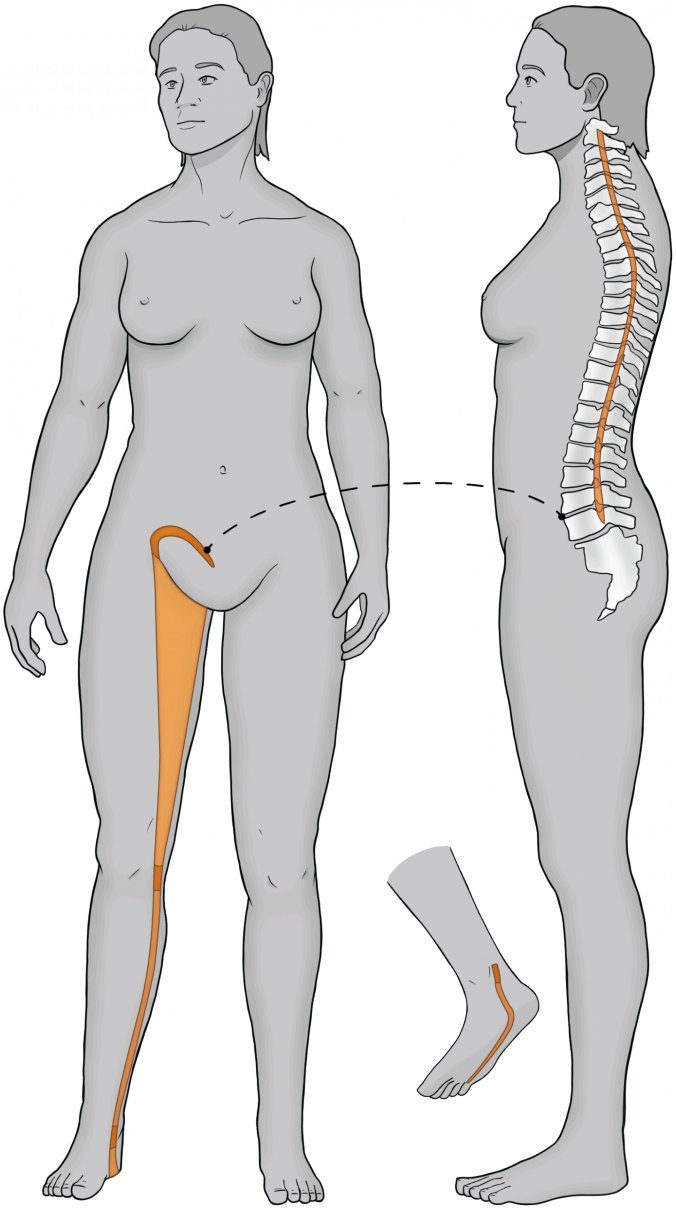


Figure 5.1 Kidney sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Kidney Sinew Channel: Trajectory and associated anatomy

1. The Kidney sinew channel begins on the plantar aspect of the foot under the lateral four toes. It crosses the plantar aspect of the foot following flexor digitorum longus, including all the deep intrinsic muscles of

the foot, and binds with the bladder sinew channel at the heel. **(Anatomy: Plantar interosseous, Lumbricales, Quadratus plantae, Flexor digitorum brevis)**

2. The Kidney sinew channel follows the flexor digitorum longus tendon around the medial malleolus, traveling up the medial aspect of the tibia to bind on its posterior surface. **(Anatomy: Flexor digitorum longus)**
3. The Kidney sinew channel then travels up and over the medial condyle of the tibia, following the medial collateral ligament. **(Anatomy: Medial collateral ligament)**
4. It continues up over the medial epicondyle of the femur, following the periosteum of the medial supracondylar ridge. From here with the Spleen sinew channel (traditional description) and Liver sinew channel (not included in the traditional description) flows up the linea aspera to the ischial tuberosity of the pelvis. **(Anatomy: Gracilis, Adductor magnus)**
5. From the ischial tuberosity, it travels deep into the pelvic floor to bind to the anterior aspect of the coccyx and sacrum. **(Anatomy: Levator ani (puborectalis, pubococcygeus, and iliococcygeus) and Coccygeus)**
6. Finally, the Kidney sinew channel will ascend the anterior spinal fascia and anterior cervical muscles to connect with the Bladder sinew channel at the occiput. **(Anatomy: Longus colli, Longus capitis, Rectus capitis anterior, Rectus capitis lateralis)**

1. Plantar Interossei

Origin: Bases and medial sides of metatarsals 3-5

Insertion: Medial sides of bases of 3rd-5th proximal phalanges

Action:

- Adducts digit 2-4
- Flexes metatarsophalangeal joints

Innervation: Lateral plantar nerve (S2/**3**)

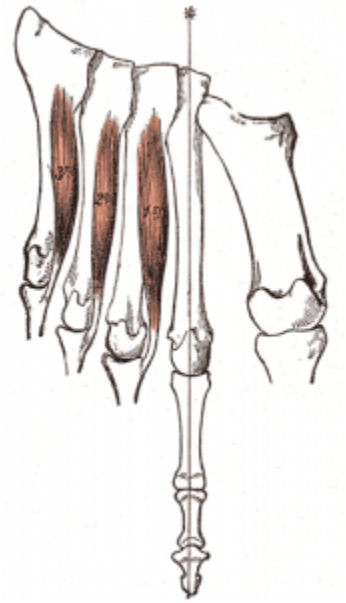


Figure 5.2 Plantar interossei, adapted by Pngbot (mikm) from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate between the metatarsals

Technique: Directly perpendicular between the metatarsals

Caution: Low – higher risk of hitting an interdigital nerve



Figure 5.3 Needling plantar interossei, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 5.1 Needling plantar interossei, original video by Nadine Crocker, CC BY-NC 4.0.

2. Lumbricals

Origin: Tendons of the flexor digitorum longus

Insertion: Medial aspect of expansion over digit 2-5

Action:

- Flex proximal phalanges 2-5
- Extends middle and distal phalanges 2-5

Innervation:

- Medial one: Medial plantar nerve (S2/**3**)
- Lateral three: Lateral plantar nerve (S2/**3**)

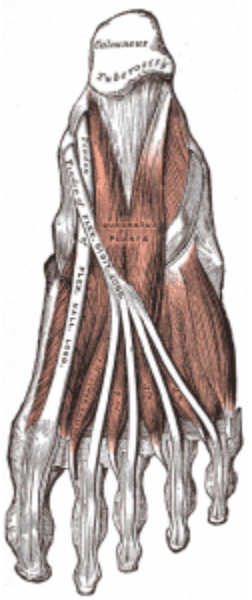


Figure 5.4 Lumbricals, adapted by Pngbot (mikm) from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the tendons of flexor digitorum longus

Technique: Needle just lateral to the tendons (same technique as for interossei)

Caution: **Low – higher risk of hitting an interdigital nerve**



Figure 5.5 Needling lumbricals, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 5.2 Needling lumbricals, original video by Nadine Crocker, CC BY-NC 4.0.

3. Quadratus Plantae

Origin:

- Lateral head: lateral border of calcaneal tuberosity
- Medial head: medial surface of calcaneal tuberosity

Insertion: Tendon of the flexor digitorum longus

Action:

- Assists flexor digitorum longus
- Helps in maintaining the line of pull of flexor digitorum longus in line with the midline of the foot

Innervation: Lateral plantar nerve (S2/**3**)

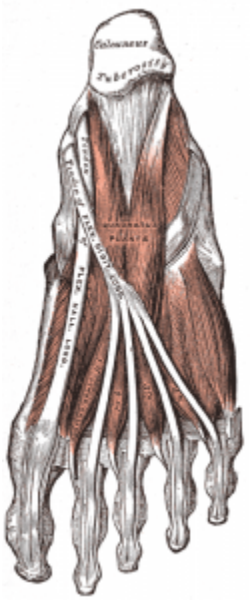


Figure 5.6
Quadrate planate, adapted by Pngbot (mikm) from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate just caudal from the calcaneus

Technique:

1. Needle directly towards the calcaneus (can aim towards medial and lateral borders)

2. Needle transversely in a medial-to-lateral direction just below the navicular tuberosity

Caution: Low



Figure 5.7 Needling quadrate plantae directly at the calcaneus, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 5.8 Needling quadrate plantae through a catch-all technique laterally just below the navicular tuberosity, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1895#oembed-1

Video 5.3 Needling quadrate plantae prone, original video by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1895#oembed-2

Video 5.4 Needling quadrate plantae lateral, original video by Nadine Crocker, CC BY-NC 4.0.

4. Flexor Digitorum Brevis

Origin: Medial tubercle of calcaneal tuberosity

Insertion: Both sides of the middle phalanges of digit 2-5

Action: Flexes digit 2-5

Innervation: Medial plantar nerve (S2/**3**)

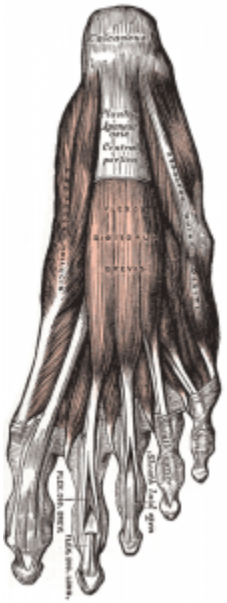


Figure 5.9
Flexor digitorum brevis
, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the medial plantar arch and resist digit 2-4 flexion to help isolate this muscle

Technique:

1. Needle perpendicular to the foot, can target more the origin of this muscle if the patient is adverse to needling/sensitive
2. Can needle transversely from medial to lateral just under the navicular tuberosity (catch all technique)

Caution: **Low – medial and lateral plantar nerves do run under this muscle, chance of hitting them**



Figure 5.10 Needling flexor digitorum brevis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1897#oembed-1

Video 5.5 Needling flexor digitorum brevis, original video by Nadine Crocker, CC BY-NC 4.0.

5. Flexor Digitorum Longus

Origin: Medial aspect of the posterior surface of the tibia inferior to the soleal line

Insertion: Plantar aspect of the bases of digit 2-5 distal phalanges

Action:

- Flexes digit 2-4
- Assists in plantar flexion of the ankle

Innervation: Tibial nerve (S**2**/3)



Figure 5.11 Flexor digitorum longus, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

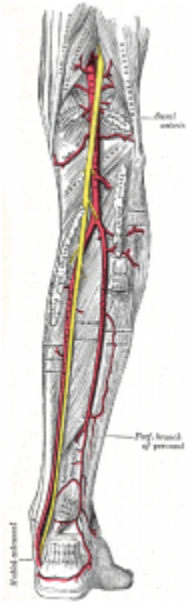


Figure 5.12 Neurovascular bundle of the calf (tibial nerve, posterior tibial artery and nerve), by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the posterior calf and resist toe flexion to help isolate this muscle – This muscle is located more towards the medial side of the calf

Technique: Needle perpendicularly towards this muscle avoiding the midline (Posterior tibial artery and tibial nerve)

Caution: **Low – moderate: The posterior tibial artery and tibial nerve lie in the midline of the calf**



Figure 5.13 Needling flexor digitorum longus through the medial aspect of gastrocnemius, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 5.6 Needling flexor digitorum longus, original video by Nadine Crocker, CC BY-NC 4.0.

6. Gracilis

Origin: Body and inferior ramus of the pubis

Insertion: Superior medial aspect of the tibia

Action:

- Adducts the thigh
- Flexes the knee
- Assists in medial rotation of the leg

Innervation: Obturator nerve (L**2**/3)

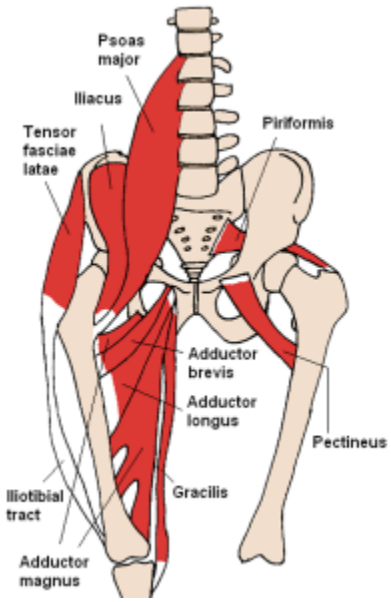


Figure 5.14 Gracilis, adapted by Mikael Häggström from the original image by Beth Ohara, CC-BY-SA 3.0.

Needling

Position: Supine with patient's knee supported by a bolster or the therapist's knee

Palpation: Palpate the medial thigh and resist adduction with an extended knee to help isolate this muscle

Technique:

1. Pick up the muscle in a pincher grip and needle superior to inferior

Caution: Low



Figure 5.15 Needling gracilis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1901#oembed-1

Video 5.7 Needling gracilis, original video by Nadine Crocker, CC BY-NC 4.0.

7. Adductor Magnus

Origin:

- Adductor portion: Inferior ramus of the pubis and ramus of the ischium
- Hamstring portion: Ischial tuberosity

Insertion:

- Adductor portion: Gluteal tuberosity, linea aspera, and medial supracondylar ridge
- Hamstring portion: Adductor tubercle of the femur

Action:

- Adductor portion: Adducts the thigh and helps stabilize the hip
- Hamstring portion: Assists with hip extension

Innervation:

- Adductor portion: Obturator nerve (L2/**3/4**)
- Hamstring portion: Tibial division of the sciatic nerve (L4)

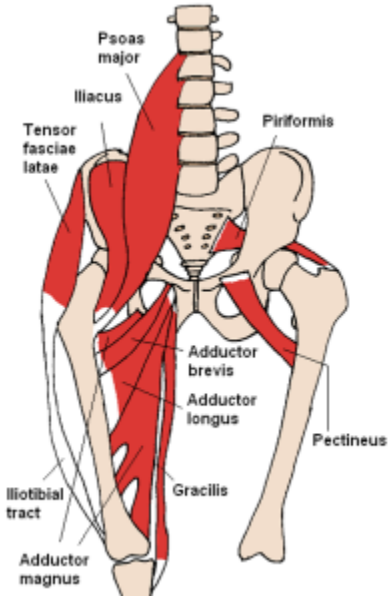


Figure 5.16 Adductor magus, adapted by Mikael Häggström from the original image by Beth Ohara, CC-BY-SA 3.0.

Needling

Position: Prone

Palpation: Palpate the medial posterior aspect of the thigh

Technique:

1. Make a shelf by compressing the adductor magus on the medial aspect of the thigh and needle perpendicularly in a posterior to anterior direction

2. Pick up this muscle in a pincher-type grip and needled in a similar fashion as above

Caution: Moderate – The femoral artery and vein passes through this muscle through the adductor hiatus and canal to exit posteriorly becoming the popliteal artery and vein (Needling in the proximal 1/3 of this muscle avoids these structures)



Figure 5.17 Needling adductor magnus making a shelf, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 5.18 Needling adductor magnus with pincher grip, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1903#oembed-1

Video 5.8 Needling adductor magnus, original video by Nadine Crocker, CC BY-NC 4.0.

None of these muscles in this last section of the sinew channel are taught

Note: There are specific needling techniques for pelvic health that will include levator ani, but these are not covered here

CHAPTER 6: LIVER SINEW CHANNEL (LEG JUEYIN)

Overview: Liver Sinew Channel (Leg Jueyin)

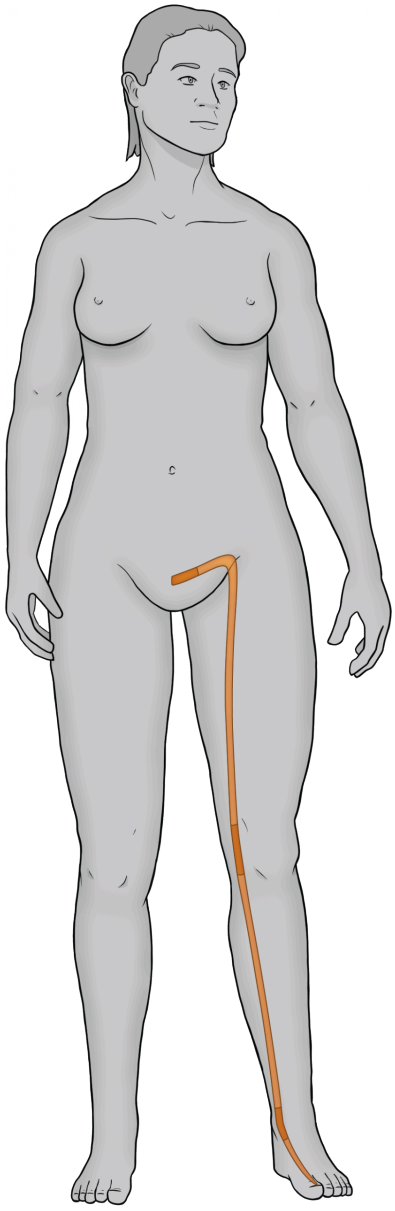


Figure 6.1 The liver sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Liver Sinew Channel: Trajectory and associated anatomy

1. The Liver sinew channel begins at the most distal aspect of the great toe. It follows the path of the

flexor hallucis longus (FHL), crossing the sole of the foot. It continues along the path of the FHL wrapping around behind the medial malleolus towards the deep compartment of the calf. **(Anatomy: Flexor hallucis brevis, Flexor hallucis longus, Adductor hallucis)**

2. From its binding point on the posterior aspect of the fibula, the Liver sinew channel continues up the posterior aspect of the leg with the Spleen sinew channel to cross behind the knee, travel through the adductor hiatus, and along the linea aspera to adductor brevis. **(Anatomy: Adductor brevis)**

1. Flexor Hallucis Brevis

Origin: Plantar surface of the cuboid and cuneiforms

Insertion: Both sides of the base of proximal phalanx of digit 1

Action: Assists with flexion of digit 1

Innervation: Medial plantar nerve (S2/S**3**)



Figure 6.2
Flexor hallucis brevis, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the plantar aspect of digit 1 metatarsal

Technique:

1. Needle directly perpendicular to this muscle using digit 1 metatarsal
2. Needle just inferior to the navicular tubercle in a medial to lateral direction (catch all technique for foot intrinsic muscles)

Caution: **Low – interdigital nerve**



Figure 6.3 Needling flexor hallucis brevis, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 6.4 Needling flexor hallucis brevis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1910#oembed-1

Video 6.1 Needling flexor hallucis brevis, original video by Nadine Crocker, CC BY-NC 4.0.

2. Flexor Hallucis Longus

Origin: Inferior 2/3 of the posterior surface of the fibula and interosseous membrane

Insertion: Base of distal phalanx of digit 1

Action:

- Flexes digit 1 – very important in push-off
- Helps support the medial arch

Innervation: Tibial nerve (S**2**/S3)

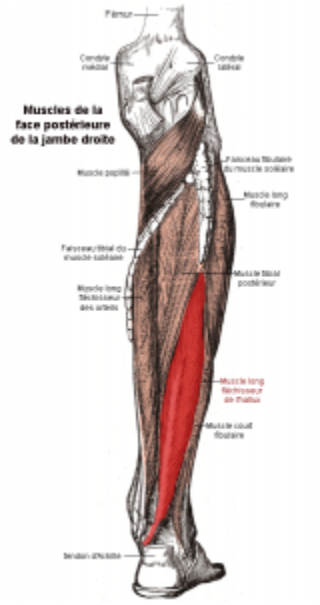


Figure 6.5
Flexor hallucis longus, adapted by Berichard from the original image by Henry Gray and Henry Vandyke Carter, CC BY-SA 3.0.

Needling

Position: Prone

Palpation: Palpate the lateral aspect of the calf

Technique: Needle perpendicular towards the posterior aspect of the fibula

Caution: **Low – posterior tibial artery and vein run just medial to this muscle**



Figure 6.6 Needling flexor hallucis longus through lateral aspect of gastrocnemius/soleus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1912#oembed-1

Video 6.2 Needling flexor hallucis longus, original video by Nadine Crocker, CC BY-NC 4.0.

3. Adductor Hallucis

Origin:

- Oblique head: bases of metatarsal 2-4
- Transverse head: plantar ligaments of metatarsophalangeal joints

Insertion: Lateral aspect of the base of digit 1 proximal phalanx

Action: Adducts digit 1

Innervation: Medial plantar nerve (S2/**3**)



Figure 6.7
Adductor hallucis, adapted by Pngbot (mikm) from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate towards attachment point of this muscle

Technique:

1. Needle towards attachment point of this muscle
2. Can needle between metatarsals (more sensitive)

Caution: **Low – interdigital nerves are vulnerable**

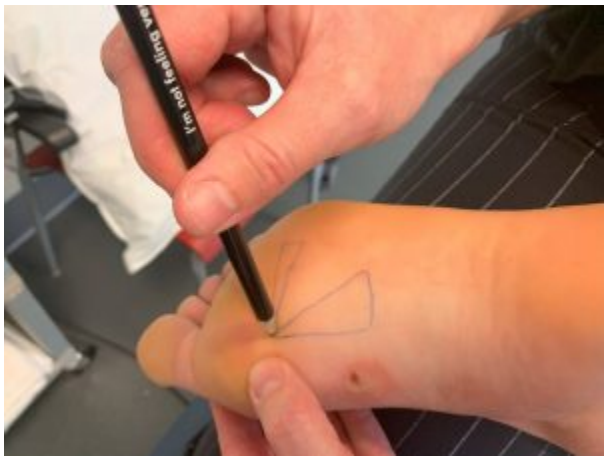


Figure 6.8 Needling adductor hallucis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1914#oembed-1

Video 6.3 Needling adductor hallucis, original video by Nadine Crocker, CC BY-NC 4.0.

4. Adductor Brevis

Origin: Body and inferior ramus of pubis

Insertion: Pectineal line and proximal part of linea aspera of femur

Action:

- Adducts the thigh
- Weak flexor of the thigh

Innervation: Obturator nerve (L2/**3**/4)

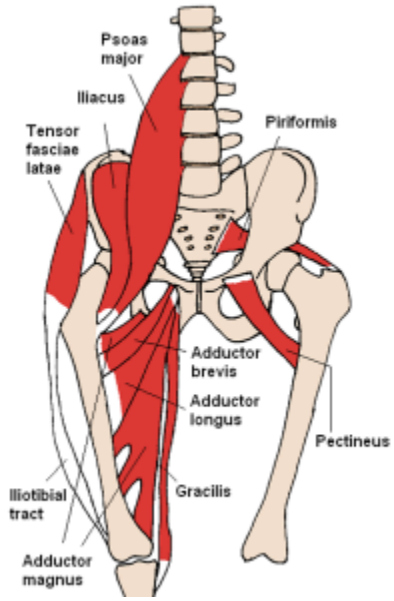


Figure 6.9 Adductor brevis, adapted by Mikael Häggström from the original image by Beth Ohara, CC-BY-SA 3.0.

Needling

Position: Supine

Palpation: Patient with knee over therapist's knee (or bolster) with leg externally rotated slightly – Gently resist adduction of the thigh to help isolate this muscle

Technique: Needle directly into this muscle either medial or lateral to the femoral artery

Caution: **Moderate – Femoral artery**



Figure 6.10 Needling adductor brevis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1916#oembed-1

Video 6.4 Needling adductor brevis, original video by Nadine Crocker, CC BY-NC 4.0.

CHAPTER 7: SMALL INTESTINE SINEW CHANNEL (ARM TAIYANG)

Overview: Small Intestine Sinew Channel (Arm Taiyang)

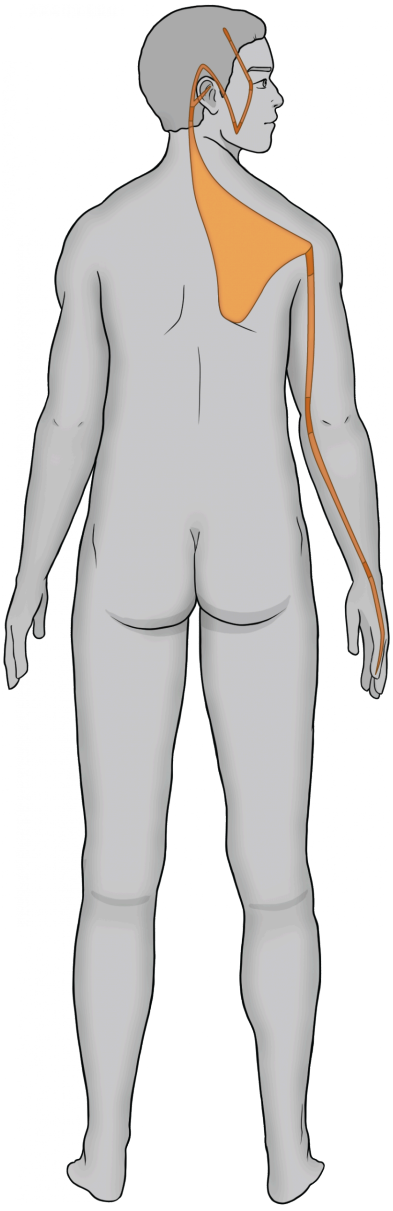


Figure 7.1 The small intestine sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Small Intestine Sinew Channel and associated anatomy

1. The Small intestine sinew channel begins on the lateral aspect of the fifth digit and travels with abductor digiti minimi to bind near SI 4. It continues up the posterior lateral aspect of the forearm with extensor carpi ulnaris, crossing the lateral aspect of the elbow between the olecranon process and the lateral epicondyle. Here it binds to the lateral epicondyle. **(Anatomy: Abductor digiti minimi, Extensor carpi ulnaris, Anconeus)**
2. The Small intestine sinew channel continues up the posterior aspect of the arm via the triceps to bind on the humerus and scapula. **(Anatomy: Triceps brachii)**
3. It then travels across the scapula with the infraspinatus and teres minor to bind to the medial aspect of the scapula. **(Anatomy: Infraspinatus, Teres minor)**
4. From the medial border of the scapula, it will travel along the fibers of the rhomboids in a cranial and medial direction to bind to the spinous process of C7-T5. A deep branch will diverge here and travel under the fibers of the rhomboids along the upper borders of the 2nd-5th rib and bind to the spinous process of C6-T2. **(Anatomy: Rhomboids)**
5. At this point, the Small intestine sinew channel will cross the midline of the body and travel to the opposite side of the occiput via the splenius cervicis and capitis on the other side. **(Anatomy: Splenius cervicis, Splenius capitis)**
6. This channel will finish by traveling around the ear and through the auricular muscles and to the corner of the eye. **(Anatomy: Posterior, superior, and anterior auricular muscle)**

1. Abductor Digiti Minimi

Origin: Piriformis

Insertion: Medial side of the base of the 5th proximal phalanx

Action: Abducts the 5th digit

Innervation: Deep branch of the ulnar nerve (C8/**T1**)

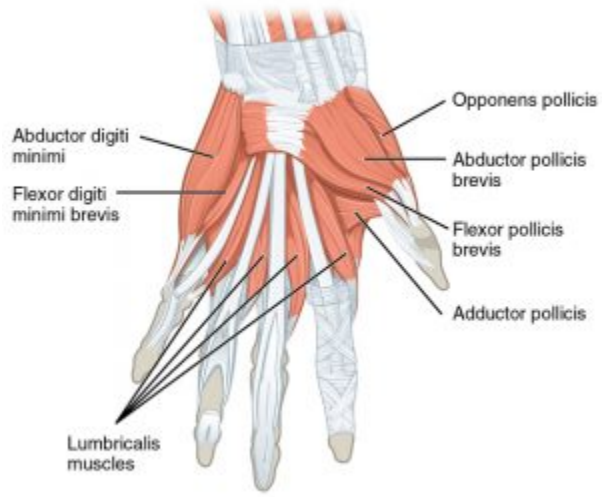


Figure 7.2 Abductor digiti minimi, by CFCF, CC BY-SA 4.0.

Needling

Position: Supine or sitting

Palpation: Medial side of hand

Technique: Directly towards the 5th metacarpal

Caution: Low

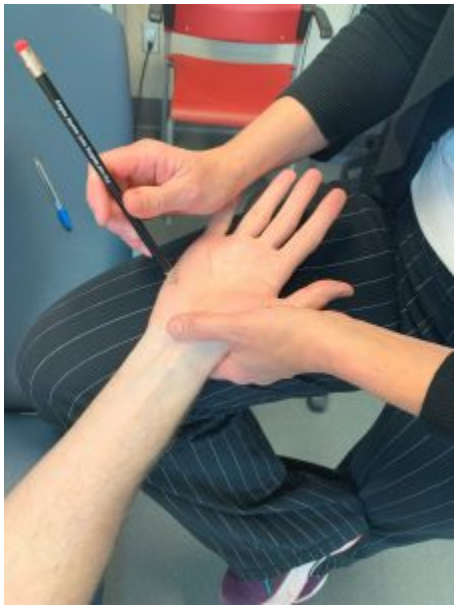


Figure 7.3 Needling abductor digiti minimi, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1923#oembed-1

Video 7.1 Needling abductor digiti minimi, original video by Nadine Crocker, CC BY-NC 4.0.

2. Extensor Carpi Ulnaris

Origin: Lateral epicondyle of the humerus and posterior aspect of the ulna

Insertion: Base of the 5th metacarpal

Action:

- Wrist extension
- Ulnar deviation or wrist

Innervation: Posterior interosseous nerve (C7/C8) – a branch off the radial nerve

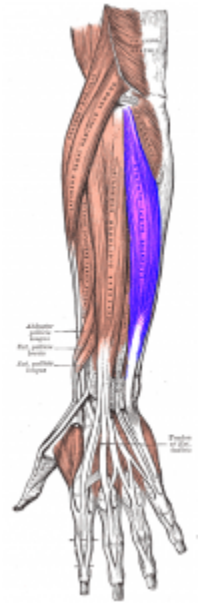


Figure 7.4 Extensor carpi ulnaris, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (prone, supine, sitting) with arm pronated to make extensor carpi ulnaris easier to access

Palpation: Dorsal ulnar border of wrist – Resist wrist extension and ulnar deviation to isolate the muscle

Technique: Perpendicular directly towards posterior border of ulna

Caution: Low

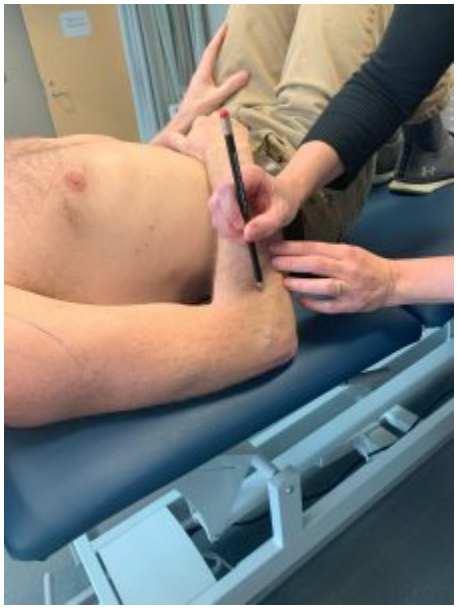


Figure 7.5 Needling of extensor carpi ulnaris, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 7.2 Needling flexor carpi ulnaris, original video by Nadine Crocker, CC BY-NC 4.0.

3. Anconeus

Origin: Lateral epicondyle of the humerus

Insertion: Lateral aspect of the olecranon process and the superior proximal aspect of the posterior ulna

Action:

- Assists with elbow extension
- Stabilizes the elbow during pronation and supination
- Prevents impingement of the elbow capsule during extension by pulling the capsule out of the joint

Innervation: Radial nerve (C5-T1)

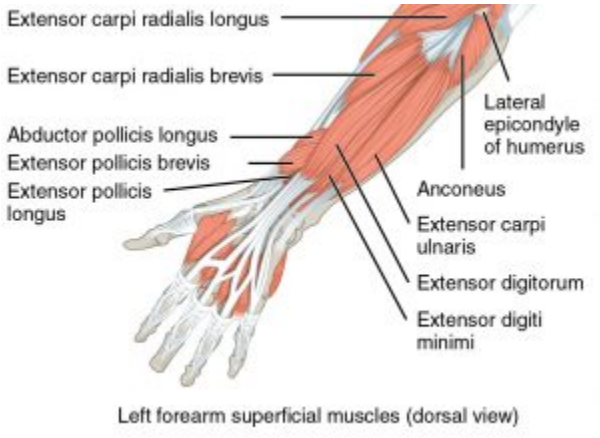


Figure 7.6 Anconeus, adapted from the original image Figure 11.25: Muscles that move the forearm, in "Anatomy and Physiology" by OpenStax, CC BY 4.0.

Needling

Position: Prone or supine

Palpation: Palpate the lateral epicondyle of the humerus and the olecranon process

Technique: Needle perpendicularly towards the posterior aspect of the ulna or lateral epicondyle of the humerus with the arm off the edge of the bed in prone or with the arm flexed in supine

Caution: Low



Figure 7.7 Needling anconeus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1929#oembed-1

Video 7.3 Needling anconeus, original video by Nadine Crocker, CC BY-NC 4.0.

4. Triceps Brachii

Origin:

- Long head: Infraglenoid tubercle of the scapula
- Lateral head: Posterior aspect of the humerus just above the radial groove
- Medial head: Posterior aspect of the humerus just below the radial groove

Insertion: Olecranon process of the ulna

Action:

- Extends the forearm
- Extends the humerus
- Long head – assists in adduction of the humerus

Innervation: Radial nerve (C6/7/8) innervates all portions of the triceps

Note: Variation does exist and in some cases, the medial head gets innervation from the ulnar nerve and the long head by the axillary nerve

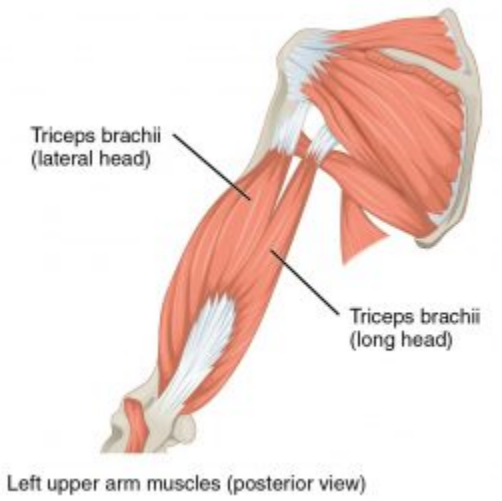


Figure 7.8 Triceps, adapted from the original image Figure 11.25: Muscles that move the forearm, in Anatomy and Physiology by OpenStax, CC BY 4.0.

Needling

Position: Variable – prone, supine, side-lying

Palpation: Hard to miss, just inferior to the deltoid on the posterior aspect of the humerus

Technique: Grasp the muscle and needle medial to lateral (or vice versa) threading through the muscle belly

Caution: **Low – caution of the ulna nerve when targeting the medial head of the triceps – caution of the radial nerve between the long and medial head of the triceps**



Figure 7.9 Needling triceps brachii, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1931#oembed-1

Video 7.4 Needling triceps brachii, original video by Nadine Crocker, CC BY-NC 4.0.

5. Infraspinatus

Origin: Infraspinatus fossa of the scapula

Insertion: Middle facet of the glenoid tubercle on the humerus

Action: External rotation of the humerus

Innervation: Suprascapular nerve (C5/6)

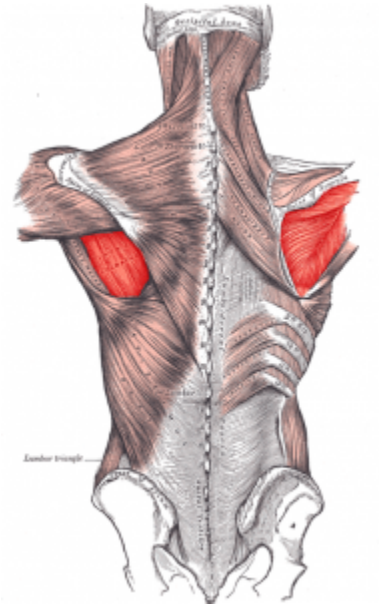


Figure 7.10 Infraspinatus, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Inferior to the scapular spine and within the borders of the scapula

Technique:

1. Perpendicular into the infraspinatus using the scapula as a bony backdrop

2. Thread the needle through infraspinatus

   Note: Banding is most common just under the scapular spine and towards the muscle tendon junction

   Caution: **Low – approximately 0.8-5.4% of the population has foramen in the body of the scapula due to incomplete ossification – Safest place to needle is just below the scapular spine**

   (McCutcheon, L., & Yelland, M. (2011). Iatrogenic pneumothorax: Safety concerns when using acupuncture or dry needling in the thoracic region. *Physical Therapy Reviews*, *16*(2), 126–132. https://doi.org/10.1179/1743288X11Y.0000000012)
   (Patel et al. (1985). Scapula foramina. *Skeletal Radiology*, 14, 270–275.)

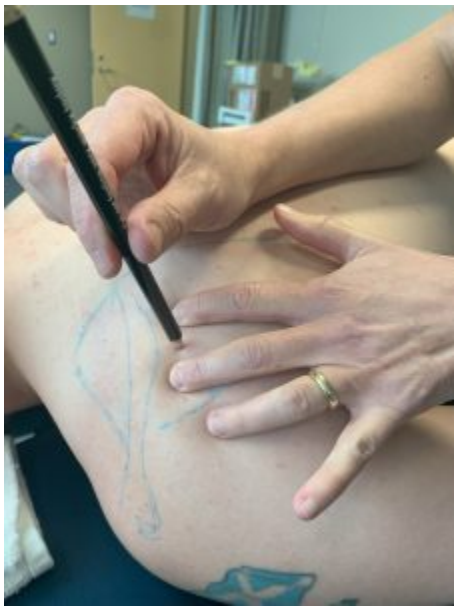


Figure 7.11 Needling infraspinatus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1933#oembed-1

Video 7.5 Needling infraspinatus, original video by Nadine Crocker, CC BY-NC 4.0.

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Video 7.6 Needling infraspinatus, original video by Nadine Crocker, CC BY-NC 4.0.

6. Teres Minor

Origin: Superior 2/3rds of the lateral posterior aspect of the scapula

Insertion: Inferior facet of the greater tubercle of the humerus

Action: External rotation of the arm

Innervation: Axillary nerve (C5/6)

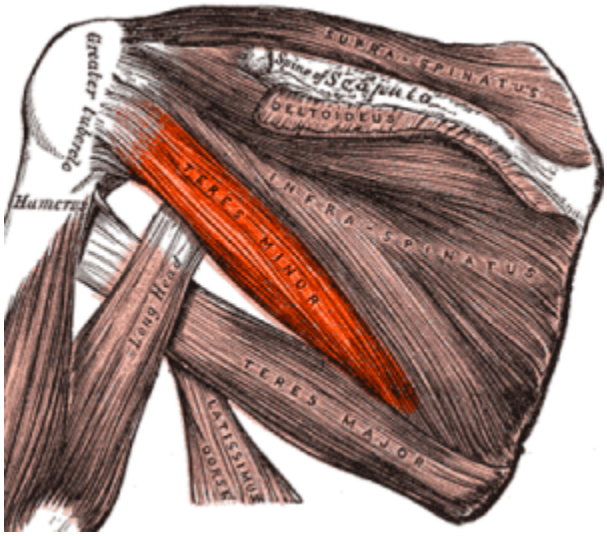


Figure 7.12 Teres minor, adapted by Michael Gasperl from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the lateral border and inferior angle of the scapula

Technique: Needling ipsilaterally or contralaterally across the body: Block the ribs by grabbing the scapula with your index finger resting against the lateral border of the scapula – Needle towards the lateral border of the scapula using it as a bony backdrop

Caution: **Moderate risk – Muscle belly is near lung field – Lung field in inferior and medial to this muscle**

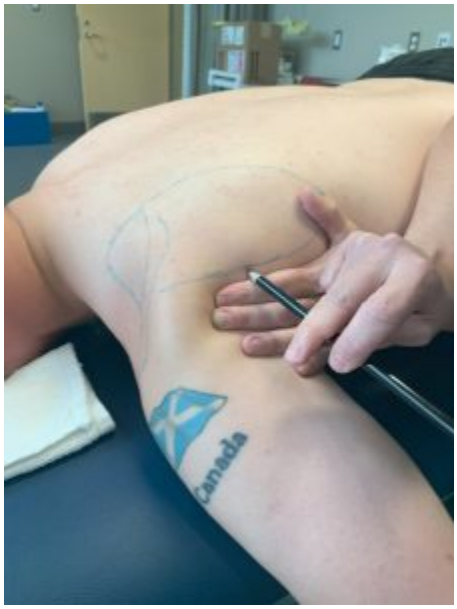


Figure 7.13 Needling teres minor 1. ipsilaterally and 2. contralaterally, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1935#oembed-1

Video 7.7 Needling teres minor ipsilaterally, original video by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1935#oembed-2

Video 7.8 Needling teres minor contralaterally, original video by Nadine Crocker, CC BY-NC 4.0.

7. Rhomboids Major & Minor

Origin:

Minor: SP of C7/T1 and lower portion of ligamentum nuchae

Major: SP of T2-T5

Insertion: Medial border of the scapular spine (slightly on the anterior surface) from the scapular spine to the inferior angle

Action:

- Scapular retraction
- Scapular elevation
- Inferior rotation of the scapula
- Stabilizes the scapula on the thoracic cage

Innervation: Dorsal scapular nerve (C4/**C5**)

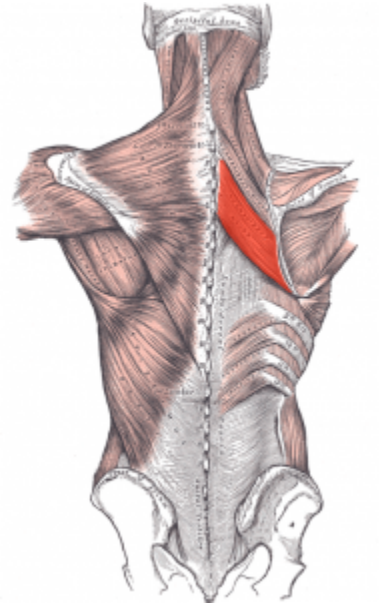


Figure 7.14 Rhomboids, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position:

1. Prone with arm behind back
2. Side lying on same side – Slightly rotate the patient forward if needed

Palpation: Palpate medial border of scapula – Encourage as much scapular winging as possible

Technique: Needle directly towards medial border of scapula hooking fingers around medial border when possible – Use medial scapular border as a backdrop for needling

Caution:**High – easy to slide under scapula – Lung field directly under scapula**

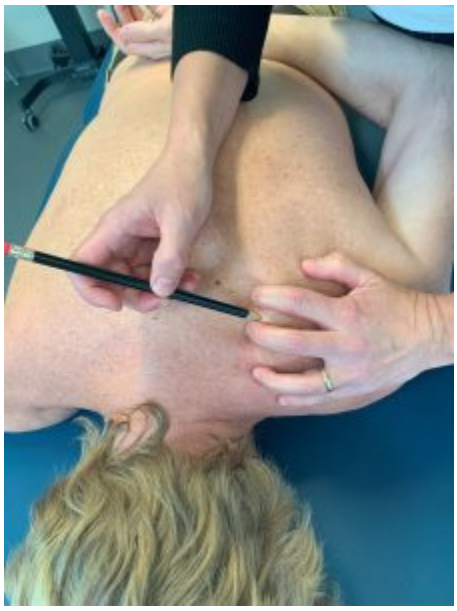


Figure 7.15 Needling rhomboids, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1937#oembed-1

Video 7.9 Needling rhomboids, original video by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1937#oembed-2

Video 7.10 Needling of rhomboids, original video by Nadine Crocker, CC BY-NC 4.0.

8. Splenius Capitis

Origin: SP of C7-T3 and nuchal ligament (lower half C4-6)

Insertion: Lateral occiput and mastoid process of temporal bone

Action:

- Bilaterally extends the head and neck
- Unilaterally side flexes and rotates the head and neck ipsilateral

Innervation: Posterior ramus of C3/C4

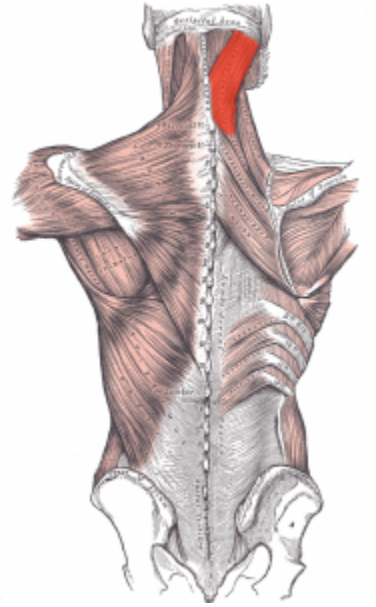


Figure 7.16 Splenius capitis, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate occiput, mastoid process and SP of C7-T3

Technique:

1. Needle directly on the lateral aspect of the occiput and mastoid process using these bones as bony backdrops
2. Needle within 1 finger breath of C7-T3 laterally in the lamina groove

Caution: **Moderate**

- **Avoid needling inferior to occiput and mastoid process (danger of needling vertebral artery) and more than 1 finger breath lateral to spinus process (lung field)**



Figure 7.17 Needling splenius capitis/ cervicis at origin, original image by Nadine Crocker, CC BY-NC 4.0.

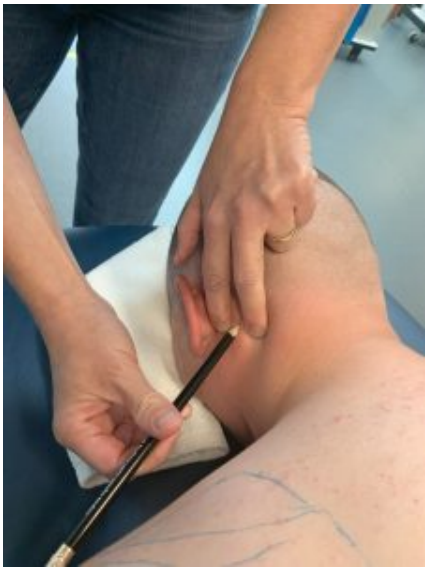


Figure 7.18 Needling of splenius capitis at insertion, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1939#oembed-1

Video 7.11 Needling splenius capitis, original video by Nadine Crocker, CC BY-NC 4.0.

9. Splenius Cervicis

Origin: SP of T3-T6

Insertion: TVP of C1-C3

Action:

- Bilaterally extends the head and neck
- Unilaterally side flexes and rotates to the same side

Innervation: Posterior rami of lower cervical nerves

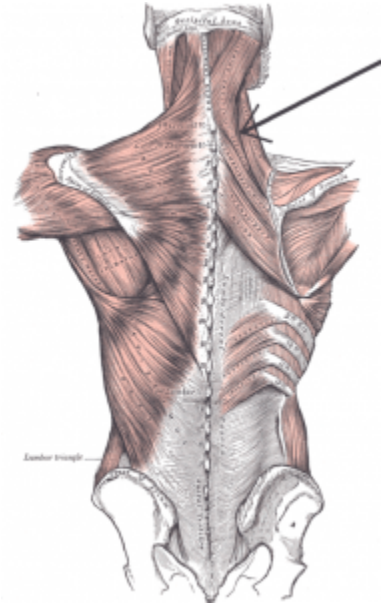


Figure 7.19 Splenius cervicis, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the SP of T3-6

Technique: Needle perpendicular to the SP of T3-6 within 1 finger breath laterally using the lamina groove as a bony backdrop

Caution: **Moderate – lung field is lateral to lamina groove**



Figure 7.20 Needling splenius capitis/ cervicis at origin, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1941#oembed-1

Video 7.12 Needling splenius cervicis, original video by Nadine Crocker, CC BY-NC 4.0.

These muscles are not needled

CHAPTER 8: TRIPLE ENERGIZER/SAN JIAO (ARM SHAOYANG)

Overview: Triple Energizer/San Jiao (Arm Shaoyang)

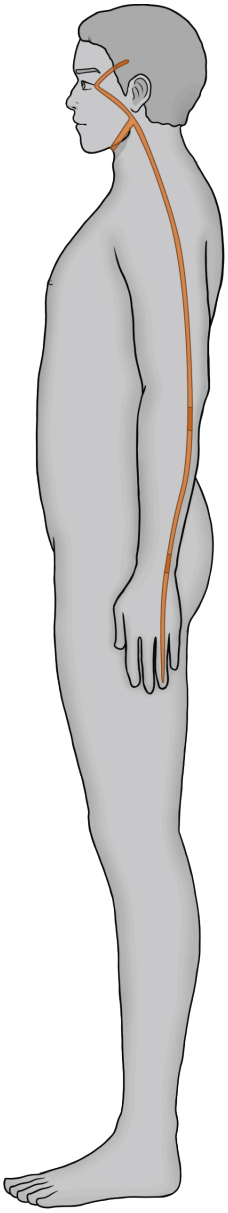


Figure 8.1 Triple energizer sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0 .

The San Jiao Sinew Channel and associated anatomy

1. The San Jiao sinew channel begins on the dorsum of the hand, spanning a space between the radial aspect of the 5th finger and the ulnar aspect of the 2nd finger. **(Anatomy: Tendons of the extensor digitorum communis and the dorsal interosseous muscles)**
2. It travels up the dorsal aspect of the forearm to bind to the lateral epicondyle. **(Anatomy: Extensor digitorum communis)**
3. From the lateral epicondyle, it travels up the lateral intermuscular septum to bind to the lateral tubercle of the humerus connecting with the supraspinatus tendon. **(Anatomy: Lateral intermuscular septum, Supraspinatus)**
4. From the supraspinatus, it extends up the levator scapulae to bind to the transverse processes of C1-C4 (just anterior to the arm Small Intestine sinew channel). **(Anatomy: Levator scapulae)**
5. From here, it travels posterior to the mandible to the insertion of the pterygoids, attaching to the temporal bone. **(Anatomy: Lateral and medial pterygoids)**

1. Dorsal Interossei

Origin: Adjacent sides of two metacarpals

Insertion: Extensor expansion and bases of proximal phalanges of digit 2-4

Action:

1. Abducts fingers from midline
2. Acts with lumbricals to flex metacarpophalangeal joints and extends interphalangeal joints

Innervation: Deep branch of ulnar nerve (C8/T1)

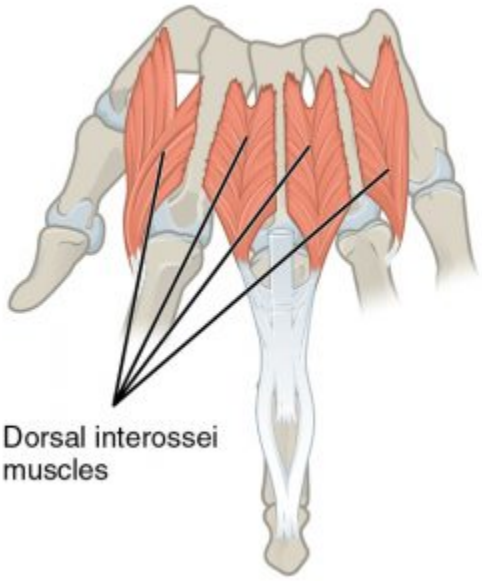


Figure 8.2 Dorsal interossei, by CFCF, CC BY-SA 4.0.

Needling

Position: Various (sitting, prone, supine) with forearm pronated

Palpation: Palpate metacarpals

Technique: Needle perpendicular between the metacarpals – can aim for the sides of the metacarpals

Caution: **Low – caution with interdigital nerve**



Figure 8.3 Needling dorsal interossei, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1949#oembed-1

Video 8.1 Needling dorsal interossei, original video by Nadine Crocker, CC BY-NC 4.0.

2. Extensor Digitorum Communis

Origin: Lateral epicondyle of the humerus

Insertion: Extensor expansion of the digit 1-5 (bases of the distal and middle phalanx)

Action: Extension of digit 1-4 and of the wrist

Innervation: Posterior interosseous nerve (**C7**/C8) – branch of the radial nerve

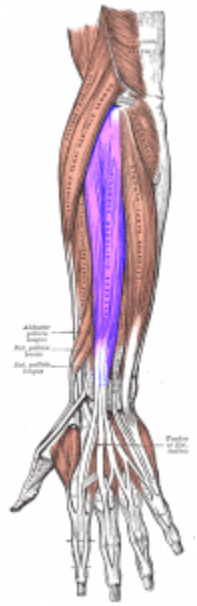


Figure 8.4 Extensor digitorum communis, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (supine, prone, sitting) with arm pronated to access extensor digitorum communis

Palpation: Palpate the lateral epicondyle – Resist wrist/finger extension to isolate muscle

Technique: Needle perpendicular

Caution: Low



Figure 8.5 Needling extensor digitorum communis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1952#oembed-1

Video 8.2 Needling extensor digitorum communis, original video by Nadine Crocker, CC BY-NC 4.0.

3. Supraspinatus

Origin: Supraspinatus fossa of scapula

Insertion: Superior facet on greater tuberosity of humerus

Action:

1. Initiates abduction
2. Assists in stabilization of humerus in glenoid – Assists with depression of humerus

Innervation: Suprascapular nerve (C4/5/6)



Figure 8.6 Supraspinatus, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone

Palpation: Palpate the spine of the scapula and hook fingers up and over it

Technique: Needle directly down between fingers in an inferior direction aiming for the suprascapular fossa

Caution: **Moderate – ensure you have located the scapular spine and not the superior border of the scapula**

Supraspinatus foramen have been reported in literature

(McCutcheon, L., & Yelland, M. (2011). Iatrogenic pneumothorax: safety concerns when using acupuncture or dry needling in the thoracic region. *Physical Therapy Reviews*, *16*(2), 126–132. https://doi.org/10.1179/1743288X11Y.0000000012)

(Patel et al. (1985). Scapula foramina. *Skeletal Radiology*, 14, 270–275.)



Figure 8.7 Needling supraspinatus, original image by Nadine Crocker, CC BY-NC 4.0.

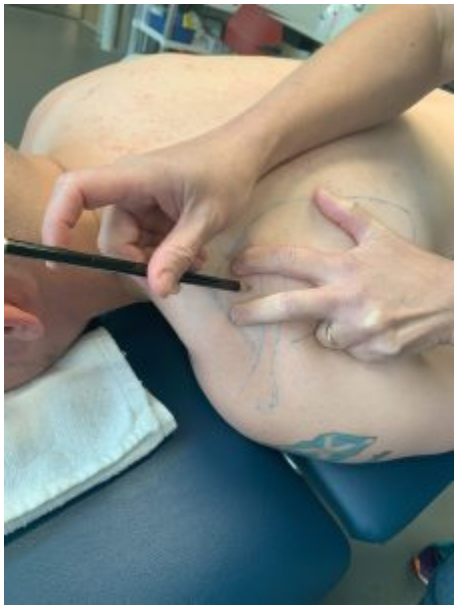


Figure 8.8 Needling supraspinatus, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 8.3 Needling supraspinatus, original video by Nadine Crocker, CC BY-NC 4.0.

4. Levator Scapulae

Origin: Posterior tubercles of transverse process of C1-C4

Insertion: Medial scapular angle

Action:

1. Elevates the scapula
2. Inferiorly rotates the scapula

Innervation: Dorsal Scapular nerve (C3-5)

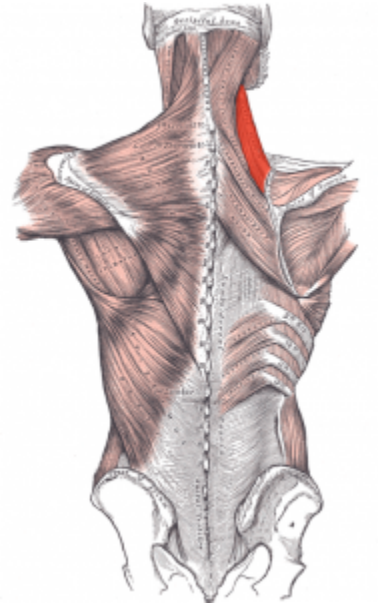


Figure 8.9 Levator scapulae, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone with arm behind back if possible

Palpation: Palpate the medial angle of the scapula – Can possibly pick up levator scapulae as well

Technique:

1. Pick up the bulk of this muscle and needle in a cranial direction (similar to trapezius)
2. Make a bracket of your fingers around the medial angle of the scapula

Caution:**High – Lung field is right under this muscle**

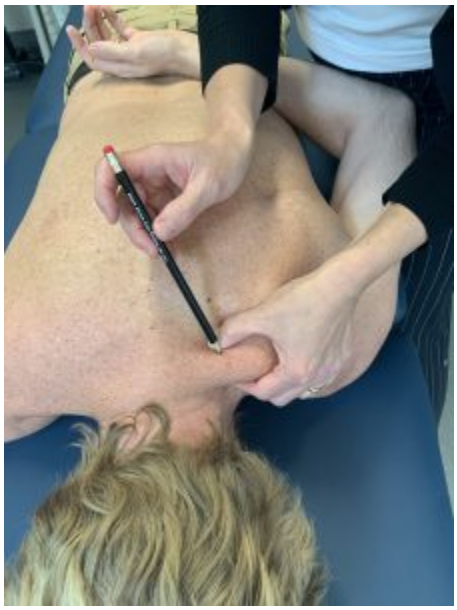


Figure 8.10 Needling levator scapulae 1. mid-belly 2. at insertion, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 8.4 Needling levator scapulae mid-belly, original video by Nadine Crocker, CC BY-NC 4.0.

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Video 8.5 Needling levator scapulae origin, original video by Nadine Crocker, CC BY-NC 4.0.

5. Lateral Pterygoid

Origin:

1. Superior head: Infratemporal surface of sphenoid bone
2. Inferior head: Lateral pterygoid plate (temporal bone)

Insertion: Neck of the mandible, articular disc, and capsule of the temporomandibular joint

Action:

1. Bilaterally, they protrude the mandible and depress the chin
2. Unilaterally, they produce lateral deviation of the jaw

Innervation: Lateral pterygoid nerve via the mandibular nerve via the trigeminal nerve (CN V)

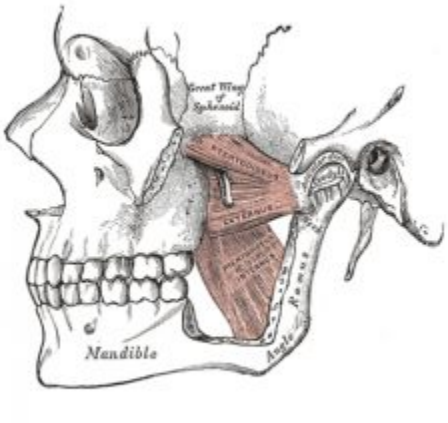


Figure 8.11 Lateral pterygoid, by Henry Gray and Henry Vandyke Carter (Public domain).

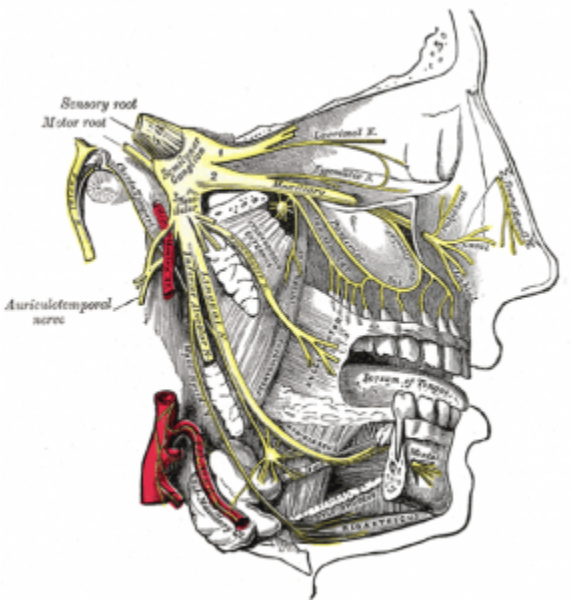


Figure 8.12 Trigeminal nerve, by Henry Gray and Henry Vandyke Carter (Public domain).

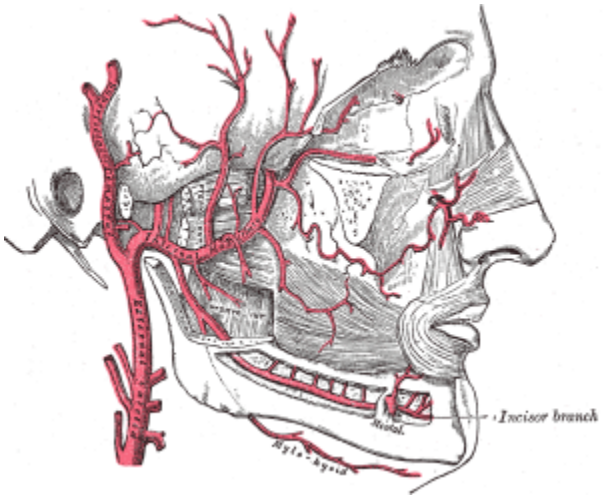


Figure 8.13 Blood supply, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine (often with the head turned to the side)

Palpation: Palpate the zygomatic arch and the hollow just inferior to it and anterior to the tragus (Stomach 7)

Technique: Directly perpendicular

Caution: Moderate



Figure 8.14 Needling lateral pterygoid, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 8.15 Needling lateral pterygoid, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1958#oembed-1

Video 8.6 Needling lateral pterygoid, original video by Nadine Crocker, CC BY-NC 4.0.

CHAPTER 9: LARGE INTESTINE SINEW CHANNEL (ARM YANGMING)

Overview: Large Intestine Sinew Channel (Arm Yangming)

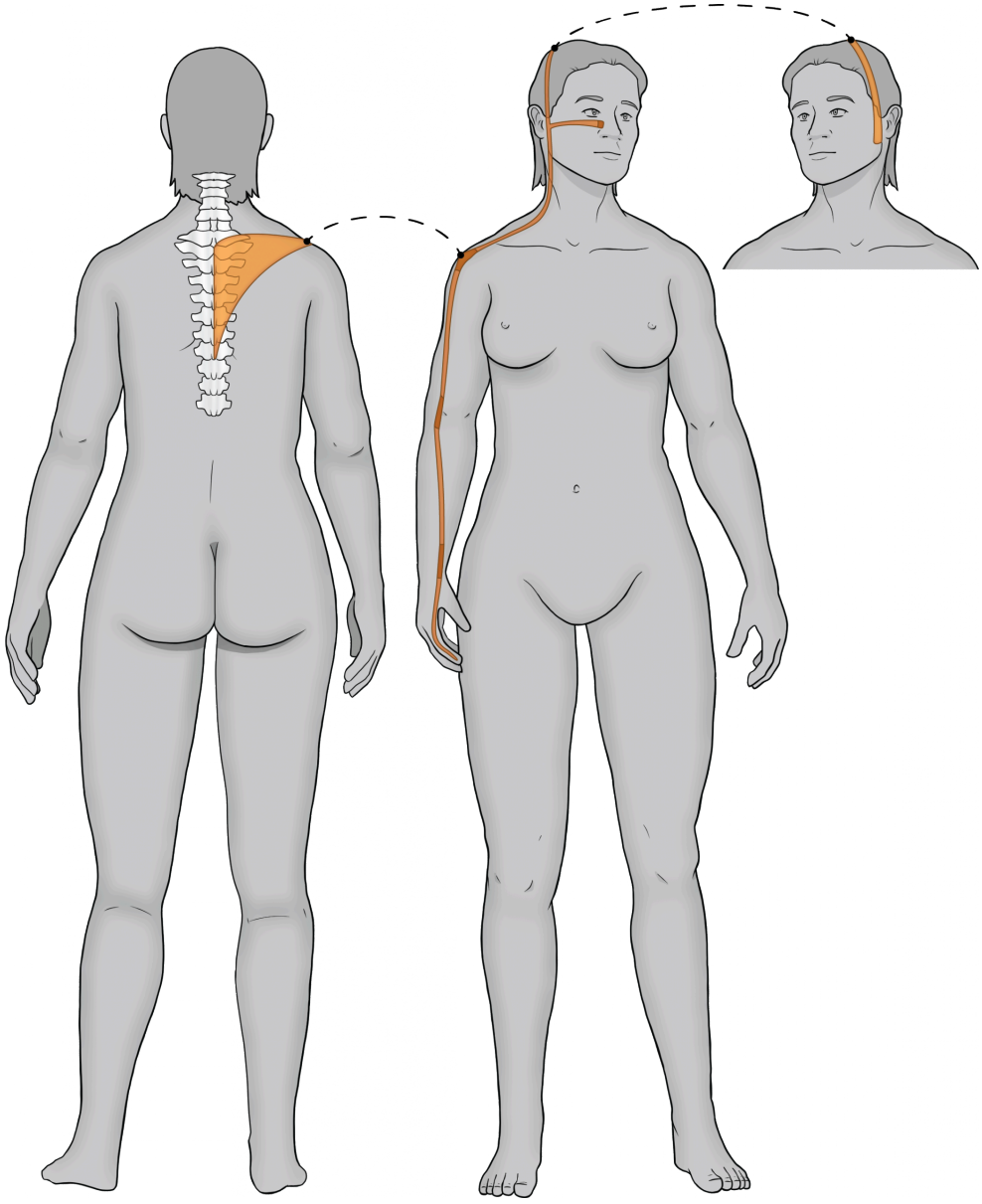


Figure 9.1 Large intestine sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Large Intestine Sinew Channel and associated anatomy

1. The Large Intestine sinew channel begins on the dorsal aspect of the index finger and between the radial side of the index finger and the thumb. This includes the muscles of the snuff box that pass over the main branch and attach as separate branches onto the radius and ulna. **(Anatomy: Extensor pollicis brevis,**

Abductor pollicis longus extensor, Extensor pollicis longus)

2. The main branch begins as the first dorsal interosseous muscle and binds to the wrist. It then continues up the forearm as the "mobile wad of three" (extensor carpi radialis brevis, extensor carpi radialis longus, and brachioradialis) binding to the lateral epicondyle and supracondylar ridge. **(Anatomy: First dorsal interossei, Extensor carpi radialis brevis, Extensor carpi radialis longus, Brachioradialis)**
3. This sinew channel then travels up the intermuscular septum (with the Sanjiao sinew channel) to the insertion of the deltoid and through the deltoid to attach at the shoulder. **(Anatomy: Deltoid)**
4. It then continues up the trapezius to attach to the spine and occiput. **(Anatomy: Trapezius)**
5. A branch will deviate from the shoulder and travel up the front of the neck and attach in the cheek. **(Anatomy: Platysma)**
6. A final branch lies deep to this as the scalenes attach to the upper cervical vertebrae. **(Anatomy: Scalenes)**

1. Extensor Pollicis Brevis

Origin: Posterior surface of the ulna, radius, and interosseous membrane

Insertion: Base of proximal phalanx of the thumb

Action: Extends the thumb at the carpometacarpal joint

Innervation: Posterior interosseous nerve (C7/**C8**)

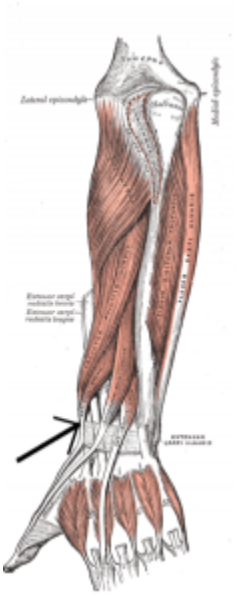


Figure 9.2
Extensor pollicis brevis
, adapted by Engusz from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (sitting, supine, prone) but with arm pronated

Palpation: Palpate approximately the middle 1/3 of the dorsal aspect of the forearm – Isolate muscle by asking patent to extend thumb

Technique: Needle perpendicular between radius and ulna

Caution: Low



Figure 9.3 Needling extensor pollicis brevis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1964#oembed-1

Video 9.1 Needling extensor pollicis brevis, original video by Nadine Crocker, CC BY-NC 4.0.

2. Abductor Pollicis Longus

Origin: Posterior surface of the ulna, radius, and interosseous membrane

Insertion: Base of first metacarpal

Action:

- Abducts the thumb
- Extends the thumb at the carpometacarpal joint

Innervation: Posterior interosseous nerve (C7/**C8**)

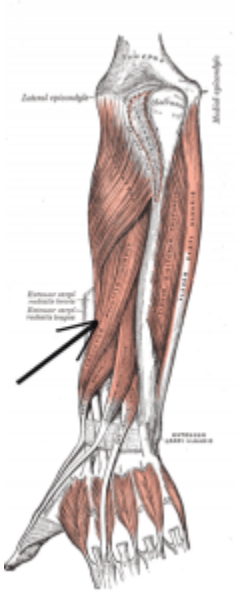


Figure 9.4
Abductor pollicis longus
, adapted by Engusz from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (sitting, supine, prone) but with arm pronated

Palpation: Palpate approximately the middle 1/3 of the dorsal aspect of the forearm – Isolate muscle by asking patient to abduct and extend thumb

Technique: Needle perpendicular between radius and ulna

Caution: Low



Figure 9.5 Needling abductor pollicis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1966#oembed-1

Video 9.2 Needling abductor pollicis longus, original video by Nadine Crocker, CC BY-NC 4.0.

3. Extensor Pollicis Longus

Origin: Posterior surface of the ulna, radius, and interosseous membrane

Insertion: Base of distal phalanx of the thumb

Action: Extends the distal phalanx of the thumb at the metacarpophalangeal joint and interphalangeal joint

Innervation: Posterior interosseous nerve (C7/**C8**)

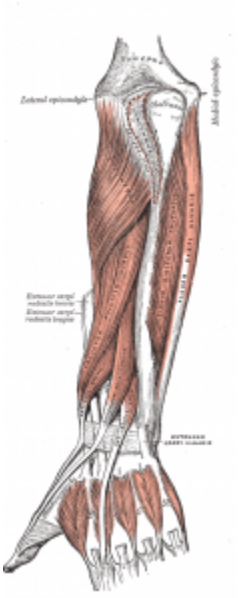


Figure 9.6
Extensor pollicis longus
, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (sitting, supine, prone) but with arm pronated

Palpation: Palpate approximately the middle 1/3 of the dorsal aspect of the forearm – Isolate muscle by asking patient to extend thumb

Technique: Needle perpendicular between radius and ulna

Caution: Low



Figure 9.7 Needling extensor pollicis longus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1968#oembed-1

Video 9.3 Needling extensor pollicis longus, original video by Nadine Crocker, CC BY-NC 4.0.

4. First Dorsal Interossei

Origin: Adjacent sides of metacarpals 1 and 2

Insertion: Extensor expansion and base of proximal phalanges of digit 2

Action: Abducts digit 1

Innervation: Deep branch of ulnar nerve (C8/**T1**)

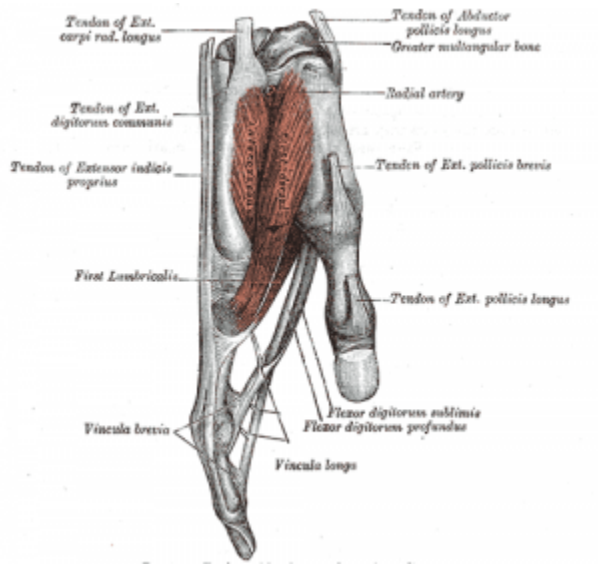


Figure 9.8 First dorsal interossei, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (sitting, prone, supine) with forearm pronated

Palpation: Palpate the 1st web space – typically banding is located close to the metacarpals

Technique:

- Needle through the muscle belly
- Needle towards the metacarpals

Caution: Low

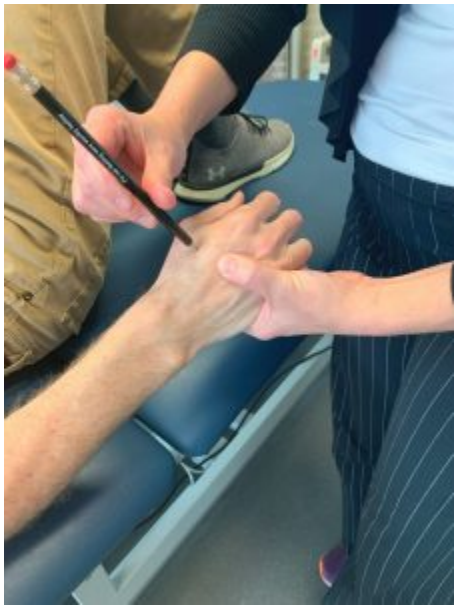


Figure 9.9 Needling the first dorsal interossei, original image by Nadine Crocker, CC BY-NC 4.0.

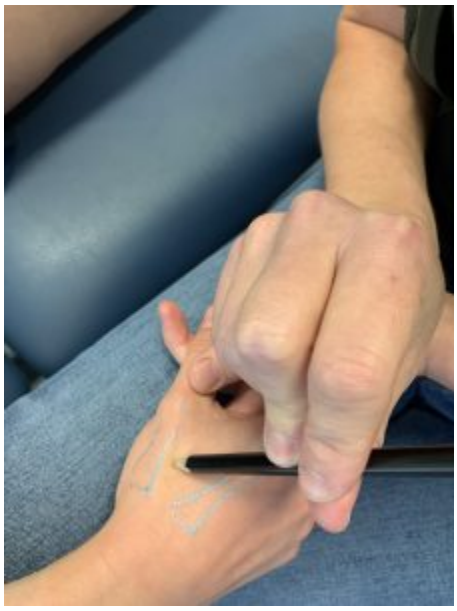


Figure 9.10 Needling the first dorsal interossei, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1970#oembed-1

Video 9.4 Needling the first dorsal interossei, original video by Nadine Crocker, CC BY-NC 4.0.

5. Extensor Carpi Radialis Longus

Origin: Lateral supracondylar ridge of the humerus

Insertion: Base of the 2nd metacarpal

Action:

- Extends the wrist
- Radially deviates the wrist

Innervation: Radial nerve (C6/7)

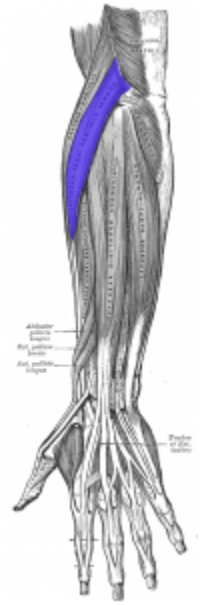


Figure 9.11 Extensor carpi radialis longus, adapted by Selket from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (prone, supine, sitting) with arm pronated

Palpation: Isolate this muscle by resisting wrist extension and radial deviation

Technique: Needle directly perpendicular to this muscle

Caution: Low

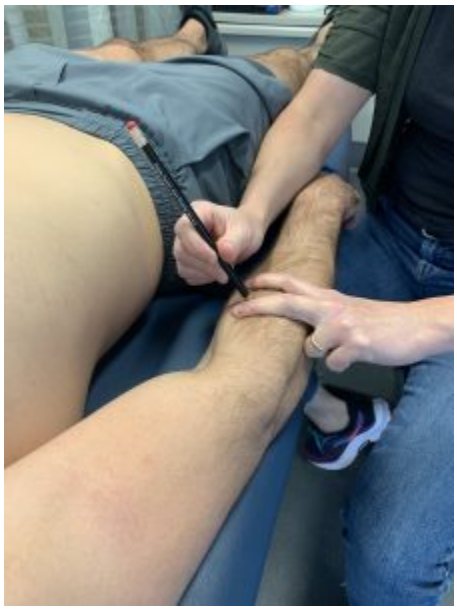


Figure 9.12 Needling extensor carpi radialis longus, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1972#oembed-1

Video 9.5 Needling extensor carpi radialis longus, original video by Nadine Crocker, CC BY-NC 4.0.

6. Extensor Carpi Radialis Brevis

Origin: Lateral epicondyle of the humerus

Insertion: Base of the 3rd metacarpal

Action:

- Extends the wrist
- Radially deviates the wrist

Innervation: Deep branch of the radial nerve (C**7**/8)

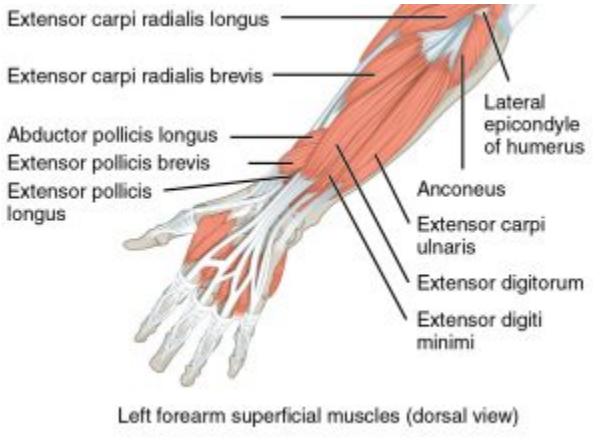


Figure 9.13 Extensor carpi radialis brevis, adapted from the original image [Figure 11.25: Muscles that move the forearm](), in "Anatomy and Physiology" by OpenStax, [CC BY 4.0]().

Needling

Position: Various (supine, prone, sitting)

Palpation: Isolate muscle by resisting wrist extension and radial deviation

Technique: Directly perpendicular to this muscle

Caution: Low



Figure 9.14 Needling extensor carpi radialis brevis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1974#oembed-1

Video 9.6 Needling extensor carpi radialis brevis, original video by Nadine Crocker, CC BY-NC 4.0.

7. Brachioradialis

Origin: Lateral supracondylar ridge of humerus (inferior 2/3)

Insertion: Lateral surface of distal radius

Action: Flexes the forearm when in mid supination

Innervation: Radial nerve (C5,**6**,7)

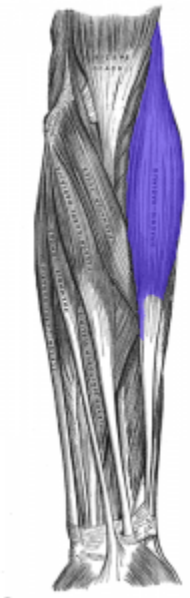


Figure 9.15 Brachioradialis, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (supine, prone, sitting) with arm pronated

Palpation: Palpate this muscle on the posterior aspect of the forearm and on the humerus as it passes the elbow

Technique: Needle perpendicular into this muscle

Caution: Low

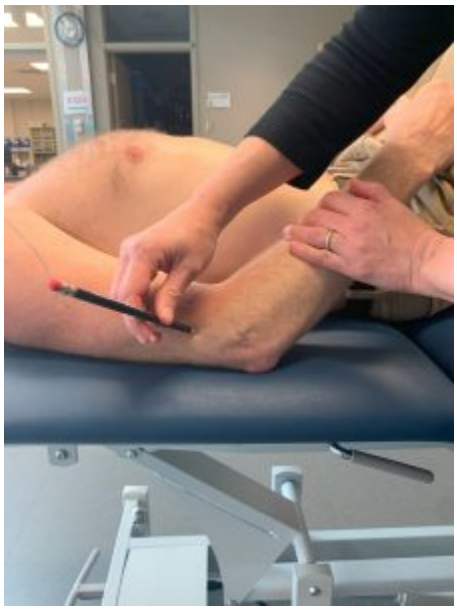


Figure 9.16 Needling brachioradialis, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 9.7 Needling brachioradialis, original video by Nadine Crocker, CC BY-NC 4.0.

8. Deltoid

Origin: Lateral 1/3 of the clavicle, acromion and spine of the scapula

Insertion: Deltoid tuberosity

Action:

- Anterior portion: flexes and medial rotates the arm
- Middle portion: abduction of the arm
- Posterior portion: extends and laterally rotates the arm

Innervation: Axillary nerve (C**5**/6)

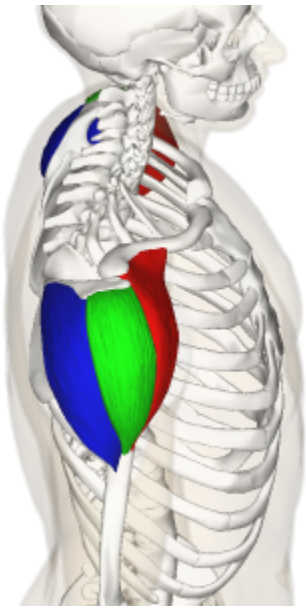


Figure 9.17 Deltoid muscle, by Anatomography, CC BY-SA 2.1 JP.

Needling

Position: Various (supine, prone, sitting)

Palpation: Palpate the deltoid tuberosity and trace the deltoid up from there, identifying the 3 different fiber directions (anterior, middle, and posterior)

Technique: Needle perpendicular towards the humerus

Caution: Low – moderate in the presence of a subdeltoid bursitis



Figure 9.18 Needling anterior deltoid, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 9.19 Needling posterior deltoid, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 9.20 Needling middle deltoid, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 9.8 Needling deltoid, original video by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1978#oembed-1

Video 9.9 Needling deltoid, original video by Nadine Crocker, CC BY-NC 4.0.

9. Trapezius

Origin: Medial 1/3 of the superior nuchal line of the occiput, external occipital protuberance, nuchal ligament, and spinous process of C7-T12 vertebrae

Insertion: Lateral 1/3 of clavicle, acromion, and the scapular spine

Action:

- Superior fibers elevate scapula
- Middle fibers retract scapula
- Inferior fibers depress scapula
- Superior and inferior fibers work together to upwardly rotate the scapula

Innervation: Spinal Accessory Nerve (Cranial nerve XI) and C3/4)

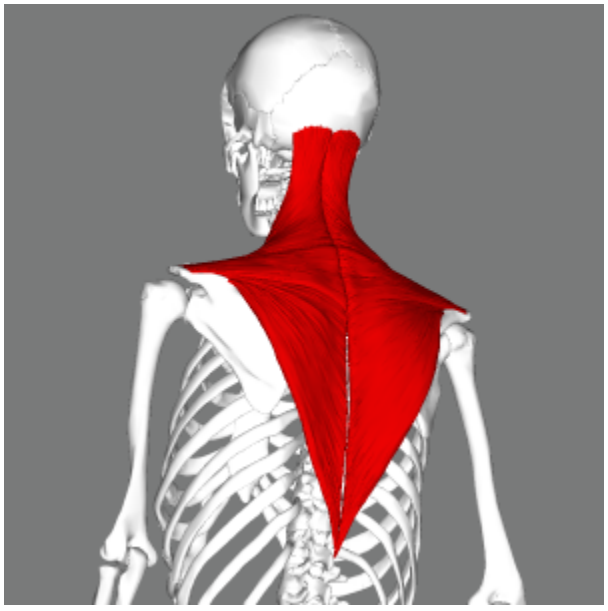


Figure 9.21 Trapezius muscle, by Anatomography, CC BY-SA 2.1 JP.

Needling

Position: Prone or supine

Palpation: Grab the upper fibers of trapezius and pick it up

Technique:

1. Prone: needle in a superior anterior direction
2. Supine: needle in a superior posterior direction

Caution: **High – apex of the lung comes above the clavicle**

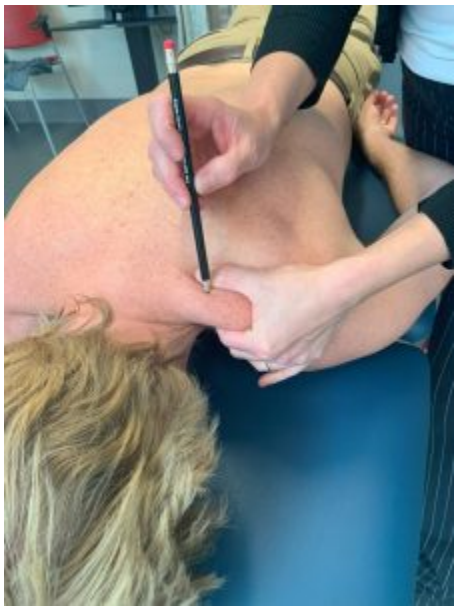


Figure 9.22 Needling trapezius from prone, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 9.23 Needling trapezius from supine, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1980#oembed-1

Video 9.10 Needling upper fibers of trapezius, original video by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1980

Video 9.11 Needling trapezius supine, original video by Nadine Crocker, CC BY-NC 4.0.

10. Scalenes

Origin:

- Anterior scalene: Anterior tubercules of TVP of C3-7
- Middle scalene: Posterior tubercules of TVP of C3-7
- Posterior scalene: Posterior tubercules of TVP of C4-6

Insertion:

- Anterior scalene: Anterior aspect of 1st rib
- Middle scalene: Superior surface of 1st rib
- Posterior scalene: External border of 2nd rib (occasionally 1st rib as well)

Action: All are accessory muscles of inspiration as they elevate the first two ribs

- Anterior scalene: Side bend and rotation ipsilaterally
- Middle scalene: Side bend and rotation ipsilaterally
- Posterior scalene: Ipsilateral side bend

Innervation:

- Anterior scalene: C5-7
- Middle scalene: C3-8
- Posterior scalene: C7-8

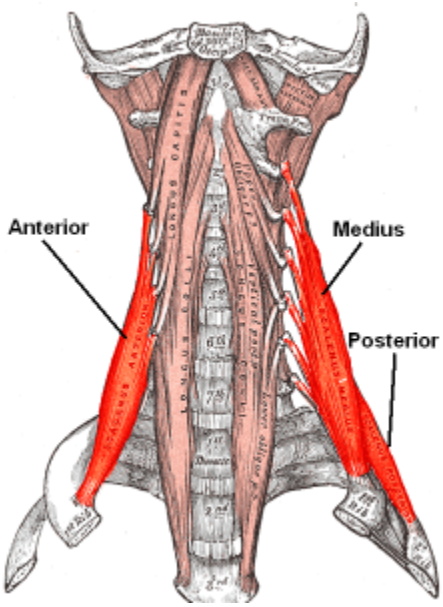


Figure 9.24 Scalenes, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

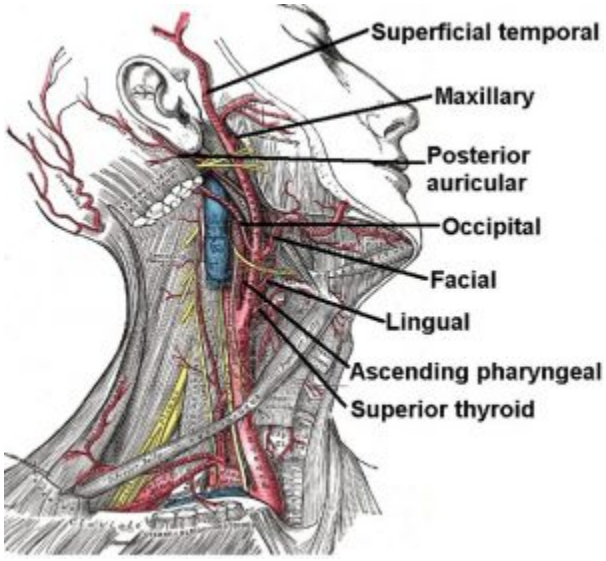


Figure 9.25 Neurovascular, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine, with head in neutral or slightly rotated to opposite side

Palpation: Palpate the posterior triangle of the neck

- Anterior border: posterior margin of the sternocleidomastoid
- Posterior border: anterior margin of the trapezius
- Inferior border: middle 1/3 of clavicle

Technique: Needle very superficially in the posterior triangle of the neck, threading the needle either in a superior-inferior direction or an inferior-superior direction

Caution: **High**

- **The external jugular vein sits very superficially at the anterior margin of this triangle – It can typically be seen, if not ask the person to hold their breath, bear down, or resist head rotation/side-flexion to make it more visible**
- **The roots of the brachial plexus exit between the anterior and middle scalene**
- **The internal jugular vein and common carotid artery lie directly underneath these muscles**

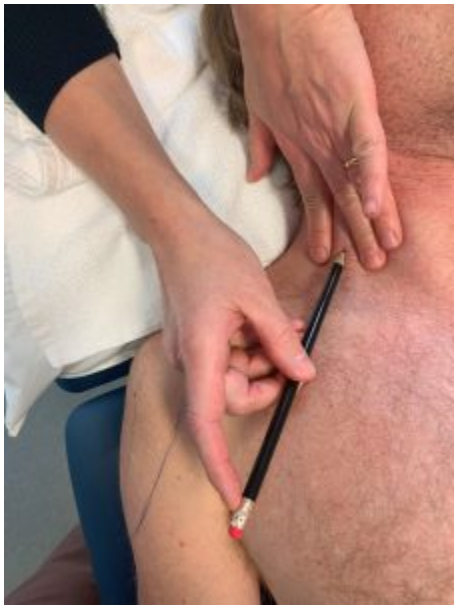


Figure 9.26 Needling scalenes, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 9.27 Needling scalenes, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1982#oembed-1

Video 9.12 Needling scalenes, original video by Nadine Crocker, CC BY-NC 4.0.

CHAPTER 10: LUNG SINEW CHANNEL (ARM TAIYIN)

Overview: Lung Sinew Channel (Arm Taiyin)

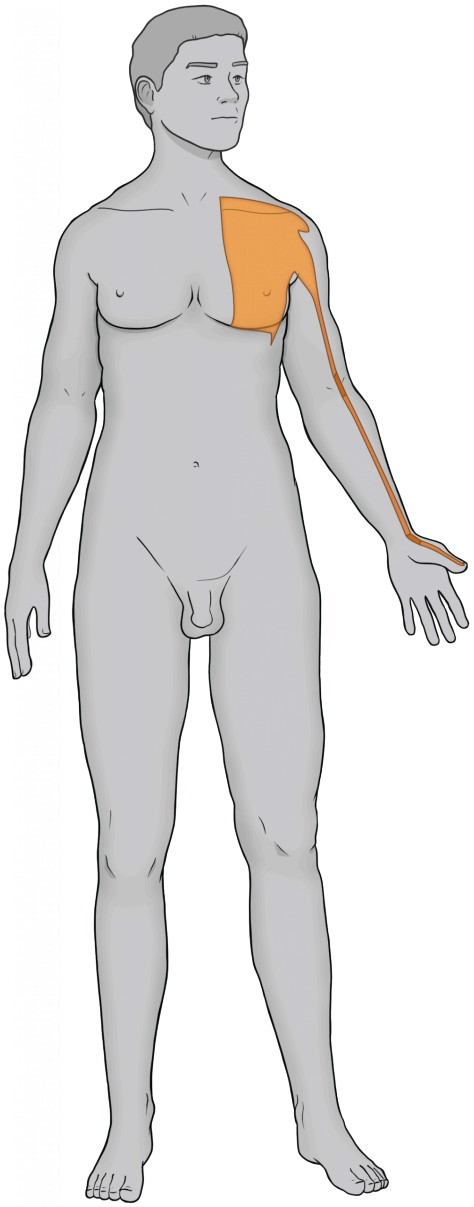


Figure 10.1 The lung sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Lung Sinew Channel and associated anatomy

1. The Lung sinew channel starts on the palmar aspect of the thumb and travels down to the base of the

wrist to attach to the base of the first metacarpal and adjacent carpal bones. It then continues up the lateral aspect of the forearm to bind in the anticubital region. **(Anatomy: Thenar muscles (Abductor pollicis brevis, Flexor pollicis brevis, Opponens pollicis), Flexor pollicis longus, Supinator)**

2. This sinew channel will then travel up the anterior aspect of the arm to bind to the two attachments of the biceps. **(Anatomy: Brachialis, Biceps brachii, Brachialis, Coracobrachialis)**
3. One branch will travel under the clavicle following the subclavian artery and vein, over the first rib, and descend to the chest and diaphragm. **(Anatomy: Subclavian artery and vein)**
4. The second branch will travel to the anterior aspect of the ribs via the subclavius and pectoralis minor. **(Anatomy: Subclavius, Pectoralis minor)**

1. Flexor Pollicis Brevis

Origin:

- Superficial head: Trapezium and flexor retinaculum
- Deep head: Trapezoid and capitate

Insertion: Proximal palmar phalanx of digit 1

Action: Flexes thumb at the metacarpophalangeal joint

Innervation:

- Superficial head: Median nerve (C8/T1)
- Deep head: Ulnar nerve (C8/T1)

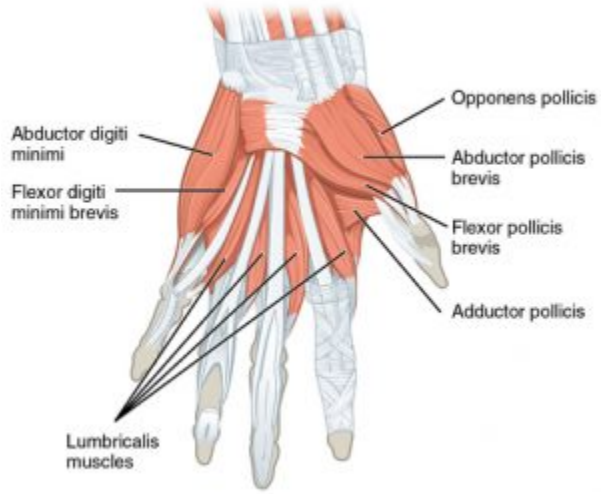


Figure 10.2 Flexor pollicis brevis, by CFCF, CC BY-SA 4.0.

Needling

Position: Various (sitting, supine)

Palpation: Palpate the thenar eminence and resist thumb flexion to help isolate this muscle

Technique: Needle perpendicular to this muscle using digit 1 metacarpal as a bony backdrop

Caution: Low



Figure 10.3 Needling flexor pollicis brevis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=1989#oembed-1

Video 10.1 Needling flexor pollicis brevis, original video by Nadine Crocker, CC BY-NC 4.0.

2. Abductor Pollicis Brevis

Origin: Scaphoid and trapezium

Insertion: Base of the palmar proximal phalanx of the thumb

Action: Abducts the thumb

Innervation: Median nerve (C8/T1)

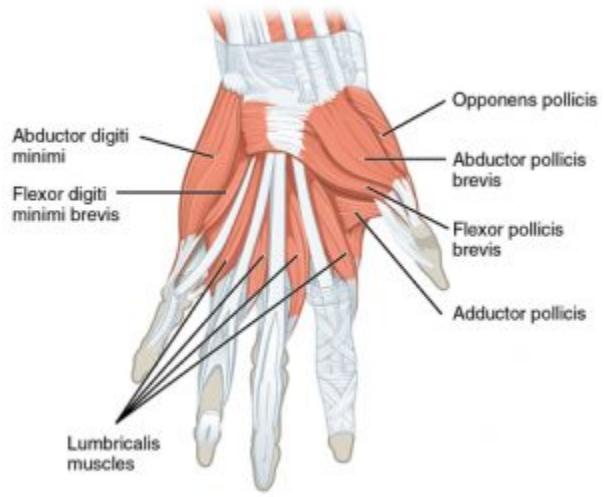


Figure 10.4 Abductor pollicis brevis, by CFCF, CC BY-SA 4.0.

Needling

Position: Various (sitting, supine)

Palpation: Palpate the thenar eminence and resist thumb abduction to help isolate this muscle

Technique: Needle perpendicular to this muscle using digit 1 metacarpal as a backdrop

Caution:Low



Figure 10.5 Needling abductor pollicis brevis, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 10.2 Needling abductor pollicis brevis, original video by Nadine Crocker, CC BY-NC 4.0.

3. Opponens Pollicis

Origin: Flexor retinaculum, scaphoid tubercle, trapezium, and tendon of abductor pollicis longus

Insertion: Radial aspect of base of digit 1 proximal phalanx

Action: Opposes thumb with digit 5

Innervation: Median nerve (C8/T1)

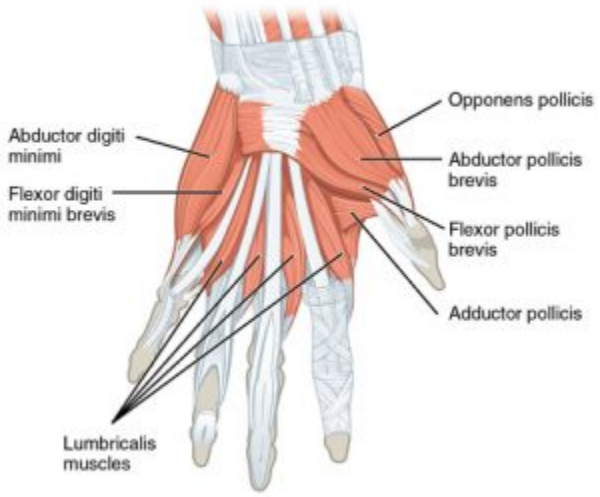


Figure 10.6 Opponens pollicis, by CFCF, CC BY-SA 4.0.

Needling

Position: Various (sitting/supine)

Palpation: Palpate the thenar eminence and resist opposition to help isolate this muscle

Technique: Needle perpendicular to this muscle using digit 1 metacarpal as a bony backdrop

Caution: Low



Figure 10.7 Needling opponens pollicis, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 10.3 Needling opponens pollicis, original video by Nadine Crocker, CC BY-NC 4.0.

4. Flexor Pollicis Longus

Origin: Middle 1/2 of anterior surface of radius and adjacent interosseous membrane

Insertion: Base of the palmar distal phalanx of digit 1

Action: Flexes distal phalanx of digit 1

Innervation: Anterior interosseous nerve – a branch of the median nerve (C8/T1)

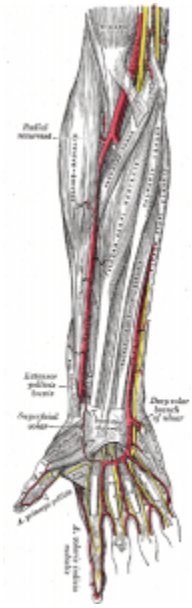


Figure 10.8 Flexor pollicis longus, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (sitting/supine)

Palpation: Palpate the anterior radial aspect of the forearm and resist thumb flexion to help isolate this muscle

Technique: Needle perpendicular to this muscle using the radius as a bony backdrop

Caution: **Low – caution of the median nerve that travels in the midline of the forearm**

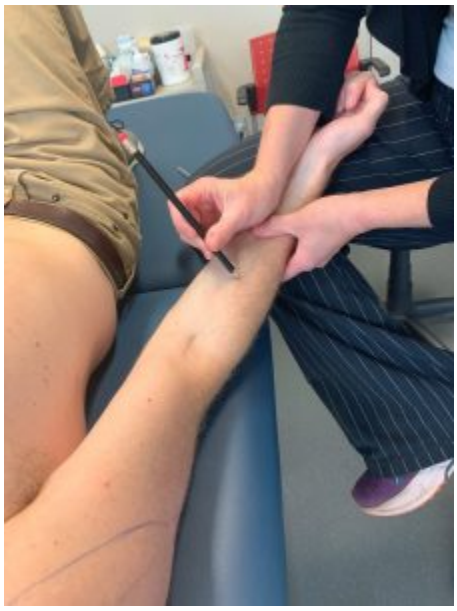


Figure 10.9 Needling flexor pollicis longus, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 10.4 Needling flexor pollicis longus, original video by Nadine Crocker, CC BY-NC 4.0.

5. Supinator

Origin:

- **Superficial head**: Lateral epicondyle of the humerus annular ligament, radial collateral ligament
- **Deep head**: Supinator crest of the ulna, annular ligament, radial collateral ligament

Insertion: Lateral proximal shaft of the radius

Action: Supinates the forearm

Innervation: Deep branch of the radial nerve (C5/6)

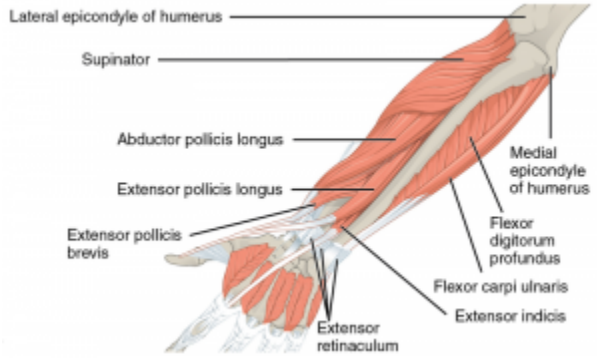


Figure 10.10 Supinator, by CFCF, CC BY-SA 4.0.

Needling

Position: Various (sitting/supine) with arm in midpronation

Palpation: Palpate the upper 1/3 of the posterior aspect of the radius and resist supination to help isolate this muscle

Technique:

- Direct – Palpate the head of the radius and the ulna next to it on the posterior aspect
  - Needle directly towards the radius using it as your bony backdrop.
  - Needle between the two bones aiming toward the supinator crest of the ulna, using the ulna as a bony backdrop
- Threading – Needle as above, but redirect the needle in an inferior-to-superior direction along

the ulna near its attachment

Caution: **Low – the posterior interosseous nerve (a branch of the radial nerve) will pass through this muscle**



Figure 10.11 Needling supinator directly, original image by Nadine Crocker, CC BY-NC 4.0.



Figure 10.12 Needling supinator threading, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 10.5 Needling supinator, original video by Nadine Crocker, CC BY-NC 4.0.

6. Brachialis

Origin: Inferior 1/2 of anterior humerus

Insertion: Coronoid process and tuberosity of the ulna

Action: Flexes the elbow

Innervation: Musculocutaneous nerve (C5/6/7) and radial nerve (C7)

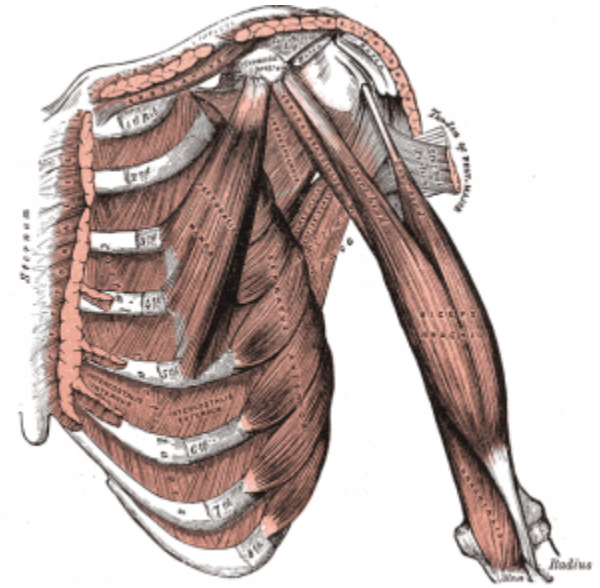


Figure 10.13 Brachialis, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine, forearm supinated

Palpation: Push the biceps medially on the lower 1/2 of the humerus and your fingers will be on brachialis

Technique: Push the biceps medial to expose the brachialis and make a bracket of your fingers on top of brachialis – Needle perpendicular to this muscle using the humerus as a bony backdrop

Caution: Moderate

Median nerve and brachial artery lie deep to biceps brachii and on top of brachialis along the medial aspect of the humerus

Radial nerve lies between brachialis and triceps laterally



Figure 10.14 Needling brachialis, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=2000#oembed-1

Video 10.6 Needling brachialis, original video by Nadine Crocker, CC BY-NC 4.0.

7. Biceps Brachii

Origin:

- Long head: supraglenoid tubercle of the scapula
- Short head: coracoid process

Insertion: Radial tuberosity and bicipital aponeurosis

Action:

- Flexes elbow
- Supinates the forearm
- Assists with shoulder flexion

Innervation: Musculocutaneous nerve (C5/6/7)

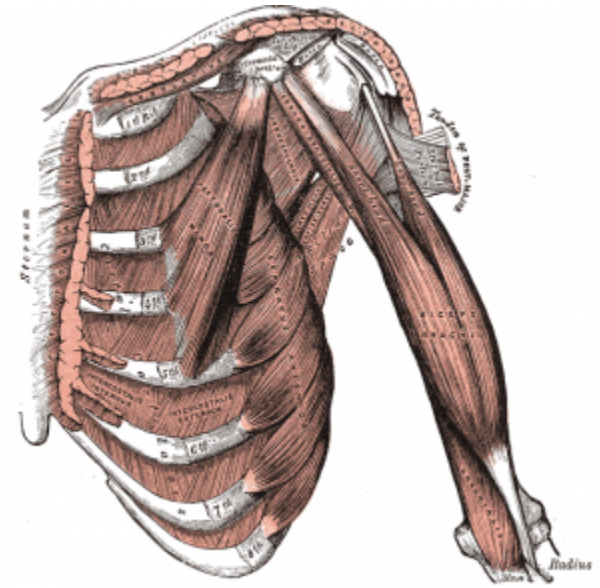


Figure 10.15 Biceps brachii, by Henry Gray and Henry Vandyke Carter (Public domain).

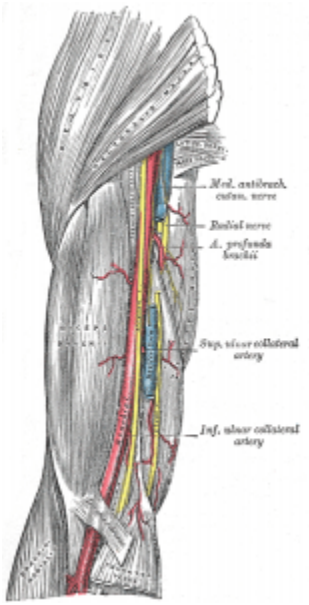


Figure 10.16 Brachial artery, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate on the anterior aspect of the upper arm and resist elbow flexion in full supination to isolate this muscle. Palpate the brachial artery to ensure you are anterior to it.

Technique: Pick up the biceps brachii in a pincher grip pulling the muscle away from the neurovascular structures and needle medial to lateral or lateral to medial into this muscle

Caution: **Moderate – the brachial artery (along with the median nerve) will pass deep to this muscle along the medial aspect of the humerus – Ensure that you are needling transversely into this muscle and not directly towards the humerus – Avoid the brachial pulse**

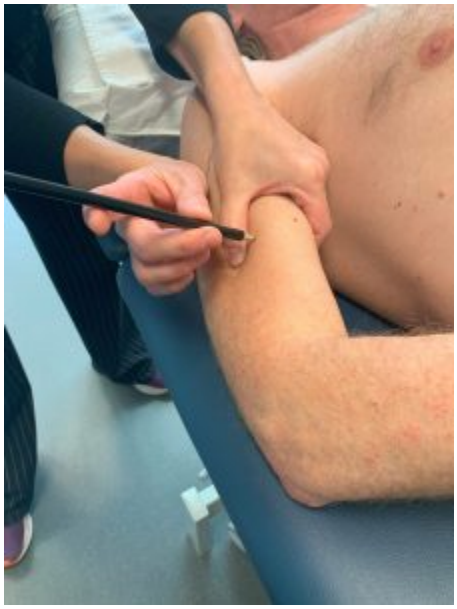


Figure 10.17 Needling biceps brachii, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=2002#oembed-1

Video 10.7 Needling biceps brachii, original video by Nadine Crocker, CC BY-NC 4.0.

8. Coracobrachialis

Origin: Coracoid process of the scapula

Insertion: Midshaft of the anterior medial aspect of the humerus, just above the origin of brachialis

Action:

- Adducts the humerus
- Flexes the humerus

Innervation: Musculocutaneous nerve (C5/6/7)

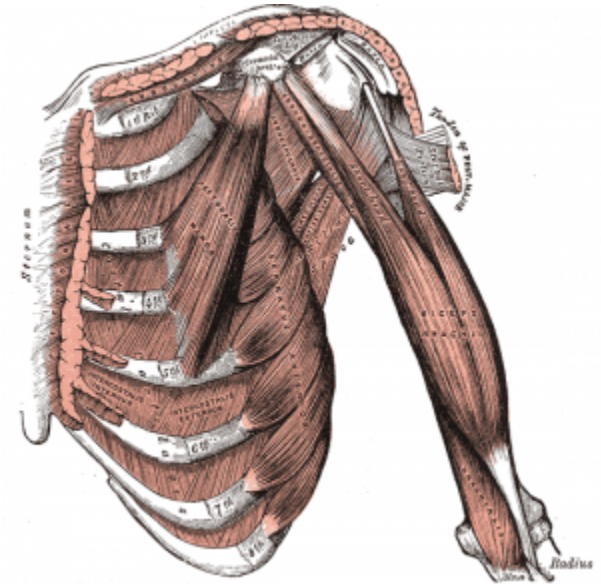


Figure 10.18 Coracobrachialis, by Henry Gray and Henry Vandyke Carter (Public domain).

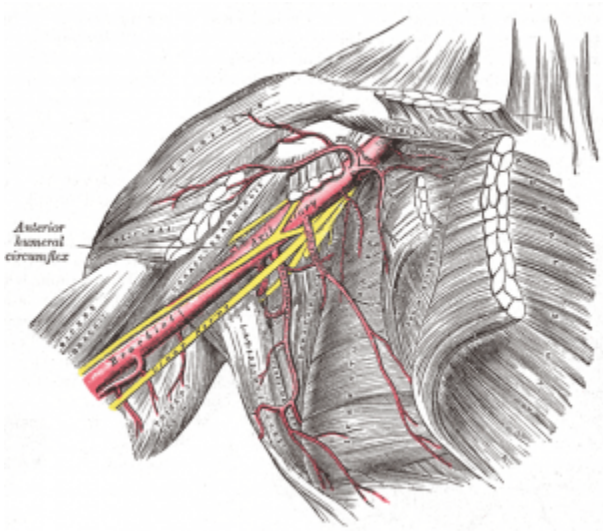


Figure 10.19 Brachial neurovascular bundle, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate the coracoid process

Technique:

1. At the coracoid directly – Bracket the coracoid process with your fingers and needle perpendicularly downwards using the coracoid process as a bony backdrop
2. Externally rotate the shoulder if possible. Needle through the muscle belly of this muscle just lateral to the axillary and brachial artery aiming towards the humerus – Needle in an anterior-to-posterior direction with a slight lateral bias

Caution: **High – the lung field lies directly medial and deep to the coracoid process and the axillary and brachial artery lie just medial to this muscle belly – Also note, the position of the patient's shoulder may alter where the lung field is in relation to the coracoid process**



Figure 10.20 Needling coracobrachialis at the coracoid process, original image by Nadine Crocker, CC BY-NC 4.0.

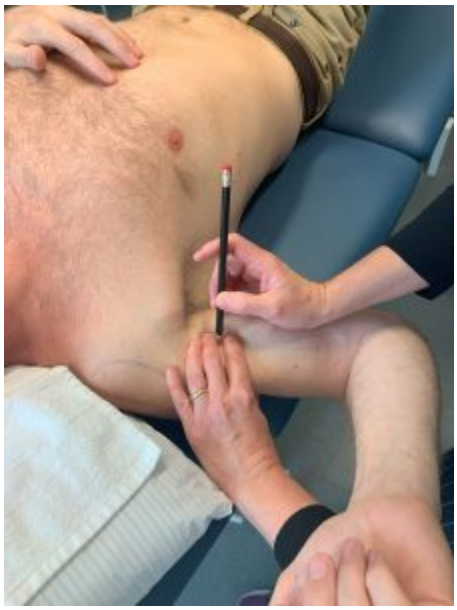


Figure 10.21 Needling coracobrachialis in the muscle belly, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=2004#oembed-1

Video 10.8 Needling coracobrachialis at the coracoid process, original video by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=2004#oembed-2

Video 10.9 Needling coracobrachialis in the muscle belly, original video by Nadine Crocker, CC BY-NC 4.0.

9. Subclavius

Origin: 1st rib at junction between rib and costal cartilage

Insertion: Groove on the inferior surface of middle 1/3 of clavicle

Action:

- Elevates 1st rib
- Depresses clavicle
- Pulls the clavicle medially to stabilize the sternoclavicular joint

Innervation: nerve to subclavius (C5/6)

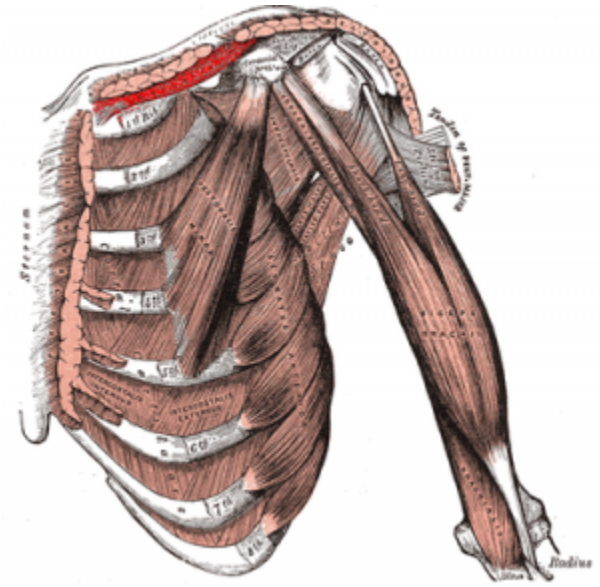


Figure 10.22 Subclavius, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate along the inferior ridge of the middle 1/3 of the clavicle

Technique: Standing at the head of the patient, make a bracket of your fingers on the inferior

ridge of the clavicle – Needle between your fingers in an inferior-to-superior direction using the clavicle as a bony backdrop

Caution:**High – lung field is below this muscle – Ensure that you are not needling under the clavicle – Your needle should almost immediately hit the clavicle; if not, withdraw your needle**



Figure 10.23 Needling subclavius, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=2006#oembed-1

Video 10.10 Needling subclavius, original video by Nadine Crocker, CC BY-NC 4.0.

10. Pectoralis Minor

Origin: Anterior surface of ribs 3-5 near their costal cartilages

Insertion: Coracoid process

Action:

- Tilts scapula anteriorly/protracts scapula
- Accessory muscle of inspiration (elevates ribs 3-5)

Innervation: Medial pectoral nerve (C8/T1)

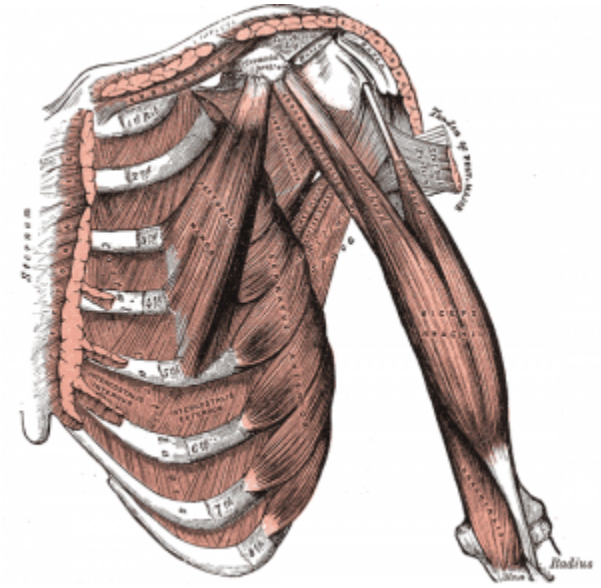


Figure 10.24 Pectoralis minor, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Palpate the coracoid process – Laterally rotate the shoulder to ensure you are on the coracoid and not the shoulder joint

Technique: Bracket the coracoid process with your fingers either medial to lateral or superior

to inferior – Needle perpendicular between your finger bracket towards the coracoid process using it as a bony backdrop

Caution:**High – lung field is directly inferior and medial to the coracoid process – Note that the position of the lung field in relation to the coracoid process may change depending on the position of the patient's shoulder**



Figure 10.25 Needling pectoralis minor, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 10.11 Needling pectoralis minor, original video by Nadine Crocker, CC BY-NC 4.0.

CHAPTER 11: PERICARDIUM SINEW CHANNEL (ARM JUEYIN)

Overview: Pericardium Sinew Channel (Arm Jueyin)

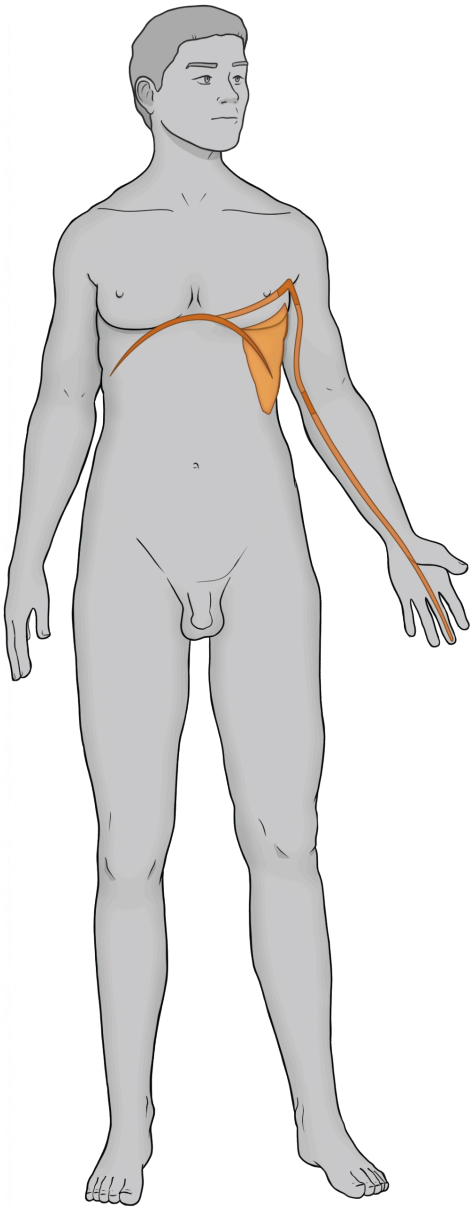


Figure 11.1 Pericardium sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Pericardium Sinew Channel and associated anatomy

1. This sinew channel begins at the base of the distal phalanges (insertion of flexor digitorum profundus)

and travels cranially up the fingers and across the palm to bind at the wrist. From here, it continues up the flexor surface of the forearm to bind at the medial epicondyle of the elbow. **(Anatomy: Flexor digitorum profundus, Flexor digitorum superficialis, Lumbricales, Palmar interossei, Palmar fascia, Palmaris longus, Pronator quadratus, Flexor carpi radialis, Pronator teres)**

2. The Pericardium sinew channel will then travel up the medial intermuscular septum to the insertion of the teres major, latissimus dorsi, and subscapularis. **(Anatomy: Teres major, Serratus anterior, Latissimus dorsi, Subscapularis)**
3. The sinew channel then divides into three branches:

    - The first branch travels with the subscapularis and the teres major to insert on the scapula, then continues with the serratus anterior to wrap around the ribcage.
    - The second branch travels with the latissimus dorsi to insert into the thoracolumbar fascia.
    - The third branch travels with the Lung sinew channel to penetrate the thoracic cavity.

1. Palmar Interossei

Origin: Ulnar side of 2nd metacarpal, radial side of metacarpals 4 and 5

Insertion:

- 1st – ulnar base of the proximal phalanx/extensor expansion of digit 2
- 2nd and 3rd – Radial base of proximal phalanges/extensor expansion of digits 4-5

Action: Adduct the fingers towards midline

Innervation: Deep branch of the ulnar nerve (C8/T1)

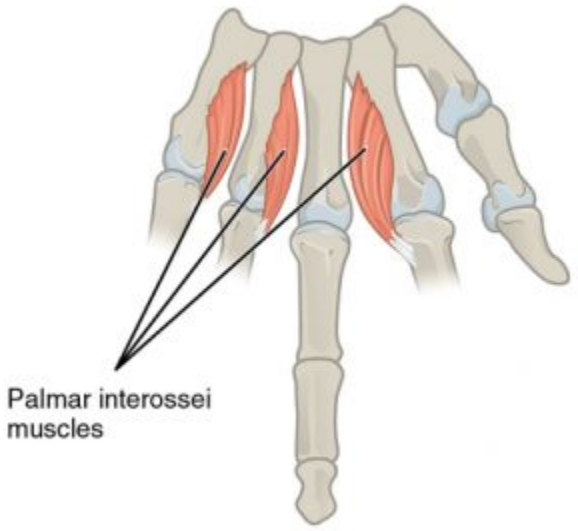


Figure 11.2 Palmar interossei, by CFCF, CC BY-SA 4.0.

Needling

Position: Various (sitting, supine, prone) with arm supinated

Palpation: Palpate between the metacarpals

Technique: Needle between the metacarpals using the medial aspect of the metacarpal 2, 4, and 5 as a bony backdrop

Caution: **Low – interdigital nerves vulnerable when needling these muscles**



Figure 11.3 Needling palmar interossei, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=2016#oembed-1

Video 11.1 Needling palmar interossei original video by Nadine Crocker, CC BY-NC 4.0.

2. Lumbricals

Origin: The tendons of flexor digitorum profundus

Insertion: Extensor expansion near the metacarpophalangeal joint

Action: Flexion of the metacarpophalangeal and extension of the interphalangeal joints

Innervation:

- First two lumbricals – Median nerve (C8/T1)
- Third and fourth lumbricals – Ulnar nerve (C8/T1)

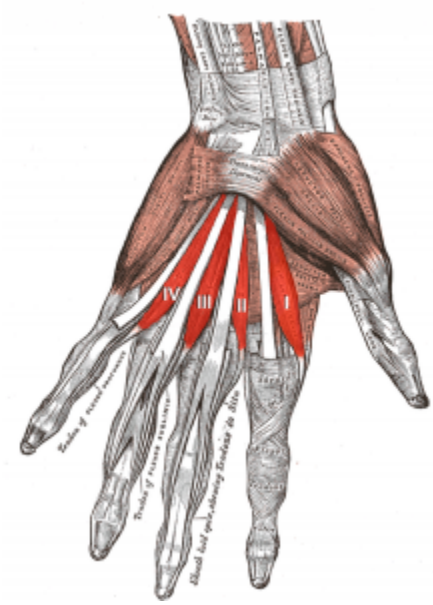


Figure 11.4 Lumbricals, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (supine/prone or sitting) with arm supinated

Palpation: Palpate between the metacarpals

Technique: Needle between the metacarpals approximately ½-1 cun deep

Caution: **Low – interdigital nerves are vulnerable when needling these muscles**



Figure 11.5 Needling lumbricals, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=2018#oembed-1

Video 11.2 Needling lumbricals, original video by Nadine Crocker, CC BY-NC 4.0.

3. Flexor Digitorum Profundus

Origin: Upper 3/4ths of the anterior and medial aspect of the ulna and adjacent interosseous membrane

Insertion: Palmar aspect of the base of digits 2-5 distal phalanx

Action: Flexes the fingers (specifically the distal interphalangeal joint

Innervation: Median nerve (C8/T1)



Figure 11.6 Flexor digitorum profundus, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine or sitting with arm supinated

Palpation: Palpate the anterior forearm and resist finger flexion

Technique: Needle perpendicular to this muscle using the ulna as a bony backdrop if needed

Caution: Low



Figure 11.7 Needling flexor digitorum profundus, original image by Nadine Crocker, CC BY-NC 4.0.

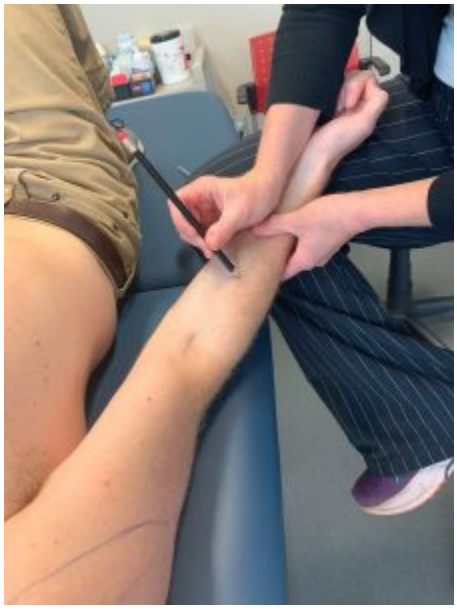


Figure 11.8 Needling flexor digitorum profundus, original image by Nadine Crocker, CC BY-NC 4.0.



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Video 11.3 Needling flexor digitorum profundus, original video by Nadine Crocker, CC BY-NC 4.0.

4. Flexor Digitorum Superficialis

Origin:

- Humeroulnar head: Medial epicondyle of the humerus and coronoid process of ulna
- Radial head: Proximal half of the anterior radius

Insertion: Sides of the middle phalanges of D2-5

Action: Flexes the fingers (specifically the proximal interphalangeal joint

Innervation: Median nerve (C7/8/T1)

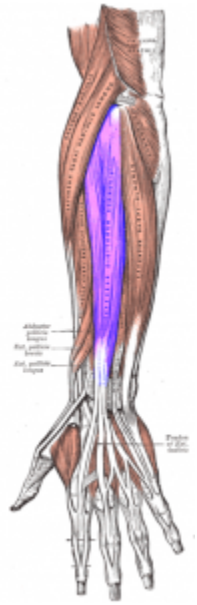


Figure 11.9 Flexor digitorum superficialis, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine or sitting with arm supinated

Palpation: Palpate the anterior forearm and resist finger flexion

Technique: Needle perpendicular to this muscle using the ulna as a bony backdrop if needed

Caution: Low

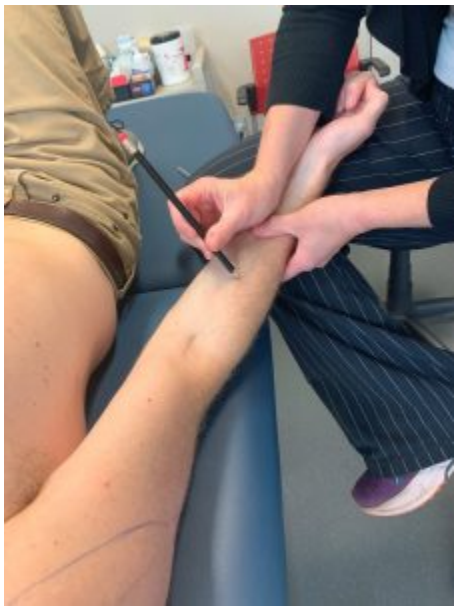


Figure 11.10 Needling flexor digitorum superficialis, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 11.4 Needling flexor digitorum superficialis, original video by Nadine Crocker, CC BY-NC 4.0.

5. Pronator Quadratus

Origin: Distal anterior surface of the ulna

Insertion: Distal anterior surface of the radius

Action: Pronates the forearm

Innervation: Anterior interosseous nerve – a branch of the median (C7/C8)

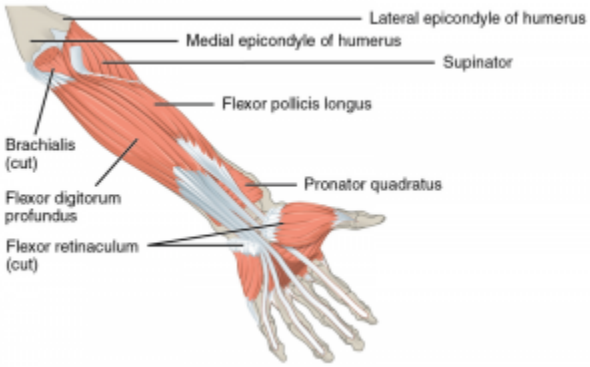


Figure 11.11 Pronator quadratus, by CFCF, CC BY-SA 4.0.

Needling – Do not needle this muscle

6. Flexor Carpi Radialis

Origin: Medial epicondyle of the humerus

Insertion: Bases of 2nd metacarpals

Action:

1. Flexes the wrist
2. Radial deviation of the wrist

Innervation: Anterior interosseous nerve – a branch of the median nerve (C7/8)

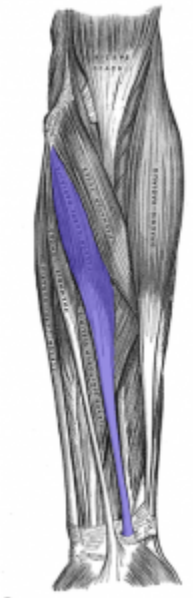


Figure 11.12 Flexor carpi radialis, adapted by Uwe Gille from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (sitting, supine, prone) with arm supinated

Palpation: Palpate the radial aspect of the anterior forearm and resist wrist flexion and radial deviation

Technique: Needle perpendicular to this muscle using the radius as a bony backdrop

Caution: Low

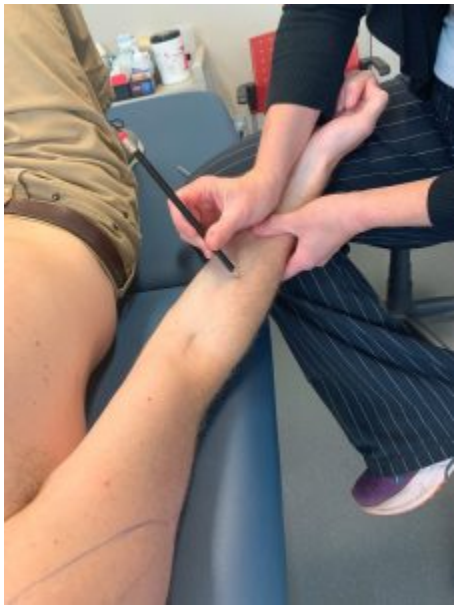


Figure 11.13 Needling flexor carpi radialis, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 11.5 Needling flexor carpi radialis, original video by Nadine Crocker, CC BY-NC 4.0.

7. Pronator Teres

Origin:

- **Humeral head**: Medial supracondylar ridge of the humerus
- **Ulnar head**: Coronoid process of the ulna

Insertion: Lateral surface of the radius just distal to the ulna

Action:

- Pronates the forearm
- Assists in flexing the elbow

Innervation: Median nerve (C6/7)

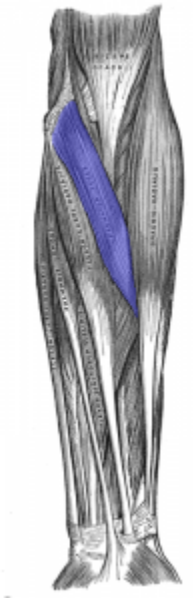


Figure 11.14 Pronator teres, adapted by Selket from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (sitting, supine, prone) with forearm supinated

Palpation: Palpate from the medial epicondyle of the humerus to the midradius and resist forearm pronation to help isolate this muscle

Technique: Needle directly into this muscle avoiding midline to avoid the brachial artery – Needle at either the insertion or origin region

Caution: **Moderate – this muscle lies directly over the brachial artery as it bifurcates into radial and ulnar arteries – The median nerve will pass through the two heads of this muscle as well**

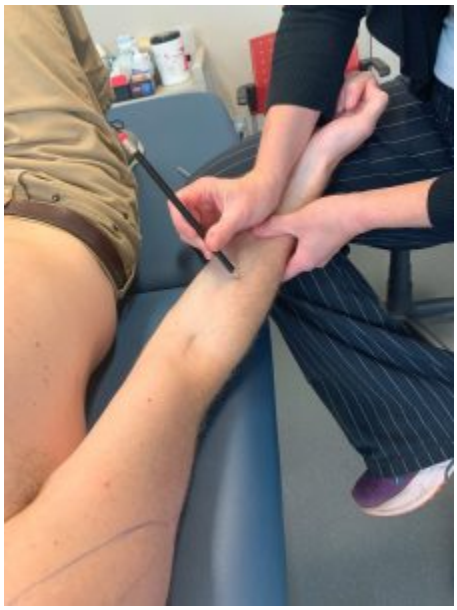


Figure 11.15 Needling pronator teres, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 11.6 Needling pronator teres, original video by Nadine Crocker, CC BY-NC 4.0.

8. Teres Major

Origin: Post surface of the inferior angle of the scapula

Insertion: Medial lip of the intertubercular sulcus on the anterior aspect of the humerus

Action:

- Medial rotation of the shoulder
- Assists with shoulder extension

Innervation: Inferior subscapular nerve (C5/6/7)

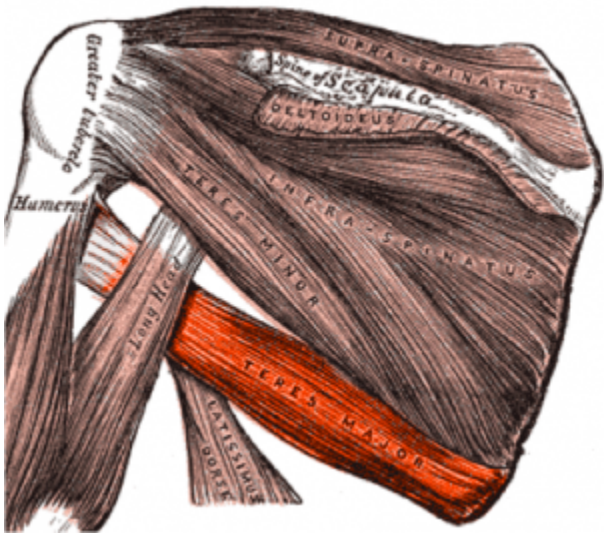


Figure 11.16 Teres major, adapted by Michael Gasperl from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone with the arm resting in 90 degrees abduction

Palpation: Palpate the inferior angle of the scapula and move up the lateral border to palpate this muscle – Gently resist shoulder medial rotation to help isolate this muscle

Technique:

1. On the same side of the body: Either block the ribs with your hand and needle above your

finger onto the lateral border of the scapula or grab the teres major in a pincher grip and needle in an anterolateral direction

2. From the opposite side of the body: Reach across and make a bracket on the lateral scapular border – Needle directly towards the lateral border of the scapula, ensuring that the needle contacts the lateral border and does not dive beneath the scapula

Caution: **Moderate-High: the lung field is directly below this muscle in an anteromedial direction**

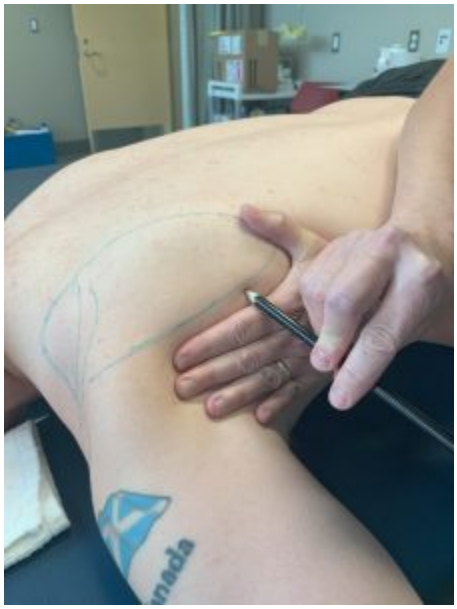


Figure 11.17 Needling teres major from the same side, original image by Nadine Crocker, CC BY-NC 4.0.

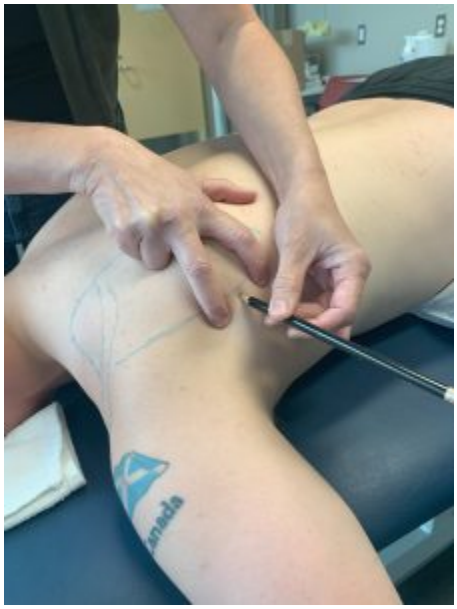


Figure 11.18 Needling teres major from the opposite side of the body, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 11.7 Needling teres major, original video by Nadine Crocker, CC BY-NC 4.0.

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Video 11.8 Needling teres major, original video by Nadine Crocker, CC BY-NC 4.0.

9. Latissimus Dorsi

Origin: SP of lower 6 thoracic vertebrae and related interspinous ligaments, inferior 3-4 ribs, thoracolumbar fascia, and iliac crest

Insertion: Floor of the intertubercular groove of the humerus

Action:

- Shoulder extension
- Shoulder medial rotation
- Shoulder adduction
- Raises the torso during climbing
- Role in lumbar stabilization

Innervation: Thoracodorsal nerve (C**6**/**7**/8)

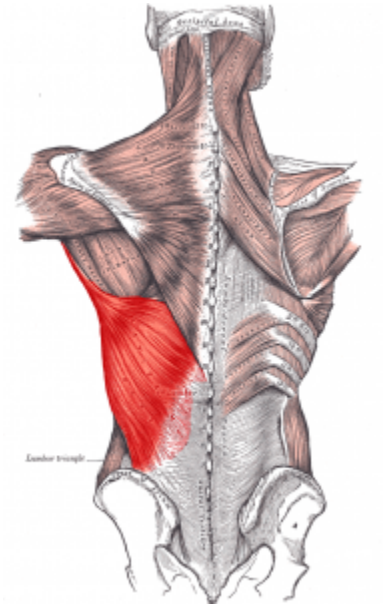


Figure 11.19 Latissimus dorsi, adapted by Mikael Häggström from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone or supine

Palpation: Palpate the bulk of this muscle in the subaxilla space when the arm is abducted

Technique: Pick up the bulk of this muscle and pull it away from the rib cage – Needle in an anterolateral direction when in prone and a posterior lateral direction when in supine

Caution: **Moderate – never needle in a medial direction due to the position of the lung field**



Figure 11.20 Needling latissimus dorsi, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 11.9 Needling latissimus dorsi, original video by Nadine Crocker, CC BY-NC 4.0.

10. Subscapularis

Origin: Medial 2/3 of subscapular fossa

Insertion: Lesser tubercle of the humerus

Action: Internal rotation of the shoulder

Innervation: Upper (C5/6/7) and Lower (C6/7) subscapular nerves

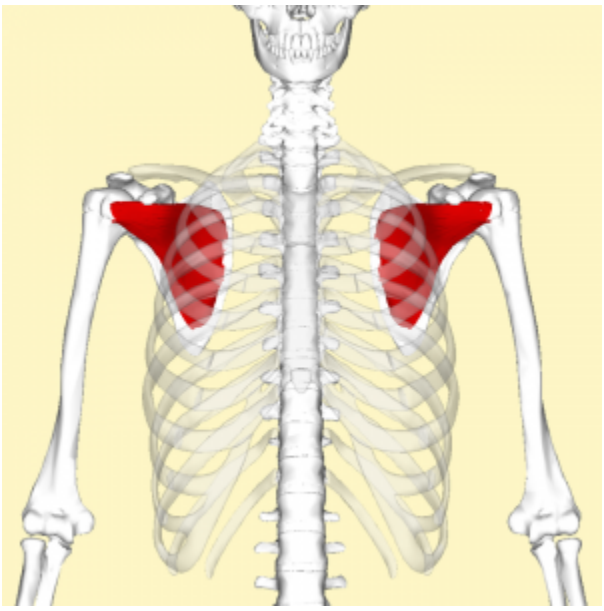


Figure 11.21 Subscapularis, by Anatomography, CC BY-SA 2.1 JP.

Needling

Position: Supine with the arm abducted to above 90 degrees – If possible, have the patient place their hand on their forehead to help expose this muscle

Palpation: Trace the ribcage down until your fingers are on the anterior surface of the scapula – Lateral to this will be the latissimus dorsi

Technique: Needle perpendicularly in an anterior-to-posterior direction using the scapula as a bony backdrop

Caution: **Moderate- lung field is located medially – Do not needle medially until you have made bony contact with the scapula**

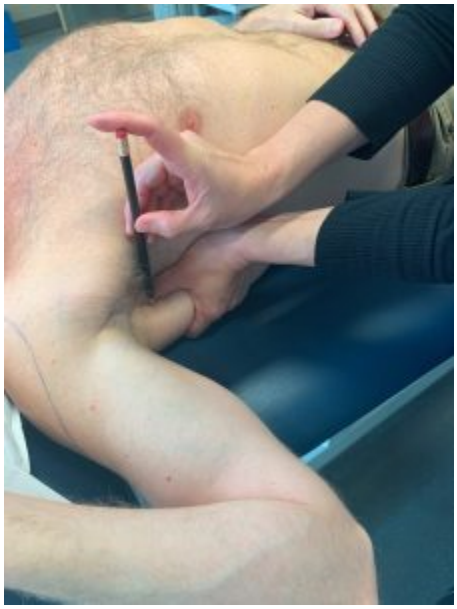


Figure 11.22 Needling subscapularis, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 11.10 Needling subscapularis, original video by Nadine Crocker, CC BY-NC 4.0.

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Video 11.11 Needling subscapularis from sidely, original video by Nadine Crocker, CC BY-NC 4.0.

11. Serratus Anterior

Origin: Lateral aspect of ribs 1-8

Insertion: Anterior surface of medial scapular border

Action:

- Protracts scapulae
- Assists in scapular stabilization

Innervation: Long thoracic nerve (C5/6/7)

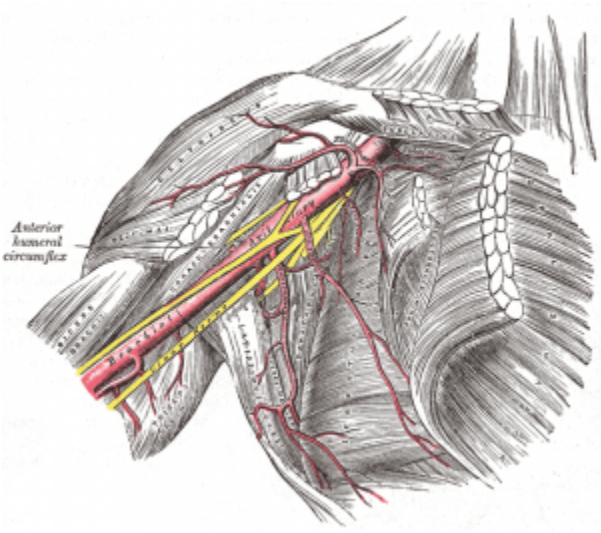


Figure 11.23 Serratus anterior, by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Prone with arm in a hammer lock – can use a small rolled-up towel under the shoulder

Palpation: Palpate this muscle between the latissimus dorsi and the abdominals along the midaxillary line

Technique: Lift the inferior angle and medial border of the scapula away from the ribcage

and needle in a lateral medial direction using the anterior aspect of the medial scapular border as a bony backdrop

Caution:**High – the lung field lies directly below this muscle**



Figure 11.24 Needling serratus anterior, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 11.12 Needling serratus anterior, original video by Nadine Crocker, CC BY-NC 4.0.

CHAPTER 12: HEART SINEW CHANNEL (ARM SHAOYIN)

Overview: Heart Sinew Channel (Arm Shaoyin)

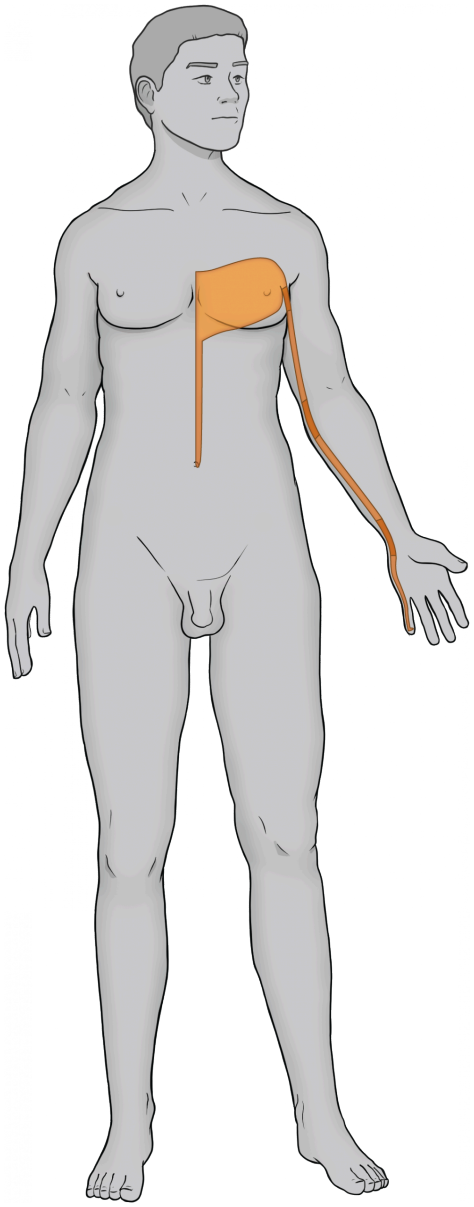


Figure 12.1 The heart sinew channel. Original image by Abigail Graham in association with MacEwan Open Books, CC BY-NC 4.0.

The Heart Sinew Channel and associated anatomy

1. This sinew channel starts on the distal palmar aspect of the fifth finger at the attachment of the flexor

digiti minimi brevis, picking up the attachment of the opponens digiti minimi, it binds at the wrist. From here it continues up the medial aspect of the forearm to bind at the medial epicondyle of the elbow. **(Anatomy: Flexor digiti Minimi brevis, Opponens digiti minimi)**

2. From the medial epicondyle, this sinew channel travels up the medial intermuscular septum (with the Pericardium sinew channel) to the bicipital groove. It then travels to the center of the chest via the pectoralis major. **(Anatomy: Medial intermuscular septum, Pectoralis major)**

1. Flexor Digiti Minimi

Origin: Hook of hamate and flexor retinaculum

Insertion: Medial side of the base of the proximal phalanx of digit 5

Action: Flexes the proximal phalanx of digit 5

Innervation: Deep branch of the ulnar nerve (C8/**T1**)

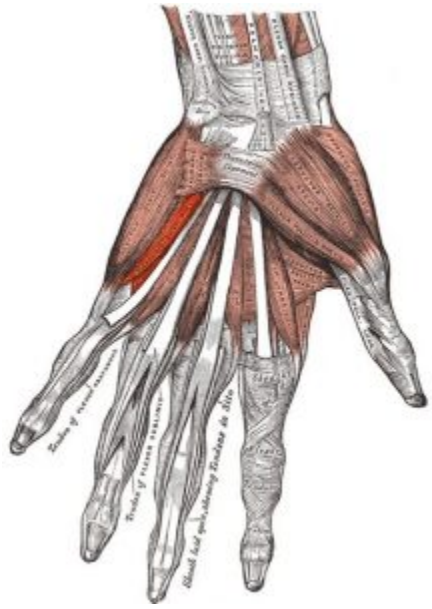


Figure 12.2 Flexor digiti minimi, adapted by Liskova.klara from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Various (sitting, supine, prone)

Palpation: Palpate the hypothenar eminence and resist digit 5 flexion to help isolate this muscle

Technique: Needle perpendicularly towards digit 5 metacarpal

Caution: Low

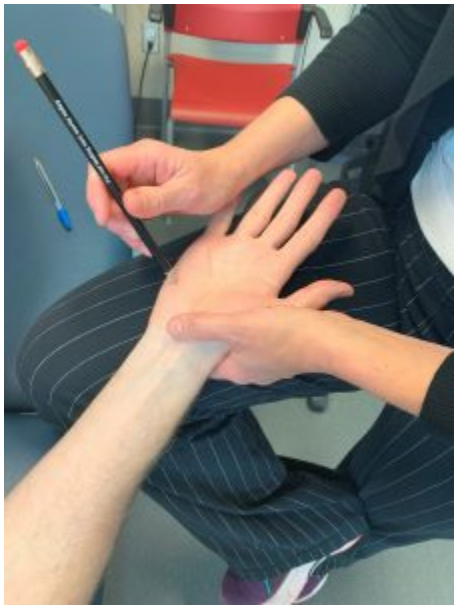


Figure 12.3 Needling flexor digiti minimi, original image by Nadine Crocker, CC BY-NC 4.0.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://openbooks.macewan.ca/sinewchannelneedling/?p=2043#oembed-1

Video 12.1 Needling flexor digiti minimi, original video by Nadine Crocker, CC BY-NC 4.0.

2. Opponens Digiti Minimi

Origin: Hook of hamate and flexor retinaculum

Insertion: Medial border of the 5th metacarpal

Action: Opposes digit 5

Innervation: Deep branch of the ulnar nerve (C8**/T1)**

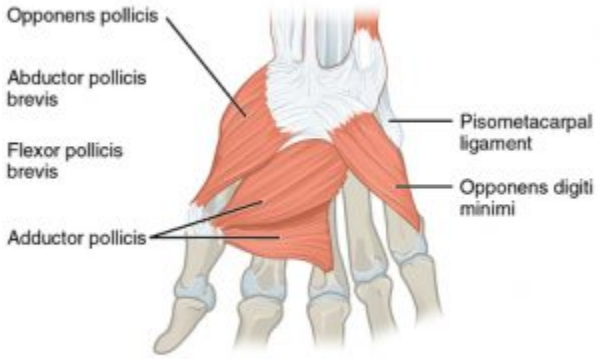


Figure 12.4 Opponens digiti minimi, by CFCF, CC BY-SA 4.0.

Needling

Position: Various (sitting, prone, supine)

Palpation: Palpate the hypothenar eminence and resist opposition to help isolate this muscle

Technique: Needle perpendicularly towards digit 5 metacarpal

Caution: Low

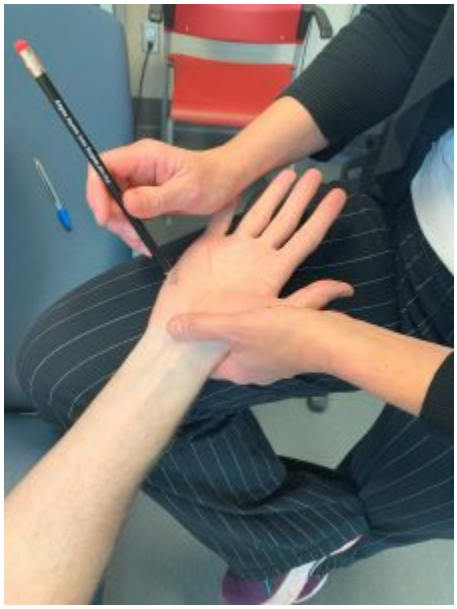


Figure 12.5 Needling opponens digiti minimi, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 12.2 Needling opponens digiti minimi, original video by Nadine Crocker, CC BY-NC 4.0.

3. Pectoralis Major

Origin:

- Clavicular head: anterior surface of the medial ½ of the clavicle
- Sterno-costal head: anterior surface of the sternum, costal cartilages of ribs 1-6

Insertion: Lateral lip of the bicipital groove of the humerus

Action:

- Adducts the humerus
- Medial rotates the humerus
- Positionally dependent: may extend the arm from a flexed position or flex the arm from an extended position

Innervation: Medial (C8-T1) and Lateral (C5/6/7) pectoral nerves

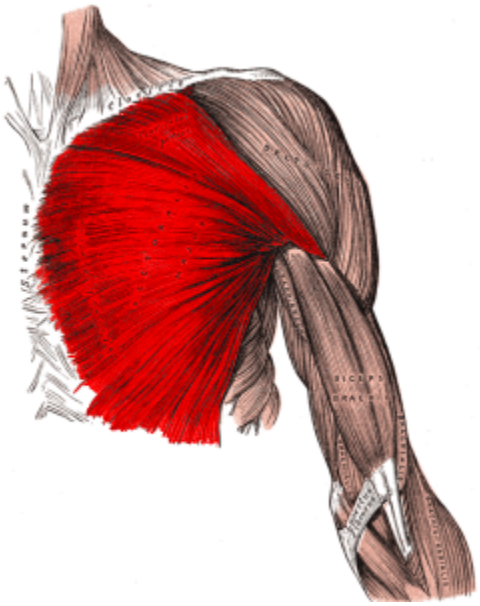


Figure 12.6 Pectoralis major, adapted by Lies Van Rompaey from the original image by Henry Gray and Henry Vandyke Carter (Public domain).

Needling

Position: Supine

Palpation: Pick up the bulk of this muscle on the anterior chest wall towards the axilla

Technique: Pick up the pectoralis muscle resting your fingers on the anterolateral aspect of the ribcage – Needle in an inferolateral direction away from the ribcage

Caution:**High – the lung field lies directly under this muscle – Be mindful of your needling direction**



Figure 12.7 Needling pectoralis major, original image by Nadine Crocker, CC BY-NC 4.0.

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Video 12.3 Needling pectoralis major, original video by Nadine Crocker, CC BY-NC 4.0.

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Organizing Content	Headings and subheadings are used sequentially (e.g. Heading 1. Heading 2, etc.) as well as logically (if the title is Heading 1 then there should be no other Heading 1 styles as the title is the uppermost level)	Yes
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Images	Images do not rely exclusively on colour to convey information.	Yes
Illustrations	Illustrations meet contrast and colour requirements	Yes
Tables	Tables include row and column headers	Yes
Tables	Tables include a title or caption	Yes
Tables	Tables do not have merged or split cells	Yes
Tables	Tables have adequate cell padding	Yes
Weblinks	The weblink is meaningful in context, and does not use generic text such as "click here" or "read more"	Yes
Weblinks	Weblinks do not open new windows or tabs	Yes
Embedded Multimedia	A transcript has been made available for a multimedia resource that includes audio narration or instruction. *Transcripts unavailable: The videos demonstrate acupuncture needling techniques, and their primary instructional content is visual. Needle placement, positioning, and manipulation cannot be adequately conveyed through a text transcript alone. Please refer to the accompanying text and instructional materials for additional information.	No*
Embedded Multimedia	Captions of all speech content and relevant non-speech content are included in the multimedia resource that includes audio synchronized with a video presentation. Machine captions are not 100% accurate.	Yes
Embedded Multimedia	Audio descriptions of contextual visuals (graphs, charts, etc.) are included in the multimedia resource	N/A
Embedded Multimedia	H5P content is listed as accessible on the H5P content types recommendations list	N/A
Font Size	Font size is 12 point or higher for body text	Yes
Font Size	Font size is 9 point for footnotes or endnotes	N/A
Font Size	Font size can be zoomed to 200%	Yes

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