Why Bother?

- Visualisation of nerves and surrounding structures: vessels, muscles, bone and viscera - pleura, lung, peritoneum, bowel
- Diagnostic - Recognizing anatomical variabilities and pathology
- Real time visualisation of needle trajectory, needle – nerve contact and injectate spread.
- Avoid radiation
- Portable equipment / not bulky Fluoroscopy
- No need for Radiographer
- Office based procedures
- Cost reduction
Problems

- Lack of experience
- Deeper less defined structures comparing to PNB

To Overcome

- Anatomy revisited
- Practice-courses/workshops
- Studies/research
- High quality of US systems required
- Variety of probes
- US needles
Probes
NEEDLES
TECHNIQUE

- Pressure
- Alignment
- Rotation
- Tilt
Head & Neck

- Occipital nerve
- Extraforaminal cervical nerve roots
- Superficial cervical plexus
- Cervical medial branch/ facet
- Stellate ganglion
- Suprascapular nerve
Trunk & abdomen

- Intercostal nerve block
- Iliouinguinal/iliohypogastric nerve
- Transversus abdominis plane
- Coeliac plexus
Lumbar spine

- Facet joints
- Medial branch of posterior ramus
- Lumbar plexus
- Paraspinal muscle injection:
  - Erector spinae
  - Quadratus lumborum
  - Psoas
- Sacroiliac joint
- Piriformis muscle
- Pudendal nerve
Lower Limb

- Femoral nerve
- Lateral cutaneous of the thigh (LCT)
- Saphenous nerve
- Sciatic/ popliteal
- Hip joint
- Knee joint
Cervical Medial Branch Block
Trapezius Muscle (entrapment)

Greater Occipital Nerve

Semispinalis Muscle (entrapment)

Inferior Oblique Muscle (entrapment)

Stealth needle with bullet tip and side port - for suboccipital compartment injection - 10 ml

The Three Entrapments
1) Trapezius
2) Semispinalis (contrast and anesthetic)
3) Inferior Oblique

Courtesy of Prof. G. Racz
Lumbar plexus/ facet joints/ epidural
Longitudinal View
2-5 MHz Probe
8-13 MHz Probe
Piriformis Muscle
Hip joint
Lumbar plexus

- Intercostal nerve (T11)
- Subcostal nerve (T12)
- Hypogastric nerve (T12, L1)
- Genitofemoral nerve (L1)
- Lateral femoral cutaneous nerve (L1, 2)
- Femoral nerve (L2, 3, 4)
- Deep femoral artery (L2, 3, 4)
- Sciatic nerve (L4, 5, 6)
- Common peroneal nerve (L4, 5, 6)
- Superior gluteal nerve (L4, 5, 6)
- Inferior gluteal nerve (L5, S1, 2)
- Obturator nerve (T12, L1, 2)
- Accessory obturator nerve (L3, 4, 5)
- Perforating cutaneous nerve (S2, 3, 4)
- Posterior femoral cutaneous nerve (S1, 2, 3)
- Posterior femoral cutaneous nerve (S1, 2, 3)
- Pudendal nerve (S2, 3, 4)
- Sural nerve (L4, 5, S1, 2, 3)
- Hypogastric nerve
- Superior hypogastric plexus
- Inferior hypogastric plexus
- Pelvic splanchnic nerves
- Nerve to levator ani
- Nerve to coccygeus
- Perineal branch
- 4th sacral nerve
- Anterior cutaneous nerve
- Obturator nerve
- Superior gluteal nerve
- Inferior gluteal nerve
- Iliac branches
- Femoral artery
- Femoral nerve
- Sciatic nerve
- Tibial nerve
- Common peroneal nerve
- Superficial peroneal nerve
- Deep peroneal nerve
- Genitofemoral nerve
- Obturator nerve
- Femoral nerve
- Superior gluteal nerve
- Inferior gluteal nerve
- Ilium
Deep dissection

- External iliac artery and vein
- Inguinal ligament (Poupart's)
- Femoral artery and vein (cut)
- Pectineus muscle (cut)
- Obturator canal
- Obturator externus muscle
- Adductor longus muscle (cut)
- Anterior branch and Posterior branch of obturator nerve
- Quadratus femoris muscle
- Adductor brevis muscle
- Branches of posterior branch of obturator nerve
- Adductor magnus muscle
- Gracilis muscle
- Cutaneous branch of obturator nerve
- Femoral artery and vein (cut)
- Descending genicular artery
- Articular branch
- Saphenous branch
- Adductor hiatus
- Sartorius muscle (cut)
- Adductor magnus tendon
- Adductor tubercle on medial epicondyle of femur
- Superior medial genicular artery (from popliteal artery)
- Infrapatellar branch of Saphenous nerve
- Meralgia Paresthetica

- L2
- L3

- Iliacus muscle
- Lateral femoral cutaneous nerve
- Inguinal ligament
- Femoral nerve
Ultrasound guided electrode placement

Radial nerve

Fig 1
Feasibility of Ultrasound-Guided Percutaneous Placement of Peripheral Nerve Stimulation Electrodes and Anchoring During Simulated Movement: Part Two, Upper Extremity

Huntoon, Marc A.; Hoelzer, Bryan C.; Burgher, Abram H.; Hurdle, Mark Friedrich B.; Huntoon, Elizabeth A.
doi:

Fig 2. Ulnar nerve. Upper panel: a cross section though the lower third of the upper arm shows the approach to ultrasound-guided electrode placement for the ulnar nerve. Middle panel, left: the needle shaft is passing inferior to the ulnar nerve approximately 12 cm above the medial epicondyle. The medial triceps muscle tissue is inferior to the lead and the nerve; right: the line drawing depicts the relationships seen on ultrasound image. Lower panel: the lead contacts are clearly seen under the nerve on gross dissection. The proximal portion of the lead can be seen to have a thin “film” of triceps muscle tissue that has been passed through. A, anterior; L, lateral; M, medial; P, posterior.
Ultrasound guided electrode placement

Fig 1
Ultrasound guided electrode placement

Sciatic Division

Posterior view

Sciatic nerve
Electrode
Tibial nerve
Common peroneal nerve

Tibial nerve

Biceps femoris
Sciatic nerve division

Electrode
Tibial nerve
Anchor point
Peroneal nerve

Biceps femoris
Sciatic nerve division

Tibial nerve

Electrode
Peroneal nerve