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**DEPARTMENT OF OPERATION THEATRE AND ANAESTHESIA
TECHNOLOGY**

3rd YEAR

PAPER 2: PRINCIPLES OF ANAESTHESIA -2

TOPIC: NERVE BLOCKS



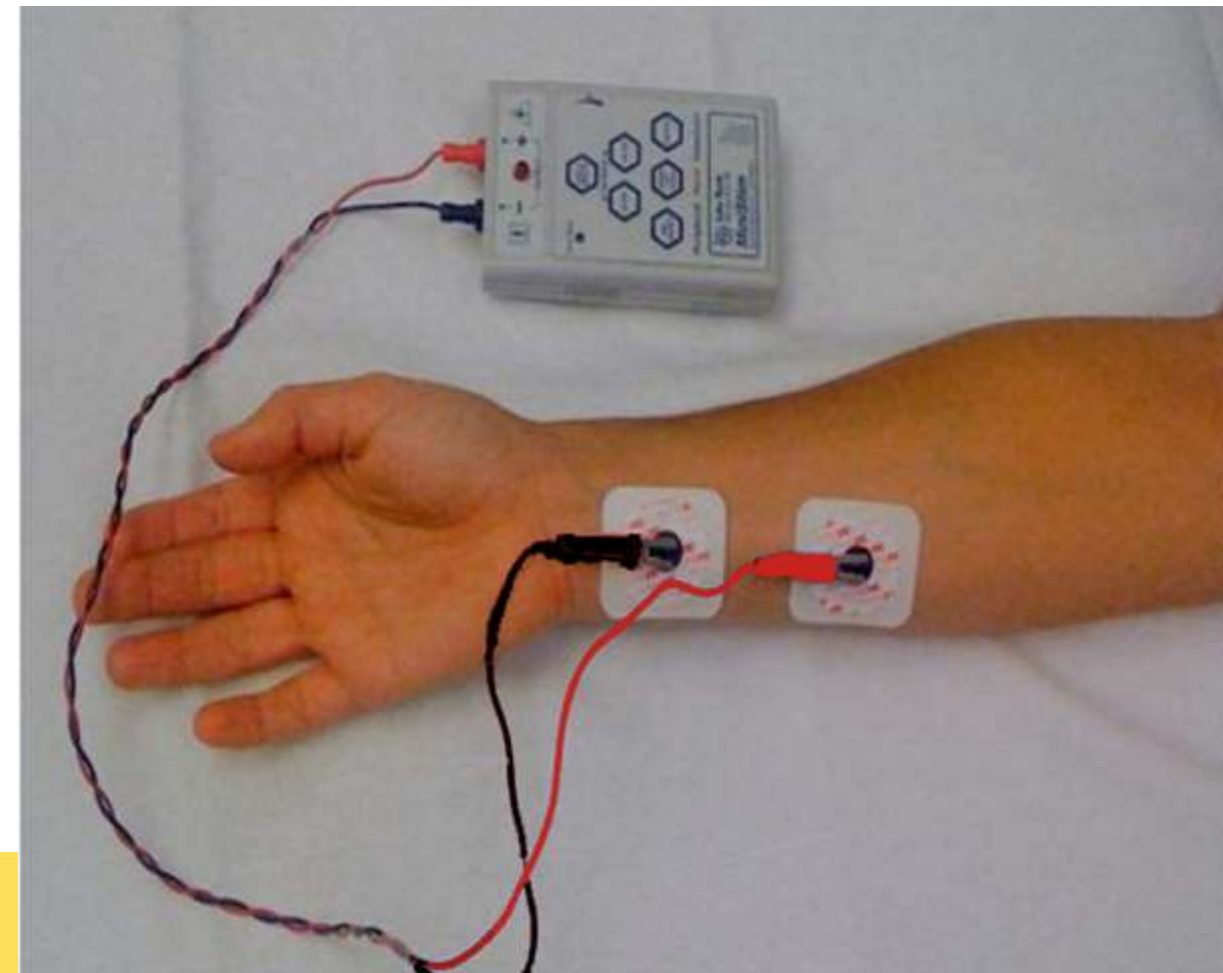
NERVE BLOCKS:

- NERVE BLOCKS MAY BE CLASSIFIED AS CENTRAL NEURAXIAL BLOCK [SPINAL & EPIDURAL] AND PERIPHERAL NERVE BLOCKS.
- NERVE BLOCKS ARE GIVEN EITHER FOR REGIONAL ANAESTHESIA FOR ACUTE AND CHRONIC PAIN RELIEF.



TECHNIQUE:

- THE CONVENTIONAL METHOD OF GIVING A NERVE BLOCK IS BY ELICITING PARAESTHESIA OR USING THE NERVE STIMULATOR.
- HOWEVER THE USE OF ULTRASOUND HAS REVOLUTIONIZED THE PRACTICE OF NERVE BLOCK IN MODERN DAY ANAESTHETIC PRACTICE.



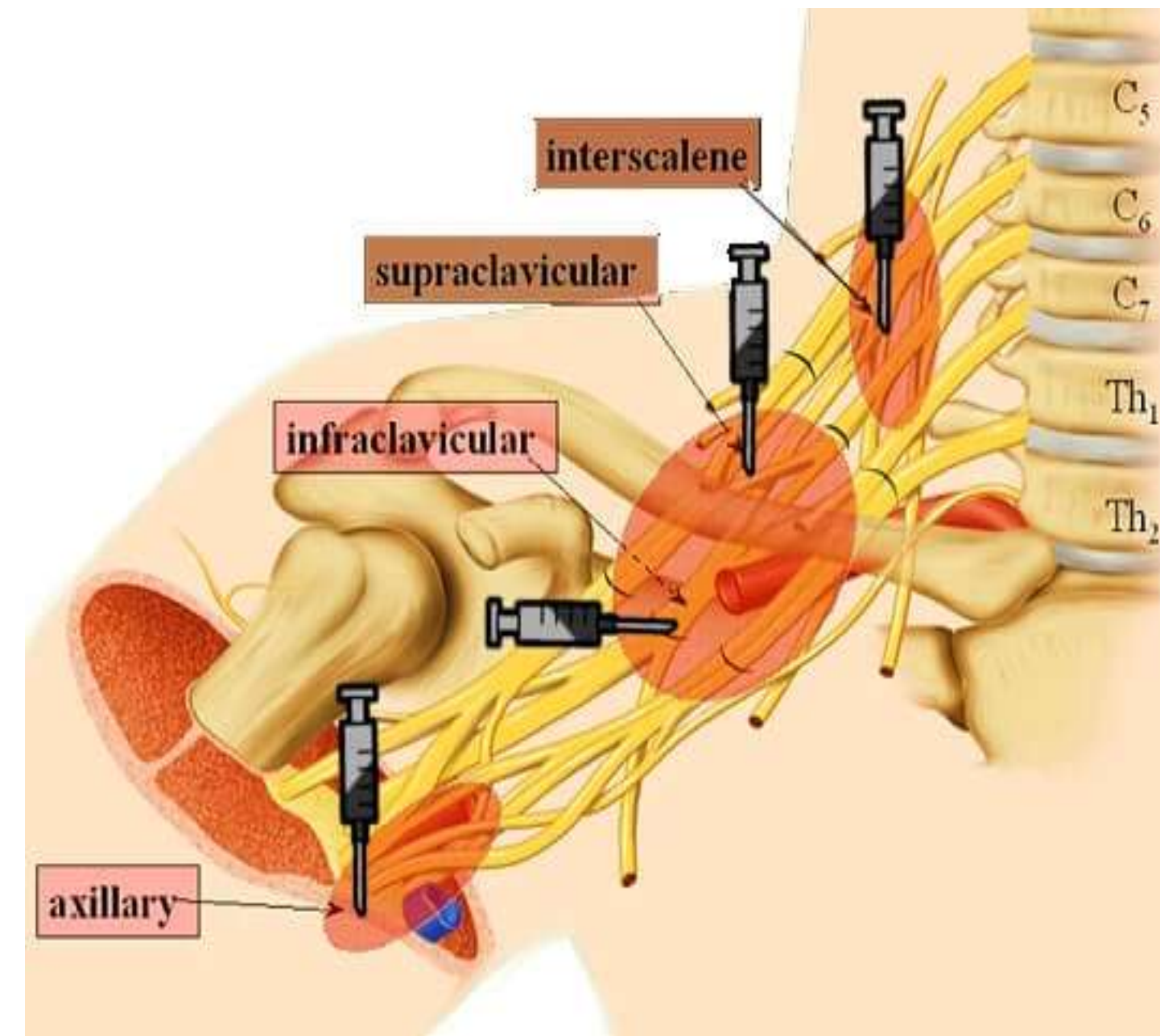
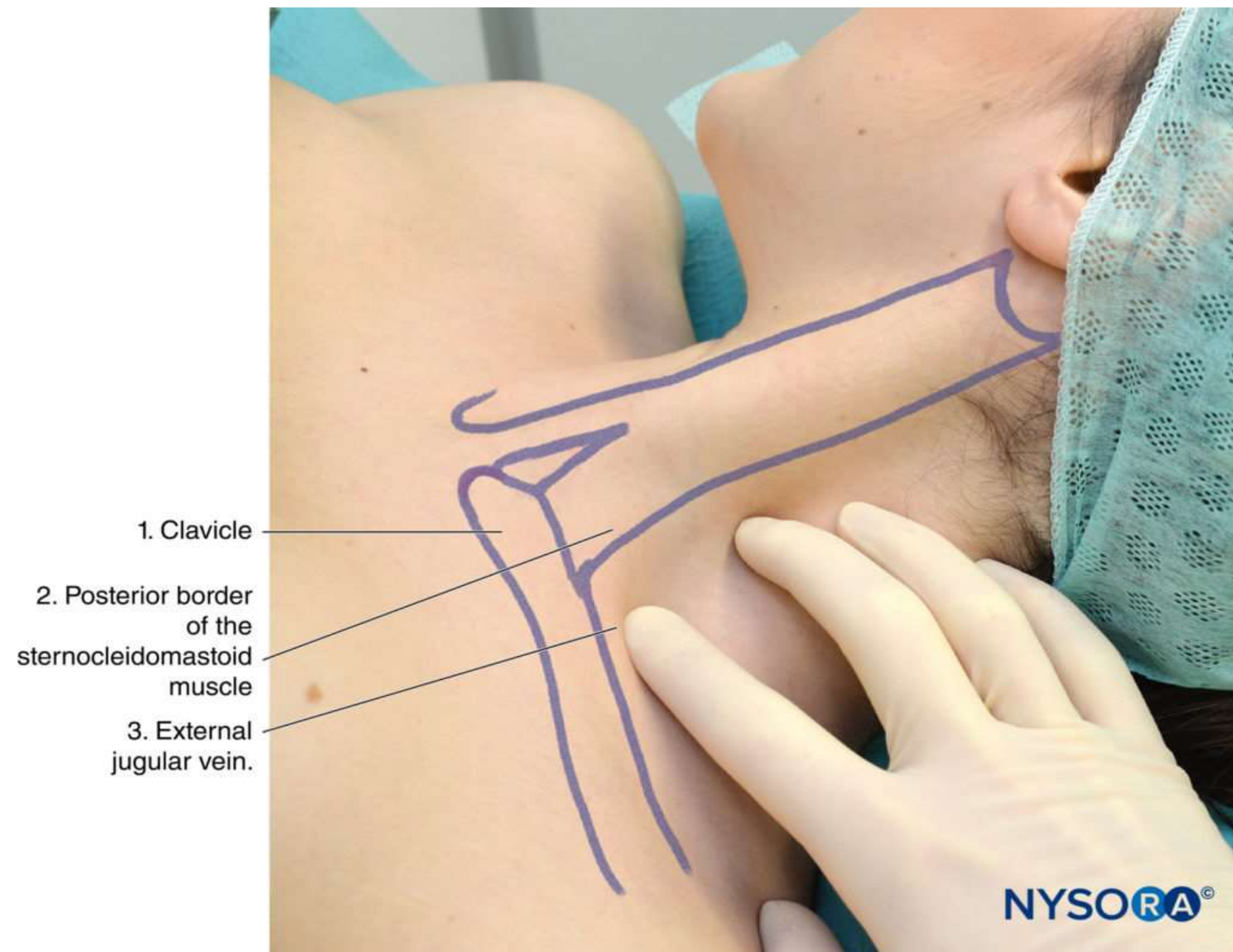


BLOCKS OF UPPER LIMB:

- BRACHIAL PLEXUS BLOCK
 - INTERSCALENE APPROACH
 - SUPRECLAVICULAR APPROACH
 - INFRACLAVICULAR APPROACH
 - AXILARY APPROACH
- INDIVIDUAL NERVE BLOCKS
- INTRAVENOUS REGIONAL BLOCK(BIER BLOCK)



BRACHIAL PLEXUS BLOCK:





BRACHIAL PLEXUS BLOCK:

1. C6 LEVEL IN CRICOID CARTILAGE [C8-T1] ULNAR NERVE SPARES.

2. THIS IS THE SECOND MOST COMMONLY PERFORMED BLOCK, AFTER CENTRAL NEURAXIAL BLOCK. IT IS USED FOR SURGERY OF UPPER LIMB AND SHOULDER.

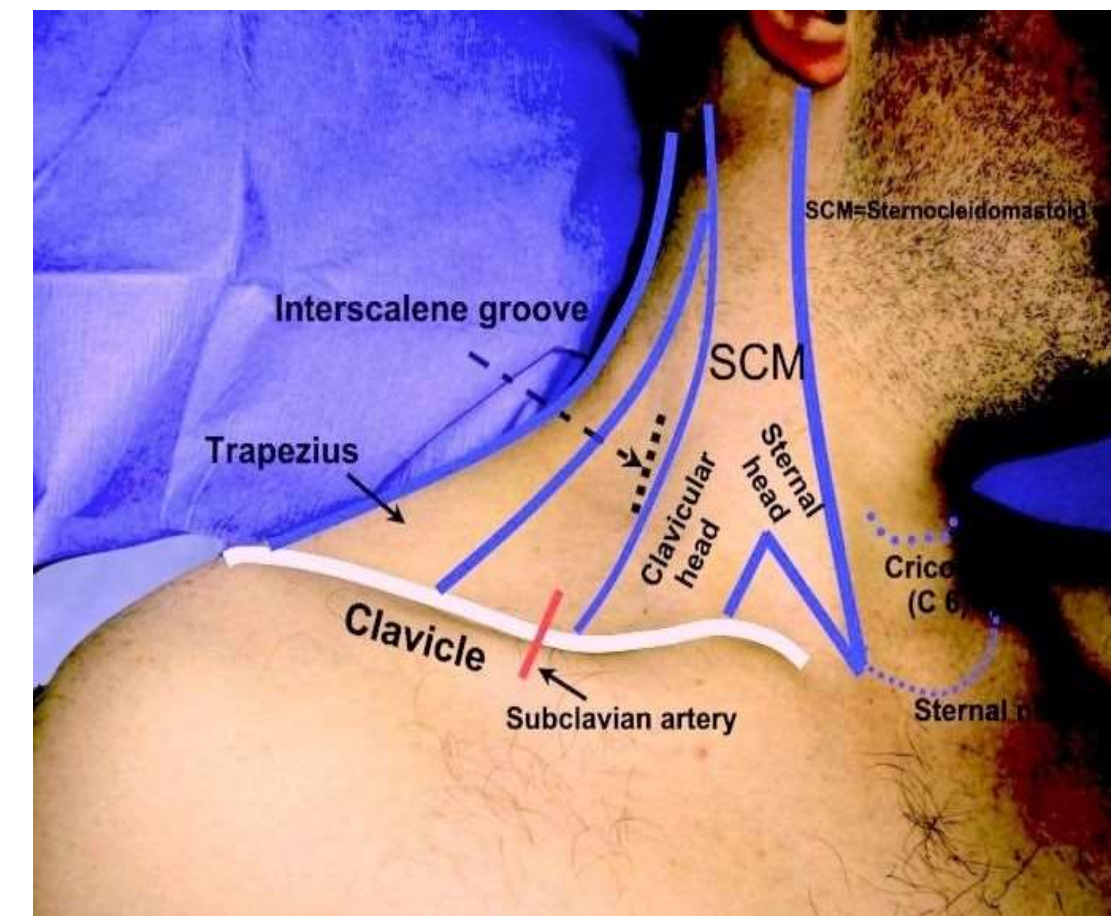
3. BRACHIAL PLEXUS CAN BE BLOCKED BY 4 APPROACHES:

1. INTERSCALENE APPROACH
2. SUPRACLAVICULAR APPROACH
3. INFRACLAVICULAR APPROACH
4. AXILLARY APPROACH.



INTERSCALENE APPROACH:

- 1.THE USUAL INDICATION FOR INTERSCALENE BLOCK IS SURGERY ON THE SHOULDER OR UPPER ARM.
- 2.IN THIS TECHNIQUE BRACHIAL PLEXUS IS BLOCKED BETWEEN ANTERIOR AND MIDDLE SCALENE AT THE LEVEL OF CRICOID.
- 3.BLOCKADE OCCURS AT THE LEVEL OF SUPERIOR AND MIDDLE TRUNKS.
- 4.ULNAR NERVE IS USUALLY SPARED WITH THIS APPROACH MAKE IT UNSUITABLE FOR HAND SURGERIES.





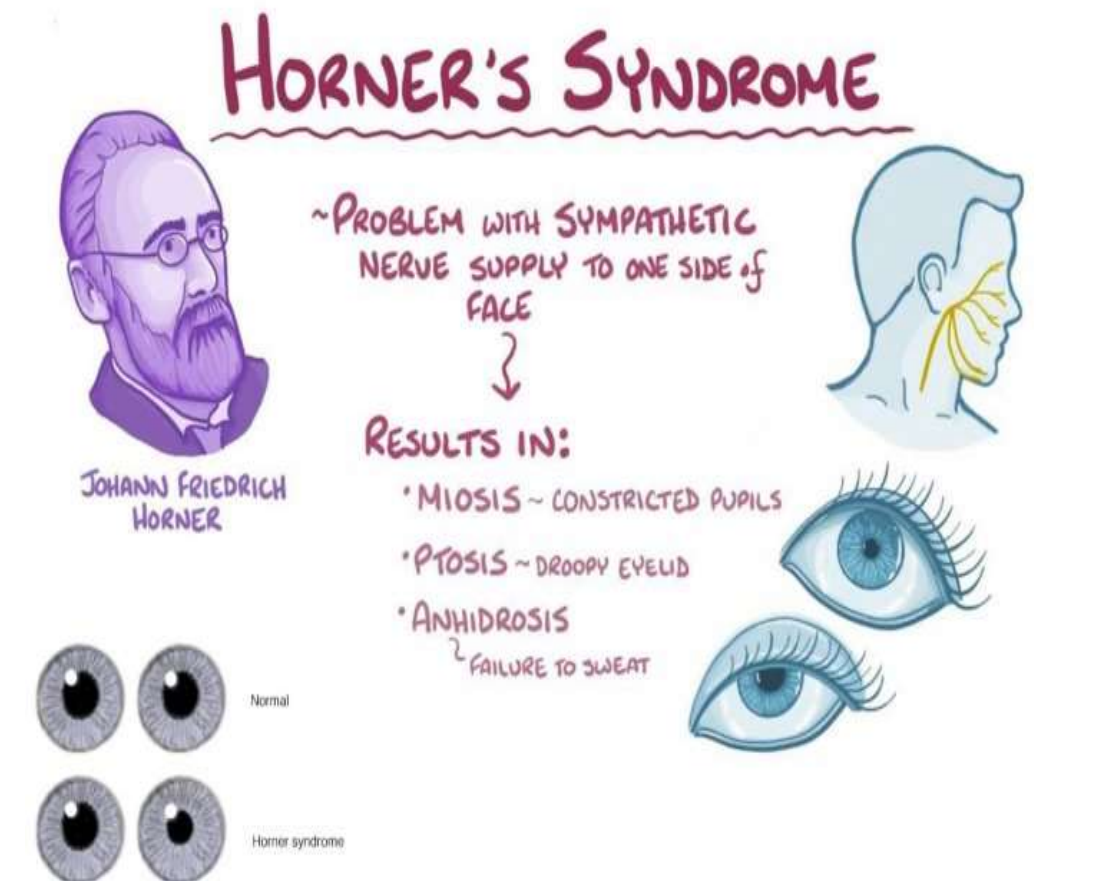
COMPLICATIONS:

- PHRENIC NERVE BLOCK
- HORNER SYNDROME
- PNEUMOTHORAX
- NERVE INJURY
- BLEEDING
- HAEMATOMA
- LOCAL DRUG TOXICITY



HORNER SYNDROME:

- A disrupted nerve pathway on one side from the brain to the face and eye.
- Horner's syndrome is the result of another medical condition, such as a stroke, tumour or spinal cord injury.
- Symptoms include a smaller pupil, drooping eyelid and little or no sweating on the affected side.
- There's no specific treatment for Horner's syndrome, but treatment for the underlying cause may restore normal nerve function.





SPRACLAVICULAR APPROACH:

1. THIS IS VERY COMMONLY USED, APPROACH, THIS APPROACH IS USUALLY EMPLOYED FOR SURGERIES ON LOWER ARM, ELBOW, FOREARM, AND HAND.
2. DISTAL TRUNK AND PROXIMAL DIVISION OF BRACHIAL PLEXUS IS BLOCKED BY THIS APPROACH.



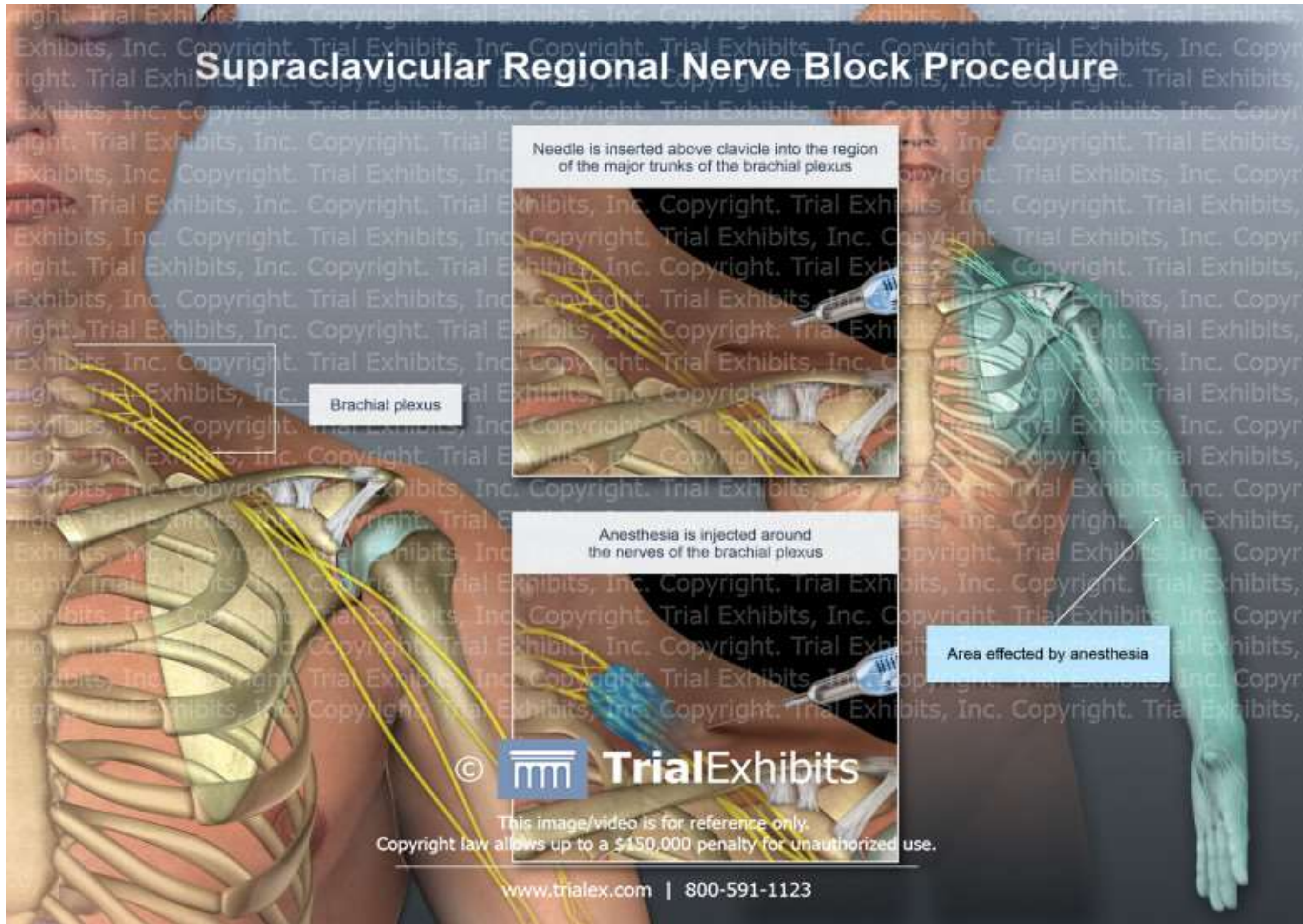


TECHNIQUE:

1. PATIENT LIES SUPINE WITH A SMALL WEDGE UNDER THE SHOULDER.
2. THE ARM IS EXTENDED AND ADDUCTED, NEEDLE IS INSERTED AT A POINT 1CM SUPERIOR TO MIDPOINT OF CLAVICLE AFTER PALPITATING THE SUBCLAVIAN ARTERY.
3. THE NEEDLE IS INSERTED LATERAL TO SUBCLAVIAN VESSEL.
4. THE NEEDLE IS INSERTED IN DOWNWARD AND BACKWARD DIRECTION TILL PARAESTHESIA IS ELICITED.
5. ELICITING PARAESTHESIA 20-30ml OF BUPIVACAINE IS INJECTED.



Supraclavicular Regional Nerve Block Procedure



Needle is inserted above clavicle into the region of the major trunks of the brachial plexus




Brachial plexus

Anesthesia is injected around the nerves of the brachial plexus



Area effected by anesthesia

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COMPLICATIONS:



1. PNEUMOTHORAX: DOME OF PLEURA CAN BE PUNCTURED. INCIDENCE IS 1-6% BUT FORTUNATELY MORE THAN 98% OF THE CASES PNEUMOTHORAX IS SMALL ENOUGH INTERVENTION.
2. AS THE DOME OF PLEURA IS ON MEDIAL SIDE, THEREFORE BEST WAY TO AVOID PNEUMOTHORAX IS TO KEEP THE DIRECTION OF NEEDLE Laterally.
3. PHRENIC NERVE BLOCK
4. HORNER SYNDROME
5. GENERAL COMPLICATIONS



AXILLARY APPROACH:

AXILLARY APPROACH IS ALSO COMMONLY USED APPROACH, THE
DRUG IS INJECTED AROUND AXILLARY ARTERY IN AXILLA.
BLOCKADE OCCURS AT THE LEVEL OF TERMINAL NERVES.



ADVANTAGES OVER SUPRACLAVICULAR APPROACH:

COMPLICATIONS LIKE PNEUMOTHORAX, PHRENIC NERVE BLOCK, HORNER SYNDROME CAN BE AVOIDED.

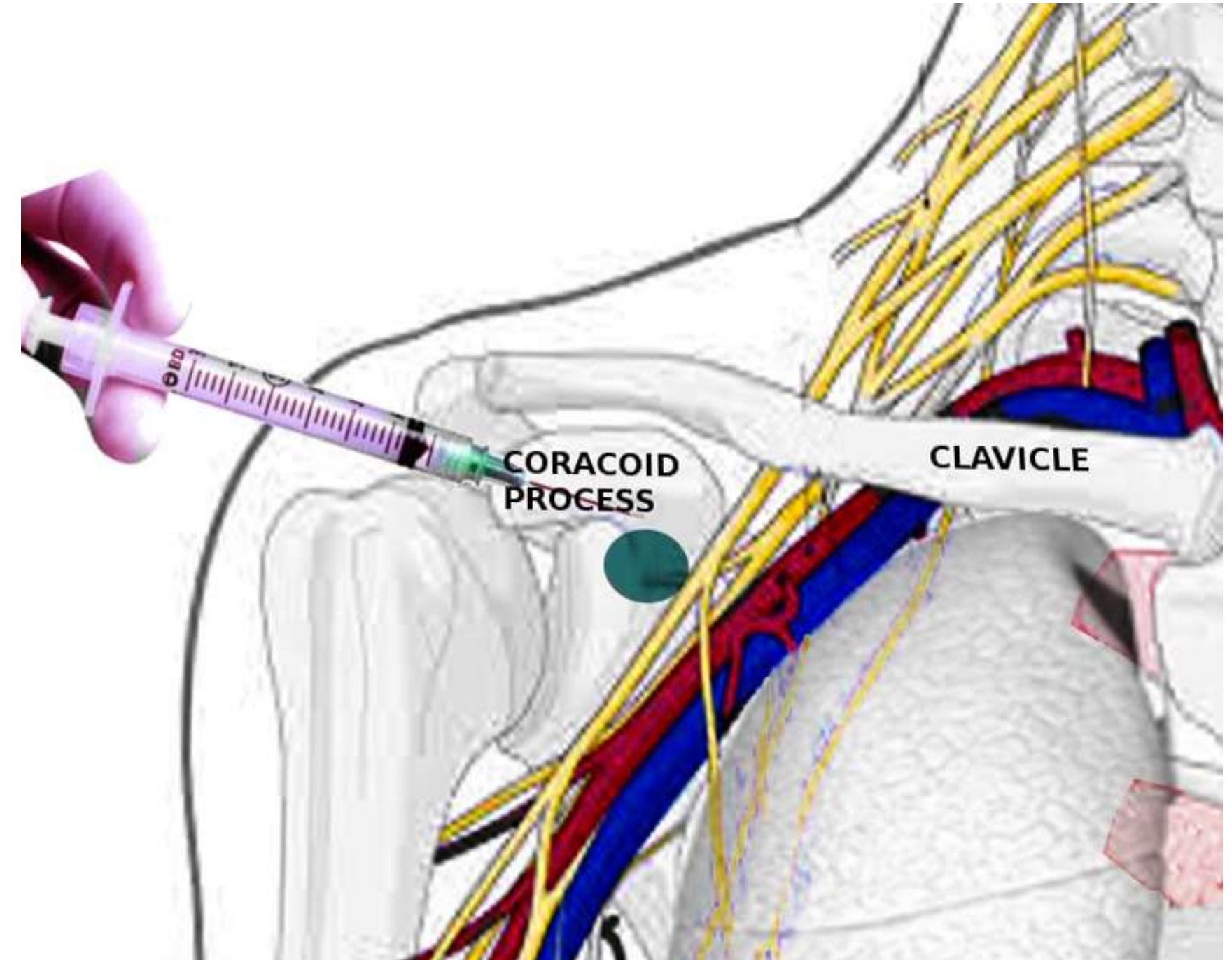
DISADVANTAGE OVER SUPRACLAVICULAR APPROACH:

1. MUSCULUTANEOUS AND INTERCOSTOBRACHIAL NERVES ARE SPARED THEREFORE, AXILLARY BLOCK IS NOT SUITABLE FOR ARM SURGERY.
2. THE CHANCE OF INTRAVASCULAR INJECTION AND HEMATOMA FORMATION ARE ALSO HIGH WITH AXILLARY APPROACH.



INFRACLAVICULAR APPROACH:

- IN THIS APPROACH BRACHIAL PLEXUS IS BLOCKED EITHER JUST BELOW THE MIDPOINT OF CLAVICLE OR JUST MEDIATED TO CORACOID PROCESS.
- THE THEORETICAL ADVANTAGE IS THAT MUSCULATENOUS AND AXILLARY NERVE IS BLOCKED.DUE TO HIGH RATE IN CORACOID APPROACH AND INCREASED INCIDENCE OF PNEUMOTHORAX AND HAEMOTHORAX.



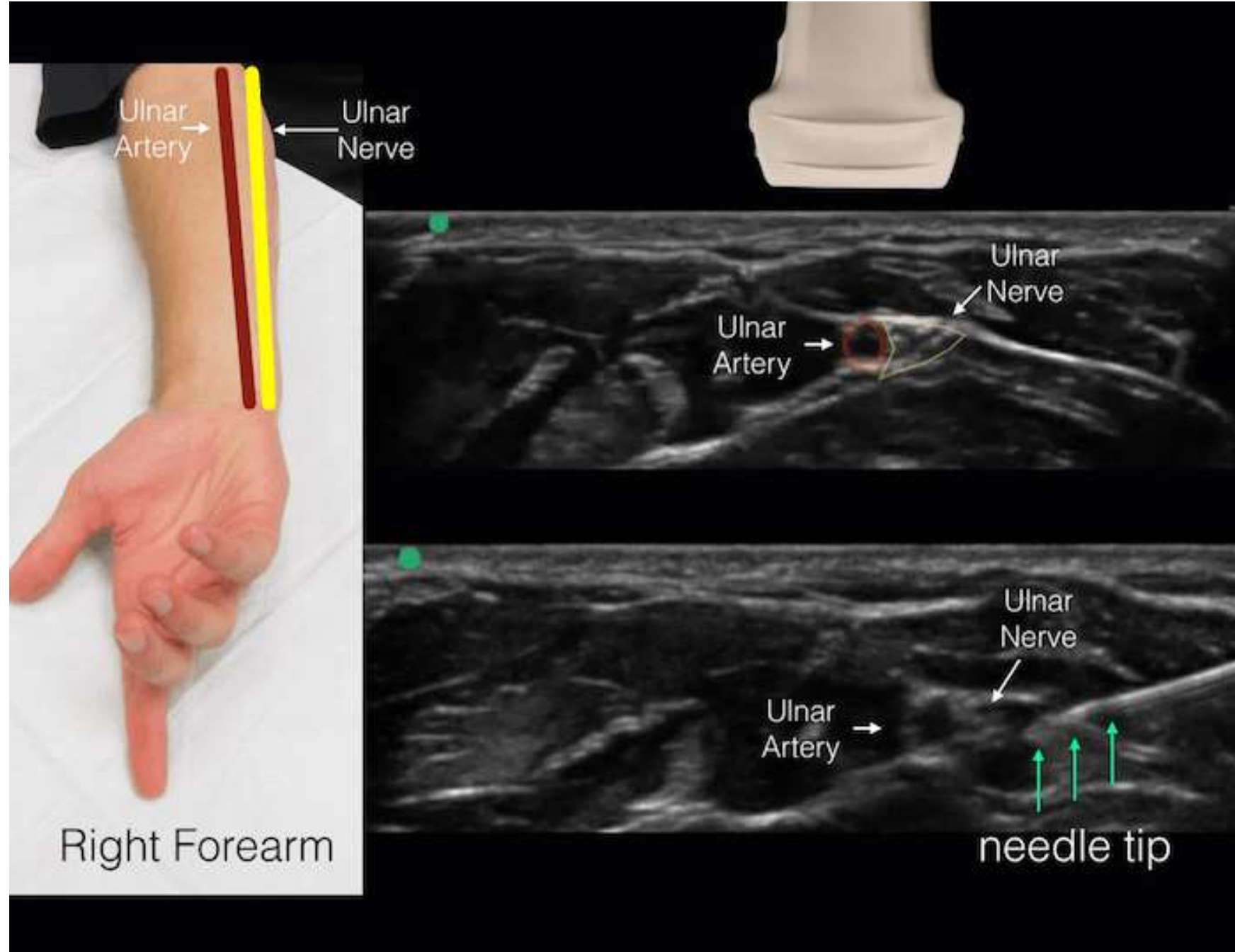


INDIVIDUAL NERVE BLOCKS:

- RADIAL, ULNAR, AND MEDIAN NERVES CAN BE BLOCKED SEPARATELY AT ELBOW AND WRIST.
- WRIST BLOCK IS USED FOR HAND SURGERIES WHERE ULNAR NERVE IS BLOCKED JUST LATERAL TO FLEXOR CARPI ULNARIS TENDON
- MEDIAN NERVE IS BLOCKED BETWEEN TENDONS OF PALMARIS LONGUS AND FLEXOR CARPI RADIALIS.
- RADIAL NERVE IS BLOCKED BY 8-10ml OF SUBCUTANEOUS INJECTION OF L.A EXTENDING FROM RADIAL ARTERY ANTERIORLY TO EXTENSOR CARPI RADIALIS TENDON POSTERIORLY



ULNAR NERVE

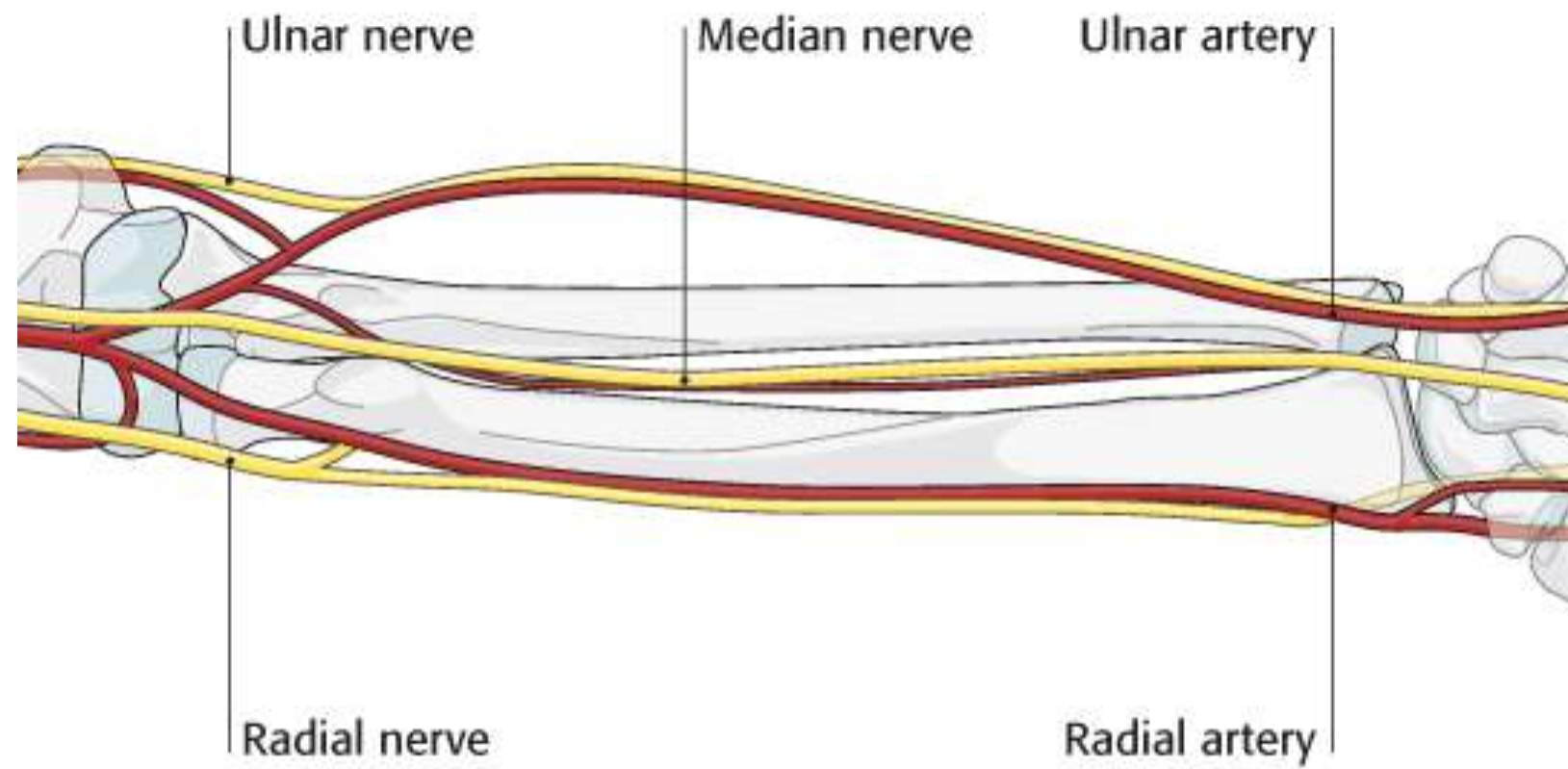


RADIAL NERVE

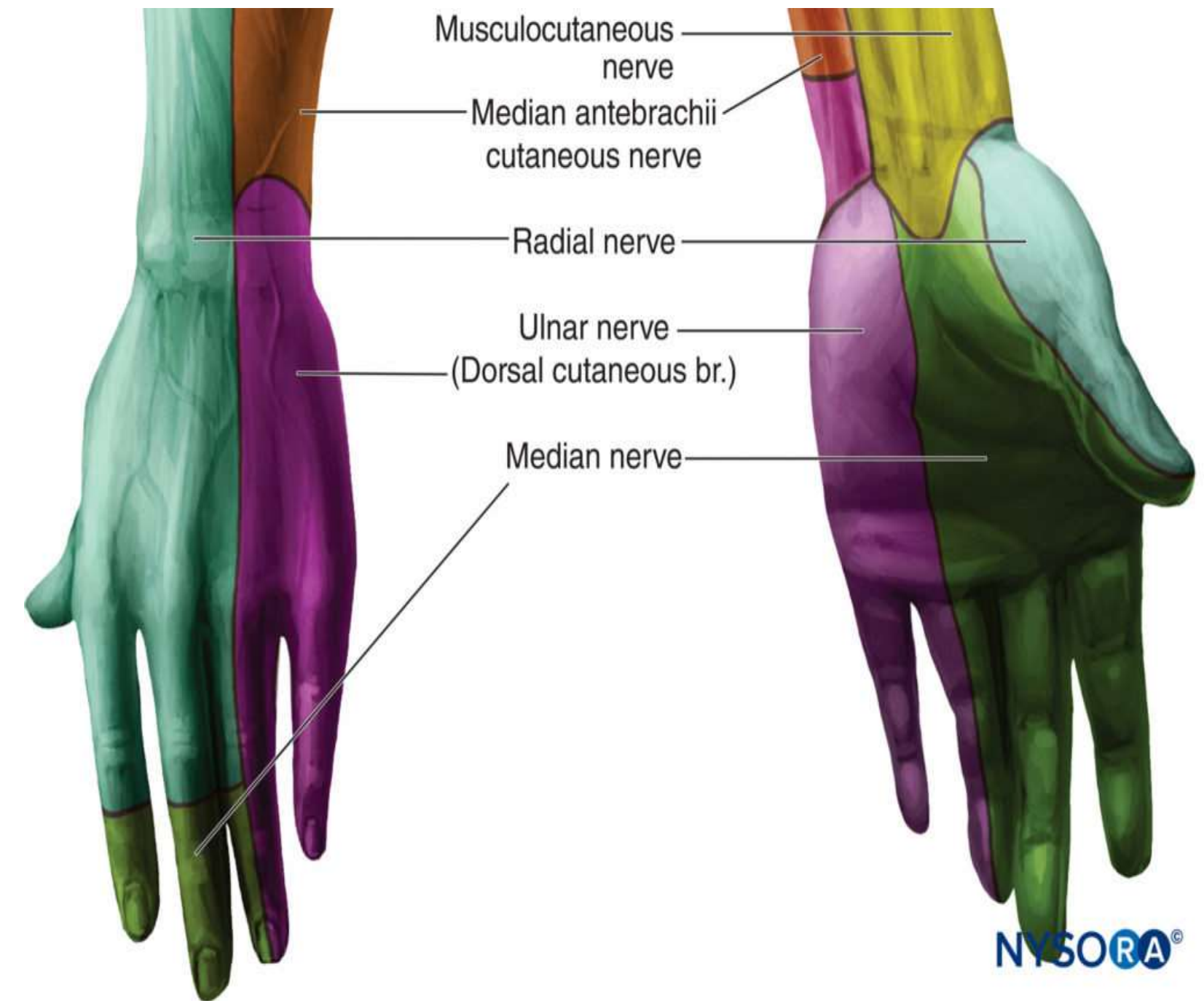




MEDIAN NERVE



WRIST BLOCK



NYSORA®



INTRAVENOUS REGIONAL BLOCK(BIERS BLOCK):

- IVRA IS ALSO CALLED AS BIRES BLOCK AS IT WAS FIRST TIME GIVEN BY AUGUST BIER.

TECHNIQUE:

- AFTER APPLYING TOURNIQUET (PREVENTS SYSTEMIC ABSORPTION OF DRUG)30-40ml OF DRUG IS INJECTED INTO A PERIPHERAL VEIN.ADEQUATE TIURNIQUET FUNCTIONING IS MOST VITAL IN BIER BLOCK.DEFLATION OR LEAK CAN CAUSE DRUG TOXICITY AND DEATH,THEREFORE TOXIC DRUG LIKE BUPIVACAINE IS ABSOLUTELY CONTRAINDICATED FOR BIERS BLOCK.AS TOURNIQUET COMPROMISED VASCULAR SUPPLY,THEREFORE LIGNOCAINE WITH ADRENALINE SHOULD NOT BE USED.

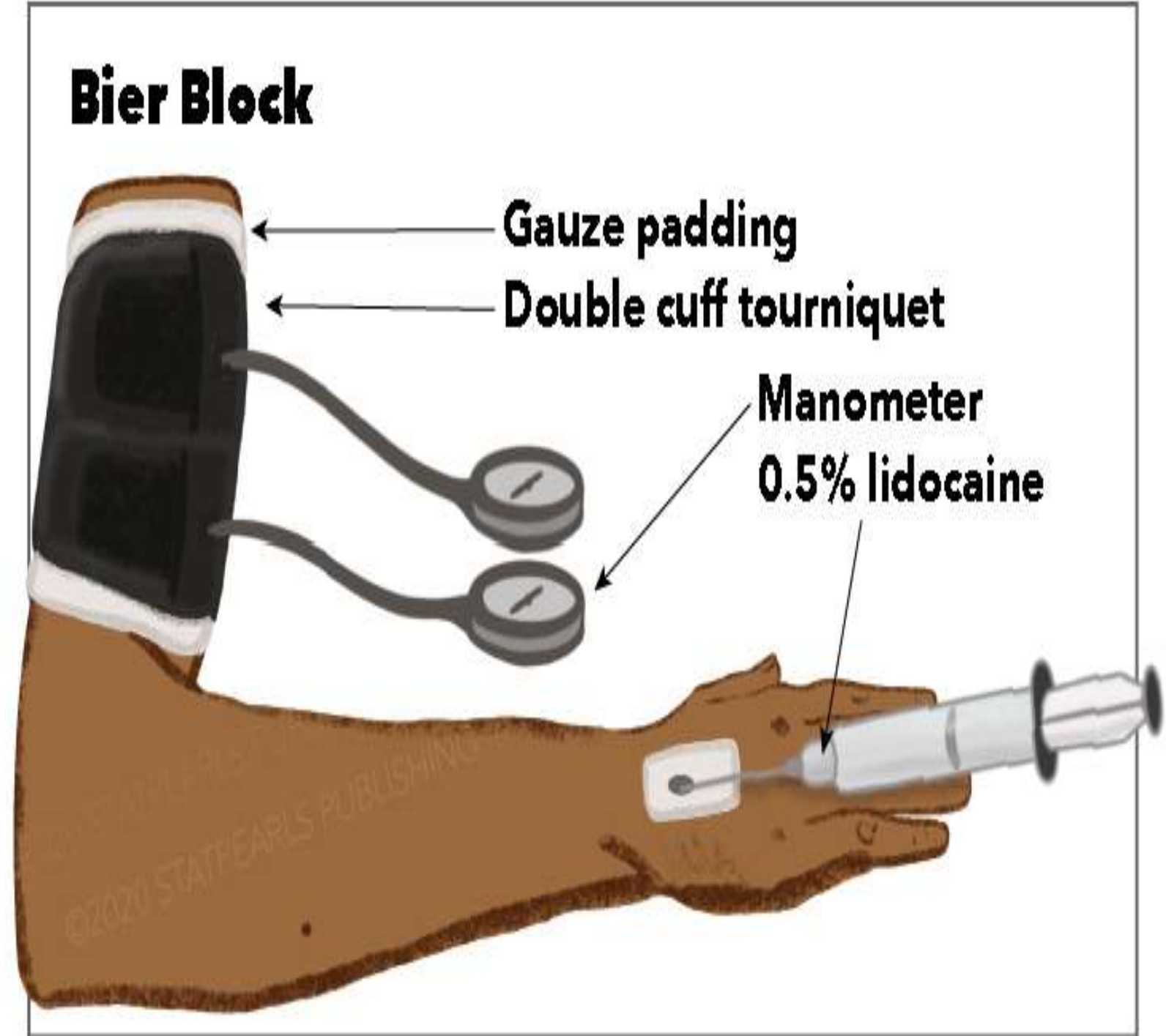


ADVANTAGES:

- EASY PROCEDURE
- ALMOST NO CHANCES OF FAILURE
- RAPID ONSET
- GOOD MUSCLE RELAXATION

DISADVANTAGES:

- TOURNIQUET DISCOMFORT OR COMPRIMSED SYNDROME
- ACCIDENTAL; DEFLATION OR LEAK OF TOURNIQUET
- TOURNIQUET CANNOT BE RELEASED BEFORE 30mins .





BLOCKS OF LOWER LIMB:

- BLOCKS OF LOWER LIMB ARE SURELY USED FOR PROVIDING ANAESTHESIA.
- AS MAJORITY OF LOWER LIMB SURGERIES CAN BE PERFORMED UNDER SPINAL AND EPIDURAL ANAESTHESIA.
- THE NERVE BLOCKS WHICH ARE SOMETIMES UTILIZED ARE:-



PSOAS COMPARTMENT BLOCK : TO BLOCK LUMBAR PLEXUS

- 1.PSOAS COMPARTMENT BLOCK:TO BLOCK LUMBAR PLEXUS
PERIVASCULAR BLOCK(3 IN 1):DRUG IS INJECTED IN FEMORAL CANAL WHILE MAINTAINING DISTAL PRESSURE WILL RESULT, IN UPWARD SPREAD OF DRUG,BLOCKING FEMORAL,SCIATIC AND OBTURATOR NERVES.
- 2.FEMORAL,SCIATIC&OBTURATOR NERVE BLOCKS:THESE NERVES
CAN BE BLOCKED SEPARATELY DEPENDING ON WHICH PART OF THE LOWER LIMB SURGERY IS TO BE PERFORMED.
- 3.FASCIA ILIAC NERVE(MODIFIED FEMORAL):A LARGE VOLUME OF
DRUG IS INJECTED JUST BELOW THE FASCIAC ILIAC TO BLOCK FEMORAL NERVE AS IT TRANSVERSE THE FASCIAL ILIAC.



ANKLE BLOCK:

PERFORMED FOR FOOT SURGERIES, IN ANKLE BLOCK DEEP PERONEAL, SUPERFICIAL PERONEAL & SAPHENOUS NERVE ARE BLOCKED.

BIRES BLOCK:

NOT COMMONLY PERFORM AS IT REQUIRES VERY LARGE VOLUME (60-80ml)



THANK YOU



QUESTIONS RELATED TO ABOVE SLIDES



REFERENCES & THANKING SLIDE