

PATIENT SAFETY

POSITIONING IN OPERATING THEATRE

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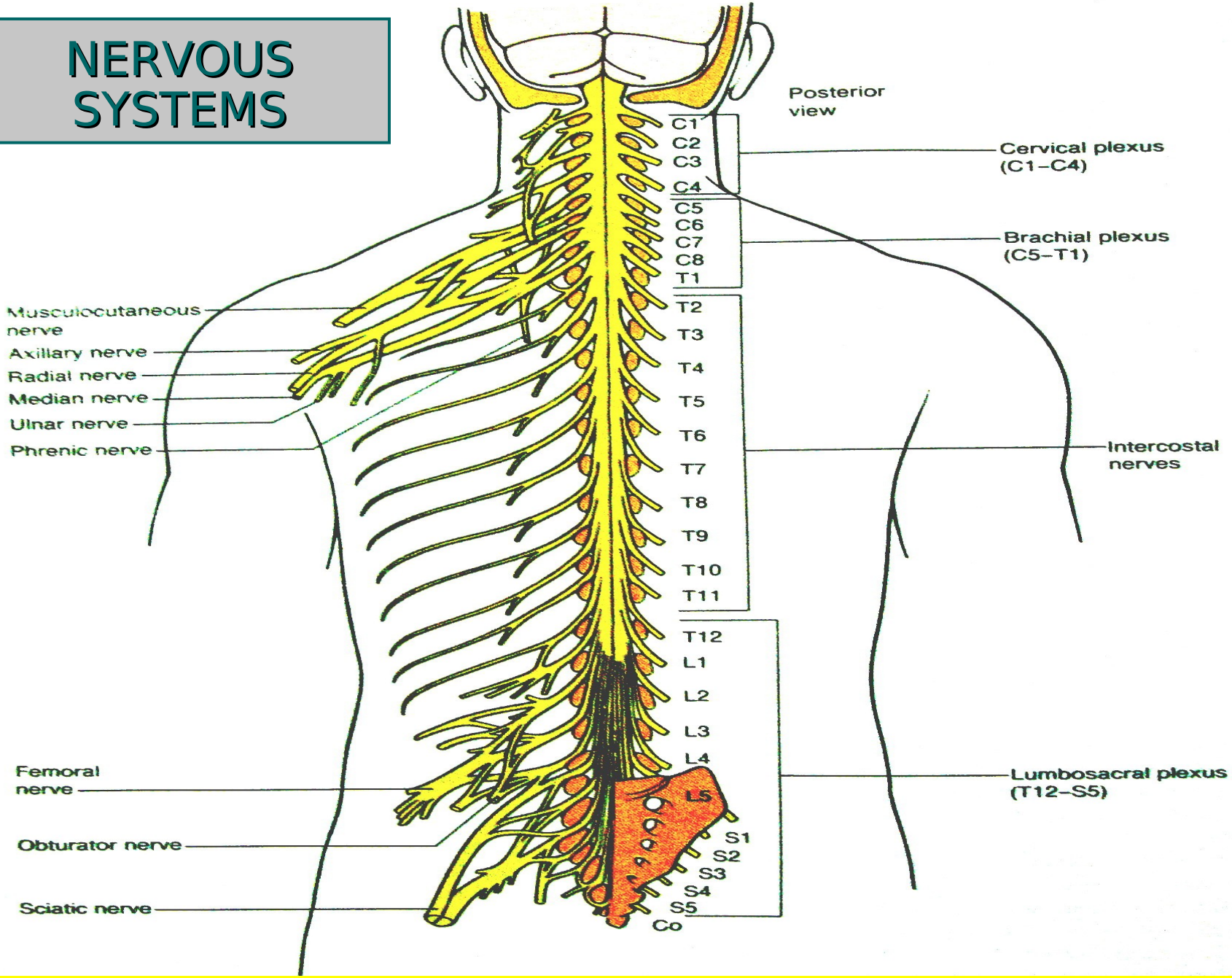
AIM AND OBJECTIVES

- **To provide knowledge on common surgical position of patient in during surgery**
- **To identify and develop awareness of potential complication in patient positioning**
- **To practice measure to avoid injuries and others complication to patient during surgery**
- **To promote safety and safeguarding patient well-being during intra-operative period**

UNDERSTANDING BODILY SYSTEM

- **INTEGUMENTARY SYSTEM**
  - **Forces include pressure, shear, friction and maceration**
- **VASCULAR SYSTEM**
  - **Dilation of peripheral vessels lead to drop in BP**
  - **Venous compression predispose to thrombosis**
- **NERVOUS SYSTEM**
  - **CNS depression due to anaesthetic drugs**
  - **Pressure on nerves may lead to temporary or permanent damage**

NERVOUS SYSTEMS



UNDERSTANDING BODILY SYSTEM

- **RESPIRATORY SYSTEM**
  - **Alteration in diaphragmatic movements and lung expansion**
  - **Inadequate tissue oxygenation and perfusion**
- **MUSCULOSKELETAL SYSTEM**
  - **Loss control of normal ROM**
  - **May resulted in joint damage, muscle stretch, strain and dislocation**
  - **Potential of pressure formation**

BONY PROMINENCES

- ***Occiput***
- ***Peri - orbital arch***
- ***Zygomatic Arch***
- ***Mastoid region***
- ***Acromion process***
- ***Scapulae***
- ***Thoracic vertebrae***
- ***Iliac crest***
- ***Greater trochanter***
- ***Medial or lateral femoral epic***
- ***Tibial condyles***
- ***Malleolus***
- ***Olecranon***
- ***Sacrum and coccyx***
- ***Patella***
- ***Calcaneus***



ASSOCIATED RISK PATIENT FACTOR

- **ADVANCED AGE**
- **NUTRITIONAL STATUS**
- **RESPIRATORY DISORDER**
- **CIRCULATORY DISEASE**
- **OBESE PATIENT**
- **CHRONIC IMMOBILITY**
- **PRESCRIBED MEDICATIONS**
- **UNDERLYING MEDICAL PROBLEMS**
- **NATURE OF SURGERY**

GOAL OF PATIENT POSITIONING

- **PROMOTE PROPER PHYSIOLOGICAL ALIGNMENT**
- **MINIMAL INTEFERENCE WITH CIRCULATION**
- **PROTECTION OF SKELETAL AND NEUROMASCULAR STRUCTURES**
- **OPTIMUM EXPOSURE TO OPERATIVE AND ANAESTHETIST SITE**
- **PROVIDE PATIENT'S COMFORT AND SAFETY**
- **MAINTENANCE OF PATIENT'S DIGNITY**
- **STABILITY AND SECURITY IN POSITION**

OPERATIVE NURSING ROLES

- Be knowledgeable on table mechanism
- Prepare table attachments and accessories
- Familiar with various patient position for optimum surgery access
- Placement of patient to comfortable position
- Correct position placement when a table break is needed intra-operatively
- Prevent interference with respiration whilst moving

OPERATIVE NURSING ROLES

- Ensure patient is fully anaesthetized before positioning
- Never reposition without anaesthetist supervision
- Table fitting must be placed without obstruction to incision site
- All fitting and attachments must be secure completely
- Ergonomic care whilst positioning
- Applying diathermy plate

INTRAOPERATIVE NURSING CONSIDERATIONS

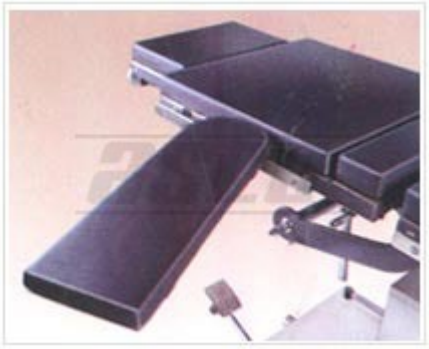
- Maintenance of unimpaired respiratory action
- Maintenance of physiological alignment from pressure
- Maintenance of adequate circulation avoiding impaired venous return
- Maintenance of body temperature by limiting exposure
- Avoiding metal contact
- Sufficient staffs and equipments for positioning
- Pressure over the patient

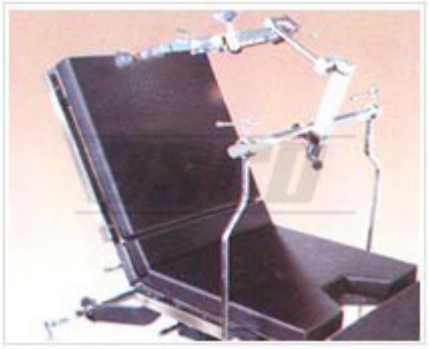
POSITION DEVICES

- Patient-positioning devices can be divided into two categories
- One which are primarily geared toward pressure-relief
- Ones which are designed to provide better access to the surgical site

TABLE ACCESSORIES AND ATTACHMENTS









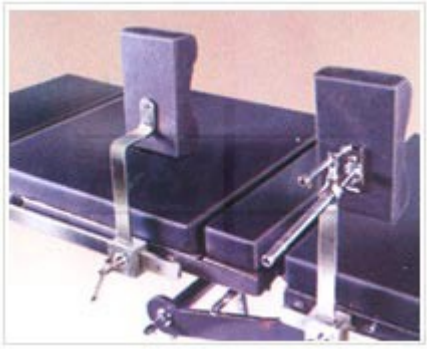










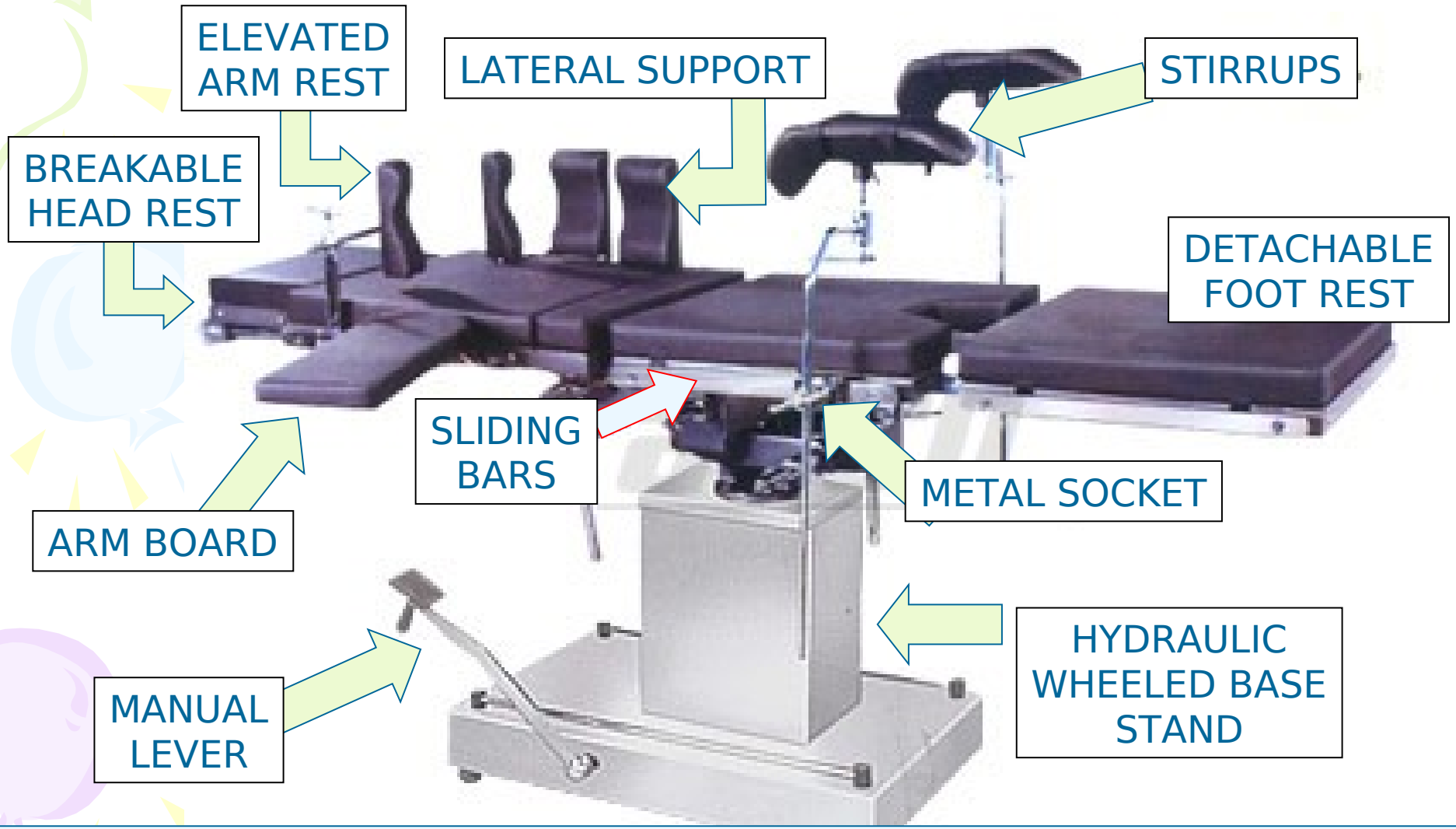








TABLE FEATURES AND ATTACHMENTS



ERS – PILLOWS, HEAD RING, SANDBAGS, ROLL SUPPORT, SOFT PADS, MATTR

POSITION DURING INDUCTION OF ANAESTHESIA

- **SUPINE POSITION**
- **HEAD EXTENDED**
- **NECK FLEXED**
- **AIM – to visualized C**
  Pharyngeal and Trac
  spaces



- **POSSIBLE COMPLICATIONS – Trauma to lips and teeth, Jaw dislocations, laryngeal or vocal cords injury, epistaxis and trauma to pharyngeal wall**

SURGICAL POSITIONING



SUPINE OR DORSAL POSITION

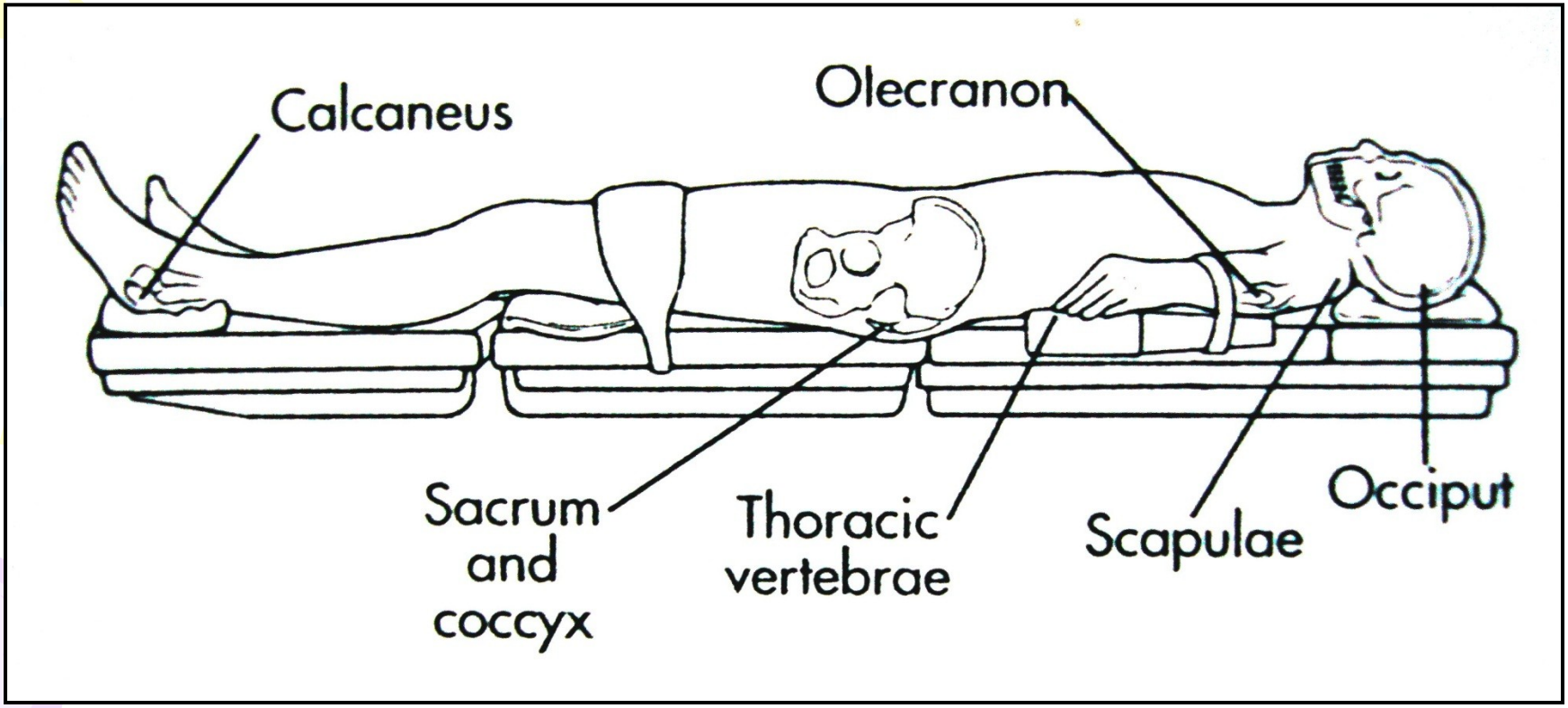
- The patient lies f
  on his back
- The arms may be
  placed beside th
  body, on an arml
  or supported acr
  the chest by lifti
  up the gown which acts as sling
- Most common Operative position, such as in Laparotomy, certain Gynecological and Orthopedic cases

SUPINE/DORSAL POSITION



NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
Head not Hyperextended	Backache resulted from unsupported lumbosacral curvature
To ensure that arms are not abducted < 90°	Paralysis of arm and hand due to over abduction
Armboard is padded	
Hand in prone position	Radial or Ulnar nerve palsy due to arm or elbow hanging or tight strapping
Arms do not overlap or hang over table edge	
Patient protected	Continuous pressure on

Potential pressure points



PRONE POSITION

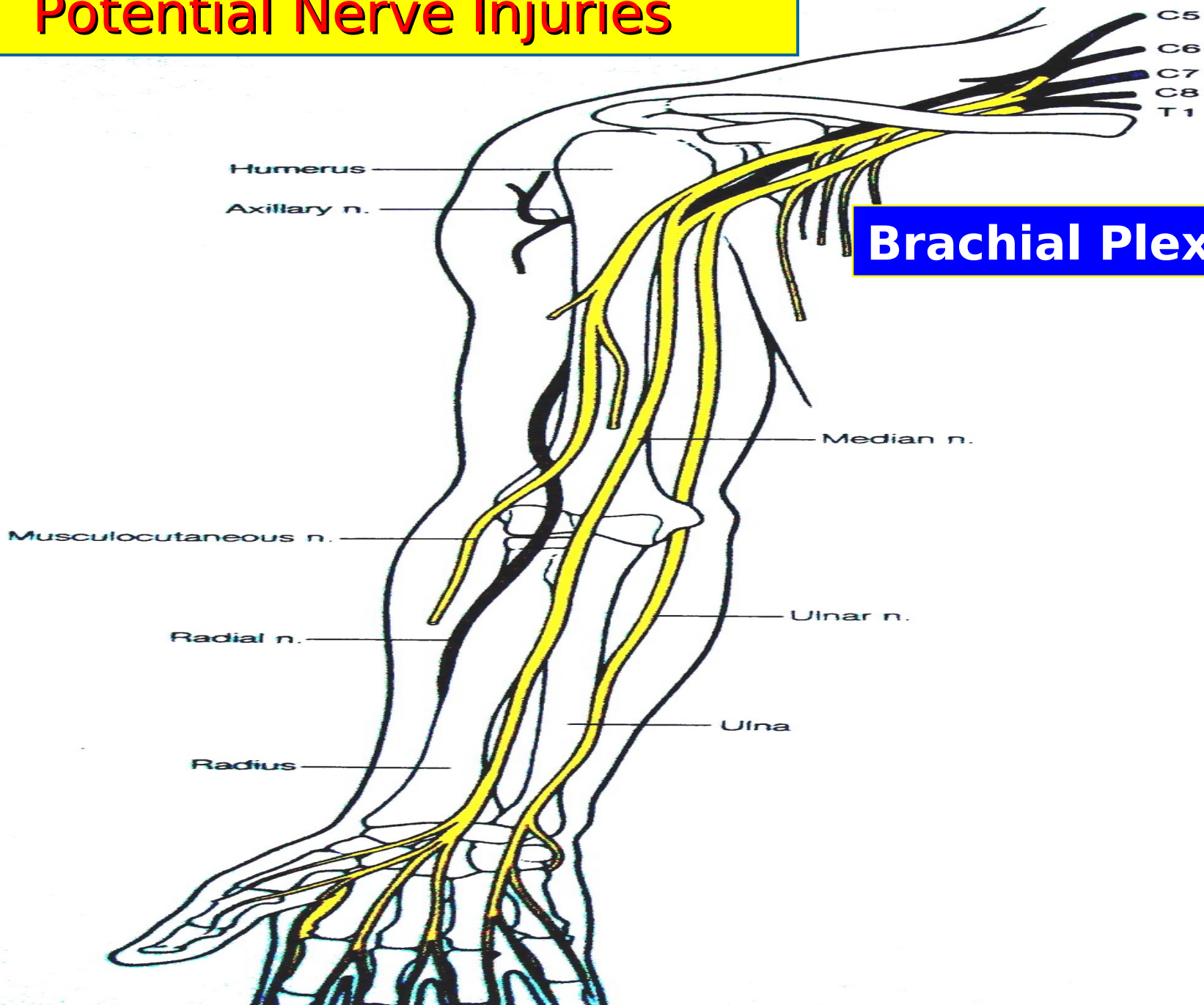
PRONE POSITION



- The patient lying with abdomen on table surface
- Arms are placed above the head
- Pillows are placed under the shoulders, hips and feet
- Access for all surgeries involving posterior back (cervical spine, back, rectal area and dorsal extremities)

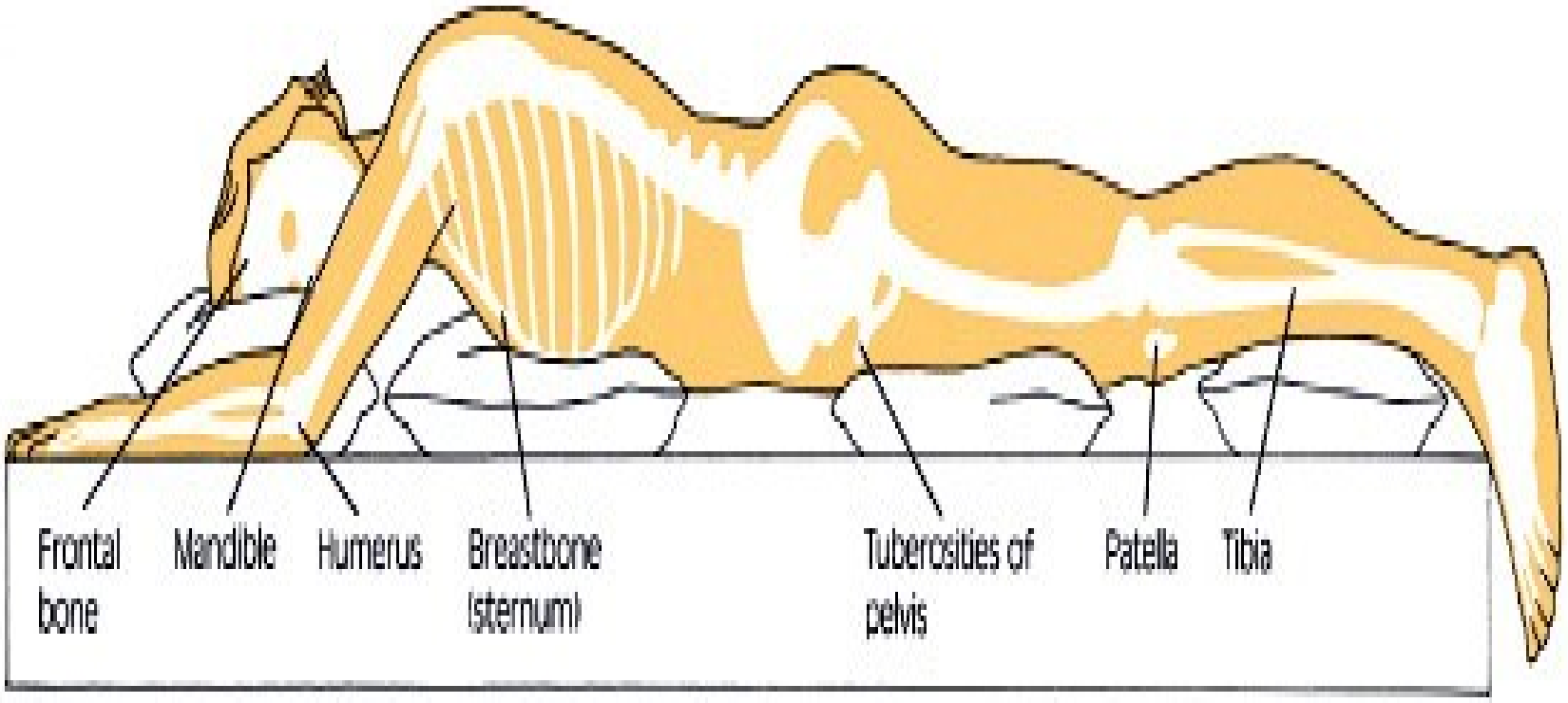
NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
Pillow or towel under shoulders and hip facilitate chest expansion, reduce abdominal pressure and venous oozing at operation site	Lower neck and upper back pain resulting from hyperextension of head
	Radial and ulnar nerve palsy due to arm restrainer
Head not hyperextended, placed on side and kept supported	Hypotension resulted from pressure on inferior vena cava and pooling of blood in lower limbs
Pressure point are well protected with	Shoulder dislocation during arm positioning

Potential Nerve Injuries



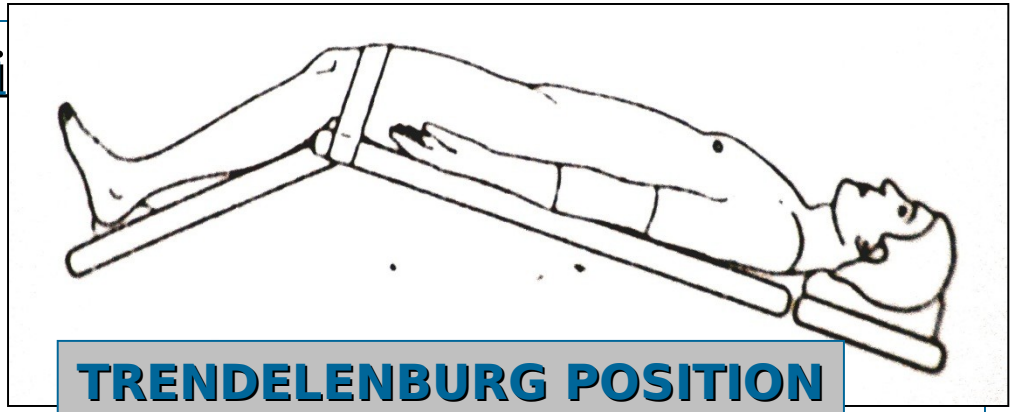
Brachial Plexus

Potential pressure points



TRENDELENBURG POSITION

- Patient lying in supi position with knees over lower break of the table
- Head tilted down to 15° or according to the surgeon preferences
- Arms may placed on the chest or armboard
- Common position for laparoscopic surgeries in pelvic or lower abdominal region
- Using of shoulder or knee braces may benefit patient from sliding



TRENDELENBURG POSITION

NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
Head not hyperextended and arm not abducted beyond 90°	A 30° Trendelenburg position may caused changes in blood pressure, cerebral edema, congestion of face and neck
Hands on padded armboards are supinated	
Arms not overlap the table edge or hang over	
Patient is protected from metal contact	A too steep position may result in cyanosis due to alteration on diaphragmatic extension and lung expansion
Bony prominences are well protected *(occiput, scapulae, thoracic vertebrae, olecranon, sacrum and coccyx and*	Shearing of skin may

REVERSE TRENDELEBURG POSITION

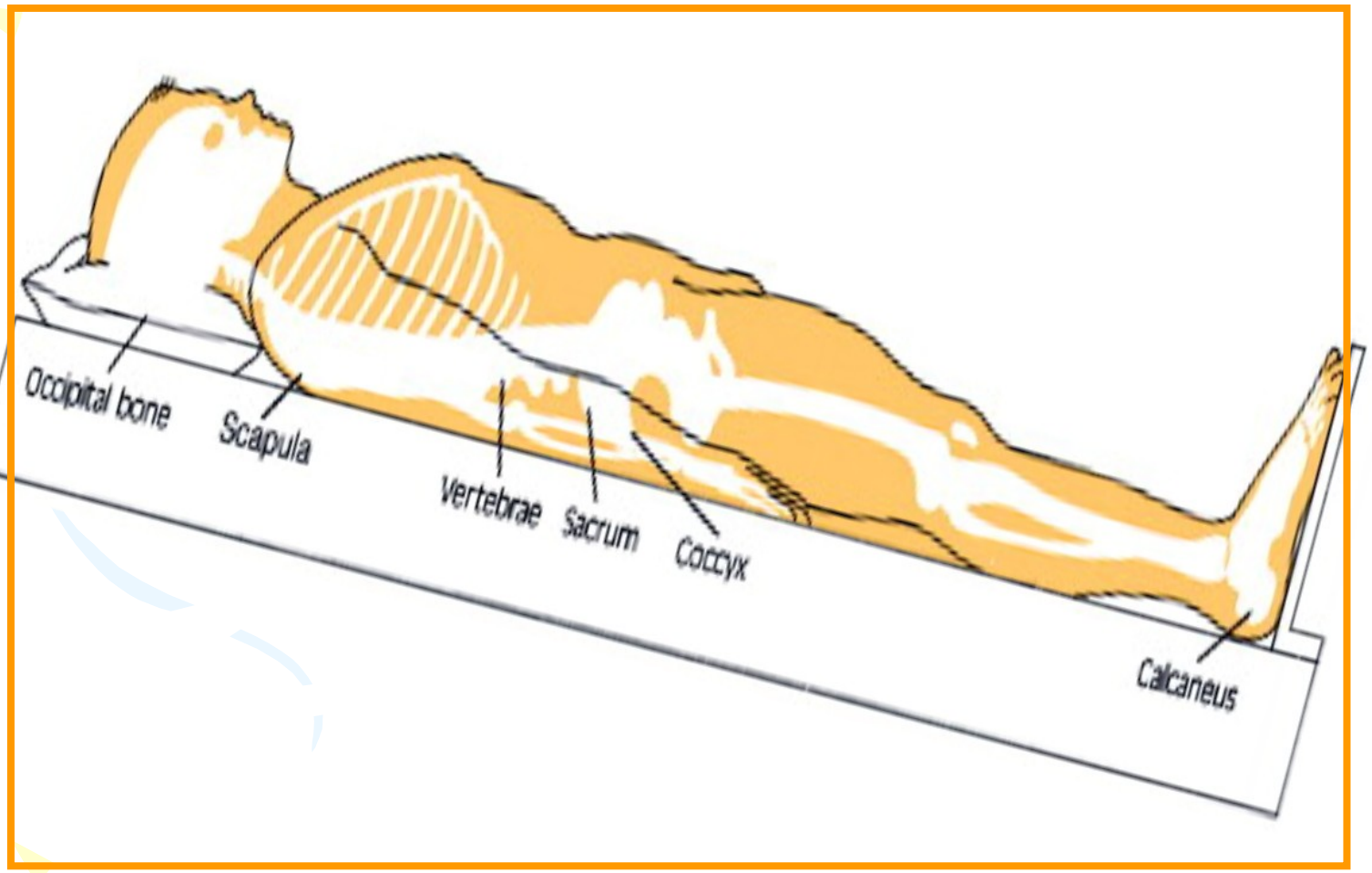
- Patient in supine position with arms by sides or on armb
- Table tilted to 5-10° raising the head
- A sand bag may use below the neck and the shoulder blade for extension of neck (RUSS TECHNIQUE)
- The head stabilized by head ring
- Position often used for head and neck surgery to reduce venous congestion
- To prevent stomach regurgitation during induction of anaesthesia

REVERSE TRENDELENBURG POSITION



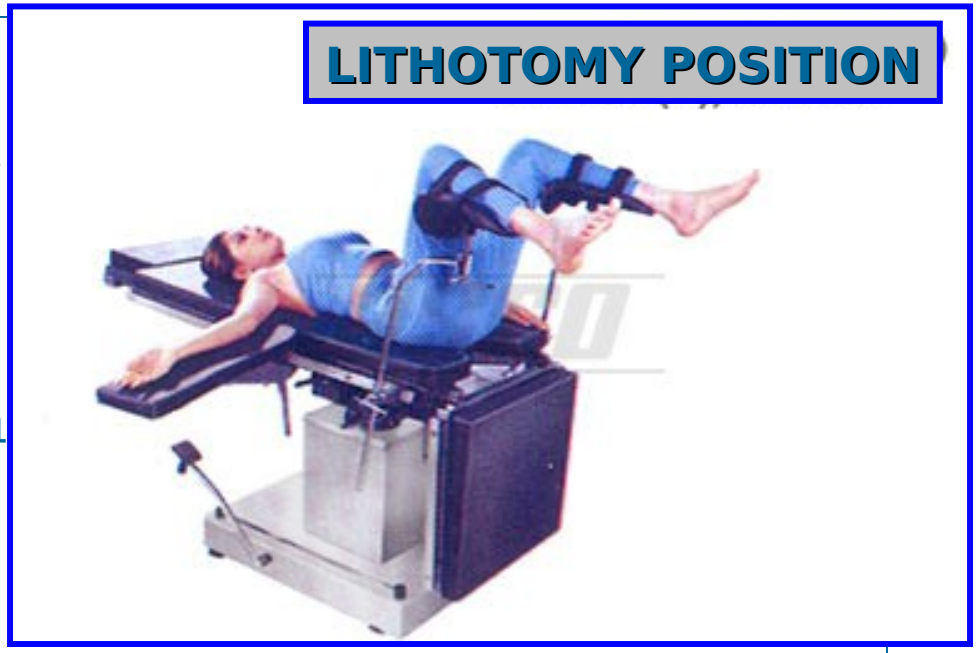
NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
Head not hyperextended and arm not abducted beyond 90°	Backache may result from unsupported lumbosacral curvature
Hands on padded armboards are supinated	Paralysis may occurred due to over abduction of arm
Arms not overlap the table edge or hang over	Ulnar and radial palsy due to elbow or arm hanging over the table or tight restraint
Patient is protected from metal contact	Pulmonary embolisms as a result of venous stasis
Bony prominences are well protected *(occiput, scapulae, thoracic vertebrae, olecranon, sacrum and coccyx and calcaneus)*	Cardiovascular overloaded due to
Anti embolic stocking may be	

Potential pressure points



LITHOTOMY POSITION

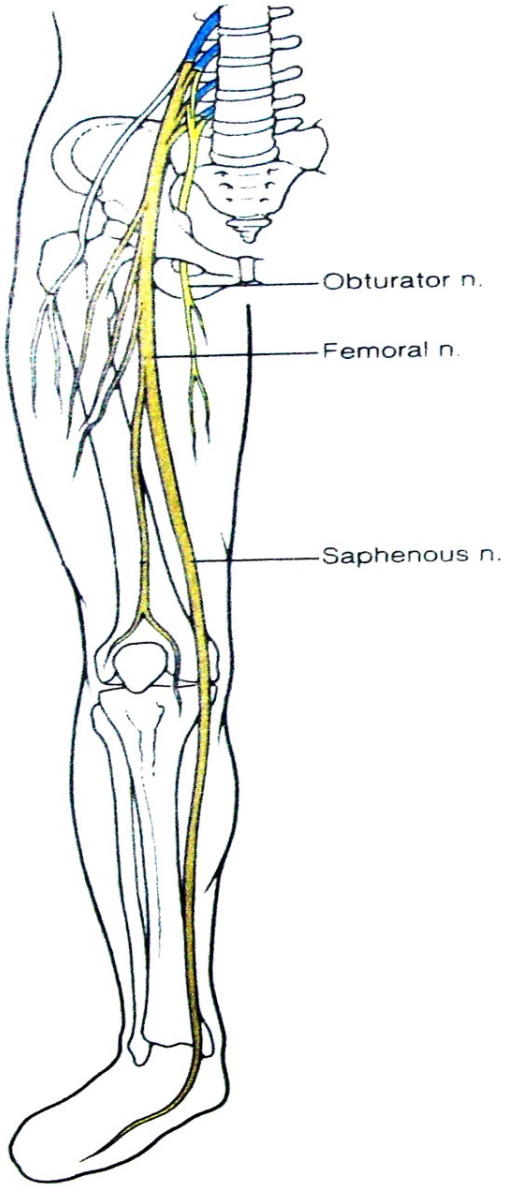
- Patient lies in supine position with buttocks at the lower break of the table
- Lithotomy stirrups pla in position level with patient ischial spine

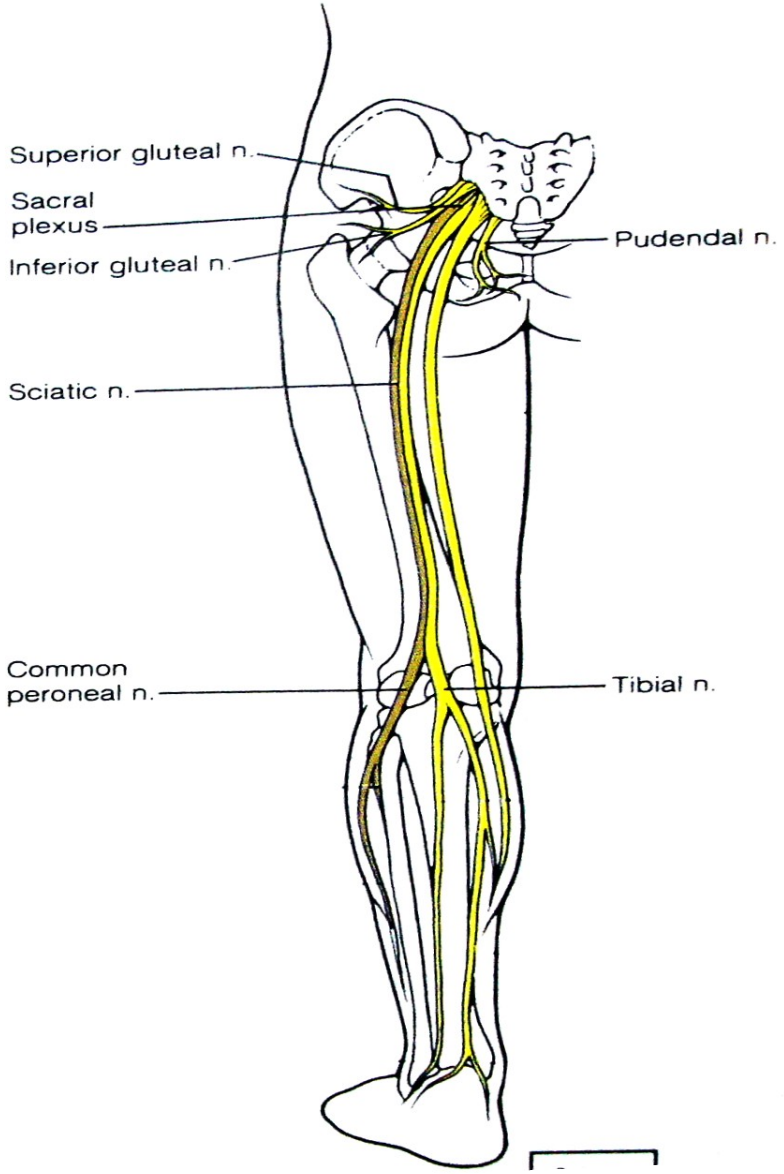


- Arms placed over the chest or on an armboard
- Legs are lifted together upwards and outwards and feet placed in knee crutch or candy cane
- Common position for Urology, Gynecology, perineal or rectal operations

NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
Two person required to raised the legs simultaneously by grasping the sole and other hand supporting the calf	Severe backache caused by too high stirrups
Stirrups bars must be checked and secure before use and it's height must be similar and not suspend the patient weight	Calf holder may resulted peroneal or femoral obturator nerve damage
The buttock must be even with the edge of bed to prevent	Osteoarthritis or stiff hips due to rough handling
	Too quick of lowering the legs may cause hypotension
	Femoral nerve damage

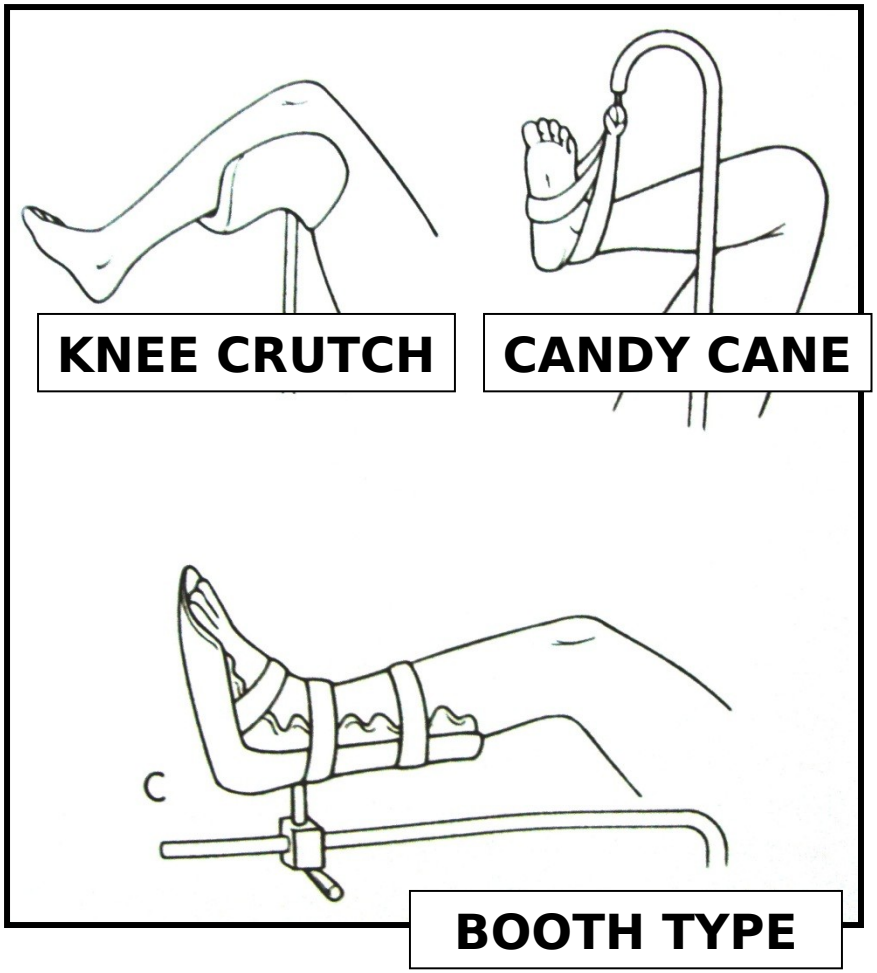
Potential Nerve Injuries





TYPES OF STIRRUPS AND IT'S HAZARDS

- KNEE CRUTCH
  - Pressure on peroneal nerve resulting footdrop and neuropathies
- CANDY CANE
  - Pressure on distalsural and plantar nerves which can cause neuropathies of the foot
  - Hyperabduction may exaggerated flexion and stretch sciatic nerve
- BOOTH TYPE
  - May produce support more evenly and reduce localized pressure



LATERAL OR KIDNEY POSITION

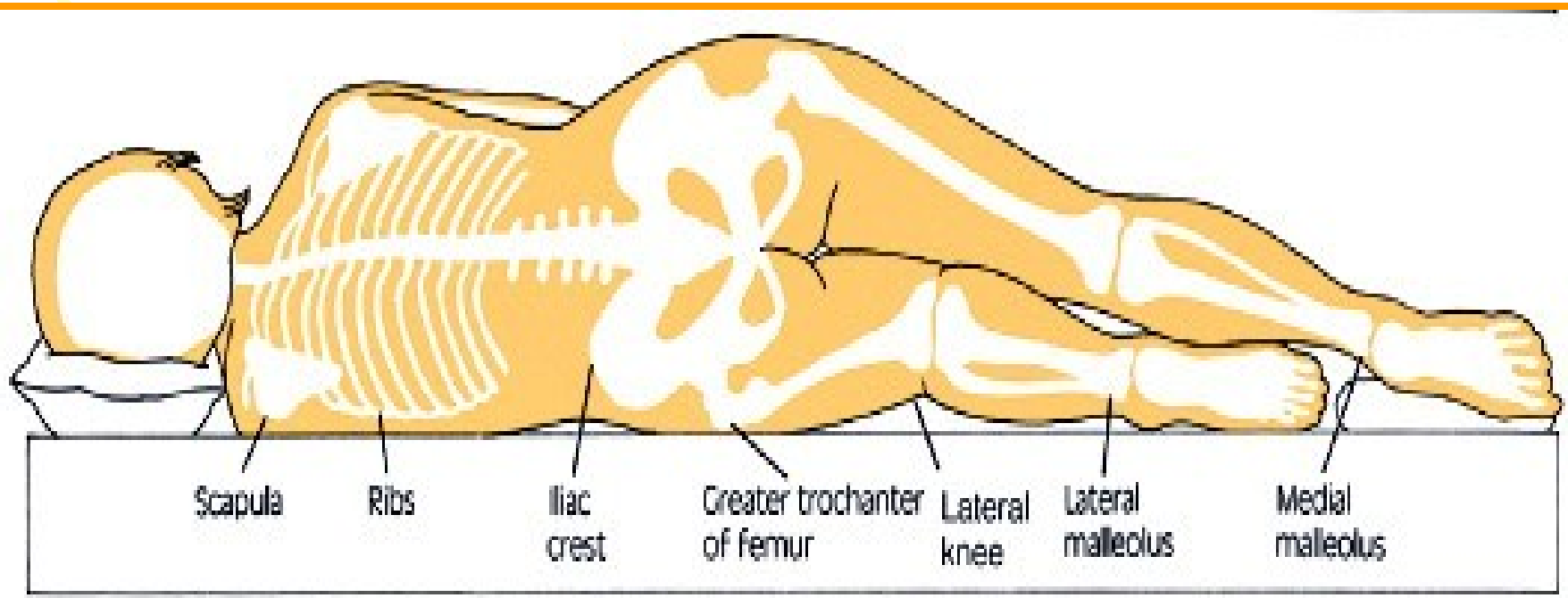
- Patient lying with one side facing operative side uppermost
- The legs flexed to 90° and a pillow is placed in between
- Upper arm rested on elevated arm rest and the other remains flexed on the table or armboard
- A roll bags may used below the hip/kidney to increased exposure of iliac region
- Position is maintained by use of sandbags or braces attached to the side of bed
- Head supported on a pillow

LATERAL/KIDNEY POSITION



NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
If table break is used, it must be correctly level with iliac crest to prevent alteration in respiration and severe post-operative backache	If the kidney rest raised too much, the lungs will not expand adequately which will result in cyanosis and hypotension
Ensure ear is not trapped when supporting the head	Injuries to brachial plexus, median, radial and ulnar nerves can occur if upper arm is not supported
Arms are supported with adequate padding to prevent pressure necrosis	If the head is not supported adequately, brachial plexus can get stretched

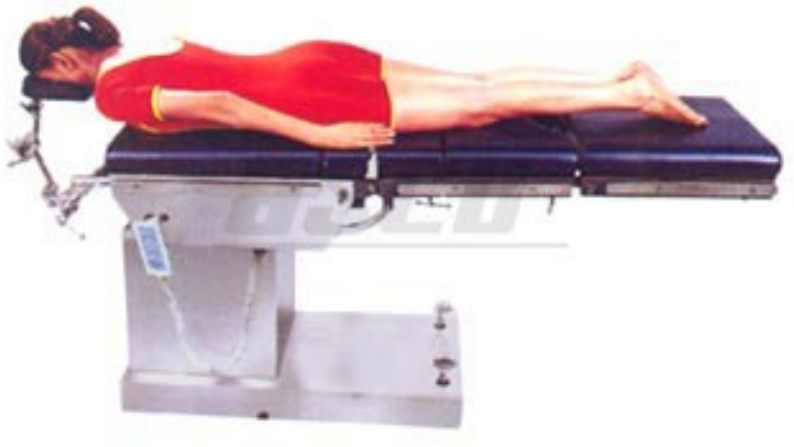
Potential pressure points



NEUROSURGICAL POSITION

- The patient may ly
  in a supine positio
  prone or lateral
- The head is positio
  either on soft ring
  spiked head rest
- The head of the table may be tilted a little to facilitate venous drainage and to reduce CSF pressure in the brain

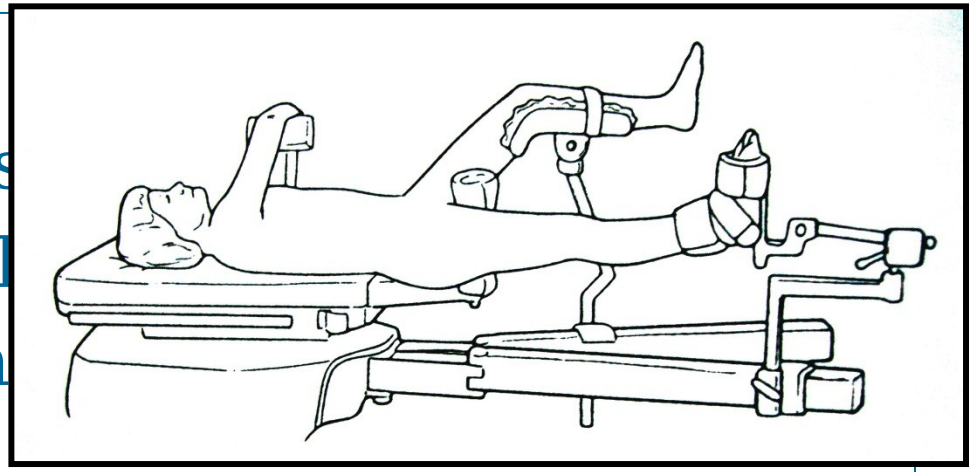
NEUROSURGICAL POSITION



NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
Ensure patient is fully anaesthetized before	Similar complications as for prone and supine positions Development of skin pressure over the ear, cheek or face if using head ring for several hours (supine)
positioning or insertion or head spike	
Eye are well covered and fully protected by pads	
Position of spike must not harm patient's ears and eyes	
Face is protected from pressure when in prone position	Sciatic nerve damage may
Arms are in good	

FRACTURE TABLE POSITION

- Patient positioned in
  supine with the pelvis
  stabilized against wel
  padded vertical perin
  post
- Traction of operative leg is achieved either by boot-shaped cuff or devices with restraining straps
- Un affected leg may be rested on well padded, elevated leg holder
- Common position for ORIF of hip or closed femoral nailing



FRACTURE TABLE POSITION

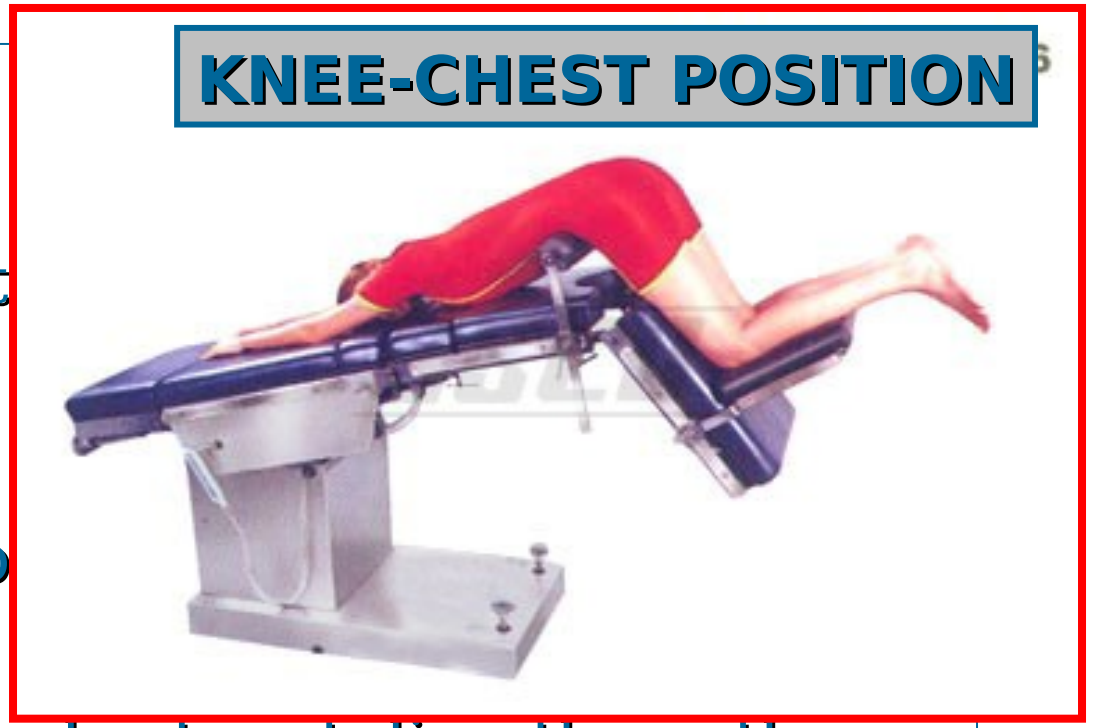
ORTHOPAEDIC FRACTURE TABLE



NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
Patient usually brought into theatre with hospital bed and traction applied	Pressure due to perineal post may injured genital structure
Ensure patient is anaesthetized before transfer onto OT table	Fecal incontinence and loss of perineal sensation may occurred as a result of pressure injury to perineal and pudendal nerve
Operating table are and attachments are ready according to surgeon preferences or standard manual	
Cautions and extra care regarding shear force	Tight strap may resulted peroneal or femoral obturator

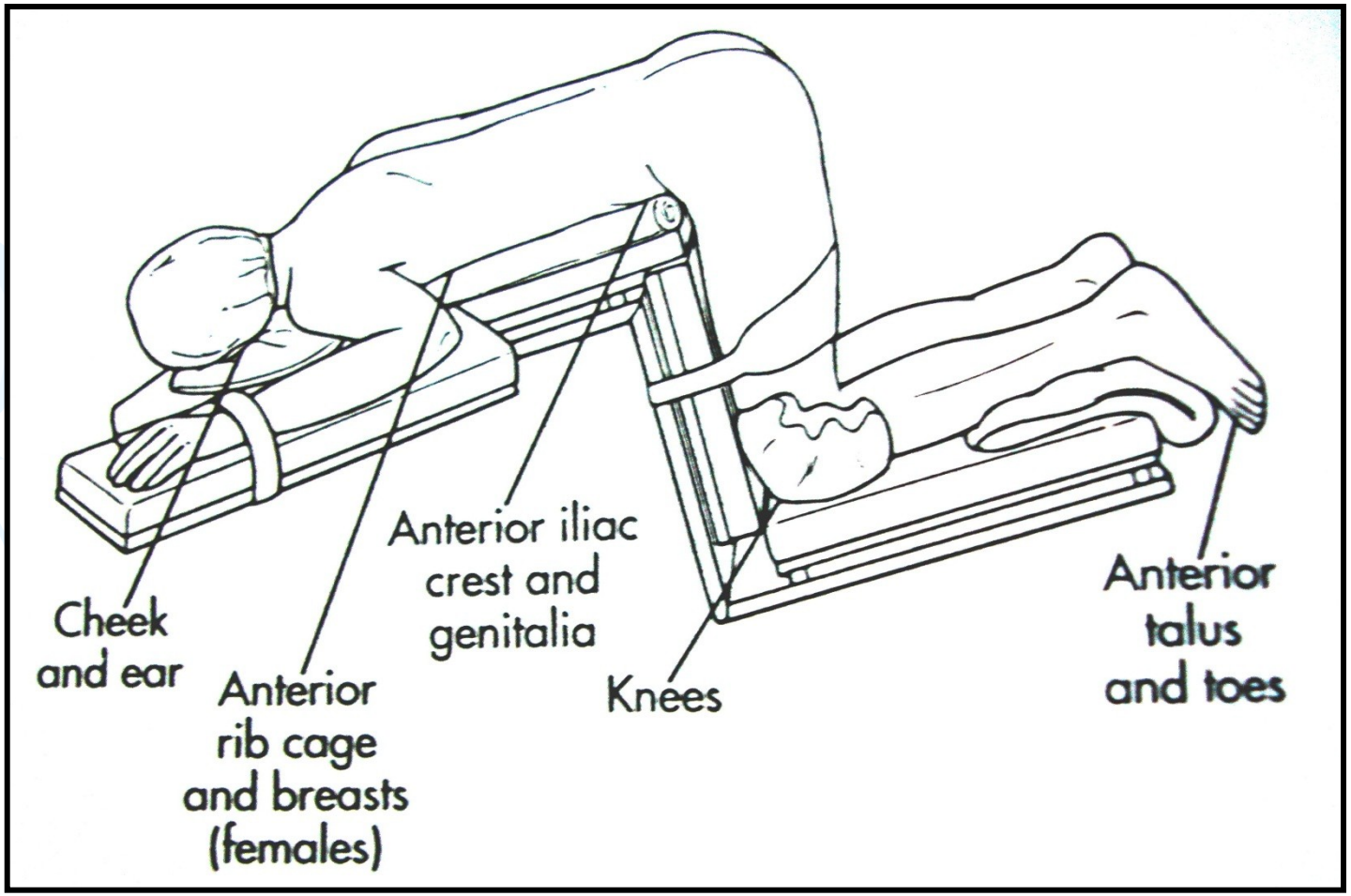
KNEE-CHEST POSITION

- Patient lying into prone position
- Both legs are abduct and flexed together at right angles
- Knees flexed and hip elevated
- Head, shoulders and chest rest directly on the table
- Arms are placed above the head
- Primary position for sigmoidoscopies and laminectomy procedure



NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
Legs moved together to prevent back strain	Lower neck and upper back pain due to hyperextended head
Arms gently lift up to prevent dislocation	Ulnar or radial nerve palsies as a result tight arm restrainer
Head is not hyperextended and placed to the side on a pillow	Hypotension due to pressure on inferior vena cava and pooling of blood at lower extremities
Bony prominences are well protected *(cheek, ear, forehead, nose, eyes, acromion*	Shoulder dislocation or brachial plexus injury when placing the arms
	Patient may fall from

Potential pressure points



SEMI-FOWLER'S AND FOWLER'S POSITION

- The patient positioned i
  supine with the upper b
  part is flexed to 45° or 9
  and the knees slightly
  flexed and legs lowered
- Arms may be placed ove
  the laps or armboard
- A footrest is used to pre
  footdrop and head spike to stabilized
- Useful position for craniotomies, sho
  breast reconstruction and ENTS'

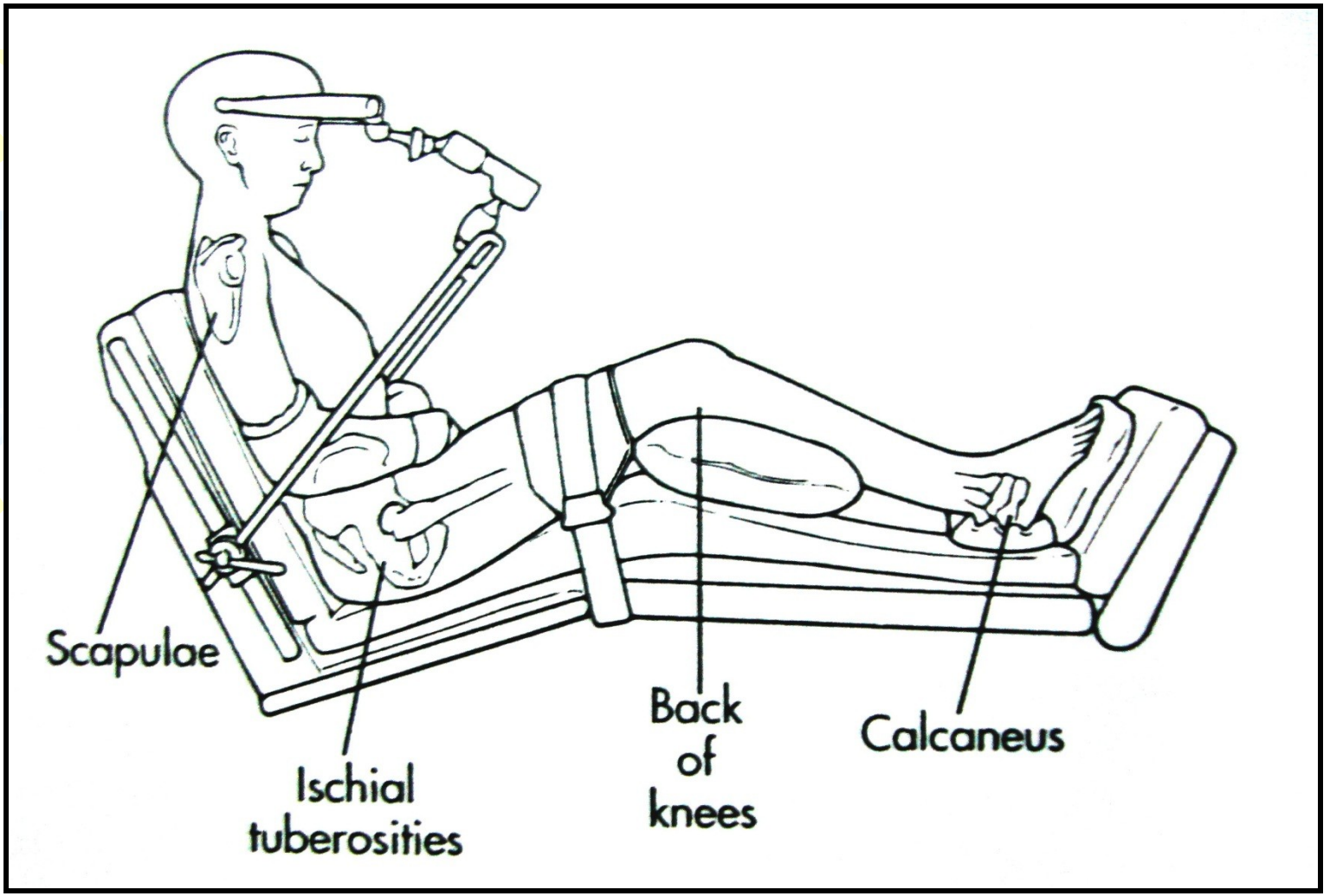
SEMI-FOWLER'S AND FOWLER'S POSITION





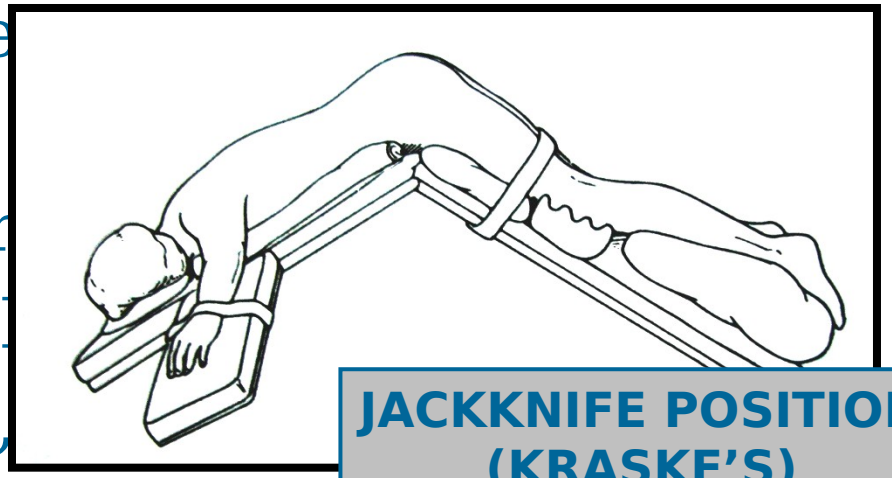
NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
The cervical, thoracic and lumbar section of spine must be aligned once position established	Orthostatic hypotension due to blood pooling at lower extremities
Extra padding are requires over bony prominences *(coccyx, ischial tuberosities, calcaneus, elbows, knees and scapulae)*	Risk of venous thrombosis and embolisms as a result of impended venous return
The use of anti-embolism stocking may necessary to assist	High risk of development of skin pressure over affected bony prominences
	Alteration on sheet

Potential pressure points



JACKNIFE POSITION

- A modification of prone
  position
- Patient hips are suppor
  on a pillow and the tabl
  are flexed at 90° angle,
  raising the hips and lowering head and body
- A straps used over the thigh to prevent shearing and sliding
- The head, face, shoulders, chest and feet are supported by soft pads or rolls to prevent bony pressure
- Common position for hemorrhoidectomy or pilonidal sinus procedures



JACKKNIFE POSITION (KRASKE'S)

NURSING PRECAUTIONS	POTENTIAL COMPLICATIONS
Pillow or towel under shoulders and hip facilitate chest expansion and reduced abdominal pressure	Lower neck and upper back pain resulting from hyperextension of head
	Injury to genitalia due to pressure
Anti-embolisms stocking aid venous return	Radial and ulnar nerve palsy due to arm restrainer
Head not hyperextended, placed on side and kept supported	
	Hypotension resulted from pooling of blood in lower limbs
Pressure point are well protected with pad *(cheek, ear, acromion process, breast, genitalia, patella, dorsum*	Shoulder dislocation during arm positioning
	Brachial plexus injury

POSITIONING OF ELDERLY PATIENT

- **FRAGILE SKIN SURFACES**
- **ARTHRITIC JOINTS**
- **LIMITED RANGE OF MOTION**
- **PARALYSIS**
- **LIFTING RATHER THAN SLIDING OR DRAGGING**
- **AVOID OF ADHESIVE TAPE FOR STRAPPING**
- **ADEQUATE PADDING FOR BONY PROMINENCES**
- **ALLOW PATIENT TO POSITIONING BEFORE ANAESTHETIZED**

POSITIONING OF PAEDIATRIC PATIENT

- **Think of '*appropriate size*'**
- **Right size for bed and attachments**
- **May necessary to use safety strap**
- **Never overextended limbs or keep in one position for longer periods**
- **Due to small size, children are prone to and has greater risk of physiologically compromised**
- **Appropriate positioning and observation are essential**


THANK YOU