

Practical conduct of Anesthesia



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Practical conduct of anesthesia

There are different techniques for induction of anesthesia is performed in one of the following methods:

A- Using general anesthetics:

- 1. Inhalational induction.**
- 2. Intravenous induction.**

B- Using local anesthetics:

- 1. Regional anesthesia.**
- 2. Nerve block.**
- 3. Local infiltration.**

Inhalational induction

Indications:

- 1. Young children.**
- 2. Upper airway obstruction, e.g. epiglottitis.**
- 3. Lower airway obstruction with foreign body.**
- 4. Broncho-pleural fistula or empyema.**
- 5. No accessible veins.**

Inhalational induction

Conditions and technique:

- 1. Pulse oximetry ,ECG and arterial pressure monitoring must accompany this technique.**
- 2. If spontaneous ventilation is planned airway patency must be ensured by oro-pharyngeal airway, a LMA or tracheal tube once anesthesia has been established.**
- 3. Using a close-fitting mask, gradual increments of inhalational anesthetic agent at a rate of 0.5% each 3 breaths, until the required depth of anesthesia is achieved.**

Inhalational induction

Complications and difficulties:

- 1. Slower induction of anesthesia.**
- 2. Problems particularly during stage 2 of anesthesia.**
- 3. Airway obstruction , bronchospasm.**
- 4. Laryngeal spasm ,hiccups.**
- 5. Environmental pollution.**

Intravenous induction

Indications:

- 1. Is suitable for most routine purposes.**
- 2. Avoid many of the complications of inhalational induction.**
- 3. Is the most appropriate method for (Rapid Sequence Induction) used in emergency surgery.**

Intravenous induction

Conditions and technique:

- 1. Wear rubber gloves for cannulation and airway management.**
- 2. A cannula must be inserted into a suitable vein and check function of an existing cannula.**
- 3. All drugs required for induction should be prepared.**
- 4. Attach patient monitors (SpO₂, ECG, Arterial pressure before i.v. induction.**
- 5. Pre-oxygenation (100% O₂ for 5 min. with a close fitting face mask), alternatively 3-4 vital capacity breaths, before elective induction to avoid transient hypoxemia before establishment of effective lung ventilation.**

Intravenous induction

Conditions and technique:

6. A small test dose is administered and its effect is observed.

- Slow injection in aged and those with slow circulation time(e.g. shock, hypovolemia, cardiovascular disease and patients on beta blockers) meanwhile CV and respiratory systems are assessed .
- RSI is indicated in anesthesia for emergency surgery and those who are at risk vomiting or regurgitation. It ensures rapid transition to stage 3 anesthesia. This is maintained by introduction of an inhalational agent or by repeated i.v. bolus injections or by infusion of an i.v. anesthetic agent.

Intravenous induction

- Doses of commonly used i.v. agents are shown in the following table.

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TABLE 21.3
Intravenous Induction Agents

<i>Agent</i>	<i>Induction Dose (mg kg⁻¹)</i>
Thiopental	3-5
Etomidate	0.3
Propofol	1.5-2.5
Ketamine	2

of the drug on the cardiovascular and respiratory systems are assessed.

Intravenous induction

7. The induction dose varies with the patient's:

- a) Weight.**
- b) Age.**
- c) State of nutrition.**
- d) Circulatory status.**
- e) Premedication.**
- f) Concurrent medication.**

Intravenous induction

Note : for I.V. cannula insertion:

- Cannula with a side injection port is useful.
- Large gauge(e.g. 16G, 14G) are necessary for transfusion of blood and fluids.
- Avoid antecubital veins, use forearm or hand dorsum veins are preferable.
- EMLA or Ametop cream preoperatively.
- Confirm i.v. entry.
- Secure with adhesive tape or specific dressing for long-term cannula.

Intravenous induction

Complications and difficulties:

- 1. Regurgitation and vomiting.**
- 2. Intra-arterial injection of Thiopental.**
- 3. Peri-venous injection.**
- 4. Cardiovascular depression.**
- 5. Respiratory depression.**
- 6. Histamine release as with thiopental ,ranging from wheals to severe anaphylactic reaction for which appropriate emergency drugs and fluids should be available in the induction room.**
- 7. Porphyria with barbiturates.**
- 8. Others like:**
 - a) Pain on injection specially with (Etomidate or Propofol).**
 - b) Hiccups with thiopental and Propofol.**
 - c) Involuntary movements with Propofol.**

Position of patient for surgery

- 1. Supine position.**
- 2. Trendelenburg position.**
- 3. Reverse Trendelenburg position.**
- 4. Orthopedic table position.**
- 5. Lithotomy position.**
- 6. Prone position.**
- 7. Jack-knife position.**
- 8. Sitting position(Fowler's position).**
- 9. Knee-chest position(lateral or prone).**
- 10. Modified lateral position (Kidney position).**
- 11. Lateral position.**
- 12. Wilson frame position.**

Position of patient for surgery



Supine Position



Trendelenburg Position



Reverse Trendelenburg Position



Fracture Table Position



Lithotomy Position



Prone Position



Jackknife Position



Fowler's Position



Knee-Chest Position



Kidney Position



Lateral Position



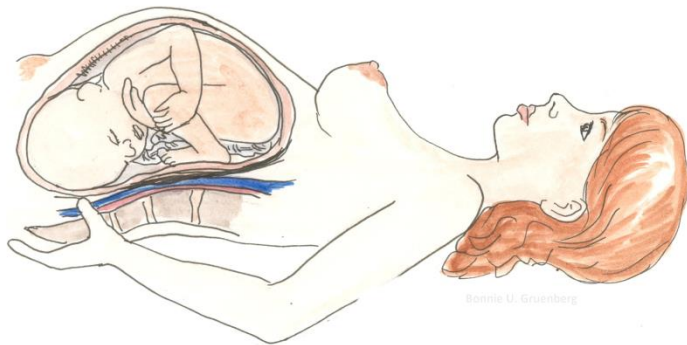
Wilson Frame Position

Position of patient for surgery

- **After induction of anesthesia the patient is placed on the operating table in one of the 12 positions appropriate for the proposed surgery, taking into account:**
 - a) Surgical access.**
 - b) Patient safety.**
 - c) Anesthetic technique.**
 - d) Monitoring.**
 - e) i.v. cannulae.**
- **Each may have adverse skeletal, neurological, ventilatory and circulatory effects.**

Adverse effects of different Positions during surgery

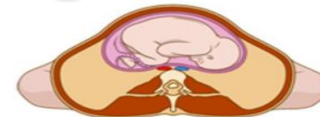
- **Supine position** : carries risk of supine hypotensive syndrome in pregnant or patients with large abdominal mass.



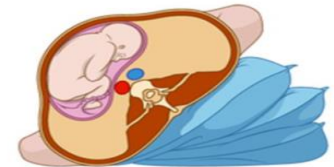
Supine Hypotension Syndrome

- Also called *aortocaval compression* or *vena cava syndrome*
- Occurs if woman lies flat on her back
 - Allows heavy uterus to compress inferior vena cava
 - Reduces blood returned to her heart
 - Can lead to fetal hypoxia
- Symptoms
 - Faintness
 - Lightheadedness
 - Dizziness
 - Agitation
- Turning to one side relieves pressure on inferior vena cava, preferably the left side

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Yena cava & aorta
compressed by fetus



Compression relieved by
tilting patient on left side

- Thus left lateral tilt of the patient using pillows, is a must.

Adverse effects of different Positions during surgery

- **Trendelenburg position:**
 - 1) Upward pressure on the diaphragm by abdominal contents reduces tidal volume.
 - 2) Damage to the brachial plexus by pressure from the shoulder supports.
 - 3) Pooling of blood in the upper part of the body may result in brain edema and delayed recovery.



Adverse effects of different Positions during surgery

- **lithotomy position :**

- 1) Leg (medial and lateral) nerve damage from stirrup which should be well padded.
- 2) Thrombo-embolism as a result of calf compression and venous stasis.
- 3) Back pain as a result of asynchronous leg elevation and pelvic asymmetry or unsupported sacrum.
- 4) Pooling of blood in the lower extremities during rapid lowering of the lower limbs and resultant hypotension.

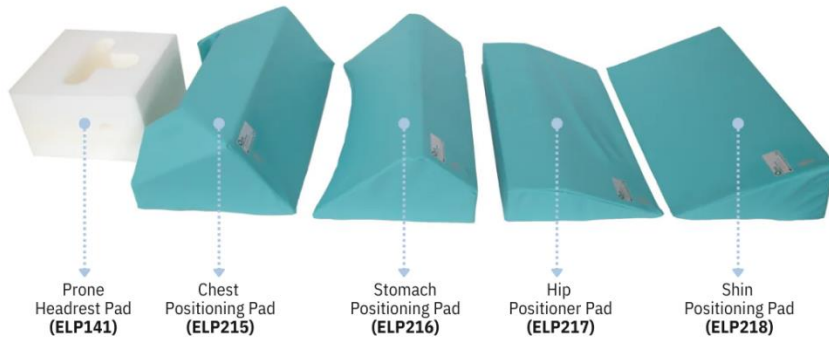


Adverse effects of different Positions during surgery

- **Prone position :**
 - 1) **Abdominal compression which may cause ventilatory and circulatory embarrassment thus pelvic and shoulder support is essential .**
 - 2) **Shoulder injury by excessive extension.**
 - 3) **Face(eyes, ears, nose, lips, tongue and teeth) injuries.**
 - 4) **Risk of kinking, inward displacement or outward dislodgement of tracheal tube, thus avoid pressure on and firmly secure the tube.**

chest and pelvic support

ARDS Prone Positioning System ELP200



Headrest for prone position



Steris L...



IndiaMART



Hipac...



David...



AneticAid



AliExpress

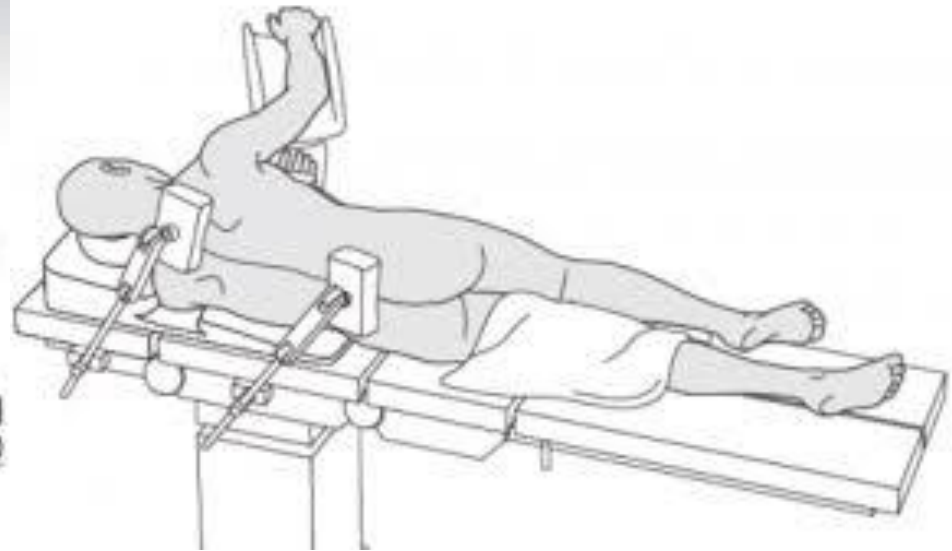


Adverse effects of different Positions during surgery

- **lateral position:**
 - 1) **Asymmetrical lung ventilation resulting in ventilation/perfusion (V/Q) miss match.**
 - 2) **Arms position may lead to skeletal and neurovascular injury and congestion of the dependent arm ,thus chest and arm's support is mandatory.**
 - 3) **Rolling backwards and falling from the table or forward into recovery position, thus pelvis and shoulders must be supported.**

Adverse effects of different Positions during surgery

- **lateral position:**



Adverse effects of different Positions during surgery

- **Modified lateral (Kidney) position:**
- **in addition to the adverse effects of lateral position, further effects are:**
 - 1) Skeletal injury (spine and limbs).**
 - 2) Nerve injury.**
 - 3) Stretching of inferior vena cava causes decreased venous return to the heart and impairs cardiac output.**

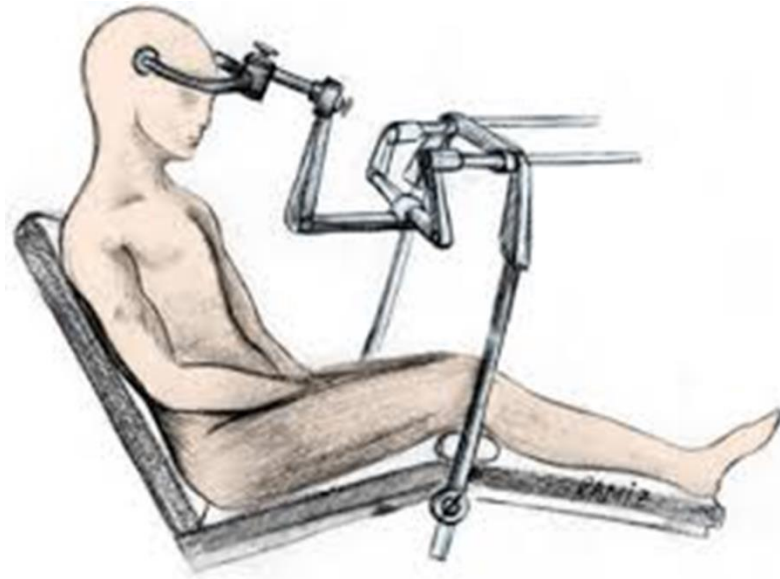
Adverse effects of different Positions during surgery

- **Modified lateral (kidney) position:**



Adverse effects of different Positions during surgery

- **Sitting position:**



1) Hypotension.

2) Venous air embolism (in craniotomy).

3) (cervical spine) injury, thus skull frame must be applied.