

Thiopental Sodium

It is one of the barbiturates group:

Physical properties:

- ***Yellowish powder.***
- ***Bitter taste.***
- ***Faint smell of garlic.***
- ***Available in a single ampoules and dissolved in distilled water to produce 2.5% solution with a pH of 10.8 ,slightly hypnotic.***
- ***The fresh solution may be kept for 24 h.***

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Pharmacological effects :

Central Nervous System:

- ***Produces anesthesia usually less than 30s after i.v. injection (some delay in low C.O.)***
- ***A potent hypnotic but a weak analgesic.***
- ***Surgical anesthesia requires large doses which causes cardiorespiratory depression.***
- ***Reduces cerebral metabolic rate(CMR) and cerebral blood flow (CBF), cerebral blood volume(CBV) and intracranial pressure(ICP).***

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Central Nervous System:

- ***Consciousness usually regained in 5-10 min.***
- ***During recovery or at low doses has an antanalgesic effect(reduces pain threshold)***
- ***Very potent anticonvulsant.***
- ***Sympathetic N.S. is depressed more than parasympathetic N.S. which may cause bradycardia, but tachycardia after induction***

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Cardiovascular System:

- ***Myocardial depression and peripheral vasodilatation specially with large doses or rapid injection.***
- ***Arterial pressure decreases, profound hypotension in a patient with hypovolemic or cardiac disease.***
- ***Decreased heart rate but reflex tachycardia.***

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Respiratory System:

- *Decreases ventilatory drive.*
- *A short period of apnea preceded by a few deep breaths is common.*
- *Respiratory depression is influenced by premedication (more with opioids).*
- *Assisted or controlled ventilation may be required.*
- *When spontaneous ventilation is resumed RR and V_T are usually lower than normal, increase on surgical stimulation.*

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Respiratory System:

- ***Increases bronchial, although frank bronchospasm is uncommon.***
- ***Bronchospasm may be precipitated by surgical stimulation, secretions, foreign body, Guedel or LMA in the Oropharynx, (propofol is more satisfactory in this respect).***

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Skeletal Muscles:

- ***Reduces tone.***
- ***Produces poor muscle relaxation when used as a sole anesthetic agent, and movement in response to surgical stimulation is common.***

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Uterus and Placenta:

- ***Suppresses uterine , but no effect on resting uterine tone.***
- ***Readily crosses placental barrier, but does not reach the maternal blood level.***

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Eye:

- *Intraocular pressure is reduced by 40%.*
- *Pupils dilate first but constricts as surgical anesthesia is reached.*
- *Corneal, conjunctival, eye lash and eye lid reflexes are abolished.*

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Hepatorenal Function:

- ***Hepatic and renal functions are impaired transiently .***
- ***Hepatic enzyme induction may increase metabolism and elimination of the drug.***
 - a) The dose must be reduced in cases of: malnutrition or hepatic impairment as (75-85)% of the drug is bound to albumin.***
 - b) Hyperventilation and alkalemia.***

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Dosage and Administration:

- *Must be administered as a of 2.5% solution.*
- *1-2 ml should be administered initially to detect severe pain of inadvertent intra-arterial injection, if there is no or little pain then the remainder is administered.*
- *The anesthetic dose is variable among people.*

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Dosage and Administration:

- ***Initial dose in healthy adult is 4mg/kg ,if eye lash reflex does not occur within 30s ,supplemental doses of 50-100mg should be given slowly.***
- ***In young children a dose of 6mg/kg is usually necessary.***
- ***Elderly dose is smaller (2.5mg/kg), in very frail patients even 50mg may induce sleep.***

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Dosage and Administration:

- ***No other drug should be mixed with thiopental.***
- ***NMBA should not be given until anesthesia is certain.***
- ***The i.v. cannula should be flushed with saline before ketamine, vecuronium or atracurium to obviate precipitation.***

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Adverse effects:

- 1. Hypotension: (more with high doses or in hypovolemic, shocked or previously hypertensive patients. It should not be in sitting position.*
- 2. Respiratory depression:(more with high doses or opioid premedication. Facilities for artificial ventilation must be available.*

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Adverse effects:

- 3. Tissue necrosis: may follow perivenous extravasation. Median nerve damage may occur in the antecubital fossa. The needle must be left in place and Hyaluronidase injected.*
- 4. Intra-arterial injection: usually occur in the brachial artery or an aberrant ulnar artery in the antecubital fossa or occasionally at the wrist.*

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Adverse effects of Intra-arterial injection:

Causes severe arterial spasm and thrombosis , ischemia or gangrene (if left untreated). Risk is greater with 5% solution.

- a) The needle should be left in place.***
- b) Papaverine 20mg(vasodilator) is injected into the artery.***
- c) Stellate ganglion or brachial plexus block may reduce arterial spasm.***
- d) i.v. heparin and oral anticoagulants post operatively.***

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Adverse effects:

- 5. Laryngeal spasm.***
- 6. Bronchospasm :is unusual but may be precipitated in asthmatic patients.***
- 7. Allergic reaction: ranges from cutaneous reaction to (rare) severe anaphylaxis with CV collapse.***
- 8. Thrombophlebitis: uncommon with 2.5% solution.***

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Indications:

- ***Induction of anesthesia.***
- ***Maintenance of anesthesia for short procedures(as cumulation may follow repeated doses.***
- ***Treatment of status epilepticus.***
- ***Reduction of intracranial pressure.***

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Absolute contraindications:

- *Airway obstruction : i.v. anesthesia should not be given if difficult airway maintenance is anticipated e.g. epiglottitis or oropharyngeal tumors.*
- *Porphyria :causes paralysis or CV collapse.*
- *Previous hypersensitivity to barbiturates*