

# Inspired Induction Natural Emergence

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# Inspired Induction

- Smooth
- Anxiety free
- Fosters parental and patient satisfaction

# Oral Premedication

- Given to mother
  - Accessing the rhythm of the mother and child
- Improving parental satisfaction
  - Easing separation
- Less forceful inductions

# Oral Midazolam

- In clinical studies involving more than 480 patients, Versed Syrup was shown to be a **safe and effective** sedative. Additional safety data are provided in approximately 200 publications that describe the experiences of more than 3,000 patients who received Versed Syrup in different clinical settings.

# Minimizing Stimuli



# Gradual Induction

- Warm Bed, Low Lighting, Quiet music
- High Flows (12 L) Nitrous Oxide, and Oxygen
- Sevoflurane, Nitrous Oxide, Oxygen
  - Concentration Effect/ Second Gas Effect
- Sevoflurane, Oxygen



# Acuvein

Less tactile

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Loss of 3d perception

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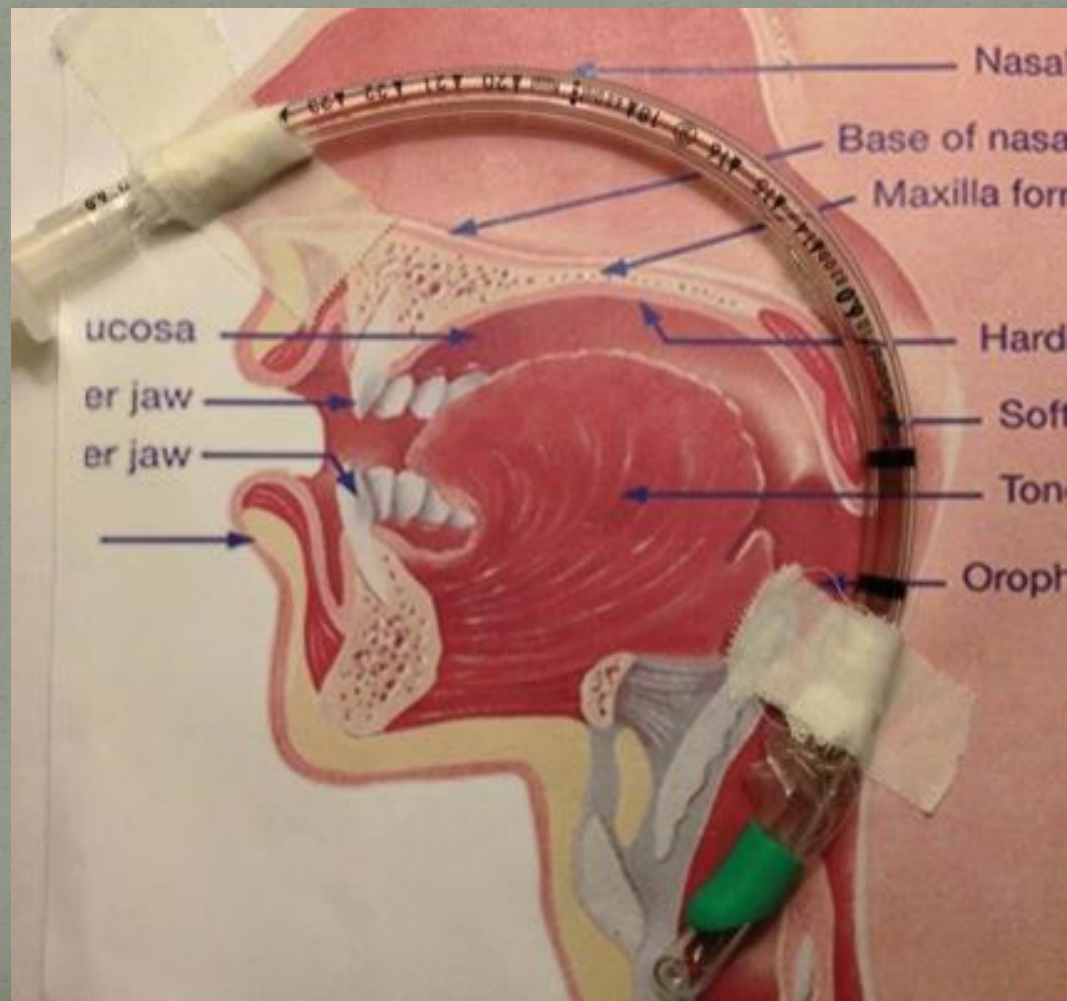


# Atraumatic Nasal Intubation





# Avoid The Upper Passageway

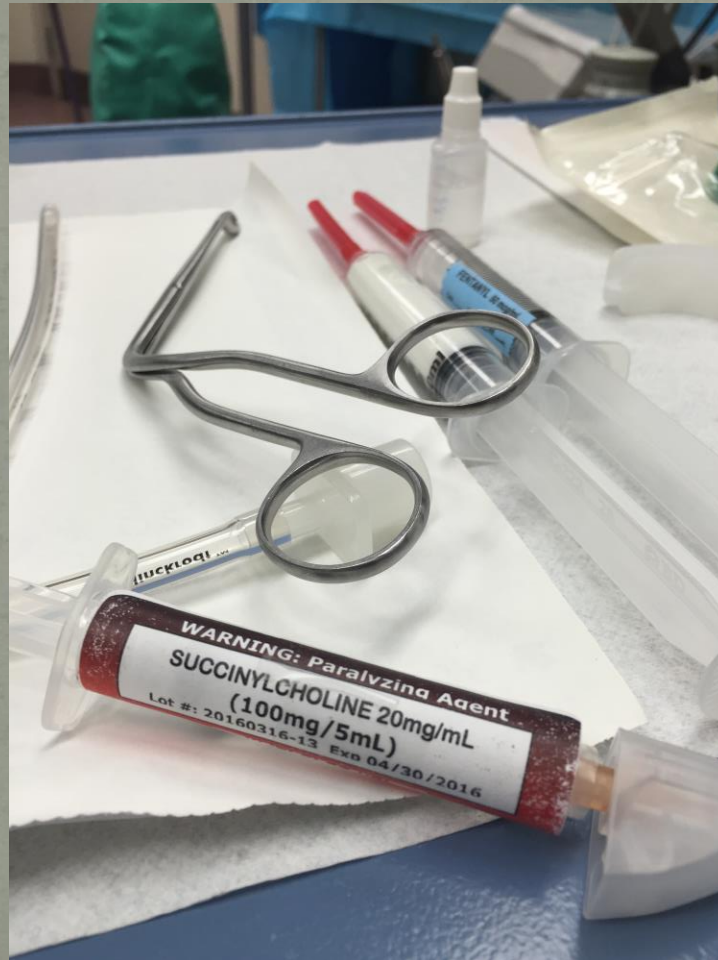


# Use the lower passage

- Less vascular
- Larger
- Kovanase
- Point caudad and contralateral



# Invasive versus noninvasive ventilation



# Non Invasive Ventilation



# Enhancing Respiration



# Emergence Delirium

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# defined as

- dissociated state of consciousness
- child inconsolable
- does not make eye contact
- irritable and uncompromising, thrashes around
- even presence of parent does not help
- paranoid ideation (may think clinician or even parent is trying to harm him)

# clinical presentation

- usually lasts 5 to 15 min
- usually self- limiting, but may cause harm to child or caretaker
- associated with most anesthetic agents
- particularly with introduction of sevoflurane in 1996
- associated more with inhalational agents than other forms of anesthesia



# etiology

- attributed initially to inadequate pain control, but later studies noted appearance even when good analgesia provided
- associated with rapid emergence anesthetics,

# risk factors include

- age 1 to 5 yr
- often re- solves spontaneously, but may last up to 45 min
- may occur even when children do not undergo surgery (eg, general anesthesia for magnetic resonance imaging)
- incidence lower among children given fentanyl as well as sevoflurane (slows emergence)
- pain may contribute,
  - particularly important in short surgical cases in which patient awakens quickly
  - administer analgesics early to ensure adequate pain control before patient awakens

# anesthetic technique:

- very low incidence associated with propofol
- administration of clonidine or midazolam reduced incidence of emergence delirium among boys given penile nerve block for circumcision, compared to placebo; benefit thought to be due to slowing of emergence
- in several studies, single dose of dexmedetomidine administered with sevoflurane associated with significantly lower emergence delirium or agitation, compared to placebo
- premedication has no benefit and may exacerbate.

# proposed mechanism;

- sevoflurane has biphasic effect on post-GABA receptor-mediated inhibitory postsynaptic currents (inhibits at low concentrations; potentiates at high concentrations)
- propofol induction potentiates receptors, resulting in calmer patients
- as child ages, GABA receptors evolve from excitatory to inhibitory; may explain why risk decreases as children mature
- developmental differences in neurotransmitters and neuromodulators may explain different reactions to sevoflurane at different ages

# risk factors:

- age <5 yr
- no previous surgery
- poor adaptability to change
- ophthalmology or otorhinolaryngology procedure
- sevoflurane or isoflurane
- use of analgesics
- short time to awakening

# biggest risk factors;

- otorhinolaryngology procedures
- short time to awakening
- use of isoflurane

# emergence agitation scale:

- positive signs
  - child makes eye contact with caregiver, is purposeful, aware of his or her surroundings
- negative signs
  - child restless or inconsolable; lower score suggests lower risk; other studies suggest risk increased if child's preoperative anxiety high or induction difficult

# clinical approach to child with emergence delirium:

- administer small dose of propofol, allow child to go back to sleep and awaken calmer
- if child has pulled out intravenous (IV) line, may simply have to wait
- if child agitated, rule out obstructed airway, hypercarbia, hypotension, hypoglycemia, increased intracranial pressure, and bladder distention



# discussion; personal observations

- extubation
  - important potentiator
  - natural emergence
- recovery
  - non stimulating environment
  - treat as a sensory overload issue
- physostigmine
- xerostomia

# Natural Emergence

- Allow Patient to be totally unstimulated
  - Dim lighting, quiet environment
- Prolonged period allowing for
  - Blowing off inhaled agents
  - Degradation, and metabolism of anesthetics
- Warmth, security
- Rapid feeding



