There is no such thing as anesthesia for general practitioners or any other dental specialist. Anesthesia is anesthesia and when you try to dumb it down, quality suffers.

Doing it correctly is the same for specialists and non-specialists.

82% of deaths are airway in nature
What is the actual risk?

1.4 per 1,000,000

Since December 1844, when Dr. Horace Wells, a dentist, first demonstrated that volatile gases could be inhaled and used for medical and dental anesthesia, oral and maxillofacial surgeons have been recognized leaders among the nation's dental and medical professions for the delivery of safe and effective outpatient anesthesia. In addition, the American Association of Oral and Maxillofacial Surgeons continues to be consulted by other medical and dental specialties, accrediting agencies and regulatory bodies regarding standards and anesthetic safety.

The history of oral and maxillofacial surgery office-based anesthesia parallels the emergence of the medical hospital model when, in the early 1930's, Dr. John Lundy, who first developed and used the IV pentothal technique at the Mayo Clinic, taught the new IV procedure to Mayo's Chief of Oral Surgery, Dr. Ed Staffney. Dr. Staffney, in turn, ensured that all oral surgery residents at the Mayo Clinic were taught IV pentothal anesthesia as part of their clinical training. The Mayo Clinic's senior oral surgery resident at that time was Adrian Hubble, who went on to teach this technique to oral surgeons across United States.

Clearly, dental office-based anesthesia is not new; in fact, it actually predates the development of certified registered nurse anesthetists. Dentistry, specifically oral and maxillofacial surgery, has remained in the forefront of the field of anesthesia. Fearful patients, who are often in pain, are effectively, economically and safely managed in the oral and maxillofacial surgery office with the use of deep sedation/general anesthesia that frequently incorporate agents such as propofol and/or ketamine.

Prospective and retrospective morbidity and mortality studies of deep sedation/general anesthesia in the oral and maxillofacial surgery office reveal an enviable safety record. The OMS National Insurance Company (OMSNIC) Anesthesia Morbidity and Mortality Data (2000-2010) examined a total number of 29,975,459 in-office anesthetics (conscious sedation, deep sedation and general anesthesia) administered by oral and maxillofacial surgeons and found the ratio of office fatalities /brain damage per anesthetics administered to be 1.365,534.

1 per 365,534
Utilizing too much benzodiazepines and not administering enough narcotic.

BECAUSE...

Airway Management
One of the biggest mistakes during the administration of moderate sedation

What do I do if the patient stops breathing?

The primary responsibility in anesthesia is to make sure that the good air goes in and the bad air gets out.
Airway Management

It is the dynamics of drugs and the patient's anatomy that can compromise the patient from getting the good air in and the bad air out.

Airway obstruction

Lucky pajamas

Airway obstruction

Lucky pajamas

Unlucky airway
Airway Management

Apnea or obstruction are not medical emergencies

Failure to recognize them will deteriorate into a medical emergency

They can be treated without immediately resorting to reversal agents
Anatomic Obstruction

The patient will only abruptly stop breathing for a reason.

Drugs

Airway Management

BE PREPARED!

Airway tray

Apnea

- suspension of external breathing
- no movement of the muscles of respiration
- voluntary, drug induced

Obstruction

- a lack of patency of the airway
- movement of the muscles of respiration
- mechanically induced

The patient is not breathing
Apnea or Obstruction?

Pre-tracheal stethoscope

Capnography

mild obstruction with reduced tidal volume
patency improved with improved tidal volume

Chinning a mild obstruction

Apnea or Obstruction?

Watch your surgical site
The full face mask is used to definitively determine...

- Is the patient breathing?
- Is the airway patent?

Diagnostic tool

You must be able to achieve a proper mask fit

Airway Management

Placing a face mask and supporting the airway
You must be able to achieve a proper mask fit

Apnea or Obstruction?

Examination & Evaluation
- chest excursions
- breathing sounds (snoring, crowing)
- reservoir bag moving
- breath sounds (pre-cordial stethoscope)
- End-tidal CO₂ (capnography)
- Pulse oximetry
Apnea

Diagnosis
- no chest excursions
- reservoir bag not moving
- no breath sounds (pre-cordial stethoscope)
- no end-tidal CO2 (capnography)

Apnea

Treatment
- chin tilt
- jaw thrust
- positive pressure ventilation (PPV) with nasal hood (3 attempts)
- positive pressure ventilation (PPV) with face mask

Apnea or Obstruction?

Reservoir bag moving?
Airway obstruction presents on many levels

- Supra-glottic (anatomic obstruction)
  - short & thick neck
  - large tongue
  - large tonsils and adenoids
  - deviated septum
  - secretions
- Glottic (partial or full laryngospasm)
  - primitive reflex
  - patient is semi-conscious
- Sub-glottic (bronchospasm)
  - asthma
  - anaphylaxis
  - aspiration
- Sub-diaphragmatic (New concept)

Obstruction

Diagnosis

- chest excursions, tracheal tug, nasal flaring
- reservoir bag not moving
- diminished or no breath sounds (pre-cordial stethoscope)
- diminished or no end-tidal CO2 (capnography)
Obstruction

Treatment
- chin tilt
- jaw thrust
- positive pressure ventilation (PPV) with nasal hood (3 attempts)
- positive pressure ventilation (PPV) with face mask
- place an airway adjunct (NPA, Oral airway, LMA)
- positive pressure ventilation (PPV) with face mask
- administer paralyzing agent to treat complete laryngospasm

If the patient isn’t breathing...

Ventilate the patient that is apneic ✓
Stop agents, continue to ventilate until the patient resumes respirations
Ventilate with a nasal mask to overcome mild supra-glottic obstructions.
This is a poor choice for managing a partial or full laryngospasm

Initial apnea and ventilating with a nasal hood
Reservoir bag not moving. You must ventilate.

Correct mask placement and fit

The full face mask is quickly placed, the airway supported and is used to determine...

Is the patient breathing?

Diagnostic tool
If you can’t ventilate well or at all...

There is partial or complete obstruction

Diagnose the level of obstruction... and attempt to overcome with positive pressure

supra-glottic (soft tissue)
glottic obstructions (laryngospasm)
sub-glottic (bronchospasm)
sub-diaphragmatic (obese belly)

Drug induced Apnea

Diagnosis & Treatment

Apnea & Obstruction

You will be ventilating and placing airway adjuncts and using a paralyzing agent
**Supra-glottic obstruction**

**Deviated nasal septum**

**Contraindications for the NPA**
- deviated septum

**Contraindications for the NPA**
- deviated septum with large turbinate
Supra-glottic obstruction

Nasal polyp

Supra-glottic obstruction

Thick fleshy neck

Airway Evaluation

Oral opening to hypopharynx

Mallampati classification
Airway Evaluation
Oral opening to hypopharynx

Mallimpatti 0

Airway Evaluation
Oral opening to hypopharynx

WTF

Supra-glottic obstruction
Large tonsils
Supra-glottic obstruction

Very large tonsils

Supra-glottic obstruction

Extremely large tonsils

Supra-glottic obstruction

Large tongue
Supra-glottic obstruction
Foreign body or secretions

Supra-glottic obstruction
Thick secretions

Supra-glottic obstruction
Treatment - placement of airway adjuncts
Airway Algorithm

Is the patient breathing?

Muscles of respiration moving?
Capnography tracing?
Pulse oximeter dropping?

If no.....

Airway Algorithm

Attempt to ventilate 3 times
with the nasal hood

If successful, continue until respirations return

If not....

Airway Algorithm

Attempt to ventilate with
the face mask

If successful, continue until respirations return

If not....
Airway Algorithm

You are dealing with an obstruction
determine level of obstruction
supra-glottic, glottic, sub-glottic

Then....

Airway Algorithm

Supra-glottic
place airway adjunct(s) and
continue to ventilate

Or....

Airway Algorithm

Glottic
place airway adjunct(s),
administer succinylcholine,
and continue to ventilate

Or....
Airway Algorithm

Sub-glottic

place airway adjunct(s),
administer bronchodilators,
and continue to ventilate

Call 911

Supra-glottic obstruction
Patient is breathing
Chinning

Supra-glottic obstruction
Patient is breathing
Placement of a NPA to improve patency
Supra-glottic obstruction
Mild thoraco-lumbar rocking

Sub-diaphragmatic obstruction
- thoraco-lumbar rocking

Supra-glottic obstruction
Patient is breathing
Jaw thrust
Rigid Chest
Positive pressure ventilation & rigid chest?

Glottic obstruction
Partial laryngospasm

Glottic obstruction
Partial laryngospasm - treatment
Glottic obstruction

Complete laryngospasm

Glottic obstruction

Treatment

- Positive pressure ventilation
- Airway adjuncts
- Paralyzing agent (succinylcholine)

Glottic obstruction (laryngospasm)

Treatment

- Paralyzing agent (succinylcholine)
Glottic obstruction

Laryngospasm

Treatment
- Deepen the anesthesia

Succinylcholine

Side effects
There is a hierarchy of what emergencies must be treated first and quickest

1. airway - 10 seconds
2. bradycardia - 30 seconds
3. hypotension - 2 minutes
4. tachycardia - 5 minutes
5. hypertension - 15 minutes

Respiratory Emergencies
Respiratory distress - obstruction
Respiratory failure - at the cellular level
Respiratory Emergencies

Respiratory depression
- depth & rate
- airway resistance

Airway obstruction
- anatomic (supra-glottic)
- laryngospasm (glottic)
- bronchospasm (sub-glottic)

Emesis with aspiration

Respiratory Emergencies - hypoventilation

H₂O + CO₂ = H₂CO₃ = H⁺ + HCO₃⁻

- Titratin of narcotics
  (only drug titrated to side effects)
- EtCO₂ vs. PO₂
- Capnograph vs. pre-cordial stethoscope

Respiratory Emergencies - airway obstruction

- Anatomic (supra-glottic)
  - short & thick neck
  - large tongue

- Laryngospasm (glottic)
  - primitive reflex
  - patient is semi-conscious

- Bronchospasm (sub-glottic)
  - asthma
  - anaphylaxis
  - physical irritation
Respiratory Emergencies- airway obstruction

Anatomic (supra-glottic)
short & thick neck
large tongue

Respiratory Emergencies- airway obstruction

Laryngospasm (glottic)
primitive reflex
patient is semi-conscious

Respiratory Emergencies- airway obstruction

Don’t hesitate
Apply full face mask
Evaluate level of obstruction
Positive pressure
100% oxygen
**Respiratory Emergencies- airway obstruction**

Anatomic obstruction will respond to positive pressure

Evaluate airway management with the capnograph

Resume procedure when respirations are adequate

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**Respiratory Emergencies- bronchospasm**

Increased airway pressure required to ventilate

Disease of exhalation

- 100% oxygen
- albuterol inhaler
- epinephrine sub-Q
- inhalation anesthetic agents

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**Respiratory Emergencies- emesis with aspiration**

place in Trendelenburg and suction out vomitus

roll patient on their right side to protect left lung

100% oxygen via full face mask

albuterol inhaler
Respiratory Emergencies- hypoxemia

leads to shock which is an attempt to save the core by shunting blood from the periphery

Normal --------Compensated Shock--------Decompensated Shock--------Arrest

↑ heart rate
↑ respiratory rate
↑ work of breathing
↓ level of consciousness

mottling of the skin
decreased peripheral pulses
normal blood pressure
Respiratory Emergencies - hypoxemia

Normal -------- Compensated Shock -------- Decompensated Shock -------- Arrest

↓ heart rate
↓ respiratory rate
↓ work of breathing
↑ loss of consciousness

mottling of the skin
decreased peripheral pulses
low blood pressure

Respiratory Emergencies - hypoxemia

Normal ------------ Compensated Shock----------- Decompensated Shock------ Arrest

3 minutes                           2 minutes                              1 minute

Sedation	Airway	Emergency	Algorithm

Is the patient breathing?
Capnography tracing, Muscles of respiration moving, Reservoir bag collapsing
If yes:
Is the patient breathing?
Capnography tracing, Muscles of respiration moving, Reservoir bag collapsing
If yes:
Deliver positive pressure ventilation with bag-valve-mask
If air goes in:
Continue to ventilate until respirations return
If air does not go in, or there is considerable resistance
Place a nasopharyngeal airway and attempt to ventilate
If air goes in, continue to ventilate until respirations return
If air does not go in, or there is considerable resistance
Place an oral airway and attempt to ventilate
If air goes in, continue to ventilate until respirations return
If air does not go in:
Administer 10-30mg succinylcholine until able to ventilate (30 sec for response)
If after 30-40 seconds, you still can't ventilate,
You are probably dealing with a bronchospasm
Administer 0.3mg epinephrine IM
Bag-Mask Ventilation

Bag-mask ventilation is an acceptable method of providing ventilation and oxygenation during CPR but is a challenging skill that requires practice for continuing competency.

From the updated 2010 AHA ACLS GUIDELINES

Proper training and practice is the foundation for safely delivering sedation and anesthesia.

DON'T HESITATE TO USE IT
If you think airway management is confusing....

Thank You

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