OFFICE ORAL SURGERY MADE
SIMPLE AND FUN

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“Practice is the best of all instructors” …. Publilius Syrus Maxim 439

Disclaimer: This program is offered as an educational tool only. Attendees are referred to oral surgery textbooks for additional information and the enrollment in an advanced educational program for additional and more through experiences. Attendance at this program does not reflect specialty status, advanced training, specific skills or educational status. The opinions expressed today should be combined with additional educational experiences before considering them in your practice.
**Medical History**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever received radiation or chemotherapy to the head, neck, or chest?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you take any medication?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Are you allergic to any medications?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**INFORMED CONSENT**

We will gladly complete any necessary insurance forms for you, but inasmuch as we are not aware of many different forms of financial aid to our services, it is recommended that you discuss this with your insurance company. We are willing to make any necessary arrangements for you directly from the insurance company to you.

**INTRA-VENOUS SEDATION ONLY CONSENT**

If I elect to receive intravenous sedation during surgery, I have been informed of the possible complications of allergic reaction, pain or swelling at the injection site and unexpected bleeding or cardiovascular effects.
Fig. 8.34. If root is fractured at level of bone, buccal aspect of forearm can be used to remove small portion of bone at same line that it grupos root.

Fig. 8.36. When removing bone from buccal surface of teeth or tooth root to facilitate removal of this root, mesiodistal width of bone removal should be approximately same as mesiodistal dimension of tooth root itself. This allows unimpeded path for removal of root in buccal direction.

Fig. 8.2. Correct incision being made at most dependent portion of root.

Fig. 7-23. Cross-sectional section of lingual frenum for sublingualising. A, Area grasped by hemostat. B and C, Incisions above and below hemostat. D, Surgical defect prior to closure. E, Closure.
Fig. 5.1. Simple alveoloplasty. A, Rongeur removing labial plate. B, Removal of interproximal tip. C, Side view of interproximal tip removal.

Fig. 5.2. Elevation of cervices root remnant with straight-shank elevator. A, Palatal approach parallel with long axis of root. B, Labial-buccal approach at right angles to long axis of root.
Fig. 9-43. A, Envelope incision, most commonly used to reflect soft tissue for removal of impacted third molar. Posterior extension of incision should diverge laterally to avoid injury to lingual nerve. B, Envelope incision is reflected laterally to expose bone overlying impacted tooth. C, When three-carried flap is made, release incision is made at medial aspect of second molar. D, When soft tissue flap is elevated by means of release incision, greater visibility is possible, especially at apical aspect of surgical field.
Fig. 23-25. Illustration showing closure of lip laceration or avulsion. A. First suture is placed at mucocutaneous junction. It is extremely important to realign tissue, or cosmetic disability may be noticeable. Lip is then closed in three layers: oral mucosa, muscle, and dermal surface (B and C). Choice of suture for oral and dermal surfaces varies with surgeon; however, muscle layer should be closed with either chromic or plain catgut suture (resorbable).

Fig. 21-6. Illustration of excisional biopsy of soft tissue. A. Surface view. Elliptic incision is made around lesion, staying at least 3 mm away from lesion. B, Side view. Incision is made deep enough to remove lesion completely. C, End view. Incisions are made convergent to help in repair. Incision is made in this manner, closure is facilitated.
Fig. 71-10: Illustration showing principles used in closing an esophageal biopsy wound. Mucosa should be undermined slightly with scissors to width of original ellipse in each direction. This allows approximation of wound margins without tension.
Fig. 8-51. A, When larger portion of tooth root is left behind after extraction of tooth, small pright elevators can sometimes be used as wedge, or shoval, to displace tooth in occlusal direction. It is important to remember that pressure applied in such fashion should be in gentle wiggling motion; excessive pressure should not be applied. B, Excessive pressure in apical direction results in displacement of tooth root into undesirable places, such as maxillary sinus.

Fig. 8-48. A, When small (2 to 4 mm) portion of root apex is fractured from root, root tip pick can be used to elevate it. B, Root tip pick is leased into periodontal ligament space and used to elevate root tip gently from its socket.

Fig. 8-17. When three-cornered flap is used, only anterior papilla is reflected with sharp end of elevator. Browing end is then used with push stroke to elevate posterosuperiorly.
**Fig. 8-15.** A. When crown of lower molar is lost because of fracture or caries, small envelope flap is reflected, and small amount of crestal bone is removed. Bar is then used to suctions tooth into two individual roots. B. After small straight elevator has been used to mobilize roots, C. Here elevator is used to elevate distal root. Fig. 8-15 elevator is placed into slot created by bar, and elevator is turned to deliver root. C. Opposite member of paired C. Here elevator is then used to deliver remaining root, using same type of rotation movement.

**Fig. 8-15.** Small straight elevator can be used as shown here to elevate broken root. When straight elevator is used in this position, hand must be securely supported on adjacent teeth to prevent instrument damage to adjacent teeth and subsequent injury to adjacent tissue.

**Fig. 16-1.** When infection erodes through bone, it will enter soft tissue through thinned bone. A. Tooth apex is near thin labial bone, so infection erodes labially. B. Apex is near palatal aspect, so bone will be perforated.
Fig. 8-1. A, Flap must have base that is wider than free gingival margin. B, If flap is too narrow at base, blood supply may be inadequate, leading to flap necrosis.

Fig. 8-2. A, To have sufficient access to root of second premolar, envelope flap should extend anteriorly, mesial to canine, and posteriorly, distal to first molar. B, If release incision (three-cornered flap) is used, flap extends mesial to first premolar.

Fig. 8-3. A, When designing flap, it is necessary to anticipate how much bone will be removed so that, after surgery is complete, incision rests over sound bone. In this situation, vertical release was one tooth anterior to bone removal, leaving an adequate margin of sound bone. B, When release incision is made too close to bone removal, delays healing results.

Fig. 8-4. A, Cross section of mandibular torus. B, Lingual periosteum reflected, exposing torus but leaving lateral periosteum attached. C, Superior grooving of torus. D, Incision
Fig. 8.47. A, crown of upper molar has been lost to caries at has been injured from roots, small envelope incision is reflected and small amount of cortical bone is removed. Bar is then used to section three roots into independent portions. B, after roots have been located with small straight elevator, mesiobuccal root is delivered with Cryer elevator placed into slot prepared by bar. C, once mesiobuccal root has been removed, Cryer elevator is again used to deliver distal buccal root. Tip of Cryer elevator is placed into empty socket of mesiobuccal root and turned in usual fashion to deliver roots root. D, maxillary root forceps can occasionally be used to grasp and deliver remaining root. Palatal root can then be delivered either with straight elevator or with Cryer elevator. If straight elevator is used, it is placed between root and palatal bone and gently wiggled in effort to displace palatal root in buccal-occlusal direction. E, small straight elevator can be used to elevate remaining root of maxillary third molar with gentle wiggling pressures, displacing root in buccal-occlusal direction.
Fig. 24-4. Apical cystectomy performed at time of tooth removal. A to C, Removal with curette via tooth socket. This must be performed with care because of proximity of apices of teeth to other structures, such as maxillary sinus and inferior alveolar canal.

Fig. 24-4. Two types of incisions for apicectomy.

Fig. 5-5. Surgical flap. A, Incision. B, Retraction of flap and removal of labial bone to greatest width of tooth. Note that the edge of the flap, which will be sutured, will be supported by undisturbed bone.
Figure 1. Intraoral relations of the inferior alveolar nerve and the lower third molar. A. Cervical outline of the canal & intact. Tip probably represents superincisor only. B. There is loss of the cervical outline of the nerve canal. The nerve may be growing the tooth. C. There is loss of cervical outline and narrowing and deviation of the nerve canal, denoting an intimate relation with the tooth and possible perforation of the tooth cavity by the nerve.

Figure 2. Incisally placed incision suitable for removal of a lower third molar. Incision goes down the external oblique ridge to the distobuccal angle of the second molar and down into the mental sulcus.
Helpful Tips Following Oral Surgery

Bleeding
Coping and staining are normal after surgery. Bite down on a damp, sterile gauze pad for half an hour. If the bleeding does not subside, use a fresh pad for an additional 30 minutes. Repeat as necessary.

Pain
Some discomfort may be experienced following oral surgical procedure. The medication I have recommended, take as directed, should relieve the pain.

Cleansing
Do not rinse your mouth today. Tomorrow, use a glass of salt solution (1/2 teaspoon of salt dissolved in a glass of warm water) after meals to cleanse the affected area.

Swelling
Some swelling of the jaw may occur. Do not be alarmed as this is a normal reaction after surgery. Apply an ice bag or towel wrapped around a research ice to the affected area for 20 minutes. Remove for ten minutes. Repeat this procedure for 3 hours.

Eating
To aid the healing process, it is important to obtain adequate nutrition and calories. If chewing is difficult, try blended, smooth and creepy foods such as eggs, soup, and casseroles, and sip on juices and other fluids throughout the day. Avoid very hot or very cold foods. Also, food should not be too salty, spicy or pectoral.
Basic Instruments Described By only name-brand dental instruments, i.e. Hu-Friedy, etc.

# 6 Surgical Round Bur
Highspeed handpiece with air exiting through rear, not into surgical site
#15 scapel blade and handle
Dean surgical scissor non serrated. Tenotomy scissor, straight 4"
Seldin #13 tissue retractor
Wax carver instead of molt periodontal elevator
Various sizes surgical double ended curettes

mouth props small for children-medium for adults-large for adventitious patients
universal upper for sep #150-biocapsids and molars
#1 Straight for maxillary anterior teeth
Medd MD3- mandibular anterior and bicuspids teeth
#23 cewborn posterior mandibil teeth (straight or curved handles by preference)
tissue forcep (one or two teeth)
two medium curved bioester-truncetomy 5" or 6"
needle holder-Mayo 5' -7' your preference
Alin tissue clamp-biopsies
bone hew- carbide-croscut -double ended-different size
#301 small straight elevator

Cryer, crane pick, Miller, Potts, Seldin elevators various sizes
rougner-smal curved backs side and end cutting-30 degree Bionesthal
osteome 4mm and 3mm for ten
suction tips- various widthto reach bottom of socket 1mm-5mm
iodoform gauze 1 & D
socket packing material, surgical, oxid, gelfoam, etc. (your choice of many)

Hu-Friedy root tip pick double ended, apical picks
2-0 silk on cutting needle, for skin-silom, for children- gut
American Society of Anesthesiologists Physical Status Classification

I Normal, healthy individual
II Patient with mild to moderate systemic disease
III Patient with severe systemic disease which limits activity but is not incapacitating
IV Patient with severe systemic disease which limits activity and is a constant threat to life
V Moribund patient not expecting to survive 24 hours with or without an operation
VI Clinically dead patient being maintained by hemorrhaging of organs

<table>
<thead>
<tr>
<th>Insulin Type</th>
<th>Onset</th>
<th>Peak Activity (Hours)</th>
<th>Duration (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unpro</td>
<td>15 minutes</td>
<td>0.5 - 1.5</td>
<td>5</td>
</tr>
<tr>
<td>Regular</td>
<td>30 - 60 minutes</td>
<td>2 - 3</td>
<td>4 - 12</td>
</tr>
<tr>
<td>NPH</td>
<td>2 - 4 hours</td>
<td>4 - 10</td>
<td>14 - 18</td>
</tr>
<tr>
<td>Lente</td>
<td>3 - 4 hours</td>
<td>4 - 12</td>
<td>16 - 20</td>
</tr>
<tr>
<td>Ultralente</td>
<td>6 - 10 hours</td>
<td>12 - 16</td>
<td>20 - 30</td>
</tr>
</tbody>
</table>

Note: Beef and pork preparations may have slightly longer onset, peak, and duration of activity.
BASIC EMERGENCY DRUG KIT FOR THE DENTAL GENERAL PRACTITIONER

An emergency kit should only contain the drugs that a dentist is trained to use in an emergency. American Heart Association basic CPR certification for you and your staff should also be required. All equipment should be maintained in good working order. Drugs should be inspected for their expiration dates and replaced if necessary. Mock emergency drills should be practiced and evaluated. The information on this page is a brief outline. The practitioner is referred to recent publications for the management of emergencies in the dental office.

EQUIPMENT

Oxygen – stationary and portable E cylinders

Different sized masks

Ambu Bag

Various size oral airways

Yankauer Tonsillar suction

Blood pressure cuff and stethoscope

Syringes 1cc 5/8 needle and 1 1/2 inch needle

Mouth to mouth breather

Glucometer

DRUGS

Oxygen

Diphenhydramine “Benadryl” – antihistamine

Epinephrine “Adrenaline” – vasoconstrictr – vasopressor – bronchial dilator

Glucose “sugar”

Nitroglycerine – vasodilator

Hydrocortisone – anti-inflammatory-steroid


Aromatic Ammonia – Spirits “Smelling salts” – respiratory stimulant

Aspirin
## Comparison Across Age Groups of Resuscitation Interventions

<table>
<thead>
<tr>
<th>CPR/Bagging / Breathing</th>
<th>Infant (&lt; 1 month)</th>
<th>Adult and Older Child</th>
<th>Child (1-8 years)</th>
<th>Newborn</th>
<th>Neonate (≤ 28 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Establish airway</strong></td>
<td>Head tilt, chin lift; jaw thrust if trauma is present, use jaw thrust</td>
<td>Head tilt, chin lift; jaw thrust if trauma is present, use jaw thrust</td>
<td>Head tilt, chin lift; jaw thrust if trauma is present, use jaw thrust</td>
<td>Head tilt, chin lift; jaw thrust if trauma is present, use jaw thrust</td>
<td>Head tilt, chin lift; jaw thrust if trauma is present, use jaw thrust</td>
</tr>
<tr>
<td><strong>Open airway</strong> (Head tilt-chin lift or jaw thrust)</td>
<td>2 effective breaths at 1 to 3 breaths (cures oxygen available)</td>
<td>2 effective breaths at 1 to 3 breaths</td>
<td>2 effective breaths at 1 to 3 breaths</td>
<td>2 effective breaths at 1 to 3 breaths</td>
<td>2 effective breaths at 1 to 3 breaths</td>
</tr>
<tr>
<td><strong>Foreign-body inhaled obstruction</strong></td>
<td>Abdominal thrusts</td>
<td>Abdominal thrusts</td>
<td>Abdominal thrusts</td>
<td>Abdominal thrusts</td>
<td>Abdominal thrusts</td>
</tr>
<tr>
<td><strong>Signs of circulation</strong></td>
<td>Pulse (check healthcare provider's* radial)</td>
<td>Auscultate</td>
<td>Auscultate</td>
<td>Auscultate</td>
<td>Auscultate</td>
</tr>
<tr>
<td><strong>Check for breathing</strong> (look, listen, feel)</td>
<td>20 breaths/min (approximate)</td>
<td>20 breaths/min (approximate)</td>
<td>20 breaths/min (approximate)</td>
<td>20 breaths/min (approximate)</td>
<td>20 breaths/min (approximate)</td>
</tr>
<tr>
<td><strong>Signs of breathing</strong></td>
<td>Back blows and chest thrusts (no abdominal thrust)</td>
<td>Back blows and chest thrusts (no abdominal thrust)</td>
<td>Back blows and chest thrusts (no abdominal thrust)</td>
<td>Back blows and chest thrusts (no abdominal thrust)</td>
<td>Back blows and chest thrusts (no abdominal thrust)</td>
</tr>
<tr>
<td><strong>Compensationimbus</strong></td>
<td>Lower half of sternum</td>
<td>Lower half of sternum</td>
<td>Lower half of sternum (1 finger's width below sternal-bony line)</td>
<td>Lower half of sternum (1 finger's width below sternal-bony line)</td>
<td>Lower half of sternum (1 finger's width below sternal-bony line)</td>
</tr>
<tr>
<td><strong>Compensation method</strong></td>
<td>Hold of one hand, other hand on top</td>
<td>Hold of one hand</td>
<td>Hold of one thumb-exercising hand for 2-rescuer assisted providers</td>
<td>Hold of one thumb-exercising hand for 2-rescuer assisted providers</td>
<td>Hold of one thumb-exercising hand for 2-rescuer assisted providers</td>
</tr>
<tr>
<td><strong>Compensation depth</strong></td>
<td>1 to 2 in (4 to 5 cm)</td>
<td>1 to 2 in (4 to 5 cm)</td>
<td>1 to 2 in (4 to 5 cm)</td>
<td>1 to 2 in (4 to 5 cm)</td>
<td>1 to 2 in (4 to 5 cm)</td>
</tr>
<tr>
<td><strong>Compensation rate</strong></td>
<td>100/min</td>
<td>100/min</td>
<td>100/min</td>
<td>100/min</td>
<td>100/min</td>
</tr>
<tr>
<td><strong>Compensation ventilation</strong></td>
<td>15.2:1 (1 to 2 rescuers; unassisted airway) 12:15 breaths/min asynchronous with compressions (2 rescuers, processed as 1:2)</td>
<td>8:1 (1 or 2 rescuers)</td>
<td>8:1 (1 or 2 rescuers)</td>
<td>8:1 (1 or 2 rescuers)</td>
<td>8:1 (1 or 2 rescuers)</td>
</tr>
</tbody>
</table>

*Pulse check is performed at one of the signs of circulation assessed by healthcare providers. Key: rescuer checks for other signs of circulation (breathing, coughing, movement).
LOCAL ANESTHESIA

1. Calculations:
   - 1% solution = 10 mg/cc
   - 2% solution = 20 mg/cc
   - 3% solution = 30 mg/cc

   1 carpule of Lidocaine 2% contains 1.8 cc x 20 mg = 36 mg.
   1 carpule of Carboeaine 3% contains 1.8 cc x 30 mg = 54 mg.

2. My Maximum Dosage:

   2 mg. per pound of either Lidocaine or Carboeaine for an adult or child
   never to exceed 300 mg. which is 1.33 carpules of Lidocaine or 5.56
   carpules of Carboeaine

   50 lb. child = 50 x 2mg = 100 mg maximum divide by either 36 for
   Lidocaine or 54 for Carboeaine

   \[ \frac{100}{36} = 2.78 \text{ carpules of Lidocaine} \]
   \[ \frac{100}{54} = 1.85 \text{ carpules of Carboeaine} \]

   175 lb. adult = 175 x 2mg = 350 mg. - Only give 300mg. of Lidocaine or
   Carboeaine

3. Epinephrine (SAFETY-antagonistic to vasodilation effect)

   Healthy patient can receive up to .2 mg.
   Carpule contains Epinephrine 1:100,000 or .01 mg/cc
   or .01 mg x 1.8 cc = .018 mg epinephrine per carpule

   \[ 2 \text{ mg. (maximum dose)} = 11.11 \text{ carpules} \]
   \[ .018 \text{ mg/carpule} \]

   Already decided maximum is 8.33 carpules- Never reach maximum dose

   Cardiac patient can receive up to .04 mg.
   \[ .04 \text{ mg.} = 2.2 \text{ carpules} \]

   I only give ONE after taking a very good history!
   \[ .018 \text{ mg/carpule} \]

3. Toxie Dose or Overdose - occurs a majority of time in children
   - low - stimulation, anxiety, confusion - stop- monitor & observe for 1 hour
   - internal - tremors, headache, dizziness, drowsiness - monitor and observe for 90 min.
   - high - depression, seizure, cardiac irreg., arrest - CY collapse - CPR-Emergency assist.

4. Other Complications: nerve damage; hematoma, muscle irsimus
Oral Piercing and Health

Procedure Related Risks
- Infection
- Prolonged Bleeding
- Swelling and Possible Nerve Damage
- Bloodborne Disease Transmission i.e. Hepatitis, Tetanus
- Endocarditis

Jewelry Related Complications
- Injury to Gingiva
- Damage to Teeth
- Interference with Oral Health Evaluation
- Aspiration

Suturing Information

Nonabsorbable Sutures
- Silk - popular, intraloral usage, reactive to tissue, tears tissue if left too long, memory
- Nylon - skin usage, non-reactive
- Teflon (PTFE) - Gortex, non-reactive, used with implant surgery, membranes, can remain weeks

Resorbable Sutures (natural)
- Plain Gut - sheep gut, resorbs within one week, no memory, pointed ends painful
- Chromic Gut - chromium salts treated gut, lasts up to two weeks, same properties as gut

Resorbable Sutures (synthetic)
- Dexon - polyglycolic acid
- Vicryl, polyglactin 910 - non-reactive, resorbs 21 days, used for implant surgery & layered closures

Numbering system is based on width; the higher the number the thinner the suture material.
- 2-0 used for muscle layer closure
- 3-0 most commonly used in oral cavity
- 4-0 apicoectomy and periodontal surgery
- 5-0 skin

Needles
- 22G better (most common) than 26G round
- Reverse cutting (most common) doesn’t rip through tissue
- Cutting rip tissue
- Supere - rounded; difficult for mucosa suturing

Hints: grip needle midway to stop needle bending; suture through movable tissue first then immovable tissue; too tight sutures rip through tissue; not enough knots unravel; don’t overknit.
Oral Piercing and Health

Procedure Related Risks
- Infection
- Prolonged Bleeding
- Swelling and Possible Nerve Damage
- Bloodborne Disease Transmission (e.g., Hepatitis, Tetanus)
- Endocarditis

Jewelry Related Complications
- Injury to Gingiva
- Damage to Teeth
- Interference with Oral Health Evaluation
- Aspiration

Suturing Information

Nonabsorbable Sutures
- Silk - popular, introsomal usage, reactive to tissue, tears tissue if left too long, memory
- Nylon - skin usage, non reactive
- Polytetra Fluoroethylene (PTFE) Gortex, non reactive, used with implant surgery, membranes, can remain weeks

Resorbable Sutures (natural)
- Plain Gut - sheep gut, resorbs within one week, no memory, pointed ends painful
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- Dexon; polyglycolic acid
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Numbering system is based on width; the higher the number the thinner the suture material.
- 2-0 used for muscle layer closure
- 3-0 most commonly used in oral cavity
- 4-0 apexectomy and periodontal surgery
- 5-0 skin

Needles
- 3/8 round (most common) than 1/2 round
- Reverse cutting (most common) doesn't tip through tissue
- Cutting tips tissue
- Tapered - rounded; difficult for mucosa suturing

Hints: grab needle midway to stop needle bending; insert through movable tissue first then immovable tissue; too tight causes rips through tissue, not enough knots unravel; don't overstretch.
### Maximum Doses

<table>
<thead>
<tr>
<th>Local Anesthetic</th>
<th>Max. Dose mg/dl</th>
<th>Max. Dose mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articaine</td>
<td>7.0</td>
<td>500</td>
</tr>
<tr>
<td>Mepivacaine</td>
<td>6.8 (4.8)</td>
<td>400 (300)</td>
</tr>
<tr>
<td>Etidocaine</td>
<td>8.0</td>
<td>400</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>7.9 (4.4)</td>
<td>500 (300)</td>
</tr>
<tr>
<td>Prilocaine</td>
<td>8.0 (6.0)</td>
<td>600 (400)</td>
</tr>
<tr>
<td>Bupivacaine</td>
<td>1.3</td>
<td>90</td>
</tr>
</tbody>
</table>

*Figure 4: Doses given are for healthy adults unless otherwise specified. product concentration. Values in parentheses are clinically reasonable values. Note that all cartridges contain 1.0 ml of solution. 600 mg refers to total mg in 6 cartridges, each containing 0.1 ml of solution.*

### Local Anesthetic Half-Lives

<table>
<thead>
<tr>
<th>Local Anesthetic</th>
<th>Half-Life (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articaine</td>
<td>20</td>
</tr>
<tr>
<td>Prilocaine</td>
<td>90</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>90</td>
</tr>
<tr>
<td>Mepivacaine</td>
<td>115</td>
</tr>
<tr>
<td>Etidocaine</td>
<td>155</td>
</tr>
<tr>
<td>Bupivacaine</td>
<td>210</td>
</tr>
</tbody>
</table>

*Figure 5: The typical half-life of local anesthetics.*

### Toxicity: Lidocaine vs. Articaine

<table>
<thead>
<tr>
<th>% Solution</th>
<th>Lidocaine 1.0%</th>
<th>Articaine 1.7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>mg/ml</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>mg of drug</td>
<td>1.8 ml x 20 mg/m = 36 mg</td>
<td>1.7 ml x 40 mg/m = 68 mg</td>
</tr>
<tr>
<td>per cartridge</td>
<td>36 mg</td>
<td>68 mg</td>
</tr>
<tr>
<td>Maximum dose</td>
<td>500 mg</td>
<td>500 mg</td>
</tr>
<tr>
<td># of cartridges allowed</td>
<td>500 mg = 13.8</td>
<td>500 mg = 7.3</td>
</tr>
<tr>
<td></td>
<td>36 mg</td>
<td>68 mg</td>
</tr>
</tbody>
</table>

*Figure 6: Values are for a healthy 70-kg adult and do not take into account the toxicity of the vasoconstrictor.*

*Figure 6: The number of cartridges tolerated before the maximum dose is reached for the average 70-kg (154 lb) adult comparing 2% lidocaine with 4% articaine, both with epinephrine.*
Signs & Symptoms of Hypo & Hyperglycemia
- Hypoglycemia
  - Low blood sugar
  - Rapid onset
  - Aggressive, irritable behavior
  - Moist skin, pallor
  - Normal or rapid breathing
- Hyperglycemia
  - High blood sugar
  - Slow onset
  - Downswings & disorientation
  - Dry skin
  - Deep labored breathing

Medical Emergencies Commonly Provoked By Anxiety
- Angina (old or new)
- Myocardial Infarction
- Hypoglycemia
- Hyperventilation

Hyperventilation Syndrome
- Increased respiratory rate and depth of breathing
- Dizziness, tingling of fingers and toes
- Tachycardia, palpitations, chest pain, shortness of breath
- Tremors, weakness, anxiety, syncope

Psychogenic response

Hyperventilation

Pregnancy Considerations
- First trimester: teratogenic effects - AVOID
- Second & Third Trimester: mostly growth, development and maturation, limit to basics and emergencies
- Avoid x-rays and pharmacologic agents if possible
- Vena Cava syndrome: 3rd trimester
- Postpartum: breast feeding considerations
Fig. 9-42. A. Envelope incision, most commonly used to reflect soft tissue for removal of impacted third molar. Posterior extension of incision should deviate laterally to avoid injury to lingual nerve. B. Envelope incision is reflected laterally to expose bone overlying impacted tooth. C. When three-cornered flap is made, release incision is made at mesial aspect of second molar. D. When soft tissue flap is reflected by means of release incision, greater visibility is possible, especially at apical aspect of surgical field.
Fig. 9-24. A. Envelope flap, most commonly used flap for removal of maxillary impacted teeth. B. When soft tissue is reflected, buccal overlying third molar is easily visualized.

Fig. 9-25. Delivery of impacted maxillary third molar. A. Once soft tissue flap has been reflected, small amount of buccal bone is removed with bur or hand chisel. B. Tooth is then delivered by small straight elevator with rotational and lever types of motion. Tooth is delivered in distobuccal and occlusal direction.
Fig. 9-45. A. After soft tissue has been reflected, bone overlying occlusal surface of tooth is removed with Fischer bur. B. Bone on buccal and distal aspect of impacted tooth is then removed with bur.

Fig. 9-46. A. When removing mesioangular impaction, buccal and distal bone are removed to expose crown of tooth to cervical line. B. Distal aspect of crown is then sectioned from tooth. Occasionally it is necessary to section entire tooth into two portions rather than to section distal portion of crown only. C. After distal portion of crown has been delivered, small straight elevator is inserted two purchase point on mesial aspect of third molar, and tooth is delivered with rotational and lever motion of elevator.
Fig. 9-42. A, When removing vertical impaction, bone on occlusal, buccal, and distal aspects of crown is removed, and tooth is sectioned into mesial and distal sections. If tooth has fused single root, distal portion of crown is sectioned off in manner similar to that depicted for mesioangular impaction. B, Posterior aspect of crown is elevated first with Greer elevator inserted into small purchase point in distal portion of tooth. C, Small straight elevator No. 301 is then used to elevate mesial aspect of tooth by rotary and riever type of motion.
Fig. 9-47. A, During removal of horizontal impaction, bone overlying tooth—that is, bone on distal and buccal aspect of tooth—is removed with bur. B, Crown is then securable from roots of tooth and delivered from socket. C, Roots are then delivered together or independently by Cryer elevator used with rotational motion. Roots may need to be separated into two separate parts; occasionally, purchase point is made in root to allow Cryer elevator to engage it. B. Mesial root of tooth is elevated in similar fashion.
Fig. 2-49. A. For distoangular impaction, occlusal, incisal, and distal bone is removed with bur. It is important to remember that more distal bone must be taken off than for vertical or mesioangular impaction. B. Crown of tooth is sectioned off with bur, and crown is delivered with straight elevator. C. Purchase point is put into remaining root portion of tooth, and roots are delivered by Crown elevator with wheal and airline type of method. If roots diverge, it may be necessary in some cases to split them into independent portions.
<table>
<thead>
<tr>
<th>Dose (mg)</th>
<th>Epinephrine 0.2% (1:200,000)</th>
<th>Epinephrine 1:10,000</th>
<th>Epinephrine 1:1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9 mg</td>
<td>0.006 mg</td>
<td>0.06 mg</td>
<td>0.6 mg</td>
</tr>
<tr>
<td>0.75 mg</td>
<td>0.0045 mg</td>
<td>0.045 mg</td>
<td>0.45 mg</td>
</tr>
<tr>
<td>0.5 mg</td>
<td>0.003 mg</td>
<td>0.03 mg</td>
<td>0.3 mg</td>
</tr>
<tr>
<td>0.3 mg</td>
<td>0.0018 mg</td>
<td>0.018 mg</td>
<td>0.18 mg</td>
</tr>
<tr>
<td>0.25 mg</td>
<td>0.00125 mg</td>
<td>0.0125 mg</td>
<td>0.125 mg</td>
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</tbody>
</table>

**Maximum Dose:** According to the physician's discretion (PDR), the maximum dose should not exceed 0 mg per under-72 hours in children.

**Local Anesthetics:**

<table>
<thead>
<tr>
<th>Anesthetic Agent</th>
<th>Epinephrine 0.2% (1:200,000)</th>
<th>Epinephrine 1:10,000</th>
<th>Epinephrine 1:1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lidocaine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mepivacaine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prilocaine</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Each 1.8 ml dental cartridge contains 2% Lidocaine (W/V) with Epinephrine (W/V) = 1:100,000.
Bisphosphonate Associated Necrosis of the Jaws

Alan R. Rossin DDS
President, Connecticut Society of Oral and Maxillofacial Surgeons

The widespread use of bisphosphonate drugs to treat osteoporosis, Paget's disease and hypercalcemia of malignancy has escalated in recent years. A newly described condition, Bisphosphonate Associated Bone Necrosis (BAN), has emerged necessitating medical and dental health professionals become aware of this disease and identify their patients at risk.

Bisphosphonate drugs are synthetic analogues of inorganic phosphate. They have a great affinity for binding calcium in the hydroxyapatite matrix of bone mineral. The bisphosphonates act by inhibiting osteoclastic activity, with this result in a reduction of bone remodeling. These actions help retain skeletal bone density in osteoporosis and reduce the spread of skeletal metastasis in patients with multiple myelomas and malignant lymphomas and prostate cancer. At higher doses, the bisphosphonates may also possess tumoricidal activity by inhibiting angiogenesis in bone tissue, hence they have become an important weapon for oncologic physicians to improve length of patient survival.

The exact mechanisms and combination of events that produce osteonecrosis of the jaw in some patients and not in others is still indeterminate. The patients at greatest risk are those receiving intravenous bisphosphonates (Zometa and Aredia) although patients taking oral forms of these drugs are also believed at risk to a much lesser extent. A list of the chemical and proprietary names of the clinically used bisphosphonates can be found in Table 1. The risks appear to increase with length of time on therapy. Osteonecrosis most commonly occurs following some physical trauma. Dentoalveolar surgery, periodontal surgery and denture sore spots have all been implicated as well as focal dental infection. Patients with prevalent periodontal disease are at the highest risk although numerous cases of spontaneous bone exposure have also been documented. The lesions clinically appear as ragged painful or painless ulcers with dental bone necrosis and an erythematous halo of inflamed mucosa. There is no known cure to date and all osteous tissues are affected however bone exposure has only been documented in the jaw. Dental flap closure, esthetically and hygienic, have failed to cure or even alleviate this condition. Local measures such as smoothing rough surfaes, topical chlorhexidine swabs and systemic antibiotics produce a palliative effect in most patients.

Prevention of this condition through increased awareness and reducing risk factors is our best and only approach at this time. Current protocols to prevent BAN have been established based on expert opinion and published discussion. Some of these recommendations are listed in Table 2. More time and the establishment of standardized based research is necessary to develop care standards from which the health care community may bear manage risks for patients on these medications. Collaborative efforts between the health care community and pharmaceutical agents are currently underway to help provide more answers.


### Table 1

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Proprietary name</th>
<th>Pharmaceutical company</th>
<th>Relative potency</th>
</tr>
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<tbody>
<tr>
<td>Ezetimibe</td>
<td>Zetia</td>
<td>Merck</td>
<td>100,000 Oral</td>
</tr>
<tr>
<td>Alendronate</td>
<td>Fosamax</td>
<td>Merck</td>
<td>100-1,000 Oral</td>
</tr>
<tr>
<td>Ibandronate</td>
<td>Boniva</td>
<td>Roche</td>
<td>1,000-10,000 Oral</td>
</tr>
<tr>
<td>Pamidronate</td>
<td>Aredia</td>
<td>Novartis</td>
<td>100 Intravenous</td>
</tr>
<tr>
<td>Ibandronate</td>
<td>Zometa</td>
<td>Novartis</td>
<td>&gt;10,000 Intravenous</td>
</tr>
</tbody>
</table>