Dr. Steven Buckley has no relevant financial relationships with commercial interest to disclose.
COST OF FACIAL INJURIES IN SPORTS

$49 MILLION PER YEAR
## INCIDENCE OF INJURIES

- Dramatic Increase in Facial Injuries in Soccer, Bicycle and Motorcycle
- MidFace Fracture: Soccer & Motorcycle
- TMJ Injuries: Bicycle, Rollerblading & Basketball
- Lower Contact Sports With Higher Incidence Rate Than High Contact Sports

### BLOWOUT FRACTURE

**VS**

### ZMC FRACTURE
MOTORCYCLE INJURIES
The High Cost of Riding:
Life Threatening Mid-Face Fracture
Making Turn at 20 MPH
Non-Compliance Is A Real Problem
Concussion and Post Concussion Syndrome

Blows to the Lower Jaw Drive the Jaw Up and Back

Stewart & Witzig Have Estimated That In Athletes, About 90% of Concussions Resulting In Unconsciousness Are From Blows To The Lower Jaw

GROWTH AND DEVELOPMENT OF MANDIBLE

GROWTH CENTER OF MANDIBLE

Only ½ Mature at Age 8
Full Maturity at Age 17-18

POTENTIAL PROBLEMS:
• Receding Chin
• Limited Jaw Movement
• Need for Possible Surgical Correction
DENTAL VEOLAR FRACTURES

5-65% of Pediatric Facial Injuries

Classifications
- Tooth Fracture
- Tooth Luxation
- Tooth Avulsion
- Alveolar Process Fracture

Treatment
- Fractured Teeth – Call Your Dentist Tomorrow
- Luxation/Avulsion – Reposition +/- Stabilization
- Alveolar Fracture – Stabilize 4 Weeks
A KNOCKED-OUT TOOTH SHOULD BE:
- Found
- Cleaned
- Replaced
SAVE - A - TOOTH

DISPLACED TOOTH

![Image of displaced tooth and Save-a-Tooth kit]

![Image of a mouth with braces]

![Image of a mouth with a tooth knocked out]
IMPLANTS IN FACIAL TRAUMA PATIENTS

SUCCESS RATE FOR IMPLANTS IN TRAUMA PATIENTS

- 98% in Mandible
- 91% in Maxilla
<table>
<thead>
<tr>
<th>TMJ INJURIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Dislocation</td>
</tr>
<tr>
<td>- Hemarthrosis</td>
</tr>
<tr>
<td>- Fracture</td>
</tr>
</tbody>
</table>

- TMJ INJURIES

- NEW MEDICO-LEGAL FRONTIER
MANDIBULAR CONDYLAR FRACTURES

- Most Common Mandibular Fracture (up to 60%)
- Closed Treatment versus Observation
- Rare Open Treatment
- Potential for Growth Disturbance
- Frequently Undiagnosed

TRAUMA

- Hemarthrosis
- Fractures
PANORAMIC RADIOGRAPHY
• Imaging of Choice with Dentoalveolar and Mandibular Fracture
COMPUTED TOMOGRAPHY

- Imaging of Choice with Facial Fractures

<table>
<thead>
<tr>
<th>Anatomic Distribution of Facial Fractures</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Mandible</td>
<td>15-86%</td>
</tr>
<tr>
<td>Midface</td>
<td>8-54%</td>
</tr>
<tr>
<td>Upper Face</td>
<td>12-45%</td>
</tr>
</tbody>
</table>
**NASAL INJURIES**

- 2nd Most Common Mid-Face Injury in Young Athletes
  - Most Common – Dentoalveolar Injuries

**SIGNS OF NASAL FRACTURE**

- Epistaxis
- Depression or Deviation of Nasal Pyramid
- Periorbital Ecchymosis & Edema
- Tenderness
- Crepitation or Abnormal Motion of Nasal Bone
- Obstruction of Airway by a Buckled or Deviated Septum

**NASAL FRACTURE**

- Gently Pack Nose with Gauze
- Apply Ice
- Do Not Blow Nose

**Young Person’s Nose**

- Less Susceptible to Fracture But More Vulnerable to Soft Tissue Injuries
  1) Cartilaginous Detachment
  2) Septal Hematoma
<table>
<thead>
<tr>
<th>Septal Hematoma</th>
<th>Most Common Location of Nosebleed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Must Be Incised and Drained to Prevent Septal Necrosis and Subsequent Growth Disturbances</td>
<td>Anterior Septal Bleed from Kiesselbach Plexus</td>
</tr>
</tbody>
</table>

### Ways To Stop A Nosebleed

1. Patient Sit Up and Lean Forward
2. Cotton Soaked with Neo-Syn or Afrin and Press Against Bleeding Site for 5-10 Minutes
3. If This Fails – Use Some Local Anesthetic
4. Then Silver Nitrate Sticks
5. Can Place Surgical or Pack Gauze Strip in for 24 Hours
NASAL TAMPONS

1) Merocel
2) Rapid Rhino
3) Rhino Rocket

MEROCEL
- Compressed, dehydrated sponge
- Requires rehydration to achieve optimal size to compress vessels
RAPID RHINO

- Nasal Catheter covered with a layer of well-knitted hydrofibre
- Hydrofibre forms a gel in contact with water – self lubricating

1) Less painful on insertion and removal
2) Causes less bleeding on removal
EPISTAT

- Distal and Proximal Balloons inflate.
- Distal First – pull forward until against Choana
- Then inflate Proximal
Complications of Nasal Packing

1. Failure to stop bleeding
2. Toxic Shock Syndrome
3. Blockage of:
   - Nasolacrimal Duct
   - Sinus Drainage
   - Nasal Airway
4. Nasovagal Reflex
5. Displacement of Pack into oropharynx
6. Sleep Apnea
7. Sleep Apnea
8. Sleep Apnea

Post Bleed Orders

1. Do Not Blow Nose
2. Avoid Strenuous Exercise and Stooping
3. Sleep with 2-3 Pillows
4. No Alcoholic Beverages
5. Use a Laxative if Constipated

Facial Bleeding

- Cover Wound with Cloth – Apply Pressure
- Do Not Remove Soaked Cloth
- Use Additional Cloth and Continue Pressure
LIP LACERATION

- White or Gray Line = MucoCutaneous Line
- Is Most Important Landmark
- 1/4 of Lip Can Be Lost Without Resultant Functional or Aesthetic Defect
Ear Laceration

- Hematoma of Ear Must Be Aspirated So The Ear Will Not Get Fibrosed and Thickened (Cauliflower Ear)

1) Proper Sports Equipment
2) Dental and Oral Screening Before Play
   Example: Montreal 1976

HARD HATS FOR LITTLE HEADS
- Is designed to help physicians and their families generate goodwill and demonstrate their commitment to preventing injury and saving lives.
- A record 6,800 Texas children received a free bicycle helmet through this community service effort during 2004.
HEAD INJURY IS THE LEADING CAUSE OF SERIOUS DISABILITY OR DEATH IN BICYCLE CRASHES

- Bicycle helmets can help reduce the risk of head injury by as much as 85 percent.
- Unfortunately, only about 25 percent of bikers put on a helmet when they ride.

Helmets are purchased through the TMA.
- Buying at least 50 helmets, you are guaranteed a match of 50 helmets.
- For the price of 50 helmets (@ $250), you can put helmets on 100 children.
House Bill 675

House Bill 675 prohibits school districts from using football helmets 16 years or older. Under the new law school districts must recondition all helmets 10 years or older at least once every 2 years.
PROPER FITTING MOUTH GUARD SHOULD:
- Hold teeth in place
- Allow athlete to speak and breathe properly
- Resist tearing
- Provide protection

BENEFITS OF MOUTH GUARD PROTECTION
- Absorbs energy from falls or blows
- Cushions force of lower jaw slamming into upper jaw
- Helps maintain jaw alignment
Mouth guards are common in football, hockey and boxing. However a growing number of athletes in non-contact sports are claiming improved strength, power, accuracy and improved thinking under pressure by using a jaw positioning retainer.

Theory: Clenching your teeth pinches nerves that run through the TMJ causing the bone to produce cortisol.Increase HB, BP and triggers fright or flight response.
Examples:
1. Derek Jeter
2. Shaq
3. Hunter Mahan (wears his mouth piece while he practices but not during tournaments)

There are many types of mouth guards:
1. ArmourBite # Mouthpiece - Under Armour
2. Makkar PPM – Pure Power # Performance Enhancing mouth guards
3. Shock Doctor # mouth guards- MORA( mandibular orthopedic repositioning appliances)

Cortisol “The Stress Hormone” is essentially the trigger for adrenaline.
Properly designed oral appliances can interrupt the fright or flight signal by preventing the completion of clinching mechanism.

Mandibular position and oral appliances positively affect not only upper body strength but also endurance, recovery from athletic competition, concentration and stress response.

MORA - Mandibular Orthopedic Repositioning Appliance
Muscular activity is an integral part of the “Fight” or “Flight” response.
Bicoronal Flap
Security Hi-Tech Individual Extra-Light Devices
Mask: A New Protection for [Soccer] Players

Piero Cascone, MDS, Bernardino Petrucci, MD,
Valerio Ramieri, MD & Marianetti Tito Matteo, MD.

Courtesy of The Journal of Craniofacial Surgery
COMPUTER GENERATED PROSTHESIS

1) Converts CT Scan Data to 3 Dimensional Images, Anatomical Models and Custom Implants
2) Reduces OR/Chair Time
3) Lower Patient Cost
4) Patient Friendly
SUMMARY

EMERGENCY EQUIPMENT

- Towel Clamp
- Hemostat
- Pin Light
- Tongue Blade
- Cotton Balls
- Afrin or Neosynephrine
### General Considerations
- ABCs
- Concomitant Injury
- Diagnosis
  - Physical Examination
  - Imaging

### PANOREX X-RAY
The Most Effective X-Ray

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**DO NOT NEGLECT OR MISS A CONDYLAR OR TMJ INJURY**

**TIME**
most important factor in reducing a TMJ dislocation

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**IF TEETH GET KNOCKED OUT**
-- FIND THEM --
Septal Hematoma
Must Be Incised and
Drained to Prevent Septal
Necrosis and Subsequent
Growth Disturbances

FACIAL BLEEDING
• Cover Wound with Cloth –
  Apply Pressure
• Do Not Remove Soaked Cloth
• Use Additional Cloth and
  Continue Pressure

NON-COMPLIANCE IS A REAL PROBLEM

Steps to Sideline Preparedness
1) Equipment
2) Education
3) Practice & Teamwork
80% of Epitaxis is from Anterior Bleeding in Kiesselbach Plexus

Posterior Bleeding Derives Primarily from Post Septal Nasal Artery (a branch of Shenopalatine artery) which forms part of Woodruff Plexus