Dental Impressions

“Taking a bite out of Crime”
Teeth Survive!

- Fire, trauma, age, weathering, water do not greatly effect teeth

- Most people have records from dental check-ups available

- Good source of identification
Investigators can analyze **bite marks** for characteristics to help them identify victims or suspects as well as to exclude others. Marks can be left on a victim’s **skin** or other **objects**, such as Styrofoam cups, gum, or foods. **Saliva** or **blood** may be left behind that can be tested for **DNA**. Dental records including **x-rays** can also provide useful information, especially when attempting to identify a victim.

**Features to analyze:**
- **Type** of bite mark (human or animal)
- Characteristics of the **teeth** (position, evidence of dental work, wear patterns, etc.)
- **Color** of area to estimate how long ago the bite occurred (old or recent bite)
- **Swab** for **body fluids** for DNA tests

**Did you know?**
*The most famous incident where bite mark evidence led to a conviction, was in the case of the notorious serial killer, Ted Bundy. He was responsible for an undetermined number of murders between 1973 and 1978 and was finally tied to the murder of Lisa Levy through bites that he had inflicted on her body.*

History of Forensic Dentistry

- **66 AD**
  - Enemy of Emperor Nero’s Mother identified by a discolored tooth.

- **U.S. Revolutionary War**
  - Paul Revere (a young dentist) helped identify war casualties by their bridgework.

- **WWII**
  - Identification of Adolf Hitler

- **9/11/01**
  - Victims of the attack on the World Trade Center identified by dental records
Anatomy of Teeth - Adult

- incisors
- central incisor
- lateral incisor
- canine
- premolars
- first premolar
- second premolar
- first molar
- molars
- wisdom tooth
- second molar+
Development of Teeth

- Baby teeth:
  - Central Incisor: 7-12 mos.
  - Lateral Incisor: 9-13 mos.
  - Canine (Cuspid): 16-22 mos.
- Adult teeth:
  - First Premolar (Bicuspid): 25-33 mos.
  - Second Premolar (Bicuspid): 13-19 mos.
  - First Molar: 20-31 mos.
  - Second Molar: 12-18 mos.
  - Third Molar: 16-23 mos.
  - Central Incisor: 7-16 mos.
  - Lateral Incisor: 7-8 yrs.
  - Canine (Cuspid): 6-10 mos.
  - First Premolar (Bicuspid): 6-8 yrs.
  - Second Premolar (Bicuspid): 6-8 yrs.
  - First Molar: 6-8 yrs.
  - Second Molar: 6-8 yrs.
  - Third Molar: Variable 17 to 21 years.

This chart is a guideline only, children grow at their own pace.
The solid, white part of teeth is composed of two different kinds of tissue: a tough covering of **enamel** that protects the living **dentine** tissue underneath.

**Enamel** is composed of calcium and phosphorous, is the hardest substance in the human body. It protects teeth at high temperatures.

The approximate age of a child can be estimated by viewing the child’s teeth. The presence of wisdom teeth usually indicates an age of over seventeen (17).

The complete, adult set of teeth has 32 teeth, including wisdom teeth.
Dental Impressions

• Occasionally a perpetrator will leave behind a bite mark—considered individual evidence
• Note differences in the size of teeth and jaws, position, fillings, crowns, caps, breakage, and crowding
Evidence Collection: Victim

**Physical appearance**
- Color
- Size and orientation of the injury
- Relative shape of the site
- Location on the body

**Types of injuries present**
- Cuts?
- Bruises?
- Scrapes?

Can the difference between marks from the upper and lower teeth be determined?
Evidence Collection: Victim

Photographs

• Take extensive orientation and close-up photographs
• Include a reference Scale.
### Evidence Collection: Victim

**Saliva swabs**

Use the double swab technique:

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<tr>
<th>First, Moistened swab to wash the surface</th>
<th>Second, a dry swab to collect the remaining moisture that is left on the skin</th>
<th>Both swabs are thoroughly air-dried at room temperature for at least 45 minutes</th>
<th>The envelopes or boxes should be refrigerated or frozen during storage.</th>
<th>A DNA sample must also be collected from the victim to compare with the sample</th>
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Evidence Collection: Victim

**Impression**

Use vinyl polysiloxane, polyether or other dental impression materials to create an impression of the bite mark.
Evidence Collection: Suspect

Clinical Examination
- Establishes basis for dental irregularities

Photographs
- Full facial
- Profile
- Intra-oral exposures
- Include a reference scale

Impressions
- Accurate dental impression materials should be used.
Evidence Collection: Suspect

• A sample of the suspect’s bite is recorded using either a wafer of baseplate wax, a sample of silicone putty material, or other material
• This exhibit should be photographed immediately after it is recorded.
**Conclusions**

- **Positive ID:**
  - The same individual
  - No unexplained discrepancies

- **Possible ID:**
  - Consistent features but, because of the quality
  - Not possible to establish identity positively.

- **Exclusion:**
  - Clearly inconsistent

- **Insufficient Evidence:**
  - The available information is insufficient to form the basis for a conclusion.
Career in Forensics

- Forensic Odontologist
  - Dentist specialized in dental impressions