Tooth Anatomy
Crown – the visible portion of the tooth, above the gumline, covered by enamel.
Cusp – the very tip of the crown.
Enamel – hardest substance in the body, covering of the crown. Comprised of mineral, organic material and water.
Root – the portion of the tooth below the gumline, within alveolar bone, covered by cementum.
Apex – the very tip of the root, deepest portion into alveolar bone.
Apical Delta – Several openings at the apex of the tooth in which blood supply and nerves enter the pulp cavity.
Cementum – mineralized connective tissue covering of the root, provides attachment of the periodontal ligament to the tooth. Appears dull and often shows “pits”.
Periodontal ligament – holds the tooth in place within the alveolar bone by fibrous connective tissue. Ligament attaches to both the cementum and alveolar bone.
Alveolar bone – commonly referred to as the “tooth socket”, it is a thin layer of bone surrounding each tooth within the mandible or maxilla.
Dentin – layer below the enamel or cementum. Dentinal tubules formed by inorganic material, collagen fibers and water, comprise this porous material. They are responsible for transmitting pain to the nerves within the pulp cavity when exposed.
Cementoenamel junction (CEJ) – line of the tooth where root and crown meet. Sometimes referred to as the “neck” or cervical neck line.
Lamina dura – compact alveolar bone lying adjacent to the periodontal ligament surrounding each tooth. Seen on radiographs as a white line just outside of the periodontal ligament space.
Pulp chamber – divided into the root canal and pulp cavity, within the root and crown respectively. This is the most “alive” portion of the tooth, containing veins, arteries, nerves, lymph vessels and some cells.

Soft Tissue Anatomy
Gingival margin – free gingival tissue (unattached) that surrounds the crown of the tooth.
Attached gingiva – lies apically to the gingival margin and coronal to the mucogingival line, adheres to the alveolar bone below.
Gingival sulcus – junction where the gingival margin and the attached gingiva meet. Normal depth in dogs is 3 mm or less in dogs and 1 mm or less in cats.
Mucogingival line – area where alveolar mucosa and attached gingival tissues meet.
Hard palate – created by three different bones of the skull, covered by palatine rugae.
Incisive papilla – raised, round structures, just palatal to the maxillary incisors at the most rostral aspect of the hard palate. Aids in sense of smell.
Soft palate – smooth tissue at the most caudal aspect of the mouth continuing beyond the hard palate. This area does not have palatine rugae and connects the oral cavity and pharynx.

Skeletal Anatomy
Maxilla – upper jaw
- Incisive bone – bone which houses the incisors
- Palatine bone – bone that forms the “roof” of the mouth
- Zygomatic arch – cheekbone

Mandible – lower jaw is broken into the left and right sides which are joined by the incisors the mandibular symphysis.
- Angular process – boney, angular protrusion at the most distal aspect of the mandible.
- Coronoid process – boney, angular protrusion at the distal, dorsal aspect of the mandible.
- Condylar process – boney, angular protrusion that forms part of the temporomandibular junction.

Tempromandibular joint (TMJ) – joint which hinges the mandible and maxilla, capable of mild rostral and lateral movement and rotational hinge movement.
- Horizontal ramus – bulk of mandibular bone in which the alveolar bone houses the mandibular teeth.
- Vertical ramus of mandible – distal half of the mandible which extends dorsally medially to the zygomatic arch.

Mesaticephalic – average head shape & jaw length; think, retriever, beagle, domestic cat.
Brachycephalic – rounded head shape & shortened jaw length, resultant crowding and rotated teeth; think pug, boxer, Persian cat.
Dolichocephalic – long, narrow head shape & longer jaw length; think collie, greyhound, Siamese cat.

Nerve Anatomy
Trigeminal Nerve – Cranial nerve V, branches into the ophthalmic, maxillary and mandibular.
Maxillary Nerve – serves the lower eyelid, nasal mucosa, maxillary teeth, upper lip and nose.
- Nerve branches into the palatine nerves and infraorbital nerve.
- Major & Minor palatine nerves – serves the soft and hard palate and taste
- Infraorbital nerve – branches to the caudal superior (maxillary molars), middle superior (maxillary premolars), and rostral superior (maxillary canines and incisors), which serves the alveolus of each tooth.

Mandibular Nerve – serves the cheeks, tongue, mandibular teeth, lower lip, and skin, branches to masticator nerve (opening the mouth), lateral and medial pterygoid (raising the mandible while eating), buccal nerve (skin and mucosa in the cheek), inferior alveolar (all mandibular teeth), mental (lower lip and intermandibular region), and lingual (tongue).
- Inferior Alveolar – travels along the mandible and exits through the mental nerve branches and foramen.

Directional Terminology
Mesial – toward the midline of the face
Distal – away from the midline of the face
Buccal – toward the cheek
Palatal – toward the palate
Lingual – toward the tongue
Labial – toward the lips
Apical – toward the root apex
Coronal – toward the crown cusp
Interproximal – between two teeth
Rostral – refers to the head and structures on the head (not the teeth), moving closer to the nose
Caudal – refers to the head and structures on the head (not the teeth), moving toward the back of the head

Tooth Types
Incisors – single rooted teeth at the front of the mouth, used for cutting, picking up items and grooming, abbreviated \textit{I}.
Canines – large, single rooted teeth, “fang” teeth, used for ripping, tearing and holding.
Mandibular canines also help hold the tongue in place, abbreviated \textit{C}.
Premolars – along the sides of the maxilla and mandible distal to the canines, used for holding food and breaking it down to smaller bits, abbreviated \textit{PM}.
Molars – distal to the premolars, have a true occlusal surface, used for grinding food, abbreviated \textit{M}.

Primary Dental Formulas
Canine: Total of 28 teeth
\begin{itemize}
\item Maxilla: incisors (6), canines (2), premolars (6), molars (0)
\item Mandible: incisors (6), canines (2), premolars (6), molars (0)
\end{itemize}
Feline: Total of 26 teeth
\begin{itemize}
\item Maxilla: incisors (6), canines (2), premolars (6), molars (0)
\item Mandible: incisors (6), canines (2), premolars (4), molars (0)
\end{itemize}

Permanent Dental Formulas
Canine: Total of 42 teeth
\begin{itemize}
\item Maxilla: incisors (6), canines (2), premolars (8), molars (4)
\item Mandible: incisors (6), canines (2), premolars (8), molars (6)
\end{itemize}
Feline: Total of 30 teeth
\begin{itemize}
\item Maxilla: incisors (6), canines (2), premolars (6), molars (2)
\item Mandible: incisors (6), canines (2), premolars (4), molars (2)
\end{itemize}

Modified Triadan System
My preferred way to chart and document teeth.
Identifies each tooth with a unique three digit number, is by far the fastest way to document teeth.
\begin{enumerate}
\item Divide the mouth into four quadrants.
  \begin{enumerate}
  \item Upper right = quadrant 1, teeth are all 100’s
  \item Upper left = quadrant 2, teeth are all 200’s
  \item Lower left = quadrant 3, teeth are all 300’s
  \end{enumerate}
\end{enumerate}
d. Left right = quadrant 4, teeth are all 400’s

2. Remember the rule of 4 & 9
   a. All canines will always be tooth #4: maxillary right canine 104, maxillary left canine 204, mandibular left canine 304, mandibular right canine 404.
   b. All first molars will always be tooth #9: maxillary right first molar, 109, maxillary left first molar 209, mandibular left first molar 309, mandibular right first molar 409.
   c. If you are counting a premolar or molar always begin with the first molar and count down (mesially), or up (distally).
      i. Eliminates possibly missing first premolars in numerous dogs.
      ii. Back up reminder that cats do not have a maxillary first premolar or mandibular first and second premolars.

3. Deciduous teeth are treated the same
   a. Restart the tooth quadrants
      i. Maxillary right = 500’s
      ii. Maxillary left = 600’s
      iii. Mandibular left = 700’s
      iv. Mandibular right = 800’s
   b. Rule of 4 & 9 still applies but may be simpler to remember 4 & 8 as there are no molars in patients with full deciduous dentition.
      i. 04 is always the canine
      ii. 08 is always the fourth premolar

Pathology & Charting
Identifying pathology and charting it with corresponding treatment plan is as critical as the “cleaning” itself. It has been suggested dogs have “42 patients” and cats have “30 patients”. Each one of these “patients” deserves individualized treatment and monitoring.
A complete dental chart should include: abnormalities on each tooth surface and the treatment performed. Further, the medical record should indicate in detail treatments performed/recommended, radiographic findings, advanced dentistry procedures, home care treatment plan and follow up appointment recommendations.
Documentation allows us to have a better understanding of the previous abnormalities, treatments, recommendations and hence client compliance at each follow up visit.

Calculus Index (CI) – chart per tooth, per quadrant, or as the entire mouth
- 0 = no calculus
- 1 = Supragingival calculus extending slightly below the free gingival margin
- 2 = moderate amount of supragingival and subgingival calculus or subgingival calculus only
- 3 = large amounts of supragingival or subgingival calculus

Gingivitis Index (GI) – chart per tooth, per quadrant, or as the entire mouth
- 0 = normal gingiva, no inflammation, discoloration or bleeding
- 1 = mild inflammation, slight color change, mild alteration of gingival surface, no bleeding
- 2 = moderate inflammation, erythema, swelling, bleeding on probing or when pressure is applied
- 3 = severe inflammation, severe erythema and swelling, tendency toward spontaneous hemorrhage, some ulceration

**Periodontal Disease Stage (PD)** – chart per tooth, per quadrant, or as entire mouth
- 0 = normal periodontium
- 1 = gingivitis only
- 2 = less than 25% attachment loss
- 3 = 25-50% attachment loss
- 4 = greater than 50% attachment loss

**Attachment loss** – the cumulative total loss of gingival recession and periodontal pocket

**Attrition (AT)** – normal wear on a tooth surface, tooth wearing on another tooth
- 1 = slight wear
- 2 = moderate wear
- 3 = severe wear

**Abrasion (AB)** – wear on a tooth surface by an outside force, tennis balls, cage bars, food bowls
- 1 = slight wear
- 2 = moderate wear
- 3 = severe wear

**Caries (CA)** – bacterial induced destruction of the occlusal surface of a tooth, occasionally seen on the labial or buccal surfaces. Most common in dogs, rarely seen in cats.

**Crowding (CWD)** – interproximal space is decreased predisposing to periodontal disease

**Enamel Defect (ED)** – enamel is missing from the tooth surface

**Enamel Hypoplasia (EH)** – disruption of ameloblasts during enamel development, drug-induced, trauma

**Furcation Exposure (F)** – gently explore areas of horizontal bone loss exposing the furcation of multirooted teeth. Use the periodontal probe end of a handheld probe.
- 1 = probe extends less than half way under the crown in any direction
- 2 = probe extends greater than half way under the crown in any direction but does not pass through
- 3 = probe extends fully under the crown and passes from one side to the other

**Tooth Fractures**
- Enamel Infraction (EI) – crack in the enamel without loss of tooth substance
- Enamel Fracture (EF) – fracture of enamel with loss of tooth substance on the crown but involving only enamel
- **Uncomplicated Crown Fracture (UCF)** – fracture within the crown that does not extend to the pulp cavity
- **Complicated Crown Fracture (CCF)** – fracture within the crown that does extend to the pulp cavity
- **Uncomplicated Crown-Root Fracture (UCRF)** – fracture of the crown and root that does not extend to the pulp cavity
- **Complicated Crown-Root Fracture (CCRF)** – fracture of the crown and root that does extend to the pulp cavity

**Gingival Hyperplasia (GH)** – enlargement of the gingiva extending over the crown surface and creates a ‘pseudo pocket’. Measure pseudo pockets from the gingival margin to the edge of the gingival enlargement.

**Gingival Recession (GR)** – measure loss of attached gingival above the gingival margin
- Depth is measured in millimeters
- Chart by documenting the mm depth after the GR

**Missing Teeth**
- Circle the tooth on the dental chart which corresponds to the missing tooth after confirming with dental radiographs.

**Tooth Mobility (M)** – gently move the tooth with the explorer end of a handheld probe
- 0 = movement of up to 0.2 mm
- 1 = movement in any direction of 0.2 – 0.5 mm
- 2 = movement in any direction of 0.5 – 1 mm
- 3 = movement in any direction exceeding 1 mm

**Oral Mass (OM)**

**Oronasal Fistula (ONF)** – caused by extensive periodontal disease or during extraction process

**Periodontal Pocket (P)** – gently explore areas of sulcus depth which extend beyond the gingival margin and into the attached gingiva.
- Depth should be measured in millimeters.
- Chart by documenting the mm depth after the P (perio pocket of 5 = P5)
- May also be charted by placing the 5 on the side of the tooth it was probed. Buccal P5 would be written as a 5 on the buccal aspect of the tooth.

**Closed Root Planing (RPC)** – process of curettage along the root of a periodontal pocket and debridement of the correlating attached gingiva to treat a periodontal pocket of less than 6 mm.

**Open Root Planing (OPC)** – process of creating a surgical flap and performing curettage along the root of a periodontal pocket and debridement of the correlating attached gingiva to treat a periodontal pocket of greater than 6 mm.

**Tooth Resorption (TR)**
- TR1 (stage 1): mild tissue loss, extends to cementum or cementum and enamel
- TR2 (stage 2): moderate tissue loss, extends to dentin but not the pulp cavity
- TR3 (stage 3): deep tissue loss, extends to pulp cavity, however most of the tooth integrity is still present
- TR4 (stage 4): extensive tissue loss, extending to pulp cavity, most of the tooth has lost its integrity
  - TR4a: crown and root are equally affected
  - TR4b: crown is more severely affected than the root
  - TR4c: root is more severely affected than the crown
- TR5 (stage 5): remnants of the affected tooth are present only as irregular opacities and the gingival covering is complete.

Retained Root (RTR) - previous extraction or fractured tooth which the crown is missing but the root is still present within the alveolus, confirmed with radiograph.

Retained Root Tip (RRT) – previous extraction or fractured tooth which leaves a portion of a root within the alveolus, confirmed with radiograph.

Retained deciduous tooth (RD) – draw the tooth that is present

Rotated tooth (ROT)

Subgingival Curettage (SC) – process of using hand instrumentation to remove subgingival calculus

Supernumerary (SN) – note the tooth number as well as SN after confirming radiographically

Therapies & Diagnostics
Crown Amputation (CRA) – treatment for stage 2 tooth resorption in which the crown is amputated and the resorbing roots are left to continue resorbing by the surrounding alveolar bone.

Tooth extraction performed – draw an X over the tooth that was extracted

Endodontic Treatments
  - Root Canal Therapy (RC)
  - Vital Pulp Therapy (VP)

Excisional Biopsy (B/E)

Gingivoplasty/Gingivectomy (GV) – periodontal surgery used to remove gingival hyperplasia. At least 2 mm of attached gingiva should be left to maintain the tooth’s health.

Incisional Biopsy (B/I)

Perioceutic Therapy (PCT)
Restorative Treatments

- Composite Restoration (R/C)

This is only a small list in comparison of what is available at [www.avdc.org/nomenclature.html](http://www.avdc.org/nomenclature.html)

There are several examples of dental charts available at [www.avdc.org/dental_charts.pdf](http://www.avdc.org/dental_charts.pdf)

RESOURCES

