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The Professional Dental Prophylaxis: From Start to Finish

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The Professional Dental Prophylaxis: From Start to Finish

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Learning Objectives

- Describe the components involved in performing a dental prophylaxis.
- Understand the foundations of how professional cleaning treats and prevents periodontal disease.
- Understand why prophylaxis should be performed during a COHAT and articulate the importance of general anesthesia
- Identify appropriate instrumentation for cleaning and the correct techniques for handling these instruments.
- Describe techniques for evaluating the proficiency of a performed prophylaxis.
- Advise on when to conduct a prophylaxis during a COHAT depending upon the patient and other treatments required.

What Is A Dental Prophylaxis?

- Prophylaxis means prevention of or protective treatment.
  - Can be confused with prophylactic.
- Prophylaxis aka prophy or dental cleaning.
- Goal is to change to preventative measure instead of reactive.
- Purpose is to restore the gingival tissues to health.
- Includes:
  - inspection and charting of the teeth
  - supragingival and subgingival scaling
  - root planing
  - Polishing
  - pocket irrigation
  - home care instruction
- The professional cleaning is only one part of the COHAT.

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What is a COHAT?

- COHAT stands for **C**omprehensive **O**ral **H**ealth **A**ssessment & **T**reatment and is a multistep procedure.
- What makes up a COHAT?
  - Awake oral & physical exam w/ pre-anesthesia workup
  - Induction of general anesthesia
  - Full mouth dental radiographs
  - Oral exam & charting
  - Ultrasonic scale & polish teeth
  - +/- Periodontal therapy
  - +/- Advanced or surgical treatment
  - Recovery
  - Discharge instructions
  - Homecare instructions

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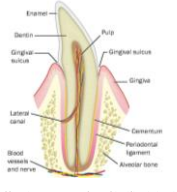
What Is Periodontal Disease?

- Periodontal disease (PD) is an inflammation and infection of the tissues surrounding the tooth structures called periodontium (gingiva, periodontal ligament, cementum, and alveolar bone).
- It is one of the most common health issues among dogs & cats. It is even more prevalent in smaller breeds.



Causes:

- Plaque
  - Soft, gelatinous matrix of bacteria & bacterial by-products that lead to gingival inflammation.
- Calculus
  - Aka tartar, is calcified plaque.

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https://www.thevetinarynurse.com/content/clinical/dentalradiography-in-veterinary-practice/

What Is Periodontal Disease?

Clinical Signs:

- Halitosis
- Bleeding, red, or swollen gums
- Hypersalivating
- Pawing at mouth
- Reluctance to chew
- Loose or missing teeth
- Behavioral changes
- Gingival recession
- Purulent discharge
- Facial swelling
- Draining tracts
- Nasal discharge

Risk Factors:

- Age
- Brachycephalic
- Small breeds
- Breed predisposition like Greyhounds or poodles

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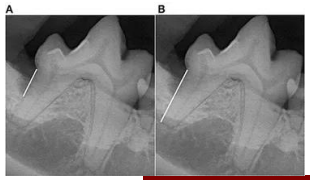
Diagnosis of Periodontal Disease

- Periodontal disease is scored by attachment loss.
- Attachment loss = Pocket depth + bone loss percentage on X-rays.



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https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2023.1247347/full

Periodontal Disease Staging

- Stage is the assessment of the extent of pathological lesions in the course of a disease that is likely to be progressive.
  - Scored from 0 – 4
- Index is a quantitative expression of predefined diagnostic criteria whereby the presence and/or severity of pathological conditions are recorded by assessing a numerical value.
  - Gingival, plaque, and calculus index scored from 0 - 3
- Definitions found on AVDC.org

PD0: Normal

- Attachment loss is 0%
- No inflammation of the gingiva
  - Pink, smooth, and lies flat against the teeth.
- No treatment required, but homecare should be done to maintain oral health.
- Usually only seen in young patients.

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Periodontal Disease Staging

PD1: Gingivitis

- Attachment loss is 0%
- Gingivitis is now present.
- May be slight increase in sulcus depth due to gingival swelling, called psuedo pocket.
- Treatment: COHAT – professional cleaning and homecare
- * Only stage that is reversible!

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Periodontal Disease Staging Continued…

PD2: Early Periodontitis

- Attachment loss is < 25%
- Pocket depth increases due to attachment loss.
- Bone around the neck of the tooth starts to deteriorate.
- Treatment: COHAT and close/root planning +/- perioceutic placement (antibiotic gel) to re-establish soft tissue attachment & reduce pocket depths. Homecare.

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Periodontal Disease Staging Continued…

PD3: Moderate Periodontitis

- Attachment loss is 25-50%
- Bone surrounding the roots of the teeth starts to deteriorate, tooth roots may be exposed, possible furcation exposure.
- Alveoitis (inflammation of the alveolus) or osteomyelitis may occur.
- Treatment: Frequent COHATs and periodontal therapy including close/open root planning +/- perioceutic application, guided tissue regeneration, extraction of affected teeth if owner is unable or uninterested in performing homecare or frequent COHATs.

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Periodontal Disease Staging Continued…

PD4: Severe Periodontitis

- Attachment loss is > 50%.
- Tooth roots and furcations are exposed.
- Teeth may be loose; some held in place only by calculus or granulation tissue.
- Teeth with > 50% attachment loss may not be possible to salvage.
- Treatment: Extraction or guided tissue regeneration, possible periodontal splinting of mobile teeth. Frequent COHATs. Homecare.

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How to Perform A Professional Dental Cleaning

Steps Overview:

1. Remove heavy calculus deposits w/ ultrasonic or hand scaler
2. Supragingival ultrasonic scaling
3. Subgingival ultrasonic scaling
4. Use water syringe to irrigate & flush debris from the subgingival areas
5. Use air syringe to dry the crown and highlight any remaining calculus (looks chalky) and assess subgingival areas
6. Use hand scaler and/or curettes for specific areas that need more attention – root planing
7. Polish the crowns of the teeth to remove micro-etching from scaling
8. Perform final subgingival irrigation to remove debris and polishing paste.
9. Apply any barrier sealants, if applicable.

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Why Should A COHAT Be Performed Under General Anesthesia?

- Unable to perform dental radiographs and oral exam without anesthesia.
- Can only clean above the gumline and unable to look / assess below.
- Sharp instruments – can cause harm to the patient.
- Unable to polish. Scaling leaves grooves in the teeth & a rough surface prime for the adherence of more bacteria.
- Sometimes there are no visible signs of PD until the damage is already done.
- It is very likely that the pet is uncomfortable and in pain
- Give owners a false sense of security.
- The American College of Veterinary Dentists (www.avdc.org) & the Academy of Veterinary Dental Technicians (www.AVDT.us) have created position statements regarding anesthesia-free dentistry.

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Instrumentation Needed For a Prophylaxis

Scaling instruments
- Manual
  - Supragingival scalers
  - Subgingival scalers
- Power driven
  - Sonic scalers
  - Ultrasonic scalers
    - Piezo-electric scalers
    - Magnetorestrictive scalers
      - Stacked
      - Ferrite rod

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Instrumentation Needed For a Prophylaxis

- Root planing & curetting instruments
  - Area specific curettes
    - Gracey curettes
  - Universal curettes
    - Columbia curette
    - Barnhart curette

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Instrumentation Needed For a Prophylaxis

- Cleaning and polishing instruments
  - Rubber cups
  - Bristle brushes
  - Dental tape
  - Air powder polishing

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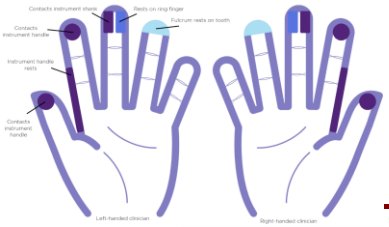
The Modified Pen Grasp

The modified pen grasp is a way of holding the dental instrument that is similar to holding a pen. It's a stable and efficient grasp that works with most dental instruments.



https://ucsfcme.com/2015/10/the-modified-pen-grasp/

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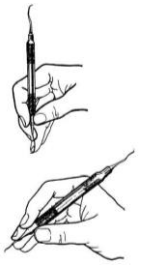
The Modified Pen Grasp



How to perform a modified pen grasp:

1. Hold the instrument in your dominant hand
2. Place the pads of your thumb and index finger opposite each other on the handle.
3. Slightly curve your thumb in a C shape.
4. Keep your index finger straight from the fingertip to the second knuckle.
5. Place the pad of your middle finger on the handle of the instrument.
6. Use your ring finger as a fulcrum (support at a point in which a lever turns) for support.

https://austinjdental.com/2017/02/the-modified-pen-grasp/

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The Modified Pen Grasp Cont…

HYGIENE EDGE

MODIFIED PEN GRASP

https://www.youtube.com/watch?v=GJMhicwK1E

Benefits:

- Provides more strength and stability.
- Creates a tripod effect that facilitates ease of instrument control.

Tips for using the modified pen grasp:

- Avoid extreme movements.
- Minimize the force of your grip. Correct grasp aids in posture, minimizing risk of injury.
- Position both hands symmetrically to each other.
- Maintain neutral positioning of your wrist, forearm, elbow, and shoulder.

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Instrumentation: Power Scalers

Power scalers convert electric or pneumatic energy into a mechanical vibration.

Power scalers are great for reducing table time, hand fatigue, and cutting injuries that may occur with sharp hand instruments.

- Ultrasonic scalers are divided into two categories: piezoelectric or magnetostrictive.
- Each converts the energy into a sound wave, which vibrates the tip or insert.
- Uses rapid vibrations to effectively remove biofilm and calculus deposits.
- Micro-etching will still occur with proper techniques.
- Thermal injuries to the tooth can occur with improper usage.
- Never use for longer than 10 seconds on one tooth to avoid overheating.

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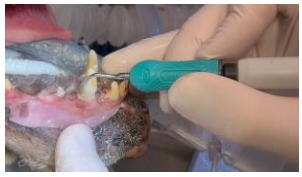
Instrumentation: Power Scalers

- Ultrasonic scalers provide the additional benefit of a stream of water coming from the tip to cool and flush debris from the sulcus.
- The flushing action is destructive to the biofilm by causing acoustic streaming and cavitation.
  - Acoustic streaming is disruption of bacteria in plaque caused by churning of fluid within the confined pocket space.
  - Cavitation is the energy created from the mist of water.
- As the water coolant exits the handpiece and strikes the vibrating working end, it creates thousands of water bubbles. These bubbles implode with enough energy to disrupt the bacterial cell walls.



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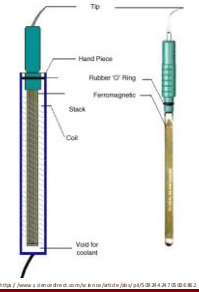
Instrumentation: Ultrasonic Scalers

Magnetostrictive ultrasonic scaler may be a metal stack (lower end Hz range) or a ferrite rod (higher end Hz range).

Metal Stack:
- Vibrate at 18,000, 25,000, and 30,000 cycles/second.
- Working tip is all sides.
- Uneven motion.
- Moves in elliptical motion.
- Small amplitude of 0.01-0.05mm
- Versatile applications in supragingival and subgingival debridement.



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Instrumentation: Ultrasonic Scalers Cont…

Ferroceramic rod aka Ferrite rod
- Vibrate sat 42,000 cycles/second.
- Amplitude of 0.01 to 0.02mm.
- Circular-type motion.
- All sides are equally active.

*One precaution is in pets with a pacemaker, it's possible for the magnetic components to interfere with pacemaker function.

* Generates heat during prolonged use.

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Instrumentation: Ultrasonic Scalers Cont…

Piezoelectric scaler

- Ceramic disc or crystal as the transducer
- Frequency ranges from 25,000 to 45,000 cycles/second.
- Amplitude is approximately 0.2mm
- Wide, back-and-forth tip motion.
- Approximately 3mm of the working tip is active.
- Small metal tips that screw into the handpiece

* Limitations of effective vibrating surfaces cause this scaler to be more technique-sensitive than other power scalers.
*The ceramic disc of the transducer is fragile and easily breakable if the handpiece is dropped.

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Instrumentation: Ultrasonic Scalers Tips

Universal Tip

Best for general deposit removal in all quadrants.

Square Tip

Flat chisel
Used for supragingival Calculus removal.

BS-P Tip

Slim tip design
Used for Supra and subgingival scaling

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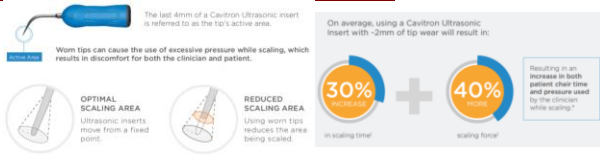
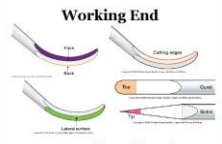
When To Replace Ultrasonic Tips / Inserts

When To Replace Ultrasonic Tips / Inserts



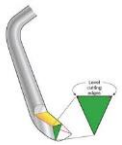
- Precision tips are extremely fragile and must be used with a light touch.
- Tips should be replaced at least annually, or when they are bent or worn down.
- As the tip wears, it becomes shorter, and the effectiveness of scaling diminishes. For each mm of wear, a 25% decrease in efficiency has been noted.

Hand Scaling Instrumentation



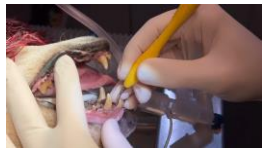
Hand Scaling Instrumentation: Scaler

- Scalers are designed for supragingival use on the tooth crown to remove plaque and calculus.
- Designed for the removal of moderate to heavy deposits.



How to use:

- Place the blade against the crown of the tooth with the face at an angle between 45 and 90 degrees to the tooth surface.
- The cutting edge is placed at the apical edge of the calculus and pressure is placed against the tooth.
- The instrument is used with a short pull stroke to disengage the debris.



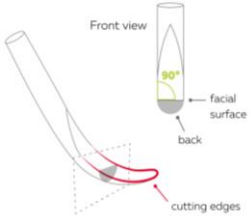
Hand Scaling Instrumentation: Curette

- Curettes are used to remove calculus and debris from below the gumline on the root surface called root planning, and to remove calculus and debris from the opposing surface of the gingival tissue called gingival curettage.
- This instrument has one or two sharp edges, a rounded back and a blunt tip or toe.
- The two most used curettes are the Universal and Gracey.

Hand Scaling Instrumentation: Curette

Universal Curettes

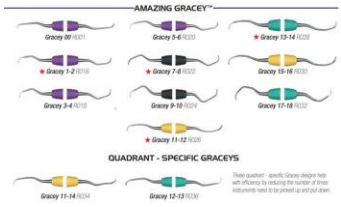
- For the removal of sub-gingival calculus.
- Designed to adapt to all teeth surfaces to be treated.
- Sharpened on both sides.
- Blades/Cutting Edges perpendicular (90°) relative to the shank.
- Round back (semi-circular cross section) and round tip/toe for a less traumatic subgingival cleansing.



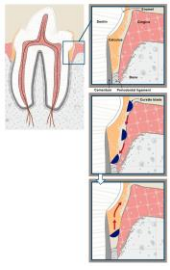
Hand Scaling Instrumentation: Curette

Gracey Curettes

- For the removal of sub-gingival calculus
- Site specific: designed to adapt to the specific area or tooth surface to be treated.
- Sharpened only in one side.
- Blade/Cutting Edge laterally offset by 70 degrees relative to the shank.
- Round back (semi-circular cross section) and round tip/toe for a less traumatic subgingival cleansing.



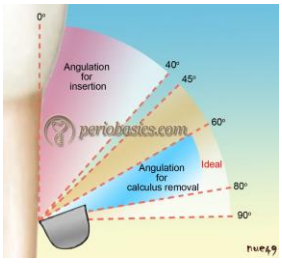
How to Perform Closed Root Planing

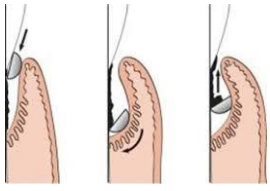


The subgingival curette blade is introduced atraumatically below the gumline with the face of the instrument nearly parallel to the root surface. At the bottom of the sulcus, the handle is adjusted, causing the down (cutting) edge of the instrument to contact the root surface. Plaque, calculus, and debris is removed on the upward pull stroke

http://www.aaha.org/resources/2019aahadentalcareguidelinesfordogsandcatspresentation.pdf

How to Perform Closed Root Planing





Polishing

Prophy angles come in 3 types:

1. Metal reusable prophy angle
   - Rotates 360 degrees and can lead to overheating of the tooth if not used appropriately.
   - Can be less expensive but require maintenance and autoclaving between patients.
2. Disposable prophy angle
   - Rotates at 360 degrees
   - Should be used with caution to prevent overheating and hair entanglement.
3. Oscillating prophy angle
   - Move back and forth at 90 degrees.
   - Generate less heat than the circulating prophy angles.
   - Less likely to get hair entanglement.

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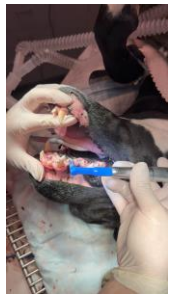
Polishing Continued…

- Moving approximately 2,000 - 4,000 rpm.
- Soft cups are preferred, require less pressure to conform to the contour of the tooth.
- Cup should be run at a slow speed to allow the prophy paste and cup to smooth the surface w/o generating too much heat – lead to pulp damage and tooth death.
- Just enough speed should be applied that the edges of the cup flare.
- Use modified pen grasp technique.



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Polishing Continued…

Prophy Paste

- Many different types available commercially.
- Come in varying grits, like sandpaper: coarse, medium, fine, and flour grit
- Using prophy pastes with a high grit can add additional etches to the teeth.
- Use of a prophy paste with fine or extra fine grit will help smooth out the etching.
- Premade human prophy pastes may contain xylitol.
- If an endodontic procedure or restoration need to be performed a pumice flour mixed with water is needed.

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Irrigation

- Irrigation of the mouth after calculus removal and polishing is vital.
- All pieces of calculus, debris, and prophy paste must be removed from the mouth to avoid aspiration during recovery.
- Can be done with air-water syringe on the dental delivery unit.
- Gingival sulcus should be irrigated to remove debris and help oxygenate the intrasulcular tissues.

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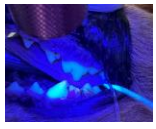
Check For Missed Plaque And Calculus

- A thorough check should be done to make sure there is no plaque and calculus remaining.
- Multiple methods available:
  - An explorer can be used to check the surfaces of the teeth.
  - Disclosing solution can be applied and gently rinsed with water.
    - Use with care because it can stain the hair around the patient's mouth.
  - Ultraviolet (UV) light will make the plaque and calculus fluoresce.
  - Thoroughly air dry the teeth, will make the calculus appear chalky white. Clean teeth are white and shiny.



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Barrier Sealants: Oravet

OraVet® Barrier Sealant binds electrostatically to tooth enamel, creating an invisible barrier that helps prevent plaque-forming bacteria from attaching. OraVet Barrier Sealant has been clinically shown to significantly reduce the formation of plaque when followed by use of OraVet® Plaque Protection Gel.

- Creates an invisible barrier that helps prevent plaque-forming bacteria from attaching to the teeth.
- Takes just minutes to apply.
- Extends the benefit of the dental prophy by at least 2 weeks.

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Barrier Sealants: Oravet

How to apply **OraVet**® Barrier Sealant
1. Allow teeth to dry thoroughly following a prophy.
2. Apply **OraVet** Barrier Sealant along the gum line using the applicator gun, a prophy cup, or a finger or swab.
3. Spread the sealant into the sulcus and interdental spaces.

Barrier Sealants: Sanos

SANOS® Veterinary Dental Sealant is a one-step application that helps keep the subgingival gumline of dogs and cats clean. SANOS® is applied after every professional dental cleaning to protect under the gumline and the 'difficult to reach' areas such as under the gums of the back (caudal) teeth. SANOS® is not for the cosmetic visible crown of the tooth, it is for keeping plaque and tartar from forming under the gums. SANOS® is designed to be applied after a professional dental cleaning. The Veterinary Oral Health Council (VOHC) has awarded its Seal of Acceptance to SANOS® Companion Animal Veterinary Dental Sealant.

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