IDENTIFICATION AND CARE OF VETERINARY DENTAL INSTRUMENTS AND EQUIPMENT

By

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Identification and Care of Veterinary Dental Instruments and Equipment

Nurses are frequently the cornerstone of veterinary dental procedures – before, during and after the procedure! It is important for nurses to know what instruments or pieces of equipment there are, how they are used and how they are maintained to enable a safe and thorough procedure to occur. Correct use of equipment means the job is done quicker, with less frustration and fatigue on the operator.

Ask yourself with each piece of equipment or instrument, three questions.

WHAT is it?
WHERE is it used?
HOW is it maintained?

This lecture will answer those questions for dental equipment found in general small animal practice. There are no notes on radiology equipment or dental charts, both of which are necessary in dental work, but will be covered in other lectures. Brief notes at the end are on rabbit and rodent dentistry equipment for your interest.

Basically there are three broad groups of veterinary dental instruments, all of which are necessary for a complete, thorough dental procedure.

1. Power instruments – scalers, high and low speed handpieces
2. Hand instruments – includes probes, curettes, elevators, forceps, etc
3. Veterinary care team – yep that’s you and the vet!

Together they make up the dental equipment triad as shown below:

![Veterinary dental equipment triad for a complete procedure](image-url)
1. POWER INSTRUMENTS

*These are the powered scalers, high speed handpieces and low speed handpieces found on the dental base.*

**Scalers**

There are a number of types of powered dental scalers on the veterinary dental market. All of them are designed to remove gross calculus from the crown of the tooth and are classified by how they operate.

They can be classified into 4 main types: sonic, piezoelectric, magnetostrictive (Cavitron-like) and magnetostrictive ferrite rod (see Table 1 below for differences). Generally the higher the frequency (number of cycles the tip makes per second), the shorter the working time. The smaller the excursion (how far the tip moves in a cycle), the less trauma that is delivered to the enamel. Ideally you want to have a scaler that has a high frequency and a small excursion.

<table>
<thead>
<tr>
<th>Type of scaler</th>
<th>Action of working tip</th>
<th>Freq(cps)</th>
<th>Excursion at tip (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonic</td>
<td>elliptical</td>
<td>3000-8000</td>
<td>0.5-1.5mm</td>
</tr>
<tr>
<td>Magnetostrictive (metal stack)</td>
<td>fig of eight</td>
<td>25-30,000</td>
<td>0.8-1.1</td>
</tr>
<tr>
<td>Piezoelectric</td>
<td>linear</td>
<td>20-45 000</td>
<td>0.2-0.4</td>
</tr>
<tr>
<td>Magnetostrictive (rod types)</td>
<td>circular</td>
<td>42 000</td>
<td>0.01-0.2mm</td>
</tr>
</tbody>
</table>

**Table 1: Features of various types of dental scalers**

The correct use of a scaler tip involves using the tip parallel to the tooth surface. Don’t use as a pick or hammer, instead use over the tooth like a brush painting the surface. A universal tip is used supragingivally (crown only) while a perio tip can be used subgingivally (below the gum line). Don’t scale over tooth restorations or crowns as you may damage them.

As the tip moves it heats up so ensure water is used to reduce the heat at the working end. Keep moving the scaler tip to prevent thermal and enamel damage (microscopic scratching). Thermal damage occurs when the tooth is heated causing the pulp to become inflamed. This may lead to death of the tooth. Don’t use the scaler tip on the tongue or mucosa either, as it may overheat and damage these structures.

Following use ensure all power is turned off and the lines depressurized prior to cleaning. The control box and cords can be wiped down to remove blood and debris with alcohol, soap or water based disinfectant. Scaler tips and handpieces shouldn’t be soaked after
use, just wipe down with disinfectant and then autoclave. Scaler components should be autoclaved between patients at 121 degrees Celsius (plastics cycle). Check the operating manual for any other particular maintenance tasks.

**Handpieces**

Most equipment is air driven as it is faster and more effective than electric motor units. Handpieces may be powered by either an air compressor or bottled gases.

**Air compressors** maybe remote or tableside, the advantage of a remote compressor is that there is less noise, and it leaves more room in the operating room. There are three main maintainance duties- just like a car check the oil, air and water!

Air compressors maybe oil free or contain oil. Oil is important for lubrication of the unit and levels should be checked regularly. Note that even some “oil free” units require some oil!

As air is compressed it heats up and the heat is transmitted to the compressor, as the tank cools condensation forms. Excess water needs to be drained from the compressor regularly.

Another thing to check is the pressure in the tank. The pressure should be 80-120psi to ensure adequate pressure at the handpiece. There is a regulator on the tank which will display the pressure. Always check the operating manual for maintenance tasks.

If an air compressor is not available then the dental base can be powered by bottled gases. Do not use oxygen as it may explode. Carbon dioxide and nitrogen are non-flammable and can be used, or alternatively you can get bottled compressed air. Bottled gas is impractical if using regularly as the bottles need to be refilled. The advantage however is that there is no maintenance.

Handpieces are either high speed or low speed. Regardless of the speed the handpieces are held like a pen with the spare fingers and the heel of the hand/wrist upon the patient’s jaw (modified pen grip). See Table 2 for a summary of the differences.

Attachments connect to handpieces, and handpieces are connected to the dental base. The attachments may connect to the handpiece in a snap on-off fitting (E fitting) or by a twist and lock fitting (Doriot fitting). Handpieces connect to the dental base by one of two types of fittings also, a 4 hole (Midwest) connection or a 3 hole (Borden) connection.

The names of the fittings are not important however it is important to know that there are different fittings when buying new or replacement parts for your dental base.
High speed handpieces are used to attach FG (friction grip) burs for sectioning teeth and removing alveolar bone. Sometimes they are just called the “turbine” and always have a contra-angle configuration, which facilitates access to the hard to reach areas.

High speed handpieces must always be used with water, which is usually integrated in the unit, to prevent thermal damage to sensitive structures including bone. They spin at 350000 – 400000 rpm and have low torque. Lower torque allows fine control but means the handpiece will stall if pressure is applied, and result in less tactile sense.

After use remove blood and debris with a damp tissue or cloth, spray with disinfectant and dry. Remove the rubber seal at the connection to the motor as it may perish during autoclaving. Clean and autoclave after each patient. Before using again replace the rubber seal and lubricate with a lubricant as specified by the manufacturer. Oil is placed in the smaller of the two air inlet holes.

**Table 2: Differences between high and low speed handpieces**

<table>
<thead>
<tr>
<th>Handpiece type</th>
<th>Configuration</th>
<th>Speed (rpm)</th>
<th>Tactile sense</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>High speed</td>
<td>Contra-angle</td>
<td>350000-400000</td>
<td>low</td>
<td>Attach FG burs for sectioning teeth and removing alveolar bone</td>
</tr>
<tr>
<td>Low speed</td>
<td>Contra-angle</td>
<td>1000-20000</td>
<td>high</td>
<td>Attach RA burs and some types of prophy heads</td>
</tr>
<tr>
<td>Low speed</td>
<td>Straight</td>
<td>1000-20000</td>
<td>high</td>
<td>Attach HP burs and some types prophy heads</td>
</tr>
</tbody>
</table>

Low speed handpieces spin at 1000-20000 rpm, and have high torque so are less likely to stall. There is also greater tactile sense. They don’t usually have integrated water lines so are more prone to causing thermal damage to the teeth. Manually irrigating the tissues with sterile water when using these handpieces and limiting the amount of time used on each tooth will reduce the likelihood of causing thermal damage.

Low speed handpieces maybe contra-angle or straight in configuration. Contra-angle low speed handpieces take RA (right angle) latch grip burs and some prophy heads. Straight low speed handpieces can take prophy angle attachments and HP (handpiece) burs used in rabbit/rodent dentistry and orthopaedic work.

Straight low speed handpieces are either speed reducing, speed increasing or equal speed with each having a different purpose. Each type is colour coded to make identification easier.
Green = speed reducing used to attach prophy angles
Red = speed increasing rare in general practice
Blue = equal speed used to attach HP burs for rabbit/rodent dentistry

Burs

Burs are used for sectioning teeth, bone removal, shaping and finishing restorations and occlusal adjustments (especially in rabbits and rodents).

Burs are made most commonly of tungsten carbide steel as they need to be very strong to cut though enamel. Some burs have a coating of small diamond fragments embedded in a resin on the shank. Known as diamond burs these burs generate more heat than the tungsten burs but create a smoother edge. These are the burs that are used for finishing bone removal tasks and alveoloplasty.

Burs can go in the high speed handpiece or in the low speed handpieces. They come in standard lengths except the FG burs. FG burs have a consistent cutting surface length but vary in overall length. The shank of the bur dictates the handpiece that it is used in. See table 3 for details.

Table 3: Comparison of bur types

<table>
<thead>
<tr>
<th>Bur type</th>
<th>Handpiece used</th>
<th>Shank Diameter</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>FG</td>
<td>High speed</td>
<td>1.6mm</td>
<td>12mm*</td>
</tr>
<tr>
<td>RA</td>
<td>Low speed, contra-angle</td>
<td>2.4mm</td>
<td>20mm</td>
</tr>
<tr>
<td>HP</td>
<td>Low speed, straight</td>
<td>2.4mm</td>
<td>40mm</td>
</tr>
</tbody>
</table>

* cutting surface length, overall length variable

Water is needed at the cutting tip during use. This is not a problem with FG burs as they are used in the high speed handpiece which has an integrated water supply. Hot tips will cause thermal damage to teeth and bone, and burs will blunt quicker. When using HP and RA burs you need to limit the time the bur is used on one piece of tissue continuously and irrigate with sterile saline as bur is in use.

Burs come in a range of sizes from ¼ (very,very small) to 8 (huge!). The most commonly used sizes are 2,4 and 6. There is an alternative sizing system where the size is given in tenths of millimetres (eg a size 14 bur is 1.4mm in diameter at the working tip), however this ISO sizing system is rarely used.

Burs come in a range of different shapes, the most common are the tapered fissure and the round burs. Tapered fissure burs are a cylindrical, tapered shape with cutting surfaces
on the side. They are used for sectioning teeth and bulk tissue removal. Only the sides do the cutting. The more flutes (or valleys) between the blades the smoother the finish as the flutes act to carry cut material away from the bur, similar to the twists in a wood drill. Cross cut burs may have grooves at right angles to the cutting surfaces to reduce clogging of tooth debris and maintain cutting efficiency.

Round burs cut on all surfaces and are used to finish tissue eg smoothing alveolar bone. They may also be used for sectioning very small teeth such as in cats.

Burs come individually in sterile packets or you can place in a bur block and autoclave. Ideally burs should be disposed of after each use, although in practice they can be cleaned with a brush and re-autoclaved. Re-used burs will be blunter therefore slower to use. Re-used burs are more likely to break especially with impatience. Broken burs are difficult to remove from the tooth and pose an OH&S risk to vets, nurses and the animal when the broken piece flies off. For this reason never use a bur without adequate eye protection for all staff nearby.

2. HAND INSTRUMENTS

There are so many hand instruments that it would be impossible to cover all of them in one lecture. I have tabled below a suggested list of instruments that would be useful in general small animal practice (cats and dogs) and exotic practice (rabbits, rodents, guinea pigs).

<table>
<thead>
<tr>
<th>Use</th>
<th>Small Animal</th>
<th>Exotics</th>
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<tbody>
<tr>
<td>Examination</td>
<td>Mirror</td>
<td>Mouth gags</td>
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<tr>
<td></td>
<td>Probes</td>
<td>Cheek dilators</td>
</tr>
<tr>
<td></td>
<td>Mouth gags</td>
<td>Probes</td>
</tr>
<tr>
<td></td>
<td>Good light</td>
<td>Good light</td>
</tr>
<tr>
<td>Calculus removal</td>
<td>Tartar removing forceps</td>
<td></td>
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<tr>
<td></td>
<td>Hand scalers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>curettes</td>
<td></td>
</tr>
<tr>
<td>Extraction</td>
<td>Elevators - standard, winged &amp;</td>
<td>Crossley luxator</td>
</tr>
<tr>
<td></td>
<td>Fahrenkrug (deciduous)</td>
<td>Right angled forceps</td>
</tr>
<tr>
<td></td>
<td>Root tip pick</td>
<td>Suturing equipment</td>
</tr>
<tr>
<td></td>
<td>Molt periosteal elevator</td>
<td>Hypodermic needles</td>
</tr>
<tr>
<td></td>
<td>Minnesota retractor</td>
<td>Small scalpel blades</td>
</tr>
<tr>
<td></td>
<td>Extraction forceps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suturing equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scalpel blades</td>
<td></td>
</tr>
<tr>
<td>Incisor work</td>
<td></td>
<td>Diamond discs</td>
</tr>
<tr>
<td>Molar work</td>
<td></td>
<td>Long shank burs,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>preferably guarded</td>
</tr>
</tbody>
</table>
SMALL ANIMAL (dog and cat)

EXAMINATION

1. Mirror
- used for indirect visualization of the teeth and retracting the lips, cheek or tongue out of the way.
- the use of patient saliva on the mirror surface, warming the mirror or application of an antifogging mixture may help prevent fogging.

2. Periodontal probes
- used for measuring gingival recession and periodontal pocket depth
- pocket depth varies with the degree of disease. The more severe the disease, the more tissue destruction and therefore the deeper the pocket. Normal depth of the gingival sulcus is <1mm in cats and 1-3mm in dogs.
- the depth is the distance from the attachment of the tooth to the gingival margin (tip). Be careful when measuring as excessive gingival tissue may create a pseudopocket.
- probes are used by inserting the end gently into the gingival sulcus (groove) between the tooth and the gum. Don’t push too hard as you will artificially create pockets, also be careful as diseased gums are very fragile and more likely to bleed when probed.
- there are a number of types of periodontal probes however they all have a notch or band of colour to indicate the number of millimeters. They may be flat or round in shape. Note whilst the coloured bands can be easier to see than notches the coloured bands can wear off over time on some brands, especially if instruments are cleaned with ultrasonic cleaners.
- periodontal probes are usually double ended. The other end being a periodontal explorer.

3. Periodontal explorer
- has a sharp, pointed tip designed to give maximum tactile sensitivity
- used to - detect debris and calculus on subgingival (below the gum) root surfaces
  - explore furcations (forking of the roots)
  - detect softened tooth structure
  - check for exposed pulps in worn or fractured teeth
  - detect resorptive lesions in cats
- need to be gentle when using an explorer so that you don’t cause any further soft tissue damage

4. Mouth gags
- usually placed between the canines to keep the mouth open so that you can see what you are doing and so you don’t get bitten!
- may be manufactured out of metal acting like a spring or homemade.
- use the smallest gag required to get the job done. Imagine what it would feel like if you had you mouth jammed open at a really wide angle for an hour! Try and release the gag regularly to prevent muscular fatigue and potential damage to the temperomandibular joint (TMJ).
- take care when applying the metal gags especially, so that you do not hit or damage the teeth.
- metal gags can be scrubbed and autoclaved although be careful with those that have a rubber ring as these may not cope with repeated autoclaving.
- a cheap disposable gag can be made from the barrel of a syringe with the tip broken off. A 2-3ml syringe would be the most commonly used.

CALCULUS REMOVAL

Calculus can develop above and below the gum line. Different instruments are used depending on the location of the calculus.

For supragingival (above the gum line) calculus removal:

- large hand instruments such as a dental hoe (or chisel) and a dental claw were once the mainstay of veterinary dentistry before ultrasonic scalers came about. (No wonder older vets hated dentistry especially as most of their instruments wouldn’t have been sharpened regularly!) They were used to remove large pieces of calculus from the crown of the tooth.
- now it is easiest to use calculus removing forceps for the largest pieces followed by ultrasonic scalers. Fine details such as developmental grooves, pits and fissures need to be cleaned using hand scalers. Therefore both mechanical and hand instruments are required to perform a thorough “prophylaxis”.

Calculus removing forceps look like a bird’s beak as one jaw is angled at almost 90 degrees towards the other. They are used vertically on the tooth crown, with care not to damage or pinch the gingiva. Some people try and use extraction forceps for the same job but you are more likely to fracture the crown of the tooth trying to “get” the angle right.

Hand scalers have two straight cutting surfaces, a pointed tip and are usually triangular in section (ie they are sharp and pointy). Do not go below the gumline with these instruments because they are sharp and pointy! Hand scalers are usually double ended with a left and right angled version of the same shape at each end. Hand scalers have names such as Jacquette, Sickle and Morse, depending on the angle of the blade.

For subgingival (below the gum line) calculus removal:

- principally this is performed by the use of curettes however some ultrasonic scaler manufacturers claim that some of their tips can be used safely subgingivally. Check first if yours is one of them.

Curettes have two sharp working edges, a flat face and a rounded back. Looking end on they have a half moon shape. Like scalers they are double ended with a left and right
angled blade of the same configuration. There are different types such as Universal, Gracey and Barnhart.

**EXTRACTION**

1. **Elevators**
   - are used to stretch and sever the periodontal ligament which holds the tooth in the socket
   - come with straight sides or wings to increase the surface area of periodontal ligament that is being severed.
   - used by inserting parallel to the tooth surface rotate slightly and hold for 20 sec. Keep moving around the tooth until the periodontal ligament is completely severed.
   - don’t use as a lever as you will fracture the tooth you are working on making it more difficult to remove; also do not put pressure on adjacent healthy teeth as you may damage them too.
   - handles come in a range of sizes, stubby handled instruments give the operator with small hands better control
   - be careful not to slip as you can lacerate the tongue, gums or penetrate through the hard palate and/or into the orbit.

   Fahrenkrug or deciduous elevators are used to extract retained deciduous teeth. They have a curved blade to follow small curved roots and are very sharp. Since they are double ended it is very easy to cut yourself if you are using them incorrectly. Fahrenkrug elevators come in 2, 3 and 4mm sizes.

2. **Molt periosteal elevator**
   - consist of a convex shaped blade (dished) which is used to reflect and retract mucoperiosteal flaps during surgical extraction of teeth
   - need a range of sizes as the flap sizes are different in cats and dogs
   - used parallel to the alveolar bone to reduce slipping and tearing of the soft tissues

3. **Root tip pick**
   - are a thicker instrument than an elevator with a stubby handle. The point is narrower to help gain access to root tips that may have fractured. Root tip picks can come in a range of sizes.

4. **Minnesota retractor**
   - is a flat, thick retractor used to move the lips, tongue or cheeks
   - safer to use than the nurse’s fingers as a retractor when the vet slips!
5. **Extraction forceps**
- are pincher like instruments used to grab the tooth whilst extracting.
- they are not designed to place force on the tooth in a twisting or pulling motion otherwise it is possible to break the tooth
- ideally the tooth should be loose enough to remove with your fingers hence the extraction forceps only need to be small. If it isn’t this loose put away the extraction forceps and keep using the elevators.
- come with either straight or curved jaws. A right-angled pair can be useful for small, caudal teeth where access is difficult. They are especially useful in rabbits and rodents where exposure is very difficult.

**GENERAL CARE AND MAINTENANCE OF HAND INSTRUMENTS**

Items that are not considered dental equipment include metal files, nail clippers, embryotomy wire, rusty old tools, chisels and pliers. Bin these and maintain the rest!

All instruments should be clean, rust-free and sharp!

Hand instruments should be cleaned and sharpened after every use. See table 5. Routine use of lubricants such as instrument milk isn’t recommended as they are a potential source of contamination. Never use saline to clean or rinse stainless steel instruments as it damages the protective passification layer and may leave the instrument open to corrosion. Soaking instruments in iodine solutions will discolor, pit and damage stainless steel instruments.

Once sharp and dry, hand instruments should be autoclaved. Don’t re-use single use autoclave packaging as repeated steam sterilizing reduces the barrier function. Don’t use waxed paper bags as the wax may leach on to the instrument and when used on a patient may potentially cause a tissue reaction.

**Table 5: Steps in cleaning and maintaining hand instruments**

| Step 1: wash with disinfectant soap to remove debris |
| Step 2: dry the instrument |
| Step 3: sharpen the instrument (if appropriate) |
| Step 4: rinse and dry the instrument |
| Step 5: autoclave – singularly or in an instrument tray or cage |

Sharpening instruments reduces operator fatigue, improves deposit removal, saves time and improves tactile sensitivity. Each time you use an instrument minute particles of metal are worn away, leading to a “dull” surface. Metal instruments can be sharpened with a sharpening stone. Sharpening stones maybe straight, curved or tapered, and can be used dry, with water or with oil.
How to sharpen:
   a. curettes and scalers – use curve that best suits their shape; use a back and forth and a rotating movement of the stone to sharpen the face of the instrument.
   b. elevators – use flat surface of the stone; put cutting surface at same angle on the stone, move stone upwards, rpt 2-3 times.

RABBITS AND RODENTS (just like small horses!)

EXAMINATION

1. Mouth gags
   - there are a number of commercially available gags made of metal
   - some have a side screw to open to a particular length, others have a spring action to keep the mouth open
   - placed over the incisors so use is limited if you are performing certain tasks on the incisor teeth, or the incisors have been extracted!
   - can be cleaned and autoclaved like other dental instruments.

2. Cheek dilators
   - rodents and lagomorphs (rabbits) have a small oral opening with large cheeks which are great to store food when eating but not so good when you want to get a good look at the “cheek” teeth.
   - made of metal and look a bit like a mouth gag except they usually have a solid flat piece on either side to keep the cheeks apart.
   - used in conjunction with mouth gags to enable “hands free” visualization.
   - come in a range of sizes from rat to rabbit.
   - can be cleaned and autoclaved like mouth gags.

3. Light source
   - not exactly a dental piece of equipment but really necessary so you can see what you are doing!
   - some of the handpieces now come with fibreoptic tips which are useful in tight spaces
   - alternatively a handheld light can be used
   - if you have nothing else you can use the otoscope with out the ear tip for illumination
   - otoscopes are also useful in a consult with the ear tip on to get a “sneak peek” at the cheek teeth (pre-molars and molars) to check for sharp points or entrapment of the tongue.

INCISOR WORK

Diamond disc
   - fit via a mandrel (looks a bit like a straight HP bur with a clip) to the slow speed handpiece (the blue 1:1 handpiece)
- acts like a circular saw to reduce the length of the incisors on rabbits and rodents that have become overgrown
- NEVER use nail clippers to do this job as you will fracture the tooth and possibly expose the pulp (nerves and blood supply)
- use in a protective metal guard to prevent soft tissue damage to the cheeks and gums
- the diamond coating provides the smoothest finish for a cutting disc
- syringe sterile water on the disc as it cuts to prevent thermal damage to teeth
- need to replace the disc as it wears out
- clean the disc with water and disinfectant

**MOLAR WORK**

*Long shank burs*
- these are about 60mm long and fit onto the slow speed handpiece (blue 1:1 ratio)
- the working tip is diamond coated to give the smoothest cutting edge
- can come with a soft tissue guard to protect the surrounding tissue from laceration
- used to remove sharp enamel points on the cheek teeth
- clean as for other burs, a diamond cleaning stone is available
- irrigate during use as the slow speed handpiece has no water cooling line

**EXTRACTION**

1. *Crossley luxator*
- double ended metal instrument with the working ends flat, arched and with a rounded tip.
- used to stretch the periodontal ligament surrounding the curved incisors of rabbits and rodents, once the epithelial attachment is broken with a small blade, hypodermic needle or elevator tip.
- makes incisor extraction easy!
- clean and autoclave as for other metal dental instruments.

2. *Right angled extraction forceps*
- angled extraction forceps are useful in small herbivores due to the restricted access in their oral cavity.
- changes the angle of the force placed on the tooth so that the extraction force is parallel to the crown of the tooth which helps to prevent fractures.

3. *Hypodermic needles*
- these make useful, sharp and disposable elevators for severing the epithelial attachment, and then with gentle use the periodontal ligament, surrounding each tooth
- various sizes from 25G to 18G depending upon the animal and the tooth extracted
- cheap and readily available
3. VETERINARY CARE TEAM

The third arm of the veterinary dental equipment triad is the humans involved. Both nurses and vets are required for the job and need to consider their own personal health and safety.

Don’t wait for others to tell you, look after yourself! How?

1. **Safe set up of dental equipment**
   - ensure electrical cords are in good condition; do not leave them in fluids or in such a way that they will become a trip hazard
   - check the position of the animal and equipment so that you are not stretching or in an unnatural stance for prolonged periods
   - check all handpieces and scalers before use to ensure they are working correctly

2. **Maintain power equipment and hand instruments**
   - sharp instruments mean less force is exerted to perform the necessary task
   - clean instruments will be sharper and less likely to cause infections to the patient or yourself
   - keep fluid lines in scalers and handpieces clean to reduce the aerosilising of bacteria and debris during a procedure

3. **Use equipment and instruments correctly**
   - you are more likely to hurt yourself and those around you if you use a piece of equipment that is not meant to do the job, or at the correct angle, etc.
   - don’t force power instruments such as cutting burs as they will fracture and fly around the room

4. **Wear personal protective equipment (PPE)**
   - wear gloves during examination and dental work, cover any open skin lesions to prevent bacteria entry
   - wear a mask or face shield to reduce inhalation of aerosolized particles and bacteria
   - wear goggles, safety glasses or face shield to protect you eyes from aerosolized particles and fractured tooth, drill bits, etc
   - wear a scrub top or other protective clothing, you want to be able to eat later on! And also you don’t want clothing to be caught in power equipment
   - tie your hair up or better still wear a surgical cap or hair net. You do not want to get your hair caught in a scaler, or handpiece!!

The veterinary dental equipment triad for a complete dental procedure requires power instruments, hand instruments and the veterinary care team. Vet nurses are integral to dental procedures as they use and maintain dental equipment. I hope these notes have been helpful in answering the three questions we asked at the beginning of the lecture regarding dental instruments and equipment - What is it? Where is it used? How do I maintain it?