Helpful Hints for Rubber Dam Isolation

Learning Objectives

1. List the options for operative field isolation. Discuss the advantages and disadvantages of each.

2. Discuss helpful tips to improve rubber dam technique including:
   a. hole placement
   b. importance of a sharp, nick-free rubber dam punch
   c. importance of lubricating the dam
   d. rubber dam retainer selection
   e. alternative retainer methods
   f. use of the rubber dam napkin
   g. rubber dam selection
   h. the importance of pre-wedging

3. Understand the technique for stabilizing rubber dam retainers with compound.

4. Discuss a technique for rubber dam isolation of fixed partial dentures.

5. Discuss techniques for handling difficult tooth isolation during endodontic procedures.
The need for proper tooth isolation during restorative procedures is obvious. Anything that obscures the operative field negatively impacts operator efficiency and effectiveness. Visibility, patient/operator safety, infection control and the physical properties of dental materials are all compromised when proper isolation is lacking.

**Isolation Options**

- absorption - cotton rolls, gauze, retraction cord, etc
- evacuation - saliva ejectors, high volume suction, svedopters, etc
- barrier - rubber dam and associated retainers and retractors
- combinations of the above

**Rubber Dam**

With today’s heightened awareness of infection control, patient safety, and technique sensitive dental materials, meticulous operative field isolation is mandatory. Barrier isolation (rubber dam) is the most reliable method. If isolation is so important, why do so many clinicians resist using the rubber dam? Perhaps they never really learned to use it effectively. Today the rubber dam is the “Standard of Care” for isolation during restorative procedures and should be employed whenever possible.

If you don’t have a working relationship with the rubber dam, take the time to **learn** and **practice** proper rubber dam techniques. Train your staff. Commit to using it. You will be surprised how quickly the rubber dam will become your friend.

**Rubber Dam Benefits**

- Dry, clean operating field
- Improved access and visibility
- Improved properties of dental materials
- Patient protection
- Improved infection control
- Increased operating efficiency
Rubber Dam Helpful Hints

1. Hole placement
   - Hole position: Holes should be placed far enough apart so that if the rubber dam were laid passively over the dental arch, each hole would be located over the center of its corresponding tooth. When restoring a facial class V lesion requiring gingival retraction with a 212 retainer, punch hole to the facial of the normal arch form for the tooth to be treated. Use a larger hole than normal and allow more space between it and the adjacent holes.
   - Hole size: Use the larger holes for the posterior teeth and correspondingly smaller holes as you go forward in the mouth. Use the largest hole on the punch for the tooth to receive the rubber dam retainer. This facilitates stretching the dam over the retainer during placement.
   - Common hole placement problems:
     - Holes punched too close together ⇒ holes pull away from teeth causing leakage
     - Holes punched too far apart ⇒ dam bunches up between teeth
     - Hole position too low on dam ⇒ dam covers patient’s nose or eyes
     - Hole position too high on dam ⇒ dam does not extend over upper lip

![Image of rubber dam placement diagrams]

Figure 1
2. Use a **sharp, nick-free punch**
- Examine the rubber dam for cleanly punched holes. Tags remaining in the holes after punching generally indicate a dull or nicked cutting edge on the punch. Even though the tags can be removed, a ragged edge remains which often causes the dam to rip when stretched over the teeth.

3. **Water-soluble lubricant**
- Possibly the most common rubber dam placement error is attempting to place it without lubrication. Lubrication greatly facilitates passing the dam through the interproximal contacts. Use a water-soluble lubricant (e.g. brushless shave cream, a slurry from ordinary bar soap, Velvachol available from the pharmacy) Avoid petroleum based lubricants (e.g. Vaseline) as they are difficult to remove and can contaminate dental materials.

4. **Retainer selection**

![Figure 2](image)

<table>
<thead>
<tr>
<th>Retainer</th>
<th>Appropriate Teeth</th>
<th>Retainer</th>
<th>Appropriate Teeth</th>
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<td>W4</td>
<td>most premolars</td>
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<td>W2</td>
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</tr>
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<tr>
<td>W27</td>
<td>distal extension-mandibular molars</td>
<td>- D</td>
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</tr>
<tr>
<td>Hyg B-6</td>
<td>anterior teeth</td>
<td></td>
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</table>

The Ferrier 212 retainer is designed for tissue retraction for Class V restorations. It should be modified before use by slightly bending the lingual jaw occlusally after heating the clamp to remove its temper. The forceps notches should also be deepened to prevent slippage.

**DO NOT** be afraid to modify rubber dam retainers. Examples may include removing a bow from the 212 clamp, shortening a prong to achieve 4-point contact, removing an interfering wing, etc.

Discard sprung retainers. Teach dental assistants to not over-expand retainers when engaging them with the forceps.

All retainers applied before the rubber dam is in place must be ligated. A 12” piece of floss should be attached to the retainer and threaded through both holes to catch all of the pieces should the retainer break.
Ligation of Rubber Dam Retainers (clamps)

5. Alternative retainers
- Strips of rubber dam, doubled or tripled lengths of floss, Wedjets®, or wooden wedges placed through the interproximal contacts are especially helpful for anterior tooth isolation
- Compound locked into embrasures
- Ligate abutment tooth with floss tied around circumference of rubber plunger from anesthetic carpule
- Tofflemire matrix and retainer

6. Pre-attach dam to frame
- To avoid fighting with the corners of the rubber dam during placement, attach dam to the frame prior to inserting it in the mouth. Stretch the dam taut from side to side at the top and attach to the frame as close to the top edge of the dam as possible. Stretch the dam taut from side to side at the bottom and attach to the frame as close to the bottom of the dam as possible. The dam attached at the top and the bottom will sag in the middle. This is enough slack to easily slip the most distal hole over the retainer.
7. **Use waxed floss or tape**
   - Fine unwaxed floss will often cut the dam rather than pull it through the interproximal contacts.
   - For best results:
     * Floss through interproximal contacts prior to dam placement. Smooth rough fillings and cavity margins to avoid tearing the dam. Occasionally, a broken restoration will have to be removed prior to rubber dam placement.
     * Use waxed dental tape or floss. After the distal hole has been slipped over the retainer, stretch the dam so that the remaining holes line up with the teeth. Begin with the most anterior hole and work back. Stretch the septum between the first two holes and start an edge through the embrasure. Carry the rubber dam on through the interproximal contact with floss or tape. If the dam is not totally carried through the contact, the lingual end of the floss is looped over and carried through the embrasure again. The floss, now doubled upon itself, can be removed to the facial without disturbing the dam. This process can be repeated until the septum is completely through the contact. Do not allow the rubber dam to bunch up in the embrasure and then attempt to pass the entire septum through the contact. This will generally result in a cut or torn dam.

8. **Rubber Dam Napkin**
   - The rubber dam napkin is primarily for patient comfort. It reduces skin irritation from dam placement and absorbs saliva that may leak from the oral cavity. With allergies to latex becoming more commonplace, the use of rubber dam napkins may be an important step in reducing skin exposure to latex.

9. **Heavy Rubber Dam**
   - Thin rubber dam is easier to apply but is more subject to tearing. Heavier dam, though more difficult to pass through interproximal contacts, is more tear resistant and gives better soft tissue retraction.

10. **Pre-wedge**
    - Inserting a wedge in the gingival embrasure prior to preparing a tooth for a Class II restoration protects the rubber dam from being damaged by the rotating dental bur.
Retainer Stabilization with Compound: Usually the 212 and occasionally other retainers require compounding for better stability.

Armamentarium: green or red stick impression compound
alcohol lamp
stellite/plastic instrument
cup of cool water
Tri-flo syringe (air)

Compounding steps:

1. Place rubber dam retainer

2. Rotate green stick compound back and forth while slowly heating the end portion over an alcohol flame. If compound starts to smoke, it is heating too fast.

3. When the compound begins to slump, dip it in cool water, then apply to the inside of the bow being compounded while rotating the compound stick slightly. Dip gloved fingers in water and adapt compound to the retainer bow and the teeth. The idea is to force the compound into the embrasures so that it will be “locked-in” when it hardens. A plastic instrument may be helpful. Cool compound with a stream of air.

To remove compound after the procedure, engage retainer with forceps. The compound will crack away when the retainer is expanded for removal.

Caution: To avoid frustration, practice on a typodont or dentaform prior to compounding in the mouth if you are not accustomed to heating and manipulating impression compound.

Isolation of Fixed Partial Dentures

The slit technique can often be used to isolate an FPD with reasonable success, but occasionally better isolation is required, e.g. porcelain repair utilizing HF, microetching, and bonding agents.

Armamentarium: Usual rubber dam paraphernalia
Blunted suture needle (old type with eye)
Needle driver or hemostats
Floss
Iris scissors
Technique for isolation of fixed partial denture:

A. Punch rubber dam as if the FPD were multiple unattached single units. (Punch large hole for each unit of the FPD) See (figures 3 and 4)

B. Place rubber dam retainer on a tooth distal to the FPD and apply lubricated dam. Floss dam through interproximal contacts (except for the pontic areas of the FPD) (figure 5).

C. Thread floss through the eye of a blunted suture needle (Though more difficult, floss threaders can be used if needles are not available.)

D. Ligating the Dam: (See figure 6) The dental assistant stretches the rubber dam over the FPD facially and lingually. 1 Starting from the facial, the dentist, using a needle driver or hemostats, threads the needle through the hole for the distal FPD abutment, 2 under the solder joint, and 3 up and out of the same hole on the lingual side. 4 The floss loops around the interproximal septum of the rubber dam and continues back down through the next hole, 5 under the solder joint, and 6 up and out of the same hole to the facial.

E. Tie the ends of the floss with a surgical knot on the facial side, tighten, and cut the ends short.

F. Repeat steps D and E for second and subsequent solder joints.

(When the above steps are completed correctly, the interproximal septa of the rubber dam will be tightly pulled around the solder joints of the FPD and the rubber dam will be closely adapted under the bridge eliminating leakage. For porcelain repair on the bridge being isolated, snip the rubber dam septa over the solder joints. The ligated rubber dam will remain intact under the bridge while allowing access to the facial surfaces.)
Endodontic Considerations

1. If rubber dam retainer is unstable:
   a. modify rubber dam retainer beaks to achieve 4-point contact with the tooth.
   b. bond resin composite or glass ionomer lugs on facial and/or lingual to stabilize retainer
   c. specialized retainers are available, e.g. serrated jaws
   d. may want to use thinner gauge dental dam to decrease tension on retainer

2. On badly broken down teeth, may need to build up crown with glass ionomer or composite. This can be facilitated by using copper bands, orthodontic bands, or temporary crown forms (aluminum, polycarbonate, stainless steel).

3. Some cases may requiring clamping the gingival tissues. Profound soft tissue anesthesia required. Generally heals quickly.

4. If minor leaking occurs, can sometimes seal it off with CAVIT, Oraseal, or “liquid dam” products like Opal Dam (Ultradent).