Introduction
It is essential that clinicians minimize contamination of the root canal system by fluids and bacteria of the oral cavity between endodontic therapy appointments and after the canal system has been obturated. Additionally, remaining tooth structure must be preserved and protected until a permanent coronal restoration can be placed. The purpose of this clinical update is to describe the principles involved in choosing a material that will best accomplish these goals.

Background
A multitude of materials have been used to seal preparations created for endodontic access. A material should be chosen for temporization that provides the following:

- A marginal seal that prevents leakage from the oral environment
- Protection of tooth structure until the final restoration is placed
- An adequate seal of the temporary material itself
- Dimensional variation that closely approximates tooth structure
- Resistance to dissolution in oral fluids
- Resistance to abrasion and compression
- Ease of insertion and removal
- Retention of any intracanal medicaments placed
- An acceptable esthetic appearance where indicated (1,2,3)

Specific materials for temporization
Zinc-oxide eugenol (ZOE) is the most common type of material used for temporization and is available as Intermediate Restorative Material (IRM)®. IRM was originally developed by the L.D. Caulk Co. for use by military dentists when sealing teeth with endodontic access preparations. Reasons for using amalgam include: 1) when access has been made through a cast restoration (the amalgam thus will be a permanent restoration), 2) when it is anticipated that a permanent restoration might not be placed for an extended length of time, and 3) when very heavy occlusal forces preclude using even IRM. In the case of the latter two, however, it is critical that the patient be informed that the amalgam is not intended to be permanent, and a definitive restoration (cuspal coverage on all posterior teeth) should be placed as soon as possible.

Amalgam is also advocated as a material of choice for sealing the access preparation. Reasons for using amalgam include: 1) when access has been made through a cast restoration (the amalgam thus will be a permanent restoration), 2) when it is anticipated that a permanent restoration might not be placed for an extended length of time, and 3) when very heavy occlusal forces preclude using even IRM. In the case of the latter two, however, it is critical that the patient be informed that the amalgam is not intended to be permanent, and a definitive restoration (cuspal coverage on all posterior teeth) should be placed as soon as possible.

Comparisons of various materials
Despite a multitude of materials used for temporary filling of endodontic access preparations, only Cavit and IRM have withstood the rigors of testing and evaluation. They have been joined in the last decade by TERM. Many studies over the last 10 years have compared Cavit, IRM and TERM. In almost universal agreement, research has found Cavit to leak significantly less than IRM (1,7,11,12,13). Additionally, a similar finding was...
then choose the most suitable material for temporization. Conver-
sely, in a bacterial leakage study, Beach et al showed that Cavit, while not different from IRM, provided a significantly bet-
ter seal than TERM after three weeks (8).

Placement of temporary fillings
These materials will provide an adequate seal and strength if
used in sufficient thicknesses. It is essential that all materials be
placed into an access preparation with parallel, or preferably di-
vergent, walls (12). This is necessary to prevent masticatory
forces from causing the temporary filling material to be pushed in
an apical direction thus destroying the marginal seal. After the
canals have been appropriately filled (with either gutta percha or
interappointment intracanal medicaments), a dry cotton pellet
should be placed to occlude the canal orifice(s). The cotton pel-
et need only be thick enough to block movement of the tempo-
rary material into the canal and thus simplify access for subse-
quent endodontic therapy or restorative procedures. Conver-
sely, it must be thin enough to allow for sufficient space be-
tween the cotton and the access preparation’s cavosurface mar-
gin. This space permits placement of an adequate thickness of
temporary material. A thickness of at least 3 millimeters is re-
quired. Proper placement of material involves incremental addi-
tion. Initial amounts are placed via a “beaver-tail” or other pad-
dle-shaped instruments (e.g. Glick #1 or Woodson) to cover the
base (the cotton pellet). Material is then smeared against one
wall and pulled to the cavosurface margin. This technique is
then similarly used against the opposite wall. The center is filled
last and all material is compressed apically. Gross excess may be
removed with the same instrument, although this technique
yields only minor excesses. Excess may be wiped away with a
moist cotton-tipped applicator, always being careful to pull to-
ward the margins. Complete setting takes approximately one
hour, so appropriate post-operative instructions should be given
to the patient (14).

Conclusions
When choosing a temporary filling material, consideration
should be given to space available for the material, occlusal
forces on the tooth, and length of time until permanent resto-
ration. Accurate placement of the material is essential in order to
provide proper marginal sealing. Regardless of the type of mate-
rial chosen to temporarily fill an endodontic access preparation,
an adequate thickness of material is critical to ensure that an
acceptable seal is created. Not ensuring this seal jeopardizes
even the best 3-dimensional obturation of the root canal system.
Because no material has been shown to be superior in all situa-
tions, clinicians should consider all factors in any given case,
then choose the most suitable material for temporization.

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