

Formalin Bladder Irrigation

Directions for Making the 4% Solution:

Make a **4% formalin solution** by mixing buffered formalin 10% 200 mL with sterile water for irrigation 300 mL (total volume, 500 mL). At Memorial, we can obtain the 10% solution from the pathology lab. Ask them for 200 mL of their **10% buffered formalin** solution. Ask them to please open a new bottle and dispense from it since this will be used on a patient. It should be made in the 2 L Sterile Water for Irrigation bottle because it can be attached to the irrigation tubing (our 1 L bottles cannot). It may work best to pour all but 300 mL sterile water out and then add the formalin carefully to the bottle, but the bottles are difficult to measure the small volumes on. This solution should be used in surgery only.

Information About the Procedure:

Formalin intravesical installations are reserved for severe and intractable hemorrhagic cystitis. It hydrolyzes proteins and coagulates superficial bladder mucosal tissue. The most critical factor in the effectiveness of formalin is its concentration. Installation is painful and requires general or regional anesthesia. The concentration used is 2.5-4% for 10-30 minutes. Intraoperative cystography is mandatory to rule out Vesicoureteral Reflux (VUR) because formalin contact with ureteral tissue leads to fibrosis, obstruction, and necrosis. In the presence of VUR, formalin can be used if occlusion balloon catheters are inserted in both ureters.

What is Formalin?

Formaldehyde is a gas at room temperature. Aqueous solutions of formaldehyde are referred to as **formalin**. "100%" formalin consists of a saturated solution of formaldehyde (this is about 40% by volume or 37% by mass) in water, with a small amounts of other additives. What most labs use is a **10% buffered formalin** solution. This is what we have in our lab at Memorial.

Formalin vs. Formaldehyde:

We have occasionally encountered some confusion about the difference between formaldehyde and formalin. This is an understandable problem, since the terms are sometimes used interchangeably. It is incorrect to use the two words this way. The concentrations of chemical fixative that the two names represent are quite different.

A fixative labeled as 10% buffered formalin is actually only a 4% solution of formaldehyde. This is because 10% buffered formalin is an example of old-time histologist's jargon describing a 10% solution made from a stock bottle of 37-40% formaldehyde (*or more precisely: a 3.7-4% solution of formaldehyde*).

Formaldehyde Safety:

The United States Occupational Safety and Health Administration (OSHA) is greatly concerned about formaldehyde. If you do not have a current Material Safety Data Sheet (MSDS) for formaldehyde you can locate one at the SIRI MSDS Archive.

Please be aware of the hazards involved with formaldehyde. The following statement comes from an MSDS for 10% buffered Formalin:

"DANGER! MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. STRONG SENSITIZER. MAY CAUSE BLINDNESS. COMBUSTIBLE LIQUID AND VAPOR. SUSPECT CANCER HAZARD. CONTAINS FORMALDEHYDE WHICH MAY CAUSE CANCER. Risk of cancer depends upon duration and level of exposure."