Diagnostic
Pathology
Medical
Group, Inc.

FORMALIN FIXATION OF BREAST CORES

Proper fixation of breast needle biopsy specimens is the single most important step in achieving good staining results, thus facilitating an accurate diagnosis. There is no way to correct inadequate fixation. The purpose of a fixative is to stabilize protein, to make it resistant to further change. The fixative changes the soluble contents of the cell into insoluble substances so that these substances, i.e. proteins, are not lost during processing. Immunohistochemical stains such as ER/PR/Her2Neu demonstrate the expression, or over-expression, of proteins. Treatments for cancer are based upon the quantification of these protein expressions. Thus, it becomes critical that the cores be adequately fixed to avoid false negative results. Good fixation enables good patient care.

The standard for proper fixation is that the fixative volume should be **at least 15 – 20 times the tissue volume.** It is important that all surfaces of the tissue are exposed to the fixative, otherwise the fixative has difficulty penetrating and autolysis results. Formalin achieves fixation by addition. That is, molecules of the fixative link themselves to the tissue and stabilize it in the process. This gradually depletes the fixative. At the same time, soluble salts are dissolved out of the tissue by the fixative. This two-way exchange will not alter the characteristics of the fixative as long as a large volume ratio is used.

Fixation Guidelines

Small fragments of needle breast cores, particularly the ultrasound guided cores, may be submitted in the small (40.0 ml) containers of formalin as long as they float freely in the solution. Ultrasound guided cores are generally thin and dense and fix adequately in the smaller amount of fixative. Keep in mind the 1:20 ratio. Most stereotactic and MRI enhanced cores should be placed in the larger (100.0 ml) containers of formalin, especially if the amount of core material is generous and the tissue is fibro-fatty. Remember that all surfaces of the tissue should be exposed to the formalin, so the cores should float freely, and there must be enough available formalin molecules to stabilize the proteins, otherwise we risk the proteins being lost in processing. This could make diagnosis difficult or even potentially give a false negative result when tested for ER/PR/Her 2Neu.

Specimen should be fixed in formalin for at least 6 hours before processing and should not exceed 72 hours.