

**TUFTS ORAL PATHOLOGY SERVICE****Liquid-Based Brush Cytology Analysis**

Liquid-based cytology is an adjunctive procedure that utilizes advanced technology compared to conventional exfoliative cytology smear. It significantly reduces the clumping and overlapping of debris-laden cells that result when collected cells are directly smeared onto a glass microscope slide at the chairside.

Liquid-based cytology is a painless procedure that utilizes a cell harvester (e.g., brush) to obtain a noninvasive collection of epithelial cells from the various levels of the surface epithelium. After the brush head is submerged and twirled within a bottle of alcohol-based fixative, the brush head is separated from its flexible plastic shaft. This technique helps maximize the number of collected cells available for microscopic examination by a pathologist. Liquid-based brush cytology is not a substitute for the traditional, “gold standard” invasive, surgical biopsy technique that removes architecturally intact tissue, but it may yield important screening information when the patient cannot afford, refuses, or is too ill to undergo a surgical biopsy procedure.

**Liquid-Based Brush Cytology Indications:**

- Evaluation of white (leukoplakia) or red (erythroplakia) or mixed red and white (erythroleukoplakia) mucosal lesions for possible premalignant dysplastic changes. [Request PAP staining]
- Evaluation of suspected active herpes simplex infection. [Request PAP staining]
- Evaluation of suspected candidiasis. [Request periodic acid-Schiff {PAS} staining]
- Screening for the 13 different types of oncogenic human papilloma viruses (HPV) including HPV types 16 & 18 which have been shown to cause oropharyngeal and base of tongue squamous cell carcinoma when no risk factors of tobacco use and ethanol abuse are known. [Request HPV staining]

After examination of the Papanicolaou (PAP) stained specimen, the oral pathologist renders a report with a descriptive analysis of the cellular morphology ranging from normal to atypical to suspicious for malignancy. If the liquid sample is requested to be split before processing then, in addition to the PAP stain, PAS or HPV staining can also be performed to verify the presence of infectious organisms or oncogenic HPV, respectively. Liquid-based cytology PAP stain results can aid the clinician in determining if the detected lesion should be observed clinically or immediately referred for biopsy. Because the collected epithelial cells of the oral lesion are disaggregated, liquid-based brush cytology is not appropriate for lesions that require architecturally intact tissue for diagnosis.

**Liquid Based Brush Cytology Contraindications:**

- Proliferative, traumatic, or immune-mediated epithelial lesions (e.g., papilloma, aphthous ulcer, lichen planus, traumatic ulcer, etc.)
- Connective tissue lesions (e.g., fibroma, peripheral ossifying fibroma, pyogenic granuloma, etc.)
- Pigmented lesions (e.g., amalgam tattoo, melanotic macule, nevus, etc.)

**Liquid-Based Brush Cytology Fees / Billing:**

**Sample collection fee:** The clinician charges the patient an appropriate fee for cell collection and submits the appropriate ADA CDT code #D7288; the patient may be reimbursed this cost by their dental insurance carrier.

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**TOPS lab diagnosis fee:** \$143 per stain/test (i.e., PAP, PAS or HPV probe). The patient is billed directly by TOPS for the pathology report, unless there is a special request to bill the clinician. If the patient's medical insurance information is provided (copy of the medical card is preferred), TOPS will file the appropriate medical CPT code.

**Liquid-Based Brush Cytology Kit:**

Upon request, Tufts Oral Pathology Service (TOPS) provides a no-cost liquid-based brush cytology kit in a green, laminated cardboard box. The clinician collects epithelial cells from the oral lesion by vigorously rubbing its surface with the provided, nylon bristle cytobrush and then transferring the brush to a bottle containing the SurePath<sup>®</sup> liquid preservative/fixative. The collection brush is vigorously twirled within the solution to remove most of the epithelial cells trapped within the bristles. The brush head is separated from its plastic shaft and placed within the bottle; this step helps capture the collected cells remaining on the brush. After tightly securing the top of the bottle, the bottle is placed within the provided plastic bag, which must be placed in the protective box along with the completed TOPS requisition form. The box is placed in the FedEx plastic specimen pack upon which the provided pre-paid priority delivery overnight courier stamp is attached for delivery to TOPS in Boston, MA the following morning.

**Liquid-Based Brush Cytology Specimen Processing:**

Once the specimen is received at TOPS, the epithelial cells on the nylon bristles are mechanically dispersed into the solution containing the previously removed epithelial cells. A patented machine processes the specimen in a series of steps that separates the epithelial cells from the fixative liquid and nonspecific debris, and places the disaggregated cells onto a glass microscope slide. The cells are then stained, coverslipped, and subsequently microscopically examined by a Tufts oral and maxillofacial pathologist.

**Tufts Oral Pathology Services (TOPS):**

As faculty of Tufts University School of Dental Medicine, our oral pathology expertise includes teaching, microscopic diagnosis, clinical management of oral disease, and basic and clinical research. We also hold leadership roles in national and specialty dental organizations and provide continuing dental education locally and throughout the nation.

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