

Which Pap Smear Collection Device Should I Use?

Collecting An “Adequate” Sample

Pap Test collection devices have been the focus of increased attention for their perceived role in the reduction of false-negative results in Pap test screening for cervical cancer. New devices are available which are aimed at improved cellular yield and enhanced cellular preservation over the traditional wooden Ayre spatula. Although controversy remains regarding the definition of the “adequate” Pap smear, it is generally accepted that the adequate smear consists of a thinly prepared cellular smear which is properly labeled and rapidly fixed. Adequate and relevant patient history should accompany the specimen. In our laboratory, we recommend that the “ideal” adequate Pap smear consist of a sufficient number of well-preserved epithelial cells, collected under direct visualization, containing an endocervical component (defined as either metaplastic cells or endocervical cells) in a premenopausal woman who has a cervix. Conversely, an unsatisfactory smear is one which is unlabeled, does not contain adequate numbers of cells, is poorly preserved, or is obscured with inflammatory or hemorrhagic exudate that interferes with cytologic interpretation.

The T-Zone Target

The target area of Pap smear sampling – the squamocolumnar junction or transformation zone of the cervix – is a dynamic, shifting anatomic locus in the lifetime of every woman. The location of the transformation zone is not static and is at least slightly different for every woman. It may be distinct and sharply defined at the external os, may extend onto the portio as ectropian, or may be located high within the endocervical canal and may not be visible on exam. A sharp zone of demarcation is rather rare and inconstant throughout the circumference of the cervical canal, varying in proportion in each individual. Other factors influencing the clinical presentation of the cervix and the transformation zone include the patient’s age, parity, phase of the menstrual cycle, and the presence of inflammatory, infectious, premalignant, or malignant processes. A history of prior surgery, cryotherapy, electrocautery, or laser therapy will affect accessibility of the transformation zone.

For any device to sample the target area successfully, it must be able to recover as many representative cells as possible and effectively transfer them to the glass slide with maximum ease and rapidity and without undue mechanical distortion (crushing, air drying, clumping, mixing with blood, etc.).

Air drying artifact, the bane of all cytologists, is an important factor attributed primarily to the sampler’s smearing technique rather than to the device used in making the smear.

The choice of a Pap test sampling device that results in an adequate sampling of the cervix and the transformation zone reflects the sample taker’s understanding of the many varied clinical presentations of the cervix. In our community, the two most widely utilized Pap smear sampling techniques are the spatula and the Cytobrush,[™] (“bottle” brush). The plastic Cervex brush[™] (“mop/broom”) prepares beautiful slides, and this makes this instrument our laboratory’s favorite. The following summaries are intended to aid our clients in deciding which instrument to use.

Spatulas

A variety of wooden and plastic spatulas are available. All spatulas designed and marketed since the introduction of the Ayre spatula have followed the same basic design principle. Modifications generally include variably sized hooks and extension of tips which easily reach into the endocervical canal. Wooden spatulas are the least expensive sampling device and have a long history of successful sampling, but have been criticized for their “trapping effect” of diagnostic cells which could lead to false negative results. In our experience, the major drawback of this instrument is the lack of endocervical cells in occasional smears, especially in the elderly. This instrument, however, when properly utilized and/or in combination with a swab or “bottle” brush, can result in a perfectly adequate and readable Pap smear.

Cotton-Tip Applicators

The cotton tip applicator (Q-tip swab) is widely used and is inexpensive. The combination of the spatula and cotton tip applicator is still used by many clinicians in the U.S. as the method of choice for collection of cytologic material from the cervix. The major disadvantage of the

cotton applicator relates to intertwining cotton fibers where exfoliated cells can be trapped to reduce cellular transfer from cotton tip to glass slide. The use of an *unmoistened* applicator tip, therefore, can result in absorbency entrapment of collected cellular material. There is no discomfort to the patient with its use, and minimal cervical trauma occurs due to the soft cotton surface. When a clinician chooses to use a cotton swab, we recommend that the tip of the applicator be *moistened slightly* and *squeezed to remove excess moisture*. The tip of the device can then be placed into the endocervical canal, rotated, and used to transfer the endocervical sampling onto a glass slide. When combined with the spatula, the entire cervical area extending from the upper endocervical canal to the lateral ectocervix are thus sampled.

Cytobrush™ (“Bottle Brush”)

The endocervical “bottle” brush consists of a twisted metal wire core with perpendicular plastic bristles attached to the end of a plastic handle. The pliable bristles allow insertion of the narrow tip into a small cervical os. The is particularly useful in cases of cervical stenosis and menopausal atrophy. The instrument is highly effective in obtaining endocervical material and in collecting large numbers of cells. Optimal transfer of cells is accomplished by *rolling the brush* across the slide. Unless performed expeditiously, air drying can result from the length of time needed to transfer material from both a brush and spatula to the same slide.

One problem with the Cytobrush™ is the trauma that occurs to the cervix as a result of the stiff bristles on the instrument. The resulting bleeding can obscure the transformation zone, making colposcopic examination difficult, as well as creating a bloody, thick Pap smear which is hard to screen. Patients will occasionally complain of cramping when the Cytobrush™ is used.

We recommend this instrument be used in those patients with cervical stenosis, menopausal women with transformation zones not clinically visible, in selected patients at high risk for cervical cancer, and in follow-up patients having atypical endocervical cells in their smears (see also “Endocervical Brush Samplings Submitted in Cytolyt™” section).

A spatula and “bottle” brush are a very effective sampling combination. Collect with the spatula first, followed by the brush. Do not prepare the smear until both collections are complete. Using the entire length of the slide, smear the spatula in a monolayer, then roll the brush over an unused edge of the slide or over the spatula smear. Fix immediately.

Unimar Cervex Brush™ (“Mop” or “Broom”)

The Cervex Brush™ combines features of both the spatula and the cytobrush and allows simultaneous sampling of both the endo- and ectocervix. Plastic bristles extend parallel to the plastic handle and are attached to a base in a “V” shape. The bristles are softer and thicker than those of the cytobrush, and taper toward the end of the base. The longer strands, when carefully positioned into the ectocervical os, can extend into the canal, while the shorter strands will spread over the portio and lateral ectocervix.

The technique for use of the Cervex Brush™ is the most meticulous of the four devices. (See “Collecting a Pap Smear” illustration.) The cervix must first be wiped with a large cotton swab in order to remove any mucus from the endocervical canal. The brush is applied to the cervix with the central bristles inserted into the canal and rotated. It is then smeared longitudinally across the glass slide in a single motion, rotated 180°, and again swept across the slide. If done correctly, the endocervical sample will be located in the center of the slide, and the ectocervix component will be toward the edges. Although the technique is deliberate, it can be quickly accomplished with minimal air drying by using “Tom-Sawyer-Painting-the-Fence” motions. The major advantage of the Cervex Brush™ is placement of an adequate amount of very well preserved cytologic material from both the ecto- and endocervix on one slide. In our experience, the cellular yield approaches the numbers removed by the Cytobrush™ (“bottle” brush), with far less trauma to both patient and cells, resulting in better preserved cellular monolayers having less blood. This instrument, however, is the most expensive of all the available sampling devices. It can also be used in combination with a swab or “bottle” brush as extra insurance to provide a component of endocervical cells.

A Note to Our Clients

Our Pap collection kits contain all the devices described here. We have received comments that this is “a waste of resources,” as often only one collection instrument is used. We would like you to know that we would be happy to have all unused Pap collection devices returned to us by courier. We collect and send these to third world countries for use where such Pap collection devices are scarce.