Health problem addressed

Thin-layer slide processors are used to prepare slides for evaluation/diagnosis of cervical cancer. They standardize the sample preparation technique and reduce the number of compromised cervical samples due to blood and mucus, as well as errors due to the process of transferring the sample to a slide. Some models can also process other specimen types for evaluation/diagnosis of other cancers (e.g., urine specimens).

Product description

Thin-layer slide processors use a liquid transport preservative solution and an automated device to prepare a slide with a very thin layer of cervical cells that have been cleared of obstructing debris. Systems typically include a sample tray, a fixative reservoir, robotic arms to move each sample vial, and a display and keypad or touchscreen for programming. They may also incorporate a vortexer and an automated staining station.

Principles of operation

A disposable tube with a filter capped on one end is placed into the sample vial. An aspirator draws the solution through the tube, leaving the cells on the surface of the filter outside the tube. A computer assigns a minimum number of cells for the collection and monitors the number of cells collected on the filter by measuring flow reduction. Once a sufficient number of cells are attached to the filter, the tube is transported out of the sample vial, inverted, and the filter end is pressed against the corresponding labeled slide. The cells are transferred onto the surface of the slide, which is then submerged into a fixative bath. Alternatively, a centrifuge pulls the cell solution through a density gradient. The sample is mixed by centrifugation and gravity dispersion, and cells are separated from obscuring debris. The sample is transferred to the central station, where a robotic pipetter resuspends, mixes, and transfers the cells to a settling chamber that is mounted on a slide with a coating to enhance cell adhesion. The cells sediment onto the slide by gravity.

Operating steps

• Patient sample is collected and vortexed within preservative solution.
• Patient sample vial and labeled slide is placed into tray or slot on unit.
• The unit is programmed to process slides using keypad or touchscreen.
• After slide is processed, apply stain and cover.

Reported problems

Operators should be aware of the risk of exposure to potentially infectious pathogens while handling patient specimens and should use universal precautions, including wearing gloves, face shields or masks, and gowns.