Liquid Based General Cytology
Collected Abstracts
Abstract

OBJECTIVE: To assess the utility of the ThinPrep Processor (TP) for nongynecologic cytology.

STUDY DESIGN: We reviewed the number of unsatisfactory specimens from the esophagus, common bile duct, hepatic duct, pancreas, gastric, bronchial, vertebra, submandibular area and neck over a one-year period, before and after TP implementation. For a one-year period after TP implementation, the cytologic diagnoses of selected TP specimens with corresponding surgical tissue diagnoses were compared, and the TP slides were reviewed in discrepant cases.

RESULTS: The number of unsatisfactory specimens was reduced from 17% to 1% after TP implementations. The cytologic diagnoses of 145 TP specimens were in agreement with surgical tissue diagnoses. However, in 43 cases the cytology and tissue diagnoses were discordant. On review of 26 of the discrepant cases, the majority of TP slides were cellular, with good nuclear and cytoplasmic detail. Discrepancies resulted from sampling errors in 19 cases and TP interpretation errors in 7 cases.

CONCLUSIONS: In our laboratory, TP is a reliable processor for non gynecologic specimens.

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Non gynecologic cytology utilizing the ThinPrep Processor.

Cell yields on cytologic preparations made in the Cytospin II cytocentrifuge and the ThinPrep Processor were compared. Slides were prepared by each method using calibrated volumes (25 microliters) of cell suspensions from 13 nongynecologic specimens. Cell counts for each slide were calculated by counting cells in predetermined fields using a gridded reticle at 40 x magnification, then extrapolating to the total surface area of the preparation. The cell counts demonstrated that when processing equal amounts of cell suspension, the ThinPrep method retained three times as many cells as the cytocentrifuge method. The ThinPrep method, with a higher rate of cell recovery, may provide a valuable tool toward more accurate cytologic diagnosis, particularly for cytologic samples with small numbers of cells.

**Abstract**

Cell yields on cytologic preparations made in the Cytospin II cytocentrifuge and the ThinPrep Processor were compared. Slides were prepared by each method using calibrated volumes (25 microliters) of cell suspensions from 13 nongynecologic specimens. Cell counts for each slide were calculated by counting cells in predetermined fields using a gridded reticle at 40 x magnification, then extrapolating to the total surface area of the preparation. The cell counts demonstrated that when processing equal amounts of cell suspension, the ThinPrep method retained three times as many cells as the cytocentrifuge method. The ThinPrep method, with a higher rate of cell recovery, may provide a valuable tool toward more accurate cytologic diagnosis, particularly for cytologic samples with small numbers of cells.

**Comparison of ThinPrep and cytopsin preparations in the evaluation of exfoliative cytology specimens.**

**BACKGROUND:** There exists limited literature comparing ThinPrep (TP) with conventional cytopsin (CS) in nongynecologic specimens.

**METHODS:** The differences between TP and CS were evaluated for a variety of parameters including cellularity, cytologic morphology, specimen preparation, screening time, laboratory cost effectiveness, cytologist preference, and impact on final diagnosis. Eighty-eight cases including 38 urine, 13 respiratory, and 37 body fluids were prepared simultaneously.

**RESULTS:** TP and CS demonstrated similar cellular yield in the majority of cases. Cytologists preferred TP in 63 (71.6%) and CS in 6 (6.8%) cases; whereas they indicated no preference in 19 (21.6%) cases. Of 14 abnormal cytologies, a more definitive diagnosis of malignancy was rendered by TP in 6 (42.9%) and by CS in 2 (14.3%) cases. TP demonstrated better nuclear chromatin morphology and more uniform distribution of cells. CS showed larger-sized clusters with better preservation of their architecture compared with smaller-sized clusters and significant shrinkage of cell size in TP.

**CONCLUSIONS:** TP was preferred over CS in the majority of cases by both cytotecnologists and pathologists. Cellularity, screening time, and specimen preparation were comparable, although the latter was easier to standardize in TP. In abnormal cases, TP was found to be 3 times more helpful than CS in rendering a definitive diagnosis of malignancy. TP, however, was associated with certain artifacts that cytologists must become familiar with when examining such preparations. Although TP was superior to CS in most cases, the application of both methods may be helpful in selected cases in which the TP diagnosis is not conclusive. Finally, TP was found to be more cost effective than CS.


Abstract

In order to compare and contrast conventional preparation (CP) with ThinPrep 2000 (TP) in respiratory cytology, 207 samples were divided equally and processed by the two different preparation methods, generating three CP and one TP slide per sample. No lesion identified by CP was missed by TP and there were no significant differences between TP and CP in the diagnostic categories. However, two cases of squamous cell carcinoma were detected on TP which had been classified as unsatisfactory and moderate squamous dyskaryosis, respectively, on CP. ThinPrep was found to be superior to CP in many respects as it provided standardized preparations in a greater proportion of cases and problems such as cell overlapping and background debris were markedly reduced. In several instances the diagnostic accuracy in CP was compromised by smears that were either too thick, too thin, or too scanty. Cell preservation was also better on TP when compared with CP, facilitating more accurate diagnosis and significantly reducing the primary screening and reporting time, especially of sputum samples. A major advantage of TP methodology is the fact that it facilitates optimal use of skilled cytotechnologists and streamlines the workflow in the laboratory.

Breast fine-needle aspiration. A comparison of ThinPrep and conventional smears.

Abstract

Fine-needle aspiration (FNA) of the breast has been used in our institution since 1969. In August 1993, ThinPrep (Cytyc Corp, Boxborough, MA) processing of breast FNA biopsy specimens was introduced. Comparing conventionally prepared breast FNA specimens (21,193 cases) with ThinPrep processed material (7,903 cases) shows a decrease in the unsatisfactory rate with the ThinPrep processing (29.5% to 27.7%) with no significant change in sensitivity (84.4% vs 86.3%) or positive predictive value (96.5 vs 95.0%). However, there is a slight decrease in specificity (98.6% vs 96.5%) and negative predictive value (91.1% vs 88.0%) with the ThinPrep specimens. The results span 28 years, during which time the breast cancer population has changed, with a higher prevalence of malignancy in the last decade of our study. When the 4 most recent years of conventional cytology are compared with the 4 years of ThinPrep processing, there is no significant difference in diagnostic accuracy. The results of the present study show that the ThinPrep processing technique provides an effective method for preparing breast FNA specimens.
Comparison of conventional cytologic smears and ThinPrep preparations from the anal canal.

Abstract

OBJECTIVE: To compare anal cytology prepared via conventional methods and the ThinPrep processor.

STUDY DESIGN: Cytological samples were collected from the anal canal using moistened swabs. One hundred thirty-six samples were collected from 133 gay or bisexual men; 102 were human immunodeficiency virus seropositive. A conventional smear was prepared and fixed in 95% ethanol. The residual cells on the swab were collected for thin-layer preparation using the Cytyc processor.

RESULTS: The diagnoses made from the conventional smears and thin layers agreed in 113 of 136 cases. An additional 19 cases were classified within one diagnostic category of each other. Two cases of low grade squamous epithelial lesion (SIL) diagnosed on the ThinPrep were judged negative on the conventional smear. Similarly, two cases of low grade SIL diagnosed on the conventional smear were judged negative on the thin-layer preparations. Rectal columnar cells were present on 127 of the ThinPrep samples but on only 113 of the conventional smears.

CONCLUSION: ThinPrep and conventional smears of the anal canal yielded similar diagnoses. Rectal columnar cells were more frequently encountered on the thin layers; their presence is an indication that the rectal transformation zone may have been adequately sampled. In addition, the ThinPrep technique reduces fecal and bacterial contamination and air-drying artifact, which frequently hinder cytologic evaluation of the anal canal.

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Use of a thin-layer technique in thyroid fine needle aspiration.

Abstract

OBJECTIVE: To investigate the efficacy of the ThinPrep Processor (Cytyc Corporation, Boxborough, Massachusetts, U.S.A) in fine needle aspiration (FNA) of thyroid gland lesions.

STUDY DESIGN: This study included 459 thyroid FNA specimens obtained from patients who came to our endocrinology department with various thyroid disorders over 3 years. The cytologic material was prepared using both the conventional and ThinPrep method in the first 2 years (285 cases), while in the last one only the ThinPrep method was used (174 cases). The smears were stained using a modified Papanicolaou procedure and May-Grünwald-Giemsa stain. Immunocytochemistry was performed on thin-layer slides using specific monoclonal antibodies when needed. Thin-layer and direct smear diagnoses were compared with the final cytologic or histologic diagnoses, when available.

RESULTS: Our cases included 279 adenomatoid nodules, 15 cases of Hashimoto thyroiditis, 45 follicular neoplasms, 14 Hürthle cell tumors, 58 papillary carcinomas and 15 anaplastic carcinomas. Thin-layer preparations showed a trend toward a lower proportion of inadequate specimens and a lower false negative rate. Cytomorphologic features showed some differences between the 2 methods. Colloid was less frequently observed on ThinPrep slides, while nuclear detail and micronucleoli were more easily detected with this technique. Moreover, ThinPrep appeared to be the appropriate method for the use of ancillary techniques in suspicious cases.

CONCLUSION: Thin-layer cytology improves the diagnostic accuracy of thyroid FNA and offers the possibility of performing new techniques, such as immunocytochemistry, on the same sample in order to detect malignancy as well as the type and origin of thyroid gland neoplasms.

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Thin layer compared to direct smear in thyroid fine needle aspiration.

Abstract

The efficacy of preparing thyroid fine needle aspirations (FNAs) by the thin layer as opposed to the direct smear method has not been evaluated sufficiently in a regional laboratory setting. At the Foothills Hospital (Calgary, Canada), the method of processing thyroid FNAs was changed from direct smear to thin layer in January 1996. The results of 327 patients who had direct smear from 1994 to 1995 were compared to 401 who had thin layer between 1996 and 1997. While there were no significant differences across a broad range of quality indicators, thin layer showed a trend towards a higher proportion of true benign diagnoses (31% vs 24%), a lower proportion of inadequate specimens (41% vs 50%) and, most importantly, a lower false negative rate (3% vs 9%). In conclusion, the changeover to thin layer did not compromise the interpretation of thyroid FNAs.

Split sample comparison of ThinPrep and conventional smears in endoscopic retrograde cholangiopancreatography-guided pancreatic fine-needle aspirations.

Abstract

Fine-needle aspiration (FNA) of pancreatic lesions is a common procedure to establish a tissue diagnosis before chemotherapy or surgery. In this study, the authors attempt to compare the diagnostic value of the ThinPrep (TP) method with conventional smears (CSs) in samples obtained by endoscopic retrograde cholangiopancreatography (ERCP)-guided pancreatic FNAs. Material obtained, prospectively, from ERCP-guided pancreatic FNAs was split to prepare CSs (2-5 slides) first, the remainder being rinsed in PreservCyte, and in the laboratory, 1 TP slide was prepared. The diagnostic categories of unsatisfactory, benign, reactive, suspicious for malignancy, and malignant were compared. Fifty-one pancreatic FNAs prepared by split sample method yielded the following results: TP yielded unsatisfactory, 6 cases; benign, 3 cases; reactive, 5 cases; suspicious for malignancy, 11 cases; and malignant, 26 cases; in contrast, CS yielded unsatisfactory, 13 cases; benign, 4 cases; reactive, 3 cases; suspicious for malignancy, 13 cases; and malignant, 18 cases. Histological follow-up was available in 21 cases (reactive, 8 cases; suspicious for malignancy, 1 case, and malignant, 12 cases). The foregoing data indicate a higher sensitivity in detection of pancreatic adenocarcinoma by the TP method (TP, 91% vs. 58% CS) with equivalent specificity (100%). In addition, TP provides better preservation and cytological detail.
Endobronchial ultrasound-guided fine-needle aspiration and liquid-based thin-layer cytology.

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Abstract

BACKGROUND: Optimal management of patients with lung cancer requires accurate cell typing of tumours and staging at the time of diagnosis. Endobronchial ultrasound-guided lymph node aspiration as a method of diagnosing and staging lung cancer is a relatively new technique.

AIM: To report the use of liquid-based-thin-layer cytology for the processing and reporting of these specimens.

METHODS: The specimens obtained from 80 patients were processed using the ThinPrep system, with the remainder of the samples being processed as a cell block.

RESULTS: 40 of the 81 procedures yielded malignant cells (30 non-small cell carcinoma, 8 small-cell carcinoma and 2 combined small-cell carcinoma/non-small-cell carcinoma). The cell blocks were found to contain sufficient material to allow the immunohistochemical characterisation of tumour cells with a range of antibodies.

CONCLUSION: The use of liquid-based-thin-layer cytological techniques provides high-quality specimens for diagnostic purposes. When used in conjunction with cell blocks, sufficient material may be obtained to allow immunohistochemical studies to confirm the tumour cell type. Given the current move towards centralisation of pathology services, this approach gives the pathologist high-quality specimens without the need for direct onsite support at the time of the procedure.

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Evaluation of thin-layer methods in urine cytology.

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Abstract

Conventional cytospin smears prepared from urinary tract specimens were compared with two new thin layer techniques, i.e. ThinPrep and AutoCyte PREP. Cellularity, cell preservation, background features, detection rate, screening time and ease of preparation were evaluated. Thin-layer techniques when applied to urine cytology were found to improve cell yield and cell preservation, and reduce background artefact. The reporting rate for abnormal urothelial cells was comparable to conventional cytospin smears, as was screening time. Laboratory staff found the methodologies to be practicable and easily incorporated into a large routine diagnostic service. We conclude that a one-slide thin-layer urine preparation is comparable to four cytospin slides in the detection of urothelial abnormalities, and that both ThinPrep and AutoCyte PREP have comparable features.
**Abstract**

**INTRODUCTION:** For cytologic specimens, the vast majority of immunocytochemical studies (ICC) are performed on non-gynecologic specimens for diagnostic purposes, and they can be performed on unstained or previously stained direct smears. Although the ThinPrep processor (TPP) has been approved for the preparation of non-gynecologic specimens, there is scant literature describing the utility of ICC methodology on cytology specimens fixed and processed by this method.

**MATERIALS AND METHODS:** Forty-one fresh specimens were obtained from the surgical gross room and aspirated or scraped to collect cells for thin layer (TL) and direct smears (DS). Specimens included a variety of neoplastic and nonneoplastic samples that were either Papanicolaou (P) stained or unstained (US). One group of US TL slides was subjected to antigen retrieval (AR). Staining was graded semiquantitatively. Each sample acted as its own control. Antibodies (abs) included: CAM5.2, AE1/3, K903, vimentin, MSA, desmin, s-100, HMB45, PSA, PAP, chromogranin, NSE, insulin, synaptophysin, pCEA, mCEA, mCEAD14, LCA, L26, UCHL-1, OPD-4, thyroglobulin, GCDFP, ER/PR, laminin, collagen IV, PLAP, HCG, CD68, HAM56, and MAC387.

**RESULTS:** Semiquantitative staining overall results comparisons: TLP > DSP TLP < DSP TLP = DSP TLP US > DSUS 11/25 (44%) 6/25 (24%) 8/25 (32%) 9/24 (38%) TLUS < DSUS TLUS = DSUS 3/24 (12%) 12/24 (50%) TLP vs. TLUS TLP > TLUS TLP < TLUS TLUS = TLUS 8/41 (20%) 9/41 (22%) 24/41 (58%) There were five false-negative results, 2 with TL and 3 with DS, and 1 false-positive TL.

**DISCUSSION:** Immunocytochemistry performed on the ThinPrep Processor showed equal or greater intensity and distribution of proper staining when compared to direct smears with the following advantages: (1) cleaner background, easier to interpret; (2) less abs required in a smaller area; (3) IPX can be done on Papanicolaou-stained thin layer slides; (4) thin layer slides can be modified for multiple abs tests; (5) additional thin layer slides can be prepared for ICC bases on needs. No significant differences of immunostaining were seen when comparing thin layer Papanicolaou-stained and unstained slides. Antigen retrieval offered no advantage in this study.

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**Abstract**

This study was undertaken to assess the potential value of ThinPrep-processed (Cytyc, Boxborough, MA) smears from malignant breast fine-needle aspirates (FNAs) for the determination of estrogen receptor (ER) and progesterone receptor (PR) status. The ER and PR content of 142 malignant FNAs were compared with the results of the surgically excised tumors in which the assay was done by enzyme immunoassay in 97 cases or by immunohistochemistry in 45 cases. Monoclonal antibodies directed against ER-1D5 (Dako, Carpinteria, CA) and PR-1A6 (Dako) were used with the antigen retrieval technique. By using enzyme immunoassay and immunohistochemistry as standards, the overall accuracy for ER was 97% and for PR was 89%. The results of this study show that the ThinPrep smear with microwave antigen retrieval pretreatment is a reliable method and a suitable alternative for hormone receptor analysis in breast carcinoma.

**REFERENCES:**

Dabbs DJ, Abendroth CS, Grenko RT, Wang X, Radcliffe GE. Department of Pathology, Pennsylvania State University, College of Medicine, Hershey 17033, USA.

Leung SW, Bédard YC. Department of Pathology, Mount Sinai Hospital, Toronto, Ontario, Canada.

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Characterization of RNA in Cytologic Samples Preserved in a Methanol-Based Collection Solution.

**Abstract**

**BACKGROUND:** ThinPrep is a fluid-based technique for collection and processing of cytologic specimens. The present study was designed to determine whether the collection solution preserved RNA for molecular analysis. Methods and Results: Cervical cancer cell lines and cord blood lymphocytes were used to test the efficacy of various protocols for fixation, storage, and extraction of RNA. Total RNA was extracted and analyzed by denaturing gel electrophoresis. Preserved cells stored for 24 hours at room temperature or 4 degreesC had intact 28S and 18S ribosomal RNA. Both cellular and viral messenger RNAs were amplified from preserved samples by reverse transcription polymerase chain reaction (RT-PCR). Viral messenger RNA (mRNA) could be detected in a mixture of preserved cells containing 10% human papillomavirus (HPV) positive cells. RNA preservation in clinical samples was adequate for RT-PCR of cellular mRNA. Conclusions: Both experimental samples and clinical samples collected in the preservation media had intact total RNA. Amplification of both cellular and HPV ad mRNA was successful.


Detection of hyperdiploid malignant cells in body cavity effusions by fluorescence in situ hybridization on ThinPrep slides.

**Abstract**

**BACKGROUND:** Benign body cavity effusions sometimes cannot be distinguished from malignant ones by conventional cytology. The authors performed fluorescence in situ hybridization (FISH) on ThinPrep slides using chromosome specific probes to see if hyperdiploid malignant cells could be detected in 20 body cavity effusions. The results were then compared with those of conventional cytology.

**METHODS:** A total of 20 body cavity effusions from 19 patients were studied using conventional cytology and FISH. Probes specific for chromosomes 3, 8, 10, and 12 were used to detect hyperdiploidy on ThinPrep slides (Cytyc Corporation, Boxborough, MA). RESULTS: A total of 13 patients had malignant conditions (either prior history of malignancy or the presence of malignancy anywhere in the body). Conventional cytology and FISH were both positive in 5 of these patients (6 samples) and negative in 2 patients. The results for one sample were inconclusive by both methods. There were 5 discrepant cytology-FISH results in patients with malignant conditions. One sample was positive by FISH and negative by cytology, one was positive by FISH and “atypical” by cytology, and three were inconclusive by FISH and negative by cytology. FISH results were either negative (in 4 samples) or inconclusive (in 2 samples) in the 6 patients with benign conditions.

**CONCLUSIONS:** FISH can detect hyperdiploid malignant cells in body cavity effusions and is especially useful when the major cell population consists of malignant cells that cannot be differentiated from mesothelial or “atypical” cells. It is less useful in detecting a small population of malignant cells hidden in an inflammatory or reactive cell background. More studies are needed to establish diagnostic criteria further and to assess the clinical usefulness of this procedure.


Dimulescu II, Unger ER, Lee DR, Reeves WC, Vernon SD.
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**Non Gynaecological Specimen Preparation**

**INTRODUCTION:**
This booklet provides instructions for preparing general cytology samples and production of slides with either the ThinPrep® 2000 or ThinPrep® 5000 System.

General cytology specimens include, but are not limited to: fine needle aspirates, urines, effusions, sputa, respiratory tract and gastrointestinal tract samples.

For the best results, carefully follow the instructions in this booklet or from the ThinPrep 2000 or ThinPrep 5000 System manual.

**REQUIRED MATERIALS:**

**From Hologic:**
- CytoLyt® Solution
- CytoLyt® Tubes
- CytoLyt® Cups
- CytoLyt® Bottles (bulk)
- PreservCyt® Solution
- PreservCyt® Vials
- PreservCyt® Bottles (bulk)
- Non-Gyn TransCyt™ Filters (Blue)
- ThinPrep® Microscope Slides
- ThinPrep 2000 Processor
- Multi-Mix™ Racked Vortexor

**From Other Suppliers:**
- 50ml capacity centrifuge (free swing basket)
- Centrifuge Tubes, 50ml
- Plastic transfer pipettes, 1ml, graduated
- Balanced electrolyte solutions
- Slide staining system and reagents
- Standard laboratory fixative
- Coverslips and mounting media
- Anticoagulant for needle aspirates
- Blender (optional)
- Glacial acetic acid (troubleshooting only)
- Saline (troubleshooting only)

**Specimen Preperation Protocols**

The following four subsections describe the protocols for preparing fine needle aspirates, mucoid specimens, body fluids, and superficial brushings and scrapings. The methods are described in general terms. For more detailed information about each step, refer to the system manuals.

**FINE NEEDLE ASPIRATES (FNA)**
1. Collect sample directly into 30ml of CytoLyt Solution - If specimen must be collected in an intravenous solution, use a balanced electrolyte solution.

Note: If possible, flush the needle and syringe with a sterile anticoagulant solution prior to aspirating the sample. Some anticoagulants may interfere with other cell processing techniques, so use caution if you plan to use the specimen for other testing.

2. Concentrate by centrifugation at 600g for 10 minutes.
3. Pour off supernatant and vortex to re-suspend cell pellet.
4. Evaluate cell pellet appearance - If cell pellet is not free of blood, add 30ml of CytoLyt solution to cell pellet and repeat from step 2.
5. Add specimen to PreservCyt solution vial.
6. Allow to stand in PreservCyt solution for 15 minutes.
7. Run on ThinPrep 2000 processor using sequence 2 or ThinPrep 5000 processor using non-gyn sequence.
8. Fix, stain and evaluate.
**MUCOID SPECIMENS**

Mucoid Specimens may include respiratory and gastrointestinal specimens.

1. Collect sample directly into 30ml of CytoLyt Solution. Or add 30ml of CytoLyt Solution to the fresh specimen as soon as possible.

**Note:** Large specimens (greater than 20ml) should be concentrated before addition of CytoLyt Solution to the sample.

2. Mechanical agitation
3. Concentrate by centrifugation at 600g for 10 minutes
4. Pour off supernatant and vortex to re-suspend cell pellet
5. Evaluate cell pellet appearance. Confirm the cell pellet is in liquid form. If the cell pellet is not in liquid form, add 30ml of CytoLyt Solution and repeat steps 2-4.
6. Add specimen to PreservCyt solution vial
7. Allow to stand in PreservCyt solution for 15 minutes
8. Run on ThinPrep 2000 processor using sequence 3 or ThinPrep 5000 processor using non-gyn sequence
9. Fix, stain and evaluate

**BODY FLUIDS**

Body Fluids may include serous effusions, urinary and cerebrospinal fluids.

1. Collect body fluids fresh.

**Note:** Fluids collected in CytoLyt Solution also require CytoLyt solution wash prior to instrument processing. For extremely bloody fluids (i.e. pericardial), start with only 10ml of fresh fluid.

2. Concentrate by centrifugation at 600g for 10 minutes
3. Pour off supernatant and vortex to re-suspend cell pellet
4. CytoLyt solution wash
5. Evaluate cell pellet appearance. If cell pellet is not free of blood, add 30ml of CytoLyt solution to cell pellet and repeat from step 2.
6. Add specimen to PreservCyt solution vial
7. Allow to stand in PreservCyt solution for 15 minutes
8. Run on ThinPrep 2000 processor using sequence 2 or ThinPrep 5000 processor using non-gyn sequence
9. Fix, stain and evaluate
SUPERFICIAL BRUSHINGS AND SCRAPINGS

Superficial brushings and scrapings include oral cavity specimens, nipple secretions, skin lesions (Tzanck Test), and eye brushings.

1. Deposit the specimen directly into a PreservCyt solution vial.
2. Gently shake the PreservCyt sample vial to mix the contents
3. Allow to Stand in PreservCyt solution for 15 minutes
4. Run on ThinPrep 2000 processor using sequence 2 or ThinPrep 5000 processor using non-gyn sequence
5. Fix, stain and evaluate

COLLECTION METHODS

Samples to be processed on the ThinPrep Processors will arrive in the lab either fresh or in CytoLyt Solution. There are preferred collection methods for different sample types. This section will describe the Hologic recommended procedure as well as alternate collection methods.

Fine Needle Aspirate Specimens:
The optimal collection technique for FNAs is to deposit and rinse the entire sample into a centrifuge tube containing 30ml of CytoLyt Solution. A secondary method would be to collect the sample into a balanced electrolyte solution, such as Polysol® or Plasma-Lyte® injection solutions.

For washes and lavages, do not expose the patient to CytoLyt Solution.

Note: Direct smears may be necessary for radiologic-guided FNAs when a rapid analysis of specimen adequacy is required.

Mucoid Specimens:
Mucoid specimens, sputa and brushes, are best collected into CytoLyt Solution. If they are collected fresh, CytoLyt Solution should be added as soon as possible. Early addition of CytoLyt Solution preserves the sample and initiates the mucus dissolution process. These samples must be collected in a balanced electrolyte solution. Large volume mucoid specimens (greater than 20ml) should be concentrated before addition of CytoLyt Solution to the sample.

Fluid Specimens:
The preferred method for preparing fluid samples (urinary tract, effusions, synovial, and cyst fluids) is to concentrate the fresh sample before any addition of CytoLyt Solution. If this is not possible and the samples must be preserved for transport to the lab, collect the samples in CytoLyt Solution.
Superficial Specimens:

Superficial brushings and scrapings are the only non-gynaecologic samples which are collected directly into PreservCyt Solution. In cases where CytoLyt Solution is contraindicated, balanced electrolyte solutions, such as Plasma-Lyte® and Polysol®, may be used as collection media for samples to be processed on the ThinPrep Processors. These solutions are primarily used as media for washings or lavages which contact the patient.

Non-Recommended Collection Media:

Hologic does not recommend the use of the following collection solutions with the ThinPrep System. Use of these solutions will produce sub-optimal results.

Collection solutions which harden mucus, protein, and blood leading to sub-optimal results:
- Saccomanno and other solutions containing carbowax - The use of carbowax solutions can damage the ThinPrep Processor. Use of carbowax solutions will void the instrument warranty.
- Alcohol
- Mucollex®

Collection solutions which increase the chance of sub-optimal cell morphology:
- Normal Saline
- Culture media, RPMI Solution
- PBS
- Solutions containing formalin

ADDITIONAL NOTES

Mechanical Agitation

Mucoid specimens require vigorous agitation in CytoLyt Solution to break up the mucus. Hologic recommends two methods of mechanical agitation:

Method A:
Vortex the CytoLyt/Sample mixture for minimum of 10 minutes on a “hands-free” vortexor. The vortexor speed must be adjusted to produce visible agitation to the bottom of the tube.

Method B:
Blend the CytoLyt/Sample mixture for a few seconds.

Note: Agitation times for both methods may vary due to differences in specimen consistency. The blending technique may show fragmentation or disruption of cell architecture. Excessive blending must be avoided. Vortexing for minimum of 10 minutes after blending helps break up more mucus.