

Cytopathology HELP DESK



Experts address relevant and topical questions in the field | Edited by Gladwyn Leiman, MBBCh, FIAC, FRCPath



Leigh Ann Cahill, BS, CT(ASCP)CMIAC

Ms. Cahill is the quality/education supervisor for the division of anatomic pathology and a senior cytotechnologist at Virginia Commonwealth University Health System in Richmond, Virginia. She is a member of the American Society of Cytopathology, for which she is currently serving on the Clinical Practice Committee. She has served on the Executive Board as well as chair of the Cytotechnology Advisory Committee. She has participated in several American Society of Cytopathology-sponsored Task Forces such as the Professional Identity of the Cytotechnologist Task Force, the "Future of Cytopathology Summit," and the drafting of the white paper entitled "Facing the Future of Cytopathology: Discerning the Future Needs of Our Profession" as an Executive Board member. She has also served on the Cytotechnology Programs Review Committee, and is cochair of the Cytopathology Committee for the American Society for Clinical Pathology.

Opportunities for Cytotechnologists in a Changing Environment

The profession of cytotechnology revolved primarily around the Papanicolaou (Pap) test until the advent of the human papillomavirus (HPV) test, automated screening technologies, and advances in molecular diagnostics. In 2012, new cervical cancer screening guidelines were implemented by the American Cancer Society, the American Society for Colposcopy and Cervical Pathology, and the American Society for Clinical Pathology (ASCP).¹ These guidelines set forth the following parameters:

1. Initiate Pap test screening at age 21 years.
2. Initiate cotesting with the HPV test at age 30 years.
3. Lengthen the screening interval between Pap tests: every 3 years for a negative Pap test alone and every 5 years for both negative Pap and HPV tests.
4. Stop Pap test screening at age 65 years based on 3 negative Pap tests or negative HPV test or after hysterectomy for benign disease.

The change in the screening intervals alone will affect the laboratory's volume of Pap tests. Many laboratories, especially those in private hospitals and academic medical centers, have already noticed a decrease in their numbers of Pap tests. If the HPV test receives approval from the US Food and Drug Administration for primary screening in which the Pap test will be used as a triage tool for a positive HPV test, the Pap test volume will decrease even more.

Discussion

What does the decrease in Pap tests mean for the cytotechnologist? This question has been raised over the past several years. In 2010, the American Society of Cytopathology sponsored a "Future of Cytopathology Summit," at which representatives from all cytology and pathology organizations met and discussed the various strategies outlined in the American Society of Cytopathology's white paper entitled "Facing the Future of Cytopathology: Discerning the Future Needs of Our Profession."² Even though the overall consensus from this white paper and summit recommended expanding the existing cytotechnologist models using morphology skills with novel educational tools,

changes in the profession were already occurring. These changes provide more opportunities for cytotechnologists to both enhance their morphology

skills as well as develop new skill sets.

The Standards and Guidelines for the Accreditation of Educational Programs in Cytotechnology³ were approved by the Commission on Accreditation of Allied Health Education Programs with the implementation date of July 1, 2014. These standards and guidelines also include the new entry-level competencies. Cytotechnology educational programs have already started changing their curricula to meet the needs of the workplace. One such program is the University of Tennessee Health Science Center's Master of Cytopathology Practice degree program. Barbara Dubray-Benstein, PhD, SCT(ASCP)CM, is a professor and director of this 21-month program, in which the graduates can be certified in both cytotechnology and histotechnology. This program was initially designed to include more molecular pathology but their communities of interest stated a need for individuals who were trained to work in histology. Dr. Dubray-Benstein stated that many of the local laboratories were already cross-training their cytotechnologists in histology and this helped spur the decision to incorporate histology into their program. Their students do take a molecular techniques course with the medical technology students and as such they are eligible for certification in molecular biology.

Many cytotechnologists are performing HPV testing in their laboratories, which offers them a new skill set. The number of HPV tests will increase should this test be approved for primary screening. In many laboratories that offer or support a fine-needle aspiration (FNA) service, cytotechnologists may function in several capacities. They may accompany the pathologist and assist with preparing the slides (for deep or superficial FNAs). The cytotechnologist may attend the deep FNA procedure and provide an adequacy assessment to determine whether sufficient specimen has been obtained. Many laboratories are implementing telecytology, in which the cytotechnologist is able to show the case to the pathologist remotely via the Internet. Pathologists are also starting to perform their own ultrasound-guided FNAs, in which the cytotechnologist can be trained to assist with use of the ultrasound instrument while the pathologist obtains the sample.

There are several other opportunities for cytotechnologists to expand their roles. Performing immunohistochemistry on nongynecologic and FNA specimens as well as learning interpretation skills are useful in an arena in which both types of specimens are increasing. Fluorescence in situ



hybridization (FISH) is another area in which cytotechnologists can gain new skill sets. Many cytotechnologists are already performing UroVysion (Abbott Molecular Inc, Abbott Park Ill) on urine specimens. Human epidermal growth factor receptor 2 (*HER2/neu*) is an additional test performed by FISH to detect HER2-positive breast cancer cells in various specimens. Further, RISH probe technology (Biocare Medical, Concord, Calif) is an in situ hybridization technology using proprietary DNA probes for the rapid visualization of messenger RNA (mRNA) target expression.⁴ Not only can the cytotechnologist learn how to use immunohistochemical, FISH, and RISH techniques on various samples, they can also be trained in their interpretation. The cytotechnologist can “prescreen” the specimen similar to what is done with nongynecological and FNA specimens, with the pathologist performing the final interpretation. This uses their morphology skills and also serves to assist the pathologist, whose workload may also be increasing.

In the rapidly growing world of personalized medicine, tests such as epidermal growth factor receptor (*EGFR*), Kirsten rat sarcoma viral oncogene homolog (*KRAS*) mutation, and anaplastic lymphoma kinase (*ALK*) are being ordered on small cytology and surgical pathology samples. Laser capture microdissection is another opportunity for the cytotechnologist to learn a new skill set. This technology uses morphology skills in annotating individual tumor cells on the tissue slide for the laser to cut and then capture on a specialized membrane. Upon reaching the predetermined amount of tumor cells, this specimen can be submitted for these and other molecular tests.

Several laboratories across the country have already started adapting and changing their work processes. Cytotechnologists have many assets such

as their morphologic skills, which they can use to gain more opportunities for growth and development in their careers. Change can be very overwhelming, but it can also be a catalyst for learning new skills and taking on new challenges that in the long term will be beneficial to both the cytotechnologist's career and to the profession.

FUNDING SUPPORT

No specific funding was disclosed.

CONFLICT OF INTEREST DISCLOSURES

The author made no disclosures.

REFERENCES

1. American Cancer Society-American Society for Colposcopy and Cervical Pathology-American Society for Clinical Pathology Cervical Cancer Screening Recommendations. [ascp.org/Practice-Management-3/PICSM/Cervical-Cancer-Screening-Recommendations](http://www.ascp.org/Practice-Management-3/PICSM/Cervical-Cancer-Screening-Recommendations). Accessed January 12, 2014.
2. American Society of Cytopathology. Future of Cytopathology White Paper. Facing the Future of Cytopathology: Discerning the Future Needs of Our Profession. <http://www.cytopathology.org/future-of-cytopathology-white-paper>. Accessed January 12, 2014.
3. American Society of Cytopathology. The Standards and Guidelines for the Accreditation of Educational Programs in Cytopathology Were Approved. [cytopathology.org/the-standards-and-guidelines-for-the-accreditation-of-educational-programs-in-cytopathology-were-approved](http://www.cytopathology.org/the-standards-and-guidelines-for-the-accreditation-of-educational-programs-in-cytopathology-were-approved). Accessed January 12, 2014.
4. Biocare Medical. About RISH™. biocare.net/products/molecular/rish. Accessed January 12, 2014.

DOI: 10.1002/cncy.21406

Cytopathology Help Desk represents the opinions and views of the author and does not reflect any policy or opinion of the American Cancer Society, Cancer Cytopathology, or Wiley unless this is clearly specified.