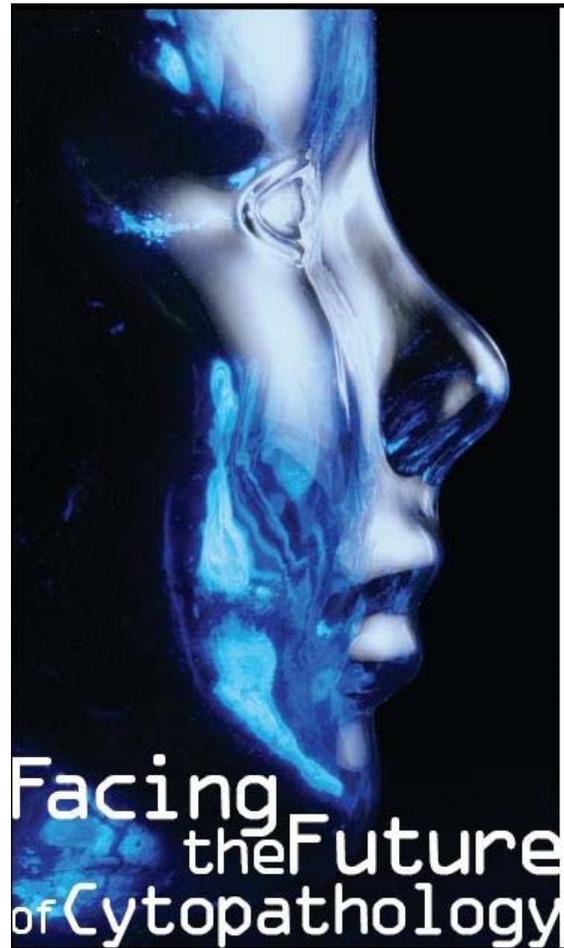


A White Paper Commissioned by the
American Society of Cytopathology



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**Discerning the Future Needs
of Our Profession**

*Prepared by the ASC Multidisciplinary Steering
Committee on the Future of Cytopathology*

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Organization Overview

The American Society of Cytopathology (ASC), founded in 1951, is a distinguished national professional society of physicians, cytotechnologists and scientists who are dedicated to the cytologic method of diagnostic pathology. The ASC's diverse membership of more than 3500 individuals includes representatives from other countries who share a vision of education, research and continuous improvement in the standards and quality of patient care. The ASC is a unique society that provides a forum through which physicians and cytotechnologists interact and network for the benefit of the patient and the profession.

The ASC recognizes that the future of medicine relies on a team of professionals and therefore the ASC collaborates with other professional and government agencies to address issues relating to cytopathology. The ASC is also involved with patient advocacy groups providing patient and community education. Education is a primary focus of these collaborations, with the outcome of improved patient care.

The educational programs of the American Society of Cytopathology are of prime importance to its members and to the Executive Board. The ASC recognizes the need to quickly integrate basic science developments, experimental and newly available techniques into research and clinical practice through its educational programs.

Executive Summary

Advancing technologies, such as testing for Human Papillomavirus (HPV) and HPV vaccination, as well as changes in market forces and practice dynamics, are driving evolutionary changes in the discipline of cytopathology. This has produced speculation about the future role of cytopathologists and cytotechnologists.

The ASC has engaged our professional community to explore the issues surrounding these changes recognizing the valued relationship between cytotechnologists and pathologists; in order to reach knowledge based consensus recommendation for action.

This white paper discusses these issues by addressing the following strategic question:

What skills will be needed to support the practice of cytopathology in the future, and what kinds of professionals will be best suited to address these needs?

Background

The history of this strategic discussion begins in November 2001, when ASC member cytotechnologists and cytopathologists assembled at the Cytotechnology Education Consensus Retreat, held in Kansas City, MO, to discuss the challenges facing cytotechnology educational programs, cytology professionals and employers. Following this conference, the ASC established the Task Force on Cytology Education (TFCE). The goals of the TFCE were to define the scope of practice of cytotechnologists in the context of workforce needs, and develop strategies for cytology educators to develop curricula to address those needs.¹ In 2002, the Task Force on Cytology Education became the Cytotechnology Professional and Educational Advisory Committee (CPEAC). This committee charges were to carry out the objectives identified during the consensus conference, including identifying and addressing short-term workforce needs and assessing the long-term market demands on the profession.

The CPEAC conducted two surveys; a career satisfaction survey for cytotechnologists, and a practice assessment survey directed at cytopathology medical directors and administrators. The career satisfaction survey identified the need to expand the roles of cytotechnologists, enhancing opportunities for advancement and professional growth.² It was unclear, however, from the practice assessment survey whether laboratory directors/administrators were confident that cytotechnologists possess the skills to expand their roles in the laboratory, or if employers would be willing to pay training and compensation for these additional skills.

Following the release of these survey results, the ASC Cytotechnology Advisory Committee (CAC) investigated the potential for a new cytopathology professional and presented their results entitled “Cytopathology Practitioner: Planning for the Future”, to the ASC Executive Board in November of 2005. The CAC subsequently collaborated with the ASC Executive Board cytotechnologists to develop a strategic plan to investigate the feasibility and development of a new profession in cytopathology. This new profession or career path envisioned using cytotechnologists’ specialized training in cytopathologic

morphology, building on their basic knowledge of ancillary testing and techniques to broaden their assistance to pathologists. In April 2006, the ASC Executive Board created the New Cytopathology Profession Task Force (NCPTF) to review the information available and assess the need for such a profession or professional by the cytopathology community.

Concluding this review, the NCPTF felt there was strong potential for this type of individual, but more concrete data was needed to support the proposal. The task force recommended to the ASC Executive Board that a consultant be hired to facilitate an evidence-based market analysis to confirm the market need, and what model should be used if such a need exists. As a result, The Forbes Group was hired in November of 2006 for this project.

In June of 2007, The Forbes Group presented the ASC with a report entitled “Plotting the Future of Cytotechnology: An Environmental Analysis of the Driving Forces of Cytology”⁴ that outlined changes in market forces and the relationships between pathologists, clinicians and other specialists that might lead to the emergence of new professions (or professional roles) in the future. The “Forbes Report” is a comprehensive snapshot of where medicine is today, how it is changing, and what cytopathology must do to retain a pre-eminent position in diagnosis and therapy. The challenge of how to enhance the scope of practice for cytotechnologists became a larger issue of how pathology as the parent discipline and cytopathology as a derivative component, must change in a changing world.

It was recommended that the ASC hold an “Alternative Futures Summit” to engage potential stakeholders in dialogue encompassing different outcomes identified in the report. The results of the summit would serve as a guide in determining what support services this new form of pathology will require and what kind of professionals are best suited to provide them.

In response to The Forbes Report, the ASC established the Multidisciplinary Steering Group on the Cytology Profession in November of 2007. This steering group was charged with developing ways to engage the ASC membership and other stakeholders in discussions surrounding possible future scenarios, as well as developing a plan for a summit.

The Steering Group developed The Future of Cytopathology Forum, an internet-based discussion board, which addressed eight topics highlighted in The Forbes Report. All individuals in the cytopathology profession were invited to participate in this Forum and were encouraged to contribute to the on-line discussions. The Forum was open for comments from July 1, 2008 – September 30, 2008. The responses from this Forum were presented at the ASC 57th Annual Scientific Meeting in November 2008 in Orlando, Florida. This panel discussion, titled 2010: A Cytology Odyssey,⁵ also reviewed the findings of the Forbes Report and allowed audience members to answer questions regarding their thoughts on the future of our profession, as well as give their feedback to the discussion panelists.

Following the Forum in October 2008, the ASC hired Jean Frankel, a Principal Partner with Tecker Consultants, due to her extensive experience with organizations undergoing changing professional environments. Ms. Frankel has facilitated the success of other health care organizations to capitalize on strategic opportunities. Under her guidance, the ASC Multidisciplinary Steering Group and Executive Board officers met in Chicago in March of 2009 to conduct a strategic planning session regarding the recommendation for a “Futures Summit”. At that time, the following strategic question was developed to guide this project:

What skills will be needed to support the practice of cytopathology in the future, and what kinds of professionals will be best suited to address these needs?

To further investigate this question, the group was asked to project how cytopathology might be practiced five years from the Summit, in 2015. In order to do so, it was necessary to identify what is collectively known about the profession. The following questions were critically considered in relation to our strategic question:

1. What do we know about the current and evolving environment of the practice of cytopathology relevant to this decision?
2. What are the needs, wants and preferences of the cytopathology community and other stakeholders relevant to this strategic question?
3. What do we know about the current skill sets of those who support the practice of cytopathology today that is relevant to this strategic question? What do we wish we knew?
4. What are the ethical, patient care and practice implications?
5. What could we do (nothing differently, new profession, different curriculum, etc.)?

At the conclusion of this planning session, the ASC Executive Board followed the Forbes Report recommendation and hosted the Future of Cytopathology Summit on November 12-13, 2009. The Summit was planned by the Multidisciplinary Steering group and facilitated by Ms. Frankel. The goal of this day-and-a-half event was to engage our professional community in meaningful dialogue surrounding the aforementioned questions, in order to come to a consensus recommendation for action.⁶

The Summit was held two days prior to the 57th Annual Scientific Meeting in Denver, Colorado with a working group intimate enough to sufficiently explore the complex issues facing cytopathology today, while maintaining workable size for the discussion groups. The deliberations of the group were conducted using a knowledge-based approach that focused on the quality of information gathered and the manner of decision-making.

Seventy-seven cytotechnologists and pathologists were invited with effort made to select participants who reflected a balanced representation of cytotechnologists and pathologists

from all sectors of the field. Participants were selected based on their previous investment in the profession and the Society, current work environment, geographic location and interest in the future development of our field. In addition, leaders from professional organizations that represent cytotechnologists and/or pathologists were also invited and participated in the Summit. These organizations included the Association for Molecular Pathology (AMP), the American Society for Clinical Pathology (ASCP), and the American Society for Cytotechnology (ASCT) and the College of American Pathologists (CAP).⁷

Prior to the summit the Multidisciplinary Steering Group developed a web site used to facilitate and encourage participation feedback from those that could not attend the summit. The discussion threads used to discuss potential strategies are described later in this document.⁸

This white paper summarizes the information from all facets of the Summit process and is a culmination of the strategic planning session, the electronic Google Group comments as well as the Summit discussions. The strategies proffered by participants of the sum of all Summit activities are explored and recommendations for action offered based on the group consensus.

Current Environment: What do we know about the current and evolving environment of the practice of cytopathology relevant to this decision?

Pap Test Market Changes

Over the last two decades, there has been a substantial amount of change in gynecologic cytopathology. Introduction of liquid-based Pap testing methods, automated and image assisted Pap test screening, the addition of HPV testing to cervical cancer screening guidelines and the HPV vaccine have all had an impact on cervical cancer prevention. There is professional anxiety within the cytopathology community leading to questions about the future viability of Pap testing and the profession of cytotechnology.

HPV Testing and Pap Test Volume

The adoption of the American Society for Colposcopy and Cervical Pathology (ASCCP) 2006 Consensus Guidelines for the Management of Women with Abnormal Cervical Screening Tests⁹ is a factor affecting our profession.

Although some estimates suggest that full compliance with these guidelines could reduce Pap test volume by as much as fifty percent,^{10, 11} adoption of these guidelines by health care providers is varied. A recent market survey conducted by the ASC revealed that providers anticipate ordering the same number of Pap tests per year in five years as they order today regardless of these guidelines, which may illustrate the reluctance of many providers to increase cervical cancer screening intervals for their patients.^{12, 13}

However, almost half of the providers surveyed indicated that they believe HPV testing will be used for primary cervical cancer screening with Pap test triage within the next

five years. This response is echoed by a recent article published in *Lancet Oncology* that suggests that primary HPV screening is more effective than Pap testing for preventing high grade lesions of the cervix.¹⁴ If implemented, this switch from “Pap first, HPV second” to “HPV first, Pap second” could have a significant impact on Pap test volume.

HPV Vaccines

The addition of HPV vaccination to cervical cancer prevention guidelines¹⁵ could also influence the use of Pap testing for routine screening. However, because these vaccines are in their infancy, little is known about their long-term effectiveness or side effects. These questions could take a decade or more to be answered.¹⁶ Despite the use of vaccination, cervical cancer screening programs will still be needed. The frequency, design and test method are still being investigated. Because of these uncertainties, the effects of HPV vaccination fall outside the 5-year projection of this paper.

Pathologists’ Practice Changes

One of the key findings of The Forbes Report is that a shortage of physicians, predicted by a 2006 U.S. Department of Health and Human Services (HHS) study¹⁷, will drive the need for new professional relationships in cytopathology. Although this study indicates there will be a 1% increase in the total number of practicing pathologists from 2005 to 2020, it also predicts a 50% increase in pathologists’ practice requirements. If this trend is realized, it could indicate a shortage of pathologists for the estimated workload.

What remains unclear is what tasks will increase, or what new tasks will be added, which may cause this predicted increase in demand for pathologists’ time, and if cytopathology will be affected by this change. We know that emerging trends in telemedicine are decentralizing our practice in diagnostics, and increased requests for FNA services are increasing pathologists’ interaction with radiology and surgery. However, there are gaps in information regarding pathologist workload; the current and emerging needs of pathologists are unknown precluding accurate assessments of whether cytotechnologists could be used to fill these gaps.

Proficiency Testing for Gynecology Cytology

With the implementation of gynecologic proficiency testing in 2005, cytotechnologists and pathologists practicing gynecologic cytopathology are now required to test their skills with a federally mandated exam.^{18, 19} This testing has been met with considerable concern from our professional organizations,²⁰ due to the questionable ability of this test to assess competency and because it sets a precedent for testing pathologists in order to continue practicing in a medical specialty. Will this mandatory testing cause pathologists to avoid gynecologic cytopathology and create gaps in cytopathology services?

Health Care Reform and Medicare Reimbursement

With health care and Medicare reform pathology laboratories continue to adjust to changes in Current Procedural Terminology (CPT) coding and billing attributable to the CMS National Correct Coding Initiative (NCCI) Edits.²¹ Restrictions in payment codes, increased need for pathologists as consultants and evolution to an outcomes based reimbursement schedule will all impact the practice of cytology. For example, limitations

for the CPT code 88712 (immediate assessment of adequacy for FNA) have resulted in decreased reimbursement for time-intensive services. While working with their professional organizations to address these billing issues, some pathologists defer this service to cytotechnologists and use their time to perform essential services with higher reimbursement.

As there is a shift in cytotechnologists' responsibilities from time at the microscope performing a billable service (Pap test screening) to more time performing the non-billable service of adequacy assessment, laboratory administrators will face new challenges to maintain adequate personnel as caseload volumes and responsibilities change.

Expansion from the Traditional Roles of Cytotechnologists

Changes in cytopathology and anatomic pathology over the last decade have challenged the traditional role of cytotechnologists. Recognizing their morphologic strength, many laboratories have successfully trained cytotechnologists to apply this skill to many emerging technologies, such as digital image analysis (DIA) of DNA ploidy and FISH.^{22, 23, 24, 25, 26}

This transition has created new roles for the cytotechnologist. Working with pathologists and other researchers, cytotechnologists are now involved in the investigation of new technologies and testing.²⁶ Their scope of practice has changed and the view of "cytology" specimens has become more encompassing.

Cytotechnologists are used for many "pathologist-extending" roles, including FISH, DIA, the review of IHC stains and, tumor identification on tissue for a variety of molecular tests, and most recently, performing Circulating Tumor Cell Analysis (CTC). Cytotechnologists have also begun to perform analysis of tissue specimens for acid fast bacilli (AFB) and fungal organisms (GMS, PAS fungus) prior to pathologist sign out.

American Society for Clinical Pathology Board of Certification (previously know as the Board of Registry) (ASCP BOC) Statistics

Cytotechnology Workforce Studies

In 2008 and 2009, cytotechnology workforce surveys were sponsored and conducted by the ASCP to collect data on current trends in the field of cytotechnology.^{22, 23} These surveys concluded that the typical ASCP certified cytotechnologist is a female in her mid 40s who works in a non-supervisory capacity in a large hospital or medical center. The average ASCP certified cytotechnologist screens less than 60 slides a day and is more than 10 years from retirement. Over the last three years the most common changes these cytotechnologists have seen in their job responsibilities are the addition of image-guided screening platforms, molecular testing and information technology related activities.

These workforce studies also revealed trends in laboratory specimen volumes and service portfolios. Overall, the survey suggests decreased Pap test volumes, stable to increased non-gynecological (non-gyn) volumes and an increase in fine needle aspiration (FNA)

volume. Image-guided screening and molecular testing are the most common changes in the cytotechnology work environment, while implementation of virtual slide technology, telepathology and increased FNA assistance are also on the rise.

BOC Examinations Statistics

As of December 2009, the ASCP BOC has granted 15,030 Cytotechnologist (CT) and 591 Specialist in Cytotechnology (SCT) certifications.²⁷ Over the last six years, there has been a steady decline of enrollment in both the CT and SCT certification exams. The following table illustrates the CT and SCT exam statistics from January 2005-December 2009:

Exam Period	CT Exam					SCT Exam				
	Total	Pass		Fail		Total	Pass		Fail	
		N	%	N	%		N	%	N	%
Jan-Dec 2009	209	187	89%	22	11%	23	17	74%	6	26%
Jan-Dec 2008	244	210	86%	34	14%	18	14	78%	4	22%
Jan-Dec 2007	246	210	85%	36	15%	10	5	50%	5	50%
Jan-Dec 2006	266	247	93%	19	7%	19	19	100%	0	0%
Jan-Dec 2005	262	234	89%	28	11%	25	20	80%	5	20%
Jan-Dec 2004	320	273	85%	47	15%	35	31	89%	4	11%

The lack of interest in the SCT exam lies with the absence of additional professional value in terms of compensation or advancement. Comments offered by participants during Summit discussions suggest that if new roles for cytotechnologists are identified and embraced, the SCT exam might be the vehicle used to certify competency for the skills needed to fulfill these new roles.

Laboratory Workforce Shortage

In addition to the predicted shortage of pathologists, there is a continuing decline in the numbers of all physicians, nurses, physician assistants and technologists. This decline contrasts with an expanding population whose longevity requires increased demands for health care and wellness services outside the context of conventional health care delivery.

Workforce shortages also exist in clinical laboratories, and although they may seem unrelated to the changes in cytopathology, the advancement of new technologies blurs conventional lines between laboratory disciplines and issues affecting the entire laboratory must be considered when considering cytopathology.

The full impact of the shortage of medical laboratory personnel is yet to be realized and, according to Tommy Thompson, former Health and Human Services (HHS) Secretary, is a much more serious problem than the well-known nursing shortage.²⁸ Projections by the Bureau of Labor Statistics indicate the U.S. will need 149,000 additional medical technologists and technicians to replace those retiring and to fill newly created positions by 2014. The demand cannot currently be met with only 4,700 individuals graduating annually from accredited training programs. According to the most recent ASCP Wage and Vacancy Report (2009), 50% of the labs in the U.S. have difficulty hiring laboratory personnel and the “demand for all laboratory professionals far outstrips supply”.²⁹ The highest vacancy rate for all surveyed positions was 10.4% for staff level certified Medical

Technologists (MTs). For cytotechnologists, the vacancy rate was 4.8% in staff level positions although the sample size reporting was small ($n < 30$). The sample size was also too small for meaningful analysis for Histotechnicians (HTs) and Histotechnologists (HTLs) where vacancy rates of 8.0% and 7.2% respectively were reported.

As with nurses, the aging laboratory professional along with the impending retirement of a large segment of the population is an important contributing factor to the workforce crisis. The median age of the laboratory workforce is approximately 48 years. Many laboratory workers report the youngest member of their staff is 40 years old.³⁰ Only two new professionals enter the laboratory workforce for every seven who retire.³¹ Compared to the entire U.S. labor market, the laboratory personnel labor force is aging at a 78% faster rate.³² Consequently, 13% of the workforce is expected to retire in the next 5 years and 25% will retire over the next 10 years.³¹

As a result, the shortage of qualified laboratory personnel will cause delays in testing and diagnosis which will seriously impact the quality of care and compromise patient safety.²⁸ It is believed that approximately 70% of data used to make health care decisions is supplied by laboratory tests, and thus by laboratory personnel. Shortages in technologists will lead to delays in diagnosis and treatment for patients, which could translate into longer hospital stays and increased costs to patients and health care organizations.³¹

In addition, personnel shortages also lead to more overtime and the possibility of fatigue, which can influence the quality of performance. While there is no concrete evidence linking shortages of personnel to increased errors, many are concerned about patient safety issues particularly, in the event of a major infectious disease outbreak, during which it would be difficult to have enough personnel resources to respond.³³ Laboratory professionals can be the key to improved patient outcomes and a safer, more effective healthcare system with their knowledge of the total testing process, the use of appropriate tests and quality improvement measures.³⁴

These shortages, as they relate to cytopathology, could result in longer turn around time for Pap testing, as well as decreased support provided to pathologists in non-gyn and FNA services. Quality assurance monitoring and process improvements in cytopathology may also be hindered directly affecting the efficiency and accuracy of providing pathology services to clinicians and patients.

Education Program Closures

The future cytotechnologist workforce crisis could be particularly acute and carry significant public health risks given the recent closure of a significant number of educational programs.^{24, 35-39}

Cytology program closures mirror those of their medical laboratory counterparts, which are adding to the workforce shortage predicament. The number of accredited medical technology programs has dropped over 70% from 709 in 1975 to 222 in 2007.²⁸ The Bureau of Labor Statistics reported in 2006 that there were 167,000 practicing clinical

laboratory technologists with a projected need for 21,000 more by the year 2016.^{40, 41, 42} The clinical laboratory science and medical technician programs currently in existence produce only 4,500 graduates on average annually leaving a 9,200 annual shortfall.⁴³

In close comparison to medical technology program closures, the number of cytotechnology programs has decreased over 60% over the last 34 years, from 100 accredited programs in 1976 to 36 accredited programs in 2009.⁴⁴ This data comes from a report generated by the ASC Cytotechnology Programs Review Committee (CPRC), which tracks program data as reported by training programs accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). At the time of this report, three of the 36 accredited programs were inactive. In addition, the CPRC also indicates that the active programs have an average vacancy rate of 30%.

In a survey conducted for the 2008 ASC Program Faculty Seminar specific to program closures,⁴⁵ respondents cited financial challenges at their institutions as the primary reason for program closure or probable program closure. Secondary reasons for closure or potential closure cited by respondents were related to changes in the current employment environment, including job market saturation in the locale of the program, graduates unable to find jobs and a decreased applicant pool.

Perception that cytotechnologists may not be needed in the future because of the implementation of the HPV vaccine and the introduction of alternative methods of cervical cancer screening fuels the speculations about the future of the profession. Estimates refute that significant decline of Pap testing will continue through the near future.³⁵

Although Pap test volumes may be projected to decrease, as recognized by the ASCP BOC workforce studies, calculations of anticipated cytotechnologist workforce needs based solely on Pap tests is inaccurate.⁴⁶ Cytotechnologists are needed for much more than screening Pap tests.^{37, 39, 47} Gyn and non-gyn laboratory caseloads are remaining stable or increasing, and there is clearly an increase in volume of fine needle aspirates.²² Furthermore, cytotechnologists possess a unique morphologic expertise that, when combined with skills in molecular analysis, could make them particularly valuable to diagnostic medicine in the future.³⁹

Education Program Challenges

As the environment and marketplace for cytopathology services transform, cytotechnology training programs are challenged with the task of adjusting their curricula to provide for current needs, as well as the needs of the future.

ASC Student Recruitment and Resources Committee Cytotechnology Programs Survey

To assist program directors as they adapt to the current educational environment, the ASC established the Student Recruitment and Resources Committee. The Student Recruitment and Resources Committee conducted a survey of current cytotechnology programs from February 25, 2009 through March 16, 2009.⁴⁸ The response rate for the survey was 83% with 30 of the 36 accredited programs responding to the survey.

This survey contained questions regarding current program curricula, job responsibilities of recent graduates in the field, as well as questions designed to gather the opinions of program faculty regarding the needs of cytotechnology programs, and employers of cytotechnologists, in the future.

Programs were asked what ancillary testing techniques were included in their current curriculum. Approximately (90%) of programs responding indicated that they included Immunohistochemistry (IHC), HPV testing and FISH in their curriculum. Other techniques reported by respondents include Polymerase Chain Reaction (PCR), flow cytometry and tissue microarray. The addition of these techniques is a considerable change from the curricula of programs as recently as 10 years ago.

The addition of ancillary testing techniques to cytotechnology curricula has contributed to variability between training programs. Sixty one percent (61%) of programs believe there is too much variability in curricula among cytotechnology training programs, yet 73.3% do not want a standard curriculum for all programs. Forty eight percent (48%) of programs responding said they were considering a partnership with another program within pathology, such as histotechnology or clinical laboratory science, not only to help support the addition of these techniques to their curriculum, but also to improve the financial viability of their programs.

It is a challenge to expand curriculum while still providing sufficient time for traditional coursework. Currently, three of the 33 active cytotechnology programs offer Master's Degrees⁴⁹, in part to accommodate this additional material. When asked what components should be included in a Master's level curriculum, 80% of programs responded with more molecular techniques and/or management topics, while 60% thought practitioner level duties should be included. Two-thirds (66.7%) of programs in this survey thought that cytology programs should be offered at multiple levels, however, almost half of hospital-based programs said a Master's level mandate would adversely affect their program.

Resources have also become a challenge for cytotechnology programs, especially those located in rural areas. Eighty-three (83%) of respondents stated their programs were in geographic areas that could be included in centralized cytotechnology education centers. In addition, a majority (87.5%) of university-based programs indicated they would be willing to share on-line molecular based courses with hospital-based programs. Two of the three master degree programs indicated that they would accept certificate-based graduates into their master degree program and accept their credits towards their master degree requirements.

In regard to the current practice of program graduates, 73% of programs that participated in the survey reported that at least one of their graduates from the past three years is performing molecular testing, with HPV and FISH being the most common tests indicated in the survey. However, only 16% of programs state they have graduates who have taken the ASCP Molecular Pathology (MP) exam in the last three years.

Cytotechnology Educators' Forum

On April 19, 2009, the ASC, in partnership with the ASCT, sponsored the Cytotechnology Educators' Forum. The forum was held in conjunction with the ASCT Annual Scientific Conference in St. Petersburg, Florida. Facilitated by the ASC Student Recruitment and Resources Committee, this forum brought cytotechnology educators together to discuss the immediate needs and future direction of all cytotechnology training programs in the US and Puerto Rico.⁵⁰ Two-thirds (24/36) of accredited programs participated in the Forum.

As a result of breakout sessions during this meeting, five workgroups were established to address "Key Issues for Action Planning" for cytotechnology programs:

1. Identify Cytotechnology Program's Communities of Interest and Survey Their Needs
2. Develop a Core Molecular Pathology Curriculum
3. Develop a Career Ladder for Cytotechnology and Identify Areas of Growth for the Cytotechnology Profession
4. Develop a Cytotechnology Education Mission and Scope of Practice
5. Investigate Public Relations Initiatives that would present Cytotechnology in a Positive Manner

Information gathered from these workgroups was shared during Summit discussions,⁷ and has been incorporated into this document in subsequent sections.

Education Curriculum Considerations

Cytotechnology educators are not alone in their struggle to develop a curriculum that balances current market needs with future demands. In June of 2009, the American Society for Clinical Laboratory Science (ASCLS) introduced a position paper that illustrates different levels of competency for clinical laboratory personnel.⁵¹ This position statement was developed after the release of a white paper by the same name in June 2007.⁵²

This proposed model for levels of practice includes a Doctorate in Clinical Laboratory Science (DCLS). The DCLS concept was previously supported by the ASCLS in a position paper issued in July 2005.⁵³ Following the release of this document, the AMA drafted a resolution stating it would "counter expansions of the scope of work by PhD scientists and other non-physician laboratory personnel to authorize the independent practice of medicine by any individual who has not completed the state's requirements for licensure to engage in the practice of medicine."⁵⁴

This example illustrates the importance of consensus with cytotechnology educators and pathologists if career levels are to be considered for cytotechnologists.

State Licensure of Medical Laboratory Professionals

The issue of state licensure needs careful consideration when discussing new roles and opportunities for cytotechnologists. State licensure is the purview of individual states, with national personnel qualifications defined by CLIA as the minimal qualifications.

Therefore, while there are national personnel standards and qualifications, additional restrictions may be levied by states.

The ASC conducted a survey regarding licensure for cytotechnologists in 2005.⁵⁵ Just under half of survey respondents (49%) indicated they were opposed to licensure of cytotechnologists, while the remainder of participants were in favor (34%) or undecided (16%). Supporters of licensure believe that it raises the professionalism of cytotechnologists and provides protection against cytotechnologists who cannot perform to the standard of practice in the state. In contrast, respondents who oppose licensure cited additional costs involved for maintenance of licensure, and restrictions in scope of practice that may restrict practice opportunities.

Although respondents indicated that restriction of cytotechnologists' scope of practice due to state licensure was a concern, the lack of language regarding scope of practice has been a more commonly documented problem.⁵⁶⁻⁵⁹ Cytotechnologists in the states of California, Tennessee and Florida have struggled to gain inclusion of ancillary laboratory techniques, such as HPV testing and evaluating bone marrow slides, to their scope of practice – not because language in the laws stated they could not perform these functions, but because there was no language stating they *could*. Cytotechnologists in the state of California are still unable to perform molecular testing.⁵⁸

Cytotechnologists in the state of Florida took great effort to gain inclusion of language in their state licensure law to permit cytotechnologists to perform responsibilities other than those traditionally accepted in cytology. Because of this, cytotechnologists in states considering laboratory personnel licensure have been encouraged to actively participate in the licensure process to ensure that bills include a cytotechnologists' scope of practice that ensure flexibility and viability now and in the future.^{56, 57, 60}

However, this situation has become more complex due to the CAP's revision of its position on state licensure for clinical laboratory personnel in December 2008.⁶¹⁻⁶³ Previously the CAP had opposed state licensure for medical laboratory professionals, citing the importance of laboratory directors in establishing the quality and qualifications of laboratory personnel. The CAP's current position in support of licensure, while generally regarded as a positive shift in support of laboratory professionals,⁶⁴ continues to exclude cytotechnologists and histotechnologists as a component of their "model of state licensure."⁶² The CAP maintains that they have taken this position because cytotechnologists have not independently sought licensure for themselves, and have often been allies with the CAP in opposition of state licensure in the past.⁶³ If the state licensure bill follows the provisions identified in their model licensure, the CAP will not oppose state licensure attempts. The CAP has added a specific statement in the model criteria in attempt to maintain the scope of practice for cytotechnologists: "Nothing contained in this (licensure) act shall be construed as a limitation on the scope of work performed by cytotechnologists who are qualified under CLIA".

However, some cytotechnologists and laboratory managers are uncertain that this statement will be enough to protect cytotechnologists' scope of practice. Further

discussions between the CAP and organizations representing cytotechnologists and pathologists may be needed to generate a consensus regarding state licensure and cytotechnologists' scope of practice.

Cytotechnology Recruitment and Retention Challenges

Aside from an aging workforce, funding cuts, program closures and state licensure, there are other challenges facing the laboratory profession.

There is great difficulty recruiting individuals into a profession with low visibility, little opportunity for advancement and lower pay than nurses, although the educational level is the same or greater.⁴¹ In addition to the difficulty of recruiting quality individuals to the field, there is also a struggle to keep them in the field once they arrive.

While the typical cytotechnologist expects to retire or leave the field in more than ten years, there is an increase in the percentage of CT's who expect to leave the field in less than three years.²² A recent wage and employment survey conducted by the ASCT indicates that a third of cytotechnologists who are considering whether to leave the field will do so to find new careers. A significant number of those respondents have been in the field for only ten years or less.⁶⁵

Insight on why individuals are not entering the field, and why cytotechnologists early in their careers may be leaving, can be found in discussion threads on job posting sites. Public postings citing poor work conditions with mandatory screening quotas and speculation of the end of the profession contribute to a negative image of cytotechnology.⁶⁶ These statements offered by a minority of cytotechnologists unhappy with their individual work environments should not be ignored. Perception is reality in the eyes of public opinion; such comments and the circumstances that cause them should be considered by our professional organizations. Our efforts to identify additional responsibilities and areas for growth will improve cytotechnologists' job satisfaction and improve the public image of the profession.

Stakeholder Needs: What are the needs, wants and preferences of the cytopathology community and other stakeholders relevant to this strategic question?

The following is a list of stakeholders and their perceived needs, completed at the Summit by our participants:

Patients: We believe patients deserve access to cost-effective quality care; accurate, understandable diagnoses; expedient delivery of test results; access to information and education regarding laboratory tests. Our participants believe that patients want laboratory tests that provide the best result for the lowest price. In addition, patients may desire more channels for communication with lab professionals regarding their tests.

Pathologists: Our participants believe that pathologists desire a quality workforce that supports technical needs of the laboratory; custody and control of cytologic/anatomic specimens within the laboratory; sustained relevance in laboratory medicine; fair

compensation for work performed; job satisfaction and security; clear lines of communication with patients and other providers; support from laboratory professionals to ease the burden caused by the shortage of pathologists or increased workload.

Cytotechnologists: There is evidence that cytotechnologists desire an expanded career ladder; career satisfaction, security, fair compensation; continuing education/training; sustained relevance in the laboratory; positive relationship with pathologists; freedom to communicate as part of the medical team. Some cytotechnologists desire changes in regulations to expand the scope of practice to include the interpretation and sign out of non-gyn cytology samples and diagnostic procedures.

Medical Directors: Possible needs of medical directors include the desire to have qualified managers adept at regulations, evaluation and selection of test platforms; overall quality and turn-around time of testing; limited legal liability without litigation; prestige of overseeing a well run and well respected laboratory.

Educators: Participants believed that educators desire program viability; resources to develop new tools to provide quality curriculum that supports the current needs of employers; ability to recruit qualified applicants to meet enrollment; satisfied employers and graduates; certifications to allow graduates to perform in expanded roles, following models within other U.S. health care specialties or those located outside of the United States. In addition, participants indicated that educators desire direction from other stakeholders, but want to preserve some of their current flexibility to provide for local job market needs.

Medical Specialists, Subspecialist and Health Care Providers: Medical subspecialists desire an expanded scope of practice performing procedures (including FNA); more flexible cytology support for ancillary testing; high quality interpretations with appropriate turn-around-time for results reporting; maintenance of income. Summit participants note that a patient's primary provider may be a nurse practitioner or physician assistant, who may desire more collaboration with pathology regarding recommendations for follow-up based on their patient's test results.

Other Lab Professionals: Other lab professionals may desire preserved/increased scope of practice without infringement by other medical professionals; respect in the healthcare marketplace; appropriate compensation; adequate workforce for sustained job satisfaction.

Payers: Payers want a reduction in costs without a decrease in quality or patient morbidity; reduction/elimination of unnecessary procedures; employees that meet the strategic needs of the laboratory.

Administrators/Employers: Administrators may want improved quality, volume, efficiency, productivity; competent staff; no litigation; ability to pass regulatory inspections.

Other Stakeholders: The following is a list of additional stakeholders included by Summit participants that did not have needs identified, whose needs and preferences may need further consideration:

- Public/Patient Advocacy Groups
- Local Communities
- Students

- Industry
- Professional Organizations/Foundations
- Public Health Organizations
- Governmental and Regulatory Agencies

Current Skill Sets: *What do we know about the current skill sets of those who support the practice of cytopathology today that is relevant to this strategic question? What do we wish we knew?*

While the intent of this question was to generate discussion surrounding current skill sets, much of the discussion drifted to what is known (or perceived) or unknown about our current and future practice environment. A list of all comments can be found in **Appendix A.**

In addition to the information and data presented previously in this document, these themes regarding skills sets were offered:

Cytotechnologists

What we know about the current skill set and scope of practice:

- Morphology is the strength and core competency of the cytotechnologist. This skill trait should be considered when discerning expanded roles. Locator skills (screening) are also valuable core skills.
- Cytotechnologists work independently, under the direction of pathologists.
- Cytotechnologists collaborate with pathologists to deliver cytology services for patients and providers.
- Cytotechnologists review and provide initial interpretation of all cytological samples, triaging non-gyn, FNA and abnormal Pap samples to pathologists and sign-out and report normal Pap tests. Some cytotechnologists are trained to also review FISH and/or IHC stains.
- Cytotechnologists are trained to provide assessment of adequacy (not to be confused with a preliminary diagnosis) during FNA sample collection.
- Cytotechnologists gather and review patient history and clinical data to facilitate optimal diagnostic reporting of their cases.
- Cytotechnologists triage samples for ancillary testing.
- CLIA regulations allow cytotechnologists to perform high-complexity testing, as well as test verification and validation studies.
- Cytotechnologists are capable of performing ancillary testing, such as FISH and HPV testing, and are doing so successfully in many laboratory environments.
- Cytotechnologists troubleshoot and triage specimen collection and handling issues of patient samples, interacting with clinic, laboratory staff and providers.
- Cytotechnologists perform cytopreparation and trouble shoot cytopreparatory problems

- Cytotechnologists can perform digital imaging and assist in the collection, transmission and storage of images for both educational and diagnostic purposes..
- Cytotechnologists have basic training in anatomy and histology
- Cytotechnologists participate in quality assurance activities in their laboratories, including daily QC, cytology/histology correlations of gyn and non-gyn samples and retrospective review.
- Because of the extent to which CLIA regulations govern cytology practices, cytotechnologists are well versed in the issues of laboratory accreditation and compliance.
- Cytotechnologists educate providers, laboratory staff and other support staff on the proper collection, handling and submission of cytology samples for testing.
- Cytotechnologists are also capable of excelling in other areas of laboratory support, including administration, IT, billing and coding.

What we do not know about the current skill set:

- We do not know the percentage of cytotechnologists holding advanced degrees or additional certifications, such as:
 - Master's Degree
 - Specialist in Cytotechnology [SCT (ASCP)]
 - Molecular Biology [MP (ASCP)] *Previously Molecular Pathology [MP (ASCP)]*
 - International Academy of Cytology [CT (IAC)]
 - Histotechnologist [HT (ASCP)]
- We do not have any current outcomes data on the value added by cytotechnologists when they interpret non-gyn samples and triage for cell blocks and special stains, or for their performance of molecular tests.
- Are locater skills declining due to the use of imagers?
- Are we sacrificing the strength of our morphology with the addition of other skills added to our curriculum?
- Do we really know what practicing cytotechnologists really want to do?
- Is there a role for CTs in screening some surgical cases?
- Do pathologists need cytotechnologists to do molecular testing?

Pathologists:

What we know about the current skill set and scope of practice:

- Pathologists are physicians and practice medicine.
- Pathologists use independent medical judgment for the interpretation of cytologic and histologic specimens and definitive diagnosis of disease.
- Pathologists consult with care providers, individually and in conference, to facilitate integrated disease management and care of patients.
- Pathologists perform FNAs (with or without image guidance), core biopsies, bone marrow procurement and autopsies.

- Pathologists provide adequacy and preliminary interpretations of FNA samples collected during special procedures.
- Pathologists contribute to the care of patients during radiology procedures.
- Pathologists provide consult services for other pathologists
- Pathologists serve as consultative and educational liaisons between the laboratory and other healthcare providers for proper test utilization.
- Pathologists provide education to medical students, residents, fellows, cytotechnologists and other laboratory professionals.
- Pathologists review the application for new technologies and ancillary testing, and direct the acquisition, validation and implementation of new tests and services.
- Pathologists assess the effectiveness of laboratory operations, including statistical analysis of performance characteristics for lab tests.
- Pathologists provide administrative oversight of laboratory finance, IT and Quality Assurance.

What we don't know about the current skill set:

- Is there a true shortage of pathologists (versus uneven distribution)?
- What responsibilities do pathologists feel limit their practice that could be delegated to a cytotechnologist in an expanded role?
- Should pathologists perform endoscopically guided biopsies?

Other Medical Specialists and Laboratory Professionals:

What we know about the current skill set and scope of practice:

- Radiologists perform radiologic imaging, digital imaging and archiving
- Medical providers and subspecialists consult with pathologists and other physicians for patient care.
- Medical specialists evaluate and direct screening and diagnostic procedures.
- Other medical specialists perform tissue banking.
- Medical Technologists and Histotechnologists perform sample troubleshooting, triage, and other related responsibilities.
- Histotechnologists process tissue, special stains and cell blocks but do not interpret.
- Medical Technologists (CLSs) perform core laboratory testing (chemistry, hematology, microbiology, immunology, transfusion medicine), in addition to molecular testing, flow cytometry, FISH, serology, etc. They also perform calibration and QA functions related to these tests.
- Pathologist Assistants perform gross examination, sample specimens for histologic processing, cut and stain frozen sections, and perform autopsies under the supervision of pathologists
- Cytopreparatory technicians process specimens.
- Laboratory Information Specialists maintain information network.

- Laboratory Administrators/Technical Supervisors are responsible for management, budgets, inventory, scheduling, inspections, human resources, safety, materials management, test validation, recruitment.
- Educators are responsible for curriculum development and planning, educational accreditation, standards, recruitment, job placement, provision of CE.

What we don't know about the current skill set:

- We do not know how the overall laboratory shortage will affect cytopathology and the job responsibilities of cytotechnologists.
- We do not have data on other lab profession looking for increase or change in scope of practice, such as pathologist assistants, medical technologists and histotechnologists, which could affect the expansion of cytotechnologists' scope of practice.
- We do not have this same type of information for other health care providers, such as radiologists, endocrinologists, internists, family practitioners and nurse practitioners, which could infringe on pathologists' current scope of practice and diminish the demand for pathologists' services.

Implications of Change: *What are the ethical, patient care and practice implications?*

During Summit activities, participants were also asked to consider what implications could develop as a result of potential changes in cytopathology support responsibilities. A summary of these comments can be found in **Appendix B**.

The following questions were developed from comments received regarding the potential implications for expanding the role of cytotechnologists:

- Will expanding the roles of cytotechnologists polarize our profession and have a negative impact on patients?
- Will cross-training of laboratory personnel (CT/HT/CLS) undermine the viability of the individual specialties?
- Can the expansion of cytotechnologists' scope of practice be realized without a negative effect on pathologists' ability to generate revenue?
- How could these changes affect patient safety and care?
- Could developing a potential new professional:
 - Expand access to care and information
 - Free pathologists for more specialized work
 - Enhance job satisfaction, security and compensation for cytotechnologists, creating a more stable workforce.
- Will disruptive technologies, such as in-vivo diagnostics, jeopardize the value of cytopathology?

Potential Strategies for Action

Taking into account the information gathered in this report, as well as the comments and discussions generated during Summit activities, participants were asked to propose potential strategies guided by our strategic question:

What skills will be needed to support the practice of cytopathology in the future, and what kinds of professionals will be best suited to address these needs?

Four potential strategies were offered for consideration. These strategies and their advantages and disadvantages were developed and collected during the March 2009 strategic planning session, and were released for comment and suggestion to all interested parties through Summit Google Group discussion threads. Additional strategies were also solicited.

During the Summit event, Summit participants added two additional strategies. Advantages and disadvantages of all six potential strategies are found in **Appendix C**. The following section of this report describes each potential strategy and offers a summarization of the advantages and disadvantages of each.

Potential Strategy #1: Do Nothing

This Strategy assumes our profession will adapt to current and future needs without changes in training or developing a new profession or professional. This strategy assumes our profession is currently in a natural market down cycle and will rebound in time.

While Pap tests utilization may decrease due to new screening guidelines and the HPV vaccine,^{10-16, 46} other areas of our field, including non-gyn and FNA services, molecular testing and other ancillary studies may increase and elicit demand.^{24, 37-39}

Training programs in areas with high demand for services will open or re-open, as was the case historically.⁶⁶ Training for the skills needed under this strategy will evolve naturally. Cytotechnology training programs will continue to provide cytotechnologists with morphology training and give basic introductions to ancillary testing concepts. Additional skills will be learned on the job, or by additional certification, such as Molecular Biology [MB (ASCP)]. However, limitations may exist if legislation is restrictive with regard to cytotechnologists' scope of practice.⁵⁵⁻⁶⁴

Advantages of this strategy:

The main advantage for this strategy is that there is no need for action. Cytotechnologists need not to learn additional skills. For industry, it could result in earlier adoption of new technologies or tests for primary cervical screening if there is inadequate workforce to perform Pap testing.

Disadvantages of this strategy:

The greatest disadvantage of this strategy is the potential for a severe shortage of cytotechnologists. The reasons for these shortages are referenced at length in previous sections of this report and include:

- Cytotechnology program closures^{24, 35-39}
- Increased number of cytotechnologists lost to retirement^{29, 65}
- Loss of cytotechnologists to other more attractive professions^{65, 66}

Severe shortages could cause the practice of cytotechnology to vanish, leaving the needs of the cytopathology laboratory to be incorporated into the scope of practice of other laboratory professionals. The implications of this scenario are numerous:

- For Educators: A loss of jobs due to continued closures of cytotechnology training programs.
- For Employers: During the interim, a shortage of skilled technologists to perform cytology could drive up costs to attract and retain the small pool of available cytotechnologists.
- For Pathologists: With fewer cytotechnologists in the field, the burden of screening, specimen triage, quality assurance and other responsibilities performed by cytotechnologists may fall to pathologists, which could cause a decrease in their productivity.²⁴
- For Patients: Although Pap testing may decline, regional shortages of cytotechnologists could affect Pap test turn around time. In addition, short staffed laboratories might exert pressure for increased productivity affecting patient safety.³³

Another disadvantage of this strategy is the uncertainty and uneasiness that current cytotechnology students and cytotechnologists currently express, which is more difficult to qualify but no less real.^{56, 57} As documented in this report, cytotechnologists have struggled with the ambiguity of cytology's future for close to a decade.¹⁻⁵ Providing no recommendation for action could further erode the perception of our field and diminish the quality of our workforce.

Potential Strategy #2: Optimize the Current Scope of Practice

This Strategy describes a "Career Wheel" that optimizes the current scope of practice with the current level of education. In this concept, skills sets derived through current education and training, as well as from skills learned on-the-job, are cultivated to develop potential areas for further development. Additional formal education is not necessary, but other educational sources could be used to supplement the current knowledge base. This can be found in a variety of educational sources, (such as those offered by professional societies or employers) could be used to supplement the current knowledge base.

Cytotechnologists are well known for their superior morphologic skills²⁴, which have shown to be an advantage in other areas within the pathology laboratory. Optimizing

these skills could lead to cytotechnologists performing any morphology based testing such as: image analysis and quantitation of immunohistochemistry (estrogen receptor, progesterone receptor and HER2/neu for example); in-situ hybridization (FISH or CISH) analysis²⁹; karyotyping or chromosome analysis in cytogenetics; photographic or image acquisition and management (for reporting, conferences, research or education). Microphotographic skills can be developed with informal additional training and can be a valuable asset to the pathology laboratory.

The cytotechnologists' knowledge of troubleshooting and regulatory compliance could be optimized and be of great value for directing the daily operations of the laboratory.

Advantages of this strategy:

Optimizing the current morphologic scope of practice for would allow pathologists and cytopathology laboratories to better:

1. **Serve** the needs of patient care
2. **Utilize** the special skills of cytotechnologists
3. **Expand** into the future of individualized medical care
4. **Continue** the tradition of cytotechnologists easing the workload burden on pathologists to optimize their time and increase the ability to expand their practice.

There are several advantages to utilizing this type of career development. Optimizing current scope of practice would meet a great workforce need in the laboratory U.S. Labor statistics predict a 30% increase in need for clinical laboratorians from 2006 to 2016.⁶⁸ While cytotechnologists are not singled out in this analysis, this stunning increase in demand will affect all sections of the laboratory. Since the latest medical advances seem to capitalize on individual genetic differences in patients, rather than a one size fits all manner of treatment, laboratorians will be needed to sustain the increased testing volume these personalized tests will create.

Using a cytotechnologist to oversee the operational and regulatory aspects of laboratory practice is a “good fit” with the current knowledge base and skills required of cytotechnologists to comply with government regulations.⁶⁹ In many practices, a pathologist must troubleshoot and follow up incorrect test results, while these tasks could be easily handled by a cytotechnologist with proper pathologist oversight.

Informal training would keep cytotechnologists within their field of practice and keep these tests within the pathology laboratory. Additionally, it would allow pathologists to use their time more efficiently, and potentially more profitably, while still maintaining their oversight of testing, as well as the relationship enjoyed between cytotechnologists and cytopathologists. This optimization and expansion of the traditional roles of the cytopathologist and the cytotechnologist could greatly benefit both groups and, most importantly, patient care.

The informal training described in this section would keep cytotechnologists within their field of practice and keep these tests within the pathology laboratory. Additionally, it

would allow pathologists to use their time more efficiently, and potentially more profitably, while still maintaining their oversight of testing, as well as the relationship enjoyed between cytotechnologists and cytopathologists. This expansion of the traditional roles of the cytopathologist and the cytotechnologist could greatly benefit both groups and, most importantly, patient care.

Disadvantages of this strategy:

There are several disadvantages to this strategy.

Cytogenetic technologists may consider cytotechnologists performing roles traditionally assigned to them as an infringement on their scope of practice. However, with a potential laboratory shortage on the horizon,²⁸⁻³⁴ the addition of these roles to cytotechnologists' scope of practice may prove a welcome and needed help.

Pathologists may feel uncomfortable relinquishing some of their duties. Similarly, some cytotechnologists may be reluctant to expand their role and just want “to sit here and screen slides” until the end of each workday.

Informal training may not be adequate for the new tasks that a cytotechnologist may encounter. Some may feel that formal training, such as that developed in a Master degree program, is necessary for acceptance of expanded roles of the cytotechnologist. Added certification may be necessary (such as the Molecular Biology [MB (ASCP)] certification) as a minimum requirement for some of these roles.

Potential Strategy #3: Expand existing Cytotechnology models using morphology skills with novel educational tools

A third strategy to consider is to expand the existing cytotechnologist (CT) models using morphology skills with novel educational tools. This strategy has the potential to become a “career ladder” that would expand the current scope of practice, and would require alternative or additional training, such as a master degree or combining curriculum with CLS programs. This strategy is an anatomic pathology analogue of clinical medical technology. It increases the current scope of practice for cytotechnologists using their knowledge of anatomic pathology as well as their morphologic skills as a foundation. In this approach, educational programs for cytotechnologists can offer additional training in such areas as cytogenetics, histotechnology, molecular diagnostics, etc.

Advantages of this strategy:

The advantages are similar to those of strategy #2. This strategy benefits both the employer and the cytotechnologist. The cytotechnologist would begin their career with additional skills, increasing their marketability and job opportunities. The employer gains a valuable, multi-skilled employee who can function in many different areas of the laboratory as needed. Change in practice is a constant theme in the face of new science and new technologies and a multi-skilled individual is able shift to different tasks better than an employee who has a narrow job focus.

Disadvantages of this strategy:

The major disadvantage of this strategy is the investment in additional training and education these practice levels would require. Existing cytotechnology programs would have to consider how to offer this training:

Course Development

- Classic cytology training would need to be evaluated and new material developed
- Would new courses and content be added to the current curricula of cytotechnology programs or would additional (or external) training be offered as an option?
- Would additional certificates or advanced degrees be offered?

Accreditation

- Would this training be in an accredited program?
- Who would accredit this program?
- *Example:* if training in histotechnology is added to a cytotechnology program's curriculum, the histotechnology portion would need to be reviewed by NAACLS (National Accrediting Agency for Clinical Laboratory Sciences) rather than CAAHEP (Commission on Accreditation for Allied Health Education Programs) which accredits cytotechnology programs. Accreditation of these programs is essential if graduates are to obtain certification in these fields.

Training

- Who will provide the training for these additional skills?
- Can current educational faculty be trained to teach the new material or will new faculty with the knowledge and skills for these areas need to be hired?
- Can traditional education be supplanted (or supplemented) by distance learning?
- How can local resources be used for clinical rotations?
- How can practicing cytotechnologists learn new techniques or obtain new skills?
- How can programs and cytotechnologists in the field maintain competence in the area of cell morphology and interpretation?

It is important to recognize that throughout the discussions surrounding potential expansion of cytotechnologists' scope of practice, cytotechnologists have not indicated they want to practice independently from pathologists. Both professions place a high value on the cytotechnologist-pathologist relationship, and preserving and strengthening this relationship is integral to the success of any of these strategies.

Potential Strategy #4: Establish a model for core skills of a cytopathology assistant

A fourth strategy for consideration is the creation of a new profession in cytopathology. For the purposes of discussion, this report will refer to this new profession as a Cytopathology Assistant (CA).

The similar concept of a Cytopathology Practitioner was first proposed to the ASC in 2005³ and has been intensely debated by cytotechnologist and pathologists within our community.⁵ A CA is envisioned as a practitioner with increasing responsibility and an increase in independent judgment in analysis and reporting of morphologic tests.

The responsibilities of Cytopathology Assistant could include:

Gynecologic Cytology:

- With their morphologic expertise and the new cervical cancer screening guidelines,⁹ cytotechnologists trained as CAs could be equipped to screen, interpret and sign out gynecologic cytology specimens.
- CAs could perform cytology/histology correlation, referring cases that do not correlate to a pathologist for further review.

Non-gynecologic Cytology:

- CAs might sign out negative non-gynecological specimens, including fine needle aspirations, referring difficult or unusual cases to a pathologist for review.
- CAs might order and interpret appropriate adjuvant techniques when cytologically indicated and requested by a pathologist or clinician. This includes tissue microarrays, proteomics and other tests such as immunocytochemistry, FISH, ISH, and chemiluminescence.

Fine Needle Aspirations:

- In addition to providing adequacy assessment, CAs could provide preliminary interpretations on FNA samples.
- CAs could evaluate, interpret and sign out, when appropriate, cell blocks under the direction of a pathologist.
- If the Nurse Practitioner model was followed, this may allow CA to order additional laboratory tests, as appropriate, per state regulations

Surgical pathology:

- CAs could perform gross evaluation of small biopsies, curettings, cervical biopsies and conizations.
- CAs could also evaluate and select areas for review for touch preparations of sentinel lymph node biopsies during frozen section.
- CAs could evaluate and select areas for review of ancillary stains like AFB, GMS, PAS fungus, and Helicobacter pylori for surgical pathology specimens prior to pathologist review.

Clinical Procedures:

- CAs could perform cutaneous sample collections (e.g. Tzanck smears)
- It has been previously suggested that an advanced cytopathology practitioner could perform uncomplicated palpable FNAs, not requiring radiologic guidance, under the supervision of a pathologist.³
- CAs could also perform other responsibilities related to FNA sample collections, including:
 - Managing FNA clinic services
 - Obtaining patient consent for FNA procedures
 - Applying topical anesthesia
 - Performing post procedure charting and documentation.

Molecular Pathology:

- CAs could order and interpret molecular pathology, focusing on those that require visual interpretation, under the supervision of a pathologist.

Advantages of this Strategy:

The most significant advantage of this strategy is additional time it may give pathologists to focus on other areas of the laboratory or on cases that are more complex. If the predicted pathologist shortage is correct,¹⁷ the addition of a CA to the pathology practice could improve the efficiency of the laboratory.

For the profession of cytotechnology, the creation of a CA would broaden the now limited career path of cytotechnologists. This increased scope of practice would make the profession more attractive to potential students and could increase the value of the cytotechnologist to the overall medical system.

Disadvantages of this Strategy:

There are significant challenges with this strategy.

The main challenge is that the diagnosis of disease is considered the practice of medicine and creation of advanced practitioner models has been met with significant resistance from pathologists, medical professionals and regulatory bodies. Expanding cytotechnologists' scope of practice as described in this manner is viewed as an infringement on the practice of medicine. The AMA has strongly upheld the privilege of physicians to use independent medical judgment in the practice of medicine, not only in the case of the "Doctorate in Clinical Laboratory Science" proposed by the American Society for Clinical Laboratory Science, but also Nurse Practitioners.^{54, 70} Defining a new professional such as a CA would require active collaboration and support from pathologists in order to define the scope of practice so it does not conflict with local and federal definitions of the "practice of medicine."

Regulations as defined in the Clinical Laboratory Improvement Act of 1988 (CLIA) require that a pathologist sign out abnormal gynecologic reports and all non-gynecological cytology reports.⁷¹ Significant regulatory revisions are needed to implement the CA model.

Billing for services performed by a CA would also be an issue. Currently all of the Current Procedural Terminology (CPT) codes for professional cytopathology services are reserved for pathologist billing. It would require significant changes in the American Medical Association (AMA) recommendations as well as approval by CMS to bill for similar services as pathologists.

The added responsibility and liability of this strategy for cytotechnologists (e.g. requiring malpractice insurance) may be a deterrent for cytotechnologists to take this career path.

In addition to these hurdles, there could be a loss of partnership between cytotechnologists and pathologists if the model of CA is viewed as competition for the

responsibilities of the pathologist. Loss of employment, loss of income and loss of job security are all significant issues for pathologists.

Other Strategies Not Previously Considered

Two additional strategies were brought forward during the Summit in addition to the four strategies offered by the Steering Committee and the Executive Board:

Potential Strategy #5: Split Training for Gynecological Cytology and Non-Gynecological Cytology, creating a Non-Gynecological Expanded Practitioner

This Strategy would create two separate entry-level certifications for cytotechnologists. One certification would concentrate only on gynecologic cytology. The other certification would include gynecologic, non-gynecologic and fine needle aspiration cytology, as well as other ancillary skills.

A strategy similar to this was discussed at Program Faculty Seminar in 2003.² This model would create two levels of certification, similar to Medical Laboratory Technicians (MLTs) and Clinical Laboratory Scientists (CLS).

Education for gynecologic cytology only (CT-GYN) certification could be provided at hospital or corporate laboratory based training programs. Because it would be focused on only gynecologic cytology, students could complete the program in a shorter time period. Additional certifications could be developed to transition these professionals if Pap tests decline.

“Comprehensive Cytopractitioner” certification could follow a model similar to the one described in Strategy 3, which will encompass morphologic and molecular tumor diagnostics in addition to anatomic pathology management. Training would be available at academic medical centers that have the resources to train this type of professional. There would be fewer numbers of programs with this certification option.

Advantages of this strategy:

This strategy would fill the emerging needs for professionals who are trained and skilled at performing new testing technologies. Education programs would collaborate with potential employers to meet local needs; market forces will drive demand.

Cytotechnologists and potential students who are content with the current scope of practice would be able to remain focused in this area; these students would receive training limited to gynecological cytology. Those cytotechnologists and potential students who desire an expanded scope of practice and find emerging technologies in tumor diagnostics appealing would have an avenue for formalized training in these areas.

The “Comprehensive Cytopractitioner”, because of its specialization, could potentially create market demand that could increase salaries for these professionals.

Additionally, there is an international model for this type of certification structure

available that could serve as a template for creating and implementing this strategy.⁷²

Disadvantages of this strategy:

There is no data available supporting market demand for gynecologic-only cytotechnologists. On the contrary, in a market survey of laboratory administrators and medical directors conducted by CPEAC in 2002, 86% of respondents stated they would not support two levels of training for cytotechnologists.² Moreover, this model may not be feasible in hospital laboratory settings were it is necessary for cytotechnologists to possess training in both areas.

Potential Strategy #6: Bachelor's Degree in Laboratory Science

This Strategy would create a four-year bachelor's degree creating a laboratory generalist who specializes later in a section of lab medicine. Some participants envisioned that this would happen at the terminus of the BS degree and others felt that the specialization would occur after attaining a B.S. degree. This strategy was not formally discussed at the Summit, but was submitted in facilitation notes that were collected at the conclusion of the Summit.

Advantages of this strategy:

The main advantage of this strategy is the flexibility it offers to students interested in laboratory science. It provides basic core laboratory competencies with the ability to specialize in multiple areas, such as histotechnology, cytotechnology, medical technology, cytogenetics, pathology assistant and molecular technology. A model similar to this was presented at the Program Faculty Seminar in 2008.⁷³ This approach may also help alleviate the burden of a potential laboratory workforce shortage.

Disadvantages of this strategy:

Certificate programs in cytotechnology currently graduate cytotechnologists who come to these programs in possession of a B.S. degree in Biology or another health-related science that includes the requisite courses for acceptance into the program.⁴⁴ The difference in the proposed model is that all persons entering the laboratory workforce would share a basic laboratory medicine education and later differentiate. Given that this model is already an option for potential cytotechnology students, it may not represent a significant change in expanding the role of the professional.

If the certification requires additional education after the core curriculum, another limitation is the students' challenge to obtain additional funding for certification programs after the completion of a B.S. degree. Additionally, this model may not favor cytotechnology.

Summary Recommendations

Following the Summit presentations and subsequent deliberations, participants were engaged in a dialogue aimed at bringing the group to a practical consensus; resultant recommendations for action would be submitted to the ASC Executive Board.

Throughout these discussions, it was clear that participants recognized the need for the cytopathology community to come together and speak with one voice to advocate for our

profession (See Appendix D). The challenges that we face are not ours alone; magnitudes of changes are experienced by pathology and laboratory medicine as a whole. It is also clear, as mentioned previously in this report that it is essential to maintain the cytotechnologist-pathologist relationship that we currently value.

It is the consensus of the Summit participants that the most feasible potential strategy for the future of cytopathology is to create a career ladder for cytotechnologists similar to that described in Potential Strategy #3. Participants recognized that Strategy #2 was already occurring in some institutions and that the concept of “Cytopathology Assistant” (Strategy #4) was premature and would likely require extensive training with courses in medicine and pathology. Furthermore the market analysis has not demonstrated a clear need for such a professional.

The creation of a career ladder will provide cytotechnologists with the education and skills to satisfy laboratory niches with unmet needs. This strategy is defined by its reliance on additional education with validation of competencies acquired through formal training, and stipulates that “on the job” training is not sufficient for certification in this role. Additionally, it involves restructuring current cytotechnology training to ensure standardization of core competencies that will prepare the individual for further subspecialization in laboratory areas that may traverse traditional anatomic and clinical pathology boundaries. This strategy requires the American Society of Cytopathology, in close collaboration with educators, to take a lead role in defining standards and core competencies. It presupposes that the Society will continue to offer cytotechnology educational programs support in the form of member committees, in addition to collaboration between academic centers and other professional organizations to bolster educational reforms and provide guidance in establishing new career directions for cytotechnologists.

Career Ladder Development Recommendations:

The following recommendations are given as a guide for a strategic plan , recognizing the fact that these recommendations may change and evolve as new information becomes available.

Scope of Practice and Career Ladder Levels:

1. Define specific areas of *current* need that can be incorporated into ‘second tier’ cytotechnologist education using existing practice models. Survey cytopathologists to identify current and emerging needs and to identify gaps that can be satisfied by the skills of cytotechnologists.
 - a. This approach may ensure the viability of our cytotechnology programs and support increased enrollment of students.
2. Define specific areas of *future* need that can be incorporated into ‘second tier’ cytotechnologist education using *proposed* practice models.
 - a. For example, what skills and knowledge would a ‘molecular cytotechnologist’ require? What types of tasks would he/she assume?
 - b. What would define an advanced cytotechnologist?

3. Determine the type of program(s) and/or education tools that could be used to meet the need (e.g., Master Degree versus certification process).
4. Conduct periodic needs assessment surveys from stakeholders to determine current and future employment trends, and to allow for future flexibility in the curriculum to fit evolving needs.

Education:

1. Charge the ASC Student Recruitment and Resource Recruitment Committee to continue the development of a Career Ladder for the Cytotechnology Profession in coordination with ASCP, NAACLS, and ASCT.
2. Provide guidance to educators on curriculum changes for core competencies
 - a. Coordinate with CPRC to establish and revise entry level competencies
 - b. Design a core curriculum for cytotechnology programs
 - c. Determine steps in the career ladder and what knowledge/ skill is required at each level
3. Establish “train the trainer” programs for competencies that cannot be assumed by cytotechnology programs
4. Investigate e-learning and virtual education opportunities that could be shared among educators. Consider an educational consortium, where participants could “barter and trade” educational products and/or credits.

Public Perception and Image of Cytopathology:

1. Advocate the cytopathologist and cytotechnologist as members of the health care team and investigate ways of changing public perception
 - a. Continue cytotechnologists representation on the Coordinating Council on the Clinical Laboratory Workforce (CCCLW), and initiate continued contributions and development of cytotechnology information on related websites.
2. Educate health care providers on the specific “value added” of having cytopathologists and cytotechnologists involved in health care.
 - a. Advocate with ASCP and CAP for the increased visibility and consultation of cytopathologists and cytotechnologists as part of the patient care team.

Recruitment and Retention:

1. Collaborate with CAP, ASCP and ASCT, in collaboration with CCCLW (if appropriate) to recruit students to laboratory science specialties.
2. Provide educational scholarships for students to encourage enrollment in cytotechnology programs.

3. Provide ASC member presence at university or secondary education career counseling forums; provide ASC informational materials that could be downloaded for recruitment.

Future Directions:

1. Create a plan that establishes timelines for re-evaluation of the educational model and reflects the current market, so the need for future changes are identified early (i.e. when a shift in strategy is required).
2. Charge the Long Range Planning Committee with oversight of long-term strategic planning and progress by defining specific outcome indicators.

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