American Society for Clinical Pathology
Board of Certification

TECHNOLOGIST IN CYTOTECHNOLOGY, CT(ASCP)
SPECIALIST IN CYTOTECHNOLOGY, SCT(ASCP)

EXAMINATION CONTENT GUIDELINE

This document should serve as a useful guide for examination preparation. The Board of Certification criterion-referenced examinations are constructed to measure the competencies described in the Certification Levels Definitions. These competency statements are specified into task definitions, linked to each of the content outlines, and measured by the test items.

It should be noted that, for the cytotechnologist, Certification Levels Definitions refer to skills and abilities expected at career entry, not those that may be acquired with subsequent experience. Certification Levels are hierarchical and it is assumed that the specialist level encompasses knowledge and skills of the preceding technologist level.

TECHNOLOGIST LEVEL

Knowledge

The technologist has an understanding of the underlying scientific principles of cytologic evaluation as well as the technical, procedural, and problem-solving aspects. The technologist has a general comprehension of the many factors which affect health and disease, and recognizes the importance of proper test selection, the numerous causes of discrepant test results (patient and laboratory), deviations of test results, and ethics including result confidentiality. The technologist correlates abnormal laboratory findings with pathologic states, determines validity of test results, and need for additional studies. The technologist understands and enforces safety regulations, uses statistical methods and applies business and economic data in decision making. The technologist has an appreciation of the roles and interrelationships of paramedical and other health related fields and follows the ethical code of conduct for the profession.

Technical Skills

- *Performs full range of cytologic procedures.*
- *Participates in the evaluation of new techniques and procedures in the laboratory.*

The technologist is capable of examining and analyzing human cell samples to identify nuclear and cytoplasmic cell changes. The technologist has an understanding of quality assurance sufficient to implement and monitor quality control programs. The technologist is able to participate in the introduction, investigation and implementation of new procedures and in the evaluation of new instruments. The technologist evaluates computer-generated data and troubleshoots problems. The technologist understands and uses troubleshooting, validation, statistical, computer, and preventative maintenance techniques to insure proper laboratory operation.

Problem Solving and Analytical Decision Making

- *Evaluates and solves problems related to collection and processing of biological specimens for analysis.*
- *Differentiates and resolves technical, instrument, physiologic causes of problems or unexpected findings.*

The technologist has the ability to exercise initiative and independent judgment in dealing with the broad scope of procedural and technical problems. The technologist is able to participate in, and may be delegated, the responsibility for decisions involving: quality control/quality assurance programs, instrument and methodology selection, preventive maintenance, safety procedures, reagent purchases, test selection/utilization, research procedures, and computer/statistical data.

Communication

- *Provides administrative and technical consulting services on laboratory testing.*

The technologist communicates technical information such as answering inquiries regarding test results, methodology, test specificity and sensitivity and specific factors that can influence test results to other health professionals and consumers. The technologist develops acceptable criteria, laboratory manuals, reports, guidelines, and research protocols.

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Teaching and Training Responsibilities

- *Incorporates principles of educational methodology in the instruction of laboratory personnel, other health care professionals and consumers.*

The technologist provides instruction in theory, technical skills, safety protocols, and application of laboratory test procedures. The technologist provides continuing education for laboratory personnel and maintains technical competence. The technologist may participate in the evaluation of the effectiveness of education programs.

Supervision and Management

- *Gives direction and guidance to technical and support personnel.*

The technologist has an understanding of management theory, economic impact and management functions. The technologist participates in and takes responsibility for establishing technical and administrative procedures, quality control/quality assurance, standards of practice, safety and waste management procedures, information management and cost effective measures. The technologist supervises laboratory personnel.

SPECIALIST LEVEL

Knowledge

The specialist has knowledge of advanced scientific principles as well as the technical, procedural and research aspects of cytologic evaluation in the specialty area and of factors which influence disease processes and laboratory findings. The specialist has knowledge of the structure and function of the organization, principles of management and education as well as the roles of other members of the health care team.

Technical Skills

- *Performs and establishes laboratory procedures for the specialty area.*

The specialist is able to perform all laboratory tests and appropriate equipment maintenance in the specialty area. The specialist has the knowledge, ability and technical skill to research, develop, implement and evaluate new and existing methodologies, including instrumentation and quality assurance.

Problem Solving and Analytical Decision Making

- *Develops and implements plans to correct and prevent problems.*

The specialist is capable of implementing and delegating decisions regarding laboratory operation and exercising independent judgment in problem solving. The specialist is able to anticipate and respond to unique situations, regarding patients and/or samples in a laboratory setting. The specialist can participate in policy decisions affecting laboratory performance or laboratory personnel in the specialty area.

Communication

- *Represents the specialty to the health care community and consumers.*

The specialist is able to communicate in depth with other health care personnel on the application and validity of laboratory data as well as the policies and operation of the specialty area. The specialist is capable of representing the specialty area to the community at large.

Teaching and Training Responsibilities

- *Designs and presents educational programs.*

The specialist has the ability to plan, implement, and evaluate effective educational programs and maintains technical competence.

Supervision and Management

- *Performs and directs administrative functions for the specialty area.*

The specialist is capable of planning, directing, controlling and evaluating the overall operation of the laboratory in the specialty area. Implicit is the capability to provide direct supervision of other personnel in the discipline.

THE EXAMINATION MODEL

The Board of Certification criterion-referenced examination model consists of three interrelated components:

COMPETENCY STATEMENTS describe the entry level skills and tasks performed and measured on the examination.

CONTENT OUTLINE delineates general categories or subtest areas of the examination.

TAXONOMY levels describe the cognitive skills required to answer the question.

Level 1 - Recall: Ability to recall or recognize previously learned (memorized) knowledge ranging from specific facts to complete theories.

Level 2 - Interpretive Skills: Ability to utilize recalled knowledge to interpret or apply verbal, numeric or visual data.

Level 3 - Problem Solving: Ability to utilize recalled knowledge and the interpretation/application of distinct criteria to resolve a problem or situation and/or make an appropriate decision.

EXAMINATION REPORTING MECHANISMS

After the examination has been administered and scored, a report is sent to the examinee. The Examinee Performance Report provides the scaled score on the total examination and pass/fail status for all candidates.

In addition, failing candidates receive scaled scores for each subtest. This information may help the examinee identify areas of strengths and weaknesses in order to develop a study plan for future examinations. A total score of 400 is required to pass the examination. The subtest percentages for the CT and SCT examinations are listed below:

SUBTEST	CT	SCT
Gynecological Cytology (GC)	**38%**	**20%**
Non-Gynecological Cytology	**32%**	**28%**
Subtest Percentages of Non-Gynecological Cytology	CT	SCT
- Respiratory System (NGRESP)	*10%*	*9%*
- Genitourinary System (NGGU)	*10%*	*8%*
- Body Cavity Fluids (NGBF)	*10%*	*9%*
- Other (NGOT)	*2%*	*2%*
Fine Needle Aspiration (FNA)	**12%**	**16%**
Laboratory Operations (LO)	**18%**	**36%**

COMPETENCY STATEMENTS
CYTOTECHNOLOGIST

In regard to Gynecological Cytology, Non-Gynecological Cytology, Fine Needle Aspiration and Laboratory Operations, the Cytotechnologist at career entry:

APPLIES KNOWLEDGE, THEORIES, AND PRINCIPLES OF

- specimen collection methods
- standard and special laboratory procedures
- laboratory operations
- sources of error
- cytologic criteria
- anatomic structure, embryologic origins, histologic structure
- cytologically related functional disorders and physiologic processes
- general and systemic pathology

IDENTIFIES/EVALUATES/DIFFERENTIATES

- cellular, noncellular and microbiologic components of cytologic specimens
- morphologic characteristics of normal/abnormal cells reflecting disease processes
- morphologic cellular variations due to collection methods
- microscopic findings to detect and correct collection/preparation problems and determine inconsistencies
- sources of error

SELECTS

- specimen processing method
- specimen acceptability
- preparation of stains and solutions
- instruments for collection/processing
- quality control for specific procedures
- standard operating procedures
- procedural courses of action
- standard and special laboratory procedures
- corrective actions

CORRELATES MICROSCOPIC FINDINGS WITH

- collection method
- clinical data
- biologic behavior
- health and disease processes
- differential diagnosis
- sources of error

COMPETENCY STATEMENTS
SPECIALIST IN CYTOTECHNOLOGY

In regard to Gynecological Cytology, Non-Gynecological Cytology, Fine Needle Aspiration and Laboratory Operations, the Specialist in Cytotechnology:

APPLIES KNOWLEDGE, THEORIES, AND PRINCIPLES OF

- specimen collection methods
- standard and special laboratory procedures
- laboratory operations and management
- sources of error
- cytologic criteria
- education and training
- anatomic structure, embryologic origins, histologic structure
- cytologically related functional disorders and physiologic processes
- general and systemic pathology

IDENTIFIES/EVALUATES/DIFFERENTIATES

- cellular, noncellular and microbiologic components of cytologic specimens
- morphologic characteristics of normal/abnormal cells reflecting disease processes
- morphologic cellular variations due to collection methods
- microscopic findings to detect and correct collection/preparation problems and determine inconsistencies
- standard operating procedures
- sources of error

SELECTS

- specimen processing method
- specimen acceptability
- preparation of stains and solutions
- new basic and special procedures
- instruments for collection/processing
- quality control for specific procedures
- standard operating procedures
- standard and special laboratory procedures
- procedural courses of action
- corrective action
- training methodologies

CORRELATES MICROSCOPIC FINDINGS WITH

- collection method
- clinical data
- biologic behavior
- health and disease processes
- differential diagnosis
- sources of error

CONTENT OUTLINE

TECHNOLOGIST (CT) and SPECIALIST (SCT) in CYTOTECHNOLOGY

Refer to the CT and SCT Competency Statements for the competencies tested in each subtest.

I. GYNECOLOGICAL CYTOLOGY
(CT, 38%; SCT, 20%)

Body Sites to include:
- Vulva
- Vagina
- Cervix
- Endocervix
- Endometrium/uterus
- Fallopian tube
- Ovary

A. Anatomy, Physiology and Embryologic Origins
B. Histology and Normal Cellular Morphology
C. Pathology, Cytopathology, Biologic Behavior
   1. Congenital anomalies
   2. Benign lesions/reactions
      a. Inflammation
      b. Organisms and contaminants
      c. Benign tumors, hyperplasias and cysts
      d. Effects of therapeutic regimens
   3. Functional disorders/endocrinology
   4. ASCUS/Atypical glandular cells/ premalignant epithelial/indeterminate lesions
   5. Malignant tumors, epithelial and nonepithelial

NON-GYNECOLOGICAL CYTOLOGY:
(TOTAL CT, 32%; TOTAL SCT, 28%)

II. RESPIRATORY SYSTEM
(CT, 10%; SCT, 9%)

Body sites to include:
- Upper respiratory system
- Lower respiratory system

A. Anatomy, Physiology and Embryologic Origins
B. Histology and Normal Cellular Morphology
C. Pathology, Cytopathology, Biologic Behavior
   1. Congenital anomalies
   2. Benign lesions/reactions
      a. Inflammation
      b. Organisms and contaminants
      c. Benign tumors, hyperplasias and cysts
      d. Effects of therapeutic regimens
   3. Functional disorders/endocrinology
   4. Premalignant epithelial/indeterminate lesions
   5. Malignant tumors, epithelial and nonepithelial

III. GENITOURINARY SYSTEM
(CT, 10%; SCT, 8%)

Body sites to include:
- Kidney
- Ureters
- Bladder
- Urethra
- Male genital organs

A. (SEE II.A)
B. (SEE II.B)
C. (SEE II.C.1-5)

IV. BODY CAVITY FLUIDS
(CT, 10%; SCT, 9%)

Body sites to include:
- Pleural, peritoneal and pericardial cavities
- Central nervous system
- Other (e.g. synovial, hydrocele, amniocentesis)

A. (SEE II.A)
B. (SEE II.B)
C. (SEE II.C.1-5)

V. OTHER (e.g. Alimentary, Eye, Skin, Anal)
(CT, 2%; SCT, 2%)

VI. FINE NEEDLE ASPIRATIONS
(CT, 12%; SCT, 16%)

Body Sites
- Breast
- Thyroid glands
- Salivary glands
- Lymph nodes
- Bone
- Soft tissues
- Liver
- Pancreas
- Kidney
- Lung
- Adrenal glands
- Other (e.g., ovary, prostate, brain)

A. (SEE II.A)
B. (SEE II.B)
C. (SEE II.C.1-5)

VII. LABORATORY OPERATIONS
(CT, 18%; SCT, 36%)

A. Quality Management
   1. Quality control
   2. Quality assurance methodology & tools
   3. Risk management
B. Cytopreparation Techniques/Instrumentation (to include collection, processing, and special techniques)
   1. Principles
   2. Procedures
   3. Troubleshooting
   4. Fixatives and stains
   5. Validation
C. Safety and Infection Control (e.g., OSHA, MSDS, NFPA, NIOSH)
D. Compliance
   1. Governmental agencies (e.g., CLIA, HIPAA)
   2. Laboratory accreditation (e.g. CAP, JCAHO)
E. Management*
   1. Work flow, scheduling and productivity
   2. Laboratory information systems/information technology
   3. Policies and procedures
      a. Accreditation
      b. Operations manuals
      c. Quality assurance plan
      d. Clinical and Laboratory Standards Institute Guidelines
   4. Financial management
      a. Operating budget
      b. Capital budget
      c. Accounting principles (e.g., balance sheets, income statements, cash flow, depreciation)
   5. Personnel management
      a. Principles of supervision
      b. Hiring/interviewing/selection
      c. Motivation/discipline/counseling
      d. Job descriptions
      e. Performance standards, evaluation, and competency assessment
   6. Communication (principles of communication)
F. Education and Training*
   1. New employee orientation
   2. In-service training
   3. Principles of education
   4. Standards & guidelines for accreditation of CT programs
G. Molecular Techniques and Applications (e.g., nucleic acid amplification, molecular markers)

*SCT ONLY

Refer to the CT and SCT Competency Statements for the competencies tested in each subtest.

All Board of Certification examinations use conventional units for results and reference ranges.

END OF CONTENT GUIDELINE