

HT AND HTL PRACTICE ANALYSIS REPORT

For Development of
HT(ASCP) & HT(ASCPⁱ)
and
HTL(ASCP) & HTL(ASCPⁱ)
Content Guideline and Examinations
for Exam Publication January 1, 2020

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INTRODUCTION

The purpose of conducting a practice analysis (a.k.a. job analysis or job task analysis) is to provide the foundation of a certification examination by defining practice in a profession. The practice analysis provides evidence of content validation. It is required by psychometric standards and is considered best practices for high-stakes examination development. It also ensures the certification examination is fair, valid, job-related, and most importantly, legally defensible (Chinn and Hertz 2010)¹. The ASCP Board of Certification (BOC) conducts a practice analysis approximately every five years in accordance with ASCP BOC Policy and requirements of the accrediting body, ANSI (American National Standards Institute), under ANSI/ISO/IEC 17024:2012.

A practice analysis is a formal process for determining or verifying the responsibilities of individuals in the job/profession, the knowledge individuals must possess, and the skills necessary to perform the job at a minimally competent level. The practice analysis process provides a complete and modern understanding of the duties and functions of practicing laboratory professionals. The results of the practice analysis inform the specifications and content of the ASCP BOC certification examinations. The practice analysis process ensures that the examinations are reflective of current practices. It also helps guarantee that individuals who become certified are current and up-to-date on the state of histotechnology and are competent to perform as certified laboratory professionals.

PRACTICE ANALYSIS PROCESS

ASCP BOC conducted a practice analysis survey to inform the following certification examination categories:

- Histotechnician (HT)
- Histotechnologist (HTL)

The process for conducting a practice analysis consists of the following steps:

1. Survey Development
2. Demographics
3. Task Inventory – Knowledge and Skill Questions
4. Rating Criteria
5. Survey Construction
6. Pilot Testing and Revision
7. Survey Distribution
8. Survey Analysis
9. Committee Review and Discussion
10. Examination Content Guideline, Standard Setting, and Exam Publication

SURVEY DEVELOPMENT

During the 2015 ASCP BOC examination committee meeting, the Histotechnology Examination Committee provided the input and discussion to develop a practice analysis survey. The committee members (subject matter experts) collectively discussed all pertinent aspects of their profession to design a concise survey to extract useful feedback from field professionals while maximizing response rate. The survey had two main components: demographics and task inventory with appropriate rating scales for each.

¹ Chinn, R.N., and N.R. Hertz. 2010. *Job Analysis: A Guide for Credentialing Organizations*. Lexington: Council on Licensure, Enforcement and Regulation (CLEAR).

DEMOGRAPHICS

The demographic questions asked about experience, education, gender, age, titles, work shift, type of facility, areas of lab work, work hours, etc. The purpose of these questions was to aid the committee in deciding whether the sample of respondents obtained was representative of the profession in general. The demographic data provided analytic categories that allowed refinement of the survey population to utilize only those responses from individuals at the targeted professional level.

TASK INVENTORY – KNOWLEDGE AND SKILL QUESTIONS

The survey was broken into two core areas: knowledge and skills. The committee developed a series of knowledge areas and job-related task questions that formed the body of the survey.

The survey had eight major sections:

- Tissues
- Processing
- Embedding/Microtomy
- Staining
- Laboratory Operations
- Quality Control/Troubleshooting
- Other Tasks
- Instrumentation

RATING CRITERIA

Different rating scales were used to assess the knowledge and skills on the survey. One rating scale was used for the knowledge-only tasks and asked respondents to assess the significance of having that knowledge to perform their job. The rating scale used for the skill-related tasks assessed whether respondents performed the specific task or not in their jobs.

SURVEY CONSTRUCTION

The practice analysis survey was created and delivered through Key Survey, an electronic survey vendor from Highroad Solution. Using an electronic tool allowed survey review and testing via the internet, email tracking of respondents using email addresses, and the ability to send email reminders for completion of the survey.

PILOT TESTING AND REVISION

The Histotechnology Committee tested pilot versions of the survey. They reviewed and revised different aspects of the survey (e.g., information correctness, grammar/spelling errors, electronic glitches, correct survey branching, etc.). The pilot testing comments and edits informed the final version of the survey.

SURVEY DISTRIBUTION

The Histotechnology Committee determined that the survey should be sent to all current HT and HTL certificants in the ASCP BOC Personify database. The survey was open for a three-week period between January 19, 2016 – February 8, 2016. ASCP BOC staff also directly emailed the survey to the Histotechnology Committee and encouraged the committee membership to disseminate the survey to their colleagues. Additionally, the survey link was posted on ASCP social media sites (e.g., Facebook and Twitter).

SURVEY ANALYSIS

The respondents were asked to answer all questions and rate all tasks in the survey. The tasks were divided amongst eight major sections (Tissues, Processing, Embedding/Microtomy, Staining, Laboratory Operations, Quality Control/Troubleshooting, Other Tasks, and Instrumentation).

Responses from individuals currently working as a supervisor or manager were considered to be inappropriate for the entry-level HT and HTL certification categories and were therefore excluded from the analysis. Any individuals not currently practicing (e.g., retired, unemployed, or simply not working in histotechnology) were removed from the practice analysis survey.

COMMITTEE REVIEW AND DISCUSSION

During the 2016 examination committee meeting, the Histotechnology Committee reviewed the practice analysis results. They agreed that the demographic results accurately reflected the HT and HTL populations (**Appendices A & C**).

In general, tasks performed by at least 40% of the respondents were retained on the task lists and considered valid to be on the examinations. The committee reviewed all tasks performed by less than 40% of the respondents. If the committee determined that these tasks were critical to patient care and/or were up-and-coming in practice, then the task was retained on the task list and considered valid for the examination. If the task was considered outdated or too esoteric, then it was removed from the task list and the exam. The committee decisions were compiled into the Final Task Lists for HT and HTL (**Appendices B & D**) which informed the exam content guideline and the content for the certification exams.

EXAM CONTENT GUIDELINE, STANDARD SETTING, AND EXAM PUBLICATION

The committee revised the HT and HTL exam content guideline to reflect the practice analysis results. They reviewed the exam content area percentages and decided where to set them based on the results of the practice analysis. The committee reviewed the exam databases according to the new content guideline and deleted or revised questions accordingly. They wrote new questions to fulfill the new content guideline, and reclassified questions according to the new guideline. After this work was completed, the committee set a new standard for each exam, and the new exam databases were published.

HISTOTECHNICIAN (HT) DEMOGRAPHIC ANALYSIS

Total respondents: 872

Total usable: 274

Usable individual respondents met the following criteria:

- Currently employed in a histopathology laboratory
- Currently working as a histotechnician

Summary:

- Certifications: individuals may have multiple credentials
 - 96% are HT certified
 - 9% are QIHC qualified
- Education:
 - 29% have less than an associate degree
 - 41% have an associate degree
 - 30% have a baccalaureate degree or higher
- Experience:
 - 53% have 10 years or less
 - 19% have 11 – 20 years
 - 28% have 20 or more years
- Geographic Distribution: there are respondents from across the U.S., and states with the highest response rate include:
 - 8% from Texas
 - 7% from California
 - 6% each from Ohio, Wisconsin, and Minnesota
 - 5% from Pennsylvania
- Facility:
 - 65% work in hospitals
 - 14% work in independent labs
 - 12% work in physician offices/clinics
 - 5% work in research labs
 - 4% work in other types of facilities
- Age:
 - 14% are younger than 30 years of age
 - 70% are 30 – 59 years of age
 - 9% are over 60 years of age
 - 7% chose not to answer this question
- Gender:
 - 85% are female
 - 14% are male
 - 1% chose not to answer this question

HISTOTECHNICIAN (HT)

FINAL TASK LIST (TOPICS KEPT ON EXAM BASED ON PRACTICE ANALYSIS RESULTS)

TISSUES	
1.	Tissue morphology/anatomy
2.	Cell/component preservation
3.	Proper cell/component demonstration
4.	Tissue function
5.	Tissue pathology
6.	Biochemical principles/theories of tissue
FIXATION	
7.	Routine H&E
8.	Electron microscopy
9.	Immunofluorescence
10.	Immunohistochemistry
11.	Special stains
12.	Decalcification
13.	Frozen sections
14.	Enzyme histochemistry
15.	Artifacts/precipitates/pigments
16.	Cytologic specimens
17.	In situ hybridization techniques
PROCESSING	
18.	Routine H&E
19.	Immunofluorescence
20.	Immunohistochemistry
21.	Special stains
22.	Decalcification
23.	Frozen sections
24.	Enzyme histochemistry
25.	Artifacts/precipitates/pigments
26.	Cytologic specimens
27.	In situ hybridization techniques

EMBEDDING/MICROTOMY

28. Preparation of paraffin-embedded sections
29. Performance of frozen sections
30. Utilization of agar and gelatin

STAINING

STAINS

31. Acid-fast carbol fuchsin (Kinyoun, ZN, fite)
32. Acid-fast carbol fuchsin (auramine-rhodamine)
33. Alcian blue
34. Alcian blue/PAS
35. Bielschowsky
36. Colloidal iron
37. Congo red
38. Crystal violet
39. Giemsa
40. Gram stain
41. Grocott/Gomori methenamine silver (GMS)
42. Fontana-Masson (melanin)
43. Melanin bleach
44. Hematoxylin/eosin (H&E)
45. Prussian blue (iron)
46. Luxol fast blue (LFB/cresyl echt violet)
47. Mucicarmine
48. Oil red O
49. PAS-digestion (PASD)
50. PAS-hematoxylin (PASH)
51. Periodic acid-methenamine silver (PAMS)
52. Periodic acid-Schiff (PAS)
53. Reticulin/reticulum
54. Steiner
55. Warthin-Starry
56. Toluidine blue
57. Trichrome (Gomori, Masson)
58. Verhoeff-van Gieson (VVG)
59. Von Kossa
60. Movat pentachrome
61. Rhodanine
62. Immunofluorescence

63. Enzyme histochemistry (e.g., ATPase, NADH)
64. Immunohistochemistry
65. Cytologic features (e.g., Papanicolaou, Diff-Quik™)
66. In situ hybridization
MOUNTING/COVERSLIPPING PROCEDURES
67. Media selection
68. Manual coverslipping
LABORATORY OPERATIONS
69. Safety activities (e.g., storage, disposal, hazards)
70. Handling biohazardous samples (e.g., CJD)
71. Calculations and unit conversions (e.g., dilutions)
72. Reagent selection, preparation, labeling, and storage
73. Regulatory compliance (e.g., HIPAA, OSHA, EPA, homeland security, state, and local)
74. Supervision/direction of department staff in daily operations
75. Personnel management activities (e.g., hiring, discipline, job descriptions, evaluations, scheduling)
76. Validation and/or development of new tests, control tissue, and instrumentation
77. Inventory maintenance and ordering
78. Policy/procedure writing, review, and revision
79. Training of new staff
80. Training of students, residents, and/or fellows
81. Development and implementation of training and educational materials
82. Competency Testing Program participation
83. Quality Assurance Program participation (e.g., HQIP®)
84. Budgeting and purchasing
QUALITY CONTROL/TROUBLESHOOTING
85. Fixation quality control
86. Fixation troubleshooting
87. Processing quality control
88. Processing troubleshooting
89. Embedding/Microtomy quality control
90. Embedding/Microtomy troubleshooting
91. Staining quality control
92. Staining troubleshooting
93. Coverslipping quality control
94. Coverslipping troubleshooting

INSTRUMENTATION	
95.	Conventional tissue processors
96.	Rapid tissue processors
97.	Embedding center
98.	Microtome
99.	Flotation bath
100.	Paraffin dispenser
101.	Slide drying oven
102.	Cryostat
103.	Cryobath
104.	Automated – Routine stainer (H&E)
105.	Automated – Special stainer
106.	Automated – Immunohistochemistry stainer
107.	Epitope retrieval
108.	Automated in situ hybridization
109.	Automated coverslipper
110.	Microwave fixation
111.	Microwave processing
112.	Microwave staining
113.	Light microscope
114.	Fluorescent microscope
115.	Dissecting microscope
116.	Digital camera
117.	pH meter
118.	Solvent recycler
119.	Cassette labeler
120.	Slide labeler
121.	Whole slide imaging
122.	Micropipettes
123.	Laser-capture microdissection

HISTOTECHNOLOGIST (HTL) DEMOGRAPHIC ANALYSIS

Total respondents: 872

Total usable: 166

Usable individual respondents met the following criteria:

- Currently employed in a histopathology laboratory
- Currently working as a histotechnologist

Summary:

- Certifications: individuals may have multiple credentials
 - 71% are HTL certified
 - 42% are HT certified
 - 15% are QIHC qualified
- Education:
 - 20% have an associate degree or lower
 - 64% have a baccalaureate degree or post-baccalaureate program certificate
 - 16% have a master's degree or higher
- Experience:
 - 58% have 10 years or less
 - 20% have 11 – 20 years
 - 22% have 20 or more years
- Geographic Distribution: there are respondents from across the U.S., and states with the highest response rate include:
 - 11% from Florida
 - 8% each from California and Texas
 - 6% from Pennsylvania
- Facility:
 - 51% work in hospitals
 - 16% work in independent labs
 - 13% work in physician offices/clinics
 - 10% work in research labs
 - 5% work in industry
 - 5% work in other types of facilities
- Age:
 - 17% are younger than 30 years of age
 - 66% are 30 – 59 years of age
 - 9% are over 60 years of age
 - 8% chose not to answer this question
- Gender:
 - 77% are female
 - 22% are male
 - 1% chose not to answer this question

HISTOTECHNOLOGIST (HTL)

TOPICS KEPT ON EXAM BASED ON THE PRACTICE ANALYSIS RESULTS

TISSUES	
1.	Tissue morphology/anatomy
2.	Cell/component preservation
3.	Proper cell/component demonstration
4.	Tissue function
5.	Tissue pathology
6.	Biochemical principles/theories of tissue
FIXATION	
7.	Routine H&E
8.	Electron microscopy
9.	Immunofluorescence
10.	Immunohistochemistry
11.	Special stains
12.	Decalcification
13.	Frozen sections
14.	Enzyme histochemistry
15.	Artifacts/precipitates/pigments
16.	Cytologic specimens
17.	In situ hybridization techniques
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40. Gram stain
41. Grocott/Gomori methenamine silver (GMS)
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50. PAS-hematoxylin (PASH)
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55. Warthin-Starry
56. Toluidine blue
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58. Verhoeff-van Gieson (VVG)
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60. Movat pentachrome
61. Rhodanine
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64. Immunohistochemistry
65. Cytologic features (e.g., Papanicolaou, Diff-Quik™)
66. In situ hybridization
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70. Handling biohazardous samples (e.g., CJD)
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72. Reagent selection, preparation, labeling, and storage
73. Regulatory compliance (e.g., HIPAA, OSHA, EPA, homeland security, state, and local)
74. Supervision/direction of department staff in daily operations
75. Personnel management activities (e.g., hiring, discipline, job descriptions, evaluations, scheduling)
76. Validation and/or development of new tests, control tissue, and instrumentation
77. Inventory maintenance and ordering
78. Policy/procedure writing, review, and revision
79. Training of new staff
80. Training of students, residents, and/or fellows
81. Development and implementation of training and educational materials
82. Competency Testing Program participation
83. Quality Assurance Program participation (e.g., HQIP®)
84. Budgeting and purchasing
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91. Staining quality control
92. Staining troubleshooting
93. Coverslipping quality control
94. Coverslipping troubleshooting

