

## Competency: Informatics

### Competency Definition:

Apply informatics principles and information systems in the practice of pathology to manage patient and lab information, facilitate workflow processes, communicate practice information, support clinical interpretation, report laboratory findings, and ultimately improve patient care.

### Competency Areas:

- A. Technology Fundamentals
- B. Laboratory Information Management in Health Systems
- C. Data Analysis & Management Tools
- D. Digital Pathology
- E. Laboratory System Management
- F. Accreditation & Regulatory Compliance
- G. Selection and Installation of Lab Systems
- H. Information System Project Management and Leadership

## COMPETENCY AREA KNOWLEDGE & SKILL STATEMENTS

### Competency Area: Technology Fundamentals

1. Utilize medical literature search engines, bibliographic software, and related computerized support services to find and organize published information for practice support, skills development and maintenance, and authorship
2. Explain the differences among pathology informatics, clinical informatics, bioinformatics, public health informatics, health care information technology, and health knowledge informatics
3. Use correct terminology to define and describe major computer hardware components, application and operating system software, computer networks and network communication protocols, servers, clients, virtual private networks, software-as-a-service (SAAS), and cloud computing
4. Define structured data
5. Understand basic aspects of database structure and function, including data types, fields, records, databases, queries, and reports
6. Explain how the structure of stored data affects data retrieval capabilities
7. Understand basic data retrieval metrics including recall, precision, and F-score
8. Describe the characteristics and appropriate application of standard terminologies (eg, CPT, ICD, SNOMED, LOINC, UCUM) used to represent pathology data in the LIS and Electronic Health Record
9. Recognize the advantages and disadvantages of standardized terminology for creating interoperable data that can be accurately retrieved and summarized
10. Describe the key features of communication standards used in laboratory system interfaces, such as HL7 v. 2, the HL7 Clinical Document Architecture (CDA), HL7 FHIR, and DICOM
11. Define interoperability and explain the role of data standards and electronic interfaces in supporting interoperability
12. Understand the basics of how health data standards are created and evolved, including key organizations involved in standards development and deployment
13. Understand how patient and asset identification standards (eg, labels, bar codes, and radio frequency IDs) and tracking systems are used to improve patient safety and laboratory workflow



#### **Competency Area: Laboratory Information Management in Health Systems**

14. Explain what laboratory information systems (AP and CP LISs, and laboratory middleware) are, what they do, and the role they play in efficient lab operations and health care delivery
15. Contribute to and, where appropriate, lead initiatives to choose or improve information systems related to the laboratory including decision support
16. Communicate opportunities to improve LIS and middleware operation
17. Supervise specification and validation of new instrument, middleware, and systems interfaces
18. Validate the appropriate and effective display of laboratory results in clinical systems
19. Recommend appropriate action to address problems with laboratory test orders and results in an EHR
20. Articulate the role and connections of the LIS within the local network of health care information systems (ie, describe the local health care information ecosystem as it relates to the LIS)
21. Understand the roles of ancillary information systems in optimizing the clinical, operational, and financial performance of the laboratory (eg, middleware, financial systems, business intelligence)

#### **Competency Area: Data Analysis & Management Tools**

22. Recognize limitations in the data analysis capabilities of current LISs
23. Request reports or extracts of laboratory operational data for analyses that inform operational decisions
24. Perform basic analyses of extracted laboratory operational data using a spreadsheet or other standard data analysis tool
25. Contribute to the development, deployment, and evaluation of clinical decision support tools to improve laboratory operations and clinical care delivery
26. Define “data science” and distinguish between the skill set of a data scientist and a biostatistician
27. Describe the strengths, weaknesses, and risks of machine learning tools in support of pathology workflows
28. Recognize systems containing decision rules or machine learning elements, specify appropriate verification procedures for these systems, and approve verification results
29. Contribute to the definition and creation of integrated health care data sets from multiple source systems to support useful, accurate, and reliable data analysis
30. Contribute to the analysis and interpretation of integrated pathology and enterprise data sets for improving care quality and increasing the efficiency of care delivery

#### **Competency Area: Digital Pathology**

31. Utilize digital imaging systems, such as whole slide imaging (WSI) and dynamic telemicroscopy/telepathology, as appropriate to practice setting
32. Describe the structure of a bitmap (raster) image and the common strategies for image compression
33. Understand the potential role, use, and limitations of WSI in the laboratory environment
34. Determine the appropriate digital image resolution for a particular need/purpose
35. Determine the appropriate telemicroscopy/telepathology technology to use for a particular application

#### **Competency Area: Laboratory System Management**

36. Work with information systems personnel to ensure that reports have proper content and formatting (eg, synoptic format and other standardized formats as appropriate)
37. Supervise the LIS team in the creation, update, review, and acceptance of the LIS procedure manual
38. Understand the process and requirements for test definition, other standard information, and configuration maintenance in the LIS



**Competency Area: Accreditation & Regulatory Compliance**

- 39. Adhere to HIPAA and other security and privacy requirements for the communication and storage of patient data
- 40. Explain protected health information (PHI), electronic Protected Health Information (ePHI), and safe harbor deidentification under HIPAA.
- 41. Describe the correct response to a data security breach under the Security Breach Notification Rule.
- 42. Maintain compliance with electronic information management requirements of regulatory and/or accreditation agencies as applicable, including the appropriate use of Business Associate Agreements (BAA) and Data Use Agreements (DUA) to support vendor and research activities
- 43. Recognize security practices consistent with HIPAA and other regulatory requirements including appropriate use of passwords, digital certificates, encryption, two-factor authentication, firewalls, and virtual private networks
- 44. Recognize situations under which information technology may be subject to current or future FDA regulation (eg, blood banking, whole slide imaging, and machine learning)

**Competency Area: Selection and Installation of Lab Systems**

- 45. Prepare the laboratory justification for acquisition of new information technology such as middleware, an interface manager, or an LIS
- 46. Articulate departmental Information Services (IS) needs sufficiently to contribute to procurement documents such as the requirements analysis, scope document, technical specifications document, and Request for Proposal (RFP)
- 47. Provide input to the LIS selection team to ensure that an optimal fit between a purchased system and departmental needs is attained
- 48. Act as “physician champion” for new information technology including, as appropriate, advising the installation team on clinical needs and lab staff and other pathologists on user operational details

**Competency Area: Information System Project Management and Leadership**

- 49. Implement new technology projects successfully, including promoting adoption of new technology, integrating the new technology with the appropriate people and their processes, following project management concepts such as those developed by the Project Management Institute (PMI), and using standard change management tools such as Plan-Do-Study-Act (PDSA)
- 50. Provide appropriate education, testing, procedure change, and deployment support to affected groups
- 51. Define key elements of a rollback plan to exit from a failed change to a critical system which minimizes downtimes and eliminates the risk to patient data and safety.