

## **Introduction to Laboratory Management (6 Modules)**

### Laboratory Information Systems (LIS)

- LIS components, functions and benefits; roles of the LIS system manager; newer LIS technology developments (point of care, bedside labeling & identification, automation systems, web access); process of selecting an LIS

### Method Evaluation

- Application of research for the laboratory
  - Basic concepts and applications of research; sensitivity, specificity and predictive value calculations; steps in the method selection process; experimental studies – random vs. systematic error; overview of how to evaluate an analytic method; documentation of experimental studies
- Introduction to statistical analysis
  - Measures of central tendency; measures of dispersion; distribution patterns; t-test; linear regression by least squares analysis - visual analysis by scatter plot
- Interpretation of experimental studies
  - Within-run precision study; day-to-day precision study; linearity or dilution study; interference study; patient comparison study

### Educational Methodology

- Goals and objectives
  - Guidelines for writing goals and objectives – behaviors, conditions & standards; objective domains – cognitive, psychomotor & affective; objective levels, e.g. for cognitive – recall, application & problem-solving
- Learning activities
  - Advantages and disadvantages of lectures, case studies, simulations, role playing, student practice laboratories, cooperative based, problem based, and computer based learning
- Instructional media
  - Advantages and disadvantages of print-based materials, transparencies, slides, flip charts, white/chalk boards, computer slide presentations, video, audio, animation, demonstrations, simulations, computer assisted and internet based media, synchronous and asynchronous electronic communication
  - Guidelines for effective use of Power Point presentations
- Test question development
  - Comparison of types of tests (placement, formative, summative, norm & criterion referenced tests) and testing platforms (written, oral, computer, and practical);

advantages & disadvantages of multiple choice, true/false, matching and essay or short answer questions; guidelines to designing quality assessment questions

### Compliance and Regulatory Issues

- Regulatory/accrediting agencies, standards and regulations
  - Overview of CAP, LAP-CAP, CMS, COLA, EPA, JCAHO, NAACLS, OSHA, CLIA, CLSI, HIPAA; CLIA certificate types and test complexity levels; CLIA regulations for non-waived testing (personnel, procedure manual, QC, method verification, proficiency testing, quality assessment, patient test management and inspection); accreditation requirements of CLIA, COLA, and JCAHO
- Personnel evaluation tools
  - Comparison of proficiency testing, competency testing and performance appraisals, based on definition, purpose, frequency of testing/appraisal, acceptable scores/ratings, actions if unacceptable results obtained and examples of each
  - Overview of the purposes, advantages and disadvantages of written or computer tests, practical exams, anecdotal records, checklists, rating scales & work records

### Principles of Laboratory Management

- Overview of leadership styles and management theories (McGregor's X and Y, Blake and Mouton grid, Maslow's theory); basic functions of management (planning, organizing, implementing); behaviors that motivate employees; human relation skills; conflict management; step-by-step approach to problem solving

### Management of Financial Resources

- Laboratory cost analysis
  - Overview of billable services, costs, expenses, financial ratios, operating margins, profit and revenue; determination of cost per test including variable, semi-variable and fixed costs; break-even analysis; purchasing capital equipment; depreciation, pay-back analysis
- Laboratory productivity
  - Determination of CAP work load units; CLSI categorizations of pre-analytical, analytical and post-analytical labor expenses; comparison of paid vs. worked productivity; calculations to determine staff size to carry out workload