REQUIRED COMPETENCY AREAS, GOALS, AND OBJECTIVES FOR POSTGRADUATE YEAR TWO (PGY2) INFECTIOUS DISEASES PHARMACY RESIDENCIES

Prepared in collaboration with the Society of Infectious Diseases Pharmacists

Introduction

The competency areas, goals, and objectives are to be used in conjunction with the *ASHP Accreditation Standard for Postgraduate Year Two (PGY2) Pharmacy Residency Programs.* The first four competency areas described herein are required, and the others are elective.

The required competency areas and all of the goals and objectives they encompass must be included in all programs. Programs may add one or more required additional competency areas from the elective competency area choices to meet program-specific needs. Programs selecting an additional competency area are not required to include all of the goals and objectives in that competency area. In addition to the potential additional competency areas described in this document, programs are free to create their own unique competency areas with associated goals and objectives based on the specific needs of their program. Each of the objectives associated with the goals encompassed by the program's selected program competency areas (required and additional) must be taught and evaluated at least once during the residency year. An elective competency area(s) may also be selected for specific residents when creating their residency development plan.

Each of the objectives listed in this document has been classified according to educational taxonomy (cognitive, affective, or psychomotor) and level of learning. An explanation of the taxonomies is available elsewhere.[1]

Competency areas for PGY1 residencies are available on the ASHP website. PGY2 competency areas, goals, and objectives in infectious diseases pharmacy are differentiated from those from PGY1 by specialization and the expectation of PGY2 residents for greater work competence and proficiency.

Definitions

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[1] Anderson, L. W. and Krathwohl, D. R., et al (Eds.) (2001) *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. Allyn & Bacon. Boston, MA (Pearson Education Group).

Competency Areas: Categories of the residency graduates' capabilities.

Competency areas are classified into one of three categories:

Required: Four competency areas are required (all programs must include them and all their associated goals and objectives).

Additional (for program): Competency area(s) that residency programs may choose to use (in addition to the four required areas) to meet program-specific program needs. Additional competency areas also include those developed by individual programs.

Elective (for specific residents): Competency area(s) or specific goals and objectives within the competency area(s) selected optionally for specific resident(s).

Educational Goal: Broad statement of abilities.

Educational Objectives: Observable, measurable statements describing what residents will be able to do as a result of participating in the residency program.

Criteria: Examples that describe competent performance of educational objectives. Since the criteria are examples, they are not all required but are intended to be used to give feedback to residents on how well they are doing on the skill described in educational objectives and how they can improve while they engage in an activity.

Activities: The Standard requires that learning activities be specified for each educational objective in learning experience descriptions. Activities are what residents will do to learn and practice the skills described in objectives. Activities are the answer to the question "What can residents do in the context of this learning experience that will provide the kind of experiences necessary to achieve the educational objective?" (Compare and contrast activities with criteria by referring to the definition of criteria immediately above.) Specified activities should match the Bloom's Taxonomy learning level stated in parentheses before each objective.

Example:

Objective R1.1.2: (Applying) Interact effectively with patients, family members, and caregivers.

Learning activity: Provide education to patients regarding proper medication use and administration, adherence, and possible adverse drug effects for all new medications initiated during clinic appointments.

Criteria:
- Interactions are respectful and collaborative.
- Uses effective communication skills.
- Shows empathy.
- Empowers patients to take responsibility for their health.
- Demonstrates cultural competence.

Competency Area R1: Patient Care

(See appendix for additional specific requirements.)

Goal R1.1: In collaboration with the health care team, provide comprehensive medication management to patients with infectious diseases following a consistent patient care process.

Objective R1.1.1: (Applying) Interact effectively with health care teams, including microbiologists and infection control preventionists, to manage medication therapy for patients with infectious diseases.
Criteria:
- Interactions are cooperative, collaborative, communicative, and respectful.
- Demonstrates skills in negotiation, conflict management, and consensus building.
- Demonstrates advocacy for the patient.
- Effectively contributes pharmacotherapy knowledge and patient care skills as an essential member of the healthcare team.

Objective R1.1.2: (Applying) Interact effectively with infectious diseases patients, family members, and caregivers.
Criteria:
- Interactions are respectful and collaborative.
- Uses effective (e.g., clear, concise, accurate) communication skills.
- Shows empathy.
- Demonstrates cultural competence.
- Maintains accuracy and confidentiality of patients' protected health information.
- Empowers patients, family members, and caregivers regarding the patient's well-being and health outcomes.
- Communicates with family members to obtain patient information when patients are unable to provide the information.
- Communicates with patient and family about initiation and changes of patient therapies.
- Utilizes effective motivational interviewing techniques, such as goal setting and identification of barriers for improved health.
- Demonstrate advocacy for caregivers.
- Makes effective use of educational aides.
- Demonstrates appropriate use of personal protective equipment and complies with universal precautions in accordance with organizational policies and procedures.

Objective R1.1.3: (Analyzing) Collect information on which to base safe and effective medication therapy for infectious diseases patients.
Criteria:
- Collection/organization methods are efficient and effective.
- Collects relevant information about medication therapy, including:
  - History of present illness.
  - Relevant health data that may include past medical history, health and wellness information, biometric test results, and physical assessment findings.

- o Social history.
- o Medication history, including prescription, non-prescription, illicit, recreational, and non-traditional therapies; other dietary supplements; immunizations.
- o Allergies.
- o Patient assessment (examples include, but are not limited to, physiologic monitoring, laboratory values, microbiology results, diagnostic imaging, procedural results, and scoring systems.)
- o Pharmacogenomics and pharmacogenetic information, if available.
- o Adverse drug reactions.
- o Medication adherence and persistence.
- o Patient lifestyle habits, preferences and beliefs, health and functional goals, and socioeconomic factors that affect access to medications and other aspects of care.
- Sources of information are the most reliable available, including electronic, face-to-face, and others.
- Recording system is functional for subsequent problem solving and decision making.
- Clarifies information as needed.
- Displays understanding of limitations of information in health records.
- Poses appropriate questions as needed.

Objective R1.1.4: (Analyzing) Analyze and assess information on which to base safe and effective medication therapy for infectious diseases patients.
Criteria:
- Includes accurate assessment of patient's:
  - o Health and functional status.
  - o Risk factors.
  - o Health data.
  - o Cultural factors.
  - o Health literacy.
  - o Access to medications.
  - o Immunization status.
  - o Need for preventive care and other services, when appropriate.
  - o Other aspects of care, as applicable.
- Identifies medication therapy problems, including:
  - o Lack of indication for medication.
  - o Medical conditions for which there is no medication prescribed.
  - o Medication prescribed or continued inappropriately for a particular medical condition.
  - o Suboptimal medication regimen (e.g., dose, dosage form, duration, schedule, route of administration, method of administration).
  - o Medication toxicity requiring therapy modification.
  - o Abnormal lab values requiring therapy modification.
  - o Therapeutic duplication.
  - o Adverse drug or device-related events or the potential for such events.
  - o Clinically significant drug–drug, drug–disease, drug–nutrient, drug–DNA test interaction, drug–laboratory test interaction, or the potential for such interactions.
  - o Use of harmful social, recreational, nonprescription, nontraditional, or other medication therapies.
  - o Patient not receiving full benefit of prescribed medication therapy.
  - o Problems arising from the financial impact of medication therapy on the patient.

- o Patient lacks understanding of medication therapy.
- o Patient not adhering to medication regimen and root cause (e.g., knowledge, recall, motivation, financial, system).
- o Patient assessment needed.
- o Discrepancy between prescribed medications and established care plan for the patient.
- o Allergies

Objective R1.1.5: (Creating) Design or redesign safe and effective patient-centered therapeutic regimens and monitoring plans (care plans) for infectious diseases patients.

Criteria:

- Specifies evidence-based, measurable, achievable therapeutic goals that include consideration of:
  - o Relevant patient-specific information, including culture and preferences.
  - o The goals of other interprofessional team members.
  - o The patient's disease state(s).
  - o Medication-specific information.
  - o Best evidence, including clinical guidelines and the most recent literature.
  - o Effectively interprets new literature for application to patient care
  - o Ethical issues involved in the patient's care.
  - o Quality-of-life issues specific to the patient.
  - o End of life issues, when needed.
  - o Integration of all the above factors influencing the setting of goals.
- Designs/redesigns regimens that:
  - o Are appropriate for the disease states being treated.
  - o Reflect:
    - Clinical experience.
    - The therapeutic goals established for the patient.
    - The patient's and caregiver's specific needs.
    - Consideration of:
      - Any pertinent pharmacogenomic or pharmacogenetic factors.
      - Best evidence.
      - Pertinent ethical issues.
      - Pharmacoeconomic components (patient, medical, and systems resources).
      - Patient preferences, culture, and/or language differences.
      - Patient-specific factors, including physical, mental, emotional, and financial factors that might impact adherence to the regimen.
      - Drug shortages.
      - Patient specific risk factors for resistant pathogens.
      - Information obtained in the clinical microbiology laboratory.
  - o Adhere to the health system's medication-use policies.
  - o Follow applicable ethical standards.
  - o Address wellness promotion and lifestyle modification.
  - o Support the organization's or patient's insurance formulary.
  - o Address medication-related problems and optimize medication therapy.
  - o Engage the patient through education, empowerment, and promotion of self-management.
  - o Represent the highest level of patient care.

- Designs/redesigns monitoring plans that:
  - Effectively evaluate achievement of therapeutic goals.
  - Ensure adequate, appropriate, and timely follow-up.
  - Establish parameters that are appropriate measures of therapeutic goal achievement.
  - Reflect consideration of best evidence.
  - Select the most reliable source for each parameter measurement.
  - Have appropriate value ranges selected for the patient.
  - Have parameters that measure efficacy.
  - Have parameters that measure potential adverse drug events.
  - Have parameters that are cost-effective.
  - Have obtainable measurements of the parameters specified.
  - Reflects consideration of compliance.
  - Anticipates future drug-related problems.
  - If for an ambulatory patient, includes strategy for ensuring patient returns for needed follow-up visit(s).
  - When applicable, reflects preferences and needs of the patient.
  - Represent the highest level of patient care.

Objective R1.1.6: (Applying) Ensure implementation of therapeutic regimens and monitoring plans (care plans) for infectious diseases patients by taking appropriate follow-up actions.
Criteria:
- Effectively recommends or communicates patients' regimens and associated monitoring plans to relevant members of the health care team.
  - Poses appropriate questions as needed.
  - Recommendation is persuasive.
  - Presentation of recommendation accords patient's right to refuse treatment.
  - If patient refuses treatment, pharmacist exhibits responsible professional behavior.
  - Creates an atmosphere of collaboration.
  - Skillfully defuses negative reactions.
  - Communication conveys expertise.
  - Communication is assertive but not aggressive.
  - Where the patient has been directly involved in the design of the plans, communication reflects previous collaboration appropriately.
- Ensures recommended plan is implemented effectively for the patient, including ensuring that the:
  - Plan represents the highest level of patient care.
  - Therapy corresponds with the recommended regimen.
  - Regimen is initiated at the appropriate time.
  - Patient receives their medication as directed.
  - Medications in situations requiring immediacy are effectively facilitated.
  - Medication orders are clear and concise.
  - Activity complies with the health system's policies and procedures.
  - Tests correspond with the recommended monitoring plan.
  - Tests are ordered and performed at the appropriate time.
- Takes appropriate action based on analysis of monitoring results (redesign regimen and/or monitoring plan if needed).
- Appropriately initiates, modifies, discontinues, or administers medication therapy as authorized.

- Responds appropriately to notifications and alerts in electronic medical records and other information systems that support medication ordering processes (based on factors such as patient weight, age, gender, comorbid conditions, drug interactions, renal function, and hepatic function).
- Provides thorough and accurate education to patients and caregivers, when appropriate, including information on medication therapy, adverse effects, compliance, appropriate use, handling, and medication administration.
- Addresses medication- and health-related problems and engages in preventive care strategies, including vaccine administration.
- Schedules follow-up care as needed to achieve goals of therapy.

Objective R1.1.7: (Applying) For infectious diseases patients, document direct patient care activities appropriately in the medical record or where appropriate.
Criteria:
- Accurately and concisely communicates drug therapy recommendations to healthcare professionals representing different disciplines.
- Selects appropriate direct patient care activities for documentation.
- Documentation is clear.
- Documentation is written in time to be useful.
- Documentation follows the health system's policies and procedures, including requirements that entries be signed, dated, timed, legible, and concise.

Objective R1.1.8: (Applying) Demonstrate responsibility to infectious diseases patients.
Criteria:
- Gives priority to patient care activities.
- Plans prospectively.
- Routinely completes all steps of the medication management process.
- Assumes responsibility for medication therapy outcomes.
- Actively works to identify the potential for significant medication-related problems.
- Actively pursues all significant existing and potential medication-related problems until satisfactory resolution is obtained.
- Ensures appropriate transitions of care.
- Helps patients learn to navigate the health care system, as appropriate.
- Informs patients how to obtain their medications in a safe, efficient, and cost-effective manner.
- Determines barriers to patient compliance and makes appropriate adjustments.

Goal R1.2: Ensure continuity of care during infectious diseases patient transitions between care settings.

Objective R1.2.1: (Applying) Manage transitions of care effectively for patients with infectious diseases.
Criteria:
- Effectively participates in obtaining or validating a thorough and accurate medication history.
- Conducts medication reconciliation when necessary.
- Follows up on all identified drug-related problems.

- Participates effectively in medication education.
- Provides accurate and timely follow-up information when patients transfer to another facility, level of care, pharmacist, or provider, as appropriate.
- Follows up with patient in a timely and caring manner.
- Provides additional effective monitoring and education, as appropriate.
- Takes appropriate and effective steps to help avoid unnecessary hospital admissions and/or readmissions.
- Considers outpatient parenteral antimicrobial therapy during transitions.
- Facilitates medication access, as needed.

Goal R1.3: Manage antimicrobial stewardship activities.

Objective 1.3.1: (Analyzing) Demonstrate an understanding of the integral members of the stewardship team, their roles, and the antimicrobial stewardship strategies used by organizations.
Criteria:
- Identifies members necessary for the success of a stewardship program.
- Accurately summarizes the advantages and disadvantages of each core and elective stewardship strategy.
- Effectively analyzes the strengths and deficiencies of the institution's current stewardship program.
- Demonstrates understanding of the inter-relationship among infection control, microbiology, and antimicrobial stewardship programs.
- Demonstrates understanding of regulatory requirements around antimicrobial stewardship.

Objective 1.3.2: (Applying) Participate in the institution's antimicrobial stewardship program
Criteria:
- Participates effectively on committees or informal work groups to promote antimicrobial stewardship.
- Participates effectively in activities to optimize anti-infective use consistent with departmental and organizational goals.
- Prioritizes antimicrobial stewardship activities appropriately.
- Communicates stewardship team interventions clearly, accurately, and in a timely manner with the appropriate level of assertiveness.
- Manages conflict effectively.
- Documents activities appropriately.
- Provides education to prescribers, as appropriate.
- Participates in the process to review anti-infective use guidelines and institutional antibiogram consistent with stewardship program, departmental, and organizational goals.
- Demonstrates understanding of the role of automated surveillance and rapid molecular diagnostic technology in optimizing anti-infective use.
- In the clinical microbiology laboratory, demonstrates appropriate use of laboratory methods.

Objective 1.3.3: (Evaluating) Evaluate stewardship program processes and outcomes.
Criteria:

- Understands antimicrobial stewardship metrics and the difference between process and outcomes metrics.
- Demonstrates understanding of effective methodologies for measuring anti-infective use.
- Participates effectively in measuring anti-infective use at the institution.
- Participates effectively in evaluating the stewardship program's impact on anti-infective use, patient outcomes, and healthcare costs.
- Use best practices to identify problems and opportunities for improvements in stewardship activities.

Competency Area R2: Advancing Practice and Improving Patient Care

Goal R2.1: Demonstrate ability to manage formulary and medication-use processes for infectious diseases patients, as applicable to the organization and antimicrobial stewardship program.

Objective R2.1.1: (Creating) Prepare or revise a drug class review or monograph, and treatment guideline or protocol related to care of infectious diseases patients. Guidance: Can include technology-related improvements.
Criteria:
- Displays objectivity.
- Effectively synthesizes information from the available literature.
- Applies evidenced-based principles.
- Consults relevant sources.
- Considers medication-use safety and resource utilization.
- Uses the appropriate format.
- Effectively communicates any changes in medication formulary, medication usage, or other procedures to appropriate parties.
- Demonstrates appropriate assertiveness in presenting pharmacy concerns, solutions, and interests to internal and external stakeholders.
- When appropriate, may include proposals for medication-safety technology improvements.

Objective R2.1.2: (Applying) Participate in the review of medication event reporting and monitoring related to care of infectious diseases patients.
Criteria:
- Effectively uses currently available technology and automation that supports a safe medication-use process.
- Appropriately and accurately determines, investigates, and reports, adverse drug events, medication errors, and efficacy concerns using accepted institutional resources and programs.

Objective R2.1.3: (Analyzing) Identify opportunities for improvement of the medication-use system related to care for patients with infectious diseases.
Criteria:

- Identifies problems and opportunities for improvement and analyzes relevant background data.
- Evaluates data generated by health information technology or automated systems to identify opportunities for improvement.
- Utilizes best practices to identify opportunities for improvements.
- When needed, makes medication-use policy recommendations based on a review of practice standards, guidelines, and other evidence (e.g., National Quality Measures, Institute for Safe Medication Practices alerts, Joint Commission sentinel alerts).

Goal R2.2: Demonstrate ability to conduct a quality improvement or research project.

Ideally, objectives R2.2.1-R2.2.6 will be addressed through residents working on one quality improvement or research project; however, if this is not possible, all objectives must be addressed by the end of the residency year and can be addressed through work on more than one initiative.

Objective R2.2.1: (Analyzing) Identify and/or demonstrate understanding of a specific project topic to improve patient care related to care of patients with infectious diseases or topics related to advancing the pharmacy profession or infectious diseases pharmacy.
Criteria:
- Appropriately identifies problems and opportunities for improvement and analyzes relevant background data.
- Determines an appropriate topic for a practice-related project of significance to patient care.
- Uses best practices or evidence-based principles to identify opportunities for improvements.
- Accurately evaluates or assists in the evaluation of data generated by health information technology or automated systems to identify opportunities for improvement.

Objective R2.2.2: (Creating) Develop a plan or research protocol for a practice quality improvement or research project related to the care of patients with infectious diseases or topics related to advancing the pharmacy profession or infectious diseases pharmacy.
Criteria:
- Steps in plan are defined clearly.
- Applies safety design practices (e.g., standardization, simplification, human factors training, lean principles, FOCUS-PDCA, other process improvement or research methodologies) appropriately and accurately.
- Plan for improvement includes appropriate reviews and approvals required by department or organization and addresses the concerns of all stakeholders.
- Applies evidence-based principles, if needed.
- Develops a sound research or quality improvement question that can be realistically addressed in the desired time frame, if appropriate.
- Develops a feasible design for a project that considers who or what will be affected by the project.
- Identifies and obtains necessary approvals and resources (e.g., IRB, funding) for a practice-related project.
- Plan design is practical to implement and is expected to remedy or minimize the identified challenge or deficiency.

Objective R2.2.3: (Evaluating) Collect and evaluate data for a practice quality improvement or research project related to the care of patients with infectious diseases or topics related to advancing the pharmacy profession or infectious diseases pharmacy.

Criteria:

- Collects the appropriate types of data as required by project design.
- Uses appropriate electronic data and information from internal information databases, external online databases, appropriate Internet resources, and other sources of decision support, as applicable.
- Uses appropriate methods for analyzing data in a prospective and retrospective clinical, humanistic, and/or economic outcomes analysis.
- Develops and follows an appropriate research or project timeline.
- Correctly identifies need for additional modifications or changes to the project.
- Accurately assesses the impact of the project, including its sustainability, using operational, clinical, economic, and/or humanistic outcomes of patient care.
- Applies results of a prospective or retrospective clinical, humanistic, and/or economic outcomes analysis to internal business decisions and modifications to a customer's formulary or benefit design as appropriate.
- Uses continuous quality improvement (CQI) principles to assess the success of the implemented change, if applicable.
- Considers the impact of the limitations of the project or research design on the interpretation of results.
- Accurately and appropriately develops plan to address opportunities for additional changes.
- Appropriately follows data security and HIPAA guidelines.

Objective R2.2.4: (Applying) Implement quality improvement or research project to improve patient care related to care for patients with infectious diseases or topics related to advancing the pharmacy profession or infectious diseases pharmacy.

Criteria:

- Creates and adheres to established timeline and milestones.
- Implements the project as specified in its design.
- Effectively presents plan to appropriate audience.
- Plan is based on appropriate data.
- Gains necessary commitment and approval for implementation.
- Effectively communicates any changes in medication formulary, medication usage, or other procedures to appropriate parties, if applicable.
- Demonstrates appropriate assertiveness in presenting pharmacy concerns, solutions, and interests to external stakeholders, if applicable.
- Participates in plan for project results and/or recommendations to be implemented for health system, if applicable.

Objective R2.2.5: (Evaluating) Assess changes or need to make changes to improve patient care related to care for patients with infectious diseases or topics related to advancing the pharmacy profession or infectious diseases pharmacy.

Criteria:

- Outcome of change is evaluated accurately and fully, if applicable.
- Includes operational, clinical, economic, and humanistic outcomes of patient care.
- Uses continuous quality improvement (CQI) principles to assess the success of the implemented change, if applicable.
- Correctly identifies need for additional modifications or changes.
- Accurately assesses the impact of the project, including its sustainability (if applicable).
- Accurately and appropriately develops plan to address opportunities for additional changes.

Objective R2.2.6: (Creating) Effectively develop and present, orally and in writing, a final project report suitable for publication related to care for patients with infectious diseases or topics related to advancing the pharmacy profession or infectious diseases pharmacy at a local, regional, or national conference.   (The presentation can be virtual.)

Criteria:

- Outcome of change is reported accurately to appropriate stakeholders(s) and policy-making bodies according to departmental or organizational processes.
- Report includes implications for changes to or improvement in pharmacy practice.
- Report uses an accepted manuscript style suitable for publication in the professional literature.
- For oral presentations, presented to appropriate audiences within the department and organization or to external audiences use effective communication and presentation skills and tools (e.g., handouts, slides) to convey points successfully.
- Demonstrates understanding of the potential benefits, to the practitioner and the profession, of contributing to the infectious diseases pharmacy literature.
- Demonstrates the ability to effectively critique one's own, and other's articles (perform peer review).

Goal R2.3: Manage and improve anti-infective-use processes.

Objective R2.3.1: (Evaluating) Make recommendations for additions or deletions to the organization's anti-infective formulary based on literature and/or comparative reviews.

Criteria:

- Includes appropriate elements and information in a comparative review for an anti-infective.
- Uses appropriate resources in the preparation of an anti-infective comparative review.
- Uses effective communication skills using a format suitable for the P & T committee.

Objective R2.3.2: (Creating) Contribute to the activities of the P&T committee, specifically the anti-infective subcommittee, when applicable.

Criteria:

- Contributions are evidence-based.
- Contributions are collaborative.
- Contributions are timely.

Competency Area R3: Leadership and Management

Goal R3.1: Establish oneself as an organizational expert for infectious diseases pharmacy-related information and resources.

Objective R3.1.1: (Applying) Implement a successful strategy for earning credibility with the organization to be an authoritative resource on the pharmaceutical care of individuals with an infectious disease.
Criteria:
- Identifies, and overcomes, barriers to the infectious diseases pharmacist for earning credibility with members of the infectious diseases team.
- Identifies and discusses promotion of the infectious diseases pharmacist within an organization.

Goal R3.2: Demonstrate leadership skills for successful self-development in the provision of care for infectious diseases patients.

Objective R3.2.1: (Applying) Demonstrate personal, interpersonal, and teamwork skills critical for effective leadership in the provision of care for infectious diseases patients.
Criteria:
- Demonstrates effective time management.
- Manages conflict effectively.
- Demonstrates effective negotiation skills.
- Demonstrates ability to lead inter-professional teams.
- Uses effective communication skills and styles.
- Demonstrates understanding of perspectives of various health care professionals.
- Effectively expresses benefits of personal profession-wide leadership and advocacy.

Objective R3.2.2: (Applying) Apply a process of ongoing self-evaluation and personal performance improvement in the provision of care for infectious diseases patients.
Criteria:
- Accurately summarizes own strengths and areas for improvement (in knowledge, values, qualities, skills, and behaviors).
- Effectively uses a self-evaluation process for developing professional direction, goals, and plans.
- Effectively engages in self-evaluation of progress on specified goals and plans.
- Demonstrates ability to use and incorporate constructive feedback from others.
- Effectively uses principles of continuous professional development (CPD) planning (reflect, plan, act, evaluate, record/review).

Goal R3.3: Demonstrate management skills in the provision of care for infectious diseases patients.

Objective R3.3.1: (Applying) Contribute to management of infectious diseases-related policies and issues.

Criteria:
- Helps identify and define departmental needs.
- Helps develop plans that address departmental needs.
- Participates effectively on committees or informal work groups to complete group projects, tasks, or goals.
- Participates effectively in implementing changes, using change management and quality improvement best practices and tools, consistent with team, departmental, and organizational goals.
- Effectively leads small work groups focused on specific issues.
- Effectively leads committees.
- Ensures continuity of implementation of policies throughout the organization.
- Acts as effective liaison for infection control groups.
- Acts as effective quality control group liaison.
- Effectively participates in infectious diseases advocacy in a regional or national organization.

Objective R3.3.2: (Applying) Manage one's own infectious diseases practice effectively.

Criteria:
- Accurately assesses successes and areas for improvement (e.g., a need for staffing projects or education) in managing one's own practice.
- Makes accurate, criteria-based assessments of one's own ability to perform practice tasks.
- Regularly integrates new learning into subsequent performances of a task until expectations are met.
- Routinely seeks applicable learning opportunities when performance does not meet expectations.
- Demonstrates effective workload and time-management skills.
- Assumes responsibility for personal work quality and improvement.
- Is well prepared to fulfill responsibilities (e.g., patient care, projects, management, meetings).
- Sets and meets realistic goals and timelines.
- Demonstrates awareness of own values, motivations, and emotions.
- Demonstrates enthusiasm, self-motivation, and a "can-do" approach.
- Strives to maintain a healthy work–life balance.
- Works collaboratively within the organization's political and decision-making structure.
- Demonstrates pride in and commitment to the profession through appearance, personal conduct, plans to pursue board certification, and participation in pharmacy association membership activities.
- Demonstrates personal commitment to and adherence to organizational and departmental policies and procedures.

Competency Area R4: Teaching, Education, and Dissemination of Knowledge

Goal R4.1: Provide effective medication and practice-related education to infectious diseases patients, caregivers, health care professionals, students, and the public (individuals and groups).

Objective R4.1.1: (Applying) Design effective educational activities related to care of patients with infectious diseases.

Criteria:

- Accurately defines educational needs with regard to target audience (e.g., individual versus group) and learning level (e.g., health care professional versus patient).
- Defines educational objectives that are specific, measurable, at a relevant learning level (e.g., applying, creating, evaluating), and address the audiences' defined learning needs.
- Plans use of teaching strategies that match learner needs including active learning (e.g., patient cases, polling).
- Selects content that is relevant, thorough, evidence based (using primary literature where appropriate), timely, and reflects best practices.
- Includes accurate citations and relevant references and adheres to applicable copyright laws.

Objective R4.1.2: (Applying) Use effective presentation and teaching skills to deliver education related to care of patients with infectious diseases.

Criteria:

- Demonstrates rapport with learners.
- Captures and maintains learner/audience interest throughout the presentation.
- Implements planned teaching strategies effectively.
- Effectively facilitates audience participation, active learning, and engagement in various settings (e.g., small or large group, distance learning).
- Presents at appropriate rate and volume and without exhibiting poor speaker habits (e.g., excessive use of "um" and other interjections).
- Body language, movement, and expressions enhance presentations.
- Summarizes important points at appropriate times throughout presentations.
- Transitions smoothly between concepts.
- Effectively uses audio-visual aids and handouts to support learning activities.

Objective R4.1.3: (Applying) Use effective written communication to disseminate knowledge related to care of patients with infectious diseases.

Criteria:

- Writes in a manner that is easily understandable and free of errors.
- Demonstrates thorough understanding of the topic.
- Notes appropriate citations and references.
- Includes critical evaluation of the literature and knowledge advancements or a summary of what is currently known on the topic.
- Develops and uses tables, graphs, and figures to enhance readers' understanding of the topic when appropriate.
- Writes at a level appropriate for the target readership (e.g., physicians, pharmacists, other health care professionals, patients, the public).
- Creates one's own work and does not engage in plagiarism.

Objective R4.1.4: (Applying) Appropriately assess effectiveness of education related to care of patients with infectious diseases.

Criteria:

- Selects assessment method (e.g., written or verbal assessment or self-assessment questions, case with case-based questions, learner demonstration of new skill) that matches activity.

- Provides timely, constructive, and criteria-based feedback to learner.
- If used, assessment questions are written in a clear, concise format that reflects best practices for test item construction.
- Determines how well learning objectives were met.
- Plans for follow-up educational activities to enhance or support learning and (if applicable) ensure that goals were met.
- Identifies ways to improve education-related skills.
- Obtains and reviews feedback from learners and others to improve effectiveness as an educator.

Goal R4.2: Effectively employ appropriate preceptor roles when engaged in teaching students, pharmacy technicians, or fellow health care professionals) about care of patients with infectious diseases.

Objective R4.2.1: (Analyzing) When engaged in teaching related to care of patients with infectious diseases, select a preceptor role that meets learners' educational needs.
Criteria:
- Identifies which preceptor role is applicable for the situation (direct instruction, modeling, coaching, facilitating) as follows:
  - Selects direct instruction when learners need background content.
  - Selects modeling when learners have sufficient background knowledge to understand the skill being modeled.
  - Selects coaching when learners are prepared to perform a skill under supervision.
  - Selects facilitating when learners have performed a skill satisfactorily under supervision.

Objective R4.2.2: (Applying) Effectively employ preceptor roles, as appropriate, when instructing, modeling, coaching, or facilitating skills related to care of patients with infectious diseases.
Criteria:
- Instructs students, technicians, or others as appropriate.
- Models skills, including "thinking out loud," so learners can "observe" critical-thinking skills.
- Coaches, including effective use of verbal guidance, feedback, and questioning as needed.
- Facilitates, when appropriate, by allowing learner independence and using indirect monitoring of performance.

ELECTIVE COMPETENCY AREAS, GOALS, AND OBJECTIVES FOR POSTGRADUATE YEAR TWO (PGY2) INFECTIOUS DISEASES PHARMACY RESIDENCIES

Competency Area E1: Academia

Goal E1.1: Demonstrate understanding of key elements of the academic environment and faculty roles within it.

Objective E1.1.1: (Understanding) Demonstrates understanding of key elements of the academic environment and faculty roles within it.
Criteria:
- Accurately describes expectations of public and private schools of pharmacy for teaching, practice, research, and service.
- Demonstrates understanding of relationships between scholarly activity and teaching, practice, research and service.
- Accurately describes the academic environment (e.g., how administration decisions and outside forces impact faculty).
- Accurately describes faculty roles and responsibilities.
- Accurately describes the types and ranks of faculty appointments.
- Demonstrates understanding of the role and implications of part-time and adjunct faculty.
- Accurately describes the complexity of the promotion and/or tenure process.
- Accurately explains the role and influence of faculty in the academic environment.
- Accurately identifies resources available to help develop academic skills.
- Accurately identifies and describes ways that faculty maintain balance in their roles.
- Accurately describes typical affiliation agreements between a college of pharmacy and a practice site (e.g., health system, hospital, clinic, retail pharmacy).

Goal E1.2: Exercise case-based and other teaching skills essential to pharmacy faculty.

Objective E1.2.1: (Applying) Develop and deliver cases for workshops and exercises for laboratory experiences.
Criteria:
- Identifies the appropriate level of case-based teachings for small group instruction.
- Identifies appropriate exercises for laboratory experiences.
- Provides appropriate and timely feedback to improve performance.

Objective E1.2.2: (Evaluating) Compare and contrast methods to prevent and respond to academic and profession dishonesty and adhere to copyright laws.
Criteria:
- Accurately evaluates physical and attitudinal methods to prevent academic dishonesty.
- Accurately describes methods of responding to incidents of academic dishonesty.

- Accurately explains the role of academic honor committees in cases of academic dishonesty.
- Identifies examples and methods to address unprofessional behavior in learners.
- Accurately describes copyright regulations as related to reproducing materials for teaching purposes.
- Accurately describes copyright regulations as related to linking and citing on-line materials.

Goal E1.3: Develops and practices a philosophy of teaching.

Objective E1.3.1: (Creating) Develop or update a teaching philosophy statement.
Criteria:

- Teaching philosophy includes:
    o Self-reflection on personal beliefs about teaching and learning;
    o Identification of attitudes, values, and beliefs about teaching and learning; and,
    o Illustrates personal beliefs on practice and how these beliefs and experiences are incorporated in a classroom or experiential setting with trainees.
    o If updating, reflect on how one's philosophy has changed.

Objective E1.3.2: (Creating) Prepare a practice-based teaching activity.
Criteria:

- Develops learning objectives using active verbs and measureable outcomes.
- Plans teaching strategies appropriate for the learning objectives.
- Uses materials that are appropriate for the target audience.
- Organizes teaching materials logically.
- Plans relevant assessment techniques.
- When used, develops examination questions that are logical, well-written, and test the learners' knowledge rather than their test-taking abilities.
- Participates in a systematic evaluation of assessment strategies (e.g., post-exam statistical analysis) when appropriate.
- Ensures activity is consistent with learning objectives in course syllabus.

Objective E1.3.3: (Applying) Deliver a practice-based educational activity, including didactic or experiential teaching, or facilitation.
Criteria:

- Incorporates at least one active learning strategy in didactic experiences appropriate for the topic.
- Uses effective skills in facilitating small and large groups.
- Development of experiential activities include the following:
    o Organizes student activities (e.g., student calendar);
    o Effectively facilitates topic discussions and learning activities within the allotted time;
    o Effectively develops and evaluates learner assignments (e.g., journal clubs, presentations, SOAP notes);
    o Effectively assesses student performance; and,
    o Provides constructive feedback.

Objective E1.3.4: (Creating) Effectively document one's teaching philosophy, skills, and experiences in a teaching portfolio.
Criteria:

- Portfolio includes:
  o A statement describing one's teaching philosophy;
  o Curriculum vitae;
  o Teaching materials including slides and other handouts for each teaching experience;
  o Documented self-reflections on one's teaching experiences and skills, including strengths, areas for improvement, and plans for working on the areas for improvement;
  o Peer/faculty evaluations; and,
  o Student/learner evaluations.

Competency Area E2: Outcomes Research

Goal E2.1: Contribute to infectious diseases clinical, humanistic and economic outcomes analyses.

Objective E2.1.1: (Evaluating) Contribute to an infectious diseases prospective clinical, humanistic and/or economic outcomes analysis.
Criteria:
- Follows, or explains, principles and methodology of basic pharmacoeconomic analyses.
- Selects, or explains, study design appropriate for their research (e.g., prospective clinical, humanistic or economic outcomes analysis).
- Appropriately uses modeling, if appropriate, or explains how modeling is used.
- Effectively collects data for their research or explains the types of data that must be collected in a prospective clinical, humanistic, and economic outcomes analysis.
- Uses, or explains, reliable sources of data for a clinical, humanistic and economic outcomes analysis.
- Effectively analyzes, or explains how to analyze, collected data in a prospective clinical, humanistic and economic outcomes analysis.
- Applies, or explain how research results can be applied, to internal business decisions including modifications to a customer's formulary or benefit design.

Objective E2.1.2: (Evaluating) Contribute to an infectious diseases retrospective clinical, humanistic, and/or economic outcomes analysis.
Criteria:
- Accurately explains the purpose of a retrospective clinical, humanistic, or economic outcomes analysis.
- Accurately explains study designs appropriate for a retrospective clinical, humanistic, and economic outcomes analysis.
- Accurately explains the types of data that must be collected in a retrospective clinical, humanistic, and economic outcomes analysis.
- Accurately explains the content and utilization of reports and audits produced by the pharmacy department.
- Accurately explains possible reliable sources of data for a retrospective clinical, humanistic, and economic outcomes analysis.
- Accurately explains methods for analyzing data in a retrospective clinical, humanistic, and economic outcomes analysis.
- Accurately explains the impact of limitations of retrospective data on the interpretation of results.

- Accurately explains how results of a retrospective clinical, humanistic and economic outcomes analysis can be applied to internal business decisions including modifications to a customer's formulary or benefit design.
- Demonstrates the ability to provide a peer review of a pharmacy professional's article submitted for publication or presentation.

Competency Area E3: Specialty Pharmacy

Thanks to the National Association of Specialty Pharmacy (NASP) for providing the job analysis on which these goals, objectives, and criteria are based.

Goal E3.1: Effectively fulfill the major functions of a specialty pharmacist, including intake, clinical management, fulfillment, and facilitating optimal outcomes.

Objective E3.1.1: (Applying) Effectively conduct the patient intake process for specialty pharmacy patients.
Criteria:
- Screens patient demographic and clinical information to determine suitability for specialty pharmacy services.
- Conducts benefits investigation and validation of insurance coverage for requested medication (submit test claims) and coordinate benefits with multiple payors.
- Determines payor coverage and which benefit channel is required by medication or optimal for patient when either channel is acceptable.
- Initiates and conducts prior authorization process.
- Determines eligibility for specific clinical management programs.
- Determines patient eligibility and need for financial assistance based on insurance, available programs, and patient financial burden.
- Works with patient care coordinator to enroll qualified patients in financial assistance programs.
- Bills payor under pharmacy benefit structure or medical benefit structure.

Objective E3.1.2: (Applying) Effectively engage in clinical management activities for specialty pharmacy patients.
Criteria:
- Addresses Risk Evaluation and Mitigation Strategies (REMS).
- Develops individualized education plan for specialty pharmacy patients to achieve treatment goals.
- Enrolls specialty pharmacy patients in specific clinical management programs.
- Manages patient treatment holidays and other extenuating circumstances.
- Manages specialty pharmacy patient discontinuation of medication.

Objective E3.1.3: (Applying) Effectively conduct fulfillment activities for specialty pharmacy patients.
Criteria:
- Verifies that medication is available.
- Refers medication referral to another provider if unable to distribute medication.

- Accurately determines delivery location and makes arrangements for the delivery and receiving of medication package.
- Ships the medication package using appropriate shipping method.
- Correctly bills patient for services rendered.
- Contacts patients prior to delivery of medication refill.
- Resolves situations in which the integrity of medication shipment has been compromised or the shipment was not received.
- Conducts investigation in the case of discrepancy between patient and facility.
- Contacts manufacturer for replacement of product in the case of patient misuse or product failure.

Objective E3.1.4: (Evaluating) Effectively facilitate optimal treatment outcomes for specialty pharmacy patients.

Criteria:
- Determines clinical, patient-reported, operational, and financial data to be collected based on the parameters of disease state and medication, and how data will be obtained from internal and external sources.
- Determines patient, internal stakeholder, and external stakeholder requirements for data reporting and structuring the format of reports to meet requirements.
- Obtain, collect, and extract clinical, patient-reported, operational, and financial data.
- Integrate and reconcile clinical, patient-reported, operational, and financial data from disparate sources and use standard data elements.
- Analyzes and interprets clinical and patient-reported data to determine clinical and patient-reported outcomes to improve patient treatment and quality of life.
- Analyzes and interprets operational and financial data to determine operational and financial outcomes to evaluate the pharmacoeconomic impact of service offerings.
- Reports clinical, patient-reported, operational, and financial data and make recommendations to patients, internal stakeholder, and external stakeholder.

Competency Area E4: Health, Wellness, and Emergency Preparedness

Goal E4.1: Design and deliver programs that contribute to public health efforts.

Objective E4.1.1: (Creating) Design and deliver programs for health care consumers that center on disease prevention and wellness promotion.

Criteria:
- Identifies target audiences for disease prevention and wellness promotion and the relative priority of programming for each of these audiences.
- Uses the data required to justify a program.
- Identifies and provides the support needed to establish a program.
- Identifies and manages problems and shortcomings associated with the maintenance of a wellness promotion program.

Objective E4.1.2: (Applying) Contributes to organizational procedures for emergency preparedness.
Criteria:
- Participates in the development or revision of organizational plans for emergency preparedness.

Competency Area E5: Public Health Initiatives

Goal E5.1: Participate in a population health initiative in collaboration with other healthcare partners.

Objective E5.1.1: (Creating) Design or update a population-focused initiative to maintain or improve public health outcomes.
Criteria:
- Consults local, state, and national rules and regulations.
- Considers community factors when designing or updating initiative.
- Considers institutional mission and current health-related goals.
- Determines potential seasonal influences on initiative.
- Communicates with appropriate institutional parties.
- Anticipates future needs for institution and surrounding community related to initiative (e.g., emerging infectious diseases, emergency preparedness).

Objective E5.1.2: (Applying) Execute an intervention to maintain or improve public health outcomes for the institution or surrounding community.
Criteria:
- Effectively educates patients, healthcare providers, and other involved personnel on relevant public health initiative (e.g. vaccines).
- Effectively implements procedures to improve or prevent patient health outcomes.
- Effectively participates in interprofessional committees or task forces at the institution or surrounding community related to public health.

Objective E5.1.3: (Evaluating) Assess outcomes of population health outcomes intervention.
Criteria:
- Demonstrates an understanding of the appropriate metrics for measuring population health interventions.
- Accurately measures impact of population health-related intervention using institutional or national metrics.
- Effectively presents outcomes to interprofessional committees or task forces.
- Ensures continuity of program upon program completion.

Competency Area E6: Initiating an Infectious Diseases-Related Service

Goal E6.1: Develop a proposal for a new infectious diseases-related service.

Objective E6.1.1: (Creating) Write a proposal for an infectious diseases-related service.

Criteria:
- Proposal meets a perceived need of the health system and its patients.
- Accurately identifies the need for a new service or program, or improvements to an existing service or program.
- Goals are realistic and clear.
- Outcomes are stated in measurable terms.
- The proposal uses the organization's format.
- Marketability of new or enhanced service is clearly outlined.
- Uses appropriate methods (e.g., modeling) to predict the financial outcome(s) of implementing a proposed new or enhanced service or program.
- Uses appropriate methods to predict the intended clinical outcomes of new or enhanced service or program.
- Proposal includes the necessary components of a new service or program (e.g., disease state management program).
- Proposal considers the role of other health care providers in meeting the needs of patients involved in a new service or program (e.g., disease state management programs).
- Proposal considers how potential shifts in market share should be factored into decisions on the marketability of a service or program.
- Proposal is clear and persuasive.

Objective E6.1.2: (Creating) Present a proposal for a new infectious diseases-related service.
Criteria:
- Identifies appropriate concerned entities as audience for presentation.
- Uses effective presentation skills.

Objective E6.1.3: (Applying) Implement a new infectious diseases-related service.
Criteria:
- Identifies appropriate strategies for implementing the new service.
- Effectively employs selected strategies for implementing the new service.

Objective E6.1.4: (Applying) Appraise a new infectious diseases pharmacy service.
Criteria:
- Accurately evaluates adequacy of the new service in meeting the stated goals.

Competency Area E7: Delivery of Medications

Goal E7.1: Manage and facilitate delivery of medications to support safe and effective drug therapy for infectious diseases patients.

Objective E7.1.1: (Applying) Manage aspects of the medication-use process related to formulary management for infectious diseases patients.

Criteria:

- Follows the appropriate procedures for formulary restrictions, including antimicrobial stewardship, following stewardship program guidelines.
- Ensures non-formulary medications are dispensed, administered, and monitored in a manner that ensures patient safety.
- Correctly interprets appropriateness of a medication order before preparing or permitting the distribution of the first dose, including:
  o Identifying, clarifying, verifying, and correcting any medication order errors.
  o Considering complete patient-specific information.
  o Identifying existing or potential drug therapy problems.
  o Determining an appropriate solution to an identified problem.
  o Securing consensus from the prescriber for modifications to therapy.
  o Ensuring that the solution is implemented.
- Prepares medication using appropriate techniques and following the organization's policies and procedures and applicable professional standards, including:
  o When required, accurately calibrating equipment.
  o Ensures intravenous solutions are appropriately concentrated, without incompatibilities; stable; and appropriately stored.
  o Adhering to appropriate safety and quality assurance practices.
  o Preparing labels that conform to the health system's policies and procedures, as appropriate.
  o Ensuring that medication has all necessary and appropriate ancillary labels.
  o Inspecting the final medication before dispensing for accuracy, as appropriate.
- When dispensing medication products:
  o Follows the organization's policies and procedures.
  o Ensures the patient receives the medication(s) as ordered.
  o Ensures the integrity of medication dispensed.
  o Provides any necessary written and/or verbal counseling for the patient and support/education for relevant interdisciplinary staff (e.g., nursing, respiratory therapy).
  o Ensures the patient receives medication on time.
- Maintains accuracy and confidentiality of patients' protected health information.
- Obtains agreement on modifications to medication orders when acting in the absence of, or outside, an approved protocol or collaborative agreement.
- References appropriate literature resources to ensure use of proper practices regarding compatibility, fluid overload, and concentrations.

Objective E7.1.2: (Applying) Manage aspects of the medication-use process related to formulary management for patients with infectious diseases.
Criteria:

- Follows appropriate procedures regarding exceptions to the formulary, if applicable, in compliance with policy.
- Ensures non-formulary medications are evaluated, dispensed, administered, and monitored in a manner that ensures patient safety.

Objective E7.1.3: (Applying) Facilitate aspects of the medication-use process for patients with infectious diseases.

Criteria:

- Makes effective use of technology to aid in decision-making and increase safety.
- Demonstrates commitment to medication safety.
- Effectively prioritizes workload and organizes workflow.
  - o Checks accuracy of medications dispensed, including correct patient identification, medication, dosage form, label, dose, number of doses, and expiration dates; and proper repackaging and relabeling medications, including compounded medications (sterile and nonsterile).
- Promotes safe and effective drug use on a day-to-day basis.

Competency Area E8: Medication-Use Evaluations

Goal E8.1: (Evaluating) Lead a medication-use evaluation related to care of patients with infectious diseases.

Objective E8.1.1: (Evaluating) Lead a medication-use evaluation related to care for patients with infectious diseases.
Criteria:

- Uses evidence-based principles to develop criteria for use.
- Demonstrates a systematic approach to gathering data.
- Accurately analyzes data gathered.
- Demonstrates appropriate confidence and assertiveness in presenting pharmacy concerns, solutions, and interests to internal and external stakeholders.
- Implements approved changes, as applicable.

Competency Area E9: Publishing

Goal E9.1: Participate in the publication process on an infectious diseases-related topic.

Objective E9.1.1: (Creating) Submit an article on a infectious diseases-related topic for a peer-reviewed publication.
Criteria:

- Chooses an appropriate journal to match the intended audience.
- Writes in a style appropriate for the audience of the publication (e.g., health care professional and/or the public).
- Article is suitably formatted and follows appropriate submission procedures.
- Effectively addresses reviewer comments, if appropriate.
- Effectively manages or participates on an authorship team.

Objective E9.1.2: (Evaluating) Perform peer review of a manuscript submitted for publication or presentation.

Criteria:

- Ensures format is consistent with journal requirements.
- Demonstrates understanding of previously published literature on the topic.
- Critically evaluate the methodology, results, and discussion of the manuscript.
- Develops constructive feedback for the authors and editors.

The effective date for implementation of these educational outcomes, goals and objectives is commencing with the entering resident class of 2017.

PGY2 Infectious Diseases Pharmacy Residency Appendix

Core Areas or Types of Patient Care Experiences
It is expected that all residents will acquire new knowledge and understanding related to core areas or types of patients for graduates of PGY2 infectious diseases residency programs. The primary method for PGY2 infectious diseases programs to help residents achieve patient care competence in providing comprehensive medication management is to provide residents with sufficient experience providing patient care for common disease states and conditions.

The resident will explain the mechanism of action, pharmacokinetics, pharmacodynamics, pharmacogenomics, pharmacoeconomics, usual regimen (dose, schedule, form, route, and method of administration), indications, contraindications, interactions, adverse reactions, and therapeutics of medications and non-traditional therapies, where relevant, that are applicable to the diseases and conditions listed below.

For these diseases and conditions, the resident will demonstrate an understanding of signs and symptoms, epidemiology, risk factors and etiology, pathogenesis, pathophysiology, clinical course, and a comprehensive pharmacotherapy treatment plan.

For this purpose, residents are required to have direct patient care experience for these disease states/infections and anti-infective classes. Those marked with an asterisk (*) may be met through didactic discussion, reading assignments, case presentations, and/or written assignments.

Bone and joint infections
Cardiovascular infections
Central nervous system infections
Fever of unknown origin *
Fungal infections
Gastrointestinal infections
Hepatitis B *
Hepatitis C *
HIV-infection and AIDS*
Intra-abdominal infections
Neutropenic fever
Ophthalmologic infections*
Opportunistic infections in immunocompromised hosts
Parasitic infections*
Reproductive organ infections*
Respiratory infections: upper and lower
Rickettsial infections*
Sepsis
Sexually transmitted diseases*
Skin and soft tissue infections
Tuberculosis and other mycobacterial Infections *
Travel medicine*
Urologic infections
Viral infections