



REQUIRED COMPETENCY AREAS, GOALS, AND OBJECTIVES FOR POSTGRADUATE YEAR TWO (PGY2) SOLID ORGAN TRANSPLANT PHARMACY RESIDENCIES

Prepared in collaboration with the American College of Clinical Pharmacy (ACCP) and the American Society of Transplantation (AST) Transplant Pharmacy Community of Practice

Introduction

The competency areas, goals, and objectives are for use 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 pharmacy residencies are available on the ASHP website. PGY2 competency areas, goals, and objectives in solid organ transplant pharmacy are differentiated from those from PGY1 by specialization and the expectation of PGY2 residents for greater work competence and proficiency.

Definitions

¹Anderson, 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).

Solid Organ Transplant Patients: Includes living donors, transplant candidates, and transplant recipients.

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 Goals (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 and how they can improve on the skill described in educational objectives 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 the appendix for additional specific requirements.)

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

Objective R1.1.1: (Applying) Interact effectively with health care teams to manage solid organ transplant patients' medication therapy.

Criteria:

- Interactions are cooperative, collaborative, communicative, and respectful.
- Demonstrates skills in consensus building, negotiation, and conflict management.
- 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 solid organ transplant patients, family members, and caregivers.

Criteria:

- Interactions are respectful and collaborative.
- Maintains accuracy and confidentiality of patients' protected health information.
- Uses effective (e.g., clear, concise, accurate) communication skills.
- Shows empathy.
- Empowers patients, family members, and caregivers regarding the patient's well-being and health outcomes.
- Demonstrates cultural competence.
- Communicates with family members and caregivers to obtain patient information when patients are unable to provide the information.
- Communicates with patient, family, and caregivers about initiation and changes of patient therapies.
- Demonstrates advocacy for caregivers.

Objective R1.1.3: (Analyzing) Collect information on which to base safe and effective medication therapy for solid organ transplant 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.
 - Social history.
 - Medication history, including prescription, non-prescription, illicit, recreational, and non-traditional therapies; other dietary supplements; immunizations; and allergies.
 - Patient assessment (examples include, but are not limited to, physiologic monitoring, laboratory values, microbiology results, diagnostic imaging, procedural results, and scoring systems.
 - Pharmacogenomics and pharmacogenetic information, if available.

- Adverse drug reactions.
- Medication adherence and persistence.
- 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 sources 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 solid organ transplant patients.

Criteria:

- Includes accurate assessment of patient's:
 - Health and functional status.
 - Risk factors for complications.
 - Health data (e.g., medical history, surgical history).
 - Cultural factors.
 - Health literacy.
 - Access to medications.
 - Immunization status.
 - Immunologic status.
 - Need for preventive care and other services, when appropriate.
 - Other aspects of care, as applicable.
- Identifies medication therapy problems, including:
 - Lack of indication for medication.
 - Medical conditions for which there is no medication prescribed.
 - Medication prescribed or continued inappropriately for a particular medical condition.
 - Suboptimal medication regimen (e.g., dose, dosage form, duration, schedule, route of administration, method of administration).
 - Medication toxicity requiring medication therapy modifications.
 - Abnormal lab values requiring medication therapy modifications.
 - Therapeutic duplication.
 - Adverse drug or device-related events or the potential for such events.
 - Clinically significant drug–drug, drug–disease, drug–nutrient, drug–DNA test interaction, drug–laboratory test interaction, or the potential for such interactions.
 - Use of harmful social, recreational, nonprescription, nontraditional, or other medication therapies.
 - Patient not receiving full benefit of prescribed medication therapy.
 - Problems arising from the financial impact of medication therapy on the patient.
 - Patient lacks understanding of medication therapy.
 - Patient not adhering to medication regimen and root cause (e.g., knowledge, recall, motivation, financial, system).
 - Discrepancy between prescribed medications and established care plan for the patient.
- Prioritize a solid organ transplant patient's health care needs.

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

Criteria:

- Specify evidence-based, measurable, achievable therapeutic goals that include consideration of:
 - Relevant patient-specific information, including culture and preferences.
 - The goals of other interprofessional team members.
 - The patient’s disease state(s).
 - Medication-specific information.
 - Best evidence, including following organizational protocols, clinical guidelines and the most recent literature.
 - Effectively interprets new literature for application to patient care.
 - Ethical issues involved in the patient's care.
 - Quality-of-life issues specific to the patient.
 - End of life issues, when needed.
 - Immunologic status (e.g., donor specific antibodies).
 - Integration of all the above factors influencing the setting of goals.

- Designs/redesigns regimens that:
 - Are appropriate for the disease states being treated.
 - 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.
- Adhere to the health system’s medication-use policies.
- Address wellness promotion and lifestyle modification.
- Support the organization’s or patient’s insurance formulary.
- Address medication-related problems and optimize medication therapy.
- Engage the patient through education, empowerment, and promotion of self-management.
- 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 adherence .
- When applicable, reflects preferences and needs of the patient.
- Plan represents the highest level of patient care.

Objective R1.1.6: (Applying) Ensure implementation of therapeutic regimens and monitoring plans (care plans) for solid organ transplant 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, adherence, 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 solid organ transplant 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 (e.g., pre-transplant assessment).

- Appropriately documents patient/caregiver communication and all relevant direct patient care activities in a timely manner.
- Documents all phases of care, including:
 - Candidate evaluation
 - Incident transplant procedure
 - Discharge planning with education to recipient and/or caregiver
 - Clinic follow-up

Objective R1.1.8: (Applying) Demonstrate responsibility to solid organ transplant patients for patient outcomes.

Criteria:

- Gives priority to patient care activities.
- Routinely ensures all steps of the medication management process are followed.
- 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.
- Communicates with patients and family members/caregivers about their medication therapy.
- Determines barriers to patient adherence and makes appropriate adjustments.

Goal R1.2: Ensure continuity of care during solid organ transplant patient transitions between care settings.

Objective R1.2.1: (Applying) Manage transitions of care effectively for solid organ transplant patients.

Criteria:

- Participates in thorough medication reconciliation when necessary.
- When appropriate, follows up on identified drug-related problems, additional monitoring, and education in a timely and caring manner.
- Provides accurate, pertinent, and timely follow-up information when patients transfer to another facility, level of care, pharmacist, or provider, as appropriate.
- Takes appropriate and effective steps to help avoid unnecessary hospital admissions and/or readmissions.
- Provides appropriate information to other pharmacists in transitions to mitigate medication therapy problems.
- Ensures patients receive needed medications.
- When appropriate, participates in pediatric to adult care transition process.

Goal R1.3: Manage and facilitate delivery of medications to support safe and effective drug therapy for solid organ transplant patients.

Objective R1.3.1: (Applying) Facilitate delivery of medications for solid organ transplant patients following best practices and local organization policies and procedures.

Criteria:

- Correctly interprets appropriateness of a medication order before preparing or permitting the distribution of the first dose, including:

- Identifying, clarifying, verifying, and correcting any medication order errors.
- Considering complete patient-specific information.
- Identifying existing or potential drug therapy problems.
- Determining an appropriate solution to an identified problem.
- Securing consensus from the prescriber for modifications to therapy.
- Ensuring that the solution is implemented.
- Obtains agreement on modifications to medication orders when acting in the absence of, or outside, an approved protocol or collaborative agreement.
- Ensures appropriate dosing, preparation, and dispensing the following types of medications:
 - Biologic agents
 - Blood factor products
 - Cytotoxic medications
 - Immunosuppressive agents
- References appropriate literature resources to ensure use of proper practices regarding compatibility, fluid overload, and concentrations.
- Ensures discharge medications are appropriate and facilitates accurate and timely acquisition of drug supply and prescriptions for transplant patients.

Objective R1.3.2: (Applying) Manage aspects of the medication-use process related to formulary management for solid organ transplant patients.

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.
- Identifies appropriate routes of communication for formulary information.
- Identifies when formulary changes must be made immediately.
- Demonstrates commitment to medication safety.

Objective R1.3.3: (Evaluating) When presented with a real or hypothetical drug shortage, identify appropriate alternative medications.

Criteria:

- States resources for identifying medications in short supply.
- Demonstrates understanding of the organization's system for communicating information regarding drug shortages.
- Makes optimal choices for alternative medications.
- Selects appropriate strategies for allocating existing supplies of a drug in short supply.

Competency Area R2: Advancing Practice and Improving Patient Care

Goal R2.1: Demonstrate ability to manage formulary and medication-use processes for solid organ transplant patients, as applicable to the organization.

Objective R2.1.1: (Creating) Prepare or revise a protocol, treatment guideline, drug class review or monograph; implement a proposal for medication safety technology improvement; or develop a new clinical service related to care of solid organ transplant patients.

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 and timeliness in presenting pharmacy concerns, solutions, and interests to internal and external stakeholders.
- When appropriate, may include proposals for medication-safety technology improvements.
- Effectively employs clinical, humanistic, and economic outcome strategies to justify solid organ transplant pharmacy services, as applicable.
- Appropriately documents outcomes of solid organ transplant pharmacy services.
- Employs effective strategies to implements a new solid organ transplant pharmacy service.

Objective R2.1.2: (Applying) Participate in medication event reporting process related to care for solid organ transplant patients.

Criteria:

- Effectively uses currently available technology and automation that supports a safe medication-use process.
- Appropriately and accurately determines, investigates, reports, tracks, and trends adverse drug events, medication errors, and efficacy concerns using accepted institutional resources and programs or demonstrates understanding of these processes.
- Demonstrates understanding of the importance of, and procedures for, monitoring compliance within the program.

Objective 2.1.3: (Analyzing) Identify opportunities for improvement of the medication-use system related to care for solid organ transplant patients.

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/guidelines, Joint Commission sentinel event alerts, Centers for Medicare and Medicaid Services).

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 2.2.1: (Analyzing) Identify and/or demonstrate understanding of a specific project topic to improve care of solid organ transplant patients or for a topic to advance the solid organ transplant pharmacy profession.

Criteria:

- Appropriately identifies or understands problems and opportunities for improvement or research projects.
- Conducts a comprehensive literature search and draws appropriate conclusions.
- Determines an appropriate research question or topic for a practice-related project of significance to patient care that can realistically be addressed in the desired time frame.
- 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 for the care of solid organ transplant patients or for a topic for advancing the solid organ transplant pharmacy profession.

Criteria:

- Develops specific aims, selects an appropriate study design, and develops study methods to answer the research question(s).
- 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 and/or basic pharmacoeconomic principles, if needed.
- Develops a feasible design for a prospective or retrospective clinical or outcomes analysis project that considers who or what will be affected by the project.
- Identifies and obtains necessary approvals, (e.g., IRB, quality review board, funding) and responds promptly to feedback or reviews for a practice-related project.
- Acts in accordance with the ethics of research on human subjects, if applicable.
- Implements the project as specified in its design.
- Plan design is practical to implement and is expected to remedy or minimize the identified challenge or deficiency.

Objective 2.2.3: (Evaluating) Collect and evaluate data for a practice quality improvement or research project for the care of solid organ transplant patients or for a topic for advancing the solid organ transplant pharmacy profession.

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.
- 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.

Objective 2.2.4: (Applying) Implement a quality improvement or research project to improve patient care for solid organ transplant patients or for a topic for advancing solid organ transplant pharmacy.

Criteria:

- Plan is based on appropriate data.
- Effectively presents plan (e.g., accurately recommends or contributes to recommendation for operational change, formulary addition or deletion, implementation of medication guideline or restriction, or treatment protocol implementation) to appropriate audience.
- Demonstrates appropriate assertiveness in presenting pharmacy concerns, solutions, and interests to external stakeholders.
- Gains necessary commitment and approval for implementation.
- Follows established timeline and milestones.
- Effectively communicates any changes in medication formulary, medication usage, or other procedures to appropriate parties.
- Outcome of change is evaluated accurately and fully.

Objective R2.2.5: (Evaluating) Assess changes or need to make changes to improve care for solid organ transplant patients or for a topic for advancing solid organ transplant pharmacy.

Criteria:

- Evaluate data and/or outcome of project accurately and fully.
- Includes operational, clinical, economic, and humanistic outcomes of patient care, if applicable.
- Uses continuous quality improvement (CQI) principles to assess the success of the implemented change, if applicable.
- Correctly identifies need for additional modifications or changes based on outcome.
- 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 or research report suitable for publication related to care of solid organ transplant patients or for a topic for advancing solid organ transplant 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.
- Oral presentations 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.

Competency Area R3: Leadership and Management

Goal R3.1: Demonstrate leadership skills for successful self-development in the provision of care for solid organ transplant patients.

Objective R3.1.1: (Applying) Demonstrate personal, interpersonal, and teamwork skills critical for effective leadership in the provision of care for solid organ transplant patients.

Criteria:

- Demonstrates efficient time management.
- Manages conflict effectively.
- Demonstrates effective negotiation skills.
- Demonstrates ability to lead interprofessional 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.
- Effectively provides leadership in patient care related services, including interprofessional teams.

Objective R3.1.2: (Applying) Apply a process of ongoing self-evaluation and personal performance improvement in the provision of care for solid organ transplant 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 R3.2: Demonstrate management skills in the provision of care for solid organ transplant patients.

Objective R3.2.1: (Applying) Contribute to solid organ transplant pharmacy departmental management.

Criteria:

- Participates actively in the development and maintenance of educational modules for training of pharmacists and other health care professionals in transplant.
- 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.

Objective R3.2.2: (Applying) Manage one's own solid organ transplant practice effectively.

Criteria:

- Review and interpret the most recent primary literature.
- Evaluate clinical practice activities for potential contributions to scholarship.
- Serves effectively as an authoritative resource on the optimal use of medications for solid organ transplant patients.
- 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, planning to pursue board certification.
- Demonstrates pride in and commitment to solid organ transplant through membership in professional organizations related to solid organ transplant.
- Demonstrates personal commitment to and adheres 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 solid organ transplant patients, caregivers, health care professionals, students, and the public (individuals and groups).

Objective R4.1.1: (Applying) Design effective educational activities related to solid organ transplant.

Criteria:

- Accurately defines educational needs, including learning styles, with regard to target audience (e.g., individual versus group) and learning level (e.g., health care professional versus patient, student versus PGY1 resident).
- Selects topics of significance to solid organ transplant pharmacy as outlined in the appendix.
- 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 solid organ transplant.

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 solid organ transplant.

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 reader's 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 solid organ transplant.

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, reviews, and applies 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 in solid organ transplant.

Objective R4.2.1: (Applying) Effectively employ preceptor roles, as appropriate, when instructing, modeling, coaching, or facilitating skills related to solid organ transplant.

Criteria:

- Accurately assesses the learner's skill level to determine the appropriate preceptor role for providing practice-based teaching.
- 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 SOLID ORGAN TRANSPLANT POSTGRADUATE YEAR TWO (PGY2) 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 variations in the expectations of different colleges/schools of pharmacy for teaching, practice, research, and service, including public versus private colleges/schools of pharmacy and relationships between scholarly activity and teaching, practice, research and service.
- Accurately describes the academic environment, including how the decisions by university and college administration impact the faculty and how outside forces (e.g., change in the profession, funding source, accreditation requirements) that impact administrator and faculty roles.
- Accurately described faculty roles and responsibilities.
- Accurately describes the types and ranks of faculty appointments, including the various types of appointments (e.g., non-tenure, tenure-track, and tenured faculty), various ranks of faculty (e.g., instructor, assistant professor, associate professor, full professor), and the role and implications of part-time and adjunct faculty as schools continue to expand and faculty shortages occur, and promotion and tenure process for each type of appointment, including types of activities that are considered in the promotion process and for tenure.
- Accurately explains the role and influence of faculty in the academic environment, including faculty in governance structure (e.g., the faculty senate, committee service) and faculty related to teaching, practice, research, and service roles (e.g., curriculum development and committee service).
- Accurately identifies resources available to help develop academic skills, including the role of academic-related professional organizations (e.g., AACP) and other resources to help develop teaching skills and a teaching philosophy.
- 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:
 - Self-reflection on personal beliefs about teaching and learning;
 - Identification of attitudes, values, and beliefs about teaching and learning; and,
 - Illustrates personal beliefs on practice and how these beliefs and experiences are incorporated in a classroom or experiential setting with trainees.
 - 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 measurable 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.
- For experiential activities:
 - Organizes student activities (e.g., student calendar);
 - Effectively facilitates topic discussions and learning activities within the allotted time;

- Effectively develops and evaluates learner assignments (e.g., journal clubs, presentations, SOAP notes);
- Effectively assesses student performance; and,
- Provides constructive feedback.

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

Criteria:

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

Competency Area E2: Publishing

Goal E2.1: Write for publication pertinent medication-use information on transplant-related topics for health care professionals and/or the public.

Objective E2.1.1: (Creating) Use knowledge of the purpose of a particular publication to write pertinent transplant-related information for health care professionals and/or the public.

Criteria:

- Accurately identifies transplant-related topics that would be suitable for a particular audience.

Objective E2.1.2: (Creating) Submit a suitably formatted article on a transplant-related topic for peer-reviewed publication.

Criteria:

- Demonstrates understanding of appropriate formatting for an article.
- Quality of article is appropriate for a peer-reviewed publication.
- Successfully submits article in a timely manner.

Objective E2.1.3: (Evaluating) Provide peer review of a pharmacy or transplant-related article for a publication.

Criteria:

- Identifies appropriate areas for comment.
- Comments address appropriate areas.
- Comments are constructive and specific.

Competency Area E3: Clinical Investigations

Goal E3.1: Contribute to the operation of a system that prepares and distributes investigational transplant-related medications.

Objective E3.1.1: (Evaluating) Evaluate relevant aspects of a transplant-related investigational drug study.

Criteria:

- Accurately identifies factors to consider (e.g., impact on pharmacy budget, personnel) when determining the feasibility of a proposed transplant-related investigational drug study.
- Demonstrates understanding of drug procurement, storage, preparation, administration, and accountability considerations for investigational or other research-related drugs.
- Identifies phases of the investigational drug development process and the objectives for each phase as it applies to gaining FDA approval of transplant-related drugs.
- Identifies the steps in the investigational drug protocol approval process.
- Demonstrates understanding of the purposes of standard sections of investigational protocols for transplant-related therapy.
- Considers relevant factors when judging the adequacy of the informed consent document.
- Demonstrates understanding of the laws and regulations governing informed consent (and, in pediatric patients, assent) and conduct of clinical research.

Objective E3.1.2: (Applying) Manage the use of transplant-related investigational drugs according to established protocols and the organization's policies and procedures.

Criteria:

- Demonstrates understanding of relevant protocols.
- Demonstrates understanding of the organization's policies and procedures.
- Effectively manages investigational drugs.

Objective E3.1.3: (Understanding) Compare and contrast record-keeping requirements of various agencies regulating transplant-related clinical research studies.

Criteria:

- Demonstrates understanding of the process for reporting adverse reactions to drugs used in a transplant-related investigational protocol.

Competency Area E4: Medication-Use Evaluations

Goal E 4.1: Lead a medication-use evaluation.

Objective E4.1.1 (Evaluating) Lead a medication-use evaluation related to care of solid organ transplant patients.

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.

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This document replaces the educational goals and objectives for PGY2 solid organ transplant pharmacy programs approved by the ASHP Board of Directors September 28, 2007.

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The effective date for implementation of these educational competency areas, goals and objectives is commencing with the entering resident class of July 2018.

PGY2 Pharmacy Residencies in Solid Organ Transplant Appendix

The resident will demonstrate an understanding of 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 related to solid organ transplant and have the ability to design appropriate treatment regimens and treat and assess outcomes.

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 diseases and conditions in transplantation.

PGY2 pharmacy residencies in solid organ transplant may vary according to the types of transplantation performed by the organization's transplant program. However, learning experiences in direct patient care occurring in both acute and ambulatory practice settings are expected. A pharmacy residency in solid organ transplant must provide direct clinical experience and build core didactic knowledge in a minimum of two of the following types of transplantation:

- Heart
- Intestine
- Kidney
- Liver
- Lung
- Pancreas/islet

Other learning experiences may be tailored to the specific needs and interests of the resident. Solid organ transplant pharmacy residency programs that are able to offer experience with any of the following should consider their inclusion in core or elective learning experiences:

- Advanced critical care
- Bone marrow/stem cell transplant
- Clinical research
- Corneal transplant
- Pediatric transplant
- Transplant infectious disease
- Vascular composite allograft transplant

The list of topics below represents core areas or diseases that graduates of PGY2 Solid Organ Transplant programs are expected to have adequate knowledge of to provide patient care. The primary method for PGY2 Solid Organ Transplant 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.

For this purpose, residents are required to have direct patient care experience for topics listed in the second column, "**Required – Direct Patient Care Experience**". Topics in the third column, "**Required Direct Patient Care Experience or Case-Based/Topic Discussion Approach Acceptable**", may be covered

by direct patient care or by case-based application through didactic discussion, reading assignments, case presentations, and/or written assignments. Topics in the fourth column, “**Elective Patient Experience**”, are considered optional topics or disease states that programs may include if applicable to the program’s patient population. Elective areas may be covered by direct patient care or by case-based application through didactic discussion, reading assignments, case presentations, and/or written assignments.

As a preface for “Diseases or conditions that frequently underlie or are an indication for transplantation”, it is left to the discretion of the program director to select the particular indications for transplantation and aspects of management of focus based on diagnoses leading to transplant as categorized by the United Network for Organ Sharing (UNOS) and those most relevant to their program’s goals. It is anticipated that those disease states comprising a larger fraction of transplant indications and those with implications for recipient preparation or specific post-transplant management due to recurrence of underlying disease or other complications would receive greater emphasis. Example conditions with recurrence concerns include, but are not limited to, focal segmental glomerulosclerosis, IgA nephropathy, atypical hemolytic uremic syndrome, membranoproliferative glomerulonephritis, systemic lupus erythematosus, autoimmune hepatitis, viral hepatitis, and hepatocellular carcinoma.

Topics	Required direct patient care experience	Required direct patient care experience or case-based/ topic discussion approach acceptable	Elective patient experience and/or case-based or topic discussion
Transplant overview		History of solid organ transplant and associated outcomes Basics of transplant immunology	
Diseases or conditions that frequently underlie or are an indication for transplantation	<i>At least two</i> of the following must be direct patient : <ul style="list-style-type: none"> • Kidney transplantation • Pancreas and/or islet cell transplantation • Liver transplantation • Intestine transplantation • Heart transplantation • Lung transplantation 	Any of the following which are not covered by a direct patient care experience: <ul style="list-style-type: none"> • Kidney transplantation • Pancreas and/or islet cell transplantation • Liver transplantation • Intestine transplantation • Heart transplantation • Lung transplantation 	
Pre-transplant phase	Pre-transplant evaluation review (in person or chart review as part of the selection committee)	Contraindications to transplant (relative and absolute) Sensitizing factors Consideration for induction and maintenance immunosuppression	Care of patients with end-stage organ disease (e.g. – cystic fibrosis, complications of cirrhosis, mechanical circulatory devices)

		Immunization recommendations	
Peri-operative phase		Basics of transplant surgical procedure Organ procurement Preservation process	
Pre- and intra-operative transplant pharmacologic considerations	Induction considerations	Desensitization strategies ABO-incompatible transplant strategies Induction types <ul style="list-style-type: none"> • Lymphocyte depleting • Non-lymphocyte depleting 	
Post-transplant pharmacologic considerations	Maintenance Immunosuppression/immunomodulation considerations	Maintenance immunosuppression strategies <ul style="list-style-type: none"> • Antimetabolites • Calcineurin inhibitors and minimization • Corticosteroids and avoidance/withdrawal/minimization • Costimulation inhibitors • mTOR inhibitors 	New immunomodulatory agent/transplant drug development
Rejection and treatment strategies	Acute cellular rejection Acute antibody mediated rejection	Chronic rejection	
Infection considerations	Infection prophylaxis, monitoring and treatment strategies Surgical infectious prophylaxis	Adenovirus BK polyomavirus nephropathy and screening and treatment Central venous catheter infections and treatment options CMV and EBV Fungus (e.g. <i>Candida sp.</i> , <i>Aspergillus sp.</i> , <i>Endemic fungi</i>) Hepatitis B virus prophylaxis and treatment Hepatitis C virus treatment Herpes simplex and zoster	Human papillomavirus Respiratory syncytial virus prophylaxis and treatment

		<p>Human immunodeficiency virus</p> <p>Immunizations Post-transplant</p> <p>Infectious exposure management</p> <ul style="list-style-type: none"> • Measles • Varicella <p>Mycobacteria</p> <p>Nocardia</p> <p>Parasites</p> <p>Parvovirus B19</p> <p>Pneumocystis pneumonia</p> <p>Sepsis</p> <p>Tuberculosis</p> <p>Urinary tract infections/pyelonephritis</p>	
Post-transplant malignancy considerations		<p>Post-transplant lymphoproliferative disease (PTLD)</p> <p>Risk of new malignancy or recurrent malignancy</p>	<p>Kaposi's sarcoma</p> <p>Lymphoma</p> <p>Skin cancer</p> <ul style="list-style-type: none"> • Squamous cell carcinoma • Basal cell carcinoma
Other post-transplant medical considerations		<p>Management of pregnancy in transplantation</p> <p>Cardiovascular [e.g. Cardiovascular risk management, congestive heart failure (CHF), coronary artery disease (CAD), hemodynamic conditions, hyperlipidemia, hypertension]</p> <p>Endocrine [e.g. - Post transplantation diabetes mellitus (PTDM), metabolic diseases (metabolic syndrome), hyperparathyroidism, osteoporosis/bone disease,</p>	<p>Erectile dysfunction</p> <p>Nutrition (parenteral & enteral)</p>

		<p>gout, pancreatitis, pediatric growth impairment]</p> <p>Gastrointestinal (e.g. malnutrition/anorexia, nausea/vomiting/diarrhea, eosinophilic esophagitis)</p> <p>Hematologic [e.g., bone marrow suppression (leukopenia, anemia, thrombocytopenia), post transplant erythrocytosis (PTE)]</p> <p>Hepatic (e.g., biliary complications and management, hepatotoxicity)</p> <p>Neurological (e.g. - Calcineurin inhibitor neurotoxicity, depression, headache, neurogenic bladder)</p> <p>Pulmonary [e.g. - Bronchiolitis obliterans organizing pneumonia (BOOP), interstitial pneumonitis, pulmonary edema]</p> <p>Renal (e.g. - acute tubular necrosis, calcineurin inhibitor nephrotoxicity, dehydration, electrolyte imbalances, hemolytic uremic syndrome/thrombotic thrombocytopenic purpura , proteinuria, renal tubular acidosis)</p> <p>Surgical/technical complications (e.g. – bleeding, hydronephrosis, ischemia/reperfusion injury, lymphocele, obstruction/leak, pain, primary graft non-function, technical graft loss, thrombosis prophylaxis and treatment)</p>	
<p>Psychosocial concerns</p>	<p>Nonadherence</p> <ul style="list-style-type: none"> • Consequences of nonadherence • Factors impacting nonadherence • Strategies to improve adherence 	<p>Pediatric to adult transition of care</p> <p>Medication and medical access</p> <ul style="list-style-type: none"> • Public vs. private • Patient assistance programs 	

Transplant regulations and quality		UNOS/Organ Procurement and Transplantation Network regulations Centers for Medicare and Medicaid Services regulations Risk Evaluation and Mitigation Strategies Organ allocation Medication distribution programs	