

# REQUIRED COMPETENCY AREAS, GOALS, AND OBJECTIVES FOR POSTGRADUATE YEAR TWO (PGY2) PEDIATRIC PHARMACY and PEDIATRIC SPECIALTY PATHWAY (PSP) RESIDENCIES

Prepared in collaboration with the Pediatric Pharmacy Association

## Introduction

ASHP and the Commission on Credentialing (COC) strongly support the stated mission of the Pediatric Pharmacy Association which is to *“advance pediatric pharmacy practice, support the health and wellbeing of children, and promote safe and effective medication use in children through Collaboration, Advocacy, Research, and Education (CARE)”*.

The COC supports the education of pharmacists in pediatric pharmacy practice and advocates for residency training of advanced level practitioners to sustain and support the complex pharmaceutical care needs of the pediatric population. This document outlines the required PGY2 Competency Areas Goals and Objectives (CAGOs) for residents to demonstrate for successful completion of a PGY2 Pediatric pharmacy residency program, including PGY2 Pediatric Specialty Pathway (PSP) programs.

Accredited PGY2 Pediatric pharmacy residency programs may apply for the Pediatric Specialty Pathway designation. If approved, programs may additionally operate a *PGY2 Pediatric Pharmacy Residency with Specialty Pathway*, in either Critical Care, Oncology, or both (i.e., a program may operate all three pathways if approved to do so).

Programs seeking to conduct PGY2 Pediatric residency programs with added PSP designation(s) (e.g., *PGY2 Pediatric Pharmacy Residency with Specialty Pathway in Critical Care*) must provide ASHP with a completed request form (specific to type) located on the website prior to initial recruitment in the Match. The request form indicates specific criteria an institution must meet to provide PSP residency training. ASHP Accreditation Services Office, along with the COC, will determine the approval of the added designation status (and any future areas) to an existing or accreditation pending status PGY2 Pediatric residency program. Programs must be authorized by ASHP, in order to receive a Match code for recruitment under the designated status.

## CAGO Overview

PGY2 pharmacy residency programs build upon Doctor of Pharmacy (PharmD) education and PGY1 pharmacy residency training to develop pharmacist practitioners with knowledge, skills, and abilities as defined in the PGY2 CAGOs for advanced practice areas. The PGY2 CAGOs outlined in this document are for use in conjunction with the *ASHP Accreditation Standard for Postgraduate Pharmacy Residency Programs*. Residents who successfully complete PGY2 residency programs are prepared for advanced patient care or other specialized positions, and board certification in the advanced practice area, if available.

The PGY2 CAGOs are designed to advance the residents' level of practice beyond PGY1 training, to facilitate additional growth and skillset development, by elevating objectives' taxonomy levels.<sup>1,2</sup> Programs develop activities specific to the learning experiences to facilitate the achievement of the objectives.

## Definitions of Educational Terminology

Competency Areas: Categories of resident(s) knowledge, capabilities, and skillsets. The four PGY2 competency areas (Patient Care, Practice Advancement, Leadership and Management, Teaching and Education) and their associated goals and objectives are required and must be included in all programs.

Educational Goals (Goal): Broad statement of desired outcomes.

Educational Objectives (Objective): Observable, measurable statements describing what residents will achieve by completing activities in a residency program.

Criteria: Statements that describe competent performance, behaviors, or skills related to the educational objective. Multiple criteria are provided to align with the activities developed by programs.

Activities: Activities are what residents will do to learn and practice the skills described in objectives. Learning activities must be developed by each residency program, for each educational objective in the learning experience descriptions. Activities should match the taxonomy learning level stated in parentheses before each objective.

Appendix: A list of fundamental topics necessary to provide optimal patient care in the advanced practice area. Required topics are categorized as either direct patient care experiences or non-direct patient care experiences. Elective topics are listed for programs to consider based on the opportunities in their program.

1. Bloom, B., Englehart, M. Furst, E., Hill, W., & Krathwohl, D. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*. New York, Toronto: Longmans, Green.

2. Nimmo, CM. *Developing training materials and programs: creating educational objectives and assessing their attainment*. In: Nimmo CM, Guerrero R, Greene SA, Taylor JT, eds. *Staff development for pharmacy practice*. Bethesda, MD: ASHP; 2000.

## COMPETENCY AREA R1: Patient Care

### Goal R1.1: Provide advanced patient care services in the practice area, following JCPP Pharmacists' Patient Care Process.<sup>1</sup>

#### Objective R1.1.1: (Analyzing) Collect relevant comprehensive information (subjective and objective) for advanced patient care in the practice area.

##### Criteria:

- Uses a systematic and organized approach to gather and verify information from appropriate sources (e.g., existing patient records, the patient, caregivers, and other healthcare professionals).
- Review medication list and medication-use history for prescription and nonprescription medications; including but not limited to dietary supplements, illicit and recreational substances, non-traditional therapies, immunizations, allergies, adverse drug reactions, and medication adherence and persistence.
- Identify relevant health data including medical and social history, health and wellness information, laboratory and biometric test results, physical assessment findings, and/or pharmacogenomics and pharmacogenetic information, if available.
- Determines patient lifestyle habits, preferences and beliefs, health literacy, health and functional goals, socioeconomic factors, and/or other health-related social needs that affect access to medications and other aspects of care.
- Determines missing objective information and performs appropriate physical assessment, orders laboratory tests, and/or conducts point of care testing, as applicable.

#### Objective R1.1.2: (Evaluating) Assess clinical information collected and analyze its impact on the patient's overall health goals and any existing unmet needs within the practice area.

##### Criteria:

- Determines appropriateness, effectiveness, and safety of each medication.
- Interprets clinical information appropriately as part of assessment.
- Identifies unmet healthcare needs of the patient when compared to population health data.
- Identifies medication therapy problems accurately.
- Includes health-related social needs and considers social determinants of health (SDOH) as part of assessment.
- Considers preventive health strategies as part of assessment.
- Accurately applies evidence-based medicine and guidelines to individual patient care which reflects patient's values, preferences, priorities, understanding, and goals.

#### Objective R1.1.3: (Creating) Formulate a comprehensive patient-centered care plan, focused on medication optimization for advanced patient care in the practice area.

##### Criteria:

- Prioritizes formulary medications, as appropriate.
- Facilitates access to non-formulary medications consistent with departmental or organizational policies and procedures.
- Deduces most appropriate medication route of administration to align with optimal patient outcomes and/or preferences.
- Chooses and follows the most appropriate evidence and/or guidelines.

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<sup>1</sup> Joint Commission of Pharmacy Practitioners. *Pharmacists' Patient Care Process*. May 29, 2014. Available at: <https://jcpp.net/wp-content/uploads/2016/03/PatientCareProcess-with-supporting-organizations.pdf>.

- Addresses medication-related problems and optimizes medication therapy, in alignment with pertinent medication-use policies.
- Addresses health-related social needs and other social determinants of health (SDOH) as part of the care plan.
- Addresses preventive health strategies as part of the care plan.
- Engages the patient in shared decision making, as appropriate.
- Sets realistic and measurable goals of therapy for achieving clinical outcomes in the context of patient's overall healthcare goals, understanding, preferences, priorities, and access to care.
- Identify when a patient requires an alternate level or method of care.

**Objective R1.1.4: (Applying) Facilitate the implementation of the comprehensive patient-centered care plan, incorporating relevant clinical optimization and/or operational processes for advanced patient care in the practice area.**

Criteria:

- Appropriately initiates, modifies, discontinues, or administers medication therapy, as authorized.
- Ensures timely completion of medication orders, prescriptions, and/or medication coverage determinations that are aligned with pertinent medication-use policies to optimize patient care.
- Modifies medication administration method to ensure optimal pharmacokinetic and/or pharmacodynamic effects for an individual patient.
- Engages other team members, as appropriate.
- Correctly interprets the appropriateness of a medication order before preparing or permitting the distribution of the first dose.
- Facilitates changes to medication therapy considering access, cost, social determinants of health (SDOH) or other barriers.
- Dispensing medication products accurately and timely.
- Prepares and/or administers medication using appropriate techniques and following the organization's policies and procedures and applicable professional standards.
- Engages the patient through education, empowerment, and self-management.
- Determines and schedules appropriate follow-up care or referrals, as needed, to achieve goals of therapy.

**Objective R1.1.5: (Creating) Follow-up: Monitor the progress of the comprehensive patient-centered care plan, focused on medication optimization and modify to achieve advanced patient care outcomes.**

Criteria:

- Reassesses all medications for appropriateness, effectiveness, safety, and patient adherence through available health data, laboratory and biometric test results, and patient feedback.
- Evaluates clinical endpoints and outcomes of care including progress toward or the achievement of goals of therapy.
- Identifies appropriate modifications to the care plan.
- Establishes a revised care plan in collaboration with other healthcare professionals, the patient, and/or caregivers.
- Communicates relevant modifications to the care plan to the patient, caregivers, and other relevant healthcare professionals, as appropriate.
- Modifies schedule for follow-up care or referral as needed to assess progress toward the established goals of therapy.

**Objective R1.1.6: (Evaluating) Facilitate medication management continuity of care throughout care transitions.**

Criteria:

- Effectively participates in obtaining or validating a thorough and accurate medication history.
- Conducts a thorough and accurate medication reconciliation.
- Routinely identifies potential and actual medication-related problems for patients who are experiencing care transitions.
- Provides medication management, when appropriate.
- Considers the appropriateness of medication therapy during care transitions.
- Evaluates cost, availability, coverage, and affordability of medication therapy.
- Takes appropriate actions on identified medication-related problems, including steps to help avoid unnecessary use of healthcare resources.
- Provides effective medication education to the patient and/or caregiver.
- Identifies appropriate resources for patients in transition and makes appropriate connections or referrals to resolve issues.
- Follows-up with patient in a timely manner, as appropriate.
- Provides accurate and timely follow-up information when patients transfer to another facility, level of care, pharmacists, or provider, as appropriate.

**Objective R1.1.7: (Analyzing) Recognize and respond appropriately to urgent or emergent patient care situations in the practice area.**

Criteria:

- Obtains appropriate certification or training to facilitate responding competently to urgent or emergent patient care situations.
- Correctly identifies situations as urgent or emergent patient care situations and responds appropriately.
- Acts in accordance with the organization's policies and procedures.
- Anticipates pharmacologic and nonpharmacologic therapy needs.
- Accurately prepares/dispenses medication, as appropriate.
- Effectively communicates with the interdisciplinary team.
- Effectively communicates with the patient and/or care givers, if applicable.

**Goal R1.2: Provide advanced patient-centered care through interacting and facilitating effective communication with patients, caregivers, and stakeholders in the practice area.**

**Objective R1.2.1: (Analyzing) Collaborate and communicate with healthcare team members to achieve patient care outcomes in the advanced practice area.**

Criteria:

- Adheres consistently and appropriately to the Core Principles & Values for Effective Team-based Health Care.<sup>2</sup>
- Follows the organization's communication policies and procedures.
- Demonstrates appropriate skills in negotiation, conflict management, and consensus building.
- Interacts collaboratively and respectfully.
- Advocates for the patient.
- Chooses an appropriate form of communication with team members based on type and urgency of information, recommendation, and/or request.
- Recommends or communicates patients' regimens and associated monitoring plans to relevant members of the healthcare team clearly, concisely, persuasively, and timely.

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<sup>2</sup> Mitchel et al. Core Principles & Values of Effective Team-Based Health Care. Available at: <https://www.nationalahaec.org/pdfs/vsrt-team-based-care-principles-values.pdf>

**Objective R1.2.2: (Applying) Interact effectively with patients and caregivers to achieve patient care outcomes in the advanced practice area.**

Criteria:

- Uses optimal method(s) to interact, in-person and/or virtually, with patients and caregivers including any accommodations to alleviate specific barriers to communication (e.g., patient-friendly language, language services, assistive technology, visual aids).
- Addresses communication barriers during telehealth interactions, as applicable.
- Interacts in a respectful, collaborative, empathetic, and personalized manner.
- Follows the organization's communication policies and procedures.
- Uses appropriate motivational interviewing techniques and open-ended questions to facilitate health behavior change.
- Considers non-verbal cues and adjusts delivery, when needed.
- In addition to an oral summary, provides a written summary of recommended medication-related changes and other pertinent educational materials and available resources, as appropriate.

**Objective R1.2.3: (Applying) Document patient care activities in the medical record, or where appropriate in the advanced practice area.**

Criteria:

- Selects appropriate information to document.
- Documents services provided, actions taken, interventions performed, referrals made, and outcomes achieved, as applicable.
- Documents in a timely manner.
- Follows the organization's documentation policies and procedures.
- Documents appropriately to support coding, billing, and compensation.
- Ensures security of Protected Health Information (PHI) throughout the documentation process.

**Goal R1.3: Evaluate the effectiveness of the medication-use system for a patient population (i.e., population health management) in the advanced practice area.**

**Objective R1.3.1: (Analyzing) Utilize population health data (e.g., dashboards, organizational health data, and/or published literature) to identify and work to close gaps(s) in medication-related care in individual patients in the advanced practice area.**

Criteria:

- Recognizes patterns within aggregate patient data (i.e., defined population data).
- Interprets outcomes benchmarks and dashboards, as applicable.
- Compares outcomes of population data to evidence-based or best practice guidelines and/or established benchmarks (e.g., Star ratings, quality metrics).
- Identifies areas for improved patient care management based on population data.
- Provides targeted interventions for individual patients within a defined group to improve overall population outcomes.
- Recommends appropriate services to patients, providers, or health plans to help improve patient and population outcomes.
- Engages leaders to determine necessary resource(s) to improve patient and population outcomes and promote equitable care.

**Objective R1.3.2: (Evaluating) Implement or improve processes aimed at optimizing medication and/or patient safety in the advanced practice area.**

Criteria:

- Adheres to concept of allowing for safe to report errors and near misses without fear of punishment, allowing for open learning and system improvements (e.g., *Just Culture*<sup>3</sup>).
- Participate in the medication safety improvement process within an interprofessional committee.
- Participation in medication event reporting and trending.
- Analyzes compliance with organization utilization management criteria and procedures.
- Develop or implement a new medication safety process.
- Participate in the medication-use policy development and communication process.

**Objective R1.3.3: (Creating) Develop or revise and/or modify a drug class review, treatment guideline, treatment protocol/pathway, collaborative practice agreement, utilization management criteria, and/or order set in the advanced practice area.**

Criteria:

- Uses the appropriate format.
- Evaluates and applies evidence-based principles.
- Effectively synthesizes information from available literature.
- Incorporates all relevant sources of information pertaining to the topic being reviewed.
- Applies medication-use safety and resource utilization information.
- Proposes changes to formulary and/or utilization management criteria based on findings of assessment.
- Demonstrates appropriate assertiveness and timeliness if presenting pharmacy concerns, solutions, and interests to internal and/or external stakeholders.
- Delivers content objectively.
- Includes proposals for medication-safety technology considerations and improvements, when appropriate.
- Includes considerations for addressing established health equity concerns, when appropriate.
- Effectively communicates any changes in medication formulary, medication usage, or other procedures, if applicable.

**Objective R1.3.4: (Evaluating) Share actionable recommendations to stakeholders to improve the medication-use process in the advanced practice area.**

Criteria:

- Prepares appropriate written materials to communicate the recommendations.
- Prepares verbal presentation to stakeholders, as appropriate.
- Delivers written and/or verbal presentation of recommendations to shareholders.

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<sup>3</sup> Boysen PG 2nd. Just culture: a foundation for balanced accountability and patient safety. Ochsner J. 2013 Fall;13(3):400-6. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC3776518/>.

## Competency Area R2: Practice Advancement

### Goal R2.1: Conduct practice advancement projects.

#### Guidance

Objectives R2.1.1-R2.1.6 will be addressed through resident completion of a “major” and “secondary” projects. Each resident is required to complete:

**Major project:** Defined as a longitudinal project with significant breadth intended to advance pharmacy practice. All Objectives (2.1.1-2.1.6) must be assigned to the learning experience(s), which contain the major project. Surveyors will review the project report for the major project, including both:

- Platform style or poster presentation to an external audience (e.g., regional residency conference or comparable professional meeting).
- Written report (e.g., manuscript and/or formal written report suitable for invested parties).

**Secondary (“minor”) project:** Defined as work on another project, which can be minor in scope. Examples of a secondary project may include: MUE, clinical program development/enhancement/analysis, pipeline forecast, cost or budget analysis, quality assurance. The secondary project must, at a minimum, be assigned to the learning experience where Objective R2.1.6 is taught and evaluated. Surveyors will review the project report for the secondary “minor” project.

#### **Objective R2.1.1: (Analyzing) Identify a project topic, or demonstrate understanding of an assigned project, to improve pharmacy practice, clinical care, patient safety, healthcare operations, or investigate gaps in knowledge related to patient care in the advanced practice area.**

Criteria:

- Explains concepts associated with project development.
- Appropriately identifies or understands problems and opportunities for projects (e.g., health information technology gaps, evaluation of newly implemented medication-use process, clinical programs).
- Conducts a thorough literature analysis to contextualize project scope.
- Determines an appropriate question or topic for a practice-related project that can realistically be addressed in the available time frame.
- Uses best practices or evidence-based principles to identify opportunities related to the project.

#### **Objective R2.1.2: (Creating) Develop a project plan related to the advanced practice area.**

Criteria:

- Develops specific aims, selects an appropriate project design, and develops suitable methods to complete the project including identifying project team members.
- Includes operational, clinical, economic, and humanistic outcomes of patient care, if applicable.
- Incorporates appropriate quality improvement process design and/or methodology (e.g., standardization, simplification, human factors training, quality improvement process, or other process improvement or research methodologies), if applicable.
- Develops a feasible design for a prospective or retrospective outcomes analysis that considers who or what will be affected by the project.
- Identifies committees or groups to provide necessary approvals, (e.g., intra- or interdepartmental committees, IRB, quality review board, health plan, funding, etc.).
- Develops a feasible project timeline.
- Develops a plan for data collection and secure storage that is consistent with the project intent and design.
- Develops a plan for data analysis.
- Acts in accordance with the ethics of human subject’s research, if applicable.



**Objective R2.1.3: (Applying) Implement project plan related to the advanced practice area.**

Criteria:

- Obtains necessary project approvals (e.g., intra- or interdepartmental committees, IRB, quality review board, health plan, funding, etc.) and responds promptly to feedback or reviews.
- Employs a systematic and organized approach to gathering and storing data.
- Collects appropriate types of data as required by project design.
- Uses appropriate electronic data and information from internal or external databases, Internet resources, and other sources of decision support, as applicable.
- Adheres to the project plan and timeline as closely as possible, adjusting for unforeseeable factors, when necessary.
- Correctly identifies need for additional modifications or changes to the project.

**Objective R2.1.4: (Analyzing) Analyze project results related to the advanced practice area.**

Criteria:

- Uses appropriate methods, including statistics when applicable, for analyzing data in a prospective or retrospective clinical, humanistic, and/or economic outcomes analysis.
- Collaborates with project team members to validate project analysis, as appropriate.

**Objective R2.1.5: (Evaluating) Assess potential or future changes aimed at improving pharmacy practice, improvement of clinical care, patient safety, healthcare operations, or specific question related to patient care in the advanced practice area.**

Criteria:

- Evaluates data and/or outcomes of project accurately and fully.
- Considers the impact of the limitations of the project design on the interpretation of results.
- Accurately assesses the interdisciplinary impact of the project outcomes, including its sustainability, if applicable.
- Considers results of a prospective or retrospective clinical, humanistic, and/or economic outcomes analysis.
- Correctly identifies need for any additional modifications, changes, or follow-up based on project outcome(s).

**Objective R2.1.6: (Creating) Develop and present a final report related to the advanced practice area.**

Criteria:

- Completes all report requirements on time and within assigned time frame.
- Develops a project report that is well-organized and easy to follow.
- Formats written report suitable for project audience.
- Uses effective written and/or oral communication to convey points successfully.
- Submits and/or presents project report to intended audience.
- Summarizes key points at the conclusion of the report.
- Responds to questions in a concise, accurate, and thoughtful manner.
- Delivers a final report for the major project in a manuscript format suitable for publication.

## **COMPETENCY AREA R3: Leadership and Management**

**Goal R3.1: Demonstrate skills necessary for the successful leadership and effective management in the advanced practice area.**

**Objective R3.1.1: (Applying) Engage in practice management of the advanced practice area.**

Criteria:

- Demonstrates ability to lead interprofessional teams.
- Demonstrates understanding of perspectives of various health care professionals.
- Demonstrates a collaborative approach to foster a team environment.
- Engages in the assessment of adequacy of pharmacy services for optimal patient care.
- Works collaboratively within the department and/or organization's political and decision-making structure.
- Engages with system-wide, site-level, or departmental committees to affect change management.
- Demonstrates effective negotiation skills.
- Contributes to committees or informal workgroup projects, tasks, or goals (e.g., contribute to committee discussions, identify pertinent background information, identify data for collection, interpret data, implement corrective action), if applicable.
- Proactively identifies issues or barriers and create potential solutions or management strategies.
- Implements system-wide, site-level, or departmental process changes.
- Operates within the confines of the organization's credentialing and privileging processes.
- Engages in pharmacy planning and practice advancement to meet legal, regulatory, and safety requirements.
- Articulates the purpose and impact of external quality metrics to the practice environment.

**Goal R3.2: Demonstrate leadership skills that foster personal growth.**

**Objective R3.2.1: (Applying) Demonstrate personal and interpersonal skills necessary for effective leadership in the advanced practice area.**

Criteria:

- Recognizes limitations and implements specific steps to address foundational and clinical knowledge gaps.
- Uses principles of continuous professional development (CPD) planning (e.g., accurately reflect on personal strengths and areas for improvement, plan, act, evaluate, record/review).
- Demonstrates ability to receive and consistently incorporate constructive feedback from others.
- Proactively solicits feedback in the provision of leadership development.
- Reviews personal goals and makes adjustments based on performance.
- Sets realistic expectations of performance.
- Fosters open communication to resolve conflict and to influence others.
- Delegates activities and instills ownership of responsibilities.
- Exercises desired behaviors of an advanced practice pharmacist.
- Implements personal strategies to enhance workload and time management skills.
- Prioritizes and organizes all tasks appropriately.
- Prepares appropriately to fulfill daily and longitudinal responsibilities (e.g., patient care, projects, management, and meetings).
- Demonstrates resilience from unanticipated changes and reprioritize responsibilities, as needed.
- Demonstrates self-awareness and emotional intelligence.
- Proactively assumes and takes on increased levels of responsibility.

- Follows through on obligations collaboratively and without prompting.
- Appropriately balances quality and timeliness in all aspects of work.
- Accepts consequences of their actions without redirecting blame to others.

### **Goal R3.3: Engage in professional development.**

#### **Objective R3.3.1: (Applying) Engage in professional activities external to the organization that relate to the advanced practice area.**

Criteria:

- Articulate personal vision and plan for ongoing professional engagement.
- Engages with professional organization(s) that align with the advanced practice area.
- Articulates the benefits of active participation in professional associations at all levels.
- Demonstrates knowledge and awareness of the significance of local, state, and national advocacy activities impacting pharmacy and healthcare.
- Participates appropriately in practice and advocacy activities of national, state, and/or local professional associations.

## **COMPETENCY AREA R4: Teaching and Education**

### **Goal R4.1: Provide effective medication and practice-related education.**

#### **Guidance**

Objectives R4.1.1-R4.1.4 will be addressed through resident activities related to teaching either a small or large group. Oral and written presentations should contain a reasonable depth of information that is appropriate for the target audience. Examples may include continuing education presentation(s), in-service(s), patient education class(es), student lecture(s), student topic discussion(s) for several participants, disease state education handout(s), and guideline summary(ies). Oral or written content that is designed for a single person (e.g., drug information response, discussion with individual student) or that is extremely brief and/or not meant for the delivery of defined education (e.g., update at team meeting or huddle, journal club, marketing flyer), does not meet the intent of these Objectives.

#### **Objective R4.1.1: (Creating) Create educational content and activities for the target audience using knowledge in the advanced practice area.**

Criteria:

- Ascertains learners' needs, health literacy and foundational knowledge.
- Defines educational objectives that are specific, measurable, and appropriate for educational needs and learning level.
- Uses appropriate teaching strategies, including active learning.
- Chooses content that is relevant, thorough, evidence-based, accurate, reflects best practices and aligns with stated objectives.
- Designs instructional materials that meet the needs of the audience.
- Develops educational materials that appropriately match the cultural needs and health literacy level of intended audience.
- Includes accurate citations and relevant references and adheres to applicable copyright laws.

**Objective R4.1.2: (Creating) Create written communication to disseminate knowledge in the advanced practice area.**

Criteria:

- Writes in a manner that is concise, easily understandable, and free of errors.
- Demonstrates thorough understanding of the topic.
- Determines appropriate breadth and depth of information based on audience and purpose of education.
- Includes critical evaluation of the literature and knowledge advancements, and an accurate summary of what is currently known on the topic.
- Develops and accurately uses tables, graphs, and figures to enhance the reader's understanding of the topic, when appropriate.
- Writes at a level appropriate for the target readership (e.g., patients, caregivers, members of the community, pharmacists, learners, and other healthcare professionals).
- Creates visually appropriate documents (e.g., font, white space, and layout).
- Creates materials that are inclusive of all audiences, accommodating any person(s) with health conditions or impairments.
- Creates one's own work and does not engage in plagiarism.
- Notes appropriate citations and references.

**Objective R4.1.3: (Creating) Create and deliver verbal communication to disseminate knowledge in the advanced practice area.**

Criteria:

- Selects teaching method to deliver the material based on the type and level of learning required (cognitive, psychomotor, and affective).
- Incorporates multiple appropriate educational techniques to present content.
- Demonstrates rapport with learners.
- Develops and effectively uses audio-visual and technology tools and handouts to support learning activities as appropriate to the learning environment.
- Demonstrates thorough understanding of the topic.
- Organizes and sequences instruction properly.
- Presents at appropriate level of the audience (e.g., patients, caregivers, members of the community, pharmacists, learners, and other healthcare professionals).
- Speaks at an appropriate rate and volume with articulation and engaging inflection.
- Effectively uses body language, movement, and expressions to enhance presentations.
- Makes smooth transitions between concepts.
- Summarizes important points at appropriate times throughout presentations.
- Demonstrates ability to adapt appropriately during the presentation.
- Captures and maintains learner/audience interest throughout the presentation.
- Responds to questions from participants in a concise, accurate, and thoughtful manner.
- Implements planned teaching strategies effectively.

**Objective R4.1.4: (Evaluating) Implement audience assessment methods and self-assess that educational activities meet the learning goals.**

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.
- Implements planned assessment methods effectively.
- Identifies appropriate time to solicit feedback from the learner.
- Solicits timely, constructive, and criteria-based feedback from the learner.
- Writes assessment questions (if used) in a clear and concise format that reflects best practices.

- Assesses learners for achievement of learning objective(s).
- Identifies and takes appropriate actions when learner fails to understand delivered content.
- Plans for follow-up educational activities to enhance or support learning and ensure objectives were met, if applicable.
- Reflects on the educational activity and how they can improve their provision of education in the future.
- Utilize feedback techniques that cultivate self-awareness and personal growth.

**Goal R4.2: Provide professional and practice-related training to support progression of learners' skills.**

**Objective R4.2.1: (Evaluating) Employ appropriate preceptor role(s) for learning scenarios in the advanced practice area.**

**Guidance**

Objective R4.2.1 will be addressed through resident practice-related training activities for one or more learners. The resident should actively employ appropriate preceptor role(s). If a program cannot provide opportunities to participate in precepting, this Objective may be assigned activities related to the simulation of precepting roles.

**Criteria:**

- Identifies experiential learning opportunities in the practice setting and engages learners appropriately.
- Creates an organized and systematic approach to designing learning experiences for the learner.
- Identifies which preceptor role is applicable for the situation (direct instruction, modeling, coaching, facilitating).
- Accurately assesses the learner's skill level to determine the appropriate preceptor role for providing practice-based teaching.
- Chooses appropriate preceptor roles to stimulate professional growth in learner.
- Adjusts the preceptor role as learner needs change.
- Engages the learner effectively in self-evaluation and self-reflection.
- Provides effective and focused direct instruction when warranted.
- Models critical-thinking skills by including "thinking out loud".
- 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.
- Selects appropriate problem-solving situations for independent learners.

**Objective R4.2.2: (Evaluating) Provide feedback and contribute to the evaluation of the learner in the advanced practice area.**

**Criteria:**

- Provides timely, constructive, and criteria-based feedback to learner, including actionable steps for continued growth and improvement.
- Feedback is based on specific behaviors, actions, or skills directly observed and examples are provided to the learner.
- Delivers feedback in the appropriate setting as soon as possible after the relevant interaction to maximize its impact.
- Uses feedback techniques that are respectful and are aligned with the type of feedback being provided.
- Feedback describes the impact of the learners' behavior or action, when appropriate.

- Provides an appropriate amount of feedback per interaction with the learner, balancing positive and constructive feedback, when appropriate.
- Encourages the learner to ask clarifying questions to ensure that the feedback is understood.
- Encourages the learner to take time to reflect on the feedback and follow up, if needed.
- Reflects on the feedback encountered and how they can improve upon their provision of feedback in the future.

## Guidance for PGY2 Residency Program Deliverables

The table below outlines the minimum required deliverables for the Objectives listed. Programs may set their completion requirements higher.

| COMPETENCY AREA                             | OBJECTIVE        | DELIVERABLE AND GUIDANCE                                                                                                                                                                                                                                                                                        |
|---------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Competency Area R1:<br>Patient Care         | Objective R1.3.3 | <u>Deliverable:</u><br>Drug class review, treatment guideline, treatment protocol/pathway, collaborative practice agreement, utilization management criteria, and/or order set.                                                                                                                                 |
|                                             |                  | <u>How this will be surveyed:</u><br>Completion requirements must include one of the above.                                                                                                                                                                                                                     |
| Competency Area R2:<br>Practice Advancement | Objective R2.1.2 | <u>Deliverable:</u><br>Develop a proposal and timeline for the major project related to patient care in the advanced practice area, as defined in the Objective and Criteria.                                                                                                                                   |
|                                             |                  | <u>How this will be surveyed:</u><br>The surveyor will review the project plan(s).<br>Key components of a project plan include background, rationale, goals and measurable outcomes, and timeline (from proposal to final project report).<br>The project plan may be accomplished using one or more documents. |
| Competency Area R2:<br>Practice Advancement | Objective R2.1.6 | <u>Deliverable:</u><br>Project report(s) for at least two projects: <ul style="list-style-type: none"> <li>• Major project</li> <li>• Secondary project</li> </ul>                                                                                                                                              |

|                                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Competency Area R2: Practice Advancement (continued) | Objective R2.1.6 (continued)          | <p><u>How this will be surveyed:</u><br/>Surveyors will review the Taught and Evaluated (T/E Grid) in PharmAcademic. Each resident is required to complete:</p> <ul style="list-style-type: none"><li>• <b>Major project:</b> Defined as a longitudinal project with significant breadth intended to advance pharmacy practice. All Objectives (2.1.1-2.1.6) must be assigned to the learning experience(s), which contain the major project. Surveyors will review the project report for the major project, including both:<ul style="list-style-type: none"><li>○ Platform style or poster presentation to an external audience (e.g., regional residency conference or comparable professional meeting).</li><li>○ Written report (e.g., manuscript and/or formal written report suitable for invested parties).</li></ul></li><li>• <b>Secondary (“minor”) project:</b> Defined as work on another project, which can be minor in scope. Examples of a secondary project may include: MUE, clinical program development/enhancement/analysis, pipeline forecast, cost or budget analysis, quality assurance. The secondary project must, at a minimum, be assigned to the learning experience where Objective R2.1.6 is taught and evaluated. Surveyors will review the project report for the secondary “minor” project.</li></ul> |
| Competency Area R4: Teaching and Education           | Objectives R4.1.1, R4.1.2, and R4.1.3 | <p><u>Deliverable:</u></p> <ul style="list-style-type: none"><li>• Completion requirements must include one verbal and one written example.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                      |                                       | <p><u>How this will be surveyed:</u><br/>Surveyors will review evidence of the verbal and written educational materials:</p> <ul style="list-style-type: none"><li>• Verbal presentation (e.g., audiovisual / slides, presentation handout).</li><li>• Written example may include of any of the following:<ul style="list-style-type: none"><li>○ Patient education (e.g., brochure, handout).</li><li>○ Education to health care providers (e.g., newsletter, medication or disease management update).</li><li>○ Education to pharmacists (e.g., guideline update).</li></ul></li></ul> <p>See additional Guidance in the document directly below Goal R4.1</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Appendix                                             |                                       | <p><u>Deliverable:</u><br/>A completed Appendix tracking tool consistent with the program's design. Program’s method for determining appropriate depth and completion of Appendix topics as part of individual resident tracking.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                      |                                       | <p><u>Guidance:</u></p> <ul style="list-style-type: none"><li>• Residents should have a deep knowledge and understanding of the topics listed as “Required” within the Appendix.</li><li>• All topics with required patient care experiences must be completed with sufficient exposure to patient management.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                      |                                       | <p><u>Definitions:</u></p> <ul style="list-style-type: none"><li>• <b>Direct Patient Care Experience:</b> Participation in the management of the condition or disease state during direct patient care, clinical course, and a comprehensive pharmacotherapy treatment plan is required.</li><li>• <b>Non-direct Patient Care Experience:</b> The resident may demonstrate understanding of the diseases and condition via didactic instruction, case-based application, simulation, or other appropriate approach. Programs may elevate topic discussions/disease state experiences beyond what is defined in the Appendix.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• <b>Electives:</b> Programs may choose to add these optional key concepts that may be covered during the PGY2 pharmacy residency. These concepts are considered elective opportunities for the residents to cover as part of the Appendix completion requirements with a program. Programs may elevate topic discussions/disease state experiences beyond what is defined in the Appendix.</li> </ul> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Developed by the ASHP Commission on Credentialing in collaboration with The Pediatric Pharmacy Association (PPA).

The design group comprised the following pediatric pharmacy practitioners, residency program directors, and ASHP staff: Kelly S. Bobo, PharmD, MBA, BCPS, BCPPS, FASHP, FPPA, Director of Pharmacy, Assistant Professor of Clinical Pharmacy and Translational Science, Director of PGY1 and PGY2 Pediatric Pharmacy Residency Programs, LeBonheur Children's Hospital and The University of Tennessee Health Science Center; Jennifer R. Hamner, PharmD, FASHP, FPPA, BCPPS, Director of Professional Development and Director of PGY1 and PGY2 Pediatric Pharmacy Residency Programs, Children's Hospital Colorado Anschutz Medical Center; Melissa Heigham, PharmD, MHA, FASHP, BCPPS, BCOP, Regional Director, Academic Medical Center Pharmacy Services, BJC HealthCare, St. Louis Children's Hospital; Peter N. Johnson, PharmD, BCPPS, FPPA, FCCM, FASHP, Professor of Pharmacy Practice, Clinical Pharmacy Specialist and Director of PGY2 Pediatric Pharmacy Residency Programs, The University of Oklahoma College of Pharmacy, Oklahoma Children's Hospital at OU Health; Sarah Scarpace Lucas, PharmD, MBA, BCPS, BCPPS, FCSHP, FPPA, Director of Pharmacy, Clinical Professor and Director of PGY2 Pediatric Pharmacy Residency Programs, UCSF Medical Center at Mission Bay, UCSF Benioff Children's Hospital, UCSF School of Pharmacy; Brandy Zeller, PharmD, BCPPS, Clinical Pharmacy Specialist and Director of PGY1 and PGY2 Pediatric Residency Programs, St. Louis Children's Hospital; Eric M. Grace, MST, Director Standards Development and Training, Accreditation Services, ASHP. The contribution of reviewers is gratefully acknowledged.

Approved by the ASHP Commission on Credentialing on August 12, 2025. Endorsed by the ASHP Board of Directors on September 18, 2025.

This PGY2 Pediatric pharmacy residency and Pediatric Specialty Pathway (PSP) CAGO replaces the previous PGY2 Pediatric residency CAGO (effective in 2016). This revision of the PGY2 Pediatric and PSP CAGO is effective July 1, 2026.

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## **APPENDIX**

### **FOR POSTGRADUATE YEAR TWO (PGY2) PHARMACY RESIDENCY PROGRAMS IN ADVANCED AREAS OF PRACTICE**

*See Guidance regarding the Appendix in the Deliverable Guidance Grid at the end of the PGY2 CAGO document.*

NOTE: Topics/disease states listed in the “Required” columns may NOT be reduced to “Elective” for any residents in the PGY2 advanced area of practice.

## **PGY2 Pediatric Residency Training and Pediatric Specialty Pathways**

### **Appendix Introduction**

Accredited PGY2 Pediatric pharmacy residency programs may apply for the Pediatric Specialty Pathways designation. If approved, programs may additionally operate a *PGY2 Pediatric Pharmacy Residency with Specialty Pathway*, in either Critical Care, Oncology, or both (i.e., a program may operate with all three Appendices if approved to do so).

Organizations must utilize a single Appendix per resident for the pediatric program type/pathway the program has been approved to operate.

- **PGY2 Pediatrics** (Appendix A)
- **PGY2 Pediatrics with added Critical Care PSP designation status** (Appendix B)
- **PGY2 Pediatrics with added Oncology PSP designation status** (Appendix C)

Pharmacy residents must commit to one specific program pathway from the beginning of the residency program (i.e., residents commit to one specialty pathway by July 1<sup>st</sup>). Residents committed to a specific pathway, may NOT change to another program type/pathway at any point during the residency year.

Special attention should be given to the assignment/utilization of the proper Appendix within the PharmAcademic system. Programs should track progress on the topic areas throughout the residency year.

## PGY2 Pediatric Pharmacy Pathway: Appendix A (REVISED Aug. 2025)

| Discipline / Practice Area Category | Required Content Area (Direct Patient Care Experience)*                                                                                                                                                                  | Required Case-Based / Topic Discussion (Non-direct Patient Care Acceptable)**                                                                                                         | Elective (Direct Patient Care or Non-direct Patient Care Acceptable)***                              |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Cardiovascular                      | Hypertension                                                                                                                                                                                                             | Arrhythmias<br>Congenital heart disease<br>Kawasaki disease<br>Pulmonary hypertension                                                                                                 | Heart failure                                                                                        |
| Critical Care                       | Pediatric acute respiratory distress syndrome<br>Fluid and electrolyte disorders<br>Sedation, analgesia, and paralytics<br>Septic shock<br>Critical asthma<br>Status epilepticus                                         | Extracorporeal membrane oxygenation<br>Iatrogenic withdrawal syndrome<br>ICU delirium<br>Shock (cardiogenic or hemorrhagic)<br>Trauma and traumatic brain injury                      | Acid-base disturbances<br>Burns<br>Palliative care<br>Submersion injury<br>Toxicological emergencies |
| Endocrine / Metabolic               | Type 1 diabetes (acute and chronic management)                                                                                                                                                                           | Adrenocortical insufficiency<br>Diabetes insipidus<br>Inborn errors of metabolism<br>Syndrome of inappropriate antidiuretic hormone<br>Type 2 diabetes (acute and chronic management) | Growth hormone deficiency<br>Pituitary disorders (e.g., panhypopituitarism)<br>Thyroid disease       |
| Gastrointestinal / Hepatology       | Constipation<br>Gastroesophageal reflux<br>Nausea/vomiting/diarrhea                                                                                                                                                      | Appendicitis<br>Cholestatic jaundice<br>Hemorrhage<br>Liver failure<br>Short bowel syndrome<br>Stress ulcer prophylaxis                                                               | Inflammatory bowel syndrome                                                                          |
| General Pediatrics                  | Fever<br>Fluid management (IV, oral)<br>Immunizations<br>Pain management<br>Parenteral nutrition (neonates, infants, children)<br>Pharmacokinetics (general, disease state, and developmental / age-related differences) | Enteral nutrition and nutritional supplements<br>Pharmacogenomics                                                                                                                     |                                                                                                      |
| Hematology                          | Anemia<br>Anticoagulation                                                                                                                                                                                                | Acute thromboembolism (stroke, PE)<br>Disseminated intravascular coagulopathy                                                                                                         | Thrombocytopenia (drug induced and idiopathic)<br>Hemophagocytic lymphohistiocytosis                 |

|                                          |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                               |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
|                                          |                                                                                                                                                                                             | Hemophilia<br>Sickle cell disease                                                                                                                                                                                                                                                                                                              |                                                                                                                               |
| Infectious Disease                       | Antimicrobial stewardship<br>Catheter-related infection<br>Meningitis<br>Otitis media<br>Pneumonia<br>Skin and soft tissue infection<br>Surgical site infections<br>Urinary tract infection | Acquired immune deficiency syndrome / human immunodeficiency virus<br>Clostridium difficile-associated diarrhea<br>Conjunctivitis<br>Croup<br>Endocarditis<br>Fungal infections<br>Osteomyelitis and septic arthritis<br>Sexually transmitted diseases<br>Shunt infections<br>Strep throat<br>Tuberculosis<br>Tracheitis<br>Viral encephalitis | Complicated intra-abdominal infections<br>Epiglottitis<br>Pandemic infections<br>Parasitic infections                         |
| Medication Administration Considerations | Alternate routes for enteral administration (e.g., J-tube, G-tube,)                                                                                                                         | Aerosolized medications<br>Extravasation management<br>Intravascular devices (e.g., arterial line, umbilical artery catheter, intrajugular line, peripherally inserted central catheter)<br>Medication management associated with Ketogenic diets                                                                                              | Best practices for management and work flow of complex medications (e.g., expensive medications, gene therapies, biosimilars) |
| Medication Safety                        |                                                                                                                                                                                             | IV smart pump technology<br>Key Potentially Inappropriate Drugs in Pediatrics (KIDs List)<br>ASHP-PPA guidelines for providing pediatric pharmacy services<br>NCPDP recommendations and guidance for standardizing the dosing designations on prescription container labels of oral liquid medications<br>ASHP Guidelines on Preventing        |                                                                                                                               |
| Neonatology                              | Apnea with bradycardia<br>Bronchopulmonary dysplasia (chronic lung disease)<br>Fluid management within first 48 hours of life<br>Hyperbilirubinemia                                         | Medication use in pregnancy and lactation<br>Hypoglycemia<br>Intraventricular hemorrhage<br>Necrotizing enterocolitis<br>Neonatal seizures<br>Ophthalmia neonatorum<br>Persistent pulmonary hypertension<br>Retinopathy of prematurity                                                                                                         | Hyperinsulinemia<br>Newborn screening<br>Metabolic bone disease                                                               |

|                           |                                                                                                |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           | Neonatal opioid withdrawal syndrome (NOWS)<br>Neonatal sepsis<br>Respiratory distress syndrome |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                      |
| Nephrology                | Renal insufficiency and failure                                                                | Medication management in dialysis and other renal modalities<br>Hemolytic uremic syndrome<br>Renal tubular acidosis | Interstitial nephritis<br>Rhabdomyolysis                                                                                                                                                                                                                                                                                                                             |
| Neurology / Psychiatry    |                                                                                                | Attention deficit hyperactivity disorder<br>Autism<br>Depression<br>Epilepsy<br>Headache / Migraine                 | Bipolar disorder<br>Critical illness polyneuropathy<br>Paroxysmal sympathetic hyperactivity (PSH)<br>Subarachnoid / intracerebral hemorrhage<br>Ventriculostomies                                                                                                                                                                                                    |
| Obstetrics                |                                                                                                |                                                                                                                     | Gestational diabetes<br>Intrauterine infections<br>Maternal fetal medicine<br>Pre-eclampsia / eclampsia<br>Premature labor<br>Premature rupture of membranes<br>Prenatal care / nutrition<br>TORCH screening                                                                                                                                                         |
| Oncology                  |                                                                                                | Febrile neutropenia<br>Leukemia (ALL, AML)<br>Tumor lysis syndrome                                                  | Central nervous system malignancies<br>Cytokine storm associated with CAR-T receptor therapy<br>Oncologic Emergencies (i.e., spinal cord, compression, superior, vena cava syndrome, hypercalcemia of malignancy, typhlitis)<br>Ewing sarcoma<br>Hodgkin's disease<br>Osteosarcoma<br>Retinoblastoma<br>Rhabdomyosarcoma<br>Wilms tumor<br>Lymphoma<br>Neuroblastoma |
| Pulmonary                 | Asthma<br>Bronchiolitis                                                                        | Cystic fibrosis and associated complications                                                                        |                                                                                                                                                                                                                                                                                                                                                                      |
| Rheumatology / Immunology |                                                                                                | Juvenile idiopathic arthritis<br>Systemic lupus erythematosus                                                       |                                                                                                                                                                                                                                                                                                                                                                      |

|            |  |                                                                                                 |                                                                                                                                        |
|------------|--|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Transplant |  | Acute and chronic rejection in transplantation (solid organ and stem cell)<br>Immunosuppression | Bone marrow transplant<br>Post-transplant lymphoproliferative disease (PTLD)<br>Solid organ transplant (Kidney, Liver, Heart, or Lung) |
|            |  |                                                                                                 |                                                                                                                                        |

**\*Direct Patient Care Experience:** For these topics, diseases, and/or 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. Based on the resident's opportunity for repeat and/or comprehensive management, the program may supplement direct patient care experiences with additional discussion or didactic learning opportunities. Verification of orders or the presence of a comorbidity without participation in direct patient management does not meet the Appendix requirements or intent.

**\*\*Non-Direct Patient Care Acceptable:** To meet the intent of this requirement, the resident must 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 and have the ability to design appropriate treatment regimens and treat and assess outcomes.

**\*\*\*Elective (Direct or Non-direct Patient Care Acceptable):** Topics/disease states listed as "Elective" for the PGY2 discipline are not required for a resident to have direct patient care experience nor case-based discussions during their residency. These elective topics may be less commonly encountered in a residency year. Elective topics may be incorporated into your required residency experience, based on the program's completion requirements and at the program's discretion. Elective topics are not necessary for the resident's completion of the Appendix requirements (Standard 2.5.c).

## PGY2 Pediatric Specialty Pathway Appendix B: Critical Care

(REVISED Aug. 2025)

| Discipline / Practice Area Category | Required Content Area (Direct Patient Care Experience)*                                                                                                                                                                                                                                                                                                                                                      | Required Case-Based / Topic Discussion (Non-direct Patient Care Acceptable)**                                                                                                                        | Elective (Direct Patient Care or Non-direct Patient Care Acceptable)*** |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Cardiovascular                      | Arrhythmias<br>Congenital heart disease<br>Heart failure<br>Hypertension<br>Post-op cardiac surgical management<br>Pulmonary hypertension                                                                                                                                                                                                                                                                    | Kawasaki disease<br>Ventricular assist devices                                                                                                                                                       | Vasoplegic shock                                                        |
| Critical Care                       | Pediatric acute respiratory distress syndrome<br>Acid-base disturbances<br>Extracorporeal membrane oxygenation<br>Fluid and electrolyte disorders<br>ICU delirium<br>Sedation, analgesia, and paralytics<br>Shock (cardiogenic, septic, hemorrhagic)<br>Sleep management in critical illness<br>Critical asthma<br>Status epilepticus<br>Trauma and traumatic brain injury<br>Iatrogenic withdrawal syndrome | Burns<br>Submersion injury<br>Toxicologic emergencies<br>Hyperglycemia of critical illness                                                                                                           | Organ donor management<br>Palliative care                               |
| Endocrine / Metabolic               | Adrenocortical insufficiency<br>Type 1 diabetes (acute and chronic management)<br>Diabetes insipidus                                                                                                                                                                                                                                                                                                         | Thyroid disease<br>Pituitary disorders (e.g., panhypopituitarism)<br>Syndrome of inappropriate antidiuretic hormone<br>Inborn errors of metabolism<br>Type 2 diabetes (acute and chronic management) | Growth hormone deficiency                                               |

|                               |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                          |                                                                                  |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Gastrointestinal / Hepatology | Constipation<br>Gastroesophageal reflux<br>Nausea/vomiting/diarrhea<br>Stress ulcer prophylaxis                                                                                                                                                                                                        | Abdominal compartment syndrome<br>Acute pancreatitis<br>Appendicitis<br>Cholestatic jaundice<br>Hemorrhage<br>Ileus<br>Liver failure<br>Short bowel syndrome                                                                                                                                                             | Sinusoidal obstruction syndrome (SOS)<br>Inflammatory bowel syndrome             |
| General Pediatrics            | Fever<br>Fluid management (IV, oral)<br>Immunizations<br>Pain management (acute and chronic)<br>Parenteral nutrition<br>Pharmacokinetics (general, disease state, and developmental / age-related differences)                                                                                         | Enteral nutrition and nutritional supplements<br>Pharmacogenomics                                                                                                                                                                                                                                                        |                                                                                  |
| Hematology                    | Anemia<br>Anticoagulation<br>Disseminated intravascular coagulopathy                                                                                                                                                                                                                                   | Acute thromboembolism (stroke, PE)<br>Hemophagitic lymphohistiocytosis<br>Hemophilia (HLH)<br>Sickle cell disease                                                                                                                                                                                                        | Drug-induced Thrombocytopenia (drug-induced and idiopathic)<br>Methemoglobinemia |
| Infectious Disease            | Antimicrobial stewardship<br>Catheter-related infection<br>Clostridium difficile associated diarrhea<br>Fungal infections<br>Meningitis<br>Pneumonia<br>Shunt infections<br>Skin and soft tissue infections<br>Surgical site infections<br>Tracheitis<br>Urinary tract infection<br>Viral encephalitis | Acquired immune deficiency syndrome / human immunodeficiency virus<br>Complicated intra-abdominal infections<br>Conjunctivitis<br>Croup<br>Endocarditis<br>Epiglottitis<br>Osteomyelitis and septic arthritis<br>Otitis media<br>Parasitic infections<br>Sexually transmitted infections<br>Strep throat<br>Tuberculosis | Pandemic diseases                                                                |

|                                          |                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                              |                                                                                                                               |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Medication Administration Considerations | Alternate routes for enteral administration (e.g., J-tube, G-tube,)                                                                                                                                                                                                                                                                                                     | Aerosolized medications<br>Extravasation management<br>Intravascular devices (e.g., arterial line, umbilical artery catheter, intrajugular line, peripherally inserted central catheter)<br>Medication management associated with Ketogenic diets                                                                            | Best practices for management and work flow of complex medications (e.g., expensive medications, gene therapies, biosimilars) |
| Medication Safety                        |                                                                                                                                                                                                                                                                                                                                                                         | IV smart pump technology<br>Key Potentially Inappropriate Drugs in Pediatrics (KIDs List)<br>ASHP-PPA guidelines for providing pediatric pharmacy services<br>NCPDP recommendations and guidance for standardizing the dosing designations on prescription container labels of oral liquid medications<br>ASHP Guidelines on |                                                                                                                               |
| Neonatology                              | Apnea with bradycardia<br>Bronchopulmonary dysplasia (chronic lung disease)<br>Fluid management within first 48 hours of life<br>Hyperbilirubinemia<br>Hypoglycemia<br>Intraventricular hemorrhage<br>Necrotizing enterocolitis<br>Neonatal resuscitation<br>Neonatal seizures<br>Neonatal sepsis<br>Persistent pulmonary hypertension<br>Respiratory distress syndrome | Medication use in pregnancy and lactation<br>Hypoxic ischemic encephalopathy (HIE)<br>Metabolic bone disease<br>Neonatal opioid withdrawal syndrome (NOWS)<br>Ophthalmia neonatorum<br>Retinopathy of prematurity                                                                                                            | Hyperinsulinemia<br>Newborn screening                                                                                         |
| Nephrology                               | Medication management in dialysis and other renal modalities<br>Renal insufficiency and failure                                                                                                                                                                                                                                                                         | Hemolytic uremic syndrome<br>Interstitial nephritis<br>Renal tubular acidosis<br>Rhabdomyolysis                                                                                                                                                                                                                              |                                                                                                                               |



|                              |                                                                                                                  |                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                    |
|------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Neurology /<br>Psychiatry    | Critical illness<br>polyneuropathy                                                                               | Attention deficit-<br>hyperactivity disorder<br>Autism<br>Depression<br>Epilepsy<br>Headache/Migraine<br>Spinal cord injury<br>Subarachnoid/intracerebral<br>Hemorrhage<br>Targeted temperature<br>management / induced<br>hypothermia<br>Ventriculostomies | Bipolar disorder<br>Non-infectious encephalitis<br>(e.g. NMDA)<br>Paroxysmal sympathetic<br>hyperactivity (PSH)                                                                                                                    |
| Obstetrics                   |                                                                                                                  |                                                                                                                                                                                                                                                             | Gestational diabetes<br>Intrauterine infections<br>Maternal fetal medicine<br>Pre-eclampsia / eclampsia<br>Premature labor<br>Premature rupture of<br>membranes<br>Prenatal care / nutrition<br>TORCH screening                    |
| Oncology                     |                                                                                                                  | Burkitt's lymphoma<br>Cytokine Storm associated<br>with CAR-T receptor therapy<br>Febrile neutropenia<br>Leukemia (ALL, AML)<br>Tumor lysis syndrome                                                                                                        | Central nervous system<br>malignancies<br>Ewing sarcoma<br>Hodgkin's disease<br>Hypercalcemia of malignancy<br>Lymphoma<br>Neuroblastoma<br>Osteosarcoma<br>Pheochromocytoma<br>Retinoblastoma<br>Rhabdomyosarcoma<br>Wilm's tumor |
| Pulmonary                    | Asthma<br>Bronchiolitis<br>Invasive and non-invasive<br>mechanical ventilation                                   | Cystic fibrosis and associated<br>complications<br>Pneumothorax and<br>hemothorax                                                                                                                                                                           | Diffuse alveolar hemorrhage                                                                                                                                                                                                        |
| Rheumatology /<br>Immunology |                                                                                                                  | Juvenile idiopathic arthritis<br>Systemic lupus<br>erythematosus                                                                                                                                                                                            |                                                                                                                                                                                                                                    |
| Transplant                   | Immunocompromised host<br>Bone marrow transplant<br>Solid organ transplant<br>(Kidney, Liver, Heart, or<br>Lung) | Acute and chronic rejection<br>in transplantation (solid<br>organ and stem cell)<br>Immunosuppression<br>Post-transplant<br>lymphoproliferative disease<br>(PTLD)                                                                                           |                                                                                                                                                                                                                                    |

**\*Direct Patient Care Experience:** For these topics, diseases, and/or 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. Based on the resident's opportunity for repeat and/or comprehensive management, the program may supplement direct patient care experiences with additional discussion or didactic learning opportunities. Verification of orders or the presence of a comorbidity without participation in direct patient management does not meet the Appendix requirements or intent.

**\*\*Non-Direct Patient Care Acceptable:** To meet the intent of this requirement, the resident must 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 and have the ability to design appropriate treatment regimens and treat and assess outcomes.

**\*\*\*Elective (Direct or Non-direct Patient Care Acceptable):** Topics/disease states listed as "Elective" for the PGY2 discipline are not required for a resident to have direct patient care experience nor case-based discussions during their residency. These elective topics may be less commonly encountered in a residency year. Elective topics may be incorporated into your required residency experience, based on the program's completion requirements and at the program's discretion. Elective topics are not necessary for the resident's completion of the Appendix requirements (Standard 2.5.c).

## PGY2 Pediatric Specialty Pathway Appendix C: Oncology

(REVISED Aug. 2025)

| Discipline / Practice Area Category | Required Content Area (Direct Patient Care Experience)*                                                                                                                                                                                                                                                        | Required Case-Based / Topic Discussion (Non-direct Patient Care Acceptable)**                                                                                                                                                | Elective (Direct Patient Care or Non-direct Patient Care Acceptable)***     |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Cardiovascular                      | Hypertension                                                                                                                                                                                                                                                                                                   | Arrhythmias<br>Congenital heart disease<br>Heart failure<br>Kawasaki disease<br>Pulmonary hypertension                                                                                                                       |                                                                             |
| Critical Care                       | Pediatric acute respiratory distress syndrome<br>Fluid and electrolyte disorders<br>Oncologic Emergencies (i.e., spinal cord compression, superior vena cava syndrome, hypercalcemia of malignancy, typhlitis)<br>Sedation, analgesia, and paralytics<br>Septic shock<br>Status epilepticus<br>Critical asthma | Extracorporeal membrane oxygenation<br>ICU Delirium<br>Pediatric advanced life support<br>Shock (cardiogenic, hemorrhagic)<br>Trauma and traumatic brain injury                                                              | Submersion injury                                                           |
| Endocrine / Metabolic               | Corticosteroid induced complications                                                                                                                                                                                                                                                                           | Adrenocortical insufficiency<br>Diabetes insipidus<br>Inborn errors of metabolism<br>Syndrome of inappropriate antidiuretic hormone<br>Thyroid disease<br>Type 1 and type 2 diabetes mellitus (acute and chronic management) | Growth hormone deficiency<br>Pituitary disorders (e.g., panhypopituitarism) |
| Gastrointestinal / Hepatology       | Constipation<br>Gastroesophageal reflux<br>Nausea / vomiting / diarrhea                                                                                                                                                                                                                                        | Appendicitis<br>Cholestatic jaundice<br>Hemorrhage<br>Liver failure<br>Short bowel syndrome<br>Stress ulcer prophylaxis                                                                                                      | Inflammatory bowel syndrome                                                 |

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| General Pediatrics      | Fever<br>Fluid management (IV, oral)<br>Immunizations<br>Pain Management (Acute and Chronic)<br>Pharmacokinetics (general, disease state, and developmental / age-related differences)<br>Parenteral nutrition (neonates, infants, children) | Enteral nutrition and nutritional supplements<br>Pharmacogenomics                                                                                            |                                                                                                                                                                                                                                                                                                                 |
| Genetic Disorders       |                                                                                                                                                                                                                                              | Genetic causes of cancer predisposition in children                                                                                                          | Congenital amegakaryocytic thrombocytopenia<br>Diamond blackfan anemia<br>Dyskeratosis congenita<br>Fanconi anemia<br>Hereditary spherocytosis<br>Hurler Syndrome<br>Paroxysmal nocturnal hemoglobinuria (PNH)<br>Schwachman diamond syndrome<br>Severe congenital neutropenia<br>X-Linked adrenoleukodystrophy |
| Hematological Disorders | Anemia<br>Anticoagulation<br>Immune thrombocytopenic purpura (ITP)<br>Sickle cell disease                                                                                                                                                    | Acute thromboembolism (stroke, PE)<br>Aplastic anemia<br>Disseminated intravascular coagulopathy<br>Hemolytic anemia<br>Hemophilia<br>Iron deficiency anemia | Beta and alpha thalassemia<br>Thrombotic thrombocytopenic purpura (TTP)<br>Thrombocytopenia (drug induced and idiopathic)                                                                                                                                                                                       |
| Hematology Malignancies | Acute lymphoblastic leukemia (ALL)<br>Acute myelogenous leukemia (AML)<br>Hodgkin lymphoma<br>Non-Hodgkin lymphoma                                                                                                                           | Myelodysplastic syndromes<br>Myeloproliferative disorders                                                                                                    | Chronic myelogenous leukemia (CML)<br>Chronic lymphocytic leukemia (CLL)<br>Multiple myeloma amyloidosis<br>Primary CNS lymphoma<br>Waldenströms macroglobulinemia<br>Juvenile myelomonocytic leukemia                                                                                                          |
| Histiocyte Disorders    |                                                                                                                                                                                                                                              | Hemophagocytic lymphohistiocytosis (HLH)                                                                                                                     | Langerhans cell histiocytosis                                                                                                                                                                                                                                                                                   |

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|------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Infectious Disease                       | Antimicrobial stewardship<br>Catheter-related infection<br>Fungal infections | Acquired immune deficiency syndrome / human immunodeficiency virus<br>Clostridium difficile-associated diarrhea<br>Conjunctivitis<br>Croup<br>Endocarditis<br>Meningitis<br>Osteomyelitis and septic arthritis<br>Otitis media<br>Pneumonia<br>Sexually transmitted diseases<br>Shunt infections<br>Skin and soft tissue infections<br>Strep throat<br>Surgical site infection<br>Tuberculosis<br>Tracheitis<br>Urinary tract infection<br>Viral encephalitis | Epiglottitis<br>Parasitic infections                                                                                          |
| Medication Administration Considerations | Alternate routes for enteral administration (e.g., J-tube, G-tube,)          | Aerosolized medications<br>Extravasation management<br>Intravascular devices (e.g., arterial line, umbilical artery catheter, intrajugular line, peripherally inserted central catheter)<br>Medication management associated with Ketogenic diets                                                                                                                                                                                                             | Best practices for management and work flow of complex medications (e.g., expensive medications, gene therapies, biosimilars) |
| Medication Safety                        |                                                                              | IV smart pump technology<br>Key Potentially Inappropriate Drugs in Pediatrics (KIDs List)<br>ASHP-PPA guidelines for providing pediatric pharmacy services<br>NCPDP recommendations and guidance for standardizing the dosing designations on prescription container labels of oral liquid medications<br>ASHP Guidelines on Preventing Medication Errors with Chemotherapy and Biotherapy                                                                    |                                                                                                                               |

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| Neonatology                 | Apnea with bradycardia<br>Bronchopulmonary dysplasia (chronic lung disease)<br>Fluid management within first 48 hours of life<br>Hyperbilirubinemia<br>Neonatal opioid withdrawal syndrome (NOWS)<br>Neonatal sepsis<br>Respiratory distress syndrome | Medications in pregnancy and lactation<br>Hypoglycemia<br>Intraventricular hemorrhage<br>Necrotizing enterocolitis<br>Neonatal seizures<br>Nutrition<br>Ophthalmia neonatorum<br>Persistent pulmonary hypertension<br>Retinopathy of prematurity | Metabolic bone disease                                                                                                                                            |
| Nephrology                  | Renal insufficiency and failure                                                                                                                                                                                                                       | Medication management in dialysis and other renal modalities<br>Hemolytic uremic syndrome<br>Interstitial nephritis<br>Renal tubular acidosis<br>Rhabdomyolysis                                                                                  |                                                                                                                                                                   |
| Neurology / Psychiatry      |                                                                                                                                                                                                                                                       | Attention deficit-hyperactivity disorder<br>Autism<br>Depression<br>Epilepsy<br>Headache / Migraine                                                                                                                                              | Bipolar disorder<br>Critical illness polyneuropathy<br>Paroxysmal sympathetic hyperactivity (PSH)<br>Subarachnoid / intracerebral hemorrhage<br>Ventriculostomies |
| Obstetrics                  |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                  | Gestational diabetes<br>Intrauterine infections<br>Pre-eclampsia / eclampsia<br>Premature labor<br>Premature rupture of membranes                                 |
| Oncology Solid Malignancies | CNS Tumors<br>Ewing sarcoma<br>Neuroblastoma<br>Osteosarcoma<br>Wilms tumor                                                                                                                                                                           | Hepatoblastoma<br>Retinoblastoma<br>Rhabdomyosarcoma<br>Burkitt's lymphoma                                                                                                                                                                       | Radiation therapies (e.g., MIBG)                                                                                                                                  |
| Pulmonary                   | Asthma<br>Bronchiolitis                                                                                                                                                                                                                               | Cystic fibrosis and associated complications                                                                                                                                                                                                     |                                                                                                                                                                   |
| Rheumatology / Immunology   |                                                                                                                                                                                                                                                       | Juvenile idiopathic arthritis<br>Systemic lupus erythematosus<br>Severe combined immunodeficiency                                                                                                                                                |                                                                                                                                                                   |

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| Supportive Care / Symptom Management      | Chemotherapy-induced nausea and vomiting<br>Febrile neutropenia<br>Growth factors<br>Mucositis<br>Tumor lysis syndrome                                                                                                                      | Hypersensitivity reactions<br>Late effects of cancer/ chemotherapy (e.g., infertility, secondary malignancies, etc.)<br>Malignant effusions<br>Palliative care<br>Organ-systems toxicity (i.e. cardiotoxicity, dermatologic, hepatotoxicity, nephrotoxicity, neurotoxicity, pulmonary) |                                                        |
| Transplantation (Hematopoietic Stem Cell) | Acute and chronic graft versus host disease (GVHD)<br>Allogeneic transplantation<br>Autologous transplantation<br>Immunosuppression<br>Opportunistic infection prophylaxis<br>Preparative regimens<br>Sinusoidal obstruction syndrome (SOS) | Cytokine release syndrome<br>Cytokine Storm associated with CAR-T receptor therapy                                                                                                                                                                                                     | Management of graft failure                            |
| Transplantation (Solid Organ)             |                                                                                                                                                                                                                                             | Acute and chronic rejection in transplantation<br>Post-transplant lymphoproliferative disease (PTLD)                                                                                                                                                                                   | Solid organ transplant (Kidney, Liver, Heart, or Lung) |

**\*Direct Patient Care Experience:** For these topics, diseases, and/or 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. Based on the resident's opportunity for repeat and/or comprehensive management, the program may supplement direct patient care experiences with additional discussion or didactic learning opportunities. Verification of orders or the presence of a comorbidity without participation in direct patient management does not meet the Appendix requirements or intent.

**\*\*Non-Direct Patient Care Acceptable:** To meet the intent of this requirement, the resident must 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 and have the ability to design appropriate treatment regimens and treat and assess outcomes.

**\*\*\*Elective (Direct or Non-direct Patient Care Acceptable):** Topics/disease states listed as "Elective" for the PGY2 discipline are not required for a resident to have direct patient care experience nor case-based discussions during their residency. These elective topics may be less commonly encountered in a residency year. Elective topics may be incorporated into your required residency experience, based on the program's completion requirements and at the program's discretion. Elective topics are not necessary for the resident's completion of the Appendix requirements (Standard 2.5.c).

Developed by the ASHP Commission on Credentialing in collaboration with the Pediatric Pharmacy Association (PPA).

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This PGY2 Pediatric pharmacy residency and Pediatric Specialty Pathway (PSP) appendices (Appendix A, B, and C) replaces the previous appendices (effective in 2023). This revision of the PGY2 Pediatric and PSP Appendices is effective July 1, 2026.

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