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Effective Integration of Students in Clinical Practice: Collaborative Approach to Achieve Win-Win for All

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January 25, 2024

Learning Objectives

- Examine the ACPE Standards and AACP Core Entrustable Professional Activities for New Pharmacy Graduates.
- Identify gaps in clinical practice based on ASHP National Surveys and review of the literature.
- Appraise documented examples of effectively integrating students into clinical practice.
- Recognize provider perceptions of pharmacy students and benefits of students to institutions.
- Apply a systematic approach to achieve a seamless transition for students into clinical practice.

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Disclosures

- Anyone in a position to influence the planning, review, or presentation of content in this activity, including Rachel Ryu, Dexter Wimer, and Rita Jue, has disclosed he/she has no relevant financial relationships with ineligible companies.

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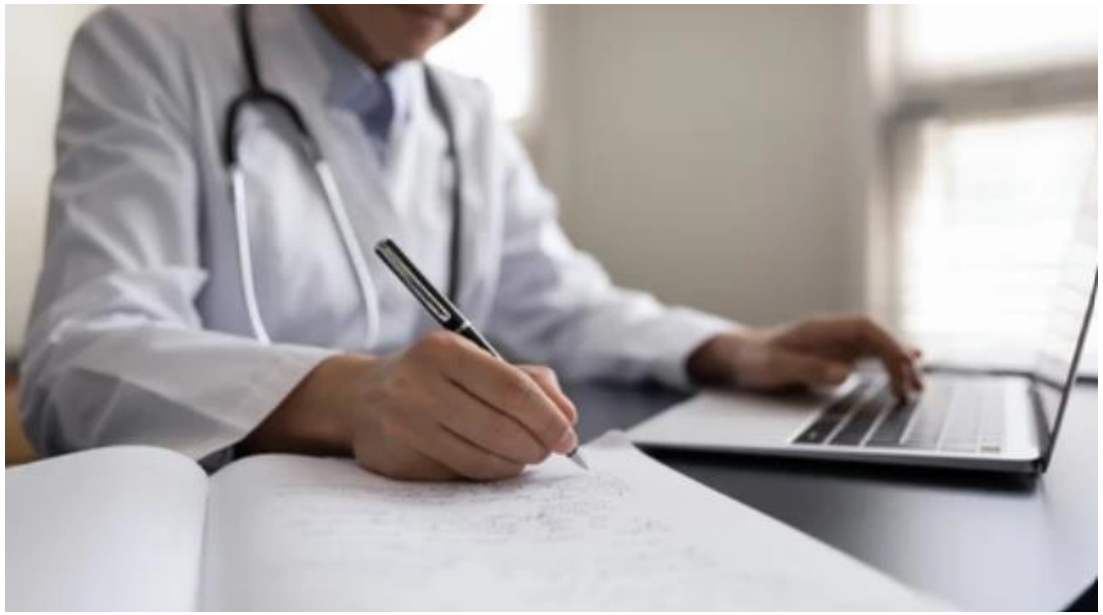
Per 2022 Needs Assessment Survey from the UC Preceptor development group

"***Balancing Clinical Responsibilities with Learner Responsibilities***" was identified as one of the topics of interest

- Fulfilling clinical duties while precepting is best achieved when students are effectively and efficiently integrated into your clinical practice.



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ACPE Standards 2016

Standard 13: Advanced Pharmacy Practice Experience (APPE) Curriculum

"A continuum of required and elective APPEs is of the scope, intensity, and duration ***required*** *to support the achievement of the Educational Outcomes articulated in Standards 1–4 and within Appendix 2 to* ***prepare practice-ready graduates****."*

- Key elements include patient care emphasis, duration (1440 hours), interprofessional experiences, etc.

Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree ("Standards 2016"). Approved January 25, 2015, Released February 2, 2015.

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ASHP National Hospital Pharmacy Survey

- Pharmacy directors at 1364 hospitals in the U.S. were contacted.
- Response rate 40.5% - submitted via mail or online.
- **97.3% had pharmacists "regularly monitor medication therapy"**
- **92% had pharmacists "routinely monitor serum medication concentrations** or their surrogate markers" (e.g. TDM)
- **80.1% had pharmacists order initial serum concentrations and adjust dosages (79.2%).**

Pedersen CA, Schneider PJ, Scheckelhoff DJ. *Am J Health Syst Pharm* 2010; 67:542-58.

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ASHP National Hospital Pharmacy Survey (con't)

- **89.0%** assigned **patient medication education and counseling** to **nurses**.
  - Pharmacists responsible in **only 5.9%**
- **Only 7.6%** had ≥26% inpatients **receiving medication counseling**.

Pedersen CA, Schneider PJ, Scheckelhoff DJ. *Am J Health Syst Pharm* 2010; 67:542-58.

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ASHP National Hospital Pharmacy Survey (con't)

- 46.7% were working to **change** (or had changed) their practice models in the past 3 years.
- Barriers for change:
  - **Lack of pharmacist staff resources (54.1%);**
  - **Lack of pharmacy staff with needed training (42.2%); and**
  - **Resistance to change from current staff (34.4%).**

Pedersen CA, Schneider PJ, Scheckelhoff DJ. *Am J Health Syst Pharm* 2010; 67:542-58.

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ASHP National Hospital Pharmacy Survey (con't)

- 57.3% had a **medication reconciliation** process "that works well."
- For hospitals whose process **<u>"did not work well,"</u>** barriers included:
  - **Lack of staff resources (37.4%);**
  - Staff resistance (11.8%);
  - Lack of commitment by institutional leadership (9.3%);
  - Nonassignment of responsibility for the process (4.0%);
  - Hospital not making the process a priority (4.0%);
  - Remaining listed "other" barriers (33.4%).

(subsequent surveys through 2022 did not always address these topics – some showed increases in pharmacists providing *discharge counseling & obtaining medication histories upon admission*)

Senate Bill No. 1254

CHAPTER 697

An act to add Section 4118.5 to the Business and Professions Code, relating to healing arts.

[Approved by Governor September 22, 2018. Filed with Secretary of State September 22, 2018.]

Sacramento, CA. California lawmakers passed a Senate Bill 1254 requiring hospital pharmacy staff to obtain an accurate medication profile for each high-risk patient upon admission under specified circumstances.

Pedersen CA, Schneider PJ, Scheckelhoff DJ. *Am J Health Syst Pharm.* 2010;67:542-58.
Pedersen CA, Schneider PJ, Scheckelhoff DJ. *Am J Health Syst Pharm*. 2017;74:1336-1352.
Pedersen CA, Schneider PJ, Scheckelhoff DJ. *Am J Health Syst Pharm*. 2016;73:1307-30.

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Incidence of prescription errors in patients discharged from the emergency department.

September 22, 2021

Gregory H, Cantley M, Calhoun C, et al. *Am J Emerg Med.* 2021;46:266-270.

Insulin Administration: Pen vs Vial – Similar, but Not Interchangeable

Hana Camarillo, PharmD, BCACP, CDCES | September 27, 2023

Anticoagulation-associated adverse drug events in hospitalized patients across two time periods.

July 26, 2023

Fanikos J, Tawfik Y, Almheiri D, et al. *Am J Med.* 2023;136(9):927-936.

When the Meds Don't Reach the Bed

Mithu Molla, MD, Kathie Le, PharmD, Pamela Mendoza, PharmD | August 26, 2020

J Gen Intern Med. 2023 Sep 27. doi: 10.1007/s11606-023-08315-z. Online ahead of print.

Multicomponent Pharmacist Intervention Did Not Reduce Clinically Important Medication Errors for Ambulatory Patients Initiating Direct Oral Anticoagulants

Alok Kapoor [1,2], Parth Patel [3], Daniel Mbusa [3], Thu Pham [3], Carrie Cicirale [4], Wenisa Tran [5], Craig Beavers [6], Saud Javed [3,5], Joann Wagner [3], Dawn Swain [7,8], Sybil Crawford [9], Chad Darling [3,5], Mayuko ItoFuKunaga [3,5], David McManus [3,5], Kathleen Mazor [3], Jerry Gurwitz [3]

Insulin pumps have most reported problems in FDA database.

December 5, 2018

Mohr H, Weiss M. Associated Press. November 27, 2018.

Potentially inappropriate medication use is associated with increased risk of incident disability in healthy older adults

Jessica E. Lockery PhD[1,2] | Taya A. Collyer PhD[3] | Robyn L. Woods PhD[2] | Suzanne G. Orchard PhD[2] | Anne Murray MD[4,5] | Mark R. Nelson PhD[2,6] | Nigel P. Stocks PhD[7] | Rory Wolfe PhD[2] | Chris Moran PhD[2] | Michael E. Ernst PharmD[8] | on behalf of the ASPREE Investigator Group

Am Surg. 2023 Jul;89(7):3272-3274. doi: 10.1177/00031348231161686. Epub 2023 Feb 28.

Incidence and Severity of Medication Reconciliation Discrepancies in Trauma Patients

Elisabeth G Dunbar [1], Ashley C Massey [1], Yannlei L Lee [1], Maryann Mbaka [1], Christopher M Kinnard [1], Andrew C Bright [1], Ashley Y Williams [1], Nathan M Polite [1], Jon D Simmons [1], Charles C Butts [1]

Insulin pump-associated adverse events: a qualitative descriptive study of clinical consequences and potential root causes.

August 2, 2023

Estock JL, Codario RA, Keddem S, et al. *Diabetes Technol Ther.* 2023;25(5):343-355.

Just What the Doctor Ordered

Missed Ordering of Venous Thromboembolism Chemoprophylaxis Is Associated With Increased VTE Events in High-risk General Surgery Patients

Baimas-George, Maria R. MD, MPH*; Ross, Samuel W. MD, MPH*; Yang, Hongmei PhD†; Matthews, Brent D. MD*; Nimeri, Abdelrahman MBBCh*; Reinke, Caroline E. MD, MSHP*

Frequency, type, and degree of potential harm of adverse safety events among pediatric emergency medical services encounters.

November 1, 2023

Cicero MX, Baird J, Brown L, et al. *Prehosp Emerg Care.* 2023;Epub Sep 12.

Hospitalization due to adverse drug events in older adults with cancer: A retrospective analysis

Darren J. Walsh [a,b,*], Laura J. Sahm [b,c], Michelle O'Driscoll [b], Bronagh Bolger [a], Hitam Ameen [a], Michelle Hannan [a], Caitriona Goggin [a], Anne M. Horgan [a]

Evaluation of detected medication errors within the operating room at an academic medical center.

June 21, 2023

Wolf M, Rolf J, Nelson D, et al. *Hosp Pharm.* 2023;58(3):309-314.

Pediatric ADHD Medication Errors Reported to United States Poison Centers, 2000 to 2021

Mikaela M. DeCoster, BS,[a,c] Henry A. Spiller, MS, D.ABAT,[b,d] Jaahnavi Badeti, MPH, BDS,[a] Marcel J. Casavant, MD,[a,b,d] Natalie I. Rine, PharmD, BCPS, BCCCP,[b,d] Nichole L. Michaels, PhD,[a,d] Motao Zhu, MD, MS, PhD,[a,d] Gary A. Smith, MD, DrPH[a,d,e]

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Room to grow…

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AACP - "Core Entrustable Professional Activities for New Pharmacy Graduates"

- Entrustable professional activities (EPAs) are
  - ***Specific, independently executable, observable, and measurable*** *in their process and outcome.*
  - ***Discrete, essential activities and tasks*** *that all new pharmacy graduates* ***must be able to perform without direct supervision*** *upon entering practice or postgraduate training.*
- "Core" expectations; **baseline, not a ceiling.**

Haines ST, Pittenger AL, Stolte SK, et al. *Am J Pharm Educ*. 2017;81:S2.

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AACP

Core Entrustable Professional Activities for New Pharmacy Graduates[a,b]

Appendix 1

Patient Care Provider Domain:	Example Supporting Tasks:
Collect information to identify a patient's medication-related problems and health-related needs.	• Collect a medical history from a patient or caregiver. • Collect a **medication history** from a patient or caregiver. • Discuss a **patient's experience with medication**. • Determine a patient's **medication adherence**. • Use health records to determine a patient's health-related needs relevant to setting of care and the purpose of the encounter.
Analyze information to determine the effects of medication therapy, identify **medication-related problems**, and prioritize health-related needs.	• Assess a patient's signs and symptoms to determine whether the patient can be treated within the scope of practice or requires a referral. • Measure an adult patient's **vital signs** and interpret the results (e.g., body temperature, pulse rate, respiration rate, and blood pressure). • Interpret laboratory test results. • Identify drug interactions. • Perform a **comprehensive medication review** (CMR) for a patient. • Assess a patient's health literacy using a **validated screening tool**. • Compile a prioritized health-related problem list for a patient. • Evaluate an existing drug therapy regimen.
Establish **patient-centered goals** and create a care plan for a patient in collaboration with the patient, caregiver(s), and other health professionals that is **evidence-based** and cost-effective.	• Follow an **evidence-based disease management** protocol. • Develop a treatment plan with a patient. • Manage drug interactions. • Select monitoring parameters to determine the therapeutic and **adverse effects** related to the treatment plan. • Determine the appropriate time interval(s) to collect monitoring data. • Create a patient-specific education plan.

Haines ST, Pittenger AL, Stolte SK, et al. *Am J Pharm Educ*. 2017;81:S2.

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Implement a care plan in collaboration with the patient, caregivers, and other health professionals.	• Write a note that documents the findings, recommendations, and plan from a patient encounter. • **Educate** a patient regarding the appropriate use of a new medication, **device** to administer a medication, or **self-monitoring test**. • **Educate** a patient on the use of **medication adherence aids**. • Assist a patient with **behavior change** (e.g., use shared decision making and motivational strategies).
Follow-up and monitor a care plan.	• Collect monitoring data at the appropriate time interval(s). • Evaluate the selected monitoring parameters to determine the therapeutic and **adverse effects** related to the treatment plan. • Recommend modifications or adjustments to an existing medication therapy regimen based on patient response. • Present a patient case to a colleague during a handoff or **transition of care**.
Interprofessional Team Member Domain: Collaborate as a member of an interprofessional team.	**Example Supporting Tasks:** • Contribute medication-related expertise to the team's work. • Explain to a patient, caregiver, or professional colleague each team member's role and responsibilities. • Communicate a patient's **medication-related problem(s)** to another health professional. • Use setting appropriate **communication skills** when interacting with others • Use consensus building strategies to develop a shared plan of action.

Haines ST, Pittenger AL, Stolte SK, et al. *Am J Pharm Educ*. 2017;81:S2.

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Population Health Promoter Domain:	Example Supporting Tasks:
Identify patients at risk for prevalent diseases in a population.	• Perform a screening assessment to identify patients at risk for prevalent diseases in a population (e.g., hypertension, diabetes, depression).
Minimize adverse drug events and medication errors.	• Assist in the identification of underlying system-associated causes of errors. • Report adverse drug events and medication errors to stakeholders.
Maximize the appropriate use of medications in a population.	• Perform a **medication use evaluation**. • Apply cost-benefit, **formulary**, and/or epidemiology principles to medication-related decisions.
Ensure that patients have been immunized against vaccine-preventable diseases.	• Determine whether a patient is eligible for and has received CDC-recommended immunizations. • Administer and document CDC-recommended immunizations to an adult patient. • Perform **basic life support**.
Information Master Domain:	**Example Supporting Tasks:**
Educate patients and professional colleagues regarding the appropriate use of medications.	• Lead a discussion regarding a recently published research manuscript and its application to patient care. • Develop and deliver a brief (less than 1 hour) educational program regarding medication therapy to health professional(s) or lay audience.
Use evidence-based information to advance patient care.	• Retrieve and analyze scientific literature to make a patient-specific recommendation. • Retrieve and analyze scientific literature to answer a drug information question.

Haines ST, Pittenger AL, Stolte SK, et al. *Am J Pharm Educ*. 2017;81:S2.

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Practice Manager Domain:

Oversee the pharmacy operations for an assigned work shift.

Example Supporting Tasks:

- Implement pharmacy policies and procedures.
- Supervise and coordinate the activities of pharmacy technicians and other support staff.
- Assist in training pharmacy technicians and other support staff.
- Assist in the evaluation of pharmacy technicians and other support staff.
- Identify pharmacy service problems and/or medication safety issues.
- Maintain the pharmacy inventory.
- Assist in the management of a pharmacy budget.
- Interpret pharmacy quality and productivity indicators using continuous improvement quality techniques.
- Assist in the preparation for regulatory visits and inspections.

Fulfill a medication order.

- Enter patient-specific information into an electronic health or pharmacy record system.
- Prepare commonly prescribed medications that require **basic sterile compounding** or **basic non-sterile compounding** prior to patient use.
- Determine if a medication is contraindicated for a patient.
- Identify and manage drug interactions.
- Determine the patient co-pay or price for a prescription.
- Ensure that **formulary** preferred medications are used when clinically appropriate.
- Obtain authorization for a non-preferred medication when clinically appropriate.
- Assist a patient to acquire medication(s) through support programs.

Self-Developer Domain:

Create a written plan for **continuous professional development.**

Example Supporting Tasks:

- Create and update a curriculum vitae, resume, and/or professional portfolio.
- Perform a self-evaluation to identify professional strengths and weaknesses.

Haines ST, Pittenger AL, Stolte SK, et al. *Am J Pharm Educ*. 2017;81:S2.

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The perfect match…

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Value of the student pharmacist to experiential practice sites: a review of the literature

- 29 publications & 6 abstracts (1990-2011)
  - Practice settings included community care sites, acute care/inpatient facilities, and a combination.
- Each students made **1.2-16 recommendations per week to prescribers.**
- **Acceptance rate of interventions, 32-98%.**

Mersfelder TL, Bouthillier MJ. *Ann Pharmacother*. 2012;46:541-8.

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Value of the student pharmacist to experiential practice sites: a review of the literature (con't)

- Students also completed IV to PO dose conversions, warfarin dose adjustment based on INR, and medication reconciliation.
- All studies assessing economic impact reported cost savings/ cost avoidance (one study reported **cost savings of $50,000-$128,000/year).**
  - Caveat: some interventions produced a net increase in costs (e.g, immunizations, initiation of appropriate therapy, etc.).

Mersfelder TL, Bouthillier MJ. *Ann Pharmacother.* 2012;46:541-8.

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Role of Pharmacy Education in Growing the Pharmacy Practice Model

- 1st-3rd year students will be more limited in their clinical ability.
- 4th year students should be able to perform more advanced tasks (in addition to basic skills from 1st-3rd years).

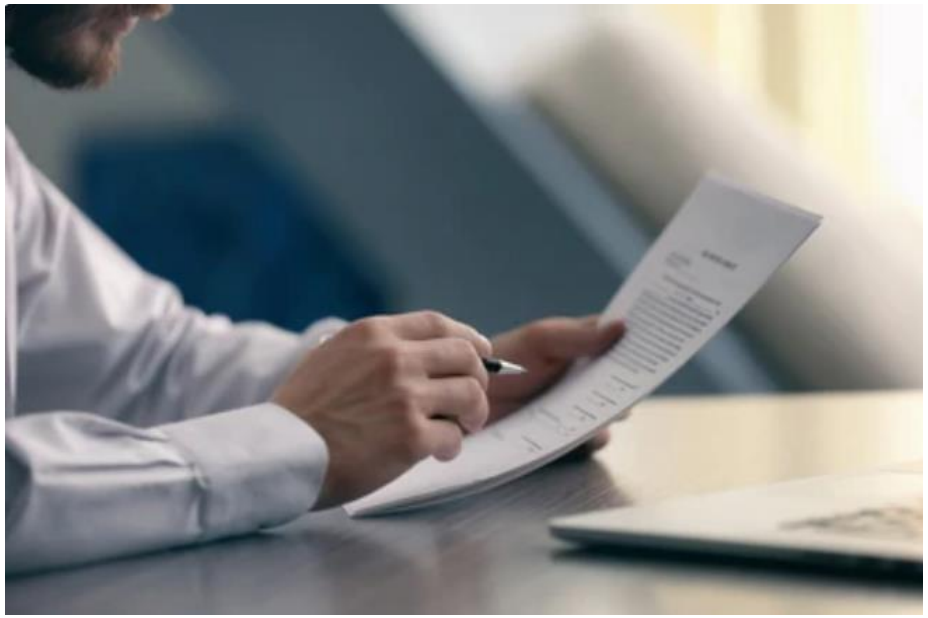

Table 1. Description of pharmacy student duties in a practice model

Patient care responsibilities
Pharmacy student years 1-3
• Obtain medication history by applying motivational interviewing skills and gathering medication use information from pharmacies, relatives, and other care providers.
• Provide patient discharge medication education that involves reviewing key uses and side effects of medication along with suggestions/strategies to maintain or improve compliance.
• Participate in quality assurance data collection and pharmacy operational activities.
Pharmacy student year 4
• Participate in pharmacokinetic or anticoagulation monitoring, involving designing a therapeutic regimen based on pharmacokinetic parameters and blood test results. Recommend dosage changes and monitoring to the preceptor (responsible pharmacist).
• Perform antimicrobial stewardship activities, including checking culture data against drug therapy and antibiotic sensitivities and suggesting antibiotic de-escalation to the preceptor.
• Participate in target-drug and drug dosing programs, reviewing a list of monitored medications and applying evidence-based guidelines to those medications and calculating appropriate drug doses for patients with renal and hepatic impairment.
• Review patient profiles for proper drug dose and frequency along with recognition of drug interactions and duplicate therapy. Recommend any changes to the preceptor.

Kennerly J and Weber RJ. *Hosp Pharm* 2013;48:338–342

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Role of Pharmacy Education in Growing the Pharmacy Practice Model (con't)

- Schools & institutions **must view students as an integral and accountable part of the patient care team**.
- Relies on **cooperation with the schools** and include:
  - A **positive/ collaborative relationship** between the director of pharmacy & dean of the school.
  - A possible **joint student evaluation** (between the institution & school)
  - **Scheduling rotations in the same institution** for 4th year students for maximal learning and patient care continuity? ***Please share your thoughts in the chat box below.***

Kennerly J and Weber RJ. *Hosp Pharm* 2013;48:338–342

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A Strategy to Develop APPEs – U. of Colorado

- 22 partnerships between University of Colorado at Denver and Health Sciences Center School of Pharmacy and institutions.
- *Diabetes, Lipid, and Hypertension Programs*
  - 6 monthly meetings between the pharmacist and the patient.
  - **Students carried out the care for each appointment.**
    - Education, "point of care" monitoring, etc. and presented case to preceptor.
  - Preceptor reviewed the recommendations.
  - Student documented, then forwarded the cosigned note to provider.

Turner CJ, Ellis S, Giles J, et al. *Am J Pharm Educ*. 2007;71:46.

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A Strategy to Develop APPEs – U. of Colorado (con't)

- *Anticoagulation (warfarin) Clinics*
  - Some clinics were **funded** by grants from school.
  - Each student **wrote notes and medication orders (co-signed by preceptor), educated patients and family/caregivers, and documented.**
  - Each case was then reviewed with a preceptor.

Turner CJ, Ellis S, Giles J, et al. *Am J Pharm Educ*. 2007;71:46.

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A Strategy to Develop APPEs – U. of Colorado (con't)

- *Medication reconciliation programs*
  - Students gathered comprehensive list of patients' home therapies.
  - Compared *admission, transfer, and/or discharge* medication orders & assessed appropriateness.
  - Addressed discrepancies/ recommendations to the provider under pharmacist supervision and documented in chart.

Turner CJ, Ellis S, Giles J, et al. *Am J Pharm Educ*. 2007;71:46.

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A Strategy to Develop APPEs – U. of Colorado (con't)

- *Vaccination program*
  - Occurred after 2nd year students completed the APhA Pharmacy-Based Immunization Delivery certificate.
  - Students followed a hospital protocol for identifying qualifying patients and provided immunizations.
  - Provided vaccine services and tuberculosis skin testing to hospital employees.

Turner CJ, Ellis S, Giles J, et al. *Am J Pharm Educ*. 2007;71:46.

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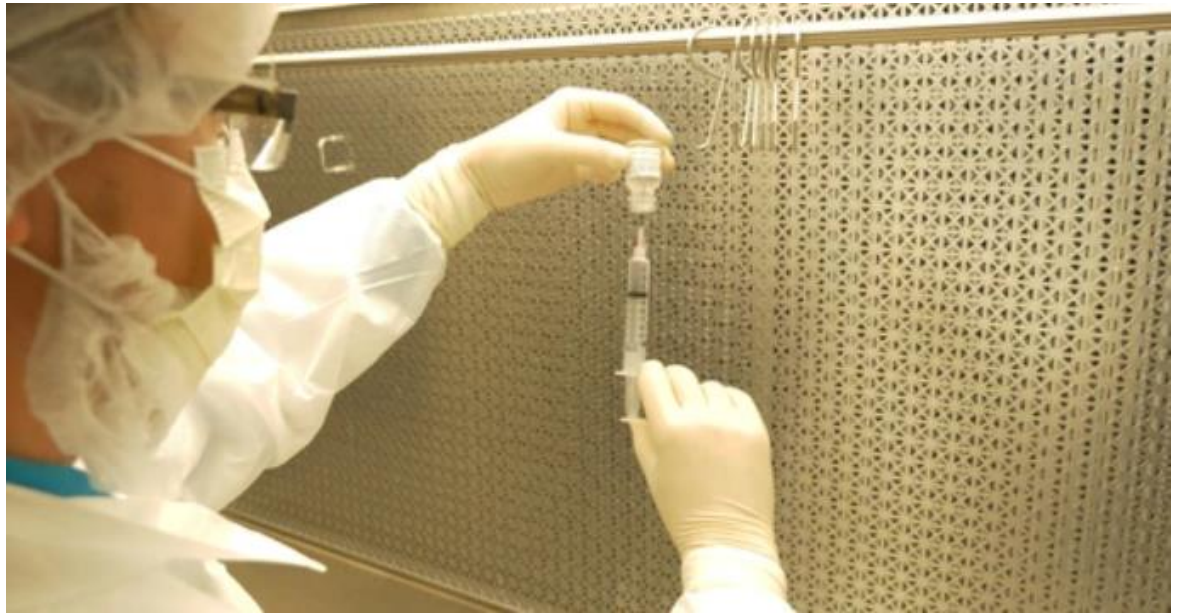
A Strategy to Develop APPEs – U. of Colorado (con't)

- *VAMC partnership - IV admixture and antibiotic stewardship service (3 weeks each)*
  - IV admixture: after 3-day introduction & training, prepared non-chemotherapy IV admixtures under supervision.
  - ASP: after 1-day introduction, provided care to all inpatients on IV antibiotics (25-30 patients/ day). Assessed indication daily as new information (e.g. culture and sensitivity data) became available & made recommendations to preceptor.



Turner CJ, Ellis S, Giles J, et al. *Am J Pharm Educ*. 2007;71:46.

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A Strategy to Develop APPEs – U. of Colorado (con't)

- *Others:*
  - At a long-term acute care facility (specializing in ventilator weaning, wound care, and traumatic brain injury)
    - Participated in daily rounds & provided **anticoagulation therapy, pharmacokinetic monitoring, and drug information services** (35-45 patients/day).
  - At a rehabilitation program (for patients recovering from strokes, heart attacks, and accidents)
    - Participated in daily rounds, **identified drug-related problems, & made recommendations**.

Turner CJ, Ellis S, Giles J, et al. *Am J Pharm Educ*. 2007;71:46.

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EXAMPLE: How to Incorporate the Student In Pediatrics

Table. Student Activities for IPPE and APPE Experiences[2–6]

Pharmacists' patient care process
Recognize and apply the differences between pediatric patients and adults (e.g., classification and definitions of age, vital signs, pharmacokinetics and pharmacodynamics, developmental pharmacology, laboratory test values) when providing patient care
Assess a pediatric patient's growth by using the growth curves
Review order entry and verification with preceptor
Assess prescriptions for accuracy and appropriateness (drug, dose, route, frequency, duration) and order verification for each respective patient by using information from the medical record
Identify medications on the KIDs List* when reviewing medication profiles
Recognize and mitigate drug-drug, drug-food, drug-allergy, and/or drug-disease interactions
Review patient care reports. Pharmacy reports, such as antimicrobial stewardship report, hemoglobin with erythropoiesis-stimulating agents, renal dosing adjustments, platelet monitoring with heparin
Create a patient care plan (e.g., may use or develop a patient workup/monitoring form)
Develop SOAP note
Make interventions to optimize patient care to the health care team and document appropriately per institutional policy
Participate in the following activities: patient care rounds, interprofessional clinical rounds (e.g., patient care rounds, nutrition rounds, radiology rounds, antimicrobial and transplant rounds), and comprehensive care team discussions
Respond to pharmacokinetic consults
Participate in patient emergencies with preceptor

*Key Potentially Inappropriate Drugs in Pediatrics (KIDs) List

Eiland LS, Fenn III NE, Shah P, et al. *J Pediatr Pharmacol Ther*. 2020;25:390–400.

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EXAMPLE: How to Incorporate the Student In Pediatrics (con't)

Evidence-based medicine and off-label use of medicine
Recommend eligible routine vaccinations or catch-up vaccinations based on age in accordance to the practice guidelines for immunizations
Identify and apply available clinical practice guidelines most appropriate for the pediatric population
Evaluate primary literature to use a medication or guide care for a pediatric patient
Assist in developing institution-specific standards of practice consistent with the clinical practice guidelines
Assist in creating/reviewing policies for off-label drug use
Calculations and dosage formulations
Perform dosing based on weight, body surface area, and fixed dosages, including dosage adjustments (e.g., based on drug interactions, renal function, lab values, therapeutic drug monitoring)
Calculate estimated glomerular filtration rate by using different equations (e.g., Schwartz and Bedside Schwartz equations)
Calculate and assess urine output
Provide recommendations regarding maintenance IV fluids, specifically with the fluid rate and fluid type
Select concentrations appropriate for the individual patient (including IV continuous infusions, IV fluids, and liquid enteral medications)
Assess nutritional needs of patients and calculations related to enteral and parenteral nutrition: calculate glucose infusion rate; parenteral nutrition; or IV additive calculations
Perform formulation conversions, such as IV-to-PO and PO-to-IV
Perform opioid conversion
Discuss palatability; conduct a suspension taste testing (antibiotics, anticonvulsant medications, steroids, etc.)
Recommend specific product formulations appropriate for pediatric patients
Discuss when to switch from oral liquids (solutions or suspensions) to solid dosage forms (tablets, capsules), and vice versa
Evaluate commercial availability of a medication versus the need for extemporaneous compounding
Create/review policies for extemporaneous compounding
Therapeutic drug monitoring
Perform TDM
Review specific parameters that influence TDM
Participate in creating collaborative practice agreement for TDM

Eiland LS, Fenn III NE, Shah P, et al. *J Pediatr Pharmacol Ther*. 2020;25:390–400.

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Personal examples

- Incorporating students in general medicine/ cardiology
  - Rounding with medical team, providing recommendations and engaging with providers, providing drug information
    - *Attractive especially for students pursuing either residency or industry*
  - Patient education
    - *Attractive especially for students pursuing ambulatory care/ community practice*
  - Development of a DOAC clinic
    - *Protocol development and approval, patient recruitment, promotion to providers, marketing strategies, finance/ billing, staff training, developing pharmacist competencies, etc.*
      - *Attractive especially for students pursuing entrepreneurship*

- Research and scholarship
  - Involvement in research projects, presentation at state/national conferences, publication in medical journals
    - *Attractive especially for students pursuing either residency or academia*

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Customize the rotation based on the needs and interests of the student

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ASHP 2020 – Involving pharmacy students in clinical research: Tips and best practices

1. Identify project & timeline
   - Standard 6-week APPE may be insufficient time – consider multiple students or discuss with student about long-term project.
   - Consider projects with less complexity, e.g. retrospective chart reviews.

2. Clarify research goals & expectations
   - Discuss any plans for journal submission & potential authorship for student, data collection alone will not suffice, etc.
   - Assess whether student interests are in developing familiarity in using EMR during data collection vs literature review for manuscript writing, etc.

Goodlet KJ and Nailor MD. *Am J Health Syst.* 2020;77:1945–1948.

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ASHP 2020 – Involving pharmacy students in clinical research: Tips and best practices (con't)

3. Check (and re-check) students' work
   - Create "rules sheet" for collecting data to show where each data point can be found in EMR, specify clinical meaning of terms such as "need for vasopressors/inotropes" to the level of the student, etc.

Please feel free to share other helpful ideas in the chat box below.

4. Research dissemination
   - Encourage formal sharing via poster presentations at conferences, manuscript publication.
   - Encourage students to take the lead on abstract writing and submission.
   - Inform students about potential travel grants from school, research grants, etc.

Goodlet KJ and Nailor MD. *Am J Health Syst*. 2020;77:1945–1948.

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Providers' Perceptions of Student Pharmacists on Inpatient General Medicine Practice Experiences

- *Typically, students are assessed by **preceptor**, not providers (although they spend more time w/ providers).*
- Anonymous survey to 134 providers in Massachusetts who interacted with Northeastern University students on inpatient general medicine APPE.
  - All had MD/DO degrees.
  - 79 responded (59%).

Lancaster JW, Douglass MA, Gonyeau MJ, et al. *Am J Pharm Educ*. 2013;77:26.

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Providers' Perceptions of Student Pharmacists on Inpatient General Medicine Practice Experiences (con't)

- **96.2%** said students were **prepared** for medical rounds.
- **87.3%** said students were **active participants in patient care.**
- **94.9% and 98.7%** said students' **recommendations were appropriate & accurate**.
- **61.8%** believed student **involvement was beneficial**.

What kind of feedback have providers given regarding your rotation students? Please share your thoughts in the chat box below.

Lancaster JW, Douglass MA, Gonyeau MJ, et al. *Am J Pharm Educ*. 2013;77:26.

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Benefits to Experiential Sites and Institutions

- Students can perform diverse activities: **drug information questions, discharge counseling, structured counseling services (e.g., warfarin/DOAC, insulin, disease-state management),** health screenings, etc.
- Relationships with schools of pharmacy may lead to **funding.**
- Can **free up preceptors to participate** in other clinical activities to meet departmental goals/needs.

American College of Clinical Pharmacy; Rathbun RC, Hester EK, Arnold LM, et al. *Pharmacotherapy*. 2012;32:e88-97.

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Benefits to Experiential Sites and Institutions (con't)

- May have increased **staff retention due to recognition associated with serving (greater job satisfaction & fulfillment)**
- Education of students may assist in **staff recruitment** by attracting students to postgraduate residency training or other pharmacist positions.
- Preceptors are often awarded **faculty appointments** with schools, provided **continuing education** & library resources, etc.

What other benefits have you received as a preceptor? Please share your thoughts in the chat box below.

American College of Clinical Pharmacy; Rathbun RC, Hester EK, Arnold LM, et al. *Pharmacotherapy*. 2012;32:e88-97.

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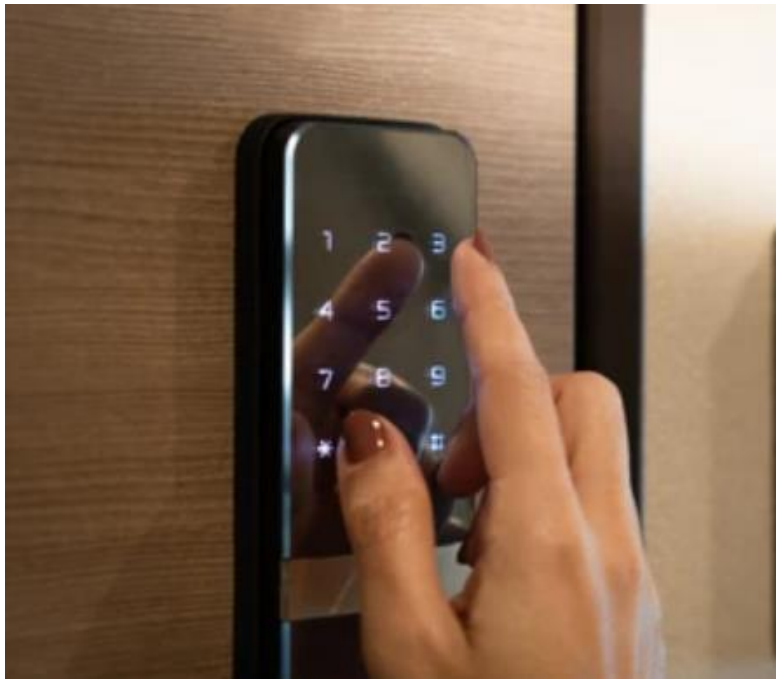
Integrating Pharmacy Students into Your Practice

"Be sure to orient students to their new temporary environment; this sets the foundation for a successful integration into practice. Remember that students are changing practice areas frequently and accommodating various expectations. This initial orientation and introduction can aid in a more rapid assimilation to the new site."

1. Orientation
   - Syllabus/schedule, tour of facility, provide map/history, introduction to pharmacy & non-pharmacy staff, share job description, storage of personal belongings.
   - ID badge/computer access, training, resources/guidelines in 1 location (e.g. GoogleDrive).
   - Be clear about expectations, grading policy, assignments.



Sheaffer, S. L., DeRemer, C. E., Yam, N. T. Chapter 1 Precepting Fundamentals. In *Preceptor's handbook for Pharmacists,* edited by Cuéllar LM and Ginsburg DB. American Society of Health-System Pharmacists. 2016, p2-19.

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Integrating Pharmacy Students into Your Practice (con't)

2. Discuss students' goals and interests
   - Review their CV, discuss short/long-term goals.
   - Seek their input in planning daily activities, assure them there is flexibility in the schedule.
   - Provide a student-specific rotation.

Sheaffer, S. L., DeRemer, C. E., Yam, N. T. Chapter 1 Precepting Fundamentals. In *Preceptor's handbook for Pharmacists*, edited by Cuéllar LM and Ginsburg DB. American Society of Health-System Pharmacists. 2016, p2-19.

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Integrating Pharmacy Students into Your Practice (con't)

3. Build the schedule

- Include dates for evaluations, assignment deadlines, holidays, etc.
- Diversify preceptors (consider including non-pharmacy personnel if able).
- Brainstorm projects that would benefit both student & site – make list available to staff, especially those that have a vested interest in the success of the project.
- Balance scholarship and projects with patient care.
- More efficient to have 2+ students on rotation concurrently?

Sheaffer, S. L., DeRemer, C. E., Yam, N. T. Chapter 1 Precepting Fundamentals. In *Preceptor's handbook for Pharmacists*, edited by Cuéllar LM and Ginsburg DB. American Society of Health-System Pharmacists. 2016, p2-19.

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Integrating Pharmacy Students into Your Practice (con't)

4. Feedback

- Provide frequent formal and informal feedback.
- Encourage students to come up with their own strategies for improvement.
- Be honest, specific, & constructive.
- Acknowledge student achievements in the presence of others to increase their confidence & self-esteem.

Sheaffer, S. L., DeRemer, C. E., Yam, N. T. Chapter 1 Precepting Fundamentals. In *Preceptor's handbook for Pharmacists*, edited by Cuéllar LM and Ginsburg DB. American Society of Health-System Pharmacists. 2016, p2-19.

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Layered Learning Practice Model

- Layered learning practice model (LLPM) was developed to accommodate the increasing # of students AND for preceptors to be able to ***BALANCE clinical & precepting tasks.***
- Many pharmacy residency programs at academic medical centers have implemented this model.

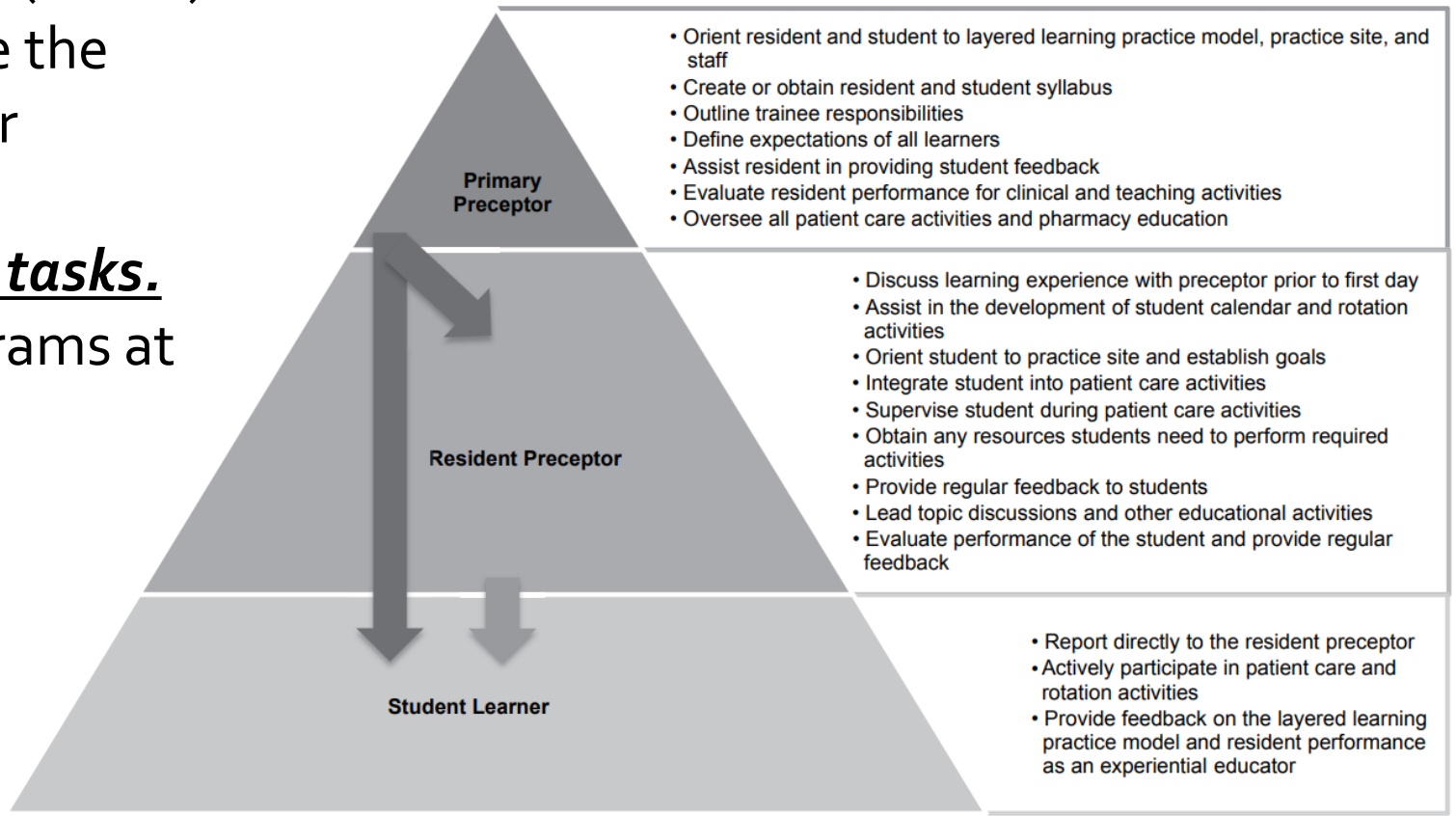

Figure 1. Overview of the roles and responsibilities in the layered learning practice model.

Loy BM, Yang S, Moss JM, et al. *Hosp Pharm.* 2017;52:266-272.

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Layered Learning Practice Model (con't)

- Has shown to **expand and increase** clinical pharmacy services (medication reconciliation, discharge counseling, overall # of pharmacy interventions).
- Students also have an overall positive perception of the experience.
- Ensure to **clearly define roles** for all parties (students should respect the authority of the resident, and not view them as a peer).

Loy BM, Yang S, Moss JM, et al. *Hosp Pharm.* 2017;52:266-272.

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Layered Learning Practice Model (con't)

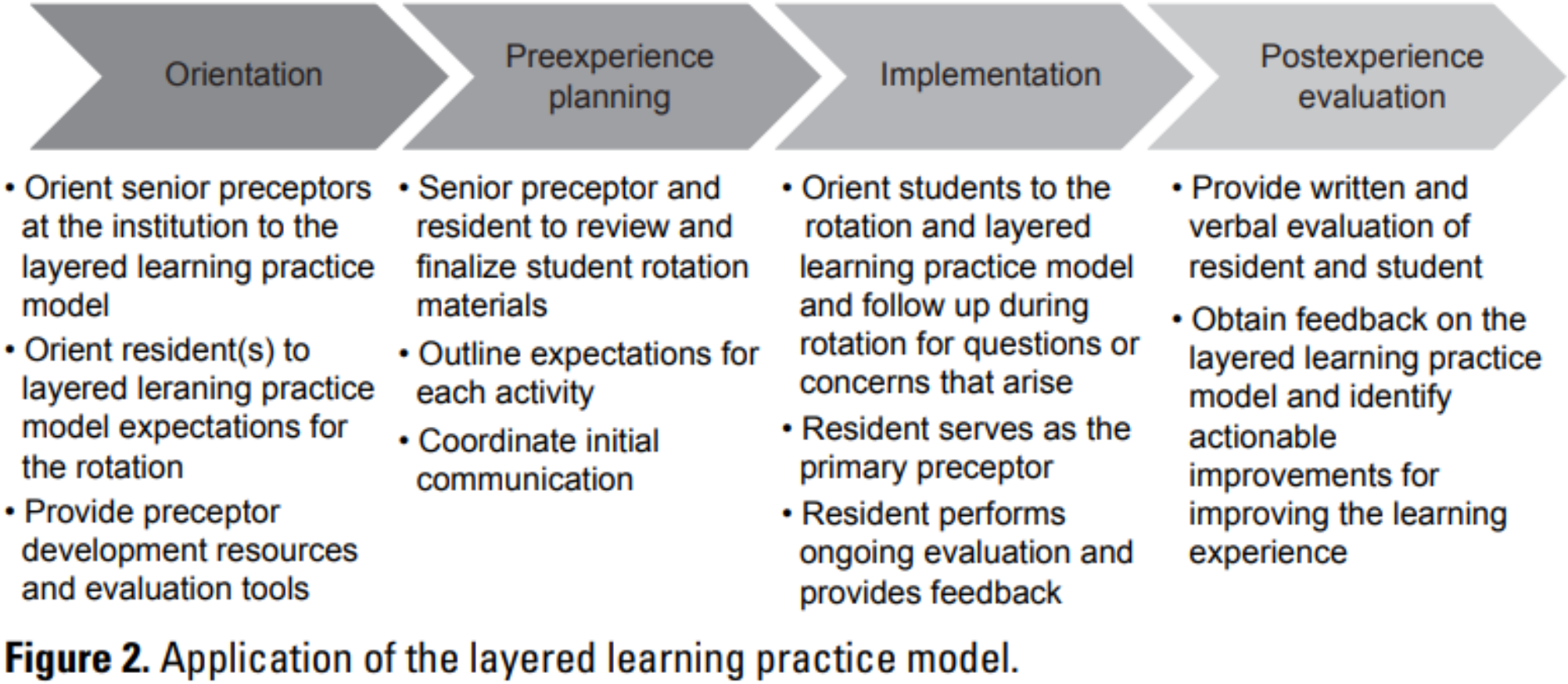

Figure 2. Application of the layered learning practice model.

Loy BM, Yang S, Moss JM, et al. *Hosp Pharm*. 2017;52:266-272.

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Remind students to take responsibility for their own learning & success

TABLE 1 Summary of strategies to ensure success in an experiential placement

The obvious strategies	The not-so-obvious strategies
• Understand and fully appreciate the syllabus. • Appear interested at all times and show that you value this experiential opportunity. • Show enthusiasm for learning. • Demonstrate independence. • Show initiative and make contributions in the experiential setting. • Share your knowledge to gain new insights. • Be ready to discuss patient care issues with your preceptor. • Be inquisitive, but expect to answer (most of) your own questions. • Do not fall behind with your assignments. • Never make anything up!	• Use clinical reasoning as the basis for your contributions to care. • Integrate yourself into the placement environment to optimize learning. • Discuss your observations with your preceptor. • Receive questions from the physician or other team members with grace and appreciation. • Consider therapeutic recommendations carefully because they will likely be put into action. • Embrace spontaneous learning experiences. • Be respectful of the clinical environment. • Use the mentorship and coaching skills of your preceptor. • Be appreciative of the time and energy being invested in you by your preceptor or other clinicians. • Consider your experiential placement as an extended job interview.

Jackson LD. *Can Pharm J (Ott).* 2015;148:308–313.

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