Elevating Student Research Projects

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Disclosures

- None

Objectives

- **At the completion of this activity, pharmacists will be able to***:*
  - Describe the definition and value of pharmacy students in research
  - Explain use cases that advance the roles of pharmacy students in research
  - Discuss opportunities to broaden the scope of pharmacy students in research
- **At the completion of this activity, pharmacy technicians will be able to***:*
  - Understand the definition and value of pharmacy students in research
  - Identify the benefits and challenges in advancing the roles of pharmacy students in research
  - List opportunities to broaden the scope of pharmacy students in research

The null hypothesis

- Clinical training without research has as much value as clinical training with research

What is research?

- An organized, systematic investigation to
  - Discover new facts
  - Develop new theories or challenge accepted theories in light of new facts
  - Apply knowledge for practical use
- Research is an integral part of modern medicine …
- The practice of medicine is based on knowledge obtained through research
  - it is not optional and cannot be ignored

Elevating Science

Pharmacy Research Team

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Types of Research

Basic Science –
Seeks to discover new knowledge; may not directly result in improved human health

Translational –
Applies basic science findings to human health

Translational –
Applies clinical research findings to basic science questions

Clinical Science –
Involves research with humans or human samples

Possible Student Research Domains

Education and training

- Training and certification
- Proof of understanding
- Compliance

Drug shortages

Preventive health

- Immunizations
- Smoking cessation

Revenue cycle optimization

- Therapy authorization
- Patient financial assistance and coverage

Patient adherence

- Patient adherence programs

Patient care services

- Medication histories
- Patient outreach
- REMS program

Patient/caregiver education

- Sterile product preparation

Compounding and dispensing

- Drug preparation
- Handling of hazardous waste

General support services

- Collect and organize data
- Prior authorization

Informatics and med safety

- Review adverse events

Supply chain management

- Purchasing
- Inventory control management

Quality improvement

- Error preventing strategies

Am J Health-Syst Pharm. 2018;75(2):1304-11.

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Motivate students

Try research if you…

- Want to be intellectually challenged
- Want to work closely with a faculty member
- Are thinking about an academic career
- Are not thinking about a career in academia
- Strengthen residency and job applications
- Want to be a better pharmacist

Make your student stand out!

How would a student be perceived….

- I am interested in things that aren't known
- I am interested in pushing development and innovation
- I am interested in the scientific process

- I am interested in personal and professional development

Understanding that research is not restricted

by location

- Important research is done in
  - academic institutions
  - government institutions
  - independent research institutions

by process

- Regardless of institution, the process is the same
  - It begins with a question or hypothesis
  - Experiments challenge this hypothesis
  - Conclusions are made and new questions emerge

Practical benefits

- Mentoring relationships
- Residency applications
- Unique learning opportunity
- Chance to make a difference
- Opportunity to be part of a team
- Opportunity to apply what you learn in class

Stages of research and student engagement

Idea and Methods	Approval	Perform Research	Writing	Presentation
Topic	Buy-in from the clinical team	Data collection	Identify conferences	Conference presentation
Research question	IRB	Consent	Write abstract	Manuscript acceptance
Literature search	Set up research area	Patient interactions	Create poster	Sharing with peers
Process development		Analysis	Write manuscript	
			Submit a manuscript	

Research components

1. Idea generation
2. Background literature search related to the idea
3. Consideration of study design, objectives and feasibility
4. Department/Residency Advisory Committee review
5. Presentation of project list to residents
6. Project selection
7. Timeline development
8. Protocol development
9. Data collection tool development
10. IRB submission and approval
11. Data collection
12. Data entry into computerized database
13. Data analysis
14. Presentation development

I. Introduction
II. Objective
III. Methods
    a. Study design
    b. Study population
        i. Patient identification
        ii. Patient selection
            1. Inclusion criteria
            2. Exclusion criteria
    c. Study procedure
    d. Outcomes assessed
    e. Outcome definitions
IV. Statistics and sample size analysis
V. Data Handling and Record Keeping
VI. Budget
VII. References

American Journal of Pharmaceutical Education 2008; 72 (4) Article 92.

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Research approval

Exempt:"Minimal to No Risk" Administratively Reviewed, Does Not Require Board Review	Expedited: "Minimal Risk" Reviewed by Subcommittee	Full: "Greater than Minimal Risk" Reviewed by Full Board
Survey of staff on medial practices	Retrospective chart/database reviews with identifiers	Clinical trials involving marketed drugs that require randomization
Retrospective review of de-identified data	Prospective chart/database reviews with or without identifiers	Clinical trials involving marketed drugs that require drug administration that is not considered part of routine care (and may present greater than minimal risk)
Assessment of student attitudes, skills, knowledge	Blood drawing (in some instances full review may be necessary)	Phase-I, II or III clinical trials involving investigational drugs or devices
Patient surveys when survey subject matter not of a sensitive nature	Noninvasive procedures (eg, electrocardiography, magnetic resonance imaging, ultrasound, etc.)	Pilot studies involving investigational drugs, devices or procedures posing greater than minimal risk
Quality improvement and quality assurance studies with internal implications	Surveys involving protected health information	Studies involving vulnerable populations (eg, children)
Case reports with internal implications	Observational studies	

Some examples adapted from Parvizi J, Tarity TD, Conner K, Smith JB. Institutional review board approval: why it matters. *J Bone Joint Surg Am.* 2007;89:418-26[13]

[a]Research intended for publication or for presentation outside the institution generally warrants review by an Institutional Review Board Researchers should consult their individual Institutional Review Board's to determine criteria for exempt from, expedited or full board review

American Journal of Pharmaceutical Education 2008; 72 (4) Article 92.

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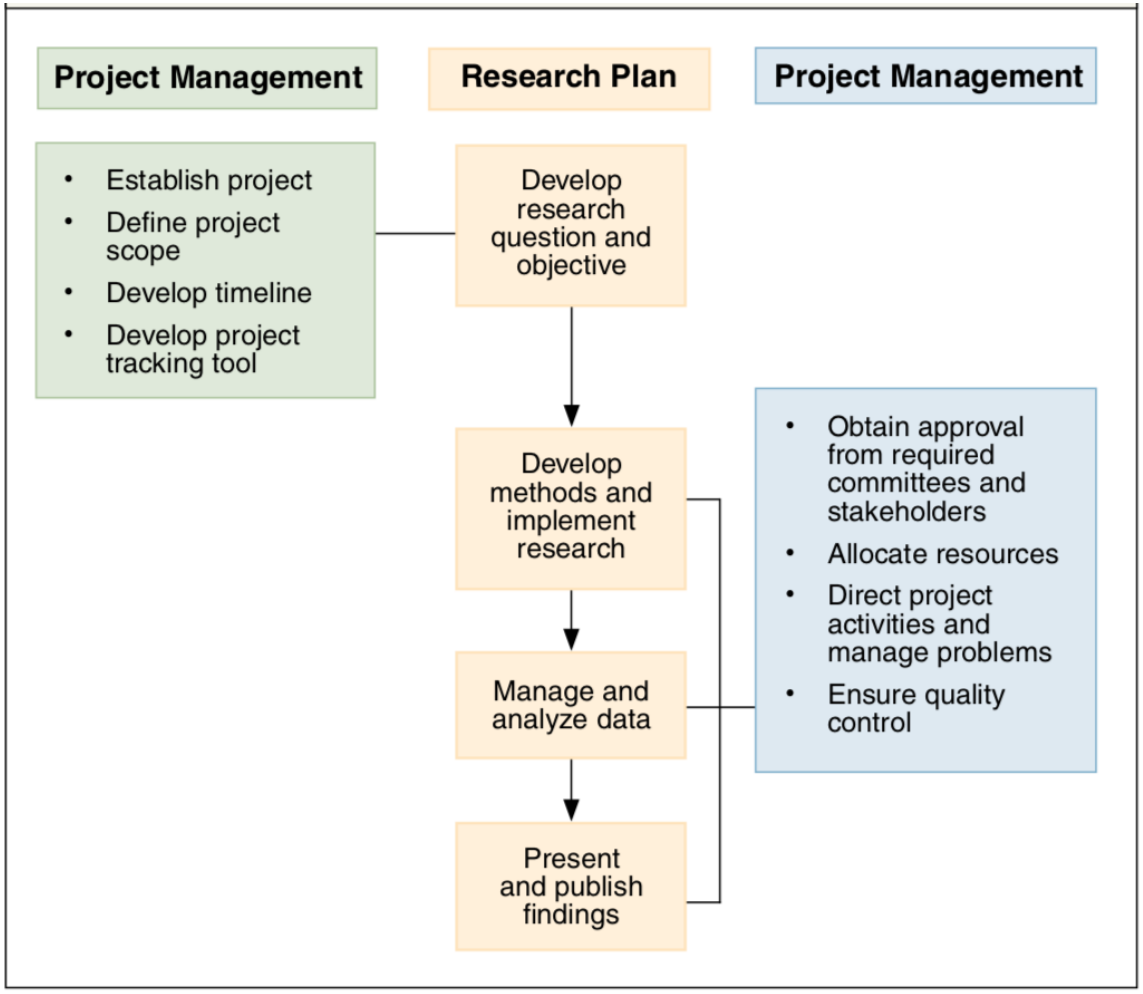
Research process



Am J Health-Syst Pharm—Vol 65 Nov 1, 2008

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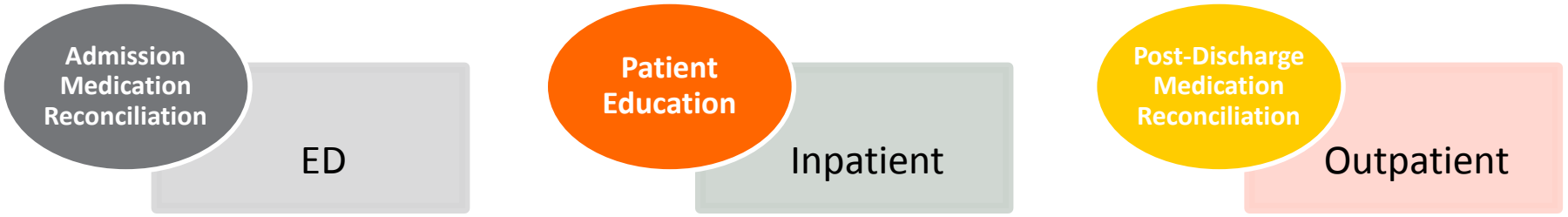
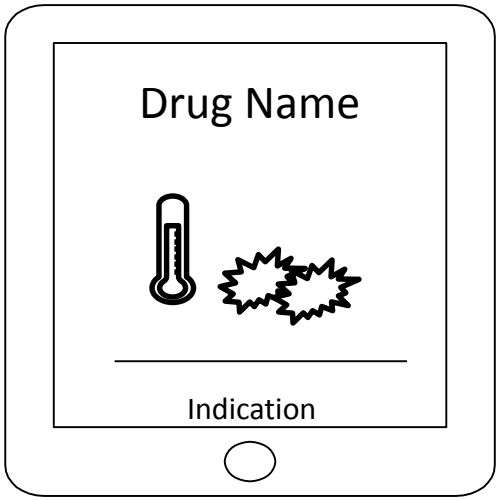
Example



Area of Focus	Patient Education (Tablet-Based)
Extender	Pharmacy Student
Setting	Inpatient
Metrics	Change in HCAHPS medication domain scores

Tablet-base patient education



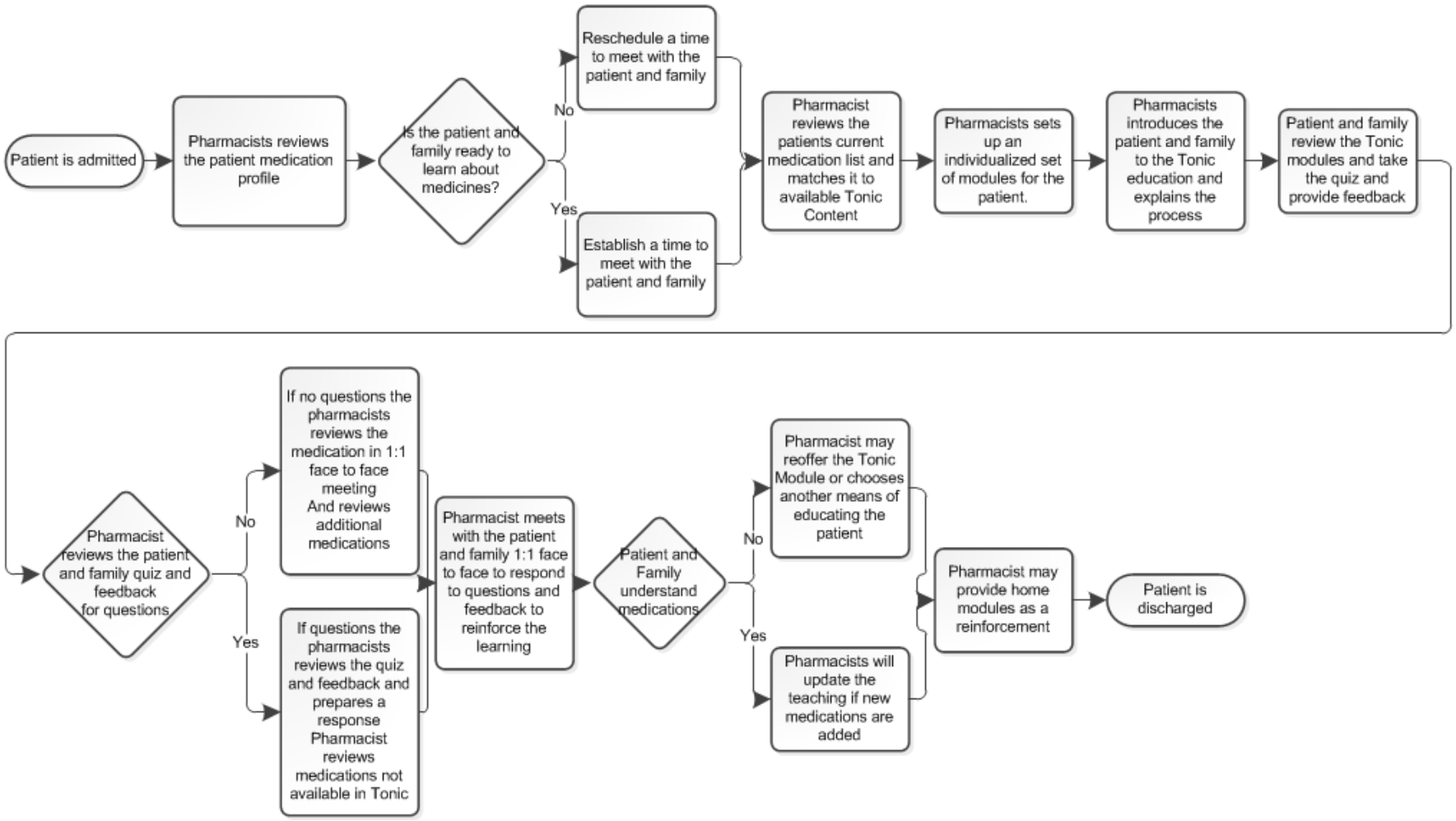
Greater pharmacy visibility

Better patient experience

Improved core measures

Higher patient satisfaction

Implementation process



- Medication education is targeted and focused individualized patient needs
- Pharmacist can enter in-person education follow-up session prepared to anticipate the issues and concerns of the patient

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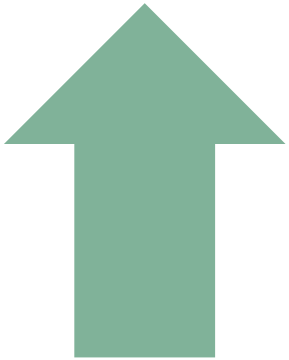
Outcomes

- % increase seen in the HCAHPS medication domain scores



7%

From the pharmacy team

- *“I have been participating in the patient education program for over a year. It is a rewarding experience to be able to interact with patients first hand and communicate the importance of the medication they are being treated with.” - GD (Pharmacy Intern)*

- *“Working in the children's emergency department as a med history intern has changed my outlook about life itself, you truly see how precious life is when you're working hand in hand with sick children. Bring positivity into these rooms with children and their parents can change someone’s whole day. I truly believe this position not only helped me grow into a better future pharmacist but also into a better person.” - IN (Pharmacy Intern)*

- *“I believe doing medication reconciliation for patients via telehealth allows us to better reach our target goals as well as manage our time more efficiently as compared to in person interview.” - SP (Pharmacy Intern)*

Final products

Lizzy Wagman, Francesca Guarrera, Hanlin Li, Demetra Tsapepas

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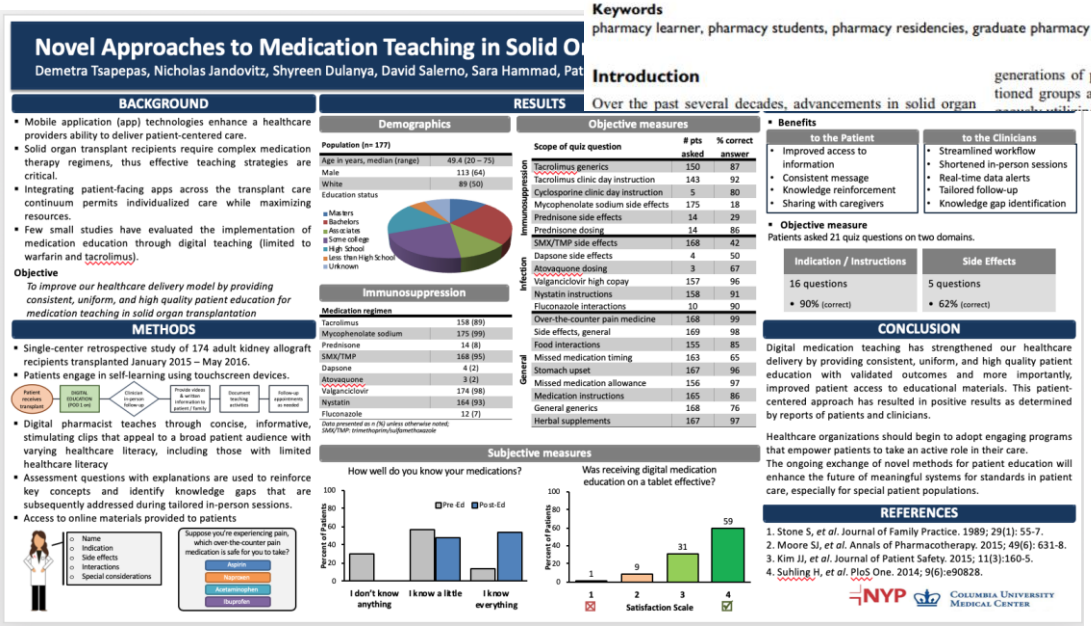
Transplantation is the treatment of choice for end stage organ failure. Successful outcomes require a thorough understanding of the transplant process, a close partnership between the patient and transplant center, and life-long adherence to a complex immunosuppressive regimen.. Understanding and customizing patient education regarding complications and the importance of medication adherence can have significant long-term benefits for patients.

Methods A single-center retrospective analysis of survey information that evaluate the multilevel factors (cognitive, attitudinal, behavioral, psychological, and social) and educational needs for an adult solid organ transplant recipient (heart, liver, lung, or kidney).. Post-transplant patients were asked to reflect on their pre-transplant waiting list experience and education received regarding general transplant knowledge and an emphasis on medications and the importance of adherence. Questions were generated locally and survey was distributed to patients in the outpatient and inpatient settings.

Results A total of 65 patients were e
reported feeling anxious, stressed, a
transplant and indicated that the inf
risks of transplant. When reflecting c
limited, 40% adequate amount, and
reported as average or above averag
post-operative care after transplant.
medications, 50% had neutral feelin
70% of patients reported that the im
attitudes towards adherence, while t
asked what the transplant center co
have targeted services for patients, r
complications and the need for long-
in pictures, illustrations, and words,
physical activity.

Conclusion Patient engagement is cr
member of the ongoing transplant e
ensure that the materials they devel



Novel Approaches to Medication Teaching in Solid O

Demetra Tsapepas, Nicholas Jandovitz, Shyreen Dulanya, David Salerno, Sara Hammad, Pat

BACKGROUND

- Mobile application (app) technologies enhance a healthcare providers ability to deliver patient-centered care.
- Solid organ transplant recipients require complex medication therapy regimens, thus effective teaching strategies are critical.
- Integrating patient-facing apps across the transplant care continuum permits individualized care while maximizing resources.
- Few small studies have evaluated the implementation of medication education through digital teaching (limited to warfarin and tacrolimus).

Objective

To improve our healthcare delivery model by providing consistent, uniform, and high quality patient education for medication teaching in solid organ transplantation

METHODS

- Single-center retrospective study of 174 adult kidney allograft recipients transplanted January 2015 – May 2016.
- Patients engage in self-learning using touchscreen devices.

- Digital pharmacist teaches through concise, informative, stimulating clips that appeal to a broad patient audience with varying healthcare literacy, including those with limited healthcare literacy
- Assessment questions with explanations are used to reinforce key concepts and identify knowledge gaps that are subsequently addressed during tailored in-person sessions.
- Access to online materials provided to patients

RESULTS

Demographics

Population (n= 177)

Age in years, median (range)	49.4 (20 – 75)
Male	113 (64)
White	89 (50)

Education status

Immunosuppression

Medication regimen	
Tacrolimus	158 (89)
Mycophenolate sodium	175 (99)
Prednisone	14 (8)
SMX/TMP	168 (95)
Dapsone	4 (2)
Atovaquone	3 (2)
Valganciclovir	174 (98)
Nystatin	164 (93)
Fluconazole	12 (7)

Data presented as n (%) unless otherwise noted; SMX/TMP: trimethoprim/sulfamethoxazole

Objective measures

Scope of quiz question	# pts asked	% correct answer
Immunosuppression: Tacrolimus generics	150	87
Immunosuppression: Tacrolimus clinic day instruction	143	92
Immunosuppression: Cyclosporine clinic day instruction	5	80
Immunosuppression: Mycophenolate sodium side effects	175	18
Immunosuppression: Prednisone side effects	14	29
Immunosuppression: Prednisone dosing	14	86
Infection: SMX/TMP side effects	168	42
Infection: Dapsone side effects	4	50
Infection: Atovaquone dosing	3	67
Infection: Valganciclovir high copay	157	96
Infection: Nystatin instructions	158	91
Infection: Fluconazole interactions	10	90
General: Over-the-counter pain medicine	168	99
General: Side effects, general	169	98
General: Food interactions	155	85
General: Missed medication timing	163	65
General: Stomach upset	167	96
General: Missed medication allowance	156	97
General: Medication instructions	165	86
General: generics	168	76
General: Herbal supplements	167	97

Subjective measures

How well do you know your medications?

Was receiving digital medication education on a tablet effective?

- **Benefits**

to the Patient	to the Clinicians
• Improved access to information • Consistent message • Knowledge reinforcement • Sharing with caregivers	• Streamlined workflow • Shortened in-person sessions • Real-time data alerts • Tailored follow-up • Knowledge gap identification

- **Objective measure**

Patients asked 21 quiz questions on two domains.

Indication / Instructions	Side Effects
16 questions	5 questions
• 90% (correct)	• 62% (correct)

CONCLUSION

Digital medication teaching has strengthened our healthcare delivery by providing consistent, uniform, and high quality patient education with validated outcomes and more importantly, improved patient access to educational materials. This patient-centered approach has resulted in positive results as determined by reports of patients and clinicians.

Healthcare organizations should begin to adopt engaging programs that empower patients to take an active role in their care. The ongoing exchange of novel methods for patient education will enhance the future of meaningful systems for standards in patient care, especially for special patient populations.

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Dynamic Interplay of Pharmacy Learners During a Solid Organ Transplantation Learning Experience

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Abstract

Institutions with established clinical pharmacy services have the ability to offer focused patient care learning experiences, often led by a clinical specialist, for pharmacy residents and pharmacy students. Since all parties are continually involved in professional development and lifelong learning, the aforementioned groups can all be considered "pharmacy learners." By utilizing the dynamic interplay and collaboration between pharmacy learners through direct and nondirect patient care activities, experiential and educational opportunities may be improved and enhanced for each learner. A tiered learning approach engages individuals in areas such as direct patient care, patient education, presentations, research projects, career development, and the feedback process. We describe our experience during a solid organ transplantation learning experience using a layered learning practice model that included a clinical pharmacy specialist, a postgraduate year 2 specialty pharmacy resident, a postgraduate year 1 pharmacy resident, and a pharmacy student.

Keywords

pharmacy learner, pharmacy students, pharmacy residencies, graduate pharmacy education, layered learning practice model

Introduction

Over the past several decades, advancements in solid organ

generations of practitioners. In essence, all of the aforementioned groups are considered "pharmacy learners." Advanta-

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Successful research projects

- Originate with a question
- Have clear and achievable goals
- Follow a specific plan of procedure
- Divide the principal problem into manageable sub-problems
- TEACH YOU TO THINK, NOT JUST MEMORIZE FACTS

Conclusions

- Research should form an integral part of all medical training of varying intensity
- Pharmacy students can be engaged in all aspects of the research process
- Possibility to develop long-lasting collaborations
- Have fun!

Elevating Student Research

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