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PROGRAMME DESCRIPTION

# Student-driven innovation: Developing pre-IPPE virtual simulations with MyDispense

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## Abstract

**Introduction:** This paper describes involving student pharmacists in a summer research fellowship to develop pre-IPPE virtual simulation cases by interviewing practicing pharmacy preceptors. **Description of innovation:** Two student pharmacists were awarded research fellowships to work on a MyDispense project. They interviewed pharmacy preceptors to determine relevant case topics, focusing on areas requiring more practice, uncommon dispensing situations, and common medication errors. Based on the interviews, the students developed six cases: medication dispensing and counseling (3), immunization schedules (2), and recognizing invalid prescriptions (1). These cases were assigned to P1 students to complete prior to their community IPPEs. **Novelty:** This approach highlighted the involvement of research students in developing MyDispense cases. The use of preceptor interviews ensured the cases were relevant to current practice and led to the inclusion of scenarios that students may not regularly encounter during their IPPE rotations. **Implementation and future plans:** Involving research students in case development proved beneficial by reducing faculty workload and providing hands-on experience for students. Future plans include expanding to other areas of the curriculum and incorporating new features of MyDispense.

## Introduction

There have been many publications describing pharmacy student research programs and their benefits for students in the literature (Kao *et al.*, 2011; McLaughlin *et al.*, 2015; Deal *et al.*, 2016). In addition, there are benefits for the faculty member and/or preceptor involved, as well as the institution (Kao *et al.*, 2011; Deal *et al.*, 2016). The 2016 American College of Clinical Pharmacy Research Affairs Committee states that "*research and scholarly training and experience provide important benefits to trainees, mentors, and their institutions*" (Deal *et al.*, 2016). Literature exists describing student pharmacist research projects focused on clinical research and direct patient care initiatives (McLaughlin *et al.*, 2015; Smith *et al.*, 2020). However, there is limited research addressing projects that engage students in academic research, particularly those involving the development and evaluation of coursework or active learning exercises for integration into the curriculum. By participating in this type of work, students can gain valuable hands-on experience, while faculty can benefit from fresh perspectives and innovative ideas, especially given the ever-increasing need for increased student engagement in curricula.

The integration of experiential rotations into the curriculum plays a crucial role in preparing students for real-world practice. However, these rotations are not without limitations. Students may not encounter certain rare or high-risk situations, and depending on their level of competence, may only play the role of an observer rather than actively participating. MyDispense is an online pharmacy simulation programme developed by the faculty of Pharmacy and Pharmaceutical Sciences at Monash University in Melbourne, Australia (McDowell *et al.*, 2016). It offers a pharmacy experience in simulated community and

institutional pharmacy settings. Incorporating MyDispense into the experiential curriculum may increase opportunities for students to have exposure to rare situations without requiring a significant increase in cost and faculty time commitment after the initial development of the activities. While the literature provides several examples of utilising MyDispense in pharmacy education, literature is lacking regarding the development of patient cases and implementation into the curriculum (Shin *et al.*, 2018; Mospan & Gillette, 2020; Tai *et al.*, 2020; Chuang *et al.*, 2021; Johnson *et al.*, 2021; Amirthalingam *et al.*, 2022; Phanudulkitti *et al.*, 2022).

The objective is to describe the use of research student pharmacists in developing virtual simulation patient cases for P1 students to complete prior to their introductory pharmacy practice experiences in the community setting.

## Description of innovation

### *Summer research fellowship programme*

The University of Arkansas for Medical Sciences College of Pharmacy Summer Research Fellowship Programme allows students interested in gaining research experience to apply to participate during the summers after their P1 or P2 year. Faculty submit project proposals, and students can interview with faculty for projects in which they are interested. Afterwards, faculty and students rank their selections, and the College's Research Committee matches students to faculty projects. Project types have a high variability including bench research, pharmacy practice-based research, and academic research.

Two P2 student pharmacists were awarded a research fellowship to work with two faculty mentors on a MyDispense project full time during the summer of 2021. Their tasks included conducting literature reviews, identifying a research question and study design, as well as developing, building, and testing cases in MyDispense. The research students helped generate cases for students to complete prior to their P1 community introductory pharmacy practice experiences (IPPEs).

### *MyDispense case development and implementation*

To generate the cases, the students used pharmacist preceptors within the state of Arkansas to identify relevant topics. The research students, with the help of their research mentors, developed 8 questions (Table I) to ask each pharmacist that would be interviewed. If needed to start the conversation, the students had examples they could share. For example, for question number 1 regarding a medication or dispensing scenario that students may not see on a rotation, the students could say: "*perhaps dispensing a medication that requires registration through iPledge*". Preceptors were identified and asked to participate in semi-structured interviews focusing on three main areas: 1) student skills requiring more practice, 2) uncommon yet relevant dispensing situations, and 3) common medication errors that occur in the pharmacy. Both students were present during the interview, and pharmacists were interviewed one at a time (2 students to 1 pharmacist). Interviews were recorded with permission from the pharmacist. After the interviews were completed, the students identified common themes from the responses by reviewing notes from the interview and listening to the recording if needed. The students met regularly with their research mentors to review the question responses and potential themes. From these themes and ideas, topics for cases were determined.

**Table I: Standardised questions for community pharmacist preceptors**

| | |
|---|---|
| 1. | Is there a medication or dispensing situation/scenario that students do not typically get to see on rotation? |
| 2. | Can you think of a medication or dispensing scenario that does not occur very often but would be beneficial for a student to have exposure to? |
| 3. | What are some of the most common medication errors you see in your community pharmacy? |
| 4. | Can you think of any scenarios or areas where students struggle with the workflow in a community pharmacy setting? |
| 5. | What are some of the common counseling points or basic knowledge do you think P1 students should have before they start their community rotation? |
| 6. | What is something (dispensing or medication related) that you wish you would have had exposure to before you started practicing? |
| 7. | Do you notice a difference in the performance of students who have worked in a pharmacy vs students who have not? |
| 8. | Can you give an example or two of interprofessional experiences that may occur in the pharmacy. |

To aid with case writing standardisation and feedback, the students developed a case writing template utilising the Pharmacists' Patient Care Process (Appendix A). The template included MyDispense fields relevant to each case including prescription information, fact finding questions and patients responses, questions that the patient would ask, counseling points, and rule-based student feedback.

Once the template for a particular case was completed and approved, the students would then use it to build each case in MyDispense. This process took several iterations for each case that was developed. Once all edits were made, the research students began a user-testing phase using upperclassman and revised cases as needed during this process.

The students developed six community IPPE cases to be assigned to P1 students for completion prior to starting their community IPPE. P1 student pharmacists were required to complete at least four of the six pre-P1 community IPPE cases.

The students developed and tested a post-implementation survey (Appendix B) for P1 students to complete after their P1 community IPPE rotation to collect students' previous pharmacy experience, IPPE experience, and opinions about the MyDispense activities. The survey consisted of 18 questions; however, some included branching logic, meaning not all students answered every question. Survey data were collected and managed using REDCap, version 12.0.12 (Vanderbilt University) electronic data capture tools hosted at The University of Arkansas for Medical Sciences College of Pharmacy (Harris *et al*., 2009; Harris *et al*., 2019).

After completing the summer research program, both students continued working on the project throughout their P3 year, earning elective credit hours and ultimately earned honors in research designation for their time spent on this project. This project was deemed non-human subjects research by the institution's institutional review board.

## Novelty

### *Case development*

Additionally, pharmacists identified several areas where students may have limited experience during rotations but which would be valuable for their learning. These include handling prescriptions that require the use of REMS programs, such as clozapine for patient safety, identifying forgeries and managing controlled substances, making vaccination recommendations, and counseling on less commonly dispensed yet important medications (e.g., antiretrovirals, inhalers).

Given this feedback, the students developed 6 cases for practice with 3 skills: medication dispensing and counseling (3 cases), utilising immunisation schedules (2 cases), and recognition of invalid prescriptions (1 case). The medication dispensing/counseling questions included opportunities for the students to collect information from the patient, such as allergies and medical history, assess the patient's current knowledge about the prescription, provide counseling points, and address patient questions about missed doses and potential side effects.

The immunisation cases each included a patient presenting to the pharmacy counter asking about recommendations for vaccinations. The students must ask the patient about their medical history and other pertinent information to determine which vaccinations are needed.

The case for recognising invalid prescriptions was set up to look like the medication dispensing/counseling cases. The same questions were available to ask the patient; however, the student should have noticed that a controlled prescription was written by a pediatrician for an older patient. The case also allowed the student to contact the prescriber to verify the prescription and determine that the prescription was a forgery.

### *Case implementation*

All students (92) completed the minimum requirement of four cases, while 20.7% completed five cases, and 13% completed all six cases (Table II). The average completion time among all six cases was 17.2 minutes (range 7-26 minutes), and the average number of attempts per student was 1.50. There was a higher number of attempts with a maximum of 5 attempts by students on the invalid prescription case.

### *Post-implementation survey results*

A total of 39 students completed the post-implementation survey, yielding a 43% response rate. Of those surveyed, 25% had no pharmacy experience, while the remaining students had experience in either a community or hospital setting. When asked to characterise their experiences during their IPPE, students reported medication counseling (59%), recording vaccinations (51%), and recommending vaccinations (18%) were the activities that they received the least experience with during the rotation. Other dispensing and vaccine-related activities were all higher than 60%, most being 80% or higher. Of the respondents, 2 students encountered a forged prescription during the rotation.

Overall, 80% strongly disagreed or disagreed that the cases helped increase their confidence level during their rotation. However, of the students that completed a vaccination case (74%), 52% agreed or strongly agreed that the cases helped them become more familiar with navigating the immunisation schedule, while only 34% agreed or strongly agree that they were more likely to recommend a vaccination to a patient. Similarly, students that completed the forgery case (80%), 58% agreed or strongly agreed that the case increased their ability to distinguish between a valid and forget prescription.

For the open response questions, 15 students said that the cases were helpful: specifically citing that the cases were a safe environment to make mistakes in and that the examples were like real life. Twenty-one students felt that the cases were not realistic, and many students commented about the logistics of figuring out how to use the program. Some ideas were given for other types of cases specifically working with insurance, more practice with vaccines, and more counseling cases.

**Table II: Student performance per case**

| **P1 experiential IPPE simulation**<br>**Class of 2025 - 92 students enrolled** | | | | |
|---|---|---|---|---|
| | **Type (topic)** | **Average of students who completed (number)** | **Average # of attempts (range)** | **Average completion time (minutes)** |
| Case 1 | Dispense (HIV) | 92% (85) | 1.48 (1-3) | 25.46 |
| Case 2 | Dispense (anticoagulation) | 94% (86) | 1.27 (1-3) | 23.5 |
| Case 3 | OTC (vaccine) | 70% (65) | 1.49 (1-4) | 21.9 |
| Case 4 | Dispense (forgery) | 89% (82) | 1.65 (1-5) | 7.38 |
| Case 5 | Dispense (HIV) | 44% (40) | 1.25 (1-4) | 14.8 |
| Case 6 | OTC (vaccine) | 21% (19) | 1.84 (1-4) | 9.6 |

P1: Professional year 1; IPPE: Introductory Pharmacy Practice Experience; HIV: human immunodeficiency virus; OTC: Over-the-counter

## Implementation and *future plans*

The use of research students to help develop the cases and learn the software provided significant benefit for the faculty by offsetting faculty time and effort. The creation of the activities was able to be done in a more robust way given the scholarly approach used by the students to design the cases. Particularly, the use of pharmacy preceptor interviews allowed students to develop cases with topics relevant to current practicing pharmacists. The development and deployment of a post-implementation survey allowed faculty to assess student perception of the activities in relation to their IPPE experience.

To the authors' knowledge, there has not been a description in the literature of utilising students to interview preceptors to develop cases to prepare students for practice experiences. Other studies describe case development by course directors and residents (Ambroziak *et al.*, 2018; Mospan & Gillette, 2020; Tai *et al.*, 2020). Topics are often determined and aligned with content taught in class(Mospan & Gillette, 2020; Tai *et al.*, 2020) or created based on typical scenarios in practice (McDowell *et al.*, 2016; Johnson *et al.*, 2021).

In this data, few students were exposed to a forgery during the IPPE rotation, which preceptors had identified as an area for which students may less commonly have experience. This was a key reason a forgery case was developed due to low exposure on rotations. Additionally, preceptors identified vaccinations as an area with limited exposure, which aligned with the survey data regarding student exposure during rotations, their perceptions of the case, and feedback on what they found helpful. The Accreditation Council for Pharmacy Education Guidance for Standards 2016 suggests that simulation experiences for students to gain IPPE credit hours may be helpful for students early in the curriculum who have had limited exposure to pharmacy. While cases were not used for IPPE credit in this study, some colleges of pharmacy do so ( Shin *et al.*, 2018; Johnson *et al.*, 2021). They may be appropriate for several reasons such as when they involve learning experiences that may be difficult to obtain in practice (e.g. high risk, low occurrence situations such as medication errors) and hands on learning scenarios to enhance the

learning experience (e.g. exposure to important disease states that they may not have to opportunity to experience on rotation (ACPE, 2015). Although many of the student respondents on the survey reported issues with logistics in figuring out the MyDispense software, as these are started early in the college of pharmacy curriculum (P1 year), students will begin to feel more comfortable as they complete future cases.

This study targeted more rare cases in practice, which may have skewed the results when students responded to questions about whether the activities were similar to real-life community pharmacy settings. To remedy, future interviews with preceptors could also include a question about common activities encountered in practice as well as rare cases. Conversely, the post-implementation survey wording could be modified to focus on the perceptions of the rare cases.

Barriers for this process include time commitment to developing and implementing the cases. This process took several months from idea generation to final case development and then another month to implement. In addition, if an institution doesn't have a research programme for students in place, the faculty mentor may have a harder time for students to commit to working on the project (e.g. due to not getting a stipend and dedicated time). One solution to this would be to create a special problems research elective (Tai *et al.*, 2020) so that the student would have dedicated time to work on the project and earn credit for doing so. Another barrier is deciding how to incorporate the final case into the curriculum. The faculty must decide whether it is required or optional, if points are to be earned, or whether it is an ungraded assignment to be completed. For this project, students had to complete four of the six cases and upload proof of completion, but there were no points associated with it.

Since this study was completed, research students have interviewed preceptors to create cases for health-system/institutional settings and have developed cases for use in other areas of the curriculum. This process could be implemented in other areas of the curriculum including brainstorming ideas for clinical labs, objective structured clinical examinations, and more. At the time these cases were developed, MyDispense Version 7, which has electronic health record capability, had not been released. Future plans include converting those cases to the new version.

In conclusion, having research students participate in case development is a benefit to the pharmacy curriculum. They, along with pharmacy preceptor practitioners, can bring real-world scenarios to simulated cases in the college of pharmacy curriculum that students may not have exposure to on their experiential rotations.

## Conflict of interest

The authors declare no conflict of interest.

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## Appendix A: MyDispense case template

**Dispensing, validation, and scenarios template**

This template should be used for building Rx exercises in MyDispense including dispensing, validation, and scenarios. The sections that already have a checkbox marked should not be altered.

| *CASE LOGISTICS* |
|---|
| ***Type of activity*** *– dispensing, validation, or scenario* |
| |
| ***Unit/Tutorial activity should be placed in*** *– where it will appear in MyDispense* |
| |
| ***Prerequisite knowledge required to complete the exercise*** *– counseling, medications, etc.* |
| |

| **EXERCISE OPTIONS** |
|---|
| **Exercise name** – *title of exercise* |
| |
| **Exercise description** – *appears on administration screen* |
| |
| **Exercise introduction** – *what the student sees on the exercise entry screen* |
| |
| **Patient symptoms** – *summary of symptoms used for feedback* |
| |
| **Keywords** – *example community, pharmacy, etc.* |
| |
| **Exercise options:**<br>☐ Cannot be reset by student<br>☐ Hide medication gallery |
| **Time limit:**<br>☐ Enable time limit Amount of time allowed: _____ |

| |
|---|
| **Exercise context:**<br>☐ Community<br>☐ Institutional |
| **Exercise date:**<br>☒ Automatic<br>☐ Manual |
| **Document attachments** |
| Add PDF/image files to increase exercise depth (disease state images, lab results, notes, etc). Up to 5 files can be attached, but each file must be less than 20MB. |
| **Link attachments** |
| Add external links to increase exercise depth (reference articles, videos, and more). You must include the full link to the page including http://. |

| **PRESCRIPTION/PRESCRIBER INFORMATION** |
|---|
| **Prescription date** – *day the prescription was written by the doctor (MM/DD/YYYY)* |
| |
| **Prescription type** – *controlled or generic Rx* |
| |
| **Prescription font** – *can either appear typed or handwritten* |
| |
| **Prescriber voicemails** – *allows the student to listen to speak to healthcare professional* |
| ☐ Enable voicemails from prescribers and healthcare professionals<br>☐ Do not enable voicemails |
| **Name of prescriber** |
| |
| **Medical center and specialty** – *where is the prescriber located and what area of practice is their specialty?* |
| |
| **Address** |
| |
| **Phone Number** |
| |
| **DEA Number** |
| |
| **License Number** |
| |
| **NPI Number** |
| |
| **Prescriber type** – *general practitioner, neurologist, etc.* |
| |

| **MEDICATION INFORMATION** |
|---|
| **Medication Brand/Generic name** |
| |
| **Brand substitutions permitted?** |
| |
| **Strength** – *example 100mg, 200mg* |
| |
| **Dosage form** – *tablet, capsule, ER capsule, suspension, solution, injection, etc.* |
| |
| **Quantity** – *how many the Rx was written for* |
| |

| **Directions** – *how the patient should take the medication* |
|---|
| |
| **Refills** |
| |
| **Ancillary stickers** – *what stickers the student should include when filling the Rx* |
| |
| **Ancillaries feedback** - *for students to see after completing exercise* |
| |

| **PATIENT DETAILS** |
|---|
| **Title** |
| |
| **Name of patient** |
| |
| **Sex** |
| |
| **Ethnicity** |
| |
| **Street address** |
| |
| **Phone number** |
| |
| **Age** |
| |
| **Weight** |
| |
| **Allergies** – *include the patient's allergies here* |
| |
| **Substance use** – *include any alcohol, tobacco, or drug use here* |
| |
| **Patient introduction** – *the first sentence said by patient* |
| Hello, how are you today? |
| **Patient notes** – *adds a fixed characteristic to the patient* |
| None |
| **Manage dispensing records** – *dispensing history of the patient that is shown on the simulated computer* |
| Click "manage dispensing records", "new dispensing record" and then fill in the information to create a fill history for the patient. NOTE that "repeats" means refills. |

| **PATIENT COMMUNICATION** |
|---|
| **Identity query** – *a question asked to the patient to determine their identity* |
| ☒ Use default response<br>☐ Customize response<br>☐ Disable identity query |
| **Fact Finding** |
| ☐ Disable patient fact finding – *checking this box will not allow any questions to be asked of the patient* |
| ☐ Randomize facts – *checking will display patient facts in random order* |
| **Facts for patient feedback type:**<br>☐ Basic feedback<br>☒ Advanced feedback |
| |

**Facts (pre-defined):**

| Display or hide question | Category | Must ask, can ask, or do not ask | Response | Feedback (for students to see after completing exercise) |
|---|---|---|---|---|
| | Age | | | |
| | Alcohol consumption | | | |
| | Allergies | | | |
| | Breastfeeding | | | |
| | Hospital admission | | | |
| | Illicit drug use | | | |
| | Other medications | | | |
| | Medicare Number | | | |
| | Pregnant | | | |
| | Previous use of meds | | | |
| | Purpose of meds | | | |
| | Smoking status | | | |
| | Symptoms | | | |
| | Other symptoms | | | |
| | Aggravating/relieving factors | | | |
| | Weight | | | |

**Add custom fact:**

| Patient question | Patient response | Must ask, can ask, or do not ask | Feedback (for students to see after completing exercise) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

**Patient prompting**

☐ Enable patient prompting – *checking this box reminds students to ask patient questions*

**Patient questions**

☐ The student should ask the patient if they have any questions BEFORE counseling the patient
☐ The student should ask the patient if they have any questions AFTER counseling the patient
☐ The student should ask the patient if they have any questions EITHER before or after counseling the patient

**Add patient question:**

| Patient question | Feedback on patient question |
|---|---|
| | |
| | |
| | |

**PRESCRIBER COMMUNICATION**

Fact Finding

☐ Disable prescriber fact finding – checking this box will not allow any questions to be asked of the prescriber

☐ Randomize facts – checking will display patient facts in random order

Facts for patient feedback type:
☐ Basic feedback
☒ Advanced feedback

Facts (pre-defined):

| Display or hide question | Category | Must ask, can ask, or do not ask | Response | Feedback (for students to see after completing exercise) |
|---|---|---|---|---|
| | **Controlled drug** | | | |
| | **Doctor's plan of action** | | | |
| | **Dosing query** | | | |
| | **Interaction** | | | |
| | **Medication purpose** | | | |
| | **Paperwork issue** | | | |
| | **Patient allergies** | | | |
| | **Potential fraudulent script** | | | |

Add custom fact:

| Prescriber question | Prescriber response | Must ask, can ask, or do not ask |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**NOTES**

☐Enable professional notes feedback – *checking this box allow feedback on professional notes (most likely should not be checked)*

**COUNSELING/DISPENSING**

**Select exercise outcome:**

☐ Do not recommend dispensing

☐ ~~Recommend dispensing the medications (basic feedback)~~

☐ Recommend dispensing the medications (advanced feedback)

**Do not recommend** – *why the student should not dispense the medication*

**Reasons to not recommend (must select at least one):**

☐ Incomplete directions

☐ Dose error

☐ Medication unsafe

☐ Medication interaction

☐ Medication expired

☐ Script expired

☐ Script not handwritten

☐ Patient misuse/addiction

☐ Prescription invalid

☐ Other (specify)

**Enable Patient Counseling** – *provides students an opportunity to counsel the patient*

☒ Yes

☐ No

**Patient counseling** – *what the student is expected to counsel the patient on*

This prescription is for _____. I would recommend…

**Correct outcome feedback** – *feedback that is displayed when a student correctly dispenses or does not dispense a medication*

Great job! You correctly did not/did dispense the medication because…

**Wrong outcome feedback** – *feedback that is displayed when a student dispenses a medication when it is not appropriate to do so or does not dispense a medication when they are supposed to*

You should not have/should have dispensed the medication for this patient because...

| **ERRORS** |
|---|
| **Errors** – *allows errors to be present within the exercise* |
| ☐ Enable exercise errors |
| **Prescription Errors** – *allows errors to be present within the prescription* |
| ☐ Enable script errors<br><br>☐ **Script:** hide ID, hide brand substitution, hide day, hide month, hide year<br>● please specify what errors should be present here<br><br>☐ **Patient:** hide first name, hide last name, hide street address, hide suburb, hide state, hide zip code<br>● please specify what errors should be present here<br><br>☐ **Prescriber:** hide title, hide first name, hide last name, hide street address, hide suburb, hide state, hide zip code, hide phone number, hide DEA number, hide license number, hide NPI number, hide signature<br>● please specify what errors should be present here |
| **Additional information** -*allows the exercise designer to mark the items necessary to reach the correct outcome* |
| ☐ Enable additional information |
| **Outcome** |
| ☐ Dispense script<br>☐ Do Not Dispense script<br>☐ Either Dispense or Do Not Dispense script is acceptable |

| **ASSESSMENTS** |
|---|
| Enable assessment:<br>☒ Disabled<br>☐ Enabled |

| **PHARMACISTS' PATIENT CARE PROCESS (PPCP)**<br>Please indicate which parts of the PCPP were integrated within this exercise (check all that apply) |
|---|
| **COLLECT:** the pharmacist assures collection of necessary subjective and objective information about the patient |
| ☐ Patient demographics<br>☐ Patient medication list<br>☐ Patient past medical history<br>☐ Patient allergies<br>☐ Patient adherence<br>☐ Patient lifestyle and social habits<br>☐ Additional Patient information gathered from prescriber or other healthcare provider<br>☐ Lab documents or other test results<br>☐ Other (please specify) |
| **ASSESS:** the pharmacist assesses the information collected and analyzes the clinical effects |
| ☐ Medication safety<br>☐ Risk factors pertinent to the patient<br>☐ Medication adherence<br>☐ Medication appropriateness<br>☐ Preventative care/other health care services<br>☐ Overall health of the patient<br>☐ Other (please specify) |
| **PLAN:** the pharmacist develops an individualized patient-centered plan |
| ☐ Recommend appropriate drug for patient<br>☐ Recommend appropriate dose for patient<br>☐ Recommend appropriate frequency of medication for patient |

| |
|---|
| ☐ Recommend appropriate directions for the patient's current therapy<br>☐ Developing a health plan for the patient<br>☐ Other (please specify) |
| **IMPLEMENT:** the pharmacist implements the care plan in collaboration with other health care professionals and the patient or caregiver |
| ☐ Patient education -- counseling<br>☐ Modifications made to medications<br>☐ Addresses medication problems<br>☐ Discontinuation of medications if necessary<br>☐ Did not dispense medication to patient<br>☐ Dispensed medication to patient<br>☐ Verified information with prescriber or other healthcare provider<br>☐ Other (please specify) |
| **FOLLOW UP: MONITOR & EVALUATE:** the pharmacist monitors and evaluates the effectiveness of the care plan and modifies the plan |
| ☐ Monitor for medication safety<br>☐ Monitor for medication efficacy<br>☐ Patient adherence<br>☐ Identification of clinical endpoints (e.g. decreased risk of stroke/heart attack, decreased mortality)<br>☐ Follow up appointment or visit<br>☐ Other (please specify) |

**OTC Template**

This template should be used for building OTC exercises in MyDispense. Certain sections have been filled in with an example case to help guide you. The sections that already have a checkbox marked should not be altered.

| **EXERCISE OPTIONS** |
|---|
| Exercise name – *title of exercise* |
| Cough Case 2021 |
| Exercise description – *appears on administration screen* |
| A patient with a cough and stuffy nose that needs a systemic analgesic and expectorant |
| Exercise introduction – *what the student sees on the exercise entry screen* |
| A patient presents to the counter and wants to know what she should take for her cough. |
| Patient symptoms – *summary of symptoms used for feedback* |
| Cough |
| Keywords |
| Cough, cold, stuffy nose |
| Exercise options:<br>☐ Cannot be reset by student<br>☐ Hide medication gallery<br><br>Maximum number of medications that can be selected by the student: 6 |
| Time limit:<br>☐ Enable time limit |
| Exercise date:<br>☒ Automatic<br>☐ Manual |
| Document attachments |
| Add PDF/image files to increase exercise depth (disease state images, lab results, notes, etc). Up to 5 files can be attached, but each file must be less than 20MB. |
| Link attachments |
| Add external links to increase exercise depth (reference articles, videos, and more). You must include the full link to the page including http://. |
| **PATIENT DETAILS** |

Select patient

**Judith Belisario**

Select patient image

Click "select patient image" and select a patient image that resembles the demographics of the chosen patient.

Patient introduction – *the first sentence said by patient*

Hi, what should I take for a cough?

Patient selected medications – *medications the patient will present to the counter at the start of the exercise*

Click "manage patient selected medications" and select which medications the patient will bring to the counter.

Patient notes – *adds a fixed characteristic to the patient*

Manage dispensing records – *dispensing history of the patient that is shown on the simulated computer*

Click "manage dispensing records", "new dispensing record" and then fill in the information to create a fill history for the patient. NOTE that "repeats" means refills.

**PATIENT COMMUNICATION**

Identity query – *a question asked to the patient to determine their identity*

☒ Use default response

☐ Customize response

☐ Disable identity query

☐ Disable patient fact finding – *checking this box will not allow any questions to be asked of the patient*

☐ Randomize facts – *checking will display patient facts in random order*

Facts for patient feedback type:

☐ Basic feedback

☒ Advanced feedback

Facts (pre-defined):

| Display or hide question | Category | Must ask, can ask, or do not ask | Response | Feedback |
|---|---|---|---|---|
| Display | Age | | | |
| Display | Alcohol consumption | | | |
| Display | Allergies | | | |
| Display | Breastfeeding | | | |
| Hide | Hospital admission | | | |
| Display | Illicit drug use | | | |
| Display | Other medications | | | |
| Display | Pregnant | | | |
| Display | Previous use of meds | | | |
| Hide | Purpose of meds | | | |
| Hide | Smoking status | | | |
| Display | Symptoms | | | |
| Display | Other symptoms | | | |
| Display | Aggravating/relieving factors | | | |
| DIsplay | Weight | | | |

Add custom fact:

| Patient question | Patient response | Must ask, can ask, or do not ask | Feedback |
|---|---|---|---|
| | | | |
| | | | |

Add patient question: – *These will be questions that the patient will ask the student. Students will be required to give an answer.*

| Patient question | Feedback on patient question |
|---|---|
| | |
| | |

☐ Enable patient prompting – *checking this box reminds students to ask patient questions*

**NOTES**

☐Enable professional notes feedback – *checking this box allow feedback on professional notes (most likely should not be checked)*

**OUTCOME**

Select exercise outcome:

☐ Do not recommend (**complete orange part of template**)

☐ ~~Recommend medications (basic feedback)~~

☒ Recommend medications-advanced feedback (**complete blue part of template**)

**Feedback For Outcome Answer: Do not recommend**

Reasons to not recommend (must select at least one):

☐ Patient has symptoms that need to be treated by other healthcare professional

☐ OTCs are not effectively treating symptoms – refer to healthcare professional

☐ No product in stock to treat those symptoms

☐ Potential for interaction with meds patient is taking

☐ Potential for overdose of active ingredient which is also in meds patient is taking

☐ Potential allergic reaction to OTC med

☐ Potential for triggering or worsening of their preexisting medical condition

☐ Inappropriate product due to contra-indication for patient's medical condition

☐ Inappropriate use of a requested OTC product / therapeutic use not established

☐ Other (specify)

Patient counseling – *appears next to student counselling notes in feedback along with the medication instructions from each treatment group the student successfully treated. This would be a good place to include counseling that should be given no matter what product is selected.*

Correct outcome feedback – *feedback that is displayed when a student correctly does not recommend a medication (labeled as patient counseling in MyDispense)*

Wrong outcome feedback – *feedback that is displayed when a student recommends a medication when they were not supposed to*

**Feedback For Outcome Answer: Recommend medications--advanced feedback**

Add treatment product group:

| Treatment product group name | Treatment product group description | Beneficial medications | Harmful medications |
|---|---|---|---|
| | | | |
| | | | |

Treatment product group feedback:

| **Treatment product group name** | **Medication instructions feedback** – only appears when a beneficial medication is chosen. *This is where you should put product specific counseling.* | **Feedback for when a student recommends a beneficial medication.** *This is general feedback for picking a medication. You can also differentiate between preferred beneficial and non-preferred beneficial medications in MyDispense. Many time you may put the same feedback for both.* | **Feedback for when student recommended harmful medication.** *Shown to the student when they recommend a harmful medication to the patient from the list above. The feedback should explain why they would not want to recommend these medications.* | **Feedback for when a student does not recommend a beneficial or harmful medication.** *This is when they chose a product but it was not in the beneficial or harmful group.* |
|---|---|---|---|---|
| | | | | |
| | | | | |

Do not display beneficial medications option:

☐ Hide beneficial medications in feedback – *prevents student from immediately receiving correct answer*

Patient counseling – *appears next to student counseling notes in feedback along with the medication instructions from each treatment group the student successfully treated. This would be a good place to include counseling that should be given no matter what product is selected.*

| |
|---|
| Wrong outcome feedback – *feedback that is displayed when a student does not recommend any medication when they were supposed to make a recommendation* |
| |
| **ASSESSMENTS** |
| Enable assessment – *Assessment allows the instructor to grade the case before feedback is given to the student. Points will need to be assigned in the MyDispense platform.*<br>☒ Disabled<br>☐ Enabled |

| **PHARMACISTS' PATIENT CARE PROCESS (PPCP)**<br>Please indicate which parts of the PCPP were integrated within this exercise (check all that apply) |
|---|
| **COLLECT:** the pharmacist assures collection of necessary subjective and objective information about the patient |
| ☐ Patient demographics<br>☐ Patient medication list<br>☐ Patient past medical history<br>☐ Patient allergies<br>☐ Patient adherence<br>☐ Patient lifestyle and social habits<br>☐ Additional Patient information gathered from prescriber or other healthcare provider<br>☐ Lab documents or other test results<br>☐ Other |
| **ASSESS:** the pharmacist assesses the information collected and analyzes the clinical effects |
| ☐ Medication safety<br>☐ Risk factors pertinent to the patient<br>☐ Medication adherence<br>☐ Medication appropriateness<br>☐ Preventative care/other health care services<br>☐ Overall health of the patient<br>☐ Other (please specify) |
| **PLAN:** the pharmacist develops an individualized patient-centered plan |
| ☐ Recommend appropriate drug for patient<br>☐ Recommend appropriate dose for patient<br>☐ Recommend appropriate frequency of medication for patient<br>☐ Recommend appropriate directions for the patient's current therapy<br>☐ Developing a health plan for the patient<br>☐ Other (please specify) |
| **IMPLEMENT:** the pharmacist implements the care plan in collaboration with other health care professionals and the patient or caregiver |
| ☐ Patient education -- counseling<br>☐ Modifications made to medications<br>☐ Addresses medication problems<br>☐ Discontinuation of medications if necessary<br>☐ Did not dispense medication to patient<br>☐ Dispensed medication to patient<br>☐ Verified information with prescriber or other healthcare provider<br>☐ Other (please specify) |
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| ☐ Monitor for medication safety<br>☐ Monitor for medication efficacy<br>☐ Patient adherence<br>☐ Identification of clinical endpoints (e.g. decreased risk of stroke/heart attack, decreased mortality)<br>☐ Follow up appointment or visit<br>☐ Other (please specify) |

**Appendix B: Post-implementation survey**

**Prior Community Pharmacy Experience**

1. Which describes your pharmacy experience **prior** to your P1 Community IPPE rotation? (select all that apply)
    a. No experience
    b. 1-3 years
    c. 3+ years
    d. Technician position
    e. Intern position
    f. Community pharmacy experience
    g. Hospital pharmacy experience
    h. Other: _____

**IPPE Experiences (what you did during your IPPE)**

2. Which tasks did you assist regarding medication filling/dispensing **during** your P1 Community IPPE rotation? (select all that apply)
    a. Entering prescription into computer
    b. Fill prescription
    c. Locating medications on shelf
    d. Counseling
    e. Working on the inventory
3. Which tasks did you assist regarding vaccinations **during** your P1 Community IPPE rotation? (select all that apply)
    a. Recommending vaccines
    b. Giving vaccines
    c. Pulling vaccines from fridge
    d. Draw up dose
    e. Counsel patient for vaccination
    f. Record vaccination into computer

**MyDispense Experience**

**Counseling**

4. Did you complete at least one MyDispense case on counseling (Reminder HIV and/or anticoagulation cases)?
    a. Yes
    b. No

If yes: go to 5; If no: go to 6

5. This case helped me be more willing to counsel patients on my P1 Community IPPE rotation.
    a. 1-Strongly Disagree
    b. 2-Disagree
    c. 3-Neither agree nor disagree
    d. 4-Agree
    e. 5-Strongly Agree

**Vaccines**

6. Did you complete at least one of the cases in MyDispense about recommending vaccines?
    a. Yes
    b. No

If yes: go to 7; If no: go to 9

7. That case helped me become familiar with how to navigate the CDC immunization schedules.
    a. 1-Strongly Disagree
    b. 2-Disagree
    c. 3-Neither agree nor disagree
    d. 4-Agree
    e. 5-Strongly Agree

8. The case made me more likely to recommend a vaccination to a patient.
    a. 1-Strongly Disagree
    b. 2-Disagree
    c. 3-Neither agree nor disagree
    d. 4-Agree
    e. 5-Strongly Agree

**Forgeries**

9. Did you complete the opioid forgery case in MyDispense?
    a. Yes
    b. No

If yes: go to 10; If no: go to 13

10. MyDispense case increased my ability to distinguish between a valid prescription and a forged prescription or verify a possible forgery during your rotation or in future practice.
    a. 1-Strongly Disagree
    b. 2-Disagree
    c. 3-Neither agree nor disagree
    d. 4-Agree
    e. 5-Strongly Agree

11. Did you encounter a forged prescription while on your P1 community IPPE rotation?
    a. Yes
    b. no

If yes: go to 12; If no: go to 13

12. Which describes your encounter?
    a. You were exposed to forgery (e.g. the pharmacist showed you a forged prescription; a forgery was identified while on rotation)
    b. You identified the forgery

**General**

13. The MyDispense exercises were similar to real-life community pharmacy.
    a. 1-Strongly Disagree
    b. 2-Disagree
    c. 3-Neither agree nor disagree
    d. 4-Agree
    e. 5-Strongly Agree
14. The pharmacy computer software (e.g. Computer Rx,etc.) on my P1 Community IPPE rotation was similar to MyDispense.
    a. 1-Strongly Disagree
    b. 2-Disagree
    c. 3-Neither agree nor disagree
    d. 4-Agree
    e. 5-Strongly Agree
15. MyDispense exercises helped increase my confidence level on my P1 Community IPPE rotation.
    a. 1-Strongly Disagree
    b. 2-Disagree
    c. 3-Neither agree nor disagree
    d. 4-Agree
    e. 5-Strongly Agree

16. Do you feel that MyDispense exercises offer a valuable learning environment? Why or why not?

17. Do you have any recommendations based on your P1 IPPE experience for MyDispense cases that you would want to see?