

**A “flipped”  
pharmacy student-led  
pharmacology course for  
physiotherapy students:**

*Trading medicines information for  
flexibility*

**Tina Brock, Stephanie Hsia, Brandon Conley,  
Amber Fitzsimmons, Allison Guerin**  
University of California, San Francisco  
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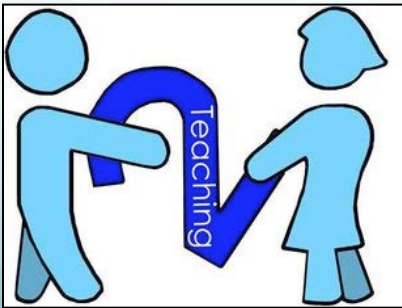
# Necessity is the mother of invention; flexibility is the father of innovation\*



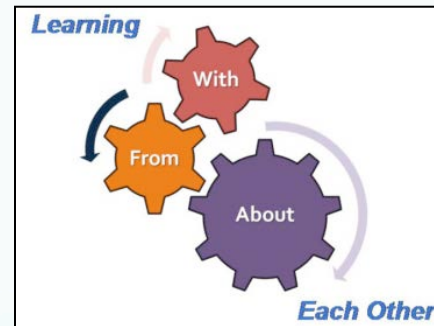
YEAR 2

**FLIPPED**  
**CLASSROOM**  
**FLIPPED**

YEAR 1



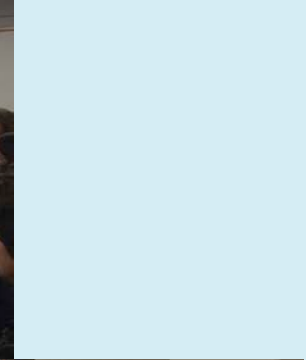
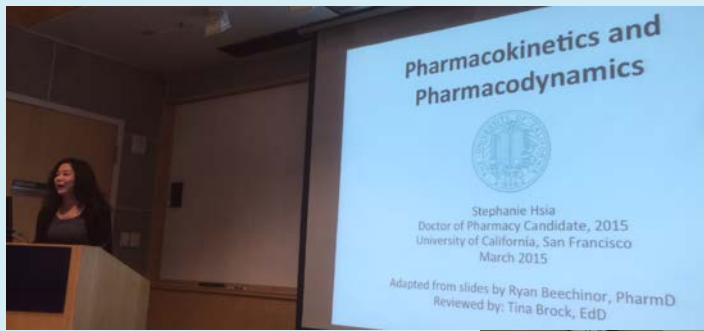
YEAR 3



YEAR 4



Date	Time	Place	Discussion Leader	Topic	Prep
Thurs March 5	9:10 – 10:15	UCSF N217	Tina Brock	Pharmacologic principles for the physical therapist (LECTURE)	See CLE for groups. Please sit in groups for each class.
	10:15 – 11:30		Stephanie Hsia	Pharmacokinetics & pharmacodynamics for the physical therapist (LECTURE)	
Thurs March 12	9:10 – 11:30	CL230 CL231	Sheri Van Osdol	Drug Information for Physical Therapists (LABORATORY)	None
Thurs March 19	9:10 – 10:15	UCSF N225	Randal Du	Respiratory medications (CASE DISCUSSION)	View video, complete quiz
	10:15 – 11:30		Marti Larriva	Glucocorticoids and bone medications (CASE DISCUSSION)	View video, complete quiz
Thurs April 2	9:10 – 10:15	UCSF CL221 CL222	Brandon Conley	OTC and Alternative medications (CASE DISCUSSION)	View video, complete quiz
	10:15 – 11:30		Gary Fong	Anti-seizure medications (CASE DISCUSSION)	View video, complete quiz
Thurs April 9	9:10 – 10:15	UCSF CL221 CL222	Allison Komirenko	Opioid pain medications (CASE DISCUSSION)	View video, complete quiz
	10:15 – 11:30		Stephanie Hsia	Diabetes medications (CASE DISCUSSION)	View video, complete quiz
Thurs April 16	9:10 – 10:15	UCSF CL221 CL222	Allison Komirenko	Cardiovascular medications (CASE DISCUSSION)	View video, complete quiz
	10:15 – 11:30		Stephanie Hsia/ Randal Du	Psychiatric and movement disorder medications (CASE DISCUSSION)	View video, complete quiz
Thurs April 23	9:10 – 10:15	UCSF CL221 CL222	All	Teach back presentations and interprofessional panel	Teach back prep
	10:15 – 11:30		Brandon Conley	Exam Review Jeopardy (LEARNING GAME)	Review
Thurs April 30	9:00 – 11:30	UCSF CL221 CL222	Final Exam		



Alison Komirenko  
Doctor of Pharmacy Candidate

Opioid Pharmacology for Physical Therapists - Slides\_FINAL (18:32 / 20:01)

Resources

Menu

1. Opioid Pharmacology for Physical Therapists
2. Overview
3. Classification of Opioids
4. Opioid Agonists (Opioid Analgesics)
5. Opioid Agonists - Clinical Indications
6. Opioid Analgesics - Mechanism of Action
7. Opioid Antagonists - Mechanism of Action
8. Routes of Administration
9. Adverse Effects and Toxicity
10. Management of Opioid Adverse Effects
11. Tolerance, Dependence, and Abuse
12. Withdrawal Symptoms
13. Mixed Agonist-Antagonists
14. Opioid Antagonists
15. WHO's Pain Relief Ladder
16. Clinical Relevance for Physical Therapists
17. Opioid Adverse Effects - Physical Therapy Focus
18. Questions? Email or Post to Canvas

### Opioid Adverse Effects – Physical Therapy Focus

Adverse Drug Effect	Effect on Rehabilitation
Orthostatic Hypotension	May require a little extra time when assuming a more upright position
Respiratory Depression	May compromise patient's respiratory response due to hypoxia or hypercapnia
Sedation and Confusion	May slow down patient understanding and response following instructions
Muscle Aches and Bone Pain during Withdrawal	May require heat, electrotherapy, massage, or relaxation techniques to relieve symptoms
Constipation	May benefit from patient/caregiver education on lifestyle and over-the-counter management

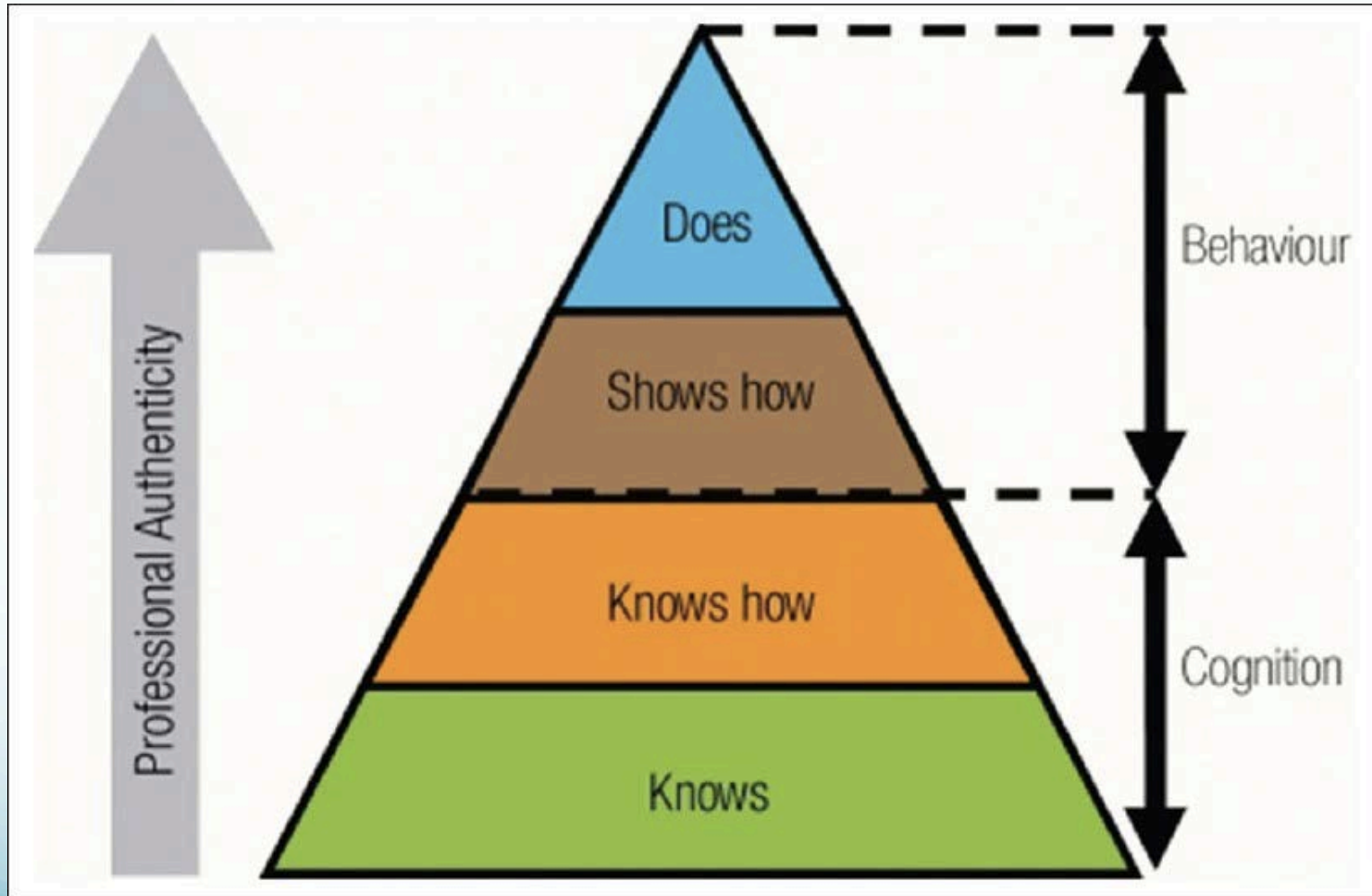
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# Key components

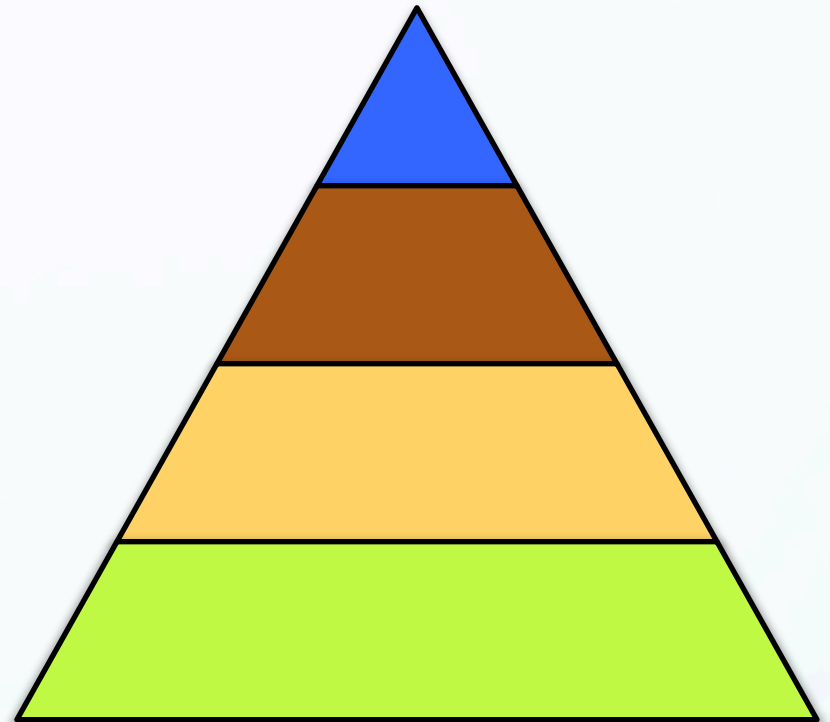
Pharm student TA duties	Physio student duties
Complete a pre-course shadowing experience (all)	Complete an in-course shadowing experience (some)
Create preparatory assignments - mini lectures (Articulate) and online readiness assessments (Moodle)	Complete pre-class preparatory activities (individual)
Review student submissions to pre-class preparatory activities	Participate actively in in-class case discussions (groups)
Facilitate in-class cases discussions and debriefings	Prepare and deliver a “teach-back session” about physio treatments (group)
Review exam submissions and reflect on their own learning	Complete final exam... including a case from an area <u>not</u> covered in the course (2015)

# Miller's Pyramid



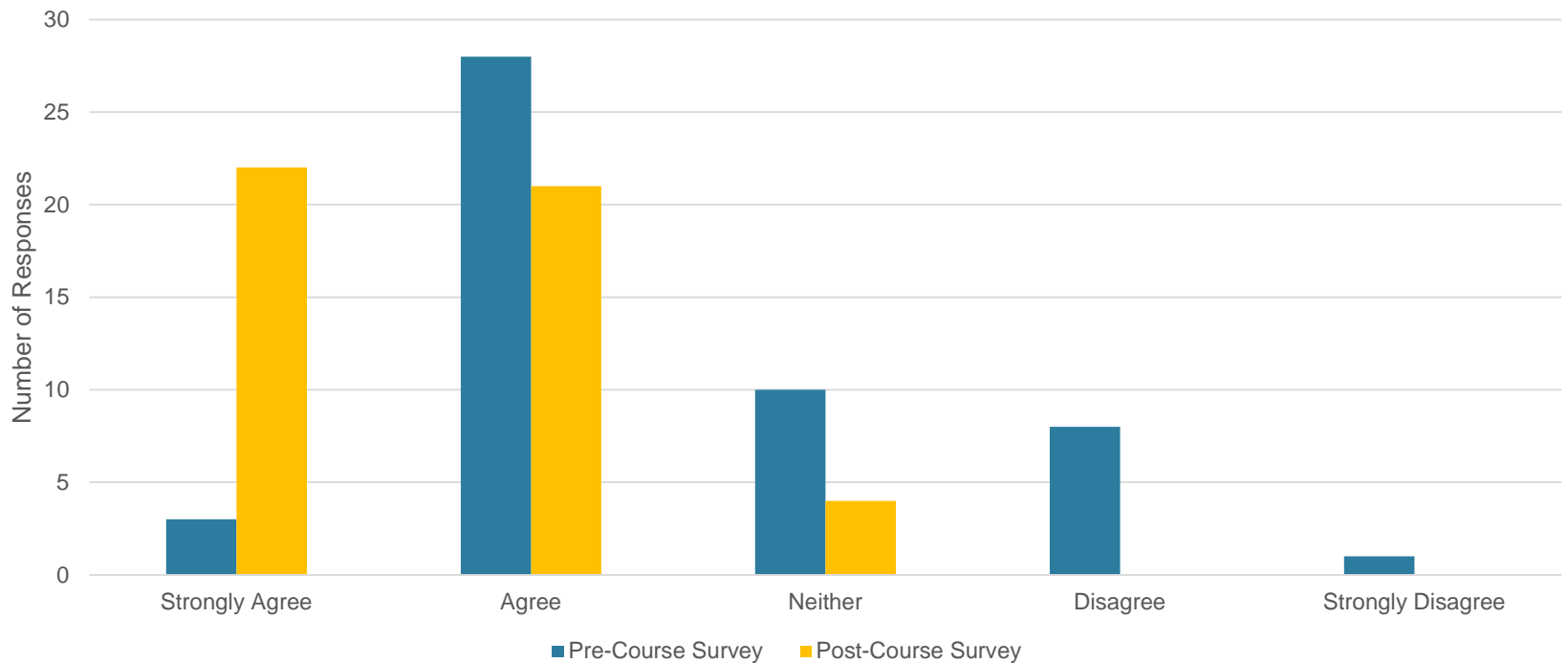
# Kirkpatrick Pyramid

- **Reaction**
  - Did they **LIKE** it?
- **Learning**
  - Did they **LEARN** it?
- **Behavior**
  - Do they **DO** it?
- **Results**
  - Did they **IMPROVE** something?



# Did they like it?

"The 'flipped classroom' model was a positive learning experience for me."



# Did they like it enough to provide comments?

- *I loved the premise of the class - the interaction between the pharmacy and PT schools and the fact that the entire course was structured around what pharmacological knowledge is relevant and important for a physical therapist to know. (2012)*
- *I was nervous about the mini lectures at first but was surprised how much I looked forward to reviewing them. I hope we can still access them during our clinicals. (2013)*
- *The [pharmacy student] TAs really cared about integrating the practices of PT and pharmacy. I appreciated that they were open to our perspective and it made me want to understand the practice of pharmacy. (2014)*
- *One of the most effective, efficient, and logically organized courses of the entire first year. More courses should be organized like this one. (2015)*

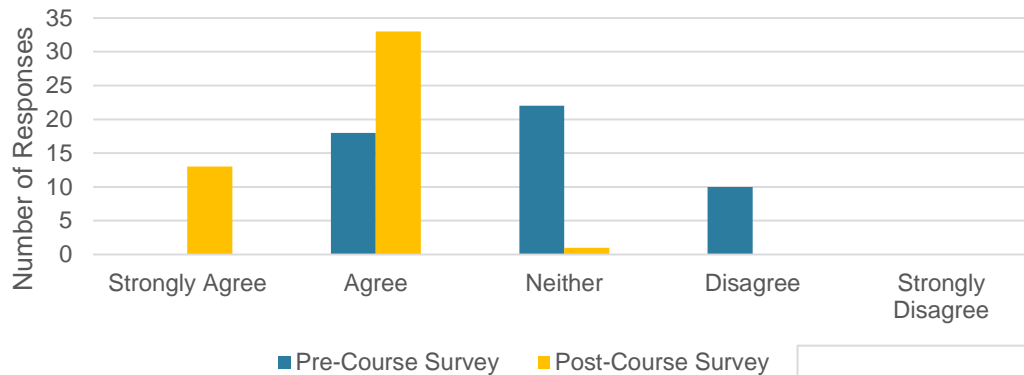


# And what about the TAs?

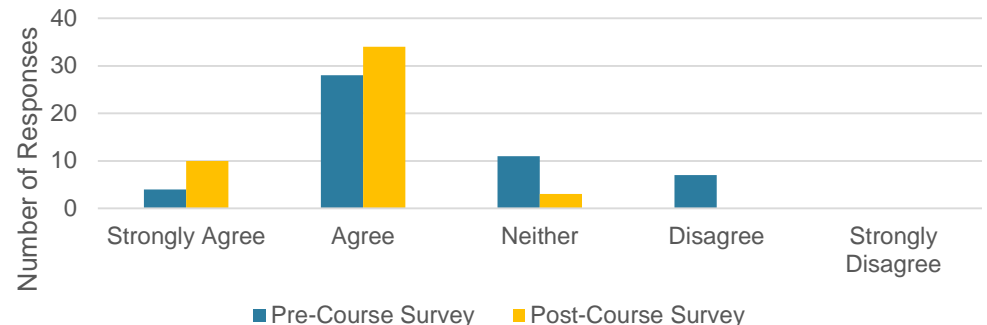
- *I enjoyed that I was able to gain knowledge about the field of PT. Figuring out what the students wanted to learn made me more aware of what was relevant to PT. I kept their point of views in mind on my rotations, and it helped me work interprofessionally.*
- *I really enjoyed the opportunity to teach and loved interacting with the PT students. Their enthusiasm was infectious!*
- *Teaching pharmacology to my PT peers was a challenging but fun experience! I've also learned useful PT knowledge along the way.*

# Did they learn it?

"I have a clear understanding of how medications can impact physical therapy treatments."



"I feel comfortable consulting other members of the healthcare team about issues that could impact patient care."

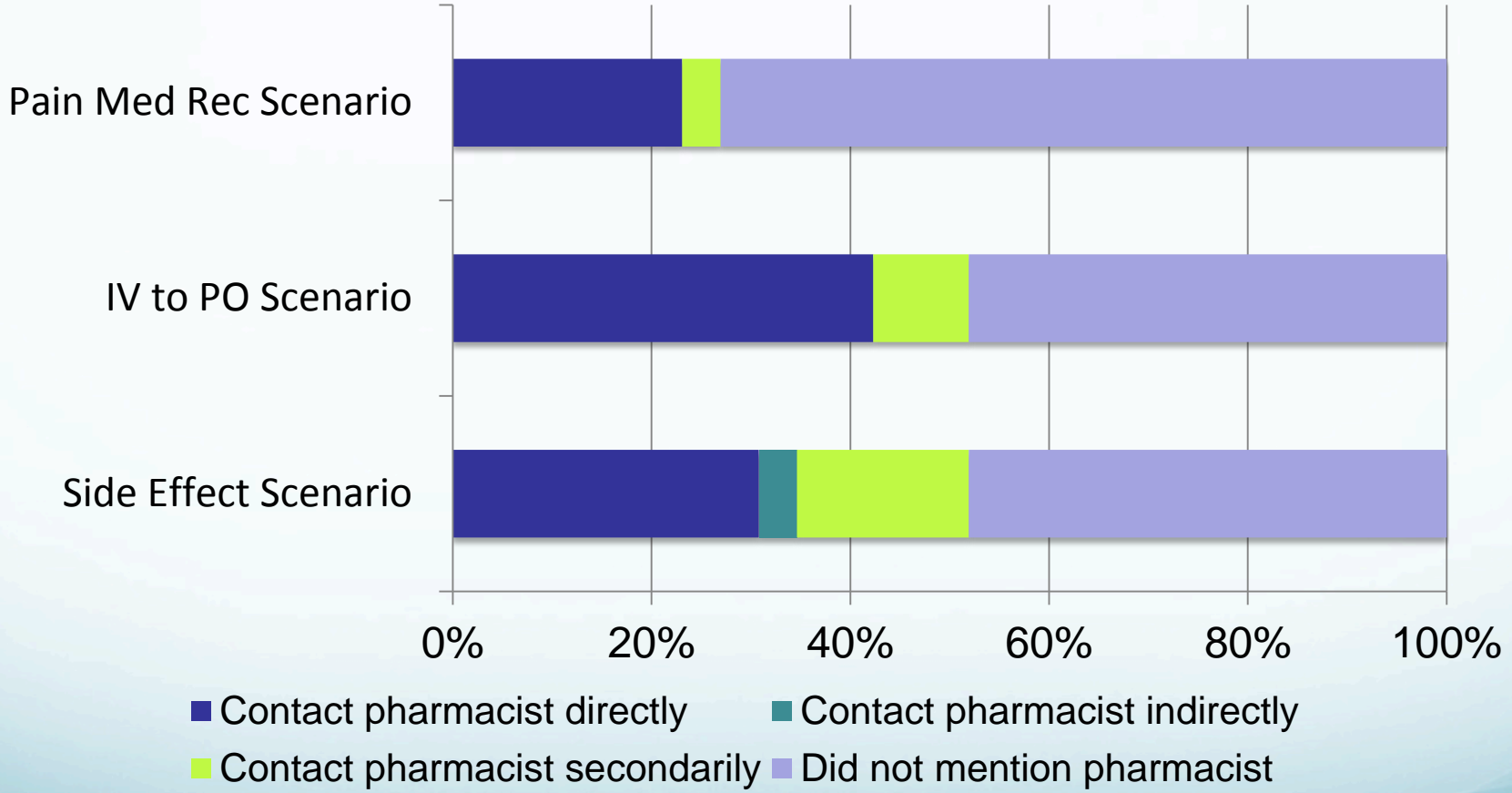


# How about that fishing?



- After learning how to access and assess several common drug information resources, students were able to respond appropriately to a complex case involving chemotherapy- induced fatigue and nausea (a topic NOT covered in the class).

# Do they do it?



# Did they improve something?

**UCSF**  
University of California  
San Francisco  
School of Pharmacy  
Department of Clinical Pharmacy

**Interprofessional Learning Experience:  
A Pharmacy Student-Led Introductory Pharmacology Course for Physical Therapy Students**  
Dan N. Tran, PharmD(c), Ryan Beechinor, PharmD(c), Melissa Treaster, PharmD, Tina Brock, BSPharm, EdD  
University of California, San Francisco

**BACKGROUND**  
In 2012, the school of pharmacy responded to a need for pharmacy education in the Doctor of Physical Therapy (PT) program. A course combining traditional lectures delivered by faculty with case-based discussions led by pharmacy students was created.  
In 2013, this course was transitioned to a "flipped" model in which 70% percent of the sessions required students to review a pre-recorded lecture and complete a formative assessment prior to class, reserving class time for more substantial interactive case-based learning.

**OBJECTIVE**  
The purpose of this project was to design, implement, and evaluate a pharmacy student-led "flipped" pharmacology course for physical therapy students.

**METHODS**  
• Student cohorts:  
• 2012: N = 41 first-year Physical Therapy (PT) students  
• 2013: N = 38 first-year Physical Therapy (PT) students  
• Instructional team:  
• Three pharmacy student teaching assistants (TAs)  
• Nine therapeutic experts  
• Course format (2012):  
• Traditional lectures (N=1)  
• One pedagogical expert  
• "Pre-recorded" lecture (N=1)  
• Articulate modules delivered via Moodle platform (see examples)  
• Case discussions in small groups of 4-5 PT students  
• Data collection:  
• Standard course evaluation survey (2013 and 2012 cohorts)  
• Supplemental survey (2013 cohort)  
• Supplemental survey (2012 cohort)

**Standardized Survey (2013 and 2012 Cohorts, N = 21)**  
[Bar chart showing survey results for 2013 and 2012 cohorts]

**Supplemental Survey (2013 Cohort, N = 16)**  
[Bar chart showing supplemental survey results for 2013 cohort]

**Supplemental Survey (2012 Cohort, N = 17)**  
After completing a clinical rotation, PT students from 2012 cohort were re-surveyed about the usefulness of the course:  
• 56.8% reported encountering medicine-related issues during their clinical rotations.  
• 47.1% felt somewhat comfortable addressing these medicine-related issues.  
• 86.3% reported that they rarely or never crossed paths with pharmacists.

**RESULTS**  
2013 Cohort Comparing In-Class Group Cases  
[Image of students in a classroom setting]

**Qualitative reports**  
• "I loved the premise of the class - the interaction between the pharmacy and PT schools and the fact that the entire course was structured around what pharmacology knowledge is relevant and important for a physical therapist to know" (PT Student, 2013)  
• "I loved the structure of it - students teaching, pre-class mini-lectures & quizzes, and the focus of case time on case studies." (PT Student, 2013)  
• "Contrary to what I previously thought, I really enjoyed the case studies." (PT Student, 2012)  
• "I really enjoyed the opportunity to teach and loved interacting with the PT students. Their enthusiasm was infectious" (Pharmacy Student, 2013)  
• "Teaching pharmacology to my PT peers was a challenging but fun experience. The whole learned useful PT knowledge along the way." (Pharmacy Student, 2013)

**CONCLUSIONS**  
• Overall, the "flipped" classroom structure and the peer-tepper learning model led by pharmacy students was very well-received.  
• Small group case-based discussions helped reinforce students' understanding of pharmacological concepts and their applications to PT treatment.  
• The model facilitated an environment for future collaborative and interprofessional practice between physical therapists and pharmacists.  
• Future exploration is warranted.

**DISCLOSURE**  
• There are no relevant conflicts of interest to disclose.

The authors would like to thank PT students from the Class of 2012 and 2013 for their willingness to engage in this new learning model. We also acknowledge Primary, TAs, PT, PhD and Adult Educators (DNTS) for their assistance in the design and implementation of the course.

- Has allowed us to explore and evaluate new technologies and new instructional methods
- Has created a linkage between clinician-educators who are now doing a PT/Pharm falls study in the medical center
- Exploring potential to expand to other courses and programs

**UCSF**  
University of California  
San Francisco  
School of Pharmacy  
Department of Physical Therapy - University of California, San Francisco

**Impact of a pharmacy student-led pharmacology course for physical therapy students on student attitudes and behaviors regarding interprofessional collaboration in clinical practice**  
Stephanie Hsua, PharmD(c)<sup>1</sup>, Amber Fitzsimmons, PT, MS, DPT(S)<sup>2</sup>, Allison Guerin, MA<sup>3</sup>, Tina Brock, MSPharm, EdD<sup>1</sup>

**BACKGROUND**  
Since 2012, the School of Pharmacy has collaborated in providing pharmacy education in the Doctor of Physical Therapy (PT) program. Beginning in 2013, this course was delivered via an interprofessional (IP) "flipped" model. Pharmacy student teaching assistants (TAs) serving under the direction of pharmacy faculty members, created pre-recorded mini-lectures that students reviewed in courses and then facilitated in-class case discussions. In 2014, the TA also shadowed physical therapists in the treatment and outpatient settings at the site of the course.

**OBJECTIVE**  
The purpose of this project was to evaluate the effect of an interprofessional pharmacy student led pharmacology course on PT student attitudes and behaviors towards interprofessional collaboration.

**METHODS**  
In spring 2014, we administered a pre-post course survey to the PT students currently enrolled in the course (N=60) before they had completed a clinical placement. This survey was distinct from the standard course evaluation instrument.  
• Peer-rated instrument  
• Items in pre-course survey and 12 items in post-course survey  
• Evaluation of "flipped" classroom model  
• Interprofessional education outcome  
In fall 2014, we surveyed all PT students who had completed the course in spring 2013 (N=41) or spring 2014 (N=60) after they had completed at least one clinical rotation.  
• Clinical instrument, using Qualtrics software  
• 12 items with attached skip logic  
• Demography  
• Perceptions  
• Case scenario responses  
• Suggestions of medicine-related cases personally experienced on clinical rotations

**Pre-Clinical Survey (2014 cohort, n = 48, 96% response rate)**  
[Bar chart showing pre-clinical survey results for 2014 cohort]

**Post-Clinical Survey (2013 + 2014 cohorts, n = 82, 87% response rate)**  
PT students were asked to describe the actions they would take in each of the following three clinical scenarios:  
• Pain med rec. Patient who is being discharged who will have pain but has no discharge orders for pain medications.  
• 60-year-old patient who is being discharged to a skilled nursing facility who needs discharge orders for insulin.  
• 55-year-old patient who is being discharged during evening physical therapy sessions.

**With regard to clinical applications of the course and attitudes towards interprofessional collaboration...**  
• 88.4% agree that interacting with pharmacy students in the course made them more likely to seek help or communicate with a pharmacist or pharmacy student on their team.  
• 21.8% reported that they would like to shadow a pharmacist and/or learn more about a pharmacist's role in healthcare.

**CONCLUSIONS**  
• Overall, the "flipped" peer-to-peer interprofessional learning model led by pharmacy student TAs was well-received.  
• Facilitation by pharmacy student TAs improved PT student attitudes towards interprofessional collaboration in clinical practice.  
• Though PT students were open to collaborating with pharmacists, this sentiment occurred in clinical practice, possibly due to a lack of accessibility.  
• Potential improvements to this education model include pharmacist and pharmacy student shadow opportunities for PT students, and simulations with pharmacists or pharmacy students.  
• Additional study is warranted.

**DISCLOSURE**  
• Author of this presentation does not have a direct or indirect interest in the subject matter presented. Nothing to disclose.

The authors would like to thank PT students from the Class of 2013 and 2014 for their willingness to engage in this new learning model. We also acknowledge Primary, TAs, PT, PhD and Adult Educators (DNTS) for their assistance in the design and implementation of the project.

# Best part

