“Responding to the Pandemic Together” Programme
Episode number 23:

Remote Laboratory Courses Across Pharmacy Schools During COVID-19: Are You Ready?

Delivered by the FIP-AIM and FIP-AcPS
Moderator

Dalal Hammoudi, RPh, MSc, PhD
Assistant Professor
Lebanese International University, School of Pharmacy
Chairperson, Department of Pharmaceutical Sciences

dalal.hammoudi@liu.edu.lb
FIP & ASM member

https://orcid.org/0000-0001-6907-4110
I. Provide relevant information and interim guidelines for pharmacists and the pharmacy workforce on Coronavirus SARS-CoV-2/COVID-19 pandemic.

II. Share and discuss strategies adopted by pharmacy leaders and workers - including our Member Organisations – in response to the pandemic.

III. Describe sector or area-specific implications, innovations and approaches adopted across pharmaceutical science, practice and education.

IV. Engage frontline workers of the health and pharmacy workforce to know about the realities facing them around the world.

V. Discuss the implications of the pandemic on issues such as safety, supply, shortages that have been exacerbated by COVID-19, across our nations and regions.

VI. Consider the impact of this disease on patients across age groups and with concurrent conditions.

VII. Assess and discuss the evidence behind treatments and the process of developing therapies, vaccines and...
Important Links & Resources

FIP Covid-19 Information Hub
A comprehensive FIP webpage containing all of our resources and outputs relating to COVID-19, including recordings of previous webinars.
Link: https://www.fip.org/coronavirus

FIP Facebook Group: “COVID-19 & pharmacy”
Link: https://www.facebook.com/groups/covid19andpharmacy/
• The International Pharmaceutical Federation (FIP) is the global federation of national associations representing four million pharmacists and pharmaceutical scientists around the world.

• FIP’s mission is to "Improve global health by supporting the advancement of pharmaceutical practice, sciences and education." FIP’s vision is a "world where everyone benefits from access to safe, effective, quality and affordable medicines and pharmaceutical care".

• FIP was founded in 1912 in the Netherlands.
FIP Academic Pharmacy Section Leadership

• President: John A. Pieper
• Vice President: Arijana Mestrovic
• Secretary: Toyin Tofade
• Treasurer: Jenelle Sobotka
• Immediate Past President: Ralph J. Altiere
• Aukje Mantel-Teeuwisse

• Executive Committee:
  • Naoko Arakawa
  • Carl Schneider
  • Rula Darwish
  • Dalia Bajis
  • Abdikarim Abdi
FIP Academic Institutional Membership (AIM)

The only global network of Academic Pharmacy Leaders

160 Pharmacy & Pharmaceutical Sciences Schools from 55 Countries

To join AIM and find out more: aim@fip.org

# AIM Advisory Committee Members

<table>
<thead>
<tr>
<th>Region</th>
<th>Name</th>
<th>Position &amp; University</th>
<th>Country</th>
</tr>
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<tbody>
<tr>
<td>Africa</td>
<td>Mwila Chiluba</td>
<td>University of Zambia</td>
<td>Zambia</td>
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<tr>
<td></td>
<td>Yahya Choonara</td>
<td>Chair and Department Head Pharmacy and Pharmacology</td>
<td>South Africa</td>
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<td>University of Witwatersrand</td>
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<tr>
<td>Americas</td>
<td>Ralph J. Altiere</td>
<td>Dean School of Pharmacy University of Colorado Denver</td>
<td>United States</td>
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<tr>
<td></td>
<td>Toyin Tofade</td>
<td>Dean Howard University College of Pharmacy</td>
<td>United States</td>
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<td>Eastern Mediterranean</td>
<td>Mohamad Rahal</td>
<td>Dean Lebanese International University</td>
<td>Lebanon</td>
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<td>Abla Mahmoud Albsoul</td>
<td>Dean School of Pharmacy The University of Jordan</td>
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<tr>
<td>Europe</td>
<td>Lilian Azzopardi</td>
<td>Head of Department of Pharmacy University of Malta</td>
<td>Malta</td>
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<td>Yulia Ladutko</td>
<td>Dean St. Petersburg Chemical and Pharmaceutical University</td>
<td>Russia</td>
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<td>South-East Asia</td>
<td>Beom-Jin Lee</td>
<td>Dean College of Pharmacy, Ajou University</td>
<td>Seoul</td>
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<td>Rajani Shakya</td>
<td>Head of Department of Pharmacy, Professor Kathmandu University</td>
<td>Nepal</td>
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<tr>
<td>Western Pacific</td>
<td>Paul Gallagher</td>
<td>Professor National University of Singapore Department of Pharmacy</td>
<td>Singapore</td>
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<tr>
<td></td>
<td>Carlo Marra</td>
<td>Dean, Professor School of Pharmacy University of Otago</td>
<td>New Zealand</td>
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Announcements

FIP Digital Events House Rules

1. This webinar is being recorded and live streamed on Facebook
2. The recording will be freely available at www.fip.org/coronavirus and on our YouTube channel
3. You may ask questions by typing them into the Q&A box
4. Your feedback is welcome (webinars@fip.org)

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Learning Objectives

1. Highlight the expertise and skills of pharmacy laboratory educators in remote laboratory instruction.

2. Identify best practices for remote laboratory instruction obtained from the preliminary experience during COVID-19.

3. Discuss methods of assessment of remote laboratory instruction.

4. Elaborate challenges of the “new norm” of remote instruction when applied to laboratory courses.

5. Discuss remote handling of pharmacy laboratory research during out-of-lab periods.
Co-organisers / Planning committee

Workforce Development Hub (WDH)
- **Shaun Gleason**, PharmD, MGS - University of Colorado Skaggs School of Pharmacy - USA

FIP WDH WDG#1 Academic Capacity – Global Lead
- **Toyin Tofade**, MS, PharmD, BCPS, CPCC, FFIP - Howard University - USA

FIP:
- **Nilhan Uzman**, Lead for Education Policy and Implementation
Panelist 1

Indiran Pather, D. Pharm

College of Pharmacy, Howard University, USA

Email: indiran.pather@howard.edu
Panelist 2

Susan Finstrom, BScPharm, RPh

University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Department of Pharmaceutical Sciences, Compounding Instructor

Email: susan.finstrom@cuanschutz.edu
Panelist 3

Peter J. Rice, PharmD, PhD, BCPS, FAPhA

University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences
Professor of Clinical Pharmacy

Email: peter.rice@cuanschutz.edu
Panelist 4

Tom Anchordoquy, PharmD, PhD

University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences
Professor of Pharmaceutical Sciences

Email: tom.anchordoquy@cuanschutz.edu
Panelist 5

Chelsea M. Baker, PharmD, MBA, BCPS

Purdue University College of Pharmacy (USA)

Email: chelseabaker@purdue.edu
Panelist 6

Jamie L. Woodyard, PharmD, BCACP

Purdue University College of Pharmacy (USA)

Email: woodyard@purdue.edu
Panelist 7

Nicolette Sammut Bartolo, BPharm (Hons), MSc, PhD

University of Malta
Department of Pharmacy

Email: nicolette.sammut-bartolo@um.edu.mt
Panelist 8

Edmund Ekuadzi, BPharm, PhD

Department of Pharmacognosy, Faculty of Pharmacy and Pharmaceutical Sciences, Kwame Nkrumah University of Science and Technology, Ghana

eekuadzi.pharm@knust.edu.gh
Panelist 9

Susana Abdel Fattah, RPh, MBA, PharmD

Clinical Instructor
Lebanese International University, School of Pharmacy
Pharmaceutical Sciences Department

susana.abdelfattah@liu.edu.lb
Panelist 10

Malaika R. Turner, PharmD, MPH

Clinical Assistant Professor
Howard University College of Pharmacy
Washington, DC, USA

malaika.turner@howard.edu
Panelist 11

Ms. Rana Mohaidly (student representative)

Lebanese International University,
School of Pharmacy

Member – Lebanese Pharmacy Students Association (LPSA)

21830706@students.liu.edu.lb
HyFlex Compounding Lab

A Response to Lab Needs under COVID-19 Conditions

Prof. Indiran Pather
Howard University
College of Pharmacy, USA
Introduction

• Terminology (classroom teaching):

• Hybrid - partly online and partly in class (fixed schedule)

• Hyflex - derived from hybrid and flexible
  • Lectures streamed - students come to class as time permits (flexible)
  • Working professionals: benefits of face-to-face (SF State Univ)

• HU Lab HyFlex Model
  • Mainly online: videos
  • Few live labs with social distancing
  • Students assigned to time slots – attendance not mandatory (flexible)
Online Component

- Each TA assigned a few preparation types
  - Practices making product (e.g., suppositories)
  - Consult professor, as needed
  - When proficient, record a VR video – special camera
- Videos of most preparations in syllabus
  - Includes preparations to be made hands on
    - Students can review and
    - Be efficient when they come to lab
- Other preparations – review: > understanding and exam prep
Points of Emphasis in Videos

- Where feasible, video will emphasize
  - Correct procedures for major steps
  - Results of common errors
Videos

- HU presently “deep cleaning” entire building
  - Labs not open yet
- Video recordings when labs open
  - Sample video ⇒ Lab Safety

https://drive.google.com/file/d/1VWGTKsoKcHjGh7Ylu4wdH4EjkIL3wkQS/view?usp=sharing
Comparison: Regular and HyFlex Labs

**Regular labs**
- Hands on lab only
- One regular lab session (3 hours)
- Work in groups of 3-4 students
- Each lab: 1 type of dosage form, eg suspension
- Each lab: 3-4 formulations (different suspensions)
- Lab reports graded

**HyFlex Lab**
- Shorter hands-on lab plus videos of other lab exercises
- Two shorter labs (1.5 hours)
- Students work individually
- Each lab: 1 type of dosage form, eg suspension
- Each lab: 1 formulation (one suspension)
- Questions on all formulations (including videos) graded
Protection

• All students tested for COVID-19 before coming on campus

• Personal Protection Equipment for lab provided by HU
  • Includes mask, gloves, eye protection

• Temperature check on entry to lab

• Sanitization procedure for lab
  • Each student wipes down lab bench, stool etc before and after use
  • All students exit lab before next batch of students enters
  • Professor is the last to leave lab: sanitizes door handles
Potential Issues and Assessment

**Potential Issues**
- Students confusion re: schedule
- Students arriving late
- Sanitization and PPE causing stress
- Not maintaining social distance
  - At balance (2 students/balance)
  - At fume hood (for VOCs)
- Bench containers - short of chemicals

**Assessment**
- Understanding procedures
- Formulation components
- Lab safety issues
- Correct labelling
- Suitability of dosage form for specific therapeutic outcomes
- Patient instructions on correct use
- Calculations
Final Thoughts

- The COVID-19 situation is changing almost daily
- Our model can be modified in either direction

- Thanks to Dr. X. Simon Wang for displayed video and videos for class
Prof. Susan Finstrom

University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, USA

Adjusting Compounding Courses due to Campus Changes during Covid-19
Sterile Compounding Lab

Spring 2020 Semester

- Lecture, reading assignment, and quiz completed by all 1st year students
- Hands-on laboratory training (4 students at a time attend 1 ½ hour block in mock sterile compounding room)
  - Approximately one-half of the class received hands-on training
  - The other half has not received this training, but instead:
    - Watched two previously recorded videos which covered handwashing/garbing and withdrawing medication from a sterile vial
    - When feasible, the plan is to offer the hands-on training to those students interested
Compounding Elective

Fall 2020 Semester

University of Colorado Anschutz Medical Campus policies

- Application process for in-person learning—ongoing process
- Class size will be limited by campus Covid 19 response
- Unknowns at this time:
  - How many students?
  - How campus check-in policy will affect students’ attendance?
  - What will be the required sanitation process?
Plans for Hybrid Learning in Compounding Elective

*Fall 2020 Semester*

- Continue reading assignments from compounding textbook
- Quiz through the online learning management software
- Host synchronous Zoom session (1 hour)
  - *Three professors discuss with students the types of dosage forms being prepared, the pharmaceutics principles of importance, the types of ingredients used in the dosage form, and the clinical use of the dosage form*
- View video-recorded demonstrations of techniques required/helpful
- Students come to the compounding lab to prepare the preparations assigned for the week (2 hours)
Adapting Pharmaceutics to Coronavirus Quarantine with Kitchen-Based Labs

Prof. Peter J. Rice
University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, USA
**Kitchen-Based Pharmaceutics Labs**

*Pharmaceutics at the University of Colorado*

- P1 Spring Semester; 4 credits; didactic and lab
  - weights and measurements
  - dissolution and assay of ascorbic acid tablets by titration
  - capsules
  - solutions
  - suspensions/emulsions
  - topicals
  - sterile products
  - guaifenesin solution
  - kaolin-pectin suspension
  - diphenhydramine cream
Kitchen-Based Pharmaceutics Labs

Pharmaceutics Laboratories

• Goals
  • reinforce concepts and didactic material
  • techniques for mixing ingredients in compounding pharmacy
  • emphasize choices made in compounding (vehicles, flavors, etc)

• Philosophy
  • pharmaceutics and compounding techniques are universal
  • “if you can make a good emulsion, you can make good gravy...”
Kitchen-Based Pharmaceutics Labs

• “remote teaching” begins after Spring Break
• just like that ... no access to laboratories or chemicals
• What we considered:
  • delay of laboratories until students return to campus
  • removal of lab content from the course
  • best we can ... compounding in the kitchen
Kitchen-Based Pharmaceutics Labs

*Emulsions/Suspension Lab: Cesar Salad Dressing*

- trituration of solid ingredients
- creation of an emulsion
  - aqueous phase
  - lipid phase
  - emulsifying agent
- addition of solid ingredients to emulsion
- digitally recorded presentation for synchronous class
- handouts, discussion and online practice quizzes
Kitchen-Based Pharmaceutics Labs

What we learned ...

- an alternative to canceling live laboratory sessions
- Advantages
  - demonstrations are more engaging than scientific sessions
  - students can try the recipes and techniques at home
- Improvements
  - having the right recipe is essential
  - right equipment is also helpful
Impact of COVID-19 on Laboratory Research

Prof. Tom Anchordoquy
University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, USA
Impact on Laboratory Research

➢ Research labs closed from March 13th to May 18th
  ○ Only researchers with Covid-19 projects allowed in labs
  ○ Researchers with animal studies were forced to sacrifice animals

➢ Research was restarted gradually
  ○ 1 PhD student resumed experiments on May 19th
  ○ Mask and gown to be worn whenever in building, campus check-in required
  ○ Computer work still to be done remotely

➢ Second lab staff member allowed on June 4th
  ○ Other staff were allowed at a different shift with a maximum of two staff members present at any one time
  ○ Social distancing and donning mask and gown still required
Impact on Laboratory Research

➢ Impact on research and student progression
  ○ PhD students lost several months of lab time, some having to restart projects due to the interruption
  ○ Didactic classes continued remotely during the campus shutdown
  ○ It remains challenging to start new students as someone needs to train them, but social distancing requirements make this difficult
Utilizing Virtual Cleanroom for Sterile Product Compounding Instruction

Dr. Chelsea M. Baker

Purdue University
College of Pharmacy, USA
Utilizing Virtual Cleanroom for Sterile Product Compounding Instruction

Dr. Jamie L. Woodyard

Purdue University
College of Pharmacy, USA
Virtual Cleanroom

Use at Purdue University College of Pharmacy

- Two sterile product focused labs within the skills lab curriculum
- First-year student pilot in Spring 2020
  - Hands-on sterile compounding
  - Virtual cleanroom activities
- Expansion to second-year in 2021
- Plan to incorporate hazardous and chemotherapy medication scenarios
Online Virtual Cleanroom

Penguin Innovations, Purdue University
Virtual Cleanroom

Tutorial Mode

- USP <797>
- Reviews the following processes:
  - Gowning and garbing
  - Gathering supplies
  - Arranging materials in hood
  - Disposal of waste
Virtual Cleanroom

*Practice Mode*

- Practice IV medication preparation
- **Immediate feedback** provided
- Displays **warning messages**
- Prevents errors
- Performance is **recorded**
Virtual Cleanroom

Test Mode

- Simulates "real world" scenario
- No feedback provided
- Errors can occur
- Performance is recorded
Virtual Cleanroom

Research: Student Perceptions

• **Objective:** to determine if the virtual cleanroom in conjunction with hands-on activities in a sterile compounding laboratory improves students’ confidence in sterile compounding procedures

• **Methods:**
  • Pre and post surveys administered to first year students
  • Wilcoxon matched pairs sign rank test conducted for each survey item to compare medians of pre and post surveys
  • Bonferroni multiple test correction used to control for Type I error of 5%
Virtual Cleanroom

Research: Student Perceptions Results

<table>
<thead>
<tr>
<th>Activity</th>
<th>Increase in Median Response Confidence Intervala (all p-values &lt;0.0001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gowning and garbing for a NONHAZARDOUS cleanroom</td>
<td>2-2.5</td>
</tr>
<tr>
<td>Gowning and garbing for a CHEMOTHERAPY/HAZARDOUS cleanroom</td>
<td>1.5-2</td>
</tr>
<tr>
<td>Cleaning and preparing a laminar airflow workbench preparation for sterile compounding</td>
<td>2-2.5</td>
</tr>
<tr>
<td>Gathering the supplies needed to prepare a sterile compound</td>
<td>1.5-2.5</td>
</tr>
<tr>
<td>Using standard references (medication guides, package inserts) to understand the requirements and/or compatibility of products</td>
<td>1-1.5</td>
</tr>
</tbody>
</table>

*Difference between median response after using the cleanroom and median response before using the cleanroom
### Research: Student Perceptions Results

Indicate your confidence with the following during the sterile compounding process:
(1=Highly Unconfident, 2=Unconfident, 3=Neutral, 4=Confident, 5=Highly confident)

<table>
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<tr>
<th>Activity</th>
<th>Increase in Median Response Confidence Interval&lt;sup&gt;a&lt;/sup&gt; (all p-values &lt;0.0001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compounding sterile products in a <strong>HORIZONTAL</strong> laminar airflow workbench</td>
<td>1.5-2</td>
</tr>
<tr>
<td>Compounding sterile products in a <strong>VERTICAL</strong> laminar airflow workbench</td>
<td>2-2.5</td>
</tr>
<tr>
<td>Recognizing when first air is blocked during the sterile product compounding</td>
<td>2-2.5</td>
</tr>
<tr>
<td>Identifying the procedures that occur in an <strong>ANTEROOM</strong></td>
<td>2-2.5</td>
</tr>
<tr>
<td>Identifying the procedures that occur in a <strong>CLEANROOM</strong></td>
<td>2-2.5</td>
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*Difference between median response after using the cleanroom and median response before using the cleanroom*
Virtual Cleanroom

Research: Student Perceptions Results

“The online virtual cleanroom helped prepare me for hands-on sterile product compounding”.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Number of Student Responses (% of Total Responses)</th>
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<tbody>
<tr>
<td>Strongly Agree</td>
<td>42 (30%)</td>
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<tr>
<td>Agree</td>
<td>68 (49%)</td>
</tr>
<tr>
<td>Neutral</td>
<td>17 (12%)</td>
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<tr>
<td>Disagree</td>
<td>10 (7%)</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>3 (2%)</td>
</tr>
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</table>
Virtual Cleanroom

For More Information

- [https://penguin-innovations.com/](https://penguin-innovations.com/)

- Contact Steve Abel at: abels@purdue.edu
Pharmaceutical Technology Practicals

The shift to the “new norm”

Dr. Nicolette Sammut Bartolo

University of Malta
Department of Pharmacy
Undergraduate Programmes

Bachelor of Science in Pharmaceutical Technology

3 years

Pharmaceutical Technologist

Bachelor of Science in Pharmaceutical Science + Master of Pharmacy

5.5 years

Pharmacist
Laboratory Practicals

Didactic

Practical discussion
• Example: use of audiovisual material

Practical sessions
Preparation for Practical Sessions

• Health and Safety session
• Quality system
  ● Standard Operating Procedures
• Safety Data Sheets
Practical Sessions Fall 2020

- In-lab practical sessions
- Virtual practical sessions
In-lab Practical Sessions

*Precautions*

- Limited number of students
- Work space: minimum 4m² per person or minimum distance of 2m
- No group work
- Students to retain same group
- Using 70% alcohol-based hand sanitisers
- Washing hands with soap and water and use of gloves
- Ventilation
- Cleaning and disinfection between groups

Virtual Practical Sessions

- Virtual interaction
- Assessment
- Student participant
- Principals vs practice oriented
Adapting to the ‘new norm’ by applying scientific knowledge for students’ safety
Internet-Based Experiments & Learning During COVID-19: A Focus on PhD Training

Dr. Edmund Ekuadzi
Kwame Nkrumah University of Science and Technology,
Faculty of Pharmacy and Pharmaceutical Sciences, Ghana
Remote Laboratory

Running NMR experiments

Piloted the remote running of NMR experiments
- Target is PhD candidates and researchers
Virtual Learning

**Learning laboratory techniques**

PhD students, are encouraged to prepare for their future wet lab sessions using online simulations and videos. e.g. JOVE, YouTube, etc.

These are complemented with virtual discussions that focus on

1. Interpretation of experimental data, and
2. Critique-based understanding of experimental procedures
Overcoming the challenges

*Isolated, overwhelmed and poor internet connection*

However, we are motivated to keep at it, while learning new approaches, until the resumption of the normal state of affairs.
Quantitative Analysis Lab
(For Pharmacy Students)
A Shift to Virtual Learning

Dr. Susana Abdel Fattah
Lebanese International University
School of Pharmacy
Quantitative analysis is the determination of the absolute or relative abundance (often expressed as a concentration) of one, several or all particular substance(s) present in a sample.
Introduction to Quantitative Analysis

Theory  Calculation  Practice
Describe the principles of experimental errors in chemical analysis

Identify the analytical terms and expressions used in analytical methods

Define and apply techniques of volumetric, gravimetric and oxidation/reduction titrations

Define and apply techniques of electroanalytical and spectroscopic analysis
Teaching Method (Before COVID-19)

**Dry Lab (50%)**
- Theoretical part discussed in class
- Preparation work done at home

**Wet Lab (50%)**
- Actual experiment performed in the lab
Assessment Method (Before COVID-19)

- Reports 20%
- Assignments and quizzes 10%
- Practical work evaluation 5%
- Midterm exam 30%
- Final exam 35%
A Time of Transition

Social Distancing

COVID-19 PANDEMIC
Challenges

- Calculations
- Practice
- Students’ willingness
- Exam conduction
Teaching Method (After COVID-19)

1. VOPP
2. PDF Files
3. Simulation lab videos
4. Live Streaming
# Teaching Method (After COVID-19)

## Lab 6

<table>
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<tr>
<th>Task</th>
<th>Description</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>Exp 7: Vitamin C Analysis page 80 questions...</td>
<td></td>
<td>Posted Apr 27</td>
</tr>
<tr>
<td>Exp 7: Analysis of Vitamin C Tablets Assign...</td>
<td></td>
<td>Due Apr 27</td>
</tr>
<tr>
<td>Exp 7: Analysis of Vitamin C Tablets Report</td>
<td></td>
<td>Due Apr 27</td>
</tr>
</tbody>
</table>

## Experiment 7: Vitamin C Analysis

- **Iodometric Titration**
  - YouTube video 1 minute

- **Standardization of Thiosul....**
  - YouTube video 2 minutes

- **Lab8 vitamin C and Iodin....**
  - YouTube video 6 minutes

- **Vitamin C Analysis Part 1....**
  - PowerPoint

- **Vitamin C Analysis Part 2....**
  - PowerPoint

View material
Assessment Method (After COVID-19)

- Reports: 25%
- Assignments: 10%
- Online Quiz: 25%
- Participation: 10%
- Final Exam: 30%
Assessment Method (After COVID-19)

Lab 6

Exp 7: Vitamin C Analysis page 80 questions... Posted Apr 27

Exp 7: Analysis of Vitamin C Tablets Assignment Due Apr 27

Exp 7: Analysis of Vitamin C Tablets Report

Posted Apr 16

0 Turned in 0 Assigned 18 Graded

View assignment

Experiment 7: Vitamin C Analysis Posted Apr 9
Communication Methods

- Google Classroom
- Google Meet
- WhatsApp Groups
- Email
The Lesson After COVID-19

Blended learning approaches will be tried, tested, and increasingly used.

Instructors and universities should receive more support for their role during COVID-19.

This crisis will help educators across boundaries to come together, share, and exchange experience.
Learning Hands On Patient Care in a Hands Off Environment

Dr. Malaika Turner
Howard University
College of Pharmacy, USA
Hands On Trainings

Device Trainings

Inhalers

Blood pressure monitors

Glucometers

Injection techniques
Adjusting Assessments

**Inhalers**

1. Students review videos & tutorials
   - Reviewed before attending lab

2. Faculty demonstration
   - Performed virtually with devices

3. Mock patient counseling
   - Students performed patient counseling while mock patient
Assessment

**Complete, Partially Complete, Incomplete**

<table>
<thead>
<tr>
<th>Task</th>
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<tbody>
<tr>
<td>Identifies self as pharmacist / student pharmacist and asks patients the purpose of the visit</td>
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<tr>
<td>Demonstrates how to hold the inhaler and push the thumb grip away until it snaps into place</td>
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<tr>
<td>Demonstrates how to hold the inhaler in a level, flat position with the mouthpiece towards you while sliding the lever away</td>
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<tr>
<td>Breathe out fully while holding the Diskus away from your mouth</td>
<td></td>
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<tr>
<td>Put the mouthpiece to your lips then breathe in quickly and deeply through the Diskus</td>
<td></td>
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<tr>
<td>Describes remove the Diskus from the mouth and hold your breath for 10 seconds</td>
<td></td>
</tr>
<tr>
<td>Breathe out slowly and close the Diskus until it clicks shut</td>
<td></td>
</tr>
<tr>
<td>Reminds to rinse mouth (&quot;swish and spit&quot;) after use</td>
<td></td>
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<tr>
<td>Reminds patient to not wash the inhaler and keep it in a dry place</td>
<td></td>
</tr>
<tr>
<td>Discusses potential side effects (dysphonia, oral thrush, cough, HA, URTIs, hyperglycemia, hoarseness)</td>
<td></td>
</tr>
</tbody>
</table>
Results and Feedback

With tools presented to the students...

• Performed 4% higher than colleagues without devices to demonstrate
• Performed counseling more timely without prompting
• Displayed more confidence in verbal explanations
The Student Perspective Regarding Remote Delivery of Lab Courses During COVID-19

Ms. Rana Mohaidly
Lebanese International University
School of Pharmacy
The Student Perspective

Acknowledging biases

Important to address that:

➔ Opinions are rarely objective.
➔ Our experiences vary greatly in any situation.
➔ Preconceptions greatly influence our experiences.

All of this applies to Remote Learning!
The Student Perspective

*E-learning in general*

A. Diversity in opinions:
   - Personally asking individuals
   - Survey results
B. Role of SOP.
C. Consistent assessment.
The Student Perspective

Quantitative Analysis

Student Feedback

Positives
- Explanation methods
- Assessment methods

Negatives
- Lack of bench experience
Quantitative Analysis

Future Opportunities

“Online learning is not the next big thing, it is the now big thing.”

– Donna J. Abernathy
Evaluation of Pharmacy Laboratory Courses Remote Learning During COVID-19

Dr. Dalal Hammoudi
Lebanese International University
School of Pharmacy
Student Feedback on remote laboratory courses delivery

Laboratory courses – Pharmaceutical Sciences Department – School of Pharmacy

Laboratory/blended courses

- Quantitative analysis
- Pharmaceutical analysis and biotechnology
- Compounding lab
- Parenteral dosage forms
Student Feedback on remote laboratory courses delivery

Laboratory courses – Pharmaceutical Sciences Department – School of Pharmacy

Survey instrument
Survey results

Demographics

Responses:
- 329 responses
- 8 campuses

Mostly P2 (63%) and P3 (31%)

First experience with remote courses:
- 83%
Remote learning tools

Survey results

Student experience

- VOPP: 81%
- Handouts/manuals: 49%
- Live conferencing: 86%
- Videotaped experiments: 69%
- Student-based formative tools (assignments/reports/homework): 96%
Simulation videos

Survey results

Student experience

Student perception

- Good quality: 67%
- Reasonable length: 64%
- Easy to access: 62%

Student perception
Student Perception of Skills Development

Learned practical skills
- No: 44
- Neutral: 29
- Yes: 17

Learned fine motor skills
- No: 49
- Neutral: 31
- Yes: 21

Learned about machines/devices
- No: 46
- Neutral: 28
- Yes: 26
Learning outcomes of lab courses

- Met goals of experiments: 50%
- Were able to analyze and interpret results: 47%
- Were able to write structured and organized reports: 50%
Survey results
Assessment of lab courses

What was students’ perception about lab assessment?

- 66% Clear
- 59% Efficient
- 56% Provided timely and effective feedback
- 49% Similar to regular assessment
- 49% Prefer at least one live exam
Survey results

*Student satisfaction and attitudes*

- **Enjoyable**: 45%
- **Flexibility**: 65%
- **Clear deadlines for assignments**: 77%
- **Motivation of self-directed learning**: 52%
- **Preferable to videotape or record**: 54%
Pharmacy lab courses for fall 2020/2021

What are the future plans? Are we ready?

Preparation of an archive of recorded experiments

Labster: Moving laboratory experiments online partially or completely

Blended labs: Remote delivery + hands-on experiments
Key Takeaways

Are we ready?

- Possible scenarios for the coming academic year?
- Identify challenges and come up with solutions
- Keep up motivation for online learning and research
- Learn new approaches; adapt to the new normal
- Identify unique virtual opportunities for learners
- Value laboratory interactions; adapt compounding and other lab courses to meet needs or remote education
- Always obtain and reflect on student feedback
Let’s get ready!

*Technology won't replace teachers...*

...but *teachers who use technology* will probably replace teachers who do not.
Thank you for participating!

Please provide your feedback through the 4-question survey that will appear to you at the end of the event.