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2024 Pharmacy Education Symposium

ORAL PAPER SESSION 5: General pharmacy education

Chair: Natalie Protuder

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2024 Pharmacy Education Symposium

Improving the effectiveness of workplace-based assessment for Australian pharmacy interns: An evaluation study

Bronwyn Clark

Improving the effectiveness of workplace-based assessment for Australian pharmacy interns: An evaluation study

Authors: Hayley A Croft[2], Josephine Maundu[1], Kirstie Galbraith[3*], Kichu Nair[2], Glenys Wilkinson[1], Bronwyn Clark[1,] Kate Spencer[1]

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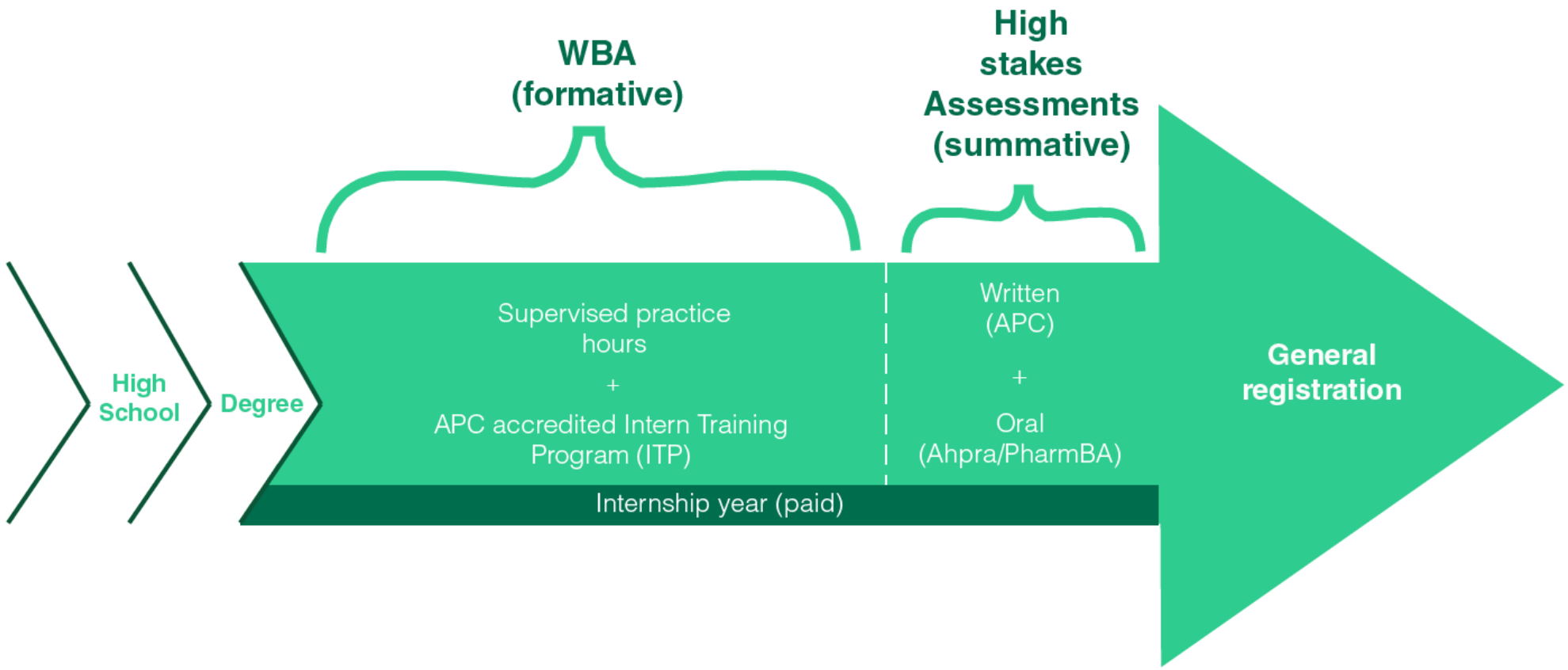
[2]University of Newcastle, Callaghan, New South Wales Australia
[3]Monash University, Melbourne, Victoria, Australia

Background: Australian Pharmacist Registration



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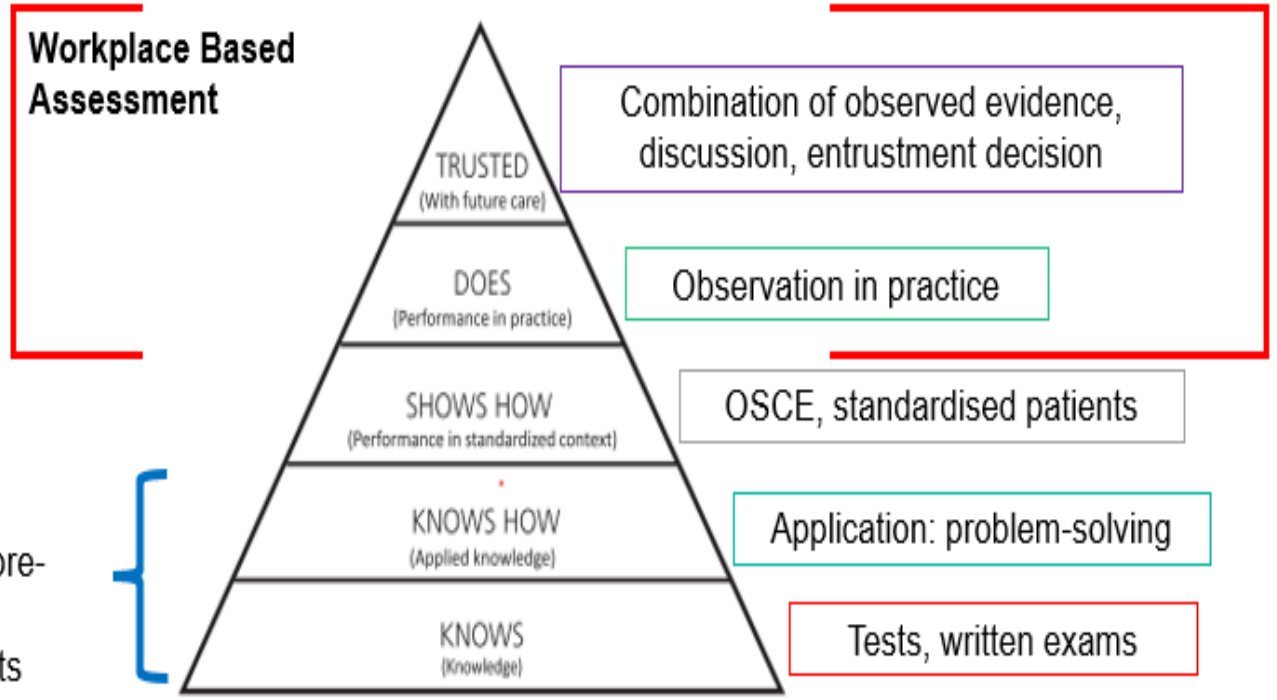
What is Workplace-Based Assessment?

- Workplace-based assessment (WBA) tests performance of an individual in their real work environment.
- It measures what they do in real-life situations.
- Effective assessment of individuals in the workplace requires different strategies to observe performance.



Miller G. 1990
ten Cate O. 2021

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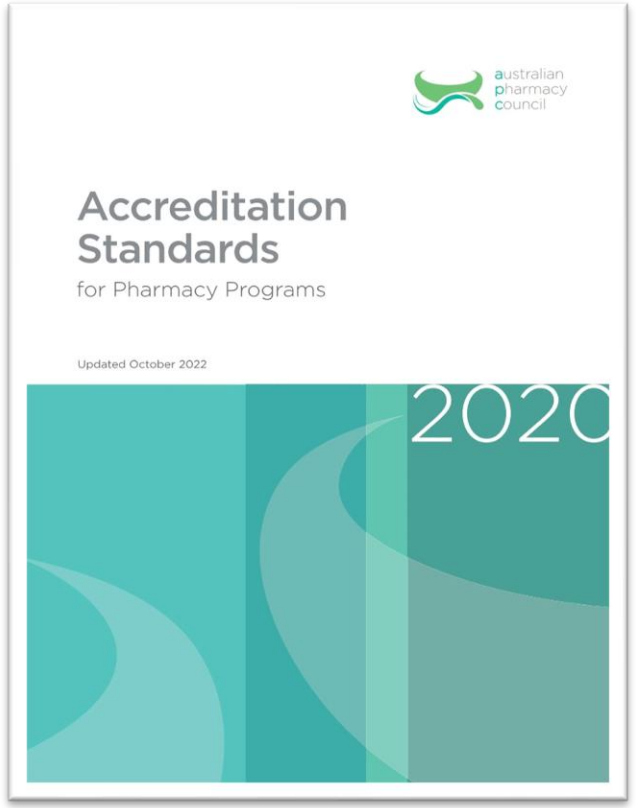
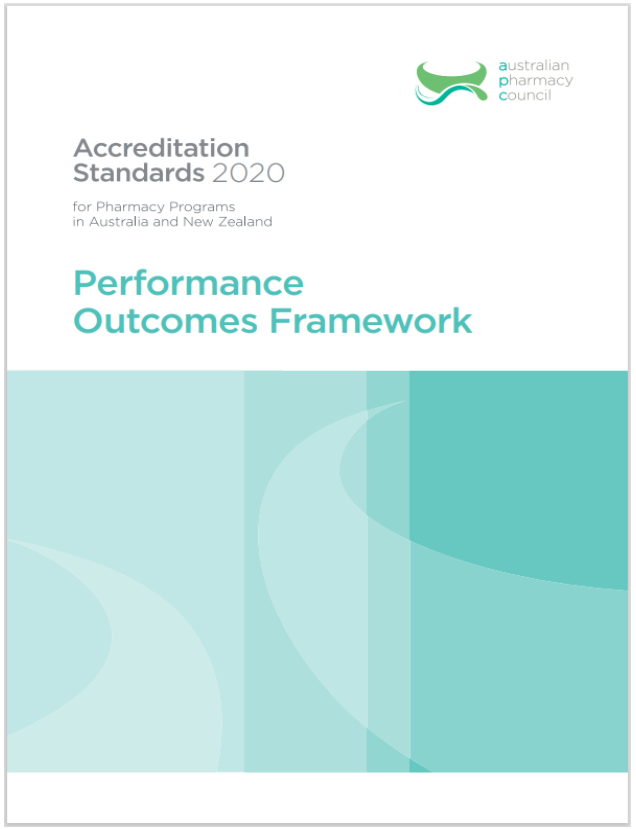
Workplace-based assessment

Why

- Outcomes focused Accreditation Standards
- Performance Outcomes Framework
- To achieve greater consistency in assessment of pharmacist interns
- To empower preceptors (pharmacists) to collect meaningful and valid evidence of intern performance in the workplace





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Development & Implementation of WBA tools for pre-registration pharmacists (interns)

jaccp Journal of the American College of Clinical Pharmacy

INTERNATIONAL CLINICAL PHARMACY PRACTICE REPORTS

Development of workplace-based assessment tools to support postgraduate training of provisionally registered pharmacists in Australia

Josephine Maundu Pharm.D., MPH, Kirsten Galbraith MClinPharm, Hayley Croft Ph.D., Bronwyn Clark MClinPharm, Sue Kirsa BPharm, Glenys Wilkinson MAppSci ... See all authors

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Workplace-based assessment (WBA) Tools and Support Materials

Case-based discussion

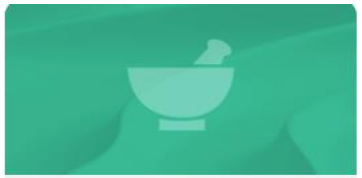
See your user guide, forms, videos and examples on CbD assessment

Health promotion

See your user guide, templates, and examples on health promotion

Dispensing EPA

See your user guide, forms, videos and examples on dispensing EPA assessments



Compounding EPA

See your user guide, templates, videos and examples on compounding EPAs

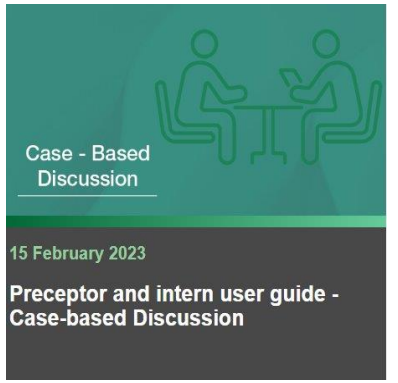
Reflective practice

See your user guide, templates, and examples on reflective practice

Counselling EPA

See your user guide, templates, videos and examples on counselling EPAs

https://www.pharmacycouncil.org.au/workplace-based-assessment/ncil



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Study objectives

1. Seek feedback on the **content, structure, and format** of the tools and supporting materials

2. Seek feedback on the **understandability and usability** of the tools and supporting materials

*3. Seek perspectives on the **impact of the tools on intern learning, provision of feedback, intern/preceptor relationships and workload***

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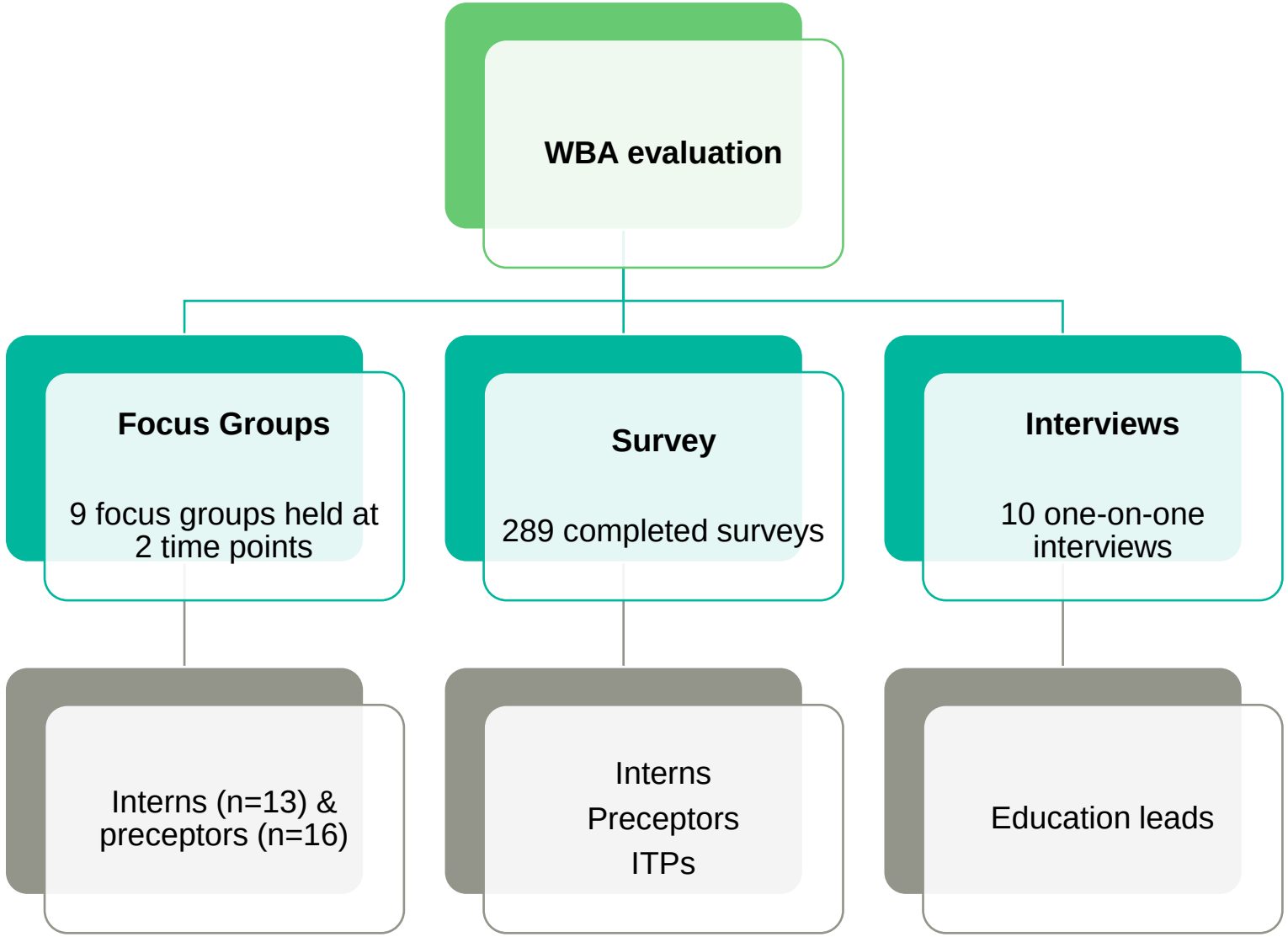
Overview of the evaluation



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Key themes - *effective practices in WBA implementation*

Theme	Subtheme
1. WBA tools enabling structured workplace learning opportunities	1.1. Feedback
	1.2. Assessing performance
	1.3. Supporting workplace supervision
	1.4. Intern self-directed learning
	1.5. Consistent standards and practices
	1.6. Reflective Practice
	1.7. Tracking Intern Progress
2. WBA resources and support	2.1. Supplementary multimedia resources: instructional guides, exemplars and videos
3. Training and support for supervision	3.1. Increasing supervisor familiarity with WBA tools and processes
	3.2. Repeated use

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Key themes – *challenges in WBA implementation*

Theme	Subtheme
1. Workload impact and resource constraints	1.1. Preceptor and intern workload
	1.2. Time to complete documentation
2. Establishing clear and consistent performance expectations	2.1. Entrustment decision making
3. Communication between stakeholder groups	3.1. ITP – intern communication 3.2. Preceptor – intern communication
4. WBA literacy	4.1. Understanding terminology and concepts around WBA
5. Case selection	5.1. Standardising complexity of case 5.2. Process of/ responsibility for case selection

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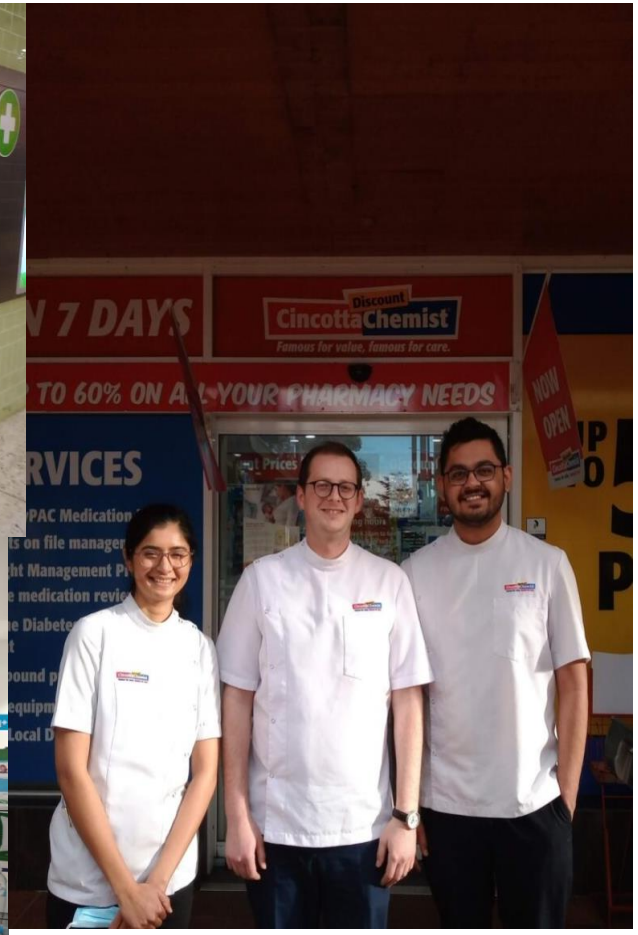
Next steps – national perspective

- Continuous Quality Improvement
- WBA literacy
- Champions
- Accreditation Standards – lever
- Technology solutions



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Acknowledgements

Research Team

Dr Hayley Croft, University of Newcastle (Chief Investigator)

Professor Kirstie Galbraith, Monash University

Professor Kichu Nair, University of Newcastle

Dr Josephine Maundu, APC

Ms Bronwyn Clark, APC

Ms Glenys Wilkinson, APC

Ms Tiara Miller, APC – project support

Organisations

Pharmacy Board of Australia

APC Board

Intern Training Programs coordinators & staff

Pharmaceutical Society of Australia

The Pharmacy Guild of Australia

Monash University

University of South Australia

The University of Sydney

The University of Queensland

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2024 Pharmacy Education Symposium

Using objective structured clinical examination (OSCE) to assess complex thinking in a pharmacy program

Dr Roy Dobson

Pharmacy Education Symposium

University of Saskatchewan
College of Pharmacy and Nutrition

Using Objective Structured Clinical Examination (OSCE) to Assess Complex Thinking in a Pharmacy Program

Presenter: Roy Dobson, PhD

Prato, Italy
July 2024

Background

- **Complex thinking (CT):** an essential component of the clinical skills used to provide quality patient care.[1]
- While OSCEs might serve as an indicator of future success in clinical practice, [2], it is unclear whether OSCEs can be used to assess or promote CT.
  - Our previous research of CT and OSCEs showed only weak associations.[3]
- Though commonly functioning as a checklist,[4] and not intended to assess CT, we hypothesised individual questions within OSCEs might potentially capture CT.

Research Aims

- To identify questions within existing OSCEs capable of capturing CT, and to develop a tool for measuring different levels of CT.

Methods

- **Third year OSCE scenarios** were reviewed to identify those containing at least one standardized patient question with the potential to assess CT.
- For the selected question, six **video recordings** of student responses were reviewed by the authors to determine its **potential for measuring different levels of CT, and to create a scoring rubric.**
- Two of the authors (Cassidy and Krol) met with two **experienced OSCE assessors** to introduce the rubric and **standardize scoring** using the same 6 videos.

Methods

- Using the rubric, the assessors reviewed the remaining **80 student videos** to confirm the suitability of the selected question for assessing CT and, if necessary, suggest changes to the rubric.
- The responses of **sixty students were reviewed by a single assessor** (30 by EK and 30 by TN), while the final **twenty videos were scored by both assessors**.
- Analysis of the twenty paired scores was carried out using **Cohen's kappa to determine inter-rater agreement**.

Results - The Scenario

- The selected OSCE contained the following scenario and scripted response of the standardized patient (SP):
  - If asked, “What did the doctor tell you to expect with this medication?”, you respond, “Nothing, but I’ve heard antidepressants can be addicting. Is that true?”
  - If the student asks any question to find out what you know about the medication, or what your preconceptions are, answer as above.
  - If not discussed during the counseling session, you MUST ask: “Is this medication addicting?”
- Regardless of the trigger, the SP asks if the drug is addicting, to which the student is expected to respond.

Results - Initial Scoring Rubric

Initial rubric developed to assess complex thinking: Year 3 Fluoxetine OSCE

Criteria	Inadequate (0)	Growing (1)	Proficient (2)	Excelling (3)
Defines addiction and/or withdrawal	Does not define either	Defines withdrawal or addiction	Defines both withdrawal and addiction	Defines both withdrawal and addiction and provides examples for at least one.
Distinguishes between addiction and withdrawal	Uses the concepts interchangeably or indicates that withdrawal may occur without additional explanation	Explains that withdrawal may occur; describes symptoms of withdrawal	Explains that withdrawal may occur; describes symptoms of withdrawal; explains how this differs from addiction.	Explains that withdrawal may occur; describes symptoms of withdrawal; explains how this differs from addiction; confirms patient understanding.

Results - Final Scoring Rubric

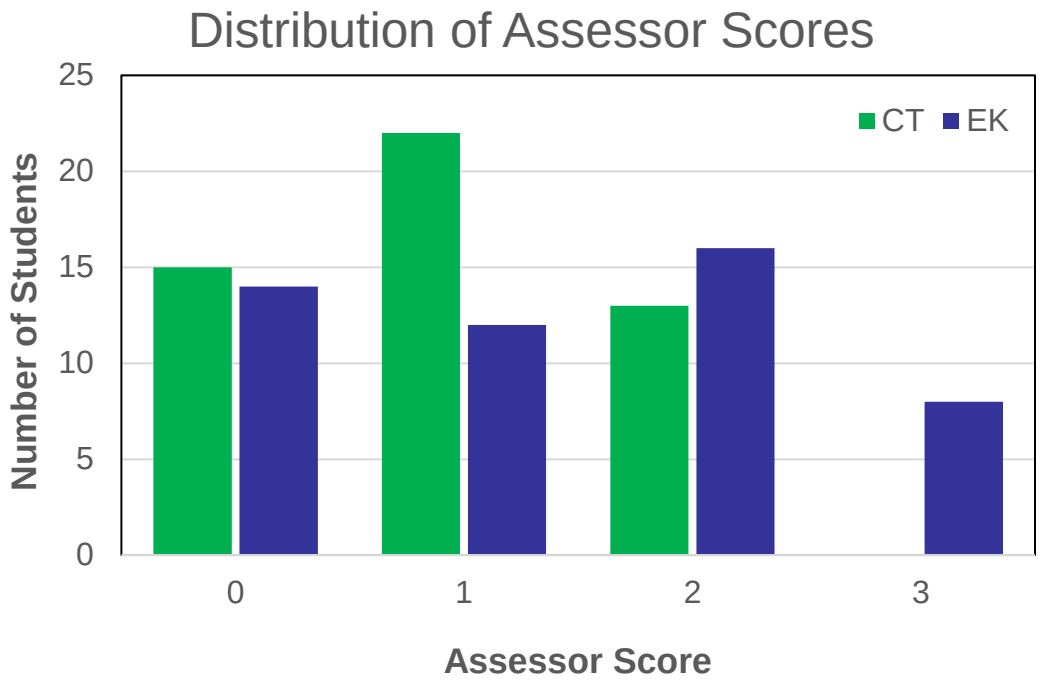
Rubric used to assess OSCE complex thinking: Year 3 Fluoxetine OSCE 2023

Criteria	CT not evident (0)	CT possible (1)	CT apparent (2)	CT confirmed (3)
Distinguishes between addiction and physical dependence	Does not define either addiction or physical dependence or incorrectly uses the terms or says fluoxetine is addicting	Defines and/ or uses the term(s) correctly for physical dependence and/ or addiction but no additional information provided to the patient	Defines and uses the term(s) correctly and explains in terms of physical dependence or addiction	Defines and uses the term(s) correctly and differentiates between physical dependence and addiction

Addiction: a neuropsychological disorder characterized by a persistent and intense urge to use a drug or engage in a behaviour that produces natural reward, despite substantial harm and other negative consequences.
Addiction: a chronic, relapsing disorder characterized by compulsive drug seeking and use despite adverse consequences.

Physical dependence: a physiological adaptation that occurs when medications acting on the central nervous system are ingested with rebound when the medication is abruptly discontinued. [5]

Results– Scoring by Assessors



- Overall, there was **good distribution of scores,** suggesting the rubric supported the assessors in **differentiating between levels** of student performance.

Results – Inter-rater Agreement

- Analysis produced a **kappa score of 0.58**, suggesting moderate agreement between the assessors.[6]

Inter-rater Analysis Using Crosstabs

		Assessor2				
		0	1	2	3	Total
Assessor1	0	7	0	1	1	9
	1	1	4	0	0	5
	2	0	0	3	3	6
Total		8	4	4	4	20

Symmetric Measures

		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Measure of Agreement	Kappa	.577	.131	4.465	<.001
N of Valid Cases		20			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Results – Assessor Debriefing

- During post-assessment debriefing, the assessors expressed **general satisfaction with the rubric.**
- In reflecting on the kappa score for the twenty videos reviewed by both assessors, **specific scoring issues were identified**.
- Issues included:
  - interpreting vague answers; and
  - assessing answers that “flip-flop” between correct and incorrect responses to the SP’s question.

Results - Debriefing

- It was also suggested that SPs be trained on the timing of the question regarding addiction.
  - If not initiated by a question from the student by the time of the warning buzzer (indicating the OSCE will end in two minutes), the SP should initiate the conversation to ensure sufficient time for a thoughtful student response.

Conclusions

- Our first attempt to develop a **scoring rubric** appeared to capture a range of student responses and was seen as **assessor-friendly** with **moderate inter-rater agreement** between experienced assessors.
- By identifying questions within existing OSCE scenarios, as well as capturing student responses that suggest a level of CT, the **potential for OSCEs to assess more complex, or higher-level thinking,** was demonstrated.

Next Steps

- Continue to **refine the rubric.**
- **Identify questions in other OSCEs** in our program with the potential to demonstrate complex thinking.
- **Compare OSCE CT scores to courses within the pharmacy program** and among pre-requisites seen to rely on complex thinking skills [7] to confirm the validity of the scoring rubric.

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- 1. Newsom et al. (2022) Enhancing the “What” and “Why” of the Pharmacists’ Patient Care Process With the “How” of Clinical Reasoning. AJPE, 86(4), Article 8697.
- 2. McLaughlin et al. (2015). Limited predictive utility of admissions scores and objective structured clinical examinations for APPE performance. AJPE, 79(6), 1-7.
- 3. Dobson, R, Krol, E, Theaker, M and Cassidy, J (2019). Associations between Pharmacy Prerequisites and OSCEs at the University of Saskatchewan. Presented at the 10th Biennial Pharmacy Education Symposium, Prato, July 7-10.
- 4. Shirwaikar A. (2015) Objective structured clinical examination (OSCE) in pharmacy education - a trend. Pharmacy Practice 2015 Oct-Dec;13(4):627.
- 5. DSM-5-TR Substance-Related and Addictive Disorders. https://doi.org/ 10.1176/appi.books. 9780890425787.x16 Substance Related Disorders.
- 6. McHugh, ML (2012) Interrater reliability: the kappa statistic. Biochemia Medica, 22(3): 276-282.
- 7.Krol, E, Dobson, R and Adesina, K (2019). The Association between Academic Success in a Professional Pharmacy Program and Performance in BSP and Pharm D Prerequisites at the University of Saskatchewan. AJPE. DOI: 10.5688/ajpe6491.

The Team

- Ed Krol, Professor, College of Pharmacy and Nutrition, University of Saskatchewan.
- Jane Cassidy, Pharmacy Skills Coordinator, College of Pharmacy and Nutrition, University of Saskatchewan.
- Roy Dobson, Professor, College of Pharmacy and Nutrition, University of Saskatchewan.

Acknowledgements

- We would like to acknowledge our two assessors, Erin Kabatoff and Teresa Nguyen, for their valuable contributions to this project.

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2024 Pharmacy Education Symposium

Experiential Learning as a pathway to success for student pharmacists in Northern Ireland

Bronoagh White and Helen Hirst

NI Centre for Pharmacy Learning & Development

EXPERIENTIAL LEARNING (EL) IN PRIMARY CARE (NI) 23-24

Northern Ireland

Bronagh White
Senior Lead for EL in General Practice

Helen Hirst
Senior Lead for EL Community Pharmacy

Experiential Learning NI

7 weeks EL within MPharm for 23/24

- **5 weeks Year 3**
- **2 weeks Year 2**

EL Programme for both NI Universities delivering structured placements – EPAs with direct Practice Supervisor supervision

NICPLD manage student to practice allocation (Community Pharmacy; General Practice and Hospital Trusts)

Travel Subsidy for all NI Student Pharmacists

EL 2023/2024:Core elements

Practice Supervisors feel student pharmacists were ….

Practice Supervisor Feedback Primary Care

NO. SURVEY RESPONSES	368 CP		11 GENERAL PRACTICE PHARMACIST		
Practice Supervisor	Individual PS	PS Shared responsibility	Individual PS		PS Shared responsibility
	83%	17%	45%		55%
Training (fully prepared for PS role)	Strongly agree/agree – 96%		Strongly agree/agree – 64%		
Right level of support from NICPLD	Strongly agree/agree – 95%		Strongly agree/agree – 72%		
Sufficient communication pre-placement	Strongly agree/agree – 96%		Strongly agree/agree – 100%		
EPA completion achievable in one week	Strongly agree/agree – 93%		Strongly agree/agree – 100%		
Understood goals of EPAs	Strongly agree/agree – 91%		Strongly agree/agree – 82%		
PS found observing EPAs	Straightforward 78%	Challenging 22%	Straightforward 36%	Challenging 36%	Very Simple 28%
PS had opportunity for feedback conversations	Strongly agree/agree – 99%		Strongly agree/agree –100%		
Student pharmacist made contribution to pharmacy team	Strongly agree/agree – 96%		Strongly agree/agree – 91%		

Student Feedback Primary Care Placement

Experiential Learning

Student Pharmacists feel Practice Supervisors were ….

Student Feedback Summary

STUDENT FEEDBACK		
No. survey responses	431	
University attended	QUB	UU
	289	142
EPA completion achievable in one week	Strongly agree/agree – 92%	
PS had a feedback conversation after EPAs	Strongly agree/agree – 93%	
PS reviewed key learning points and helped student action plan	Strongly agree/agree – 92%	
Student had opportunity to interact with broad range of patients	Strongly agree/agree – 77%	
Opportunity to communicate with patients for person-centred care	Strongly agree/agree – 89%	
Opportunity to communicate with other HCPs	Strongly agree/agree – 86%	
After this CP placement I feel more confident and competent in my professional skills	Strongly agree/agree – 91%	

Student suggestions to improve placement

More specific EPAs tailored to community pharmacy/GP Practice

Improvements could be made by learning more about general practice in university lectures before going to placement.

Let student work on EPAs they find more challenging/ broaden the range of EPAs

GP Practice
It would have been nice if there was a computer set up for the students to have their own access to the GP software i.e. Vision etc.
More scope for carrying out independent tasks
Community Pharmacy
More patient interaction and counselling opportunities
Placement location – less travel time
EPA development suggestions for GP and CP

Shorter distances to travel if available for the student

More patient consultation

What went well during placement?

Gaining understanding of responsibilities of a GP pharmacist

PS did everything they could to allow for a wonderful placement experience

Got valuable experience with 'real-life' patients and got to improve my skills and confidence.

I was able to communicate with a vast range of patients and felt that I had learnt a lot by the end of the week

Great opportunity to be a part of the GP team for a week and see the work they do

Welcome and support from the pharmacy/practice team and Practice Supervisor – valued team working and how the PS supported the student's learning

Gaining confidence communicating with and counselling a wide range of patients

Exposure to new pharmacy services , different pharmacy environments including GP Practice, putting clinical knowledge into practice through EPAs

Opportunity to communicate with other Healthcare Professionals

All staff were very friendly and helpful, and I gained great insight into many different aspects of community pharmacy. It was a great place to learn.

I learnt so much in terms of communicating effectively with patients

PS very helpful, informative and provided multiple scenarios to progress my development and complete EPAs

Summary of developments for 24/25:

- **FEL supports students and practices which consequently means greater capacity for GPP and practice team to continue normal workload on the 3 days student is in practice**
- **Payment arrangements have been amended to ensure that the GPP is recognized for the role that they will undertake as practice supervisor**
- **Placements in general practice have been extended to Year 4 students in addition to Year 3 students**
- **The period October to March brings many additional pressures for general practice so the placement weeks have been reorganised as far as possible to account for times when staff will be on leave or increased demand on HCPs time.**

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2024 Pharmacy Education Symposium

When is entrustment achieved in a pre-registrant pharmacist training program?

Natalie Protuder

When is entrustment achieved in a pre-registrant pharmacist training program?

natalie.protuder@monash.edu

When is entrustment achieved in a pre-registrant pharmacist training program?

Natalie Protuder, BPharm, BSc, FANZCAP (CommPharm.), Monash University
Steven Walker, BPharm(Hons), MClinPharm, FANZCAP (Edu.), Monash University
Simmie Chung, BPharm, University of Sydney
Ben Emery, BPharm, MPharmPrac, Monash University
Josephine Crockett, BPharm, University of South Australia
Nanette Cawcutt, BPharm, Grad Dip ClinPharm, University of Queensland

Date: 9/07/2024 | Presenter: Natalie Protuder

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MONASH UNIVERSITY recognises that its Australian campuses are located on the unceded lands of the people of the Kulin nations, and pays its respects to their Elders, past and present.

Background- Pre-registrant pharmacists in Australia

Pharmacy Board Ahpra **Registration requirements**	 **Employment and Preceptor**	NAPE National Alliance for Pharmacy Education **Intern Training Program**

Background- Implementation of Workplace-based Assessments in ITP

- "…**tasks** or responsibilities to be **entrusted** to…a trainee once he or she **has attained sufficient specific competence**"[1]

Counselling	Dispensing	Compounding

https://www.pharmacycouncil.org.au/workplace-based-assessment/

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1. ten Cate O. J Grad Med Educ. 2013;5(1):157-157.

Background- Expectations of pre-registrant pharmacist

Level[2]	Description	Example
Level 1	Observe only, even with direct supervision	Watch me dispense this medication
Level 2	Perform with direct, proactive supervision and intervention	Dispense this medication whilst I watch you complete the process
Level 3	Perform with indirect proximal (nearby) supervision, on request and quickly available	Dispense this medication yourself but ask me if you get stuck and I will double check the final item
Level 4	Perform with minimal supervision, available if needed, essentially independent performance	Dispense this medication yourself as if “you are the pharmacist”

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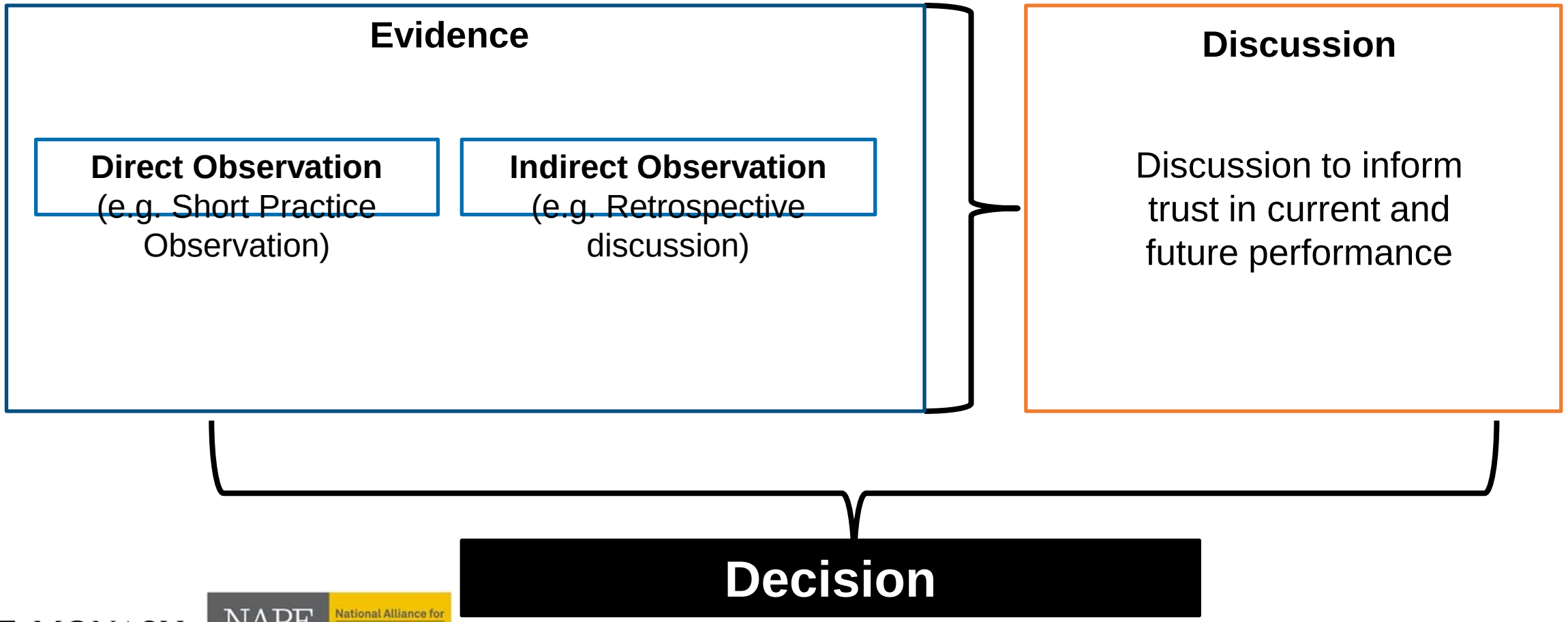
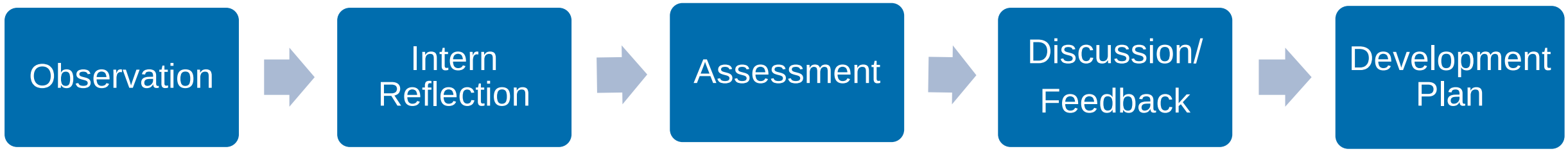
2. Australian Pharmacy Council, 2022.

Background- How to make an Entrustment Decision?



Background- Short Practice Observations (SPOs)



Background- Periodic assessment of EPAs

13-Week preceptor assessment → 26-Week preceptor assessment → Final preceptor assessment

Entrustable Professional Activities (EPA)	N/A	Level 1	Level 2	Level 3	Level 4
EPA 1- Dispensing products	☐	☐	☐	☐	☐
Circle the number of Dispensing SPOs performed by this point in time (accumulative)	0 1 2 3 4 5 6				
EPA 2- Compounding products	☐	☐	☐	☐	☐
Circle the number of Compounding Products prepared by this point in time (accumulative)	0 1 2 3 4 5 6				
EPA 3- Providing Counselling	☐	☐	☐	☐	☐
Circle the number of Counselling SPOs performed by this point in time (accumulative)	0 1 2 3 4 5 6				

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Aim

To compare the proportion of community and hospital interns entrusted to perform each EPA independently (Level 4) at 13-weeks, 26-weeks and conclusion of the program.

Level[2]	Description	Example
Level 1	Observe only, even with direct supervision	Watch me dispense this medication
Level 2	Perform with direct, proactive supervision and intervention	Dispense this medication whilst I watch you complete the process
Level 3	Perform with indirect proximal (nearby) supervision, on request and quickly available	Dispense this medication yourself but ask me if you get stuck and I will double check the final item
Level 4	Perform with minimal supervision, available if needed, essentially independent performance	Dispense this medication yourself as if "you are the pharmacist"

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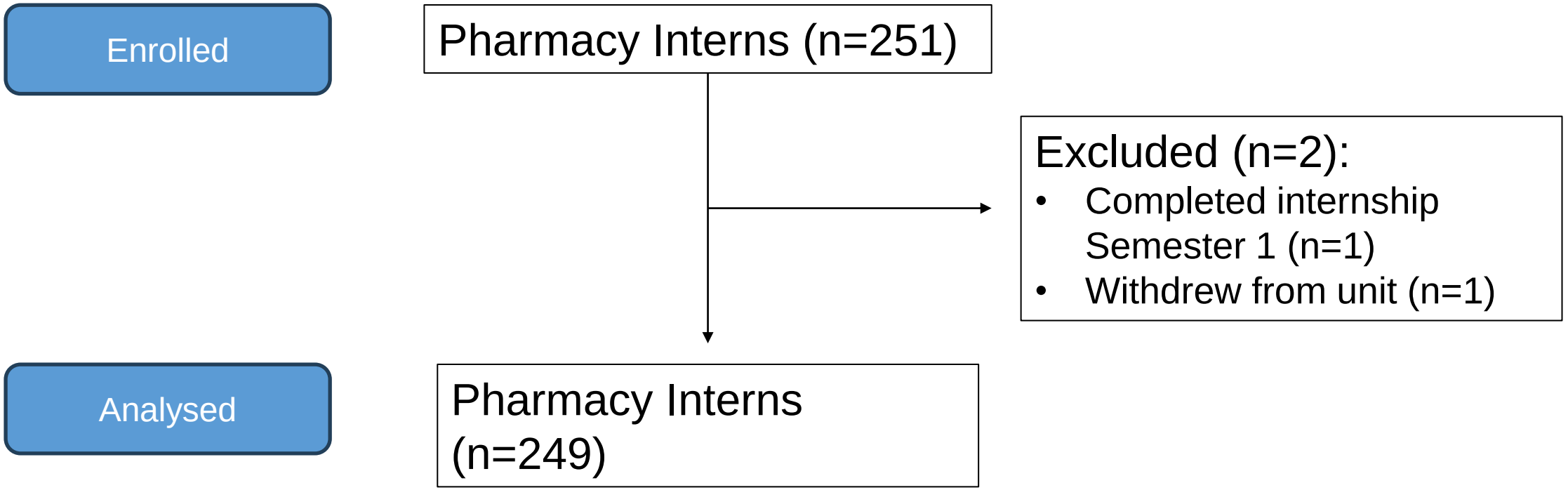
2. Australian Pharmacy Council, 2022.

Methods


Enrolled
Pharmacy Interns (n=251)
Excluded (n=2):
• Completed internship Semester 1 (n=1)
• Withdrew from unit (n=1)
Analysed
Pharmacy Interns (n=249)

Methods

- Periodic assessments were submitted by interns at 13, 26 weeks and the final assessment
- De-identified data was extracted from the learning management system
- Data was analysed for descriptive statistics
- Proportions for interns between community and hospital were compared using Chi squared statistical test
- MUHERC 40360

Results

Entrustable Professional Activity (EPA)	13-weeks		26-weeks		Final assessment	
	Level 4 entrustment	Mean SPO (SD)	Level 4 entrustment	Mean SPO (SD)	Level 4 entrustment	Mean SPO (SD)
Dispensing	42%	3 (2.1)	64%	4 (2.1)	91%	6 (0.9)
Compounding	28%	3 (1.9)	49%	5 (1.6)	87%	6 (0.5)
Counselling	36%	3 (1.8)	59%	4 (1.8)	92%	6 (0.7)

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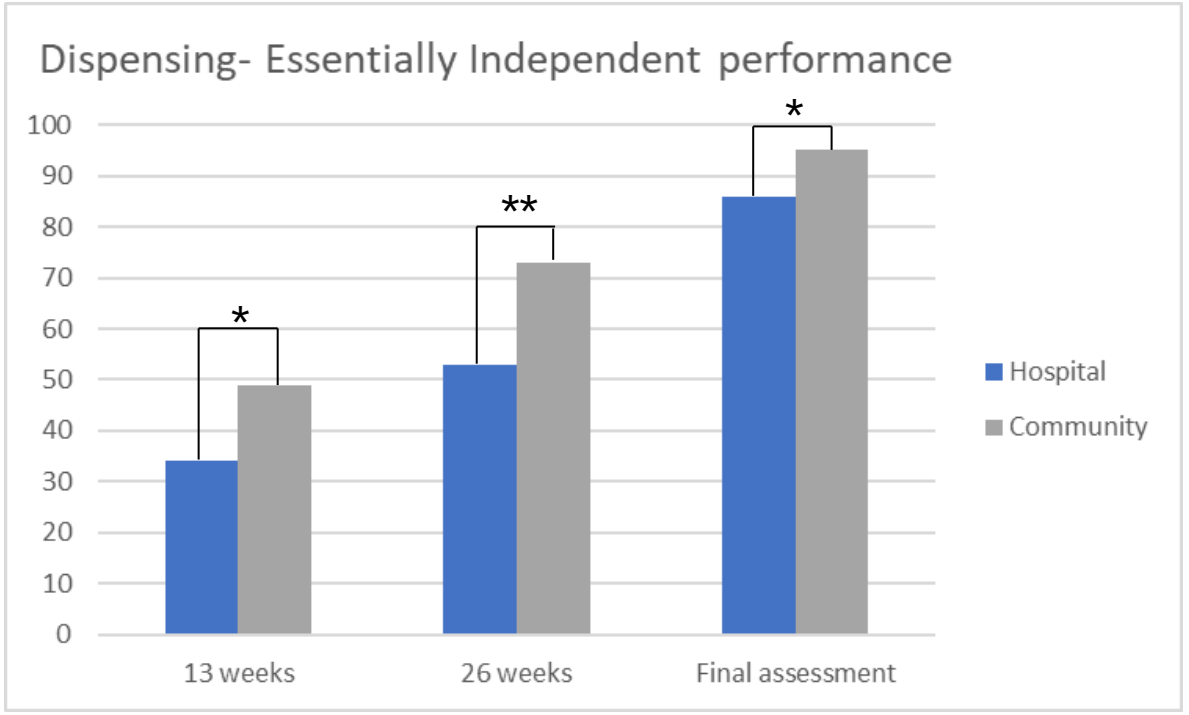
Results- EPA-Dispensing



p<0.05= *
p<0.01= **
p<0.001= ***

Time	Community		Hospital		P-value
	Level 4 entrustment	Mean SPO (SD)	Level 4 entrustment	Mean SPO (SD)	
13 Weeks	49%	4 (2.3)	34%	3(1.9)	0.029
26 Weeks	73%	5 (1.6)	53%	4 (2.0)	0.002
Final	95%	6 (0.5)	86%	6 (1.1)	0.046

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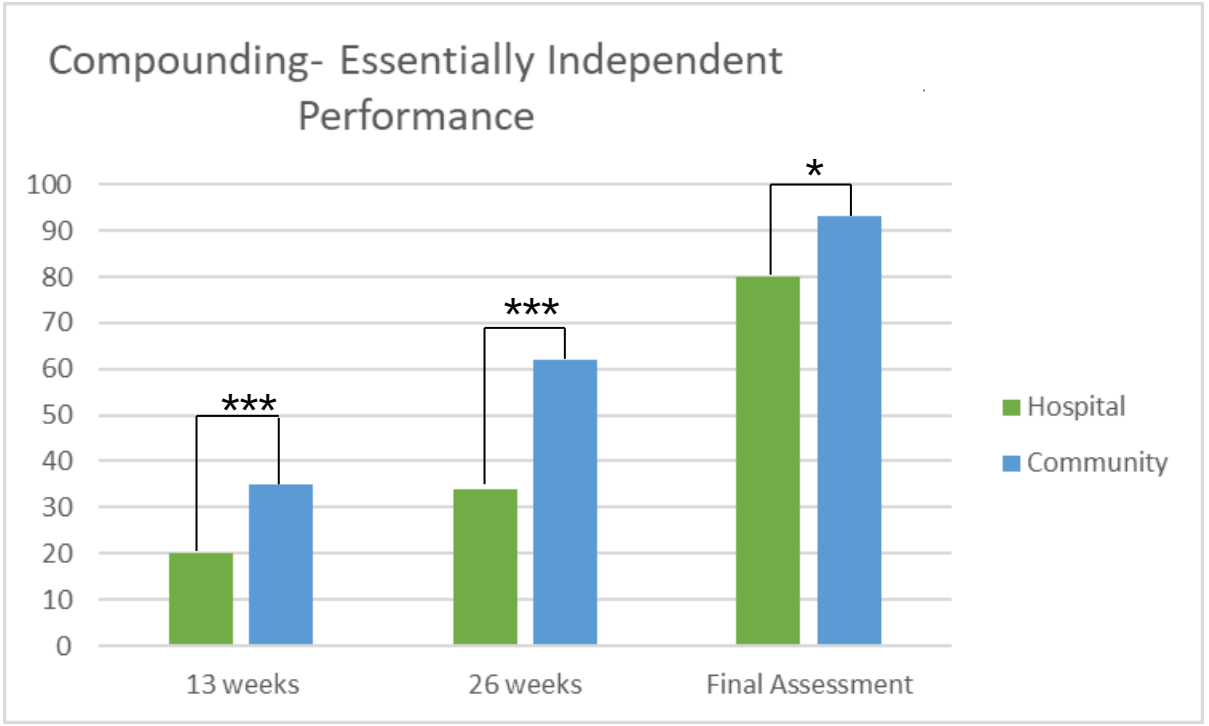
NAPE National Alliance for Pharmacy Education

Key Points- EPA Dispensing

- Dispensing is a traditional pharmacist role[3]
- Exposure to dispensing varies between community and hospital pharmacies[4]

3. Moles R.J. et al. Can J Hosp Pharm. 2015;68(5):418-426.
4. SHPA, 2024

Results- EPA-Compounding



p<0.05= *
p<0.01= **
p<0.001= ***

Time	Community		Hospital		P-value
	Level 4 entrustment	Mean SPO (SD)	Level 4 entrustment	Mean SPO (SD)	
13 Weeks	35%	3(2.0)	20%	4(1.7)	<0.001
26 Weeks	62%	5(1.5)	34%	5(0.9)	<0.001
Final	93%	6(0.3)	80%	6(0.4)	0.011

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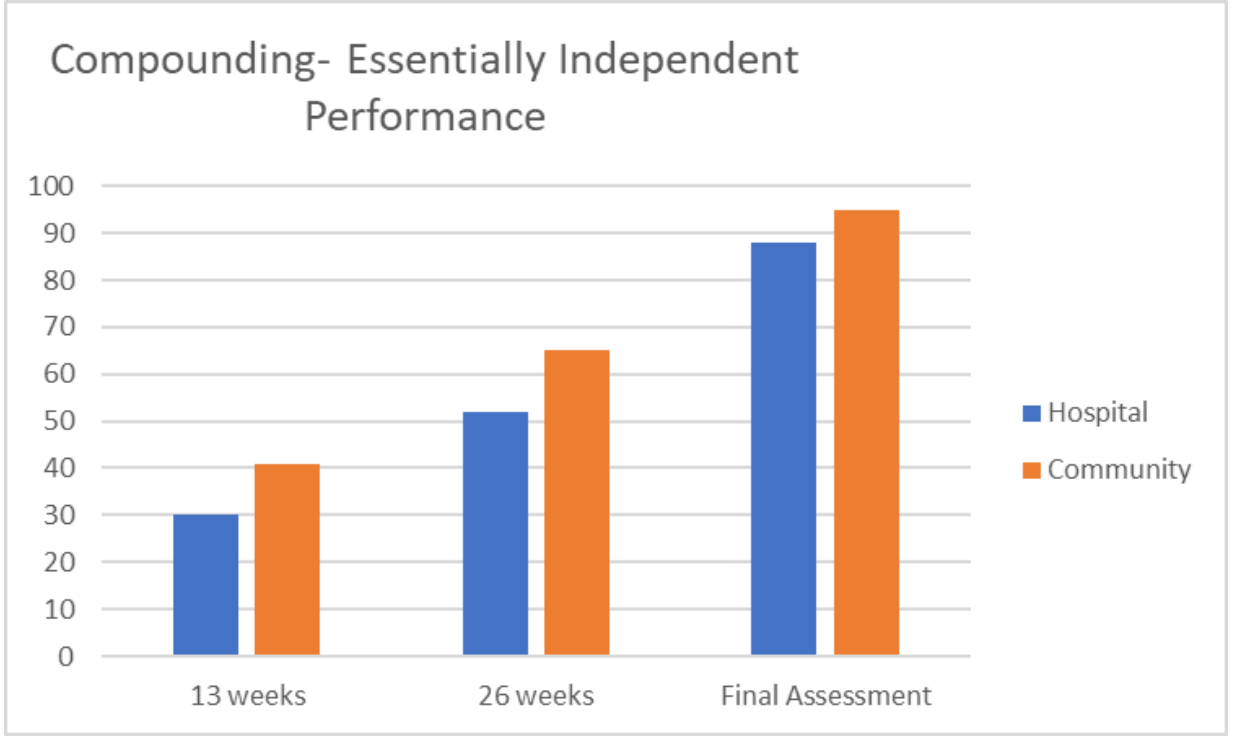
NAPE National Alliance for Pharmacy Education

Key Points- EPA Compounding

- Compounding can be defined as ‘simple or complex’ [5]
- There are differences in the type of compounded products manufactured from the hospital and community
- *“Pharmacists are required to demonstrate competency in simple compounding at the time of entry to the profession.”*[5]

5. Pharmacy Board of Australia, 2015

Results- Counselling



Time	Community		Hospital		P-value
	Level 4 entrustment	Mean SPO (SD)	Level 4 entrustment	Mean SPO (SD)	
13 Weeks	41%	4(2.1)	30%	3(1.6)	0.306
26 Weeks	65%	5(1.6)	52%	4(1.4)	0.098
Final	95%	6 (0.5)	88%	6 (0.7)	0.141

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NAPE National Alliance for Pharmacy Education

Key Points- EPA Counselling

- Providing counselling is integral for safe and effective medication management[6-7]

- Patient counselling is an expected pharmacist role, regardless of workplace[3,8]

6. The Pharmaceutical Society of Australia, 2019
7. Pharmacy Board of Australia, 2023
3. Moles R. J. et al. Can J Hosp Pharm. 2015;68(5):418-426.
8. Kellar J. et al. IJPP. 2021;29(4):299-307.

Discussion

- Interns were entrusted to perform dispensing, compounding and counselling at different times
- Trust develops over a period of time with deliberate practice[9-10]
- There were differences between attaining an entrustment level 4 between workplaces
- Pharmacist roles in hospital and community practice differ[3,8,11]

9. Dreyfus S.E. et al. Uni Berk Oper Res Cent.
10. Ericsson K.A. et al. Psych Rev. 1993;100(3):363-406.
3. Moles R. J. et al. Can J Hosp Pharm. 2015;68(5):418-426.
8. Kellar J. et alIJPP. 2021;29(4):299-307.
11. Altman I.L. et al. IJPP. 2018;27(3):249-255.

Limitations

- Data collected from Monash University interns
- EPA tools are not validated
- Influence of prior pharmacy experience
- Characteristics of the workplace

Future studies

- Potential changes to supervision models based on entrustment
- Investigating validity and impact on patient outcomes

Conclusion

A significantly higher proportion of community interns were entrusted to dispense and compound independently earlier than hospital interns, but no such difference was observed for counselling.

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3. Moles RJ, Stehlik P. Pharmacy Practice in Australia. Can J Hosp Pharm. 2015;68(5):418-426. doi: 10.4212/cjhp.v68i5.1492

4. Society of Hospital Pharmacists Australia. 2024 Victorian Hospital Pharmacy Intern Program. SHPA; 2024. Accessed June 10, 2024. https://shpa.org.au/workforce-research/early-career-pharmacists/vic-intern-program/2024

5. Guidelines on Compounding of Medicines. Pharmacy Board of Australia; 2015. Updated August, 2017. Accessed June 10, 2024. https://www.pharmacyboard.gov.au/Codes-Guidelines.aspx

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7. Guidelines for dispensing of medicines. Pharmacy Board of Australia; 2015. Updated March 15, 2023. Accessed June 10, 2024. https://www.pharmacyboard.gov.au/Codes-Guidelines.aspx

8. Kellar J, Singh L, Bradley-Ridout G, Martimianakis MA, van der Vleuten CPM, oude Egbrink MGA et al. How pharmacists perceive their professional identity: a scoping review and discursive analysis. IJPP. 2021;29(4):299-307. https://doi.org/10.1093/ijpp/riab020

9. Dreyfus SE, Dreyfus HL. A Five-Stage Modle of the Mental Activities Involved in Directed Skill Acquisition. University of Berkeley Oper Research Centre. DOI: 10.21236/ADA084551

10. Ericsson KA, Krampe RT, Tesch-Romer C. The role of deliberate practice in the acquisition of expert performance. Psych Rev. 1993;100(3):363-406. https://psycnet.apa.org/doi/10.1037/0033-295X.100.3.363

11. Altman IL, Mandy PJ, Gard PR. Changing status in health care: community and hospital pharmacists' perceptions of pharmacy practice. IJPP. 2018;27(3):249-255. https://doi.org/10.1111/ijpp.12505

When is entrustment achieved in a pre-registrant pharmacist training program?

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2024 Pharmacy Education Symposium

Skills and attributes of research supervisors: learner and supervisor perspectives

Louise Lord

MONASH University

Skills and attributes of research supervisors in clinical practice: student and supervisor priorities

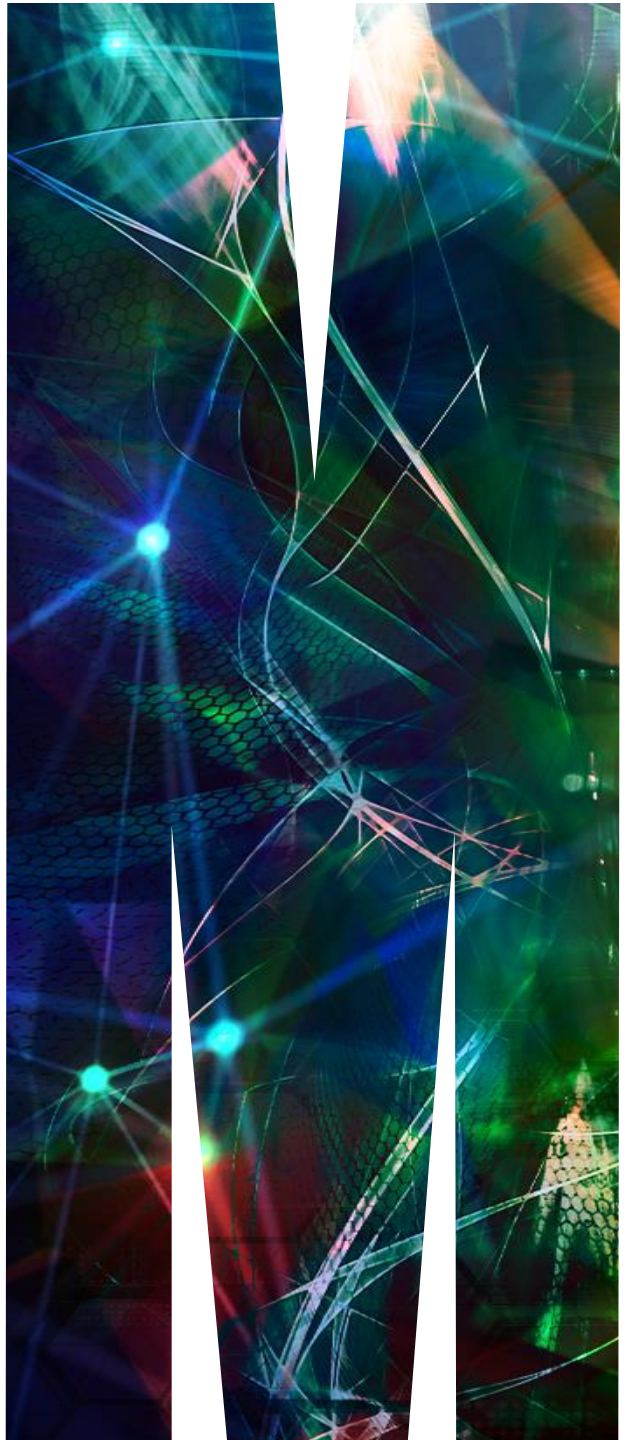
Louise Lord Senior Lecturer, PhD Candidate

Dr John Coutsouvelis Senior Lecturer

Prof. Kirstie Galbraith Professor of Pharmacy Practice and Education

Experiential Development and Graduate Education (EDGE)
Faculty of Pharmacy and Pharmaceutical Sciences, Monash University
Melbourne, Australia

Acknowledgements: Jesslyn Ha and Marianne Jovanovic, Monash Health (Delphi Study)
Student inquiry groups



Research in clinical practice

- Research skill development within the context of clinical practice has become an integral component of healthcare professional education and practice[1,2]
- Development of research skills should ideally be scaffolded throughout under and postgraduate education[2]
- Effective supervision clearly identified as a key factor to research success in structured, higher degree (HDR) research programs[1,2,3]
  - Paucity of evidence in non HDR programs

1. Langley CA. Pharmacy Education, 2018
2. Morbitzer KA. Am J Pharm Educ, 2021
3. Möller R. BMC Med Educ, 2021

Research in clinical practice – Supervision challenges

- Large number of student placements
- Competing workload
- Other workforce training
- Supervisors may be ‘allocated’ and not personally invested in the research area
- Variable research experience of practitioner-supervisors
  - As a researcher themselves
  - As a supervisor

Practice-based research learning opportunities at Monash University (and beyond)

Undergraduate

- Evidence-based practice throughout degree
- 8 week research placement (1st semester, 4th year)
- Report, poster and oral presentation

Study allocated

Pre-Registration (Interns)

- Longitudinal research project over year
- At their intern site
- Study proposal, data collection, poster and oral presentation

Student-determined study (assisted)

Master of Clinical Pharmacy

- Research stream: 3 semesters
- 1.5 years to develop, undertake and report their research
- Practice or university-based

Student-driven study

Residency Programs

- Not a part of Monash University
- Undertaken at worksite
- Predominantly hospital-based

Site-specific research requirements

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Objectives:

1) Identify the important **skills** and **attributes** required for pharmacy research supervision in clinical practice, from both supervisor and student perspectives

2) Describe areas for supervisor support and development

Methods

Survey

- Undergraduate student project
- Open invite to all undergraduates, interns and their supervisors

Modified Delphi

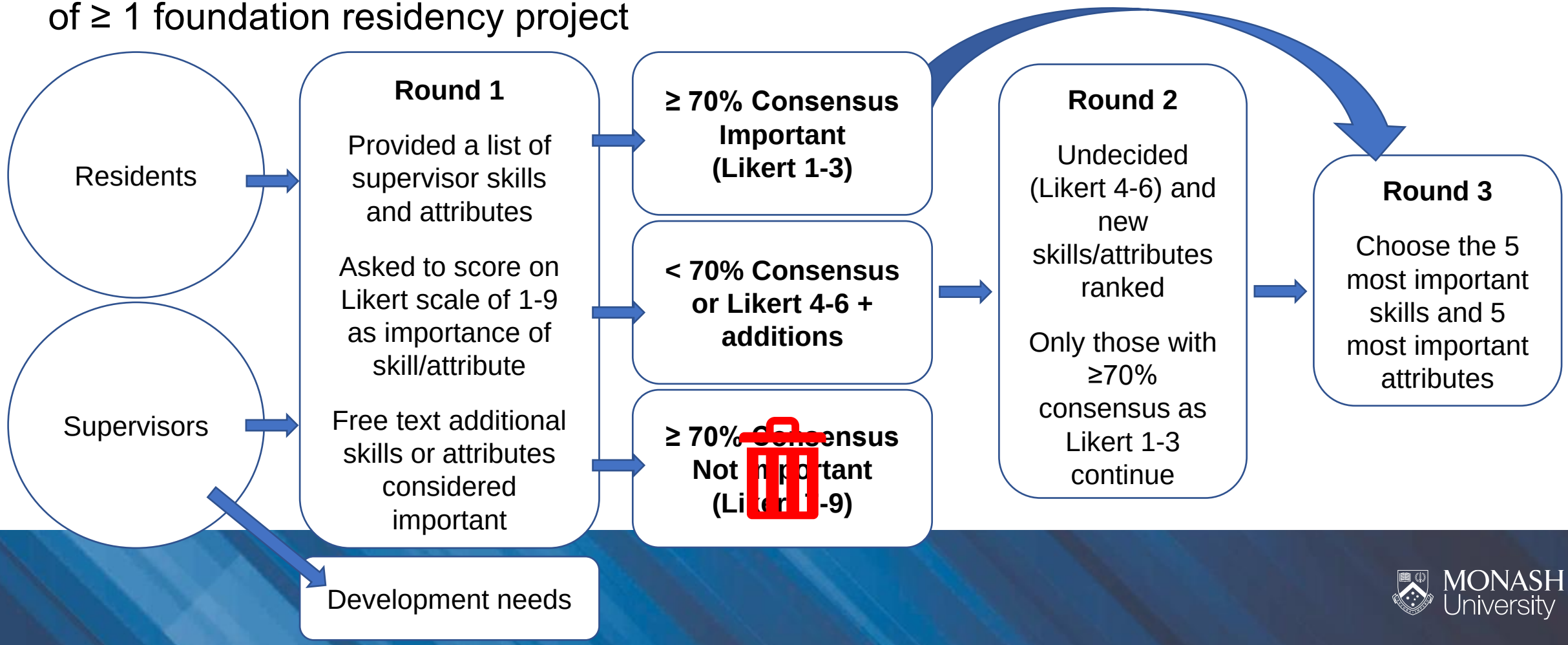
- Foundation residency project
- Large tertiary health service
- Targeted email recruitment

Existing literature informed lists

Delphi – 70% consensus required

Methods – Delphi

- Modified Delphi
- Foundation pharmacy residents successfully completed the program and supervisors of ≥ 1 foundation residency project



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Results

Survey

- Students n=27
  - 19/103 undergraduate, 4/237 interns, 4/13 postgraduate)
- Supervisors n=20
  - 20/175 supervisors

Delphi
(Pharmacy residents)

- 14 past residents and 19 past supervisors eligible
  - 12 residents started → 12 finished
  - 13 supervisors started → 10 finished

Results - Survey

Skills

Prior research experience

Topic knowledge e.g. cardiology

Prior research supervisor experience

Methodology expertise

Clear communication

Problem solving skills

Results - Survey

Students	Attributes	Supervisors
Supportive		Ability to provide constructive feedback
Interest in the project		Ability to provide clear direction
Approachable		Supportive
Ability to provide clear direction		Realistic expectations of student ability
Ability to provide constructive feedback		Interested in student development

Results – Delphi

Skills

Prior research experience

Research experience in specific topic area

Data analysis skills (statistics)

Methodology expertise (appropriateness and validity)

Expert on result interpretation

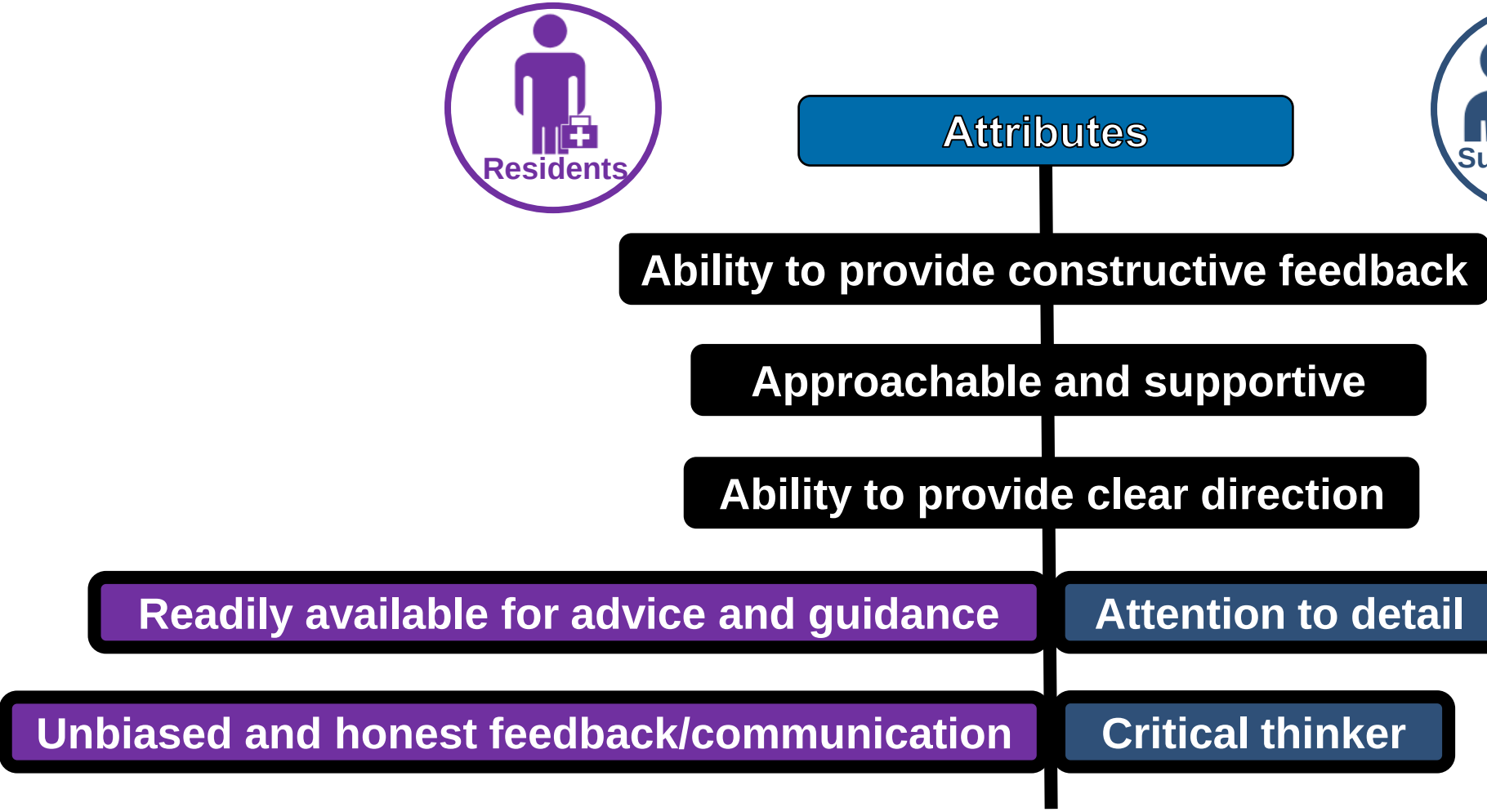
Expert on result interpretation

Methodology expertise (appropriateness and validity)

Experience in full research process from concept to publication

Manuscript writing skills

Results – Delphi



Results – Both survey and Delphi

Supervisor self-identified areas for development

Research design & feasibility

Statistical analysis

Qualitative analysis

Manuscript writing

Survey and analysis software

Skills to work with reluctant learners

Expectations of learner capability

Conclusion and what next?

- Skill and attribute expectations of practice-based supervisors were similar across both students and supervisors
- Prior research experience identified across all groups as the highest priority skill for effective research supervision
- Supervisors identified a need to upskill in study design and analysis
- **Next steps?**
  - Development of supervisor training and support resources, workshops
  - Opportunities to collaborate across sites, share expertise
  - Invite potential supervisors to be involved with research outside of the supervisor experience to develop new skills and confidence

Thank you

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2024 Pharmacy Education Symposium

Undergraduate clinical pharmacy placements: the Wales experience of the development and delivery of Entrustable Professional Activities

Dr Robert James

Undergraduate clinical pharmacy placements: the Wales experience of the development and delivery of Entrustable Professional Activities

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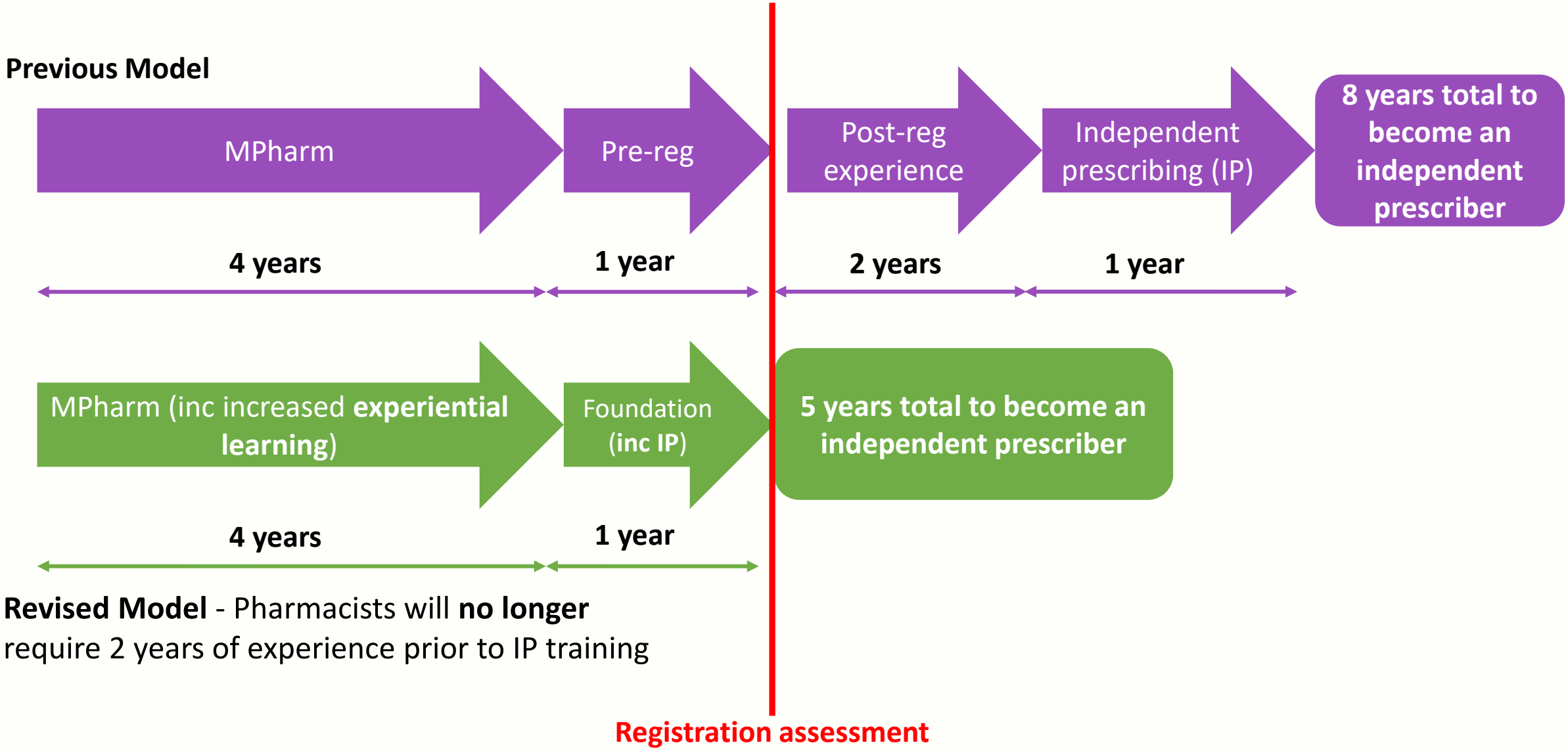
Cardiff School of Pharmacy and Pharmaceutical Sciences
Ysgol Fferylliaeth a Gwyddonau Fferyllol Caerdydd

Key Changes to UK Pharmacist Education and Training



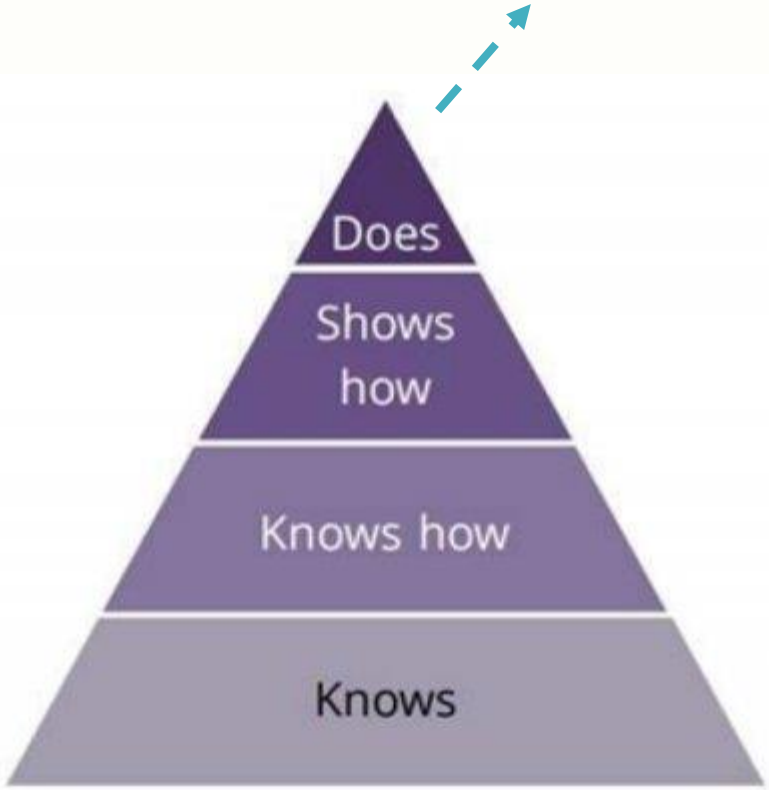
Revised Model - Pharmacists will **no longer** require 2 years of experience prior to IP training

Key Changes to Initial Education and Training Standards

- 55 learning outcomes must be achieved by the end of a trainee's **foundation training**.
- 16 of the 55 learning outcomes must be demonstrated at the 'does' level of Miller's pyramid at the end of the **MPharm**.
- Experiential learning facilitates increased clinical experiences for student pharmacists.

Source: https://www.pharmacyregulation.org/initial-training

"When a student pharmacist demonstrates the learning outcomes in a complex, familiar or everyday situation repeatedly and reliably"



Miller's pyramid

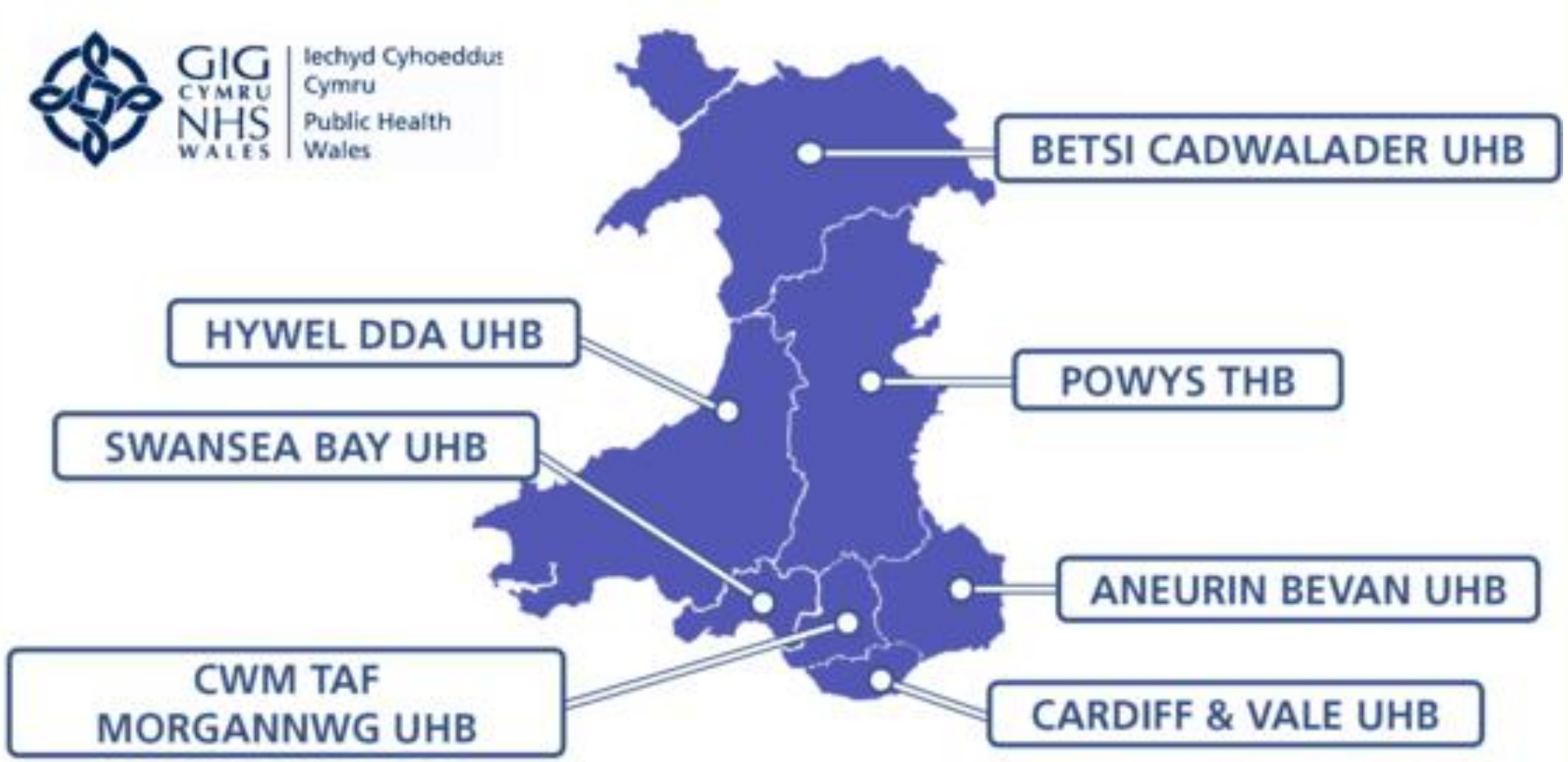
Clinical Placements

Aim: Develop and practice clinical skills across various healthcare settings

Year	Clinical Placement Days*	
	22/23	25/26
Y1	0	5
Y2	0	10
Y3	10	15
Y4	15	25
Total	**25**	**55**

*Placement days currently in 5-day blocks in either community pharmacy, hospital pharmacy or GP practice pharmacy

A National Unified Approach in Wales



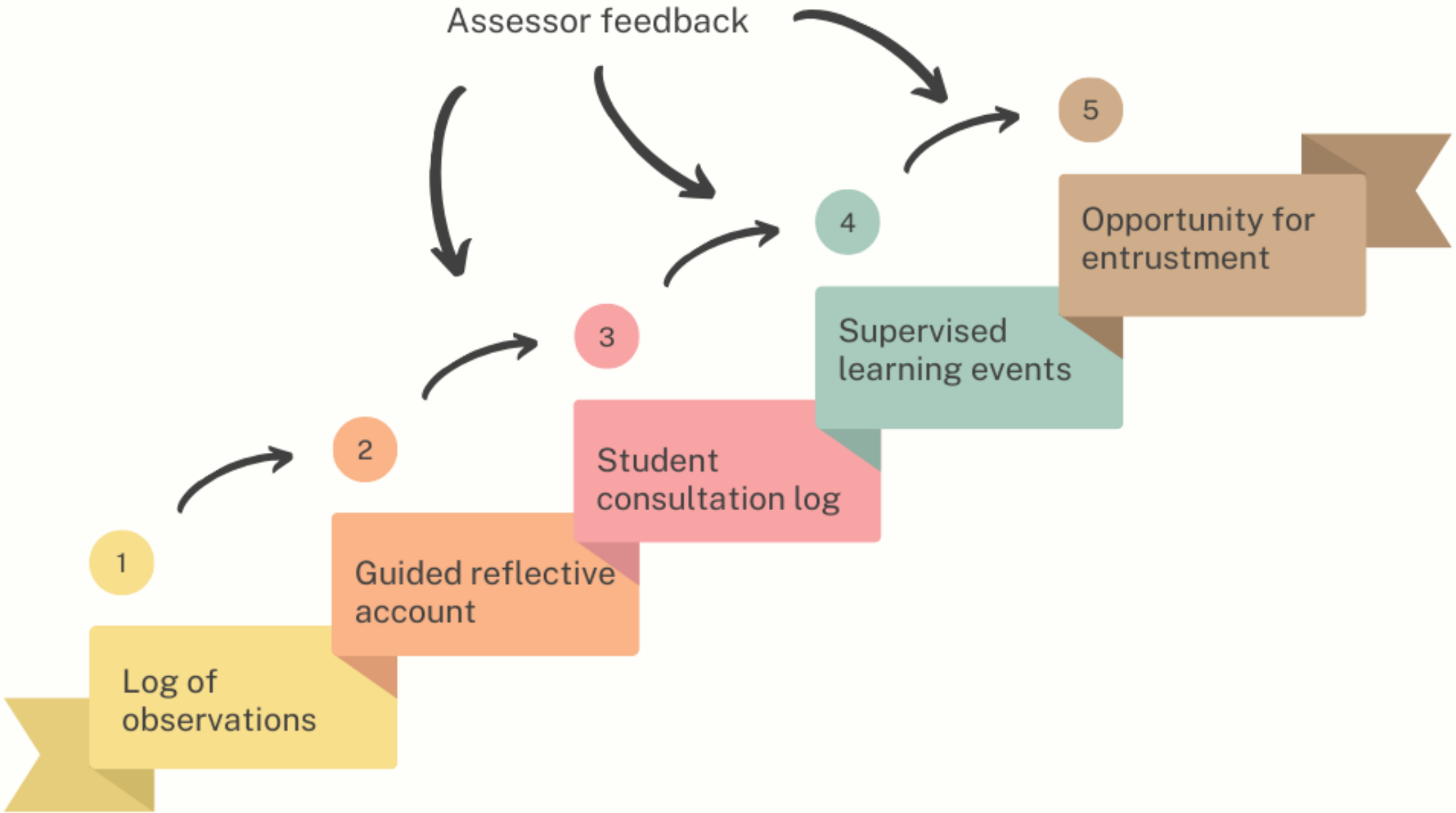
- Co-developed with Healthcare Education and Improvement Wales (HEIW), the national body for healthcare education.
- Placement scheme funded by the Welsh Government.

Entrustable Professional Activity (EPA) Framework

- EPAs are professional tasks which can be entrusted to learners once they have attained sufficient competence.
- Working group constructed to iteratively develop the suite of EPAs, each mapped to the 'does' level learning outcomes.
- Initial suite of 5 EPAs, with the addition of one more for this academic year

1. Patient history taking
2. Responding to patient queries/signs/symptoms
3. Medicines review
4. Clinical checking/prescription assessment
5. Patient counselling
6. *Lifestyle optimisation*

Road to Entrustment



Supervised Learning Events (SLEs)

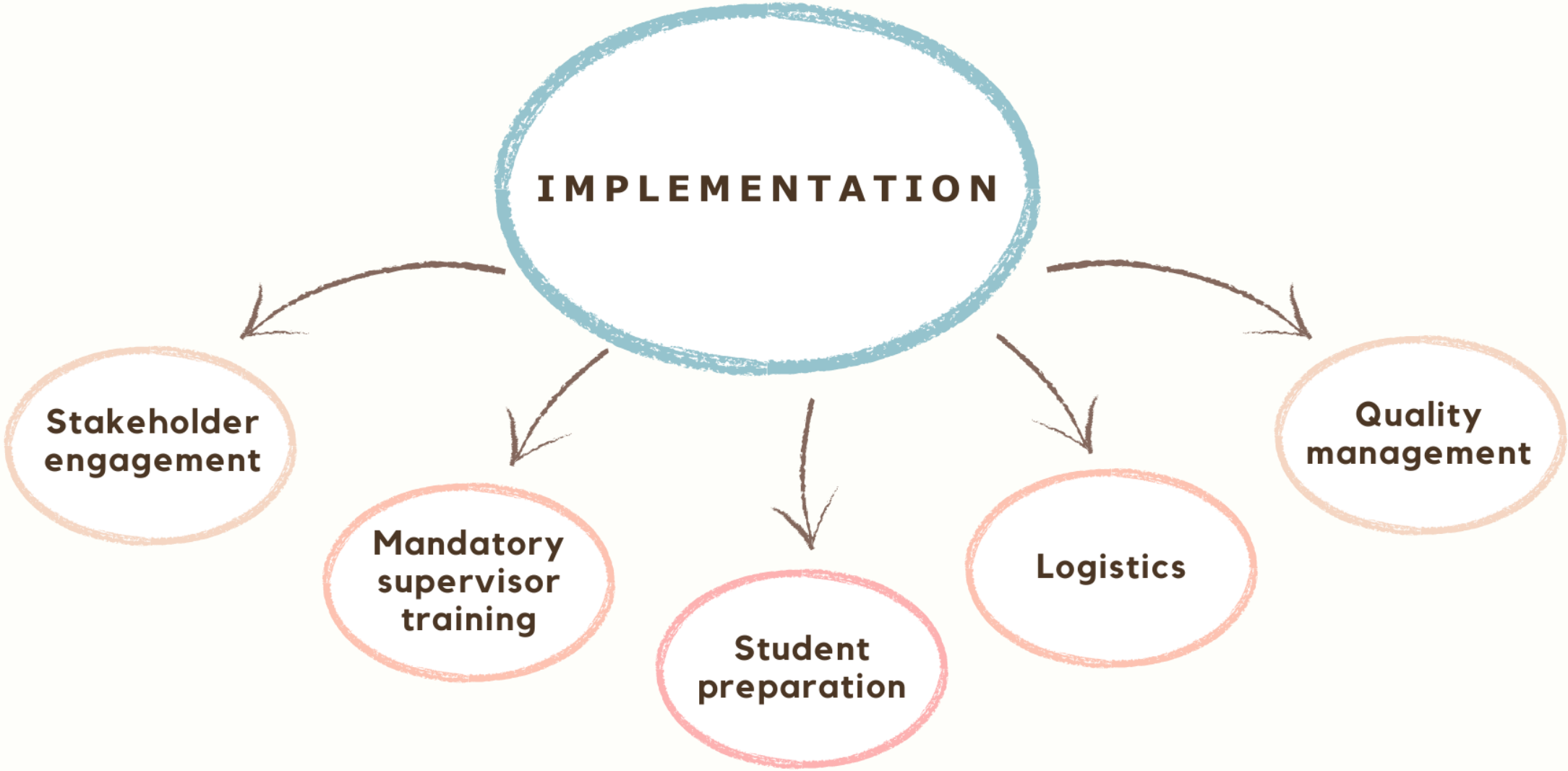
- Work-based assessment of student competence, integrated into each EPA.

- Either case-based discussions or consultation skills assessments (or both).

CONSULTATION BEHAVIOURS

Did the student fully demonstrate the following consultation behaviours?

Listen actively & allow the patient to complete statements	Y/N	N/a
Use open & closed questions appropriately	Y/N	N/a
Demonstrate empathy & support the patient	Y/N	N/a
Avoid or explain jargon	Y/N	N/a
Accept the patient (i.e. show respect, not judgemental or patronising)	Y/N	N/a
Adopt a structured & logical approach to the consultation	Y/N	N/a
Summarise information at appropriate time points	Y/N	N/a
Manage time effectively (work well within the timeframe)	Y/N	N/a
Keep the interview 'on track' or regain 'control' when necessary	Y/N	N/a



22/23 – 527 placement weeks delivered:
Two weeks for MPharm 3 (n=103)
Three weeks for MPharm 4 (n=107)

23/24 - 879 placement weeks delivered
One week for MPharm 2 (n=141)
Three weeks for MPharm 3 (n=110)
Four weeks for MPharm 4 (n=102)

Evaluation and Feedback

- Independent evaluation of the first two years clinical placement scheme, including the implementation of EPAs undertaken by CuReMED (ongoing).

- Internal student feedback for the EPAs:
  - Appreciated the structure to support their experiential learning.
  - Some felt high levels of stress and pressure with entrustment as the driver of summative assessment, especially where there was any inconsistency in placement quality.
  - Demotivation where many consultations were required to achieve entrustment.

Key Learning

Cross-sector buy-in

Positioning of EPAs within summative assessment

Student and provider preparation

National collaboration

Developments and Next Steps

- Await formal evaluation report to implement student/placement supervisor feedback and recommendations.

- Improvements made for academic year 23/24
  - EPAs split into 4 successive levels with increasing task and patient complexity.
  - EPAs nested into a wider portfolio of evidence for overall summative assessment.
  - Increased placement capacity across sectors.
  - Involvement of Swansea School of Pharmacy.

- Aiming to trial longer placement blocks in 24/25.

Acknowledgements

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GIG CYMRU NHS WALES
Addysg a Gwella Iechyd Cymru (AaGIC)
Health Education and Improvement Wales (HEIW)

Thank you for listening.

Any questions?

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2024 Pharmacy Education Symposium

Developing collaborative practitioners – perspectives from Australian pharmacy profession academics

Bronwyn Clark

Developing collaborative practitioners as Agents of Change

Perspectives from Australian pharmacy profession academics

Bronwyn Clark[1], Sarah Meiklejohn[2] , Lynda Cardiff[1], Julie Gustavs[3], Josephine Maundu[1], Glenys Wilkinson[1], Sue Kirsa[1,2], Theanne Walters AM[3], Fiona Kent[2].

[1] Australian Pharmacy Council, [2] Monash University, [3] Australian Medical Council

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Definition of Interprofessional Education (IPE)

*'**Interprofessional Education** occurs when students from two or more professions learn **about, from and with** each other to enable effective collaboration and improve health outcomes.'*

WHO Framework for Action on Interprofessional Education & Collaborative Practice (2010)

***Collaborative practice** in health-care occurs when multiple **health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities** to deliver the highest quality of care across settings.*

HPAC Forum Statement (2018)

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Aboriginal and Torres Strait Islander Health Practice
Accreditation Committee


AUSTRALIAN
DENTAL COUNCIL


Australian Medical Council Limited


anmac
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Nursing & Midwifery
Accreditation Council


Australian
Osteopathic
Accreditation Council
AOAC


australian
pharmacy
council


AUSTRALIAN
PHYSIOTHERAPY
COUNCIL


apac


Chinese Medicine
Accreditation
Committee


COUNCIL ON CHIROPRACTIC
EDUCATION AUSTRALASIA


Medical Radiation
Practice
Accreditation
Committee


OCCUPATIONAL THERAPY COUNCIL
AUSTRALIA LTD


OCANZ
Optometry Council of
Australia and New Zealand


Paramedicine
Accreditation
Committee


Podiatry
Accreditation
Committee

Health Professions Accreditation Council (HPAC) Forum IPE Timeline

Moving the dial to improve IPE and IPCP

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Project Aims

Contribute to an enhanced collaboration between accreditation authorities and education providers in the delivery of IPE and the development of collaborative practitioners by:

- Objective 1: Research - exploring the vision of a Collaborative Practitioner from the perspective of consumers, education providers and health services

- Objective 2: Exemplars and Guidance - developing specific and practical guidance to support education providers and accreditation authorities achieve the goal of developing graduates who are equipped to practise collaboratively.

Research methods

Focus groups

- Health education providers (professions represented with the Forum)
- Heath service providers
- Consumers

Potential participants invited to submit an Expression of Interest (EOI)

Criteria for inclusion was provided in the EOI

Focus group exploration

- What is the vision of a collaborative practitioner? How are we developing collaborative practitioners?
- What is working well? What is not working well?
- What does the future look like?
- How can accreditation contribute?

Focus groups & participants

Participant type	# of focus groups held	# Attending
Educators	14	62
Health service providers	2	4
Consumers	2	10
HPESG	1	8
Total	19	84

Education programs represented	# of participants
Aboriginal and Torres Strait Islander	1
Chiropractic	1
Dental	4
Medical	5
Medical Radiation Practice	6
Nursing/Midwifery	2
Occupational Therapy	3
Optometry	1
Osteopathy	2
Paramedicine	2
Pharmacy	11
Physiotherapy	4
Podiatry	1
Psychology	5
Other	14

Thematic analysis findings

Patients want care that is:

Patient Centred
- Acknowledging of patients' knowledge and agency
- Acknowledges lived experience of patient in their health journey

Inclusive of family and friends
- As being of equal importance to a person's care as health professionals
- Acceptance of valuable knowledge of family and friends of patient

Seeing aspects of care as 'complementary' rather than 'hierarchical'
- to increase patient safety
- i.e. One is not more important than another.

Thematic Analysis - pharmacists

- Instinctively pharmacists work in a collaborative multidisciplinary way
  - They are naturally complementary in the health team.
  - Pharmacists work collaboratively compared to other health professions that generally can work more autonomously i.e. health teams in hospital settings.
- They have a “case manager’ approach.

Pharmacists can be agents of change by celebrating our traits/roles as interprofessional collaborators and advocate for implementation of activities that improve collaborative practice

Pharmacists - quotes

Community pharmacists act as a coordinator for patients

"you become this sort of port of call for the community… The pharmacy is a fixed location where their clients can actually come to and you can, you're almost doing sort of like a mini triage…"(Pharmacy educator participant 19)

"I think pharmacists have the unique position of being the hub of collaboration. I think of all the health professions, we're probably seeing people more frequently and they're quite open with their communication to us"(Pharmacy educator participant 26)

Pharmacists - quotes

A hub for collaboration across professions

"I reckon like 80 to 90% of our work is collaborative. Well, it can be seen as within a collaborative framework…dispensing a prescription is[…]active collaborative practice. Whereas sometimes some of the health professionals, I imagine there's a fair bit of dental work that 90% of that can be focused on that dental work […]without necessarily bringing in other health professionals."(Pharmacy educator participant 18)

"I think there are avenues where being a collaborative practitioner is becoming much easier for pharmacists. So, in the hospital system, I see that as quite a, a not very difficult thing to achieve for pharmacists who'll be working in […]age care facilities or general practice settings, that the collaboration will just be an inherent part of their job."(Pharmacy educator participant 26)

Overcoming the barriers to collaborative practice

MEAGEN M. ROSENTHAL, MA, PHD
ZUBIN AUSTIN, BSCPHM, MBA, MISC, PHD
ROSS T. TSUYUKI, BSC(PHARM), PHARMD, MSC, FCSHP, FACC

EDITORIAL

Barriers to pharmacy practice change: Is it our nature or nurture?

THE PRACTICE OF PHARMACY HAS SEEN MAJOR CHANGES IN the past decade. Today, pharmacists from coast to coast can extend prescriptions and make therapeutic substitutions.[1] Many pharmacists can also provide influenza vaccinations and in some cases initiate drug therapies (i.e., prescribe). However, it has also been well established that the integration of many of these services by pharmacists into practice has been slow and incomplete.[2] As pharmacy regulatory and advocacy groups continue to push for pharmacists' larger role within the health care system, these efforts are hampered by the lack of widespread adoption and integration of these services within practice. Therefore, we need to more carefully consider why

To answer this question, we must start with pharmacists currently in practice. We have examined pharmacists' personality traits and the connection between these traits and behaviours in pharmacy practice and found that most respondents identified with the traits of agreeableness, conscientiousness and openness.[5] Interestingly, positive relationships between traits and behaviours were noted between respondents who identified with the trait of extroversion and the number of immunizations provided and the traits of agreeableness and openness and the number of medication reviews completed.[5] While the relationship between extroversion and immunizations was slightly stronger, the overlap with agreeableness and

Rosenthal MM, Austin Z, Tsuyuki RT. 2016 Barriers to pharmacy practice change: Is it our nature or nurture? Canadian Pharmacist Journal [Internet];149(6):317-319. doi: 10.1177/1715163516672832. Accessed 30-May-2024 at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5089336/

What does this mean for educators?

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What does this mean for accreditors like APC?

University level	• Standing health consumer advisory group to guide IPE • Facilitating radical curriculum change (not overnight) • Provision of funding and support for health professions programs
Faculty level	• Embedding IPE as a core unit/directive • Sharing of resources across health professions programs
Program and staff level	• Curriculum content covering patient centred care – free from egos and hierarchies/power differentials of health professionals • Curriculum co-design with all stakeholders including consumers
Student level	• Evidence of assessment and mapping of IPE
Health services	• Curriculum and placement co-design
Resources	• Funding for content e.g. simulations, workshops • Funded IPE roles e.g. Director of IPE/Collaborative Practice

Acknowledgements

IPE Working Group

- Ms Bronwyn Clark (Lead), Australian Pharmacy Council (APC)
- A/Prof Fiona Kent (Invited), Monash University, AIPPEN, **Chief Investigator – research arm**
- Ms Theanne Walters AM, Australian Medical Council (AMC)
- A/Prof Sue Kirsa, APC
- Prof Brian Jolly, Chinese Medicine Accreditation Committee
- David Copley, Kaurna / Peramangk Elder
- Ms Glenys Wilkinson, APC

Project Team

- Dr Josephine Maundu, APC (Project Manager) , Dr Lynda Cardiff (APC Consultant)
- Dr Sarah Meiklejohn, Monash University , Dr Julie Gustavs, AMC

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SCIENCES

2024 Pharmacy Education Symposium

Visualizing Health: A Pioneering Approach to Diabetes Awareness through Infographic Design

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VISUALIZING HEALTH: A Pioneering Approach to Diabetes Awareness through Infographic Design

Presentation by Shazwani Shaharuddin

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Monash University | School of Pharmacy | 2024

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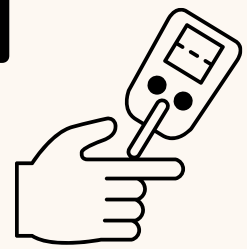
INTRODUCTION

- Diabetes Mellitus (DM) is a global health issue with a steadily rising prevalence, even in younger age groups.



General characteristics of participants (N = 4982).

Characteristics	Total	Frequency (%)		
		Non-DM	Pre-DM	DM
N (%)	4982	3854 (77.4)	537 (10.8)	591 (11.9)
Age				
≥50	2943 (59.1)	2144 (72.9)	380 (12.9)	419 (14.2)
<50	2039 (40.9)	1710 (83.9)	157 (7.7)	172 (8.4)

Ismail R et al, 2023

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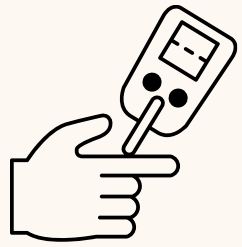
AIM

- To determine the efficacy of infographics and written texts in improving knowledge on diabetes among young adults in Malaysia



METHODOLOGY

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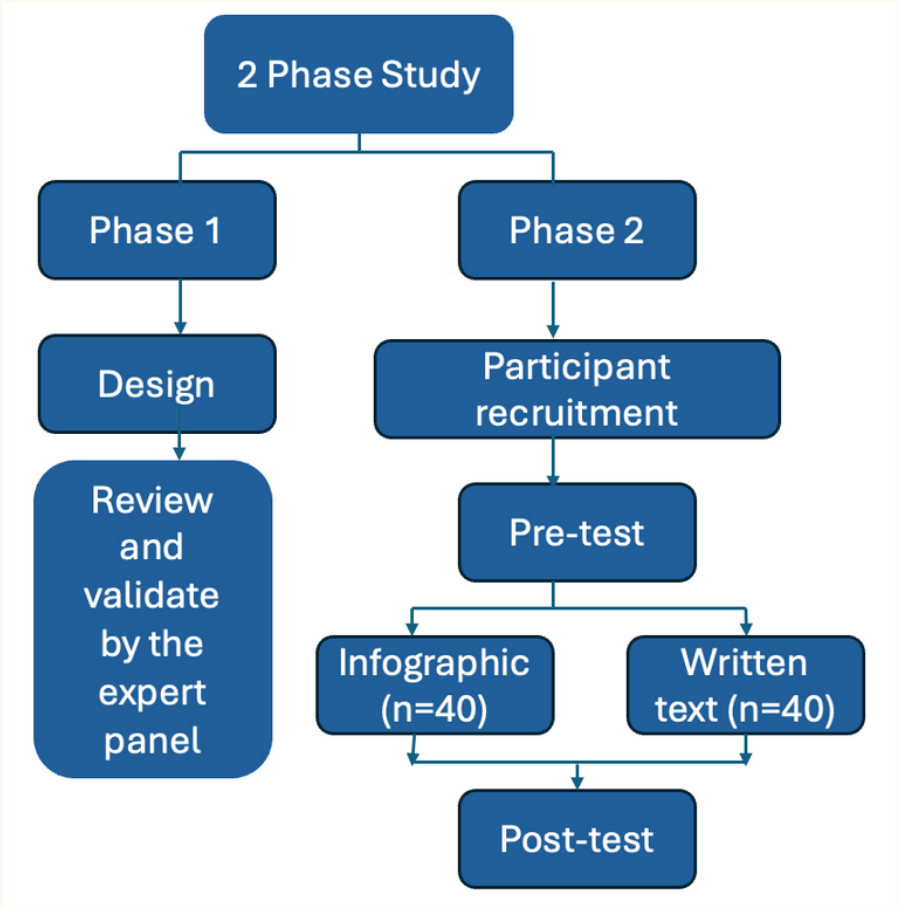
Participant recruitment

- A quasi-experimental pilot study was conducted in educating young adults about diabetes.
- Inclusion criteria:
  - Age 18-35
  - English literacy
  - No educational or occupational background in the healthcare field.
- Exclusion criteria:
  - Has a medical history of type-1, type-2 or gestational diabetes



RESULT

Demographic

Characteristics	Number of participants, n (%)		
	Infographic (n = 40)	Written Text (n = 40)	Total (n = 80)
Age			
18–20	3 (7.5)	4 (10.0)	7 (8.8)
21–25	30 (75.0)	31 (77.5)	61 (76.3)
26–30	4 (10.0)	4 (10.0)	8 (10.0)
31–35	3 (7.5)	1 (2.5)	4 (5.0)
Mean Age	23.98	23.08	23. 53
Gender			
Male	24 (60.0)	19 (47.5)	43 (53.8)
Female	16 (40.0)	21 (52.5)	37 (46.3)
Ethnicity			
Chinese	32 (80.0)	27 (67.5)	59 (73.8)
Malay	4 (10.0)	7 (17.5)	11 (13.8)
Indian	4 (10.0)	3 (7.5)	7 (8.8)
Prefer not to say	-	1 (2.5)	1 (1.2)
Others	-	2 (5.0)	2 (2.5)
Highest Education Level			
SPM	2 (5.0)	-	2 (2.5)
STPM / Pre-U	2 (5.0)	5 (12.5)	7 (8.8)
Diploma / Cert	3 (7.5)	4 (10.0)	7 (8.8)
Bachelor's degree	31 (77.5)	27 (67.5)	58 (72.5)
Master's degree	1 (2.5)	2 (5.0)	3 (3.8)
Doctorate / PhD	-	-	-
Prefer not to say	1 (2.5)	1 (2.5)	2 (2.5)
Others (IGCSE)	-	1 (2.5)	1 (1.2)
Occupational status			
Student			
Employed	21 (52.5)	28 (70.0)	49 (61.3)
Unemployed	16 (40.0)	10 (25.0)	26 (32.5)
Freelance	1 (2.5)	1 (2.5)	2 (2.5)
Prefer not to say	1 (2.5)	-	1 (1.3)
	1 (2.5)	1 (2.5)	2 (2.5)

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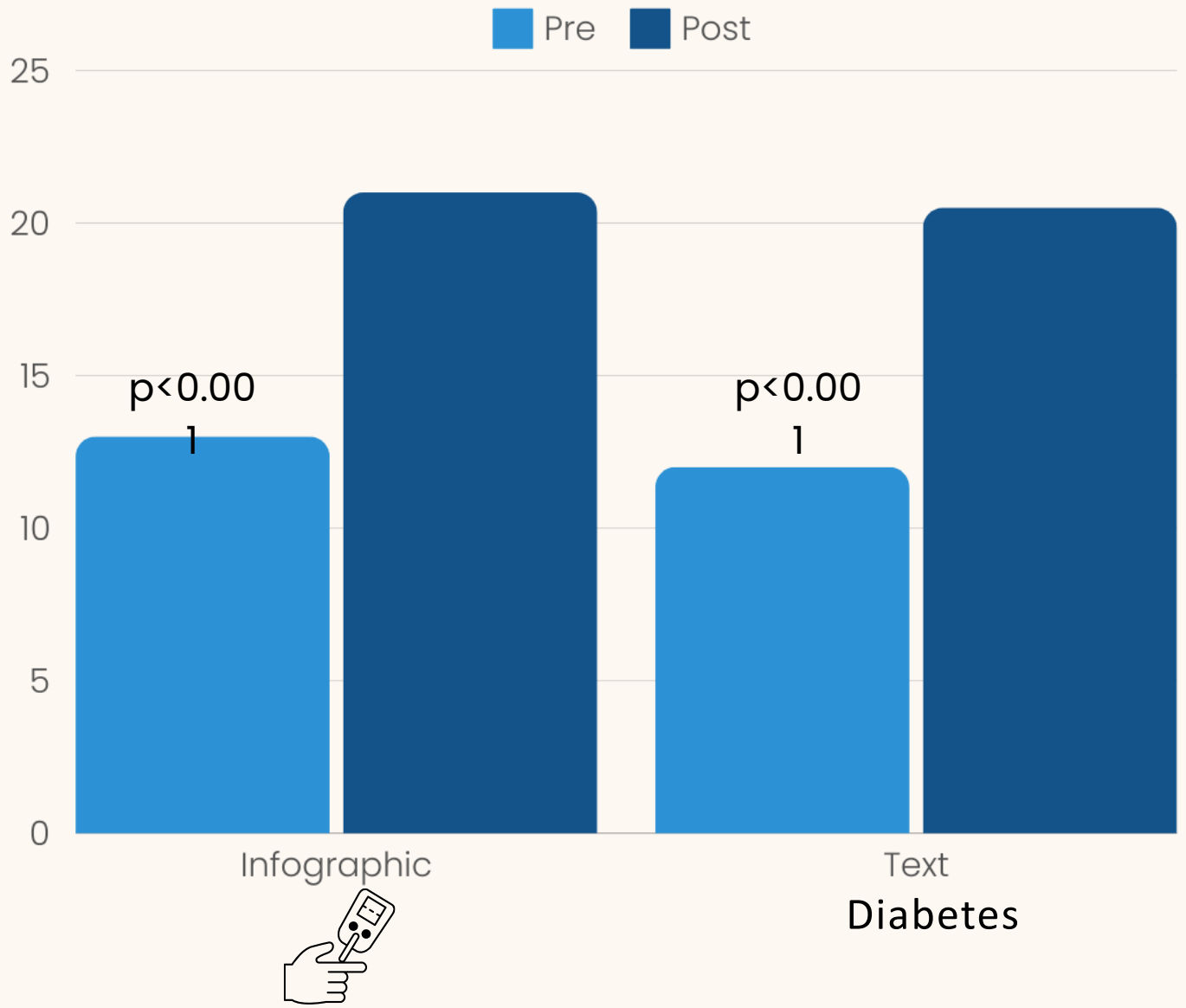
RESULT

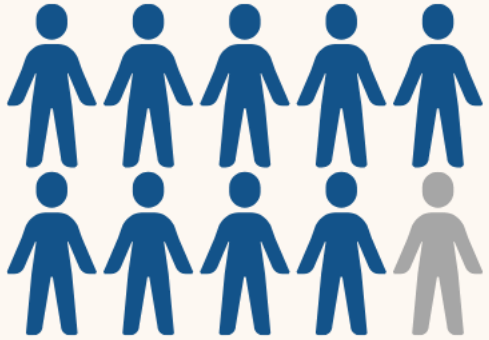
Comparison between pre and post

- There is a sig difference between pre and post (p<0.001)
  - infographic
    - pre-test median 13 -> post-test median 21
  - written text groups
    - pre-test median 12 -> post-test median 20.5
- However, there was no significant difference between the post-test scores of the infographic and the written text groups (p=0.708)
  - infographic group median 21 vs written text group median 20.5

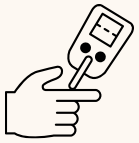


PARTICIPANTS' PREFERENCE OF LEARNING MEDIUM

Participants from the infographic and text groups were strongly inclined towards learning through infographics



9 OUT OF 10



Infographic Group
Prefers Infographic

7 OUT OF 10

Diabetes

Text Group
Prefers Infographic

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DISCUSSION

- A recent study by Lee et al. (2022) demonstrating the public's preference for infographics over written text further supports the theory.
  - About 73% of the participants were between the age of 18-24 years old
  - 86% felt it was easier to learn about COVID19 topics through infographics than written articles
- Images are processed and encoded into the memory rapidly (Delorme A et al, 2018)
- Houts et al. (2006) proved that graphics are more effective in:
  - improving knowledge and understanding on health information, esp among lower health literacy population
- Such results were in line with the latest systematic review done by Schubbe et al, 2020

Table 2. Participants Correctly Understanding Instructions on the Nystatin Suspension Label

Question	Participants, n (%)		p Value
	Text Only (n = 30)	Text + Pictogram (n = 30)	
1. How much medicine do you need to take?	29 (96.7)	30 (100.0)	0.313
2. How must you take this medicine?	14 (46.7)	28 (93.3)	0.000
3. How many times a day must you take this medicine?	30 (100.0)	30 (100.0)	
4. What are the actual times?	1 (3.3)	22 (73.3)	0.000
5. Do you have to finish all the medicine?	27 (90.0)	30 (100.0)	0.076
6. Should you stop taking this medicine as soon as you feel better?	27 (90.0)	30 (100.0)	0.076

Mansoor LE, Dowse R. et al 2003

- ‘‘How must you take this medicine’’
  - 47% correct for text only versus 93% correct for text with pictures
- ‘‘What are the actual times’’
  - 3% correct for text only versus 73% correct for text plus pictures
- In addition, there was a clear preference for the illustrated materials.

COMPARISON

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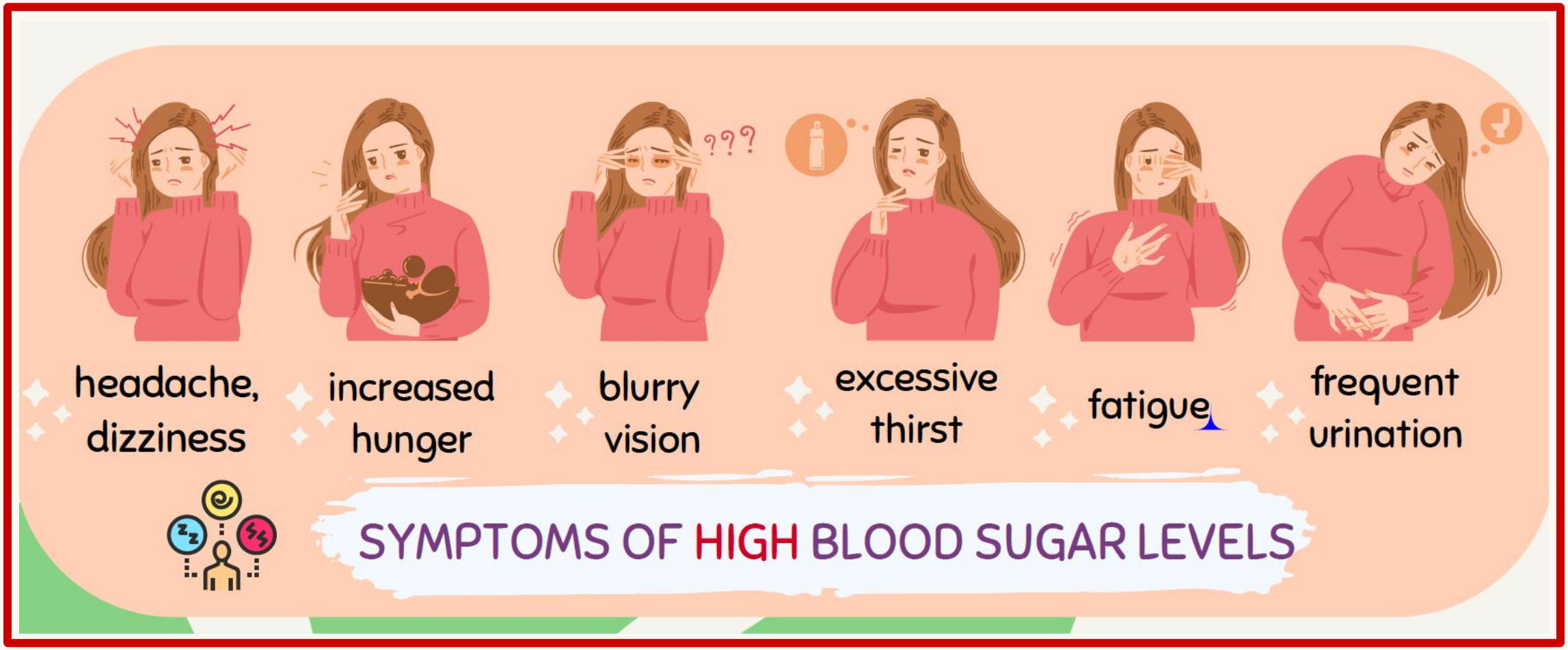

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COMPARISON

Symptoms of Diabetes

Generally, symptoms of diabetes or high blood sugar may include

- headache
- dizziness
- increased hunger
- blurry vision
- excessive thirst
- fatigue
- frequent urination.

CONCLUSION

Eventhough our study showed there's no difference between infographic and text, other studies have shown there's an increase in knowledge and understanding of health information

Future studies:

- work with graphic designer to ensure clarity, simplicity of the information and visual appeal for the target audience.
- to test on a bigger sample size
  - different socio-demographic profiles

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