



Background

- Use of antibiotics is the **biggest** factor driving the global rise in antimicrobial resistance
- The World Health Organization has noted the critical role of education of medical students and healthcare workers on rational antibiotic prescribing
- Significant gaps exist at all levels of medical training regarding knowledge of and confidence in antimicrobial prescribing and stewardship
- Medical students have low scores for both self-perceived preparedness to prescribe antibiotics and objective knowledge of antibiotics
- Medical students and trainees desire further education on antibiotics and antimicrobial stewardship
- Existing courses in antimicrobial stewardship are limited in scope and accessibility

Methods

- Initial needs assessment with review of existing online antibiotic curricula
- Design comprehensive, interactive, online antibiotic curriculum with plan to make open-source
- Curriculum composed of educational modules for adult clinical learners to build expertise at their own pace, without financial burden
- Curriculum structured on previously published framework for learning principles of antibiotics and draws on cognitive-load theory
- Partnered with student in graphic design to create visually-appealing and memorable animated videos
- Intended learners: medical students, medical and surgical residents, and advanced practice provider trainees

Results

- Needs assessment identified 24 accessible online antibiotic educational resources
 - Limited in scope and accessibility
 - 25% interactive, 4% comprehensive, >40% inaccurate
- Stakeholder interviews:
 - Learners desire: a framework to apply to choosing antibiotics, interactive content, learner customization, and a comprehensive resource
- Designed interactive online curriculum
 - Antibiotic teaching structured around the “3Ps and 3Ds”:
 - 1) from what **Place** is the infection coming,
 - 2) what **Pathogens** tend to live in the place of the infection and should be empirically covered with antibiotics
 - 3) are there **Patient**-specific factors that affect antibiotic choice
 - 4) what are the **Drug, Dose** and **Duration** of antibiotic therapy
 - Created twenty-one modules each with a brief animated video (< 12 minutes) and activities to apply and reinforce content

Antibiotic Framework (3Ps/3Ds)

Place

- Where is/are the infection(s)?
- From what possible places is/are infection(s) coming?
- Use the neighborhoods paradigm

Pathogen

- What organisms could be or are causing the infection?
- Think about specific organisms and groups of organisms
- Think about resistant organisms and resistance mechanisms

Patient

- Is the patient sick or not sick?
- What are the exposures (healthcare, travel, animal)?
- What conditions does the patient have (CKD, allergies)?

Drug

- What antibiotic(s) is patient on? Your recommendations?
- What sort of monitoring do we need (drug levels, labs)?
- What are drug nuances (cost, data, interaction, spectrum)?

Dose

- What is the dosing frequency?
- Is the dose adjusted for renal function/liver function?
- Does the dose need to be adjusted by weight?

Duration

- Is there an evidence-based duration for the indication?
- Is there an evidence-based duration for the antibiotic?
- Is there testing that needs to be done to determine duration?

Conclusion

- Created comprehensive, online, interactive curriculum targeting appropriate antibiotic selection using novel framework: the “3Ps and 3Ds”
- Short, interactive, learner-friendly modules that incorporate microbiology concepts as well as fundamentals of antimicrobial stewardship to facilitate antibiotic learning
- Next steps:
 - Evaluate learner self-perceived preparedness to prescribe antibiotics after utilizing curriculum
 - Launch curriculum on open-source website

References

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Acknowledgements

The authors sincerely thank University of Pennsylvania undergraduate design student Nicole Chau for the design of graphics and animation of videos.

This project was funded by the UPenn Department of Medicine Undergraduate Medical Education Innovation Grant.

Disclosures

The authors of this presentation no possible financial or personal relationships with commercial entities that may have a direct/indirect interest in this subject matter to disclose

