



# How do we know what we know? Teaching evidence-based practice in paramedicine

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## What is the problem?

- As part of their training, our advanced-care paramedic students develop a research question relevant to their practice, search the medical literature, and present their findings.
- Past training has supported students in their efforts, but has varied widely in its goals and delivery.
- This proposal (to be delivered Oct. 2022 – May 2023) formalizes the knowledge and expectations of the project and tailors the training to the diverse skills of the students.

## Assessment methods

- Previously completed course work was reviewed for areas of strength and opportunities for improvement.
- Former students and instructors were interviewed.
- Course content was compared to that of similar programs.
- The information received from students was compared with the gaps identified from course leaders and considered in the context of available time and resources.

## Identified gaps

- Unclear goals. Is the purpose to change practice on a particular topic? Teach critical appraisal? Foster an understanding of evidence-based practice?
- Variable skills. Some students require additional help with foundational tasks.
- Inconsistent content that did not always build towards understanding or was not logically connect to course goals
- “So what?” Where does this lead? How do students get involved in research or incorporate the principles of evidence-based practice into their care?

## Goals and objectives

### Project Overview

- Paramedic students will choose a clinical question and review current research literature to formulate an answer to it.
- Students will generate both written and oral presentations of their findings.
- Students will gain an appreciation of the value of research for the profession and how they can continue to integrate research findings into their clinical practice.

### Project Topics

- Research in EMS: What has it done for me?
- How to develop a PICO question
- How to search the literature
- How to read a paper: Foundations
- How to read a paper: Evaluation
- Communicating findings: Written essay
- Communicating findings: Oral presentation

### Example Topic: How to develop a PICO question

*Goal:* Students will be able to distill a specific research question from a general area of clinical interest

#### Objectives

At the conclusion of the topic, students will be able to:

- Define the PICO format
- Discuss the benefits and limitations of PICO
- Critique sample PICO questions
- Appraise strengths and weaknesses of PICO questions drafted by their colleagues and themselves
- Formulate their own PICO question

#### Delivery

- Preparation: students will arrive with an identified area of clinical interest and complete background reading
- Lecture: define elements of PICO
- Group discussion:
  - activity – PICO “slots”
  - critique PICOs drawn from the literature
  - reverse-engineer PICOs from published studies
  - workshop class PICOs

## Interview findings

*I'm not going to be a paramedic researcher....*

*Why do I need to learn this?*

*Could have used more information on statistics and different types of studies.*

*Loved it. Wish we could do more.*

*I get research is important, but how does it affect me day to day?*

*I didn't know what plagiarism was.*

*I'd never done anything like this and was overwhelmed by everything we had to do.*

*It really opened my eyes to what research is and helped motivate me to get a degree.*

## Strategies and implementation

### Knowledge and comprehension

*Pre-reading and lectures*

### Application and analysis

*Exercises and discussions*, where students demonstrate their understanding of concepts, critique areas of practice, and inspect and question existing studies.

### Synthesis and evaluation

*Case studies and simulated problems* that ask students to assess existing research, evaluate internal and external validity, and create their own summaries and judgements.

### IMPLEMENTATION

Time and funding has been allotted for the 7 topics to be delivered over 14 hours throughout the academic year, culminating in the submission of a final paper and oral presentation on a service-wide research day.

## Evaluation

### Reaction

Students will evaluate the delivery of each topic on an ongoing basis with existing “smile-sheet” feedback forms.

### Knowledge

Students will demonstrate their accumulated knowledge and skills in their final essay and presentation.

### Behavior

After the project, students will be (voluntarily) tracked for involvement in research-related activities.

### Results

In cases where a student's project contributes to practice change, related patient- and system-level outcomes will be tracked.

### Return on investment

Students will be surveyed before and after the project for their attitudes towards and comfort with research in paramedicine. Post-project interviews will also repeat the questions asked of former students during the needs assessment.