Test-enhanced learning: Does repeated testing enhance knowledge retention in continuing medical education

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Continuing Medical Education (CME)
Need for Evidence on CME Effectiveness

• Use theories on learning and knowledge acquisition to enhance the effectiveness of CME events?
Test-Enhanced learning (TEL)

• Students who are tested after learning remember information better than students who are not tested

• Demonstrated in medical education settings
  – UGME, PGME
  – Variety of different test materials
Testing vs. Studying

• Why does testing work?
• Retrieval Practice -> Testing and studying have different effects on memory
Test-Enhanced Learning

• But....research has focused more on novice learners
• Transferability of TEL to CME contexts?
The Present Study

• Can TEL be observed in practicing physicians within the context of a CME activity?
Methods

Annual Internal Medicine 3-Day Review Course
N = 49 physicians*

Test condition: 10 MCQs on cardiology
n = 26

Study condition: material matched for content
n = 23

One month later.....

10 new MCQs (matched in content)

Study material matched for content

One month later.....

Final Quiz Activity - 10 new MCQs matched in content

*Received $50 gift card, 2 draws for iPhone 6
Results

$t(47) = 0.943, p = 0.37$

Mean Proportion Correct

Study Group

Educational Intervention Group

Test Group
Discussion

• Did not observe TEL in practicing clinicians after a CME event.

• Why?
Discussion

• Retrieval-based practice models -> more retrieval of info from memory, more likely to recall in future contexts

• TEL may not be beneficial in populations with extensive knowledge networks
Discussion

• Limitations of Study Design
  – Spacing of tests
  – Lack of feedback

The effects of test-enhanced learning on long-term retention in AAN annual meeting courses

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Future Directions

• Increase frequency and/or difficulty of tests

• Provision of feedback
  – Participants wanted feedback on their performance in testing condition

• Examine TEL in unfamiliar topics
  – Point of care ultrasound
Next Steps – More Research!!!
Thank you for your attention!

Question or Comments?
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Effectiveness of Test-Enhanced Learning in Continuing Health Sciences Education: A Randomized Controlled Trial

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$t(54) = 0.374, p = 0.71$
Study 1: Methods

Annual Internal Medicine 3-Day Review Course
N = 56 physicians*

Test condition (n = 27),
10 SAQs on constipation

Study condition (n = 29),
10 study items on constipation

One month later.....

Complete Final Quiz Activity consisting of 10 new SAQs matched in content

*Received $50 gift card