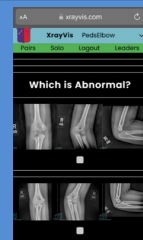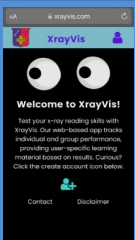# Asynchronous interactive e-learning in diagnosis of pediatric elbow X-ray pathology- a pilot study

Sridharan M, Maturana C, Mehta K, Rueda A, Bowen RE

Introduction

- In-person learning in residency = "gold standard"
- "Cost" = time, distance, missed clinical duties
- Some topics- amenable to interactive on-demand learning modules?
- Pilot study- is a peds elbow xray learning module effective / valid?
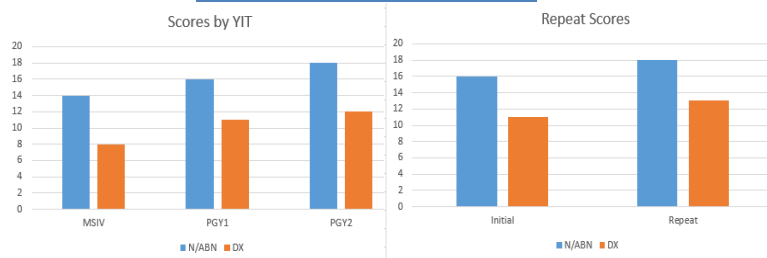
Materials & Methods

- Web-based quiz app (xrayvis.com)
- 20-question quizzes: pediatric elbow xray sets
- Identify nl/abnl xray set → choose dx
- User ("learner") –receives topic-specific learning links & immediate lookback/feedback (based on missed questions); track own progress
- Learners: complete 2 quizzes 2 months apart

Conclusions

Quiz scores correlate with YIT (valid)
Quiz scores differed by diagnosis (valid)
Quiz scores improved with repeat testing (effective(?))

Future directions- add xrays to quiz bank, examine relation between scores and :
1) Use of learning links, 2) Viewing device used, 3) Clinical rotation performance

Charts / Figures

Scores by YIT

Repeat Scores

Results

- Learners = 28
  - MSIV = 8, PGY1 = 12, PGY2 = 8
- 1864 xray sets viewed
  normal (932); supracondylar humerus fx (334), lateral condylar fx (161), radial neck fx (142), olecranon fx (69), olec +rad nck fx (68)
- Scores by YIT $p < 0.05$ (one-way ANOVA)
- Repeat scores $p < 0.05$ (paired t-test)
- Diagnosis (% correct):

SCHFx	Lat Cond	Olec	RN	RN/Olec
76	71	71	38	35

References:
1. Al Qahtani F, Abdelaziz A. *Integrating radiology vertically into an undergraduate education curriculum….* Adv Med Educ Pract. 2014;5:185
2. Lee MS, Pusic MV, Camp M, et al. *A target population derived method for developing….* Teach Learn Med. 2022 Apr-May;34(2):167-177.
3. Friedman MV, Demertzis JL, Hillen TJ, et al. *Impact of an interactive diagnostic case….* AJR Am J Roentgenol. 2017 Jun;208(6):1256-1261.
4. Thompson JW, Thompson EL, Sanghrajka AP. *The future of orthopaedic surgical education: Where…* Surgeon. 2022 Aug;20(4):e86-e94.

Contact Information:
Richard E Bowen, MD (rbowen@mednet.ucla.edu)