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Teaching First-Year Residents the Language of Diagnostic Radiology:

CAN PRINCIPLES OF LEARNING A FOREIGN LANGUAGE BE EFFICACIOUSLY APPLIED TO NEW RESIDENTS AS THEY LEARN HOW TO DICTATE REPORTS?

DISCLOSURE & ACKNOWLEDGEMENT:

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PURPOSE:

- To provide a critical assessment of the role played by methods of teaching foreign languages and their possible applications to teaching new diagnostic radiology trainees how to dictate reports efficiently and accurately.

BACKGROUND: Current Formal Reporting Instruction

- Diagnostic radiology mantra: **"Our reports are our products."**
  - Judgments of clinical colleagues are increasingly based on our products
  - Inadvertent misstatements expose us to increased liability
  - Efficient conveyance of information is required by increased workload
- **Few linguistic guidelines exist for this "foreign language."**
  - ACR provides brief common sense guidelines for the wording of reports
  - Practical primers on radiology reports are rare (Hall, 2000)
  - Most residents receive little or no formal instruction on dictation
- In a survey to 191 radiology residencies, Sistrom *et al* (2004) compiled the number of hours dedicated to dictation instructions:
  - **0-1 hours: 40%** of residency programs
  - **2-4 hours: 46%** of residency programs
  - > 4 hours: 14% of residency programs

BACKGROUND: Foreign Language Education Methodologies

- Richards & Rodgers (1986) analyzed different teaching methods:
  - Direct method, Grammar-Translation, Suggestopedia, Total Physical Response, Communicative Language Teaching, the Silent Way, Community Language Learning, Task-based Language Learning.
- Methodologies applicable to "Diagnostic Radiology Language":
  - <u>The Immersion or "Traditionalist" method</u>
    - Naïve learners are asked to start using the new language without preparation
    - *"Say anything, get corrected, say something more correct the next time"*
  - <u>The Structural or "Template-based" approach</u>
    - Naïve learners are given rules/words and asked to follow without creativity
    - *"Say something by filling in the blank, get corrected, then learn the rest"*
  - <u>The Audiolingual methodology</u>
    - Naïve learners listen to conversation and attempt to use the new language
    - *"Imitate what you hear, say it aloud, get corrected, then say it correctly"*

IMMERSION OR "TRADITIONALIST" METHOD

- Generally, resident education mainly includes didactic lecturing, Socratic questioning of cases and correcting of preliminary reports.
- Although resident satisfaction is *not* necessarily linked to a successful educational experience, it serves as an **important useful outcome measure** for quality clinical education.
- Lam *et al* (2016) published findings from a national satisfaction survey of radiology residents based on various factors.
  - **Only 15.7%** agreed that formal lectures are of high quality.
  - **Only 27.4%** agreed that the workstation teaching is generally good.
  - However, **93.9%** agreed that the faculty are committed to education.
- The data suggested that "traditionalist" method would **not** achieve the optimal clinical education for radiology residents *despite* high faculty's commitment.

IMMERSION OR "TRADITIONALIST" METHOD: Reporting

- Steele *et al* (2002) proved the immersion model inadequate:
  - Perceived lack of transferable learning
  - Lack of explicit direction from faculty
  - Need for a more structured approach to learning
- However, using validated Objective Structured Clinical Examination (OSCE), Williamson *et al* (2002) showed that the immersion method did produce linear trends with increased reporting skills coinciding with increasing experience.
  - More recently, Weinberg *et al* (2015) made a similar conclusion after using the RADPEER scoring system on >400,000 studies.
- Conclusion: Although learning the skills to report would be **gained eventually**, the model did not give residents the **confidence** and **competence** that a more structured program could provide.

STRUCTURAL OR "TEMPLATE-BASED" METHOD:

- Schwartz *et al* (2011) compared satisfaction ratings from clinicians in regards to conventional versus structured radiology reports
  - Statistically significant **increase in mean satisfaction ratings** for content and clarity from referring clinicians for structured reports
- Lin *et al* (2014) compared efficacy in reducing resident misses from using structured reporting for cervical spine CTs
  - Statistically **significant decrease** in missed non-fracture findings
  - No statistically significant decrease in fractures (as search pattern naturally included fracture detection).
- Collard *et al* (2014) longitudinally followed residents over the course of their training and showed significant improvement over the course of their residency training, using an **organized reporting curriculum** to track resident progress.

STRUCTURAL OR "TEMPLATE-BASED" METHOD: Reporting

- Structured reporting allows for easy report comparison:
  - Harari *et al* (2016) determined that categorization of corrections are useful for residents and can be helpful in assessing elements of reporting accuracy for **individual feedback**.
  - Sharpe *et al* (2012) proposed the radiology report comparator as a method to **augment resident education**.

- However, a cohort study by Johnson *et al* (2009) comparing conventional dictation versus structured reporting showed:
  - **No** significant increase in accuracy or completeness between the cohorts using structured reporting system vs. conventional method
  - Most common problems were structured reporting system was overly **constraining** with regard to report content and **time-consuming**.

PROPOSED METHODOLOGY: Audiolingualism for R1 Trainees

- Using concepts from Sierra's (1995) foreign language learning:
  - Radiology reporting is proposed be the same as other learning and can be explained by the **same laws and principles**.
  - Learning is the result of **aural experience** from hearing experienced mentor and is evident in **changes in dictation behavior**.
  - Accurate reporting proceeds by **means of analogy** (discrimination vs generalization) rather than strict set of rules (template-based).
  - Efficient reporting is a process of habit formation.
- <u>Proposed practical approach</u>: **"Day-on and Day-off"**
  - R1 trainees spend one day with an experienced attending, listening to proper dictation and asking questions. For the next day, they will attempt to dictate. After timely feedback, the cycle repeats for that one modality until the trainees feel comfortable to move on to the next.
  - Alternatively, "half-day-on and half-day-off."

PROPOSED STRATEGIES FOR JUNIOR RESIDENTS:

- Required reading for first-year resident:
  - Hall FM's *Language of the Radiology Report: Primer for Residents*.
  - ACR guideline for wording of reports.
- Reporting education should be formalized.
  - Using Collard *et al* (2014)'s method:
    - Phase 1 and 2: **Instruction and formative feedback** composed of suggestions for improvement in a 360 format from faculty, peers and others within the resident's sphere of influence.
    - Phase 3: Individual, biannual, written feedback with scored reports specifically assessing **four categories**: Succinctness, spelling/grammar, clarity and responsible referral.
  - Further, Woodfield *et al* (2008) showed the unequivocal effectiveness of the didactic lecture on resident dictation.
  - Williamson *et al* (2002) validated Objective Structured Clinical Examination for assessing the reporting skills of residents.

ON-CALL PREPARATION FOR FIRST-YEAR RESIDENT:

- Ganguli *et al* (2006) evaluated the effectiveness of an Emergency Radiology Core Curriculum and an interactive examination system to prepare first-year residents
  - R1 residents who underwent the formal program followed by an intensive ER lecture series before overnight call had **scores similar to upper-level colleagues**.
  - Implementation of the successful program was described step-by-step by Yam *et al* (2006).
- More recently, Khan *et al* (2012) developed and implemented a computer-based exam before and after the 12-month of training.
  - The exam was established to aid in the assessment of first-year residents' **competency prior** to starting call.
  - The length of training showed **no significant difference** as areas of weakness are *individually* identified for further study.

PROPOSED STRATEGIES FOR SENIOR RESIDENTS:

- Resident-Driven Clinical Consultation Service (Salama *et al*, 2017):
  - More relevant for ESIR and more senior residents
  - Valuable opportunity to improve **team-based patient care model**
  - **Indispensable basis for referrals** from clinicians
- "Learn before Lecture" didactic approach (Moravec *et al*, 2010):
  - Ideally, lecturers provide synopsis of material prior to actual lectures
    - Learners focus their pre-lecture reading on the relevant material
    - Lecturers re-enforce important/confusing concepts during lectures
    - Thought-provoking and validating questions are asked at lectures.
  - Alternatively, senior residents teach junior residents the basic concepts of the topic immediately before the attending lectures
    - Benefit both senior and junior residents
  - Rahim & Ros proposed moving away from spoon-feeding as a teaching style in radiology (2016).

CONCLUSION:

- The three approaches to teaching the “foreign” language diagnostic radiology to trainees are explored.
- Pros and cons are discussed along with their possible applications to teaching new trainees the reporting skills of diagnostic radiology.
- Applying these educational methods borrowed from foreign language education may allow diagnostic radiology educators to efficaciously teach new trainees the special language of diagnostic radiology while increasing their satisfaction and rate of progression.
- “The ability to [dictate] clearly is a skill, not an art, and it is learned by practice” (Goodman, 1991). Moreover, quality guidance from senior radiologists is indispensable.

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