Bibliography for Descriptive Evaluation
using the RIME Framework and Formal Evaluation Sessions

DEFINITIONS, DESCRIPTION AND THEORY

1.   **Pangaro LN. A new vocabulary and other innovations for improving descriptive in-training evaluations. Acad. Med.1999; 74:1203 –7.**

   [This article addresses innovative approaches to making the ongoing in-training evaluation of trainees during their clinical experiences more reliable and valid. The innovations include the development of a standard "synthetic" vocabulary as an alternative to "analytic" approaches (knowledge-skills-attitudes) that describes the progress of trainees from "reporter" to "interpreter" to "manager" and "educator" (RIME), the use of formal evaluation sessions, and closer consideration of the unit of clinical evaluation (the case, the rotation, or the year, including Turnbull's method of "work sampling".). Also includes initial results of studies assessing the reliability and validity of descriptive methods, as well as the use of quantified methods to complement descriptive methods.]

2.   **Noel G. A system for evaluating and counseling marginal students during clinical clerkships. J Med Educ. 62: 353-355.1987**.

   [original description of formal evaluation sessions as method of clinical evaluation.]

3.   **Pangaro L. Investing in descriptive evaluation: a vision for the future of assessment. Med Teach.2000; 22:478 -81.**

   [this essay places emphasis on synthetic evaluation of actual performance in the care of patients; competence defined synthetically as " consistently giving to each situation …all that properly belongs to that situation, and no more".]

4.   **Pangaro L, ten Cate O, AMEE Guide - Frameworks for Learner Assessment in Medicine (Theories in Medical Education series),** *Medical Teacher***, in press Jan 2013**

   [discussion of theory, assumptions, use and limits of analytic (KSA), synthetic (like RIME) and developmental frameworks]

5.   **Carnahan D, Hemmer P, Descriptive Evaluation, in Chapter 6 ("Evaluation and Grading"), Guidebook For Clerkship Directors, 3rd edition, Ruth-Marie Fincher editor, Alliance for Clinical Education, 2005.**

   [this practical approach discusses the purpose of descriptive evaluation, its characteristics, strengths and potential deficiencies, with suggestions on how to improve the quality and credibility of descriptive evaluation using a synthetic framework for evaluating the performance of students using descriptive evaluation known as R-I-M-E.]

6.   **Rodriguez R, Hemmer P, Descriptive Evaluation and Clinical Performance Evaluations, in chapter 15, ("Evaluation of Students") Evaluation of Students, from ACE Guidebook for Clerkship Directors, 4th edition, ed Morgenstern B, Gegensatz Press, North Syracuse, NY, 2012**

6a. Rodriguez R, Hemmer P, Descriptive Evaluation and Clinical Performance Evaluations in the Workplace, Chapter 9, ACE <u>Handbook on Medical Student Evaluation and Assessment</u>, ed Pangaro, McGaghie, Gegensatz Press, North Syracuse, NY, 2015

[revised and abbreviated version of 7 above, with focus on "workplace" assessments]

7. **Pangaro LN, Durning SJ, Holmboe ES, "Evaluation Frameworks, Forms and Global Rating Scales", <u>Practical Guide to the Evaluation of Clinical Competence</u>, ed Holmboe, Durning and Hawkins, Elsevier, 2018, p 37-60.**

[This chapter provides overview of frameworks for teachers' ratings, describes the use of numerical and verbal scales, and the need for frame-of-reference training in the use any assessment framework and the dimensions of performance]

8. **Pangaro LN, System Approaches to Student Assessment, in Pangaro and McGaghie, editors, *Handbook of Medical Student Assessment and Evaluation*, Gegensatz Press, June, 2015**

[In a discussion of horizontal and vertical approach to integrating curricula, this chapter reviews a three-level system in which framework vocabularies (such as RIME) become the neurotransmitters for conversations between teachers and students, which are calibrated by conversations between clerkship directors and teachers, and the clerkship directors are calibrated by conversations within a competency committee. This three-level system fosters two-way transfer of information at curricular interfaces that is reliable, valid and efficient.

AS A FRAMEWORK FOR COMPETENCIES (ACGME, EPAs)

9. **Rodriguez R, Pangaro L, "Mapping the ACGME competencies to the RIME Framework", *Academic Medicine*, <u>87</u>, 1781,**

[this table provides usable method for placing each subcompetency of the six ACGME competencies within the RIME synthetic framework]

10. **Pangaro LN, A Shared Professional Framework for Anatomy and Clinical Clerkships, <u>Clinical Anatomy</u> 2006, <u>19</u>: 419-428.**

[this essay discusses alternative educational frameworks in which professionalism can be located. Since the traditional "analytic" framework (knowledge, skills and attitudes) and developmental frameworks are more familiar, emphasis will be placed on a "synthetic" framework which expresses a student's progress as "reporter", "interpreter" and "manager/educator" and how skills, knowledge and attitudes must all be brought to bear *at the same time* by a successful student. It is argued that the complexity of professional development can be embraced with simplicity, without being simplistic.]

11. **Meyer EG, Kelly WF, Hemmer PA , Pangaro LN, Entrustable professional activities (EPAs) enable faculty to synthesize observable student performance into a cohesive assessment. Acad Med 2018, 93: 954.**

[This Academic Medicine "Last Page" shows how the "list" of 13 "core" , pre-GME EPAs proposed by the AAMC can be given structure within the RIME framework. It suggests how when RIME "levels" can be introduced and when proficiency can be expected.]

12.   Kim S, Copeland L, Cohen E, Galt J, Terregino CA, Pradhan P, Frame-of-Reference Training for Students: Promoting a Shared Mental Model for Clerkship Performance with an Online, Interactive Training Module *J Gen Intern Med*, DOI: 10.1007/s11606-021-06827-0

[The objectives of this study were to develop an online, interactive, frame-of-reference training module to facilitate FOR training, to determine if FOR training for students can improve rating accuracy and enhance understanding of clerkship expectations for clinical performance, and to compare if there are differences between faculty-led, in person versus remote FOR training. Core faculty in the medicine clerkship developed multiple case presentations that demonstrated different levels of performance in the Reporter, Interpreter, Manager, and Educator (RIME). Using these presentations, an online, interactive frame-of-reference training tool was developed where students, prior to starting clerkships, rated a set of case presentations, compared their ratings to those determined by core faculty (correct ratings), and received feedback about why a given presentation merits a particular rating. Overall, the percentage of cases answered correctly at baseline was 64.8% and improved to 74.5% at in-clerkship training (**p**<0.001). In looking at individual domains of RIME, improvements were seen for all domains except Interpreter.]

13.   Imm M, Agarwal G, Deshpande A, Issenberg B, Chandran, L Applying Coactivity Scales to Entrustable Professional Activity Assessments of Clerkship Students, Acad Med, 2021

[This letter from the University of Miami describes adapting a modified PRIME scale (professionalism, reporter, interpreter, and manager) to assign a developmental hierarchy to the EPAs, and supports the RIME model of student progress. Raters entrusted students more with skills of professionalism, reporting, and interpreting than with managing, a more sophisticated skill. In every domain, entrustability increased with clinical experience. To assess student skills in selected EPAs, they used the modified Ottawa coactivity scale, and assigned a value of 1–4 in order of increasing entrustability to anchors in the scale. Mean ratings of EPAs over time were calculated and compared. A total of 2,623 evaluations (Cronbach's alpha of 0.927) were completed for 247 medical students and showed a significant increase over time for professionalism (P = .011), reporter (P = .007), interpreter (P = .004), and manager (P = .007). EPA ratings: 3.51 (±0.50) for professionalism, 3.45 (±0.47) for reporter, 3.35 (±0.59) for interpreter, and 3.28 (±0.60) for manager.]

14.   Violato C, Cullen CJ, Englander R, Murray KE, Hobday PM, Borman-Shoap E, Ersan O, Validity Evidence for Assessing Entrustable Professional Activities During Undergraduate Medical Education Academic Medicine, Vol. 96, No. 7S / July 2021 Supplement

[Formative assessments on the 13 Core EPAs for entering residency were collected for 4 cohorts of students over a 9- to 12-month longitudinal integrated clerkship as part of the Education in Pediatrics Across the Continuum pilot at the University of Minnesota Medical School. The time to attain the threshold level of performance on the EPA for entrustment varied by student and EPA.

The developmental trajectory suggested by the RIME model (Reporter, Interpreter, Manager, Educator) was consistent with the findings. EPAs that would match the reporter function (oral presentation and clinical documentation) were the first that students reached threshold performance

on, while those requiring interpretation (Prioritize a differential diagnosis) and/or management (Enter and discuss orders and prescriptions and Recommend and interpret common diagnostic and screening tests) required longer time frames to reach the same threshold. EPA factors that might influence time to reach threshold levels of performance include complexity and ease of observation.]

15.   Vu TR, Ferris AH, Sweet ML, Angus SV, Ismail NJ, Stewart E, Applebaum JS, Kwan B, The New Internal Medicine Subinternship Curriculum Guide: a Report from the Alliance for Academic Internal Medicine, J Gen Intern Med. 2019 Jul; 34(7): 1342–1347.

[Since residency program directors and empirical studies have identified gaps and inconsistencies in knowledge and skills among new interns, the Association of Program Directors in Internal Medicine (APDIM) surveyed its members in 2010 and identified four core skills essential for intern readiness. The Association of American Medical Colleges (AAMC) also published 13 core entrustable professional activities (EPAs) for entering residency to be expected of all medical school graduates. The authors provide an overview of this new guide developed by the Alliance for Academic Internal Medicine (AAIM) Medical Student-to-Resident Interface Committee (MSRIC).

They chose to use the four core skills outlined by the IM residency program directors along with medical student wellness as the central framework for development of this guide. In addition to mapping these core skills to the EPAs, we also utilized the RIME (Reporter-Interpreter-Manager-Educator) framework for its practical linkage to patient care responsibilities and core EPAs, its developmental nature, and its predictive validity of future performance during internship. Table 2 outlines the link between the supporting core EPAs, ACGME competencies, and RIME model to the four core skills recommended by IM program directors.]

16.   ObesoV, Grbic D, Emery M, Parekh K · Carrie Phillipi, Swail J, Jayas A, Andriole DA, Core Entrustable Professional Activities (EPAs) and the Transition from Medical School to Residency: the Postgraduate Year One Resident Perspective, Medical Science Educator (2021) 31:1813–1822

[In September 2019, the AAMC administered a 13-item questionnaire, including the items shown in Online Resource 2, to class of 2019 graduates of nine pilot schools (one school had declined participation). Graduates who felt prepared to perform many of the core EPAs under indirect supervision at the start of PGY-1 training reported an easier-than-expected transition to residency.

At least 90% of graduates in the study sample felt prepared to perform EPAs 1, 5, and 6 under indirect supervision at the start of residency, EPAs that were identified as "reporter" level in the Reporter-Interpreter-Manager-Educator ("RIME") framework of the 13 core EPAs.]

RELIABILITY

17.   Roop S, Pangaro L, Measuring the Impact of Clinical Teaching on Student Performance during a Third Year Medicine Clerkship, Amer J Med. 110(3), 205-209, 2001.

[study demonstrating impact of teaching [through student ratings] on student growth across 12 weeks of clerkship; reliability of teachers' evaluations of students > 0.8, sufficient for high stakes decisions]

18. **Ryan MS, Lee B, Richards A, Perera R, Haley R, Rigby F, Park Y Santen S, Evaluating the Reliability and Validity Evidence of the RIME (Reporter– Interpreter–Manager–Educator) Framework for Summative Assessments Across Clerkships, Academic Medicine, 2021 96: 256-262**

[This study at Virginia Commonwealth Univ examined factors contributing to variability in RIME assessment scores using generalizability theory and decision studies across multiple clerkships, thereby contributing to its internal structure validity evidence.
From 231 students, 6,915 observations were analyzed. Interpreter was the most common RIME designation (44.5%–46.8%) across all clerkships. Variability attributable to students ranged from 16.7% in neurology to 25.4% in surgery. D-studies showed the number of assessments needed to achieve an acceptable reliability (0.7) ranged from 7 in pediatrics and surgery to 11 in internal medicine and 12 in neurology. However, depending on the clerkship each student received between 3 and 8 assessments. However, the proportion of variance attributed to the student was greater than what has been demonstrated in other generalizability studies of summative clinical assessments. Overall, these findings support the use of RIME as a framework for assessment across clerkships and demonstrate the number of assessments required to obtain sufficient reliability.]

VALIDITY AND USE IN ASSESSMENT

19. **Battistone MJ, Pendeleton B, Milne C, Battistone ML, Sande M, Hemmer PA, Shomaker TS, Global Descriptive Evaluations Are More Responsive than Global Numeric Ratings in Detecting Students' Progress during the Inpatient Portion of an Internal Medicine Clerkship , <u>Acad Med</u> 2001 76: S105-S107.**

[The R-I-M-E descriptors demonstrated greater changes in mean ratings over subsequent evaluation sessions than did the global numeric method. The changes in R-I-M-E ratings were statistically significant (p <.05 for both residents' and attending physicians' evaluations) across all three evaluation sessions, while numeric ratings did not consistently change until the third session. In contrast to the numeric system, descriptive evaluations were distributed more normally and had greater range; this finding was observed at each evaluation session. The frequency analysis also demonstrated a rapid "ceiling effect" for the numeric ratings, beginning at the first evaluation session and persisting over the subsequent evaluations.]

20. **Hemmer PA, Pangaro L. The effectiveness of formal evaluation sessions during clinical clerkships in better identifying students with marginal funds of knowledge. Acad Med.1997; 72:641 -3.**

[For the checklist descriptors, ratings of "marginal" identified three of these 16 students (a sensitivity of 19%). For the written comments on the evaluation form, ratings of "marginal" identified four of the 16 (a sensitivity of 25%). For the formal evaluation session, however, ratings of "marginal" identified seven of the 16 (a sensitivity of 44%). Although the ability of housestaff and faculty to identify students with weak funds of knowledge may be less than ideal, it may be improved by the routine use of a formal evaluation session.]

21.   Hemmer PA, Hawkins R, Jackson JL, Pangaro L. Assessing how well three evaluation methods detect deficiencies in medical students' professionalism in two settings of an internal medicine clerkship. <u>Acad Med</u>. 2000;75:167

[From 1994 to 1997, 18 students at The Uniformed Services University of the Health Sciences failed to satisfactorily complete their core 12-week third-year internal medicine clerkship due to deficiencies in professionalism. Three evaluation methods had been used to assess all students' professionalism during the two rotations of their clerkship: standard checklists, written comments, and comments from formal evaluation sessions. In the clerkship studied, deficiencies in professionalism of such magnitude as to require remediation were more likely to be identified in the inpatient than in the ambulatory care setting. Of the three evaluation methods studied, the face-to-face, formal evaluation sessions significantly improved the detection of unprofessional behavior in both clerkship settings.]

22.   Lavin B, Pangaro L. Internship ratings as a validity outcome measure for an evaluation system to identify inadequate clerkship performance. <u>Acad Med</u> . 1998;73:998 -1002.

[Responses to questionnaires from internship program directors were available for 75 of 97 remediators (78%) and 268 of 313 non-remediators (86%). The remediators were 12.9 times more likely to have low internship performance scores and 9.4 times more likely to receive unfavorable comments than were the non-remediators. However, the majority of the remediators (80%) received only favorable comments. The medicine clerkship grade was more sensitive than the non-medicine grade-point average in predicting problems during internship (75% vs 8%).]

23.   **Durning SJ, Pangaro LN, Lawrence LL, Waechter D, McManigle J, Jackson JL. The feasibility, reliability, and validity of a program director's (supervisor's) evaluation form for medical school graduates. <u>Acad Med.</u> 2005 Oct;80(10):964-8.**

[this study reports ten years of data from 1992 - 2002 demonstrating the internal consistency (0.93), construct validity and return rate (77%) for form to evaluate gradates at end of their internships {PGY1 year} used at USU since 1987]

24.   Griffith CH, Wilson JF, The association of student examination performance with faculty and resident ratings using a modified RIME process, <u>J Gen Intern Med</u>. Jul;23(7):1020-3, 2008.

[This study from determined whether a student's RIME rating was associated with end-of-clerkship examination performance; and which teacher's independent RIME rating was most predictive of a student's examination performance: attendings, residents, or interns. Design was a Prospective cohort study. Third year medical students from academic years 2004-2005 and early 2005-2006 at the University of Kentucky Each attending, resident, and intern independently assessed the student's final RIME stage attained. For the purpose of analysis, R stage=1, I=2, M=3, and E=4. Regression analyses were performed with examination scores as dependent variables (National Board of Medical Examiners [NBME] medicine subject examination and a clinical performance examination [CPE]), with independent variables of mean attending RIME score, mean resident score, and mean intern score MAIN RESULTS: For the 122 students, significant predictors of NBME subject exam score were resident RIME rating (p = .008) and intern RIME rating (p = .02). Significant predictor of CPE performance was resident RIME rating (p = .01). CONCLUSION: House staff RIME ratings of students are associated with student performance on written and clinical skills examinations.]

25.   Tolsgaard MG, Arendrup H, Lindhardt BO, Hillingsø JG, Stoltenberg M, Ringsted C. **Construct validity of the reporter-interpreter-manager-educator structure for assessing students' patient encounter skills.** Acad Med. **2012 Jun;87(6):799-806.**

[The authors in this study from Denmark developed a RIME-structured scoring form and explored its construct validity in a two-step procedure. In a randozmized, controlled experimental study, RIME scores showed significant difference between students at different levels of experience: 16 fourth-year students, mean 41.7 (standard deviation [SD] 11.0); 16 sixth-year students, mean 48.2 (SD 10.9); and 16 interns, mean 61.9 (SD 8.5), one-way ANOVA, P < .0001-and showed a progression over the four RIME elements with participants' increasing competence. In an observational study of patient encounter skills where clinician examiners used the scoring form in 547 end-of-clerkship oral examinations the mean RIME score was higher (83.8 [SD 15.5]), and advanced RIME levels were frequently missing or scored "not relevant" by the clinician examiners. The RIME structure demonstrated construct validity in terms of reflecting progress in competence in managing patient encounters when assessed according to an advanced 1lpexpected at a certain level of student experience.]

26.   Durning SJ, Dong T, Hemmer PA, Gilliland WR, Cruess DF, Boulet JR, Pangaro LN, **Are Commonly Used Premedical School or Medical School Measures Associated with Board Certification?** Military Medicine **2015, 180 (supplement), 18 – 23.**

[Data from the USU Long Term Career Outcome Study, a longitudinal data base of educational parameters, support a system using regular conversations with teachers (formal evaluation sessions) and synthetic evaluation terms. RIME-based grading in the internal medicine clerkship using the RIME scheme was significantly (p < .001), but weakly (0.117) associated with eventual dichotomous (yes/no)board certification in any ABMS specialty. This was higher than the Pearson coefficients for other parameters including College GPA: 0.062; MCAT: 0.003; preclerkship GPA: 0.068; clerkship year GPA: 0.078; cumulative med school GPA: 0.068; USMLE Step 1: 0.0066; Step 2 CK: 0.040)

RIME-based teacher evaluations in the medicine clerkship were significantly (p < .001) and meaningfully associated with performance on USMLE Step 1 (0.340) and with Step2 CK (0.368). For overall clerkship grading including quantified final examinations, e.g. the NBME subject exams, these correlations were 0.485 and 0.517 for internal medicine, and 0.459 and 0.512 for all clerkships. There are no data for teacher-based evaluations for clerkships other than medicine.]

27.   Ander DS, Wallenstein J, Abramson JL, Click L, Shayne P. **Reporter-Interpreter-Manager-Educator (RIME) descriptive ratings as an evaluation tool in an emergency medicine clerkship. J Emerg Med. 2012 Oct;43(4):720-7.**

[They hypothesized that the RIME descriptive ratings would correlate with clinical performance and examination scores in an EM clerkship, indicating that the RIME ratings are a valid measure of performance. This was a prospective cohort study of an evaluation instrument for 4(th)-year medical students completing an EM rotation. EM faculty and residents completed shift evaluation forms including both numerical and RIME ratings. Students completed a final examination. Mean scores for RIME and clinical evaluations were calculated. Linear regression models were used to determine whether RIME ratings predicted clinical evaluation scores or final examination scores.

There were 2086 evaluation forms (based on 289 students) available for analysis. There was a clear positive relationship between RIME category and clinical evaluation score (r(2)=0.40, p<0.01). RIME ratings correlated most strongly with patient management skills and least strongly with humanistic qualities. A very weak correlation was seen with RIME and final examination.]

28. **Waliany S, Caceres W, Merrell SB, Thadaney S, Johnstone N, Osterberg L. Preclinical curriculum of prospective case-based teaching with faculty- and student-blinded approach. BMC Med Educ. 2019 Jan 23;19(1):31. doi: 10.1186/s12909-019-1453-x.**

[Prospective case-based discussions with blinding of faculty and students to clinical content circumvents hindsight bias and may impart real-world cognitive skills as determined by student self-report using a RIME-based survey. Since clinical medical students at Stanford are evaluated by skills in (RIME)-based competencies, they used the same scheme to evaluate our course.

The Department of Medicine at Stanford piloted an optional medical school curriculum involving 6-7 one-hour sessions over a 3-month period each year. New groups enrolled each year from first- and second-year classes. Clinical material was presented in the chronologic sequence encountered by treating physicians. Content covered a median of 5 patient visits/case (range: 2-10) spanning over months. They developed a 14-item survey administered electronically to assess students' self-reported clinical skills in the following domains: reporter (2 items), interpreter (4 items), manager (3 items), educator (1 item), and other skills (4 items)

This elective curriculum at Stanford School of Medicine involved 170 preclinical students (22.7% of 750 eligible). A quasi-experimental study compared self-reported clinical skills between 29 course participants (response rate: 29/49 [59.2%]) and 35 non-participant controls (response rate: 35/132 [26.5%]). Two-sample t-tests compared the change in pre- and post-course skills between course participants and non-participants. Of 15 Department of Medicine faculty members invited as discussants, 12 (80%) consented to participate. Compared with controls, first-year participants self-assessed significantly greater improvement in understanding how clinicians reason through cases step-by-step to arrive at diagnoses ($P = 0.049$), work through cases in longitudinal settings ($P = 0.049$), and share information with patients ($P = 0.047$). Compared with controls, second-year participants self-assessed significantly greater improvement ($P = 0.040$) in understanding how clinicians reason through cases step-by-step to arrive at diagnoses.]

29. **Chary M, Leuthauser A, Hu K, Hexom B. Differences in Self-expression Reflect Formal Evaluation in a Fourth-year Emergency Medicine Clerkship. West J Emerg Med. 2017 Jan;18(1):174-180.**

[The authors conducted a retrospective case series by analyzing the performance and reflective statements of 116 students from a single medical school who participated in a required EM clerkship at one or two of four clinical sites from 2013–14. An attending physician evaluated each student after each shift according to the Reporter-Interpreter-Manager-Educator (RIME) scheme, with "Educator" replaced with "Superior" in our evaluation tool The authors developed software to extract the text from those comments, remove uninformative words and standardize the remaining words. The authors determined the most common words and two-word phrases that students used to describe their shift. The correlation between students' final clerkship grades and the fraction of student comments with at least one content word was analyzed.

Students who reflected more frequently received a higher grade in an EM clerkship for fourth-year medical students. The number of words in each reflection was not significantly correlated with grade performance. The most common words and phrases students wrote were associated with learning and managing patients. It suggests that those rated "Manager" used more words in common with those rated "Superior/ Educator" than did those rated "Reporter" or "Interpreter." Those rated "Reporter" used mostly different words to describe their experiences as compared with those rated "Interpreter," "Manager," or "Superior/Educator."]

30.   Tolsgaard MG. Clinical skills training in undergraduate medical education using a student-centered approach. Dan Med J. 2013 Aug;60(8):B4690.

[This study examined how complex clinical skills--such as patient management skills--develop with increasing levels of competence. The Reporter-Interpreter-Manager-Educator framework was used to reflect this change and construct validity was explored for RIME-based evaluations of single-patient encounters. In the third study the effects of training in pairs--also known as dyad practice--examined. This study showed that the students practicing in pairs significantly out-performed those training alone using RIME-based assessments and that dyad training significantly improved students' confidence in managing future patient encounters.

Another study examined students' use of self-directed clinical encounter cards (CECs) based on the RIME framework. Results from this study showed that self-directed CECs can have positive effects on participatory practice and clinical reasoning when implemented in a supporting environment but the chance of success depends on the context of use. Self-directed CECs can be successful but major faculty development initiatives are required before implementation in large and dispersed settings. In conclusion, this study demonstrated different aspects of student-centered approaches to clinical skills learning. Whereas self-directed learning is difficult in clinical clerkship, the experimental studies demonstrated remarkable advantages to peer-learning in skills-lab. Thus, peer-learning activities could be essential to providing high-quality medical training in the face of limited clinical teacher resources in future undergraduate medical education.]

31.   Meyer, EG, Cozza KL, Riley M. R. Konara RMR, Hamaoka1 D, West JC , Inflated Clinical Evaluations: a Comparison of Faculty-Selected and Mathematically Calculated Overall Evaluations Based on Behaviorally Anchored Assessment Data Academic Psychiatry, 2019. 43:151–156 https://doi.org/10.1007/s40596-018-0957-8.

This retrospective study in a psychiatry clerkship at one school (USUHS) compared faculty-selected evaluation scores with those mathematically calculated from behaviorally anchored assessments. Methods Data from 1036 psychiatry clerkship clinical evaluations (2012–2015) was reviewed. These clinical evaluations required faculty to assess clinical performance using 14 behaviorally anchored questions using P-RIME framework followed by a faculty-selected overall evaluation. An explicit rubric was included in the overall evaluation to assist the faculty in interpreting their 14 assessment responses. Using the same rubric, mathematically calculated evaluations of the same assessment responses were generated and compared to the faculty-selected evaluations. Clerkship clinical evaluation forms that require faculty to make an overall evaluation generate results that are significantly higher than what would have been assigned solely using behavioral anchored assessment questions.

FEASIBILITY and IMPLEMENTATION

32.   Hemmer PA, Papp KK, Mechaber AJ, Durning SJ. Evaluation, grading, and use of the RIME vocabulary on internal medicine clerkships: results of a national survey

and comparison to other clinical clerkships. <u>Teach Learn Med</u>. 2008 Apr-Jun;20(2):118-26.

[This survey described evaluation methods, use of the Reporter-Interpreter-Manager/Educator (RIME) framework, and grade assignment by internal medicine clerkship directors in 2005.. METHODS: In 2005, the Clerkship Directors in Internal Medicine surveyed its 109 institutional members. Response rate was 81% (88/109). The evaluation methods were as follows: teachers' evaluations, 93% (64% of grade); National Board of Medical Examiners subject examination, 81% (25% of grade); faculty written exam, 34% (14% of grade); objective structured clinical examinations, 32% (12% of grade); direct observation, 22% (7% of grade). **RIME is used by 42% of respondents**. Many clerkship directors (43%) meet with teachers to discuss student performance. Criterion-referenced grading is used by 59%, and normative grading is used by 27%. Unsatisfactory grades are given for examination failures (72%),unprofessional behavior (49%), poor clinical performance (42%), and failure to meet requirements (18%). CONCLUSIONS: Internal medicine clerkship directors emphasize description and observation of students. RIME and discussions with teachers are becoming commonplace.]

33. **Battistone MJ, Milne C, Sande MA, Pangaro LN, Hemmer PA, Shomaker TS. The feasibility and acceptability of implementing formal evaluation sessions using descriptive vocabulary to assess student performance on a clinical clerkship. <u>Teach Learning Med</u> 14(1): 5-10, 2002** .

[Attendance reproduces USU experience and was high for residents (79%) and faculty (72%). Mean survey responses from residents and faculty rated the descriptive system "more valid" than the previous method. Time requirement for eight to ten students at each teaching site, for evaluation and feedback sessions was one-half day per week of the clerkship director, every three weeks.]

34. **Ogburn T; Espey E, The R-I-M-E method for evaluation of medical students on an obstetrics and gynecology clerkship. <u>Am J Obstet Gynecol</u> 189(3): 666-9, 2003.**

[This study from the University of New Mexico was to implement and assess the R-I-M-E system as a method for evaluation for students during the ob-gyn core clerkship, and provides an example of feasibility outside of the original institution. 75% of students (n= 40 felt the system was clear and that mid-way feedback was helpful. Just over half found it was "fair" and "objective", but one quarter-one third felt that it was not [no comparison data available]. 80% of residents (n = 20) felt that the RIME system was an improvement over prior evaluations, and that feedback to students would be more helpful. The directors feel that the method allows more meaningful, complete, and timely feedback to students, especially in areas that are traditionally difficult to assess, such as professionalism.]

35. **Douglas S. Ander, Comparison of Clinical Performance Assessment Tools in a Fourth-year Emergency Medicine Clerkship, <u>Academic Emergency Medicine</u> Volume 12, Number 5 suppl 1 117-118.**

[Emory University School of Medicine: Atlanta, GA] The authors hypothesized that the RIME vocabulary may provide a better means to assess students' performance than numerical ratings. Methods: Prospective observational study of consecutive students in a 4th-year emergency medicine (EM) clerkship. On each shift EM faculty and residents completed an evaluation designed to assess clinical performance. The evaluators simultaneously ranked the student using a numerical ratings scale, a recommended grade, and the RIME scale. Using the RIME vocabulary scores were more equally distributed than numerical or grading scales. Further work is necessary to ascertain the

reliability and validity of this new evaluation instrument in the EM setting, although the initial findings are optimistic.

36. **Durning S, Pangaro L, Denton GD, Hemmer P, Wimmer A, Jamieson T, Moores** *L Inter-site Consistency as a Measurement of Programmatic Evaluation in a Clerkship with multiple, Geographically Separated Sites, Academic Medicine 78: 36S-38S, 2003.*

[demonstrates achievement of inter-site consistency in evaluation parameters in a multi-site, geographically separated clerkship, which had 22 different on-site clerkship directors with varying levels of experience in this position (1-8 years in this position). This depended on several factors including uniform expectations, consistent curriculum, a portable synthetic evaluation system (RIME), formal evaluation sessions to provide teachers with faculty development and quarterly meetings for CDs' faculty development. Ten year cumulative linear regression of clinical teachers' ratings for each six week rotation, as well as total clinical rating scores (entire 12 weeks) demonstrated no contribution of geographical site to variance in student performance. Pre-third-year GPA accounted for the largest amount of variance in students' ratings by teachers, followed by multistep-exam (MSX) of analytic ability and NBME examination performance respectively.]

37. Pangaro LN, Gibson K, Russell W, Lucas C, Marple R, A Prospective, Randomized Trial of a Six- week Ambulatory Internal Medicine Rotation, Academic Medicine, 70 : 537- 541, 1995.

[descriptive evaluation used in programmatic evaluation, as one outcome for prospective randomized trial of new ambulatory rotation.]

38. **"RIME With Reasons",** recommendation from Assoc of Professor of Gynecology and Obstetrics[excerpt from AGO website
http://www.apgo.org/getinfo/index.cfm/cat/teaching%20tips.htm

[The R-I-M-E model… has been successfully adapted to a clerkship in obstetrics and gynecology and has particular merit for providing feedback to medical students… The RIME model can also change the teaching culture as we get in the habit of asking questions of medical students that will identify where they are on this learning continuum. Questions that prompt students to think about what they are reporting will encourage them to recognize what is important and to make the learning connections. Active questioning will give them the opportunity to demonstrate their knowledge, reasoning and management skills… In this manner, the teacher can then help students progress up the RIME ladder.]

39. Metheny WP, Espey EL, Bienstock J, Cox SM, Erickson SS, Goepfert AR, Hammound MM, Hartmann DM, Krueger PM, Neutens JJ, Puscheck E, To the point: Medical education reviews evaluation in context: Assessing learners, teachers and training programs, American Journal of Obstetrics and Gynecology, 192: 34-7, 2005.

[this review of RIME methods places evaluation process within the larger context of evaluating the learners and the training program. As stated in the abstract quote the RIME method offers a unique way of assessing and providing formative feedback to the learner." The authors conclude that it is most effective when teachers evaluate learners at regular intervals in a forum with clerkship director, and improves consistency among raters, gives feedback to raters on their evaluations, increases the detection of learners' knowledge deficiencies, provides the information needed for learner feedback, and creates the opportunity for an action plan to helpful learners. The authors note that the method requires and evaluation session by teachers which may be logistically difficult to arrange, but may help overcome some of the drawbacks of individual direct observation methods.]

40.   **Pangaro L, Expectations of and for the Medicine Clerkship Director, <u>Amer J Med</u> 105: 1 -3, 1998.**

41.   **Pangaro L, Bachicha J, Broidley A, Chumley-Jones H, Fincher RM, Gelb D, Morgenstern B, Sachdeva A, Expectations of and for Clerkship Directors, accepted for publication <u>Teach Learn Med</u> , 15(3): 217 – 222, 2003.**

[Running formal evaluation sessions requires time and clerical support for the clerkship director. These position papers' recommendations include evaluation tasks and resources for the clerkship director. On average, clerkship directors report spending 28% of their time on clerkship administration . The Clerkship Directors in Internal Medicine (CDIM) recommend that 25% should be considered a minimum estimate of time for the "essential" administrative aspects of running a clerkship, not including time spent teaching students in seminars and lectures or in patient care activities. The national organizations for clerkship directors all endorse 50% of an FTE to do the organizational tasks of running a clerkship, including sufficient time for reliable, valid assessment.]

42.   **DeWitt DE, Carline D , Paauw DS , Pangaro L, A Pilot Study of a "RIME" framework-based Tool for Giving Feedback in a Multi-specialty Longitudinal Clerkship, Medical Education, 42: 1205 -1209, 2008.**

[An evaluation form based on the RIME vocabulary, with explicit additional terms for interpersonal skills and professionalism, was piloted in a longitudinal, 5-month, multi-specialty clerkship at the University of Washington. Preceptors (n = 14) and students (n = 8) preferred RIME-based feedback to 'usual feedback' (previously given using end-of-clerkship evaluation forms). After the 5-month clerkship, preceptors and students preferred feedback with a specific RIME-based tool (p = 0.002; effect size 1.2). Students felt such feedback was more useful and helped them identify specifically how to improve (p = 0.003; effect size 1.2). Whether this method can improve student performance through improved feedback remains an area for further research.]

43.   **Klocko DJ. Reporter, Interpreter, Manager, Educator (RIME): A Novel Enhancement to Clinical Evaluation Methods. J. Physician Assistant Education. 2008;19(10):29-33.**

[This is an abstract: In many physician assistant (PA) education programs, student evaluations are based on the Competencies for the Physician Assistant Profession. The reporter, interpreter, manager, educator (RIME) framework, developed by Louis Pangaro, MD, was added to the competency-based PA clinical rotation evaluation at one program to augment the assessment of PA students' clinical skills development. Preceptors and students reported that feedback in evaluation sessions was valuable for end of rotation performance. The RIME categories add a standardized vocabulary for performance assessment and uses basic terms to help preceptors visualize students' ongoing progress in developing clinical skills as they work with patients.]

44.   **Hemmer PA, Dadekian GA, Terndrup C, Pangaro LN, Weisbrod AB, Corriere MD, Rodriguez R, Short P, Kelly WF. Regular Formal Evaluation Sessions are Effective as Frame-of-Reference Training for Faculty Evaluators of Clerkship Medical Students. J Gen Intern Med. 2015 Sep;30(9):1313-8.**

[Formal evaluation sessions may provide frame-of-reference training for the RIME framework, a method that improves the validity and reliability of workplace assessment. Investigators conducted

a retrospective cohort study using the narrative assessments of ambulatory internal medicine clerkship students during the 2008-2009 academic year. Single-teacher written and transcribed verbal comments about student performance were masked and reviewed by a panel of experts who, by consensus, (1) determined whether RIME was used, (2) counted the number of RIME utterances, and (3) assigned a grade based on the comments. Analysis included descriptive statistics and Pearson correlation coefficients. Attendees explicitly used RIME more frequently than non-attendees (69.8 vs. 40.4 %; $p < 0.0001$). Grades recommended by attendees correlated more strongly with grades assigned by experts than grades recommended by non-attendees ($r = 0.72$; 95 % CI (0.65, 0.78) vs. 0.47; 95 % CI (0.26, 0.64); $p = 0.005$). Grade recommendations from individual attendees and non-attendees each correlated significantly with overall student clerkship clinical performance [$r = 0.63$; 95 % CI (0.54, 0.71) vs. 0.52 (0.36, 0.66), respectively], although the difference between the groups was not statistically significant ($p = 0.21$).

45.   Fazio SB, Torre DM, DeFer TM. Grading Practices and Distributions Across Internal Medicine Clerkships. Teach Learn Med. 2016 Jul-Sep;28(3):286-92.

[A national survey of all Clerkship Directors in Internal Medicine members was administered in 2011. The authors assessed key aspects of grading. Response rate was 76%.. With respect to grading practices, 79% of CDs define specific behaviors needed to achieve each grade, and 36% specify an ideal grade distribution. In addition, 44% have a trained core faculty responsible for evaluating students, 35% describe formal grading meetings, and 39% use the Reporter-Interpreter-Manager-Educator (RIME) scheme. About one third have formal grading meetings and use the RIME system; both have been associated with more robust and balanced grading practices.]

46.   Hochberg M, Berman R, Ogilvie J, Yingling S, Lee S, Pusic M, Pachter HL, Midclerkship feedback in the surgical clerkship: the ''Professionalism, Reporting, Interpreting, Managing, Educating, and Procedural Skills'' application utilizing learner self-assessment The American Journal of Surgery (2017) 212-216

[Using a RIME variation, PRIMES, New York Univ a total of 209 student–preceptor pairs completed PRIMES ratings. On average, student–preceptor ratings were in agreement for 38% of the time. Agreement between students and preceptors was highest for Professionalism (70%) and lowest for Procedural Skills (22%). On average, 60% of student–preceptor ratings did not agree. Students rated themselves lower than preceptors 52% of the time, while only 8% of students rated themselves higher than their preceptors' ratings (this difference is significant at the P value,.05 level). This study demonstrates the value of using the PRIMES framework to incorporate surgery clerkship students' self-assessment into formative face-to-face midclerkship feedback sessions with their preceptors with the goal to improve performance during the second half of the clerkship.]

47.   Lancaster I, Basson MD, What Skills do Clincial Evaluators Value Most in Oral Case presentations, Teach Learn Med, (2019) 31(2): 129-135.

[Using the Patient Presentation Rating tool/Formative evaluation form previously developed and validated by Lewin. The purposes of this study were to identify which specific OCP skills clinical faculty view as most important for a novice presenter and to investigate how clinical faculty values align with learner expectations. Clinical evaluators appear to expect students to function adequately as "reporters" and to be developing "interpreter" skills even at the early stages of presenting cases in a clinical setting, whereas students expect to emphasize developing their "reporter" skills over "interpreter" skills early in their clinical training.]

48. **Cendan J, Hernandez C, Castiglioni AM last page. Using Visual Radar Graph Representation of Learner Achievement to Complement the RIME Framework. Acad Med. 2015 Oct;90(10):1425**

[Modification to Pangaro's developmental markers (Introduced, Repeated practice, Proficiency, Mastery) with a minor mathematical manipulation allows representation as a visual radar graph for the RIME framework. The mathematical conversion is necessary to give relative value to each step in the progress. The conversion scale can be developed locally by programs to highlight the relative value given to these constructs at individual training programs.]

49. **Melvin L, Connolly K, Pitre L, Dore KL, Wasi P. Improving medical students' written communication skills: design and evaluation of an educational curriculum. *Postgrad Med J.* 2015 Jun;91(1076):303-8.**

[The use of the RIME model facilitated constructive feedback delivery and medical student's skills.

To enable continuous reinforcement and feedback by internal medicine residents, the authors developed a RIME-based Feedback Tool specifically targeted to students' communication skills, and a workshop for residents in its use . The study interventions featured three arms: (1) control, (2) medical student communication tutorial alone and (3) student tutorial and resident feedback workshop. The prospective, partially masked controlled trial was run for six consecutive Internal Medicine clerkship rotations, each lasting 6 weeks with 126 medical students and 13 senior medical residents in teaching hospitals affiliated with McMaster University in Hamilton, Canada.

Data were collected on 126 students during 6-week Internal Medicine clerkship rotations. Students' written consultation notes were collected prior to the educational programmes and at 6 weeks. Blinded faculty assessors used an independently validated Assessment Checklist to evaluate consultation notes. Results: Consultation note scores improved from week 1 to week 6 across all study arms. However, the change was statistically significant only in arm 3, featuring both the medical student tutorial and the resident feedback workshop, with mean scores improving from 4.75 (SD=1.496) to 5.56 (SD=0.984) out of 7. The mean difference between week 1 and week 6 was significantly different (0.806, p=0.002, 95% CI 0.306 to 1.058). The tool also featured checkboxes for scoring of the clinical encounter level of difficulty of 'Straightforward', 'Difficult' or 'Very Difficult' to address the reality that not all encounters, and thus not all communications, are equal in their level of complexity. Details of the tool were provided on cards and provided for the residents in the on-call workrooms of the hospital.

50. **Onishi H. J Med Educ Curric Dev. 2016 Sep 21;3. Assessment of Clinical Reasoning by Listening to Case Presentations: VSOP Method for Better Feedback.**

[Case presentation is used as a teaching and learning tool in almost all clinical education, and it is also associated with clinical reasoning ability. Despite this, no specific assessment tool utilizing case presentations has yet been established. SNAPPS (summarize, narrow, analyze, probe, plan, and select) and the One-minute Preceptor are well-known educational tools for teaching how to improve consultations. However, these tools do not include a specific rating scale to determine the diagnostic reasoning level. Mini clinical evaluation exercise (Mini-CEX) and RIME (reporter, interpreter, manager, and educator) are comprehensive assessment tools with appropriate reliability and validity. The vague, structured, organized and pertinent (VSOP) model, previously proposed in Japan and derived from RIME model, is a tool for formative assessment and teaching of trainees through case presentations. Uses of the VSOP model in real settings are also discussed.

If a patient complains of pain in the beginning of a medical interview, even a student without any diagnostic hypothesis is able to ask questions by following the OPQRST scheme. This is the most basic mechanism of case presentations at the reporter level in the RIME model. If a student cannot complete the relevant clinical tasks, the information they gather will be vague, and their case presentation will also be vague.]

51.   Tham KY. Observer-Reporter-Interpreter-Manager-Educator (ORIME) Framework to Guide Formative Assessment of Medical Students. Ann Acad Med Singapore. 2013 Nov;42(11):603-7.

[The Observer-Reporter-Interpreter-Manager-Educator (ORIME) is adapted from RIME, an intuitive, self-explanatory and "synthetic" framework that assesses formatively, a student's ability to synthesise knowledge, skills and attitude during a clinical encounter with a patient. The "O" refers to a student's ability to pay attention and perceive with open-mindedness, people and events around him or her. The framework is suitable for definition of interim outcomes in a 5-year undergraduate programme. To align students' and clinical teachers' expectations further, selection of case complexity that is commensurate with student's seniority and competence should be guided and an adapted version of the Minnesota Complexity Assessment Tool is proposed. See also Battistone, #12 and #59 for O-RIME]

52.   Tolsgaard MG(1), Arendrup H, Pedersen P, Ringsted C. Feasibility of self-directed learning in clerkships. Med Teach. 2013 Aug;35(8):e1409-15.

[This study explored the feasibility of self-directed learning stimulated by clinical encounter-cards (CECs) in clinical clerkships and used the RIME framework. Two focus groups of year-four and year-five students were interviewed about the usefulness of CECs to their learning in clerkships. Students were instructed to fill out brief notes on the RIME elements in their work . The CECs were then introduced in two cohorts of 248 year-four and 250 year-five medical students and evaluated on a nine-point scale with regard to usefulness and feasibility. The pilot groups reported that the CECs had positive effects in terms of engaging in diagnostic reasoning, reflection on management plans, and professional identity formation. However, the two large cohorts of students rated the usefulness of the CECs on learning in clerkship low (year-four: mean 2.92, SD 1.54; year-five: mean 2.28, SD 1.06) along with preceptor support (year-four: mean 2.68, SD 1.62; year-five: mean 2.59, SD 1.78, $p = 0.34$). Self-directed CECs can have a positive effect on participation and clinical reasoning but are highly dependent on the context of use. Self-directed learning initiatives that aim to increase participation in communities of practice may not be feasible without major faculty development initiatives.]

53.   Salib, S, The Delicate Dance of Teaching Rounds, *Medical Science Educator* (2019) 29:871–874

[from Department of Internal Medicine, Dell Medical School, University of Texas at Austin]
Help residents understand the method behind the madness. Use RIME and help them understand why—tailor its use to each learner. "When a new team and I start to work together, we briefly go through the RIME methodology of teaching(reporter, interpreter, manager, educator) …depending on the time of the year, and the level of each learner, we will typically be concentrating on a couple of aspects of RIME. For instance, for the 2nd-year resident, we are usually working on interpretation and management, but also intermittently checking that they have their R right. We discuss that reporting is not as easy as it sounds, since each hospitalized patient typically has, at a guess, more than 500 data points at any given time, let alone an extensive history."

54.   **Holmes AV, Peltier CB, Hanson JL, Lopreiato JO , Writing Medical Student and Resident Performance Evaluations: Beyond "Performed as Expected" , pediatrics.aappublications.org, doi:10.1542/peds.2014-041**

This article continues the Council on Medical Student Education in Pediatrics' series on the skills of, and strategies used by, excellent clinical teachers. Here, we provide a practical framework and helpful tips for writing student evaluations that will inform both students and their medical schools. PRIME can provide structure for observation, formative feedback, and for writing summative evaluations at the end of a clinical experience. Using PRIME to structure your observations and evaluations, written narratives can be more effective, specific, and meaningful.

55.   **Chary M, Leuthauser A, Hu K, Hexom B,   Differences in Self-expression Reflect Formal Evaluation in a Fourth-year Emergency Medicine Clerkship,   Western Journal *of* Emergency Medicine, 2017, (18, 1) 174-180**

[The authors conducted a retrospective case series by analyzing the performance and reflective statements of 116 students from a single medical school who participated in a required EM clerkship at one or two of four clinical sites from 2013-14. After each shift, an attending emergency physician evaluated the student according to the RIME scheme. The authors developed software to extract the text from those comments, remove uninformative words and standardize the remaining words. The authors determined the most common words and two-word phrases that students used to describe their shift. Students who reflected more frequently received a higher grade in an EM clerkship for fourth-year medical students. The number of words in each reflection was not significantly correlated with grade performance. The most common words and phrases students wrote were associated with learning and managing patients.]

FACULTY DEVELOPMENT

56.   **Bloomfield L, Magney A, Segelov E, Reasons to try RIME, *Medical Education* 2007; 41: 1083–1111**

[This brief report from the University of New SouthWales, Sydney in the "Really Good Stuff" feature notes that RIME participation had motivated students to see and present more patients. Team members reported that they themselves were motivated to become more involved in assessment and reflect on teaching. The authors conclude that, even in a public health system under strain, the RIME scheme delivers benefits to students and clinical supervisors by combining student assessment with staff development.]

57.   **Hemmer PA, Pangaro L. Using formal evaluation sessions for case-based faculty development during clinical clerkships. Acad Med. 2000;75:1216 -21.**

[The third-year internal medicine clerkship at the Uniformed Services University uniquely incorporates faculty development into the process of evaluation and generating feedback for students. Formal evaluation sessions are held monthly at all clerkship sites throughout the 12-week clerkship and are moderated by either the internal medicine clerkship director or the on-site clerkship directors.

Although designed to provide an opportunity for faculty to evaluate student performance and prepare formative feedback, the sessions also function as formal, planned, and longitudinal forums of "real-time," "case-based" faculty development that address professional, instructional, and leadership development. The evaluation sessions are used as a means to model and teach the key concepts of the Stanford Faculty Development Program.

58.   **Salerno SM, O'Malley PG, Pangaro LN, Wheeler GA, Moores LK, Jackson JL. Faculty development seminars based on the one-minute preceptor improve feedback in the ambulatory setting. <u>J Gen Intern Med</u>. 2002 Oct;17(10):779-8**

[uses the RIME framework as basis for rapid assessment and feedback in the ambulatory setting.]

59.   **Sepdham D, Julka M, Hoffmann L, Dobbie A, Using the RIME Model for Learner Assessment and Feedback, <u>Family Medicine</u> 39 (3): 161-3, 2007**

[Describes use of RIME model in office-based teaching, and recommends its use to establish a shared, non-judgmental vocabulary to assess learners and coach them to improve. Nice visual representation of progress of learners who are average or above or below average.]

60.   **Espey E, Nuthalapaty F, Cox S, Katz N, Ogburn T, Peskin T, Goepfert A, Hammoud, M, Casey P, Emmons S, Neutens JJ; Association of Professors of Gynecology and Obstetrics Undergraduate Medical Education Committee. To the point: Medical education review of the RIME method for the evaluation of medical student clinical performance. <u>Am J Obstet Gynecol</u>. 2007 Aug;197(2):123-33.**

[Endorsement of RIME vocabulary and evaluation sessions by APGO. This article, reviews the Reporter-Interpreter-Manager-Educator (RIME) method for the evaluation of student clinical performance on the obstetrics and gynecology rotation. This article discusses the inherent challenges of descriptive narrative evaluation and the superiority of the RIME method in producing meaningful evaluation of and feedback for students.]

RIME AND THE ELECTRONIC HEALTH RECORD [EHR]

61.   **Stephens MB, Gimbel RW, Pangaro L, The RIME/EMR Scheme: An Educational Approach to Clinical Documentation in Electronic Medical Records, Academic Medicine, 86, (1):11-14, 2010**

[This commentary specifically addresses educational issues surrounding student and resident use of EMR systems. The Reporter–Interpreter–Manager–Educator scheme is one approach to teach and evaluate clinical documentation skills using EMRs in the context of the Accreditation Council on Graduate Medical Education core educational competencies.]

62.   **Chi J, Kugler J, Chu IM, Loftus PD, Evans KH, Oskotsky T, Basaviah P, Braddock CH 3rd. Medical students and the electronic health record: 'an epic use of time'. Am J Med. 2014 Sep;127(9):891-5.**

[Study looking at medical student EHR time on clerkships at Stanford. RIME is used as basis for clinical performance evaluations completed by faculty. There was no association between time spent using the HER (approximately 6.2 hrs/day or ~ 50% of their daily time) and NBME exam scores or RIME ratings.]

63.   Habboush Y, Hoyt R, Beidas S. Electronic Health Records as an Educational Tool: Viewpoint. JMIR Med Educ. 2018 Nov 12;4(2)

[The purpose of this article is to provide a preliminary framework to guide the use of EHRs in teaching and evaluation of residents. They integrated the six Accreditation Council for Graduate Medical Education (ACGME) Core Competencies and Milestones (CCMs) framework with the Reporter-Interpreter-Manager-Educator (RIME) model to expand our assessments of other areas of resident performance related to EHR use. The article reviews how clinical utility, clinical outcome, and clinical reasoning skills can be assessed in a pilot conceptual framework-CCM framework-to guide and demonstrate the use of the EHR for education in a clinical setting.

Thus, connecting the intern's proficiency in use of the EHR as rated using QNOTE can be mapped to a Reporter performing level using the RIME model. In addition, a Reporter is expected to be proficient in placing orders, retrieving labs and diagnostic images, documenting notes, and search skills. Reporters can sometimes reflect on their own performance and identify gaps in their clinical knowledge.]

IN PROFESSIONS OTHER THAN MEDICINE

64.   Fincham SJ, Smith T, Purath J. Implementation of an educational program to improve precepting skills. J Am Assoc Nurse Pract. 2019 Nov 5.

At the Washington State University College of Nursing, Spokane, Washington. They developed a one-hour formal preceptor training program. The main components included 1) orienting a student, 2) applying the Recorder/Reporter-Interpreter-Manager-Educator (RIME) framework for clinical evaluation, 3) One-Minute Preceptor (OMP) methodology for clinical teaching, 4) strategies for giving students feedback, and 5) communicating with the university. Preceptor training was delivered to health care providers (N = 58) at eight clinics and one nurse practitioner (NP) professional group. Most participants (86%) had never received training in the RIME framework or OMP method (80%). The participants rated the following aspects of training as very useful or moderately useful: Orientation checklist (100%), RIME framework (96%), and OMP (100%).

65.   Smith SC. A Developmental Approach to Evaluating Competence in Clinical Reasoning. Journal of Veterinary Medical Education 2008 <u>35</u> (3), 375-381.

[In the past two decades there has been tremendous worldwide interest in assessing the clinical competence of learners in medical education. This interest marks a philosophical shift toward greater objectivity, accountability, and predictive power in the evaluation of trainees. One of the core competencies in medical education is clinical reasoning. Because veterinary and human medical training share several similarities and differences, a review of the current state of clinical reasoning competency assessment in medical education may be useful for veterinary educators. This article covers the core competency of clinical reasoning (not other important competencies, such as physical examination or communication) and reviews research from medical education on the development of clinical reasoning and its implications for the transition from novice to expert. Four common stage-related learner difficulties are described: reduced knowledge, dispersed knowledge, tunnel vision, and the outsider. Specific approaches to measuring competence in clinical reasoning for each developmental level are recommended. Finally, two specific examples of evaluation based on a developmental approach to clinical expertise, the RIME (reporter, interpreter, manager, expert) system and the Script Concordance Test (SCT) methods, are discussed.]

65.   **D'Aoust RF, Brown KM, McIltrot K, Adamji JD, Johnson H, Seibert DC, Ling CG.** , A competency roadmap for advanced practice nursing education using PRIME-NP , *Nurs Outlook*. 2022 Mar-Apr;70(2):337-346.

[For use in nurse practitioner education this article describes the PRIME-NP clinical competency model that is scalable, reproducible and accurately documents NP student competency across clinical courses. 5 discrete domains was necessary: (a) model development, (b) assessment tool to be used in Objective Structured Clinical Exams (OSCE), (c) rubrics to accompany the OSCE exam, (d) faculty education, and (e) evaluating the model use. Faculty and student outcomes reveal that the model and assessment tool acceptability and effectiveness of the model, especially for early identification for at risk students. The PRIME-NP offered faculty the opportunity to identify at-risk students, identify a more nuanced remediation plan, and assess student competency in simulated environments.]

Short videos explaining RIME (Reporter, Interpreter, Manager, and Educator)

1. Uniformed Services University
Matthew Eberly, MD, Dept of Pediatrics,
"The Rhythm of RIME"
Dr. Louis Pangaro discusses the RIME scheme of medical student evaluation (11minutes, 7 seconds)

https://vimeo.com/76308600

2. Rosalind Frankin Univeristy of Medicine and Science
Dr. Inis Bardella, Associate Dean for Faculty Development and Global Health

Explains to teacher how to use IRME for students and residents ((10 minues am 52 seconds)

https://www.youtube.com/watch?v=GlXRWAc3M1k

3. University of Arizona College of Medicine Tucson
Karen Spear Ellinwood, PhD, JD, EdS3.
Director of Instructional Development

A Resident as Educator (RAE) video). Explains the RIME roles with attention to identifying the next step for the student (3minues 3 seconds)

https://www.youtube.com/watch?v=r0RKLPg0K2c