From Apprenticeship to Assembly Line: Recovering Relationships in Medical Education

Adam P. Sawatsky, MD, MS
Joanna R. Rea, MD
Luke T. Hafdahl, MD
Brianna E. Vaa Stelling, MD
Jill M. Huber, MD
Majken T. Wingo, MD
Emily L. Leasure, MD

There is debate about the success of competency-based medical education (CBME) as a framework for supporting learner growth and assessment within graduate medical education. The proponents of CBME promised clear communication of the desired outcomes of medical education and promotion of greater learner-centeredness in training.[1] However, concerns have been raised about the reductionistic implementation of competency-based frameworks and assessment creating an assessment culture that limits learning and growth.[2,3] These concerns challenge CBME frameworks' usefulness as a tool to support learners in the development of a holistic professional identity, a representation of self, developed over time, that integrates various statuses and roles.[2] Competency cannot be divorced from professional identity formation, and educators continue to attempt to unite these threads, seeking to resolve the tensions between the stated values of CBME and the reality of implementation.[4,5] In uniting CBME with professional identity formation, educators must not overlook the importance of trusting relationships between faculty and learners in overcoming the contextual factors hindering CBME.[6] In this perspective, we propose that creating connectedness within our training systems can realign CBME purposes and practices and unlock the potential of CBME to support learners' professional identity formation.

Our health care system has devalued human connection in the delivery of health care and, by proxy, in medical education. The US health care system is increasingly industrialized, treating patients as consumers and physicians as service providers who generate value to institutions, which are run as businesses.[7] Within this system, the pressure for profitability pushes institutions to prioritize residents' inexpensive labor over the time it takes to educate them to become caring and excellent physicians.[8] While seeking to provide optimal medical education, educators are constrained by a system that devalues the need for human connection. While competency frameworks provide a roadmap for learning and growth in medicine, they are placed within an inflexible system with rotational structures that fail to emphasize the importance of human connection during training. Medical education has moved away from the traditional apprenticeship model, which is based on long periods of contact between faculty and learners.[9] Thus, we have created an "assembly line" that prioritizes efficiency and productivity. We insert our medical school graduates into one end of the residency training conveyer belt and believe that we spit them out the other end as fully formed physicians, ready for "unsupervised practice." Yet, the process of education and patient care, which require relationship-building, cannot be reduced to efficiency and productivity.

For example, at the Mayo Clinic Internal Medicine Residency Program in Rochester, MN, we have sought meaningful change to our training models to provide optimal opportunities for resident learning and growth. In 2018, to create a standardized resident continuity clinic experience for our trainees, residents in separate clinics within our system were combined into one large resident primary care clinic. While the changes enhanced several elements of primary care training (eg, robust interprofessional team-based care model, diverse patient panels, integrated mental health and specialty medicine professionals), residents' assigned clinic half-days became variable, changing with rotations and clinic scheduling needs. While this change expanded opportunities for growth in patient care and systems-based practice, a notable trade-off was less continuity between clinic faculty and residents, decreasing ongoing relationship-building. For example, residents felt unsure of where to seek help outside of their normal clinic days. The residency program had to create additional structures to provide this support, something previously accomplished through existing faculty-resident relationships. Overall, this intervention sought to optimize learning within our current structures but underprioritized the importance of connectedness for education and growth.

Our experience is not unique. The medical education literature contains a growing body of evidence

DOI: http://dx.doi.org/10.4300/JGME-D-23-00468.1

that relationships matter for learning and growth. First, assessment for learning, with the provision of high-quality feedback, is a central component of CBME.[10] Feedback has been characterized as a learning conversation within an educational alliance, highlighting the importance of relationships.[11,12] Relationships between faculty and learners affect how learners receive feedback and can overcome challenges to integrating assessment for learning into busy clinical learning environments.[13-15] While relationships are important for feedback, research has also demonstrated that meaningful relationships are more than the amount of time spent together[16] and that familiar relationships may create tensions, like not wanting to damage the relationship by providing critical feedback.[17] Second, the professional identity formation literature highlights the need for relationships to support learners' identity construction.[18] Relational continuity between faculty and learners provides the framework for critical dialogue that supports professional identity transformation.[19,20] Third, to support both CBME and professional identity formation, coaching has been proposed as a unique relationship to support feedback and learner growth.[3,4,21] With relationship-building at its core,[21,22] coaching promotes engagement in reflection,[23] belonging, multidimensional learning, and identity formation.[24] Collectively, we see the need for relationships and connectedness in medical education; nurturing relationships hold promise for connecting CBME and professional identity formation.

This makes sense. As humans, we have a fundamental need for connectedness. Within Maslow's hierarchy of needs, once physiological and safety needs are met, humans demonstrate a need for belongingness, manifested as a hunger for relationships with people and for a place within a group.[25] A newer motivation theory, Self-Determination Theory (FIGURE), posits relatedness as 1 of the 3 basic psychological needs that drives intrinsic motivation.[26] Based on Self-Determination Theory, the idea of autonomy support within trusting relationships can realign supervision to support learner development[27] and junior faculty's identity formation.[28] Accordingly, how do educators overcome the pressures of efficiency and productivity within a busy clinical environment to create a learning environment that reinforces relationships between faculty, learners, and the patients that they serve?

If we are to move away from assembly line medical education, we need to support meaningful relationships between faculty and learners. The concept of entrustment in CBME highlights the importance of developing connectedness between faculty, learners, and patients. To strengthen connectedness, leaders need

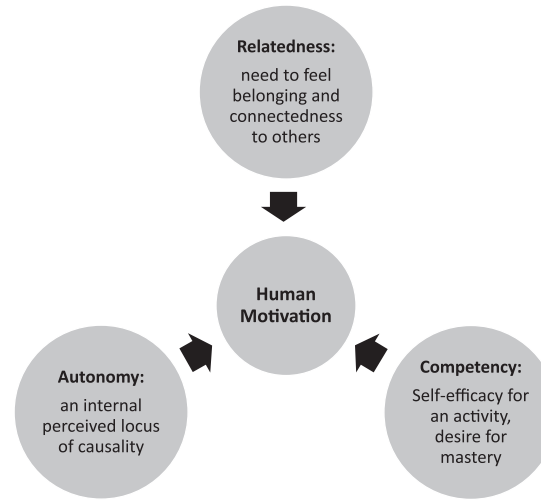

FIGURE
The 3 Basic Needs Described in Self-Determination Theory[a]

[a] Adapted from Ryan and Deci's work on intrinsic motivation.[26] Self-Determination Theory describes the importance of belonging and relatedness in human motivation and behavior.

to provide educators with time to invest in the next generation. This means building structures that sustain longitudinal relationships between faculty and learners. As programs assess existing curricula and build new curricula, they should pay attention to how those structures facilitate or hinder faculty-learner relationships. We need to move beyond the assignment of specific relationships (eg, supervisor, advisor, mentor, coach) and create an environment that nurtures faculty-learner relationships to develop physicians with mature and healthy professional identities.[29] In addition, ongoing research should focus on fundamental questions about connectedness in medical education. What are the necessary elements that encourage connectedness and how can we build those elements into our training models? What does educational continuity mean to residents and what do they want out of their preceptor relationships? Finally, we all must resist the forces of industrialized medicine, forces that constrain relationship development and create significant struggle as learners develop their professional identities.[30]

Some programs and institutions are addressing the need to increase connectedness in medical education. At the Mayo Clinic Internal Medicine Residency Program, we have developed a clinic-coach pairing for each resident to meet at least twice annually and are also working to align schedules between residents and their faculty coaches. For complex patients, we are pairing residents with faculty and nursing colleagues to create longitudinal teams to support clinical coaching. We have conducted research in professional identity formation and uncovered tension within the

TABLE
Examples of Programmatic Efforts to Support Relationship-Building in Graduate Medical Education and Beyond

Type of Effort	Examples
Creating an environment that supports relationship-building	Supporting relationships that promote a feedback culture[31]
	Supporting coaching relationships within the clinical learning environment[32]
Ongoing research that explores the role of relationships in supporting learner growth	Exploring identity threat and identity safety in medical education to support relationship-building within learning environments[33]
	Exploring the role of shame in medical training and the effect of relationships on shame experiences[34]
	Creating greater continuity in the operating room improves faculty familiarity and improves intraoperative entrustment[35]
Curriculum changes that support relationship-building	Application of coaching models to support feedback and coaching in the clinical learning environment[36]
	Creating longitudinal integrated clerkships that support relationship-building[20]
	Implementing a curriculum to cope with intraoperative error that supports team interaction and help-seeking behaviors[37]
Efforts at promoting resistance to assembly line medical training	Embracing resistance in medical education, training physicians to be change agents[38]
	Creating organizations that advocate for change in the system and train individuals for research and advocacy[39]

process.[30] We presented the findings to our residents and faculty, as well as outside our program, to stimulate discussions about change. Beyond our institution, others are working on education innovations, research, and resistance to champion connectedness in medical education (TABLE).

We are not calling for a return to an apprenticeship model of medical education, but rather for the pursuit of connectedness in medical education. We are inviting educators and scholars to move away from an assembly line model of medical education that prioritizes efficiency and productivity, toward more meaningful education to support learners' development and growth. We believe that strengthening connectedness will align CBME with the goal of supporting professional identity formation.

References

1. Frank JR, Snell LS, ten Cate O, et al. Competency-based medical education: theory to practice. *Med Teach*. 2010;32(8):638-645. doi:10.3109/0142159X.2010.501190
2. Jarvis-Selinger S, Pratt DD, Regehr G. Competency is not enough: integrating identity formation into the medical education discourse. *Acad Med*. 2012;87(9):1185-1190. doi:10.1097/ACM.0b013e3182604968
3. Sawatsky AP, Huffman BM, Hafferty FW. Coaching versus competency to facilitate professional identity formation. *Acad Med*. 2020;95(10):1511-1514. doi:10.1097/ACM.0000000000003144
4. Brand PLP, Jaarsma ADC, van der Vleuten CPM. Driving lesson or driving test?: a metaphor to help faculty separate feedback from assessment. *Perspect Med Educ*. 2021;10(1):50-56. doi:10.1007/s40037-020-00617-w
5. Farrell LM, Cuncic C, MacDonald S, Wright BJ, Eva KW, Goldszmidt MA. Thresholds of becoming: an exploration of threshold concepts as a means to support professional identity formation in competency-based curricula [published online ahead of print June 1, 2023]. *Adv Health Sci Educ Theory Pract*. doi:10.1007/s10459-023-10245-8
6. Young E, Elnicki DM. Trust as a scaffold for competency-based medical education. *J Gen Intern Med*. 2019;34(5):647-648. doi:10.1007/s11606-019-04927-6
7. Montori VM. Turning away from industrial health care toward careful and kind care. *Acad Med*. 2019;94(6):768-770. doi:10.1097/ACM.0000000000002534
8. Ludmerer KM. Reflections on learning to heal, time to heal, and let me heal. *Acad Med*. 2020;95(6):838-841. doi:10.1097/ACM.0000000000003054
9. Dornan T. Osler, Flexner, apprenticeship and the "new medical education." *J R Soc Med*. 2005;98(3):91-95. doi:10.1177/014107680509800302
10. Holmboe ES. Realizing the promise of competency-based medical education. *Acad Med*. 2015;90(4):411-413. doi:10.1097/ACM.0000000000000515
11. Tavares W, Eppich W, Cheng A, et al. Learning conversations: an analysis of the theoretical roots and their manifestations of feedback and debriefing in

medical education. *Acad Med*. 2020;95(7):1020-1025. doi:10.1097/ACM.0000000000002932
12. Telio S, Ajjawi R, Regehr G. The "educational alliance" as a framework for reconceptualizing feedback in medical education. *Acad Med*. 2015;90(5):609-614. doi:10.1097/ACM.0000000000000560
13. Telio S, Regehr G, Ajjawi R. Feedback and the educational alliance: examining credibility judgements and their consequences. *Med Educ*. 2016;50(9): 933-942. doi:10.1111/medu.13063
14. Huffman BM, Hafferty FW, Bhagra A, Leasure EL, Santivasi WL, Sawatsky AP. Resident impression management within feedback conversations: a qualitative study. *Med Educ*. 2021;55(2):266-274. doi:10.1111/medu.14360
15. Ajjawi R, Bearman M, Sheldrake M, et al. The influence of psychological safety on feedback conversations in general practice training. *Med Educ*. 2022;56(11): 1096-1104. doi:10.1111/medu.14881
16. Farrell L, Bourgeois-Law G, Ajjawi R, Regehr G. An autoethnographic exploration of the use of goal oriented feedback to enhance brief clinical teaching encounters. *Adv Health Sci Educ Theory Pract*. 2017;22(1):91-104. doi:10.1007/s10459-016-9686-5
17. Mann K, van der Vleuten C, Eva K, et al. Tensions in informed self-assessment: how the desire for feedback and reticence to collect and use it can conflict. *Acad Med*. 2011;86(9):1120-1127. doi:10.1097/ACM.0b013e318226abdd
18. Wald HS. Professional identity (trans)formation in medical education: reflection, relationship, resilience. *Acad Med*. 2015;90(6):701-706. doi:10.1097/ACM.0000000000000731
19. Sawatsky AP, Nordhues HC, Merry SP, Bashir MU, Hafferty FW. Transformative learning and professional identity formation during international health electives: a qualitative study using grounded theory. *Acad Med*. 2018;93(9):1381-1390. doi:10.1097/ACM.0000000000002230
20. Brown MEL, Whybrow P, Kirwan G, Finn GM. Professional identity formation within longitudinal integrated clerkships: a scoping review. *Med Educ*. 2021;55(8):912-924. doi:10.1111/medu.14461
21. Watling CJ, LaDonna KA. Where philosophy meets culture: exploring how coaches conceptualise their roles. *Med Educ*. 2019;53(5):467-476. doi:10.1111/medu.13799
22. Sargeant J, Lockyer J, Mann K, et al. Facilitated reflective performance feedback: developing an evidence- and theory-based model that builds relationship, explores reactions and content, and coaches for performance change (R2C2). *Acad Med*. 2015;90(12):1698-1706. doi:10.1097/ACM.0000000000000809
23. Sargeant J, Lockyer JM, Mann K, et al. The R2C2 model in residency education: how does it foster coaching and promote feedback use? *Acad Med*. 2018;93(7):1055-1063. doi:10.1097/ACM.0000000000002131
24. Selling SK, Rooholamini SN, Grow HM, et al. The effects of coaching pediatric residents on faculty coaches' relationships, learning, and professional identity formation. *Acad Med*. 2023;98(3):376-383. doi:10.1097/ACM.0000000000005011
25. Maslow AH. A theory of human motivation. *Psychol Rev*. 1943;50(4):370-396. doi:10.1037/h0054346
26. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol*. 2000;55(1):68-78. doi:10.1037//0003-066x.55.1.68
27. Sawatsky AP, O'Brien BC, Hafferty FW. Autonomy and developing physicians: reimagining supervision using self-determination theory. *Med Educ*. 2022;56(1):56-63. doi:10.1111/medu.14580
28. Vaa Stelling BE, Andersen CA, Suarez DA, et al. Fitting in while standing out: professional identity formation, imposter syndrome, and burnout in early-career faculty physicians. *Acad Med*. 2023;98(4):514-520. doi:10.1097/ACM.0000000000005049
29. Cruess RL, Cruess SR, Boudreau JD, Snell L, Steinert Y. Reframing medical education to support professional identity formation. *Acad Med*. 2014;89(11):1446-1451. doi:10.1097/ACM.0000000000000427
30. Sawatsky AP, Matchett CL, Hafferty FW, et al. Professional identity struggle and ideology: a qualitative study of residents' experiences [published online ahead of print June 3, 2023]. *Med Educ*. doi:10.1111/medu.15142
31. Ramani S, Könings KD, Ginsburg S, van der Vleuten CPM. Twelve tips to promote a feedback culture with a growth mind-set: swinging the feedback pendulum from recipes to relationships. *Med Teach*. 2019;41(6): 625-631. doi:10.1080/0142159X.2018.1432850
32. Klig JE, Stenson BA, Kivlehan SM, Jackson A, Berwick JR, Kosowsky JM. Twelve tips for practical clinical skills coaching [published online ahead of print June 15, 2023]. *Med Teach*. doi:10.1080/0142159X.2023.2220895
33. Bullock JL, Sukhera J, Del Pino-Jones A, et al. "Yourself in all your forms": a grounded theory exploration of identity safety in medical students [published online ahead of print July 30, 2023]. *Med Educ*. doi:10.1111/medu.15174
34. Bynum WE 4th, Artino AR Jr, Uijtdehaage S, Webb AMB, Varpio L. Sentinel emotional events: the nature, triggers, and effects of shame experiences in medical residents. *Acad Med*. 2019;94(1):85-93. doi:10.1097/ACM.0000000000002479
35. Sandhu G, Thompson J, Matusko N, et al. Greater faculty familiarity with residents improves intraoperative

entrustment. *Am J Surg*. 2020;219(4):608-612. doi:10.1016/j.amjsurg.2019.06.006
36. Lockyer J, Lee-Krueger R, Armson H, et al. Application of the R2C2 model to in-the-moment feedback and coaching [published online ahead of print April 14, 2023]. *Acad Med*. doi:10.1097/ACM.0000000000005237
37. D'Angelo AD, Rivera M, Rasmussen TE, et al. How I do it: implementation of a brief evidence-based intraoperative coping curriculum [published online ahead of print September 5, 2023]. *J Surg Educ*. doi:10.1016/j.jsurg.2023.08.001
38. Ellaway RH, Wyatt TR. What role should resistance play in training health professionals? *Acad Med*. 2021;96(11):1524-1528. doi:10.1097/ACM.0000000000004225
39. The Patient Revolution. Accessed September 25, 2023. https://www.patientrevolution.org/

Adam P. Sawatsky, MD, MS, is Associate Professor of Medicine, Division of General Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA; **Joanna R. Rea, MD,** is Assistant Professor of Medicine, Division of Community Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA; **Luke T. Hafdahl, MD,** is Assistant Professor of Medicine, Division of Community Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA; **Brianna E. Vaa Stelling, MD,** is Assistant Professor of Medicine, Division of Community Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA; **Jill M. Huber, MD,** is Assistant Professor of Medicine, Division of Community Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA; **Majken T. Wingo, MD,** is Assistant Professor of Medicine, Division of Community Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA; and **Emily L. Leasure, MD,** is Assistant Professor of Medicine, Division of Community Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA.

Corresponding author: Adam P. Sawatsky, MD, MS, Mayo Clinic, Rochester, Minnesota, USA, sawatsky.adam@mayo.edu, X @APSawatskyMD