Practical Suggestions for the Creation and Use of Meaningful Learning Goals in Graduate Medical Education

Suzanne Reed, MD; Tai M. Lockspeiser, MD, MHPE; Ann Burke, MD; Kimberly A. Gifford, MD; Janice L. Hanson, PhD, EDS; John D. Mahan, MD; Michael McKenna, MD; Adam Rosenberg, MD; Su-Ting T. Li, MD, MPH

From the Department of Pediatrics, Nationwide Children's Hospital, Ohio State University School of Medicine, Columbus, Ohio (Drs Reed and Mahan); Department of Pediatrics, University of Colorado School of Medicine, Aurora, Colo (Drs Lockspeiser, Hanson, and Rosenberg); Department of Pediatrics, Wright State University Boonshoft School of Medicine, Dayton Children's Hospital, Dayton, Ohio (Dr Burke); Department of Pediatrics, Children's Hospital at Dartmouth, Geisel School of Medicine at Dartmouth, Hanover, NH (Dr Gifford); Department of Pediatrics, Riley Hospital for Children and IU School of Medicine, Indianapolis, Ind (Dr McKenna); and Department of Pediatrics, University of California Davis School of Medicine, Sacramento, Calif (Dr Li)
The authors declare that they have no conflict of interest.
Address correspondence to Suzanne Reed, MD, Division of Hematology/Oncology/BMT, Nationwide Children's Hospital, 700 Children's Dr, Columbus, OH 43205 (e-mail: suzanne.reed@nationwidechildrens.org).

LIFELONG LEARNING IS an essential component in the provision of quality health care. Documentation of lifelong learning is required for both medical learners and practicing physicians.[1,2] The Accreditation Council for Graduate Medical Education (ACGME) requires all learners to set learning and improvement goals.[3] As part of Maintenance of Certification (MOC) for practicing pediatricians, the American Board of Pediatrics requires engagement in lifelong learning and self-assessment (part 2 of MOC).[4] Goal setting is a bridge between self-assessment and action in lifelong learning, allowing physicians to continue to grow during training and in practice.

Cultivation of skills in setting and achieving learning goals (LG) can help with self-assessment and promotion of successful lifelong learning.[5] In pediatrics, the ACGME requires that each resident and fellow create an individualized learning plan at least annually.[3,6] While developing LG as part of the individualized learning plan is required during pediatric residency and fellowship training, effective methods to cultivate learners' skills in the use of LG are still being evaluated and defined. In addition, increasing programmatic requirements coupled with fewer work hours have the potential to undermine attention to individual LG during residency and fellowship training.[7–9] Previous studies have shown that learners often have difficulty developing and attaining personal LG,[7–11] lack confidence in their LG skills,[8] and can benefit from LG education and experience.[9,12] While the importance of lifelong learning is clear, the challenge for graduate medical education (GME) programs is to identify methods to promote successful use of LG in their learners.

Here we describe practical strategies for the development and use of LG during training to help develop lifelong learning skills in our learners as they move forward in their careers. We use our own experiences with implementing LG in our programs over the last 5 years, our prior research on LG, review of the literature, and interviews and focus groups with learners and program directors to offer practical strategies that target the learner, faculty, and the learning environment to help learners develop and implement effective LG (Box 1).[12]

INTERVENTIONS TARGETING THE LEARNER

Learner characteristics associated with greater progress toward achieving LG include greater propensity toward lifelong learning, greater confidence in self-directed learning abilities, and alignment of LG with learning needs.[13] Targeting interventions to develop learner characteristics associated with greater progress toward achieving LG may assist learners develop and implement effective LG.

Many learners have not written individualized LG before residency. We can improve learner confidence in developing and attaining LG through education on the creation and use of LG.[14] We have found that an explicit orientation to LG helps learners set expectations, reinforces the importance of lifelong learning and goal setting, increases confidence, and can provide dedicated time for LG discussion. We have utilized LG orientations in an interactive workshop format involving sharing goals and providing feedback about peers' goals. Multiple investigators have documented the value of LG orientations that address

BOX 1. DEVELOPING AND PROMOTING EFFECTIVE LG FOR LEARNERS

Interventions Targeting Learners
- Educate learners on goal setting (orientation, workshops, example LG).
- Require a specific LG structure (eg, the I-SMART template).
- Schedule regular dedicated time for reflection, and creation and follow-up on progress of LG.
- Utilize motivating factors—like career plans, board exams, evaluations from faculty and peers, academic productivity, dedication to patients, deficient knowledge or skills—to inform creation of LG.
- Gain buy-in by discussing the value and long term purpose of goal setting.
   a. What are your career goals?
   b. What do you need to get better at/do in order to accomplish your career goals?
- Require short- and long-term LG.
   a. What are your career goals?
   b. What are your rotation goals?
   c. What are your goals for this week?
- Provide forums for learners to share LG.
- Schedule experiences (eg, rotations) to pursue LG.
- Require residents to create LG before individualized rotations.
- Encourage learners to share LG and seek feedback from faculty on outcomes of learning goal plans.

Interventions Targeting Faculty
- Provide faculty development on learner reflection and LG writing by asking faculty to:
   a. Practice developing their own LG.
   b. Discuss scenarios to help learners reflect and create their LG.
   c. Role-play Ask–Tell–Ask model to encourage reflection and LG creation.
      i. *Ask:* What did you do particularly well during this encounter and what would you like to continue to improve?
      ii. *Tell:* I noticed…
      iii. *Ask:* How can we work together to help you improve…
      iv. Follow up: I will follow up with you in *x* days and give you feedback on…
- Provide faculty with example guiding questions to promote discussion about and support for LG.
   a. What is your LG for this rotation?
   b. How can I help you accomplish your LG?
   c. What is your progress on achieving your LG?
- Encourage faculty to provide specific feedback to learners, during rotations or in formal review/advising sessions, about progress toward accomplishing their LG.
- Address potential barriers to faculty accountability (lack of time, lack of buy-in regarding faculty roles, lack of divisional support).
- Include questions about incorporation/discussion of LG into faculty evaluations.
- Elicit feedback from faculty directly regarding their roles in resident LG.

Interventions Targeting the Training Environment
- Utilize user-friendly LG documentation system.
- Provide time/resources to develop learner and faculty skills in LG development.
- Provide time for learner reflection and faculty review and support.

   LG indicates learning goals.

barriers to goal setting, including difficulty with personal reflection, goal development, and implementation.[8–10]

To aid in goal development, learners should be provided with a specific structure to write actionable LG. The I-SMART mnemonic (Important, Specific, Measurable, Accountable, Realistic, Timeline/Plan) provides a useful framework for identifying key elements of practical goals (Box 2).[10] Vague goals like "I want to learn more" can be transformed by applying the I-SMART tool into "I am planning to do a hematology/oncology fellowship (I), so I want to increase my knowledge in evidence-based oncology (S) by doing a literature search on one patient per week (M, R, T) during my hematology/oncology rotation and discuss this literature with my attending (A)." Prompting learners with reflection questions, while sometimes initially met with skepticism, can strengthen goal setting and achievement.[15] In a single residency program study, we demonstrated that quality of goals can be improved with teaching the I-SMART strategy and providing feedback on goals.[16]

By promoting reflection, we enhance resident engagement, allowing for more meaningful use of goals. When learners first think about their goals, many are reminded

BOX 2. DEVELOPING I-SMART GOALS

1. Important
   - Reflect on career goals. Self-assess areas of weakness and areas of strength needed to build on to achieve career goals.
   - Match goals to self-assessed (and externally assessed) areas of weakness, interests, and career goals.
   - Include different types of goals (eg, wellness goal, rotation-specific goal, career-oriented goal)
2. Specific
   - Clearly define terms of goal statement (eg, what does it mean to improve or learn something?).
   - Break down larger goals into smaller steps.
3. Measurable
   - Use measurable metrics to define goal success/progress (eg, number of intubations, improvement on patient evaluations).
4. Accountability
   - Build in internal accountability for goal completion (checklists, tracking system, intermittent electronic reminders).
   - Build in external accountability for goal completion (scheduled goal follow-up with advisor/program director with report-out of goal progress and barriers, share goals with faculty/staff/peers/learners with opportunity for feedback on goal progress).
5. Realistic
   - Match goals to available opportunities (eg, intubations on upcoming anesthesia rotation).
   - Design individualized rotations to meet learning goals or choose electives that would allow completion of learning goal.
6. Timeline/Plan
   - Include steps to achieve goal, resources needed for goal completion, and timeline to goal completion.

of frustrating knowledge deficits and focus their goals on improving medical knowledge. By asking probing questions, we can help learners reflect more deeply and create relevant goals that can promote their professional development.[14] By eliciting motivating factors in our learners— like subspecialty fellowship plans, board exams, clinical performance, academic productivity, dedication to patients, or fear of knowledge deficiencies—we help learners frame their LG to support their own growth and success. We encourage learners to reflect on their patient outcomes to identify ways in which they might change their practice. We stimulate learners to reflect proactively about their career plans to create a path to reach their goals. We can also help learners to reflect on their own wellness strategies to ensure that they are able to sustain their goal. Programs can encourage learners to utilize long-term career and short-term rotation goals, as well as goals in different domains beyond medical knowledge, including personal wellness goals.

Residents and fellows can develop goals that are based on optimal learning opportunities available during upcoming rotations (eg, using their neonatal intensive care unit experience to successfully intubate 5 neonates). Alternatively, learners can be encouraged to purposefully schedule experiences (eg, rotations) around LG to give them the appropriate opportunity to work on a goal (eg, schedule a breast-feeding rotation to become proficient in counseling new breast-feeding mothers). Explicitly sharing their LGs with faculty on their rotations can encourage faculty to support the learners' LG achievement

as well as hold residents accountable to progress toward their goal. Similarly, scheduled follow-up of LG progress with faculty advisors and program leadership provides opportunities for feedback on LGs and can help hold learners accountable for their goals.

INTERVENTIONS TARGETING FACULTY

Nothnagle et al[17] demonstrated how faculty coaches can help residents with goal development and achievement. We have found that many faculty need training in both developing their own LG and supporting meaningful use of LG in learners. Program leadership should provide faculty development on goal setting, feedback on LG to learners, and strategies to assist learners develop their own LG, and should also promote learner reflection.[16] This faculty development should include discussion or role-playing of scenarios related to LG development and reflection. Faculty can be challenged to lead by example and develop their own I-SMART plans, which they would then share with learners. Such role modeling can send a powerful message to learners, demonstrating the importance of reflection and goal setting and reinforcing the importance of this practice throughout the educational continuum.

We believe that faculty must go beyond helping with creation of goals by guiding learners to incorporate these into subsequent learning experiences, thus emphasizing lifelong learning beyond GME. There are several steps that faculty can use. Asking learners about their LG for each rotation is an easy first step and can be combined

with having faculty ask learners how they can help them achieve their LG. Faculty can help hold learners accountable by following up on progress of their LG after a set time period, such as at the end of a rotation. To promote reflective practice, faculty can use the Ask–Tell–Ask method: *Ask* the learner to reflect on specific encounters or overall experience ("What did you do particularly well during this encounter?"); *Tell* the learner what was observed ("I noticed…"); *Ask* the learner for strategies for improvement and refine goals or talk about next steps ("How can we work together to help you improve…?").[18,19] Encouraging faculty to provide this specific feedback to learners can reinforce the utility of LG and encourage future use of different LG.

INTERVENTIONS TARGETING THE TRAINING ENVIRONMENT

A number of different program activities can facilitate LG use. Programs should require development and use of LG regularly enough to allow deliberate practice[20] and real-time application, and may also use a longitudinal career block with focus on LG.[21] Programs should set aside time for learners to reflect and work on developing and revising goals, such as during orientation, workshops dedicated to goal setting, time at the beginning and end of rotations, and semiannual reviews. Protecting time for goal-related activities establishes that goal setting is as valued by the program as clinical didactics. Programs should also encourage learners to pursue opportunities for clinical experiences related to their LG and/or to develop goals that are based on upcoming rotations, integrating these 2 processes.

Providing a simple-to-use LG documentation system integrated with external assessment can help decrease barriers to goal setting and reflection. Because tracking progress toward LG has been associated with progress on achieving them,[13] an ideal documentation system would be electronic, easy to access and share, utilize electronic reminders, and provide a way to link self-assessments, goal setting, and external measures of goal progress or achievement. For pediatrics, the American Academy of Pediatrics Pedialink Individualized Learning Plan provides some of these valuable functions for residents, fellows, and faculty.[22]

Peer support can also help learners develop and achieve LG. Some have reported using learning communities to foster peer support within a training program.[23,24] Learners can be encouraged to join groups related to specific goals or career plans. Programs can encourage learners to share effective LG with others, either through an online forum or by providing time to discuss LG in live group settings. Sharing LG with peers, one on one or in groups, and making plans to follow up with each other can also build in external accountability.

Finally, attention must be directed to implicit and cultural aspects around use of LG in GME programs. It is not enough to just state that LG are important; programs must actively support the creation and use of LG to truly invest in developing lifelong learners. Getting feedback from learners on faculty and/or rotation evaluations with questions such as, "I was asked about my learning goals" or "This rotation helped me meet my learning goals" can reinforce program and faculty accountability.

IMPLICATIONS FOR LIFELONG LEARNING AND MAINTENANCE OF CERTIFICATION IN PRACTICING PHYSICIANS

LGs are relevant for pediatricians even after the completion of training. Their goals and motivation for creating goals may be different, but the process is the same. MOC requirements were created because it is crucial to facilitate intentional lifelong learning throughout an entire career. The use of reflection and effective LG can provide practical methods to meet these needs in practicing physicians. In addition, setting effective LG can be enriching for practitioners. How we develop more effective means of supporting and valuing LG use for practicing physicians is an important question.

Currently many practicing pediatricians have not had opportunities to explicitly learn or practice using LGs. Developing these skills during training may be the most practical way to promote effective LG use and lifelong learning in practitioners as they continue to use and refine these skills throughout their careers. The end of residency or fellowship also marks a key transition as the responsibility for use of LGs and lifelong learning shifts from the structured environment of the program to the individual. Thus, programs are responsible for training their residents or fellows to be able to identify their own learning needs and then create and implement goals to address them in the workplace.

CONCLUSIONS

Learner, faculty, and program investment in LG, from inception to achievement, can promote the best use of LG and help learners avoid missing significant learning opportunities. The methods we outline here are practical steps toward establishing the importance and practice of LG in residency and fellowship programs. More attention and research is needed to promote practitioner use of effective LG during their careers. Future studies are needed to investigate the effect of using LG in GME and even undergraduate medical education to improve goal-setting skills and learners' satisfaction with their educational programs and for posttraining success with lifelong learning. Measuring faculty satisfaction with teaching roles and mentoring effectiveness in relation to promotion of LG is another area worth exploring. Ultimately, effective lifelong learning in physicians—training and practicing—will serve to benefit our patients.

ACKNOWLEDGMENT

REFERENCES

1. American Board of Medical Specialties Maintenance of Certification (MOC). Available at: http://www.abms.org/Maintenance_of_Certification/ABMS_MOC.aspx. Accessed June 30, 2014.
2. Miller SH. American Board of Medical Specialties and repositioning for excellence in lifelong learning: maintenance of certification. *J Contin Educ Health Prof*. 2005;25:151–156.
3. Accreditation Council for Graduate Medical Education. Common program requirements. Available at: http://www.acgme.org/acgmeweb/Portals/0/PDFs/commonguide/IVA5c_EducationalProgram_ACGMECompetencies_PBLI_Explanation.pdf. Accessed June 30, 2014.
4. American Board of Pediatrics Maintenance of Certification. Available at: https://www.abp.org/content/moc-four-part-structure. Accessed March 10, 2015.
5. Burke AE, Benson B, Englander R, et al. Domain of competence: practice-based learning and improvement. *Acad Pediatr*. 2014; 14(2 suppl):S38–S54.
6. Li ST, Burke AE. Individualized learning plans: basics and beyond. *Acad Pediatr*. 2010;10:289–292.
7. Li ST, Favreau MA, West DC. Pediatric resident and faculty attitudes toward self-assessment and self-directed learning: a cross-sectional study. *BMC Med Educ*. 2009;9:16.
8. Nothnagle M, Anandarajah G, Goldman RE, et al. Struggling to be self-directed: residents' paradoxical beliefs about learning. *Acad Med*. 2011;86:1539–1544.
9. Stuart E, Sectish TC, Huffman LC. Are residents ready for self-directed learning? A pilot program of individualized learning plans in continuity clinic. *Ambul Pediatr*. 2005;5:298–301.
10. Li ST, Paterniti DA, Co JP, et al. Successful self-directed lifelong learning in medicine: a conceptual model derived from qualitative analysis of a national survey of pediatric residents. *Acad Med*. 2010;85:1229–1236.
11. Li ST, Paterniti DA, Tancredi DJ, et al. Resident self-assessment and learning goal development: evaluation of resident-reported competence and future goals. *Acad Pediatr*. 2015;15:367–373.
12. Lockspeiser TM, Rosenberg AA, Li ST, et al. In pursuit of meaningful use of learning goals in pediatric residency: what can a program do? *Acad Pediatr*. 2014;14:e1.
13. Li ST, Tancredi DJ, Co JP, et al. Factors associated with successful self-directed learning using individualized learning plans during pediatric residency. *Acad Pediatr*. 2010;10:124–130.
14. Bravata DM, Huot SJ, Abernathy HS, et al. The development and implementation of a curriculum to improve clinicians' self-directed learning skills: a pilot project. *BMC Med Educ*. 2003;3:7.
15. Lockspeiser TM, Schmitter P, Lane JL, et al. *A validated rubric for scoring LG*. MedEdPORTAL; 2013.
16. Lockspeiser TM, Schmitter PA, Lane JL, et al. Assessing residents' written learning goals and goal writing skill: validity evidence for the learning goal scoring rubric. *Acad Med*. 2013;88:1558–1563.
17. Nothnagle M, Goldman R, Quirk M, et al. Promoting self-directed learning skills in residency: a case study in program development. *Acad Med*. 2010;85:1874–1879.
18. Back AL, Arnold RM, Baile WF, et al. Approaching difficult communication tasks in oncology. *CA Cancer J Clin*. 2005;55:164–177.
19. French JC, Colbert CY, Pien LC, et al. Targeted feedback in the Milestones era: utilization of the ask-tell-ask feedback model to promote reflection and self-assessment. *J Surg Educ*. 2015 Nov-Dec;72:e274-9. http://dx.doi.org/10.1016/j.jsurg.2015.05.016. Epub 2015 Jun 27.
20. Ericsson KA. Deliberate practice and the acquisition and maintenance of expert performance in medicine and related domains. *Acad Med*. 2004;79(10 suppl):S70–S81.
21. Rosenberg AA, Lockspeiser T, Lane JL, et al. A longitudinal career-focused block for third-year pediatrics residents. *J Grad Med Educ*. 2013;5:639–645.
22. PediaLink: the AAP online learning center. Available at: http://pedialink.aap.org/visitor. Accessed Jan 13, 2015.
23. Ferguson KJ, Wolter EM, Yarbrough DB, et al. Defining and describing medical learning communities: results of a national survey. *Acad Med*. 2009;84:1549–1556.
24. Smith S, Shochet R, Keeley M, et al. The growth of learning communities in undergraduate medical education. *Acad Med*. 2014;89:928–933.