



# Interprofessional Education in the Internal Medicine Clerkship Post-LCME Standard Issuance: Results of a National Survey

Irene Alexandraki, MD, MPH<sup>1,2</sup>, Caridad A. Hernandez, MD<sup>3</sup>, Dario M. Torre, MD, MPH, PhD<sup>4</sup>, and Katherine C. Chretien, MD<sup>5</sup>

<sup>1</sup>Florida State University College of Medicine, Tallahassee, FL, USA; <sup>2</sup>Department of Clinical Sciences, Florida State University College of Medicine, Tallahassee, FL, USA; <sup>3</sup>University of Central Florida College of Medicine, Orlando, FL, USA; <sup>4</sup>Uniformed Services University of the Health Sciences, Bethesda, MD, USA; <sup>5</sup>George Washington University School of Medicine & Health Sciences, Washington, DC, USA.

**BACKGROUND:** Several decades of work have detailed the value and goals of interprofessional education (IPE) within the health professions, defining IPE competencies and best practices. In 2013, the Liaison Committee for Medical Education (LCME) elevated IPE to a U.S. medical school accreditation standard.

**OBJECTIVE:** To examine the status of IPE within internal medicine (IM) clerkships including perspectives, curricular content, barriers, and assessment a year after the LCME standard issuance.

**DESIGN:** Anonymous online survey.

**PARTICIPANTS:** IM clerkship directors from each of the Clerkship Directors in Internal Medicine's 121 U.S. and Canadian member medical schools in 2014.

**METHODS:** In 2014, a section on IPE (18 items) was included in the Clerkship Directors in Internal Medicine annual survey of its 121 U.S. and Canadian member medical schools.

**MAIN MEASURES:** Items (18) assessed clerkship director (CD) perspectives, status of IPE curricula in IM clerkships, and barriers to IPE implementation. Data were analyzed using descriptive statistics and qualitative analysis of free-text responses to one of the survey questions.

**KEY RESULTS:** The overall survey response rate was 78% (94/121). The majority (88%) agreed that IPE is important to the practice of IM, and 71% believed IPE should be part of the IM clerkship. Most (76%) CDs agreed there is need for faculty development programs in IPE; 27% had such a program at their institution. Lack of curricular time, scheduling conflicts, and lack of faculty trained in IPE were the most frequently cited barriers. Twenty-nine percent had formal IPE activities within their IM clerkships, and 38% were planning to make changes. Of those with formal IPE activities, over a third (37%) did not involve student assessment.

**CONCLUSIONS:** Since LCME standard issuance, only a minority of IM clerkships have included formal IPE activities, with lectures as the predominant method. Opportunities exist for enhancing educational methods as well as IPE faculty development.

**KEY WORDS:** medical education; interprofessional education; undergraduate medical education.

J Gen Intern Med 32(8):871–6

DOI: 10.1007/s11606-017-4004-3

© Society of General Internal Medicine 2017

## INTRODUCTION

In July 2013, the Liaison Committee for Medical Education (LCME) elevated interprofessional education (IPE) to a core MD program educational component and an accreditation standard: “The core curriculum of a medical education program must prepare medical students to function collaboratively on healthcare teams that include health professionals from other disciplines as they provide coordinated services to patients” (LCME 2013; 19-A).<sup>1</sup> Several decades of work detailing the value and goals of IPE, defining IPE competencies and best practices, and publications and position papers from many multinational organizations have highlighted the importance of IPE in medical education and practice.<sup>2,3</sup>

Interprofessional education occurs through formal interprofessional teaching sessions where two or more professions can learn with, from, and about each other to improve collaboration and quality of patient care.<sup>3</sup> IPE may enhance the learner's understanding of the roles and responsibilities of other professions, while cultivating respect among the healthcare team members.<sup>4–11</sup> In 2011, leaders from the AAMC and five other health professions crafted a report, *Core Competencies for Interprofessional Collaborative Practice*, that defines the IPE competency domains (values and ethics, roles and responsibilities, interprofessional communication, and team-based care) and sub-competencies to guide IPE efforts.<sup>2,5,6,8</sup> Some efforts have been met with challenges such as limited resources, scheduling difficulties, and lack of faculty experience and interest, raising questions on how to best design, implement, and evaluate an IPE program.<sup>12–15</sup>

Previous studies have shown that training in the context of clinical practice may increase students' confidence in communication and teamwork and their understanding of the role of other health professions.<sup>16–18</sup> Guided by Bandura's principles of social learning theory,<sup>20</sup> workplace learning,<sup>21</sup> and an understanding of situated learning,<sup>22</sup> clinical rotations including

---

**Electronic supplementary material** The online version of this article (doi:10.1007/s11606-017-4004-3) contains supplementary material, which is available to authorized users.

---

Received August 22, 2016

Revised December 9, 2016

Accepted January 20, 2017

Published online March 10, 2017

the internal medicine clerkship could be an ideal setting for IPE. Many medical schools have been using clinical care teams during clinical rotations to teach their medical students teamwork and leadership skills.<sup>13,19,23</sup>

Prior to the LCME accreditation requirement,<sup>1</sup> a national survey of internal medicine (IM) clerkship directors (CDs) in 2009, showed that only 19% of the core IM clerkships had a formal IPE curriculum and 57% of the CDs believed IPE should become part of the undergraduate clinical curriculum; scheduling conflicts, time in the existing curriculum and lack of resources were the most significant barriers to IPE implementation.<sup>13</sup>

The aim of this study was to examine the status of IPE within IM clerkships including perspectives, curricular content, barriers, and assessment a year after the LCME standard issuance.

## METHODS

In May 2014, the Clerkship Directors in Internal Medicine (CDIM) conducted its annual, online, confidential survey of its 121 US and Canadian member medical schools. The designated CD from each member medical school was sent an invitation to participate in the survey by electronic mail. Non-responders were contacted up to three additional times by email and once by telephone. The aim of the study was not included in the survey or any communications with the respondents. The Institutional Review Board at the Washington DC Veterans Affairs Medical Center declared the study exempt from further review.

## SURVEY DEVELOPMENT

A call for questions for the CDIM national survey was issued to all CDIM members in the fall of 2013. After reviewing the literature on IPE, the authors (IA and CH) formulated and submitted survey items to assess the current status of IPE in the IM clerkships. The CDIM Research Committee reviewed all the submissions and selected four major sections based on clarity, quality, appropriateness, and importance to the CDIM mission, including IPE. The survey also captured demographic information about the respondents and their institutions.

The selected questions were further edited and revised by the members of the CDIM Research Committee (including KC and IA) before being presented to CDIM Council, who provided feedback and final approval. Some survey sections contained items that branched or involved “skip logic,” so that respondents could skip questions that were not relevant to them. The final online survey instrument underwent pilot testing by the members of the Research Committee and Council (approximately 20 individuals in total), and was edited for optimal flow and clarity prior to the survey launch.

The survey section on IPE consisted of 18 items including multiple-choice, open-ended, and Likert-scaled questions

(online [Appendix](#)). These questions assessed CDs’ perspectives on IPE, the status of IPE curricula and assessment in the IM clerkships, and barriers to IPE implementation.

## DATA ANALYSIS

The survey responses were summarized using descriptive statistics. For the question, “With LCME ED-19-A, are you planning to make any changes to your clerkship,” free-text responses were organized by yes/no/no response and then classified according to theme by two authors through consensus using an inductive, iterative approach (IA, KC). For the open-ended prompt, “Describe how you overcame existing barriers,” all responses addressing the prompt were reported.

## RESULTS

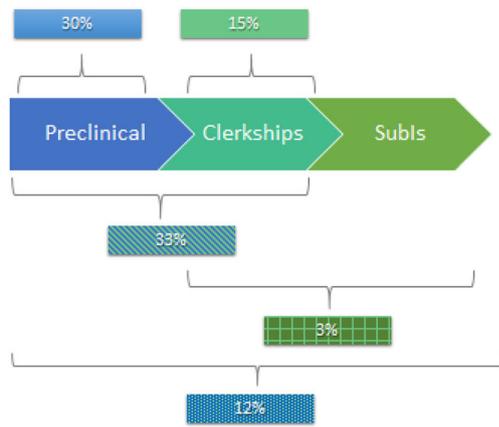
Overall, 94 of 121 (78%) institutional members responded to the survey; 92 (76%) completed the section on IPE and are included in this analysis. Table 1 displays respondents’ demographics.

Eighty-one (88%) of the respondents strongly agreed or agreed that IPE was important to the practice of IM, and 65 (71%) believed that IPE should be part of the IM clerkship. Seventy (76%) of the respondents strongly agreed or agreed that there was a need for faculty development programs to enhance faculty knowledge and skills in IPE; only 25 (27%) of the respondents had a formal faculty development program on IPE at their institution, and 19 (21%) were unsure whether they had one.

Thirty respondents (33%) reported having an *integrated* IPE curriculum at their medical school, with integration defined as interdisciplinary block courses that bring together basic, clinical, and social sciences, or include longitudinal curricular themes across the curriculum. When asked when IPE was formally taught (i.e., structured activities) at their institutions, 60 (65%) respondents reported that IPE was

**Table 1 Respondent Demographics (N=92)**

Respondent characteristic	N (%)
Gender	
Male	48 (52)
Female	42 (47)
Academic rank	
Assistant professor	27 (29)
Associate professor	41 (45)
Full professor	24 (26)
Institution—public vs. private	
Public	50 (54)
Private	41 (45)
Entering medical school class size	
≤80	5 (5)
81–120	23 (25)
121–160	22 (24)
161–200	24 (26)
>200	18 (20)



**Figure 1** When IPE is taught across the medical school curricula at 60 responding US medical schools (not shown: 3% occurring in preclinical and sub-internship years).

formally taught at their medical schools. Forty-eight (80%) responded that IPE teaching activities occurred during the preclinical years, 37 (62%) during the clerkships, and 11 (18%) during the sub-internships. Analyzing by respondent, for 20 (33%), IPE teaching occurred during the preclinical and clerkship years; 18 (30%) during the preclinical years only; nine (15%) during the clerkship year only; seven (12%) during the preclinical, clerkship, and sub-internship years; two (3%) during the clerkship and sub-internship years; and two (3%) during the preclinical and sub-internship years (Fig. 1).

Less than a third (27, 29%) responded that they had formal IPE activities within their IM clerkships, although 35 (38%) were planning to make changes to their clerkships to meet the LCME requirements for IPE. See Table 2 for analysis of the 31

**Table 2** Free-Text Responses to “With LCME ED-19-A, Are You Planning to Make Any Changes to Your Clerkship?”

	Theme	Representative comment
Yes (19)	Specific ideas (9)	“Adding new assessment tools, particularly for sub-internship” “Small-group case-based discussions with both medical students working with PA students”
	Likely in the future (4)	“Eventually want to formalize and add structure—but working on higher-priority issues at this point”
	Outside clerkship purview (3)	“The clerkship will follow the direction the school wishes to pursue in this area.”
	Already added (3)	“We added a nurse shadowing and interaction experience.”
No (9)	Already added (5)	“It is included as part of their clinical experiences—there is a vertical curriculum that starts formally in the preclinical years.”
	Outside clerkship purview (3)	“The school of medicine handles IPE outside the clerkship.”
	Time as barrier (1)	“Not enough time in an 8-week hospital-based medicine clerkship”
No response (3)	Unclear (3)	“Likely in the future, unclear at this time”

free-text comments that respondents wrote to accompany their response to whether changes were planned.

Among the 27 IM clerkships with formal IPE activities, 22 (81%) reported that these activities were mandatory. Most often, both physicians and non-physicians taught IPE together during the clerkship (16, 60%), with only physician teachers in eight (30%) and only non-physician teachers in two (7%). Nursing, pharmacy, and social work were the allied health professions most frequently involved in the IPE instruction in the IM clerkships (Fig. 2). Features of these formal IPE programs, including setting, topics taught, teaching modality used, duration, and other health professional student inclusion, is shown in Table 3.

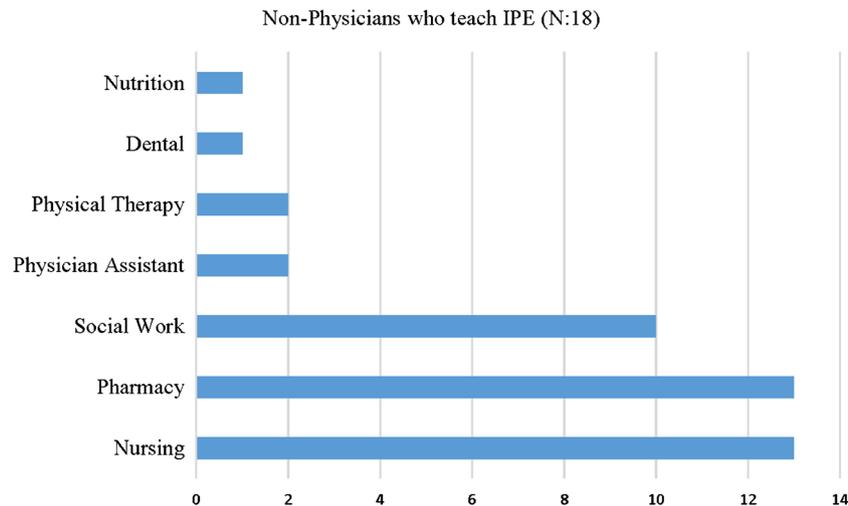
More than one-third of the respondents (10, 37%) did not assess the students during their formal IPE activities in the IM clerkship. Of those 17 who did, direct observation of students’ team skills during real patient encounters (8, 47%), student self-assessment (5, 29%), objective structured clinical exams (OSCE; 3, 17%), and multiple-choice questions (2, 12%) were the tools most often used for assessment. Lack of time during the clerkship (15, 55%), lack of faculty trained in IPE (10, 37%), and conflicting academic calendars (7, 26%) from the participating health profession schools were the major barriers that clerkship directors encountered in the implementation of a formal IPE program in their clerkships.

In response to the open-ended question, “Describe how you overcame existing barriers,” there were five responses in total that addressed the prompt. Respondents mentioned 1) mandating participation, 2) using IPE encounter cards for the IM wards, 3) having a motivated faculty member with internal grant funding, 4) identifying faculty champions in the other professions, and 5) having the curriculum delivered at their affiliated Veterans Affairs hospital by dedicated faculty and chief residents in patient safety and quality improvement.

## DISCUSSION

This national survey of IM CDs highlights existing gaps in the delivery of IPE in IM clerkships post-LCME standard issuance. Although the majority of the CDs (88%) perceived IPE as very important to the practice of IM, and 71% of CDs believed that it should be part of the IM clerkship, only a minority of IM clerkships included formal IPE activities. The attitudes of the IM CDs towards IPE appear to have changed since 2009, when only 68% of them believed that was important in the practice of IM and 57% thought it should become a part of the undergraduate medical curriculum.<sup>13</sup> However, many IM CDs indicated that they planned to make changes to their clerkships to meet the LCME requirements for IPE.<sup>1</sup>

Interestingly, all family medicine CDs ( $n = 88$ , survey response rate: 66%) who responded to a survey conducted by the Council of Academic Family Medicine Educational Research Alliance in 2012 felt that IPE was important to the practice of



**Figure 2** Non-physicians who teach IPE in the internal medicine clerkships with formal IPE curricula.

family medicine (FM), but only 38% had incorporated IPE into their clerkships.<sup>23</sup> A literature review showed a lack of similar studies among clerkships in other specialties, underscoring the need for more research in this area.

Our survey results describing structured IPE experiences during the IM clerkship are congruent with the AAMC 2011–2014 Graduation Questionnaire (GQ) report, where students indicated that they had curricular opportunities to learn with nursing (81%), pharmacy (80%), physician assistant (65%), social work (52%), and physical therapy (49%) students; however, the GQ did not inquire when these IPE experiences occurred and in what contexts.<sup>24</sup>

Our respondents indicated that the IPE activities during IM clerkships were not always conducted together with students and faculty from other health professions. This was unanticipated, as activities with a focus on interprofessional teamwork would seem difficult to carry out without interaction with other health professions. One to three hours were spent on formal IPE activities in the majority of the IM clerkships (59%). Considering the significant amount of time students spend at clinical settings where interaction with other health professions is naturally occurring, there is an opportunity to implement formal IPE activities during the IM clerkship. The AAMC GQ (2011–2014) highlighted that medical students gain a better understanding of collaborative and interprofessional patient care and are more satisfied with their medical training when they learn alongside individuals from other health professions.<sup>24</sup> In a recent review of interprofessional team training at the prelicensure level, Nelson et al. concluded that team training appeared to be effective in improving team knowledge, communication, and skills, and highlighted the need for continued exploration of the best method for team training.<sup>25</sup>

Lectures were the main modality used by the CDs for teaching IPE, while small-group teaching, including debriefings, facilitated reflections, and case conferences and

simulations, were used less often. Similarly, FM clerkship directors used lectures and grand rounds (49% and 14%, respectively), case-based learning (29%), case reviews (26%), OSCE (20%), and standardized patients (9%) to teach IPE during the FM clerkship.<sup>23</sup> Opportunities exist for the use of innovative methods, such as reflection, to teach IPE.<sup>26</sup> Only

**Table 3** Features of Formal IPE Programs During the Internal Medicine Clerkship (N = 27)

Setting	N (%)
Inpatient	27 (100)
Outpatient (university-affiliated, community, and student-run clinics)	12 (44)
Home visits	2 (7)
Skilled nursing facilities	1 (4)
Palliative care	1 (4)
Topics taught	
Team skills	22 (81)
Communication skills	19 (70)
Systems improvement through interprofessional teamwork	14 (52)
Patient management	1 (4)
Teaching modality	
Lecture	17 (63)
Simulation exercises	6 (22)
Small groups (debriefings, facilitated reflections, case conferences)	6 (22)
Multidisciplinary rounds	6 (22)
Online modules	0 (0)
Duration	
<1 h	2 (7)
1–3 h	16 (59)
>3 h	6 (22)
Not sure	3 (11)
Other health professional students involved	
Nursing	18 (67)
Pharmacy	18 (67)
Social work	13 (48)
Physical therapy	7 (26)
Physician assistant	5 (18)
Dental	1 (4)
IPE activities conducted jointly with the other health professions	
Always/most of the time	12 (44)
Sometimes	9 (33)
Rarely/never	3 (11)
Other	1 (4)

17% of the CDs in the survey used simulation in their clerkships, despite research showing that simulation is effective in improving communication and teamwork skills, knowledge, and attitudes towards teamwork.<sup>27,28</sup> Tofil et al. introduced weekly interprofessional simulations to the 8-week IM clerkship using four clinical scenarios and showed an improvement in medical and nursing students' self-efficacy communication scores and their understanding of the role of each profession role.<sup>29</sup> Interprofessional simulation used in a surgical residency significantly increased second year surgical residents' communication, leadership, teamwork, and procedural ability scores.<sup>30</sup>

Among the IM clerkships with formal IPE activities, only 63% evaluated their students' interprofessional skills. Direct observation of students' team skills during real patient encounters was the most popular assessment method—as expected, considering the abundance of these encounters during the clinical years. Student self-assessment and OSCEs were used less, while peer assessment, patient satisfaction surveys, and written reflections were not used for assessment. Lack of familiarity, time, and resources, and the logistics associated with the use of these tools could have precluded their use.

Barriers to the development and implementation of IPE programs continue to exist.<sup>13</sup> Lack of time during the clerkship and conflicting schedules, lack of faculty training and interest, lack of student interest, and funding limitations remain important barriers in IPE. Similarly, in the 2009 study by Liston et al., scheduling, time in the existing curriculum, and resources in time and money were the most significant barriers to IPE in the IM clerkship.<sup>13</sup> Better alignment of schedules among the participating health professional students and faculty and the allocation of more funds to create sustainable IPE programs are needed to respond to LCME requirements and today's healthcare demands for teamwork.<sup>1,4</sup>

IPE efforts seem to focus more on the operational aspects of IPE and less on building an educational theoretical framework that will support sustainable pedagogical approaches to IPE.<sup>31</sup> Mann et al., for example, used social cognitive theory as a guide for the design of small interprofessional student practice groups to facilitate collaborative learning experiences that involve all group members.<sup>32</sup>

The survey results confirmed the need for faculty development in IPE to fulfill the need for educators who will be confident about their knowledge on IPE and able to effectively teach diverse groups of interprofessional learners.<sup>33,34</sup> Freeth et al. described the attributes of an ideal interprofessional educator that included experience with group facilitation and team teaching, pragmatic expectations of interprofessional learning, expertise in the competencies needed for IPE practice, experience in developing targeted assessments and providing specific feedback, and engagement in critical reflection on interprofessional teaching.<sup>35</sup> Greater institutional support and resources are

needed to create a cadre of faculty at each institution who will serve as IPE champions and role models for other faculty and learners.<sup>35,36</sup> Creating opportunities for interprofessional faculty to learn from one other's pedagogy, language, and curricula will facilitate their collaboration in teaching together effectively.<sup>37</sup>

The study had several limitations, including possible participation bias and the inclusion of only IM CDs who may not have been familiar with all IPE activities occurring in their medical schools. In addition, the survey was administered only 1 year after the new LCME standard was issued, and respondents might be overstating or offering a generous view of their IPE initiatives. Secular trends may have affected the changes noted in the IPE landscape.

Because the survey was anonymous, it was not possible to correlate the responses with the type of institution. Nonetheless, despite these limitations, this was a national survey with a high response rate (78%). The survey explored areas that had not been previously examined, such as the methods and time of IPE instruction, assessment tools used, and planned changes.

## CONCLUSIONS

Despite the issuance of the LCME standard on IPE, our study found that only a minority of IM clerkships included formal IPE activities. However, an increasing number of IM CDs planned to implement formal IPE activities in their clerkships.

The changes in the healthcare landscape over the last few years call for a collaborative interprofessional team approach to healthcare delivery, and demand that medical schools focus their efforts on preparing the future physician workforce to practice in such settings. Clerkship rotations, like the IM clerkship, offer unique opportunities for IPE that may remain underutilized. More resources are needed to train faculty who will design and successfully implement IPE programs and teach IPE in the clerkships. Medical educators should continue to seek ways to enhance their skills as “interprofessional educators” and to identify opportunities to incorporate IPE into medical students' clinical immersion experiences using effective educational methodologies.

---

**Contributors:** None.

**Corresponding Author:** Irene Alexandraki, MD, MPH; Department of Clinical Sciences Florida State University College of Medicine, Tallahassee, FL, USA (e-mail: irene.alexandraki@med.fsu.edu).

**Compliance with Ethical Standards:**

**Funders:** None.

**Prior Presentations:** This work was presented at the plenary session at the Academic Internal Medicine Week 2015 meeting of the Clerkship Directors in Internal Medicine and the Alliance for Academic Internal Medicine in Atlanta, GA.

**Conflict of Interest:** The authors declare that they do not have a conflict of interest.

## REFERENCES

1. LCME. ED-19-A. 2014; [http://www.lcme.org/connections/connections\\_2014-2015/ED-19-A\\_2014-2015.htm](http://www.lcme.org/connections/connections_2014-2015/ED-19-A_2014-2015.htm). Accessed 12/17/2016.
2. IECEP. Interprofessional Education Collaborative Expert Panel. Core competencies for interprofessional collaborative practice: report of an expert panel. Washington, DC: 2011.
3. Interprofessional Education Collaborative. Core competencies for interprofessional collaborative practice: 2016 update. Washington, DC: Interprofessional Education Collaborative; 2016.
4. **Reeves S, Fletcher S, Barr H, Birch I, Boet S, Davies N, McFadyen A, Rivera J, Kitto S.** A BEME systematic review of the effects of interprofessional education: BEME Guide No. 39. *Med Teach.* 2016;38(7):656-668.
5. **Bridges DR, Davidson RA, Odegard PS, Maki IV, Tomkowiak J.** Interprofessional collaboration: three best practice models of interprofessional education. *Med Educ Online.* 2011;16.
6. **Lam AY, Plein JB, Hudgins G, Stratton MA.** Silos to systems: three models for developing geriatric interprofessional education. *Consult Pharm J Am Soc Consult Pharm.* 2013;28(2):122-133.
7. **Aston SJ, Rheault W, Arenson C, et al.** Interprofessional education: a review and analysis of programs from three academic health centers. *Acad Med J Assoc Am Med Coll.* 2012;87(7):949-955.
8. **Blue AV, Mitcham M, Smith T, Raymond J, Greenberg R.** Changing the future of health professions: embedding interprofessional education within an academic health center. *Acad Med J Assoc Am Med Coll.* 2010;85(8):1290-1295.
9. **Oandasan I, Reeves S.** Key elements of interprofessional education. Part 2: factors, processes and outcomes. *J Interprof Care.* 2005;19(Suppl 1):39-48.
10. **Ho K, Jarvis-Selinger S, Borduas F, et al.** Making interprofessional education work: the strategic roles of the academy. *Acad Med J Assoc Am Med Coll.* 2008;83(10):934-940.
11. **Oandasan I, Reeves S.** Key elements for interprofessional education. Part 1: the learner, the educator and the learning context. *J Interprof Care.* 2005;19(Suppl 1):21-38.
12. **Curran VR, Sharpe D, Forristall J.** Attitudes of health sciences faculty members towards interprofessional teamwork and education. *Med Educ.* 2007;41(9):892-896.
13. **Liston BW, Fischer MA, Way DP, Torre D, Papp KK.** Interprofessional education in the internal medicine clerkship: results from a national survey. *Acad Med J Assoc Am Med Coll.* 2011;86(7):872-876.
14. **Sunguya BF, Hinthong W, Jimba M, Yasuoka J.** Interprofessional education for whom? -challenges and lessons learned from its implementation in developed countries and their application to developing countries: a systematic review. *PLoS One.* 2014;9(5), e96724.
15. **Thistlethwaite J.** Interprofessional education: a review of context, learning and the research agenda. *Med Educ.* 2012;46(1):58-70.
16. **Morphet J, Hood K, Cant R, Baulch J, Gilbee A, Sandry K.** Teaching teamwork: an evaluation of an interprofessional training ward placement for health care students. *Adv Med Educ Pract.* 2014;5:197-204.
17. **Hylin U, Nyholm H, Mattiasson AC, Ponzer S.** Interprofessional training in clinical practice on a training ward for healthcare students: a two-year follow-up. *J Interprof Care.* 2007;21(3):277-288.
18. **Ponzer S, Hylin U, Kusoffsky A, et al.** Interprofessional training in the context of clinical practice: goals and students' perceptions on clinical education wards. *Med Educ.* 2004;38(7):727-736.
19. **Hallin K, Kiessling A, Waldner A, Henriksson P.** Active interprofessional education in a patient based setting increases perceived collaborative and professional competence. *Med Teach.* 2009;31(2):151-157.
20. **Bandura A.** Social learning theory. Englewood Cliffs, NJ: Prentice-Hall; 1977.
21. **Hager P.** Current theories of workplace learning: a critical assessment. *International handbook of educational policy.* Vol 13: Springer International Handbooks of Education. 2005;829-846.
22. **Clancey W.** A tutorial on situated learning. 1995; [http://methodenpool.uni-koeln.de/situierteslernen/clancey\\_situated\\_learning.PDF](http://methodenpool.uni-koeln.de/situierteslernen/clancey_situated_learning.PDF). Accessed 12/17/2016.
23. **Everard KM, Crandall S, Blue A, Rottnek F, Pole D, Mainous AG 3rd.** Exploring interprofessional education in the family medicine clerkship: a CERA study. *Fam Med.* 2014;46(6):419-422.
24. **Grbic D, Caulfield M, Matthew D.** Interprofessional educational opportunities and medical students' understanding of the collaborative care of patients. *AAMC Anal Brief.* 2014;14(10):1-2.
25. **Nelson S, White CF, Hodges BD, Tassone M.** Interprofessional team training at the prelicensure level: a review of the literature. *Acad Med.* 2016.
26. **Clark PG.** Reflecting on reflection in interprofessional education: implications for theory and practice. *J Interprof Care.* 2009;23(3):213-223.
27. **Robertson B, Kaplan B, Atallah H, Higgins M, Lewitt MJ, Ander DS.** The use of simulation and a modified TeamSTEPS curriculum for medical and nursing student team training. *Simul Healthc J Soc Simul Healthc.* 2010;5(6):332-337.
28. **Stewart M, Kennedy N, Cuene-Grandidier H.** Undergraduate interprofessional education using high-fidelity paediatric simulation. *Clin Teach.* 2010;7(2):90-96.
29. **Tofil NM, Morris JL, Peterson DT, et al.** Interprofessional simulation training improves knowledge and teamwork in nursing and medical students during internal medicine clerkship. *J Hosp Med.* 2014;9(3):189-192.
30. **Nicksa GA, Anderson C, Fidler R, Stewart L.** Innovative approach using interprofessional simulation to educate surgical residents in technical and nontechnical skills in high-risk clinical scenarios. *JAMA Surg.* 2015;150(3):201-207.
31. **Hean S, Craddock D, Hammick M, Hammick M.** Theoretical insights into interprofessional education: AMEE Guide No. 62. *Med Teach.* 2012;34(2):e78-e101.
32. **Mann KV, McFetridge-Durdle J, Martin-Misener R, et al.** Interprofessional education for students of the health professions: the "seamless care" model. *J Interprof Care.* 2009;23(3):224-233.
33. **Buring SM, Bhushan A, Brazeau G, Conway S, Hansen L, Westberg S.** Keys to successful implementation of interprofessional education: learning location, faculty development, and curricular themes. *Am J Pharm Educ.* 2009;73(4):60.
34. **Kroboth P, Crismon LM, Daniels C, et al.** Getting to solutions in interprofessional education: report of the AACP 2006-2007 Professional Affairs Committee. *Am J Pharm Educ.* 2007;71(6) Article S19.
35. **Freeth D, Reeves S, Koppel I, Barr H.** Effective interprofessional education: development, delivery and evaluation. Oxford: Blackwell Publishing; 2005.
36. **Lawlis TR, Anson J, Greenfield D.** Barriers and enablers that influence sustainable interprofessional education: a literature review. *J Interprof Care.* 2014;28(4):305-310.
37. **Gordon MA, Lasater K, Brunett P, Dieckmann NF.** Interprofessional education: finding a place to start. *Nurse Educ.* 2015;40(5):249-253.