

DOI: <https://doi.org/10.33314/jnhrc.v19i1.3263>

Competency Based Post Graduate Residency Program at Patan Academy of Health Sciences, Nepal

Shrijana Shrestha,¹ Ashis Shrestha,¹ Jay Narayan Shah,¹ Rajesh Nath Gongal¹¹Patan Academy of Health Sciences, Lagenkhel, Lalitpur, Nepal.

ABSTRACT

Competency-based medical education has evolved as an alternative approach in the residency training program. It shows potential to align educational programs with health system priorities through defining the competencies of graduating doctors. Designing and implementing Competency Based Post Graduate (CBPG) training in a resource-limited setting, where most of the trainings are still run in a conventional approach, is a big challenge.

Patan Academy of Health Sciences, School of Medicine has taken the competency-based approach in the postgraduate residency training. Defining core competencies and connecting those to teaching methodology and assessment system are important initial steps in implementing the competency-based approach. The institution has implemented Entrustable Professional Activity (EPA), which is a unit of professional practice and helps to measure the trainees' achievements in the form of milestones. This paper describes the process of piloting and implementing the CBPG program at this school.

The school launched the CBPG training in 2018 and so far, three batches of residents have been enrolled in nine different subjects/disciplines. The first batch of trainee, having the PAHS Core competencies and the pre-defined discipline-specific EPAs certified, will be completing their training soon. The program is time and resource consuming. Continuous faculty development, commitment, supportive leadership and faculty readiness to adapt to newer approaches are the key to the program's successful implementation.

Keywords: Competency based medical education; Nepal; patan academy of health sciences; post graduate training; residency program

INTRODUCTION

Competency Based Medical Education (CBME) is not a new concept but it has emerged as a priority topic for health professions educators in the early twenty-first century. There has been increasing attention and debate around the issues surrounding CBME which has become a dominant approach to postgraduate medical education in many countries since the beginning of this century.^{1,2} For majority of medical schools in the western world, the competency frameworks outlined by the accrediting bodies like Canadian Medical Education Directives for Specialists (CanMEDS), Accreditation Council for Graduate Medical Education (ACGME) have now become the basis of teaching/training and the 'competencies' have become the unit of medical educational planning.¹

In Nepal most medical schools undertaking residency training are doing so in the conventional apprenticeship-based program with a defined time line which is

governed by the national accreditation body, the 'Nepal Medical Council' (NMC). Patan Academy of Health Sciences (PAHS), established in 2008, having enrolled undergraduate students from 2010, decided to start a Competency Based Post Graduate (CBPG) program considering it as a rational direction of travel for effectively training residents in the current environment of greater accountability and for the ultimate benefit of the patients.³ Patan Hospital, the Teaching Hospital of PAHS had been involved in the conventional postgraduate training run by other Academic institutions in Nepal (Tribhuvan University-Institute of Medicine and National Academy of Medical Sciences) for nearly three decades.

This paper highlights the process of implementation of the competency-based program in an institution that was used to the conventional methods of residency training.

PREPARATION AND PROCESS

After starting the undergraduate program, a Post

Correspondence: Prof Shrijana Shrestha, Patan Academy of Health Sciences, Lagenkhel, Lalitpur, Nepal. Email: shrijanashrestha@pahs.edu.np, Phone: +9779841239629.

Graduate (PG) Committee headed by the Dean, School of Medicine was formed in September 2010 in preparation of Post-graduate residency training program at PAHS. This committee led the ground works for developing the competency-based program. The committee worked to define the curricular principles, educational strategies and core competencies. It was decided to pilot this competency-based training in the Emergency Medicine Fellowship, an eighteen-month program for General Practitioners.⁴ This was started in the year 2015 with the help of faculties from Canada, where the competency-based training had been running in the General Practice residency program.

This competency-based fellowship program paved the way for implementing this methodology to the post-graduate residency program as a whole, providing a lot of lessons to the institution and the faculties. A stepwise approach was used and work progressed under the following steps: (i) Defining Curricular principles; (ii) Describing Educational strategies; (iii) Defining Core competencies; (iv) Identifying Discipline-specific Entrustable Professional Activities (EPAs); (v) Defining Teaching-learning (TL) tools; (vi) Defining Evaluation tools; (vii) Tagging the Core competencies to TL and evaluation tools; (viii) Defining the criteria for final certification.

Defining curricular principles

The central principle of CBME is that the competencies required for optimal patient care outcomes should be clearly defined and this forms the basis for curricular design and its components.⁵ The vital step in shifting from a traditional to a competency-based educational framework is to define the learner competencies.⁶ Four main themes have been outlined under CBME - focus on outcomes, emphasis on abilities, de-emphasis of time-based training, and promotion of learner-centredness.¹

Before defining the curricular principles, it was ensured that all the PAHS PG Committee members and the faculties had a common understanding on terminologies of competency and competence.

'Competencies' are knowledge, skills, attitudes and personal qualities essential to the practice of medicine and are used to set performance standards that must be met.⁷ As defined by the International CBME Collaborators in 2009, competency is 'An observable ability of a health professional, integrating multiple components such as

knowledge, skills, values and attitudes'.¹

'Competence' is defined as the ability to apply the possessed knowledge, skills and attitudes in the clinical environment for patient care to achieve optimal results. It is multi-dimensional and dynamic which changes with time, experience, and setting.¹ In addition to the cognitive and technical components, professional competence has been described to have other dimensions like integrative, contextual, affective (moral) and human relationships.⁸

Multiple workshops were conducted for the faculties so that all the faculties understood the principles and were involved in the process of curricular development. A set of curricular principles, for the PAHS CBPG program, were agreed upon, Table 1.

Table 1. Curricular principles for PAHS CBPG.

1. The program should be based on the development of competencies applicable to a particular career
2. The focus should be on what students learn and not on the time spent completing credits
3. The program should have a clear definition of expected outcomes or competencies
4. The process should enable the trainee, the program and the certification body to know an individual's trajectory of competency acquisition
5. The program should be capable of demonstrating the defined EPAs and ensure that these are done consistently and within the clinical environment

Describing educational strategies

The CBME is described as having two distinct features: a focus on specific domains of competence and a relative independence of time in training, making it an individualized approach that is particularly applicable in workplace training.² The driving force for curriculum in CBME is the outcome, that is, the knowledge application with an emphasis on what the trainee does, not what the trainee knows.^{5,9} It is a learner-centered, active, and lifelong experience that incorporates feedback between the teacher and the learner to fulfill the desired competency outcomes.¹⁰ The learning experiences are guided by individual progress towards competence while reflection and self-monitoring helps in continuing professional development.¹¹

These important variables for CBME that differ from the traditional time-based curriculum were analyzed and based on the principles outlined above, educational strategies were defined (Table 2).

Table 2. Educational Strategies for PAHS CBPG.

1. Principles of adult learning
2. Learning through self-reflection and feedback
3. Competencies requiring demonstration and documentation
4. Effort required from the resident to complete the defined competencies
5. Providing protected time for structured academic activities (Academic Day)

The 'Academic Day' was a new concept which was planned as a structured academic sessions, one day or two half days a week according to the convenience of the department. The objectives of this session were: providing a protected time for academic activities; identifying the key learning issues for the week; keeping track of assessments/ milestones and making the Residents learn the skill of self-reflection and action planning.

A 'Common Academic Day' was arranged every fortnight for four hours during which time residents of all disciplines come together for learning on common/generic topics applicable through all disciplines of medicine. The topics covered in the Common Academic Days were: Communication Skills, Scientific communication, Research Methodologies and Ethics.

Defining Core Competencies

The Core Competencies are now the basic language for defining physician competence and are also the principles used in the training of physicians.¹⁰ The competency frameworks laid by different accrediting bodies were studied in depth and eight generic core competencies were embraced by PAHS. The eight PAHS Core Competencies are: Professionalism; Patient-centered care; Clinical reasoning; Procedural skills; Communication; Scholarship; Leadership and Community orientation.¹²

With the exception of the eighth competency - 'Community orientation'- the rest are similar to most other competency frameworks. As PAHS is established on the social accountability mandate, we value the community orientation as one of the important core competencies of our trainee graduates.

Identifying EPAs

The term "Entrustable Professional Activity" (EPA) was introduced in 2005 to reconnect competency frameworks to the workplace.¹³ An EPA is 'a unit of professional practice, defined as a task or responsibility to be entrusted to a trainee once sufficient specific competence is reached to allow for unsupervised practice'.² The EPAs

reflect those activities that together constitute the profession and the use of EPAs are thought to bridge a potential gap between the theory of competency-based education and clinical practice.¹⁴ Discipline-specific EPAs represent the routine professional-life activities of physicians based on their specialty and subspecialty.

The task of defining the discipline-specific EPAs was assigned to respective departments. While defining the EPAs the points outlined by Olle ten Cate in his articles, were taken into consideration. As outlined by Olle ten Cate, EPAs should be part of essential professional work in a given context, they should be observable and measurable, should be independently executable, should be executable within a time frame, should reflect one or more competencies and they should be suitable for entrustment decisions.^{2,14}

The EPAs defined by each department/specialty for their respective disciplines were then presented to the PG Committee for discussion and approval.

Defining teaching-learning (TL) tools

Competency-based medical education (CBME) is changing the way we teach and assess residents. The CBME therefore, requires a substantial redefinition of assessment practices as well as faculty and learner roles, responsibilities, and relationships.⁹ In addition to the commonly used teaching-learning tools a few new tools were added with specific objectives.

The Educational tools used were: Ward based teaching; Case Based Discussion (CBD); Demonstration, Skill teaching; Presentations/ Seminars; Interdepartmental meetings; Research/ Thesis, scientific writing; Training courses and Undergraduate (UG) teaching.

Core Content Review (CCR), Quality Improvement (QI) project and peripheral/rural health facility placement were some additional tools used at PAHS. The CCR is a review of a text book where learning objectives are set; residents are given certain chapters of the book to read and self-assessment questions are given following which faculty moderated discussions are held every two to three months. Under the QI project, the residents are required to do one complete cycle of Audit to help them understand the importance of quality assessments and quality control. The objectives of the peripheral/rural health facility placement are to make residents understand the social determinants of health, learn to manage patients in a resource-limited setup, demonstrate the leadership skills, be acquainted with the appropriate referral system and make them understand the national and rural health system.

Defining assessment tools

It has been rightly said that ‘Clinical competence is a complex construct necessitating a diverse set of assessment tools and strategies’.¹⁵ Competency-based assessments are used to distinguish between the skills and knowledge that one already possesses and those for which one needs more education and training.¹⁰ It is not possible to assess everything residents are expected to demonstrate. Using a blueprint provides evidence that the assessment strategy is valid by ensuring sufficient and appropriate sampling.¹⁶

Assessment tools must be specifically matched to the competency to effectively evaluate outcomes. Evaluation should reflect real-world observation and consist of a “portfolio” of assessment tools⁸ and requires synthesizing the data collected from multiple assessors and multiple types of assessments.^{6,17} Based on these principles assessment tools were agreed upon.

The Assessment tools chosen were: Field note (Case notes with faculty feedbacks); Clinical Evaluation Exercise (Mini CEX/ CEX); Direct Observation of Procedural Skills (DOPS); Procedure Based assessment (PBA); Case Based Discussion (CBD); CCR with self-assessment questions; Thesis and scientific paper writing; Log book and Three-monthly evaluations on Core competencies.

The CBME requires effective information management and documentation.¹⁷ To see the growth trajectory of a learner, the process of learning and assessment needs to be well documented. The residents were made responsible for timely completing and documenting all the necessary components of formative assessments. For any assessment, perfect objectivity and standardization are neither possible nor desirable. Hence determining the threshold or standard for certification requires collective judgments and the consensus of experts.^{14,18} For this purpose, a three-monthly evaluation of the core competencies was undertaken where all the concerned faculties sit together to evaluate each resident.

Tagging core competencies with TL & Assessment Tools

A competency-based curriculum begins with outcomes in mind, based on which it defines the abilities needed by graduates and then develops milestones, instructional methods, and assessment tools to facilitate their acquisition by learners.¹ In the next step, the educational tools were tagged to one or more competencies, Table 3 and 4.

Table 3. Core competency and the Educational Tools for CBPG programs at PAHS

Competencies	Educational Tools
Patient-centered care	CBD, Case presentations, Ward-based teaching
Clinical reasoning	Ward-based teaching, CCR, CBD
Procedural Skill	Demonstration/practice
Communication Skill	UG Teaching, Training courses, Audit / QI projects
Scholarship	Journal club, Presentations, Audit/ QI project, Thesis, Scientific article, UG teaching
Leadership	Training courses, Audit / QI projects
Community orientation	Peripheral posting
Professionalism	The hidden curriculum, faculty role modelling, Training courses

Note: CBPG- Competency Based Post Graduate, PAHS- Patan Academy of Health Sciences, CBD- Case Based Discussion, CCR- Core Content Review, UG- undergraduate, QI- Quality Improvement

Table 4. Core competency and the Assessment Tools for CBPG programs at PAHS

Competencies	Assessment Tools
Patient-centered care	Field note (Case notes with feedbacks), CBD
Clinical reasoning	Field note, MiniCEX, CCR with self-assessment questions, CBD
Procedural Skill	DOPS, PBA
Communication Skill	Field note, Presentations, Log book
Scholarship	Presentations, Thesis, Scientific Paper, UG teaching
Leadership	Conducting training, QI projects
Community orientation	Logbook, 3-monthly evaluation
Professionalism	Field note, 3-monthly evaluation

Note: MiniCEX- Mini Clinical Examination, DOPS- Direct Observed procedural skill, PBA-Procedure Based Assessment

Defining criteria for certification

The final step was to define the criteria for certification. A resident’s readiness for unsupervised practice is determined by the attained competencies not the length of time spent in residency.² Even though there is a standardized language around the core competencies of medical education, there are still no standardized assessment methods to determine whether or not a learner had achieved all of the core competencies before completion of residency training.¹⁰ It is said that with a greater emphasis on frequent formative feedback, training will have a more learner-centred focus where time becomes a resource rather than a specific endpoint for training.³

The PAHS PG program practices continuous formative assessments along with two summative annual exams and one final summative exit exam. In addition to the EPA certifications and showing good performance on all the eight PAHS core competencies, the resident needs to pass the final summative exit exam. A significant weightage is given to the continuous assessments, the formative and annual summative exams, with the view that the final certification should not be based upon one single exit exam.

Criteria for certification includes: Certification of all the discipline-specific EPAs; Score of 4 or more in each of the eight domains of PAHS Core Competency (minimum requirement: all behaviors performed acceptably with room for improvement); Approval of thesis and submission of a scientific publishable article (can be of the thesis itself) and should obtain the minimum required score as per the Fixed-Criterion referenced pass mark in the Year 3 Summative exam as well as in the combined score of all the continuous formative and summative assessment

PROGRAM IMPLEMENTATION

After completion of all the above steps the challenge was to smoothly implement the CBPG at PAHS. The two most important issues were faculty development and resource/logistic planning.

Faculty development

It was recognized that faculty development in CBME is needed both at the systems level and also at the level of individual faculties. The faculties also need to become accustomed to providing continual assessments based on repeated observations rather than global, end-of-rotation impressions.¹⁹ Clinical practice also includes competencies outside the domain of medical

content (eg. communication skills) and faculties are required to develop strategies for teaching and assessing competence also in these other domains of practice.¹⁹

The EPA certification and tracking the resident’s trajectory using milestone charting^{20,21} was the biggest challenge as this was a completely new thing for PAHS faculties, Figure 1, and Table 5). Several faculty meetings and faculty development workshops on the educational and assessment tools and process were conducted. Research methodology and article writing workshops/trainings were undertaken for the faculties. Though the transition the teachers make to a CBME paradigm is likely to be slow, studies suggest that faculty development initiatives change learning and behavior.²²

In our experience, developing faculty competence in assessment and establishing an appropriate feedback system within the principles of CBME needed some time and patience.



Figure 1. Growth Trajectory (Dreyfus & Dreyfus model)²⁰
 Note: MS3- Medical student year-3, MS4- Medical student year-4, PGY1- Postgraduate year-1, PGY3- Postgraduate year-3

Table 5. Milestone Chart.²¹

Descriptor	Novice/ Beginner		Advanced Beginner		Competent		Professional			
	1	2	3	4	5	6	7	8	9	
Milestones	Milestones / Benchmarking for the rating									
Procedure	Observes the procedure/ tasks and acquires knowledge (Knows)		Assists the procedure/ tasks and applies the knowledge and acquires skills (Knows how)		Performs the procedure/ tasks in simulated setting (Shows how: Perform in-vitro)		Performs the procedure/ tasks in real setting under supervision (Does: Perform in-vivo)		Performs the procedure/ tasks in real setting independently (Does)	Teaches the procedure/ tasks in simulated and real settings (Teaches how)
Clinical examination	Observes the procedure/ tasks and acquires knowledge (Knows)		Assists the procedure/ tasks and applies the knowledge and acquires skills (Knows how)		Performs the procedure/ tasks in simulated setting (Shows how: Perform in-vitro)		Performs the procedure/ tasks in real setting under supervision (Does: Perform in-vivo)		Performs the procedure/ tasks in real setting independently (Does)	Teaches the procedure/ tasks in simulated and real settings (Teaches how)
Note:	PG Resident must score the rating of minimum 8 to get certification of competencies/ tasks									

Resource and logistic arrangements

The CBPG program is time and resource consuming and as it demands more extensive faculty engagement a few additional faculties were recruited. The curriculum, teaching-learning tools and assessment system were discussed, decided and approved by the PAHS Academic Council. The readiness to start the program was approved by the accrediting body, Nepal Medical Council. Program Directors for each of the Residency program were appointed and two subject committees, one each for Medicine & allied and Surgery & allied disciplines, were formed. A review committee comprising of the Dean, the Chair of Examination Management Committee and the respective Program Director was formed.

During the implementation phase one of the important issues was faculties facing some difficulties in balancing the clinical and academic responsibilities. Showing the faculties how to identify and assess the resident's competencies in their daily work can allow them to teach and evaluate in a CBME system with a minimum of clinical disruption.¹⁸ As it has been correctly said, the logistical challenges of implementing competency-based education are far from trivial.⁶ In resource-poor settings with limited manpower, it is very important to balance, prioritize and manage schedules as we adopt a new and more complex system of education.

Resident enrollment and training

The School started the Competency-based residency program in 2018 in six disciplines (General Practice, Internal Medicine, General Surgery, Paediatrics, Orthopaedics and Obstetrics & Gynaecology), with a total of 20 residents in the first year. The number increased to 34 in the second and 38 in the third year of enrollment with three new disciplines (Radiology, Psychiatry and Otolaryngorhinology) added. The first batch will be graduating by the end of 2020. They have completed all their requirements, all EPAs been certified and all the eight domains of Core competencies passed, thesis and publishable articles submitted for approvals.

Maintaining the standards and the consistency is the next and ongoing challenge for which continuous monitoring, faculty and resident feedbacks, program evaluation and the commitment for improvement is required.

CONCLUSIONS

In this time of greater responsibility of Academic Institutions, human resources with the required competencies relevant for the society, need to be trained. In this regard, competency-based medical

education is the way forward. Implementing this program at Patan Academy of Health Sciences, Nepal has shown that it is feasible even in a resource-poor setting and it paves the way for implementing the program in other institutions with similar settings. This requires commitment from the leadership, faculty engagement and ownership, continuous faculty development and the willingness to learn, modify and improve.

REFERENCES

1. Frank JR, Snell LS, Cate OT, Holmboe ES, Carraccio C, Swing SR, et al. Competency-based medical education: theory to practice. *Med Teach.* 2010;32(8):638-45. [[PubMed](#)]
2. Ten Cate O. Competency-based postgraduate medical education: past, present and future. *GMS J Med Educ.* 2017;34(5):Doc69. [[PubMed](#)]
3. Carraccio C, Wolfsthal SD, Englander R, Ferentz K, Martin C. Shifting paradigms: from Flexner to competencies. *Academic medicine.* 2002 May 1;77(5):361-7. [[Article](#)]
4. Patan Academy of Health Sciences Fellowship in Emergency Medicine www.pahs.edu.np > PAHS-EM-Fellowship-27-Aug-2013
5. Ross S, Hauer KE, van Melle E. Outcomes are what matter: competency-based medical education gets us to our goal. *MedEdPublish.* 2018 Apr 12;7. [[Article](#)]
6. Gruppen LD, Mangrulkar RS, Kolars JC. The promise of competency-based education in the health professions for improving global health. *Hum Resour Health.* 2012;10(1):43. [[Article](#)]
7. Albanese MA, Mejicano G, Mullan P, Kokotailo P, Gruppen L. Defining characteristics of educational competencies. *Med Educ.* 2008;42(3):248-55. [[Article](#)]
8. Epstein RM, Hundert EM. Defining and assessing professional competence. *JAMA.* 2002;287(2):226-35. [[Article](#)]
9. Levine MF, Shorten G. Competency-based medical education: its time has arrived. *Can J Anaesth.* 2016;63(7):802-6. [[Article](#)]
10. What Is Competency-Based Medical Education? NEJM Knowledge+ Team, NEJM. June 2017. [Accessed on: November 2020] Available at: <https://knowledgeplus.nejm.org/blog/what-is-competency-based-medical-education/>
11. Halman M, Baker L, Ng S. Using critical consciousness to inform health professions education. *Perspect Med Educ.*

- 2017;6(1):12-20.[\[Article\]](#)
12. PAHS MD/MS Information Booklet -2019. <https://www.pahs.edu.np/mdms-program/mdms-information-booklet-2019/>
 13. Ten Cate O. Entrustability of professional activities and competency-bases training. Medical education. 2005;39:1176-7.[\[Download PDF\]](#)
 14. Ten Cate O, Scheele F. Competency-based postgraduate training: can we bridge the gap between theory and clinical practice?. Acad Med. 2007;82(6):542-7.[\[Article\]](#)
 15. Humphrey-Murto S, Wood TJ, Ross S, Tavares W, Kvern B, Sidhu R, et al. Assessment pearls for competency-based medical education. J Grad Med Educ. 2017;9(6):688-91.[\[Article\]](#)
 16. Hamdy H. Blueprinting for the assessment of health care professionals. Clin Teach. 2006;3(3):175-9.[\[Article\]](#)
 17. Lockyer J, Carraccio C, Chan MK, Hart D, Smee S, Touchie C, et al. Core principles of assessment in competency-based medical education. Med Teach. 2017;39(6):609-16.[\[Article\]](#)
 18. Van der Vleuten CP, Schuwirth LW, Driessen EW, Dijkstra J, Tigelaar D, Baartman LK, et al. A model for programmatic assessment fit for purpose. Med Teach. 2012;34(3):205-14.
 19. Dath D, Iobst W, International CBME Collaborators. The importance of faculty development in the transition to competency-based medical education. Med Teach. 2010;32(8):683-6.[\[Article\]](#)
 20. Carraccio, CL, Benson, BJ, Nixon LJ, Derstine, P L. From the educational bench to the clinical bedside: Translating the dreyfus developmental model to the learning of clinical skills. Acad Med. 2008; 83(8):761-67. [\[Article\]](#)
 21. Dhaliwal U, Gupta P, Singh T. Entrustable professional activities: Teaching and assessing clinical competence. Indian Pediatr. 2015;52(7):591-7.[\[Article\]](#)
 22. Steinert Y, Mann K, Anderson B, Barnett BM, Centeno A, Naismith L, et al. A systematic review of faculty development initiatives designed to enhance teaching effectiveness: A 10-year update: BEME Guide No. 40. Med Teach. 2016;38(8):769-86.[\[Article\]](#)