Chapter 13

New Horizons in Emergency Medicine Teaching and Training

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Additional information is available at the end of the chapter

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Abstract

Emergency medicine (EM) is a unique field where the logistics of work environment is the biggest challenge for any organized traditional teaching and training. The shift pattern of work, absence of availability of real-time situations in controlled environment, availability of teaching faculty 24/7 and quality control of teaching and training are the major challenges that need to be considered. It requires lot of organizational, departmental as well as operational support to run a successful teaching program where all the important aspects of teaching and training are considered. In the emergency teaching and training, issues of supervision are of prime importance. The fear of complaints and litigations is enormous. Meeting the six core competencies of Accreditation Council for Graduate Medical Education (ACGME) and achieving the milestones before the residents are signed off are the goals and objectives of any good teaching program. In this chapter, we discuss the important modifications in teaching methods, which can fulfill the important requirements and demands of this unique field which is full of challenges. We also discuss the different models of teaching and training which are different from standard traditional didactic teaching which can be adopted and may help in achieving emergency medicine core knowledge, competencies and skills.

Keywords: emergency medicine, teaching and training, didactic teaching, achieving goals of training, mentorship

1. Introduction

Teaching and training in emergency medicine (EM) is one of the biggest challenges considering the dynamics of this field. The nature of work, the pattern of shift duties and pressure of working environment is one of the biggest challenges in getting quality training and teaching.

All these problems can be addressed if proper guidance is provided to the trainers and the candidates, and there is an efficient system of assessing both the candidates and trainers.

2. Core of emergency medicine teaching: new horizons

Objective- and goal-oriented teaching and training are the core of modernized teaching and training. Achieving these objectives by training the trainers is the key. All these objectives will be achieved if we focus on the quality of trainers by educating them what to teach, how to teach, how to assess and how to assure achieving different milestones.

The objective of quality teaching and training program is to achieve the minimum, identifiable, and quantifiable results which can be compared to any international benchmark. It is very important to define these benchmarks at the start of any program so that everyone is aware of the expectations. In the USA, the residency teaching and training program follows the Accreditation council of Graduate Medical Education standards. The six core competencies of teaching and training are the tools used to evaluate and assess the candidates. These six core competencies include medical knowledge, patient care, professionalism, intercommunication skills, system-based practice and problem-based learning. Achieving all these competencies assures that all the important domains are met before the candidates are finally signed off from the program.

The assessment is done by looking at the milestones which are achieved in each competency mentioned earlier. Milestones are used to assess residents progress and achievement of required skill and competency over period of time. The milestones are identified in each of six core competencies. The performance in each milestone in any given core competency describes the residents' level. Each milestone is assessed individually to look at the level achieved by the resident to identify the areas which need extra support.

2.1. Important stakeholders in teaching and training

For a successful program, it is important that the stakeholders are identified. This helps in defining the roles and responsibilities of all the stakeholders. In any good teaching program, following are the stakeholders who play important roles:

1. Candidates
2. Faculty (Dedicated and nondedicated)
3. Department

Selection of focused and committed candidates is the first requirement for any successful program. Selected residents must be given the clear goals and objectives at the start of the program. The dedicated faculty is the core faculty who should lead and participate in important committees and groups to take necessary decisions and actions related to the candidates. The nondedicated faculty includes all other clinical staffs who are working in the department and responsible for the residents' teaching and training at the shop floor.

All the stakeholders need to be educated to know their roles and responsibilities. Identifying the objectives and targets makes it easy to have a self-check.

2.1.1. Candidates

Candidate selection is done in consideration of dynamics of emergency medicine specialty. During selection, the panel should make sure that candidates understand the specialty requirements and demands. Selecting the candidates whose personality can cope with the nature of emergency medicine specialty is the principle of selection criteria. Selected candidates should be accommodative, flexible, tolerating, committed, dedicated with clear vision to stay and perform with all the challenges of this field.

After selection, it is important to educate the candidates about the program requirement objectives of each year of training. Proper counseling is needed to educate them to understand the program requirements. They must be given the clear targets at the start of each academic year and assessed at the end of the academic year to look for targets and milestones achieved.

2.1.2. Trainers: core faculty and faculty

The faculty members are the pillars of any training program. They are the ones who assure the quality of candidates and the program. Selection of suitable faculty members is one of the most important and difficult task. The faculty members can be broadly divided into two groups. One group includes core faculty members who are the most experienced members in the group and are responsible for important decisions taken in the program. The other group includes faculty members who are responsible for support at shop floor and continuous feedback and assessment of residents.

2.1.2.1. Core faculty members

They are the most experienced members in the group who are selected based on their performance, commitment, excellent portfolio and dedication to the program. The selection must be done after following robust rules and criteria and should include input from the department, candidates as well as their achievements. Core faculty members are involved in important committees and groups and must be given the leadership roles and responsibilities. They must be given tasks to work autonomously but at the same time be accountable to Program Director. Their number should be enough to make sure that they are not overwhelmed with work and they fulfill the program requirements. The number of trainees defines the number of core faculty needed. For every 5–6 candidates, there must be one core faculty member. They must be responsible for the close monitoring of trainee physicians.

2.1.2.2. Faculty members

In a training institution, every member of clinical team is considered the faculty member by default. They are expected to teach, train and assess trainee and provide them all the support required. In a tertiary care setup, this is a fundamental requirement and all the staff is bound to follow this. On the one hand, the faculty members are expected to do bedside training of

trainee physician, and on the other hand, it is made sure that the faculty members are trained to train. They are capable, competent and committed. There must be a quality check on what they teach and this requires constant faculty development programs to educate them.

2.1.3. Department/training institution

The training department is one of the most important stakeholders in the program because it provides the ideal environment for teaching and training. Continuous and unlimited departmental support is a key for successful training program. All the faculty members are encouraged for professional training support and help. The department provides enough protected time to teaching core faculty to support the program. Department also provides important courses and training to faculty to run the quality program. They also provide environment for continuous medical education in the form of grand rounds, mortality and morbidity (M&M) conferences and journal clubs (JC).

2.2. Hierarchy, committees and role assignment

To run a successful program, there must be a defined hierarchy to make everyone accountable for their roles and job.

The Program Director is the overall responsible member for the whole program. The selection of Program Director is done considering the seniority, experience in education and training and the suitable portfolio for the job. The selection should be done by considering the training background, achievements in the field and performance. Program Director should delegate important tasks to all the members and make sure that they are done timely and efficiently. Different aspects of program are run and monitored by important committees. The purpose of the committees is to focus on important domains of the teaching and training.

The important domains to be addressed are education and training, program evaluation and trainees' clinical competencies. Each committee works autonomously under the leadership of a lead core faculty who report to Program Director.

2.2.1. Education group

There must be a dedicated core faculty to lead the education group to nurture the requirements of the education. The responsibility of this group should be to do curriculum mapping to international curriculum and improve it. The teaching planner must be prepared in such a way that all the important core topics are covered and important skills are taught. They must do frequent assessments to look for trainees' performance and knowledge of the subject. They choose suitable mentors who are given responsibilities of their mentee. The mentors supervise 2–3 mentees and all the important messages are delivered to residents through their mentors. Mentors should frequently hold meetings with the mentee for detailed assessment of candidates, which includes case logs, procedures, work-based assessment, medical knowledge, behavior and attitude. They are responsible for the assessment of medical knowledge by conducting exams.

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2.2.2. Program evaluation

The lead core faculty of this group assures the program quality, faculty performance, trainee performance and quality of graduates. Multiple tools can be used to measure this against a standard benchmark. It must be done by maintaining the confidentiality so that the best feedback is taken. Program quality evaluation covers all the aspects of the program including candidate's orientation to the program when they join, program design, educational format, work environment, system of evaluations, research, departmental support, resources, infrastructure, faculty support and the support of core faculty and Program Director. This is done by both residents and faculty members. The lead of the committee should maintain the confidentiality, and the result is relayed to the Program Director to take necessary actions.

The group also ensures that residents are evaluated through a robust system where all the six core competencies are assessed. Trainees work-based assessments are done. This includes case-based discussion, Mini-Cex, direct observation of procedural skills (DOPS), standardized direct observational assessment tool (SDOT), formative assessment, summative assessment, biannual evaluation and 360 evaluation.

All these evaluation helps in assessing the overall teaching environment as well as the performance. It will cover all the important stakeholders (candidates, trainers and training site) and important parameters like contents, quality, performance, professionalism, behavior and attitude. It will also look at policies and protocols followed and outcome of the product.

2.2.3. Trainees' clinical competency

The lead for clinical competency group is responsible for keeping a quality check on the milestones achieved, professionalism, performance, medical knowledge, patient care, system-based practice, problem-based learning and communication skills.

The committee report decides for final signing off of trainee at the end of each year of training. The promotion to next stage is not done if trainee fails to achieve the minimum standards.

2.3. Mentors and mentee

Mentor mentee program is one of the best ways of monitoring the resident's performance [1]. The selection of mentors should depend on competency, teaching skills, willingness to teach and train and expertise in evaluating the trainee. The number of mentors should be kept minimum. Ideally, each mentor should not supervise more than 3–4 mentees. The core faculty should further supervise 3–4 mentors as chief mentors so that there is a proper guidance of mentors as well as mentees. The chief mentors will make sure that uniform message is passed down to each mentor level. The chief mentors will make sure that all the mentors are following the same standards and protocols.

There must be 4 monthly feedbacks about the mentors and mentees. The mentors should evaluate mentees to look for their performance including work-based assessment, educational day attendance, logbook record, professionalism, 360 evaluations as well as exam preparation [2].

The mentee should also do 4 monthly evaluations of their mentors, which include availability of mentors whenever needed, their attitude, behavior, willingness to teach, bedside teaching and their support to residents in preparing for lectures and exams.

2.4. Faculty development programs and continued medical education

Teaching and training of residents need lot of faculty training and development. To have a good teaching and training program, there must be a system where the trainer must be trained and guided. Trainers need professional support and guidance to understand the requirements of the program and the candidates. They should be given expertise to know the milestones in the program and system to assess them. There should be harmony in the evaluation system so that all evaluate candidates on the same parameters. The important milestones are tested and candidates are scored. Those who are weak and are not achieving the minimum required milestones must be highlighted through a fair system and then referred to the senior core faculty for proper counseling and mitigation.

The faculty should also be provided all important courses and trainings which are needed by them for proper teaching of trainee physician. In a tertiary care setup where there is a rapid staff turnover, there is a strong need of having a good faculty development programs so that the new faculty members are given guidance and orientation to the program.

Program requirements are assessed by the senior management, and all the arrangements need to be done to provide important training courses and workshops to the trainers. The faculty is also encouraged to improve their scholarly activities and educational portfolio. It has to be assessed regularly so that necessary actions are taken if there is any deficiency in their scholarly portfolio.

2.5. Tools for assessment

For a quality education program, there must be a robust way of evaluating the candidates. Different tools must be created to assess each aspect of the program. The tools must include forms, questionnaire and surveys to assess the program quality, faculty, residents, mentors, mentee and evaluation of clinical skills and medical knowledge. Following are the different types of evaluating tools to assess the program in detail:

1. Program Evaluation Form: See **Table 1**
2. Mentors Evaluation by mentee: See **Table 2**
3. Mentee Evaluation by mentor: see **Table 3**
4. Work Based Assessment: the Work Based Assessment is one of the best ways to do detailed trainee assessment. It rely more on how the trainer is trained to do this assessment. The responsibility of evaluation lies on the trainer, and this cannot be done unless the trainer has the expertise and experience of doing this. It needs good faculty development programs which again is the responsibility of teaching institution. Thus, the responsibility of training is shared by all the three stakeholders, which form triangle of learning

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A. Induction and introduction of EMRTP according to residency year	**1**	**2**	**3**	**4**	**5**
A1.You are given proper guidance for your whole year of training.					
A2.You are given proper goals, objectives to be achieved during your residency year.					
A3.You are given proper orientation and introduction about the departments, facilities, teaching faculty, educational materials.					
Your overall rating for the Induction and Introduction module	Not Satisfactory (please comment why it is not satisfactory and what can be done to improve it)				Satisfactory
Additional comments:					

B. Over all Program design	**1**	**2**	**3**	**4**	**5**
B1.EMRTP has well defined goals and objectives					
B2.The Program is well structured and organized					
B3.The faculty and residents are aware of these goals.					
B4. The program has the means to achieve its goals and objectives					
B5.The Program incorporates core competencies into all levels of its training and evaluation					
B6.Program complies with duty hour policy for residents					
Your overall rating of this module:	Unsatisfactory				Satisfactory
Additional comments					

C. Educational format and rating	**1**	**2**	**3**	**4**	**5**
C1.The program provides ample opportunity (time and resources) for se006Cf-directed learning					
C2.The format is easy to understand and learn					
C3.The format is addressing the requirements of the candidate					
C4.The format is based on scientific and professional needs.					
C5.The bed side teaching is appropriate in terms of quality and quantity					
C6.The Tuesday activities are very helpful and informative for learning and improving					
C7. The journal clubs are very useful in developing residents' awareness of EBM and research					
C8.The additional courses and workshops are very good and helpful in terms of quality and numbers.					
Overall rating of this module:	Unsatisfactory				Satisfactory
Additional comments					

D. Work environment	**1**	**2**	**3**	**4**	**5**
D1. Your training sites are adequate in terms of number and educational contents?					
D2.The EM patient population case mix is adequate in number and variety.					
D3.You are fairly exposed to the critical cases in the ED.					
D4.Your clinical work is continuously supervised and proper teaching is assured					
D5. The supervisors and consultants guide you and teach you in most cases you see in the ED					
D6. You have ample opportunity to develop procedural, teaching and leadership skills.					
D7.You are provided with progressive responsibilities appropriate to their PGY level of training.					
D8. There is adequate number of medical staff to meet the demand for service needs of the ED					
D9. At shop floor, you can get help of seniors and Faculty whenever its required					
D10. There is presence of Consultants and faculty 24/7 at the shop floor					
How you Overall rate this module	Unsatisfactory				Satisfactory
Additional comments					

E. Evaluation	**1**	**2**	**3**	**4**	**5**
E1.My Formative evaluation have been useful and constructive					
E2.My summative evaluation has been useful and constructive					
E3.My Summative evaluation has been comprehensive in assessing all the 6 core competencies					
E4.My evaluation process has been conducted in a fair and reasonable manner and my deficiencies are discussed for my improvement.					
E5. I am given the chance to discuss my deficiencies to improve					
E6.I am regularly given proper feed backs by mentor and PD/APD on my progress.					
E7. I am given full support and help to make me eligible to sit for the board exam					
How you Overall rate this module	Unsatisfactory				Satisfactory
Additional comments					

F. Research	**1**	**2**	**3**	**4**	**5**
F1.I have been given ample opportunity to develop understanding and interest in EM research					
F2.I have received guidance and encouragement in research activities					
How you overall rate this module	Unsatisfactory				Satisfactory
Additional comments					

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G. Departmental and interdepartmental support/relations	**1**	**2**	**3**	**4**	**5**
G1.Relationship with other dept. is optimum					
G2.Other dept. co-operates in getting the required standards of teaching during rotations.					
G3. Other departments teach the required curriculum during rotations					
G4.Support of ED department staff is optimum during training					
G5.Other departments support your attendance during Tuesday activity.					
How you Overall rate this module	Unsatisfactory			Satisfactory	
Additional comments					

H. Resources, infrastructure	**1**	**2**	**3**	**4**	**5**
H1.ED infrastructure provides adequate and ample space and facilities for educational needs.					
H2.HMC infrastructure provides adequate and ample space and facilities for educational need.					
Your overall rating of this module:	Unsatisfactory			Satisfactory	
Additional comments					

I. Faculty/Mentor role	**1**	**2**	**3**	**4**	**5**
I1.There is adequate EM faculty in terms of number and availability for my educational need					
I2.The Faculty is given ample opportunity to supervise trainees in developing their clinical skills, professional, teaching, leadership, and management skills					
I3.The faculty actively participates in bedside teaching of residents					
I4.Faculty actively participates in the Tuesday activity.					
I5. The faculty gives regular feedbacks to the residents about their progress					
Your overall rating of this module	Unsatisfactory			Satisfactory	
Additional comments:					

J. Program Director	**1**	**2**	**3**	**4**	**5**
J1. PD gives feedback about your progress and deficiencies					
J2.PD addresses all the issues and problems which are relayed to him					
J3.PD plays effective role in dealing with educational and teaching issues					
J4.PD plays effective role in dealing with issues of services, Rota, education, faculty and rotation issues in other departments					
J5. The PD is approachable and respond to you whenever contacted.					
J6. The PD is Helpful and understands your problems.					
J7. The PD discuss with you to sort out your problems.					
Your overall rating of this module:	Unsatisfactory			Satisfactory	
Additional comments					

Associate Program Director	Strongly disagree	Disagree	Unable to comment	Agree	Strongly agree
K1.APD gives regular feedback about your progress and deficiencies					
K2.APD addresses all the issues and problems which are relayed to him					
K3.APD plays effective role in dealing with educational and teaching issues					
K4.APD plays effective role in dealing with issues of services, Rota, education, faculty and rotation issues in other departments					
K5. The APD is approachable and respond to you whenever contacted.					
K6. The APD is Helpful and understands your problems.					
J7. The APD discuss with you to sort out your problems.					
Your overall rating of this module:	Unsatisfactory (Comment Why)			Satisfactory	
Additional comments					

Program Coordinator	Strongly disagree	Disagree	Unable to comment	Agree	Strongly agree
L1. PC is helpful and cooperative					
L2. PC always responds to issues and problems					
L3. Pc is reliable.					
L4. PC is efficient in dealing with your issues					
Additional comments					

Chief Resident	Strongly disagree	Disagree	Unable to comment	Agree	Strongly agree
M1. Is He Easily Approachable					
M2. Does he respond to you timely and efficiently when contacted					
M3. Does he cooperate with you					
M4. Does he represent you and raise your issues to PD/ APD and CF timely?					
M5. Do you think that he is perfectly doing what he is expected to do as CR					
Additional comment: (please write your expectations and issues you would like to raise)					

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Core faculty	Strongly disagree	Disagree	Unable to comment	Agree	Strongly agree
N1. Is CF Easily Approachable					
N2. Do they respond to you timely and efficiently when contacted					
N3. Do they cooperate with you					
N4. Do they represent you and raise your issues to PD/APD timely?					
N5. Do you think that they are perfectly doing what they are expected to do as CF.					
Additional Comment: (please write your expectations and issues you would like to raise)					
1 = Unable to comment, 2 strongly disagree, 3 Disagree, 4 agree, 5 strongly agree					

Table 1. Program evaluation form.

1. Your Mentor is approachable when required. Yes/No
2. Your Mentor is helpful in your educational tasks when asked for. Yes/No
3. Your Mentor is professional whenever you approach him. Yes/No
4. Your Mentor is helpful in the clinical teaching and training whenever you approach him. Yes/No
5. Your Mentor helps you in exam preparation and guidance whenever you approach him. Yes/No
6. Your Mentor has good teaching skills. Yes/No
7. Your mentor is helpful in research guidance. Yes/No
8. Your Mentor helps you in preparing lectures and didactic activities whenever you approach him. Yes/No
9. Your Mentor has done Case Based Discussions whenever you have approached him. Yes/No
10. Your Mentor has helped you in preparing and completing logbook. Yes/No
11. Your Mentor has helped you in completing the DOPS. Yes/No
12. Your Mentor has completed SDOT forms when asked for. Yes/No
Explain what are the good things about your mentor and why?
Explain what are the concerns which you want to be addressed?

Table 2. Mentor Evaluation by Mentee.

(institution-trainee-trainer). The trainers are given objectives and goals. There is a standardized assessment tool and the trainers are trained in using these tools to do assessment. The faculty development programs run by the institution make sure that the trainers are trained to do these assessments. This is a dynamic process which makes sure that there is a continuous environment for learning and training to have better outcome. Following are the different tools used to assess the trainee:

Domains		(July- Oct) (Nov-Feb) (Mar-June)
Log Book		
WBA	Mini-CEX	
	DOPS	
	SDOT	
	CBD	
Educational	Oral cases	
	Presentations	
	M&M	
	JC	
	Follow up cases	
MSF/360 evaluation		
Formative assessment		
Research		
Quality Projects		
Courses and Conferences		
Attendance		
Global Report		

Table 3. Mentee Evaluation by Mentor.

- Mini-Cex: [5, 7] the mini clinical evaluation exercise provides a 15-min snapshot of how you interact with patients in a secondary care setting. It covers major core competencies including history taking, examination skills, communication skills, clinical judgment, professionalism and overall clinical care. This is a snapshot of performance where in a short time, the assessor assesses the trainee's performance. There is no active participation from trainee and it is just observation of what trainee does. There is no argument or discussion over the case.
- SDOT: Refs. [8–12] the standardized direct observational assessment tool (SDOT) is a tool developed by Council of Emergency Medicine Residency Directors (CORD) to assess and evaluate the residents based on the core competencies as defined by the ACGME. They are: medical knowledge, patient care, professionalism, interpersonal and communication skills, practice-based learning, and system-based practice. The SDOT is based on a direct observation of the resident by a faculty member

  This assessment tool, the SDOT, is designed to obtain objective data through observation of residents during actual ED patient encounters. Each item should be judged as either: "Needs Improvement (**NI**)," "Meets Expectations (**ME**)," "Above Expected (**AE**)," or "Not Assessed (**NA**)" for level of training. This detailed assessment tool bounds assessor as well to have a detailed evaluation of trainee. It needs proper

training and understanding of the assessor, which requires faculty development programs to make sure that all the trainers are on same page and they are trained to evaluate and assess the trainee.

- DOPS: [13–15] direct observation of procedural skills is a workplace-based assessment tool for trainees, which has been designed for the assessment of practical skills. It is an assessment of performance. All the important procedures can be taught and tested in controlled environment on models or phantoms, and this tool can be used to assess:
  - trainees' understanding of basics of subject including the anatomy and landmarks.
  - trainees' skills to perform the procedure and
  - trainees' depth of knowledge on the subject, including awareness of complications and ability to deal with them.

It provides an environment for one-to-one discussion and interaction.

- Formative Assessment: [17] this is an assessment of trainee at the end of each block or rotation. It is the snapshot of that rotation. The trainer is expected to complete this evaluation within the time frame offered by the program. Formative evaluation gives information about the performance of trainee during that block. It will reflect the performance of trainee during specialty rotation. Each rotation block will be given the objectives of rotation which are expected from the trainee and the trainer. The trainer will make sure that the trainee is given all the important skills which are required by the parent specialty. This will help in keeping the trainee focused.
- Summative Assessment: [18] this is the assessment of trainee at the end of each academic year or after completion of training. This will depend on overall performance of trainee during each rotation. It is a collective evaluation which will be based on multiple assessments done throughout the training sessions.
- Case-based assessment: [19–21] a case-based assessment or discussion involves a comprehensive review of clinical case(s) between an advanced trainee and an assessor. After the case-based discussion, the assessor provides valuable feedback to help the trainee improve and structure their future learning.

Aim of this exercise is to:

(I) Give a detailed and structured feedback on trainees' learning. This will be used as a guide to improve his learning. This is quick, instant and readily available.

(II) Improve clinical decision-making, clinical knowledge and patient management. The valuable advices of assessor which is based on his knowledge, expertise and experience will help in giving the best possible solution and also platform for healthy discussion where evidence-based problem solving is done.

(III) Provide a trainee with an opportunity to discuss their approach to the case and identify strategies to improve their practice.

(IV) Enable the assessor to share professional knowledge and experience.

2.6. Multisource feedback (360 evaluation)

Multisource feedback is one of the best ways to look at the overall personality and performance of the trainee [22]. It covers all the aspects including medical knowledge, attitude, behavior, communication skills and leadership qualities. This is done by the colleagues, seniors, paramedical staff, nurses as well as patients. Multisource feedback is one of the best ways to look at the minute details about the trainee physician which may impact the future performance as a leader.

2.7. Teaching assessment

- **Faculty and Trainee Teaching Assessment:** the program should provide opportunity and environment for teaching assessments to maintain the quality of program. All the presentations done by the trainee as well as the trainer are evaluated by the senior core faculty to have quality check of the program. The Core Faculty should give feedback to all presenters about their presentations These Feedbacks are given by completing a detailed form. The detailed form should focus on the contents of presentation, style, format, time management, audience engagement as well as the presentation skills.
- **Teaching Activity Evaluation:** the teaching activities must be evaluated to look at the outcomes and the targets achieved. The curriculum covered should be looked at. Comparison to international curriculum by curriculum mapping is done. Any deficiencies found must be addressed.

2.7.1. Rotation assessment

At the end of the rotation, the trainee must give feedback about his experience during the rotation. It will give information about the rotation if it is helpful in providing the required expertise and training. There are standard requirements and objectives for each rotation and these are mentioned in the program's letter of agreement (PLA). There is a PLA for each rotation which clearly says the objectives of this rotation, and it is expected that the department where the resident is rotating is respecting this requirement and make sure to do every effort to achieve this. The feedback given by the trainee during the rotation is a guide for the Program Director and the education team to decide how they should work to improve the system and make the rotation more effective for the trainee. We take this feedback at three stages. One is before starting the rotation where we discuss with trainee to know his awareness about the goals and objectives of his rotation. Second during the rotation when they have completed 50% of their rotation. Any issues highlighted by the trainee during this time are raised to the relevant department to take necessary steps to improve it. Third is after the completion of rotation when their input and feedback about their rotation helps us in planning

to modify and rectify the rotation as per our requirements and take necessary steps which will benefit the other trainees in future.

2.7.2. Milestone assessment

Milestone Assessment is one of the ways to assess the trainee's progress in the program. [6, 23] Different milestones are assessed in the six core competencies, and residents' level is measured. The EM milestones are a matrix of the knowledge, skills, abilities, attitudes and experiences that should be acquired during specialty training in emergency medicine. The level which a trainee is demonstrating in each year helps us in assessing his performance and gives a comparison with his other colleagues. Before the trainee is promoted to the next stage, the level is recorded so that performance is monitored. There are standard milestones identified in the emergency medicine training program. These milestones focus on ACGME core competencies and also test the following important aspects of training:

- taking focused history and performing physical examination
- requesting investigations and diagnostic tests and interpretation of these investigations
- performing important tasks like managing airway
- emergency stabilization of patient
- pharmacotherapy
- observation and reassessment
- disposition of patient
- skills of multitasking
- general approach to procedures
- anesthesia and acute pain management
- other diagnostic and therapeutic procedures (goal-directed focused ultrasound-diagnostic and procedural)
- wound management
- vascular access
- medical knowledge
- patient care
- system-based management
- practice-based learning
- technology

- professionalism
- accountability
- interpersonal communication skills
- team management

The trainee is assessed to look for if he is at beginner level or at advanced level. There are five levels based on his performance. Each level identifies trainee's capability and performance. The trainer will mark the trainee's level which can be used to identify the deficiencies so that other faculty members can work on this. These milestone levels are not related to years of training. A trainee in year 2 may be at level 3 in history taking, whereas a trainee in year 3 may be at level 2.

2.8. Designing curriculum

Curriculum designing is the core of emergency medicine program [16]. The curriculum should address the standard emergency medicine requirements as well as should address the local area requirements to focus on those important topics which need special attention. This includes important diseases prevalent in that area as well as the local management protocols and procedures. The curriculum should include all the important topics and contents which are considered core of this specialty. There must be an annual review of curriculum and mapping with international curriculum to look for any modifications needed. The curriculum should focus on skills, procedures, scientific knowledge, quality and research, leadership and management skills, communication skills, awareness about cost-effectiveness and focus on new modalities and technology.

2.9. Empowering core faculty

The core faculty must be empowered to deliver the quality education and training. They must be given protected time and resources so that they can spend enough time in delivering the quality education and training. The core faculty must be given the leadership role in each committee so that they can make sure that each aspect of the program is given proper attention. The lead for program evaluation is responsible for quality of teaching and training. He gathers all the important information and data by taking feedbacks and doing surveys about the program. He writes a detailed independent report about the program and should give recommendations to the Program Director about the changes required. These recommendations are discussed in the quarterly program evaluation committee meeting for proper actions. Each committee lead should work independently to collect information and data about the program and these data should be used for program improvement.

2.10. Dedicated educational hours and different teaching methods

To have quality training, there must be a dedicated day for the didactic teaching and training [3]. All the important topics need to be covered. Different teaching methods and styles need to

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be adopted to make sure that relevant information is delivered to the trainee. The methods adopted should assure that trainee is given the skills of teaching and presentations, skills to learn evidence-based knowledge, skills to get familiar with system and protocols in the organization and skills to implement the evidence-based knowledge. We have divided our teaching activity into four basic components. One is didactic teaching which is done by junior residents (year 1 and 2); interactive lectures and workshops which is done by the senior residents (Year 3 and 4); oral scenarios, simulations and objectively structured clinical examination (OSCE) (for clinical and applied knowledge testing of trainee) and a session for mortality and morbidity meeting, grand rounds, journal clubs which are done once per month alternatively.

Academic teaching planner: the academic teaching planner is released at the start of each academic Year. Our academic calendar starts in July and ends in June. The topics are assigned before the start of academic year. There are four slots for the teaching day. One slot is given to junior resident (Year 1 or 2) with the name of the topic and supervising faculty. The second slot is interactive lecture or workshop with the name of faculty who is responsible to prepare this topic and names of two residents who will be conducting the show as a leader but supervised by the faculty. The third slot is for the OSCE, oral clinical scenario or simulation (one alternatively on each week), and fourth is for the sessions like mortality and morbidity conference, grand rounds and journal clubs which are attended by other members of the department. Each teaching component has goals and objectives which are discussed as follows:

2.10.1. Didactics

During this teaching day, the target is to train the trainee to improve their teaching and presentation skills. This is one of the foundational requirements. The trainee should be given chance and environment to improve this skill. This assignment is given to junior residents (Year 1 and 2) who are assigned topics at the start of academic calendar. All the important topics in emergency medicine curriculum are covered in this teaching slot. The lectures are prepared by junior trainee (Year 1 and 2). Each trainee is expected to do at least one presentation in 1 year. This is prepared with the help of a mentor. The objective of this exercise is to:

- improve the presentation skills of trainee;
- develop and improve his skills to do literature search for the given topic to look for the best treatment model available;
- discuss the practical approach to deal with the problem;
- discuss the local policies and protocols and learn the system-based practice in the institution; and
- improve the skills of preparing the presentation. He learns how to improve power point presentation preparation skills by getting help from his peers, seniors and faculty members.

The presentation is given by the resident, and at the end of his presentation, one of the senior trainees does critique which improves the skills of critiquing of trainee. Finally, the faculty member gives his evaluation which is used as a tool for residents' performance assessment.

2.10.2. Interactive lectures and workshops

One of the new ways of improved teaching is interactive lectures and workshops [24]. This is different from the traditional lecturing where faculty comes on the podium and give 30–40 min talk to a big group of trainees. In the interactive style lectures and workshops, the trainees are divided into small groups who interact with a senior faculty member. The topic is divided in such a way that each group discusses a certain aspect of topic. There is a clear learning objective of each station. The group should be kept as small as possible. Ideally, there should not be more than 8–10 trainees in each group. The faculty member does interactive style discussion in each station where there is a clear objective of discussion. This makes sure that the trainees are actively participating in the discussion. The face-to-face discussion keeps them engaged, and all the important messages are given in a much better style.

These topics are prepared by the faculty members as they understand the needs and requirements of the topic. The presentation must be evidence-based discussion with emphasis on important points and take-home messages. The faculty may prepare the topics and delegate it through the final year senior residents who can discuss these in interactive style with the junior group. Each topic can be split in to three subgroups (20–30 min each). Small group discussion ensures better chance of delivering important points. When done by senior residents under the supervision of trainee, it improves their presentation and communication skills. Thus, we achieve multiple objectives at a same time. We have seen a very positive impact of these interactive presentations on teaching and training. There is more friendly discussion between the faculty and trainee. The faculty gets the opportunity to assess the individual need of trainee and thus tailor his discussion according to the need of individuals. The small groups either have representation from all years of training or may be having all trainees from the same year. The faculty then decides what difficulty level he will adopt depending on the trainee level in the group. Mixing the groups is one way of doing it where representations from all the years of training will fulfill certain aspects of requirement. On the other hand, separating all the groups strictly based on their year of training will fulfill other requirements of training. The education lead and core faculty should decide what model he wants to adopt depending on the requirement of the workshop.

2.10.3. Skill stations

The skill station includes practical demonstration of all the important skills. All the important procedures are discussed on manikins, models, phantoms or biological models. The curriculum is looked at and all the required procedures and skills are highlighted and covered during this exercise. We have highlighted all the important procedures which are included in the curriculum of emergency medicine residency training. These procedures are given slots in the planner. The faculty who is assigned this workshop has two residents from the senior group (year 3 and 4) who conduct this workshop. The faculty member prepares the workshop in such a way that all the goals and objectives are defined. The objectives are to test the knowledge for that procedure. It includes knowledge of landmarks, anatomy, steps, techniques, complications

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and management of complications. There are hands-on training sessions which include testing of skills of the trainee on models. This gives excellent opportunity to deal with the trainee in small groups (not more than 8–10). Each station is 30–40 min where all the candidates are given chance to participate. The faculty also gets the opportunity to engage all the trainees and do one-to-one discussion.

2.10.4. Objectively structured clinical examination

Ref. [15] this is one of the most important ways of teaching the subject where the topic is prepared in such a way that important clinical point is taught. Multiple topics are tested in a short time. Each OSCE has a clear objective. This is one of the best modalities to test trainees' knowledge about the subject. The OSCE topics are selected from day-to-day clinical practice. We have a pool of OSCE cases which are collected over the period of last 15 years. The OSCE cases include ECGs, ultrasound findings, CT scan findings, X-ray findings, toxicology cases, important physical signs and findings. In each OSCE case, few questions are given to test the knowledge of the candidate. In each testing session, 20 cases are given which are projected on the projector, and each case is given 3 min where they have to answer the questions. This test their clinical approach and skills of identifying and diagnosing the case.

2.10.5. Oral clinical scenarios

Oral clinical scenarios are used to test in detail the approach of emergency medicine knowledge and lateral thinking. Emergency medicine field is challenging in a way that the true and real-time testing cannot be done on patients. Different methods are thus adopted to cover these aspects. One of the ways is to have oral clinical scenarios to test the approach and knowledge of trainees. The candidate is given a scenario and the length and depth of his knowledge is tested by asking questions related to the subject. The candidate can be challenged in knowledge by taking him to different directions, and examiner has the liberty and flexibility to test him in a more broader way. We have pool of important topics and scenarios. It includes trauma, resuscitation, toxicology, pediatrics, environmental as well as orthopedics. Some scenarios are developed to test the atypical or race presentation of a common emergency. Some scenarios are used to test the approach to manage undifferentiated emergency situation. Different aspects which are tested include art of history taking, approach to deal with the scenario, selection of suitable investigation, skill of interpreting ECG, X-ray findings or CT and US findings. It helps in testing the collateral thinking of candidate and gives a chance to test the evidence-based knowledge and familiarity with the new literature. The examiner prepares a key which defines the marking scheme and strategy and also points out the important red flags which are mandatory to pass. Trainee who fails to manage these red flags is failed considering it as a basic requirement to be a safe physician. Thus, we use this as a wonderful opportunity to test the very important aspects of training which are not possible in real-time situation. The cases are long cases (15 min) or short cases (7.5 min). After each case, there is a detailed discussion and feedback session which helps residents to know about their mistakes and deficiencies.

2.10.6. Simulation-based teaching

Refs. [26–29] simulation-based teaching and testing is also one of the new ways of educating the candidate where different skills of candidates are tested at a same time. The candidate is given a scenario and he is tested on high fidelity manikins. We test different skills like communication skills, leadership qualities, approach to critical information provided and response to clinical situation. [4]. This teaching model tests the multitasking capabilities of the candidate. The instructor tests the approach of the candidate toward a clinical presentation, his performance as a leader as well as a primary responder. The examiner tests his competency in gathering important information as well as his skills of timely intervention and management. The instructor also tests his knowledge of proper disposition and timely calling for help from subspecialties. It also tests the candidates' control over his team as a lead.

2.10.7. Mortality and morbidity conference

Refs. [30–32] these conferences are arranged once a month as a departmental learning conferences where all the important cases with mortality and morbidity issues are collected and discussed. The candidate is asked to prepare the case and look at the current evidence to support the management done or best management which should have been given. This gives a platform where the department and experienced staff give their feedback and input regarding the best possible management plan.

This is one of the best ways to teach the practice-based learning, system-based learning and evidence-based clinical approach and problem-based learning. We have a dedicated senior consultant who is lead for the mortality and morbidity cases. All the cases which fulfill the criteria to be presented are reviewed by the consultant, and it is selected for presentation. The physician involved in the case prepares the case and this is discussed in M&M conference which is arranged once a month. The case is presented by the physician and the session is opened for questions and answers and discussions. This gives opportunity to the trainee to learn from the mistakes and also to learn the skills of defending their decision and management. These cases help them in improving their management skills and learn the evidence-based management as well as the departmental protocols and policies. Mortality and morbidity conferences can be used to teach the ACGME core competencies like medical knowledge, patient care, system-based practice, practice-based learning and professionalism. These cases can be used to teach different competencies in different scenarios. As a member of education team, we have found that mortality and morbidity cases are wonderful teaching examples and experiences to train junior staff by covering the different aspects of ACGME competencies.

2.10.8. Journal club

Refs. [36–40] the JC meetings are a way of training the residents to look for the best evidence-based practice. Important topics related to the specialty are selected and candidates are asked to prepare and present them. This will train them to do critique and also chose the best evidence in support or against any particular management or practice. Journal clubs stimulate critical appraisal skills among medical students. These journal clubs can be very effective

platforms where the students can gather first-hand knowledge on analyzing, evaluating, dissecting and utilizing the scientific literature. Journal clubs have also been shown to motivate reading behaviors of physicians in-training and also increase their knowledge of epidemiology and biostatistics. We feel that by making journal clubs part of the training curriculum will benefit the purpose of exposure of students to the world of frontline research and pave their way for future entry in the world of translational research. We make sure that all the senior residents present at least 3–4 articles during their residency training. They chose the article which is related to their working environment and specialty and appraise it. During the journal club presentations, the trainees are taught to do critical appraisal. They learn art of writing a research question and the abstracts. We started official research training in 2013 and as a result, multiple trainees published papers, wrote abstracts and presented in international conferences. It improved the scholarly activities in our department.

2.10.9. Grand rounds

Refs. [30, 33–35] the multidisciplinary grand rounds are used to discuss the subject where multiple specialties have stakes in management. This provides a platform where all the experts sit together and share their view point and expertise to manage the case in a best possible way and to agree on a standardized management plan agreed in the light of local policies and protocols. We have been inviting speakers from different specialties to give talks on their subjects related to emergency medicine practice. It has helped in bridging the gap between specialties and emergency department and improved the management and patient care. This platform is used to improve our understanding of the subject and to accept the common pathway accepted by both the departments.

2.10.10. Bedside teaching

Refs. [25, 41–44] bedside teaching is seen as one of the most important modalities in teaching a variety of skills important for the medical profession. Bedside teaching has shown to improve certain clinical diagnostic skills in medical students and residents. Several other skills essential for patient's contact can, for a great part, best be learned at the bedside. Bedside teaching gives an opportunity to faculty to assess the six core competencies of ACGME and different aspects of trainee's training including their communication skills, professionalism, system-based practice, medical knowledge, practical approach to patient's problems and critical thinking. The faculty members use this model of teaching to discuss the subject with evidence and also by using their experience as a teaching tool. This is the best opportunity to teach the competency of system-based practice and amalgamate it with the patient management. The faculty members assess the different qualities of trainee. They look at how they approach the patient, introduce themselves, how they take the detailed history and do proper physical examination, how they interact and communicate with patient, relatives and other staff, how they choose investigations and interpret the lab findings. They also assess the critical thinking of the trainee. Different work-based assessment (WBA) tools are used to get the detailed information about the trainee. The WBA tools include CBD, Mini-Cex and DOPS.

2.10.11. Defining learning objectives

There must be clearly defined learning objectives. All the topics should be taught in such a way that there are clear learning objectives which are conveyed and taught at the end of the teaching session. The learning objectives must include the local policies and protocols and evidence-based practice.

2.10.12. Defining rotation objectives

All rotations in emergency medicine have some objectives and goals. These objectives are defined on the basis of specialty requirement. With the passage of time and by the feedbacks provided by the trainee and the faculty, program evaluation committee and the clinical competency committee give their recommendations to improve the curriculum and the program. These recommendations must be forwarded to the Program Director who with his team should take necessary steps to improve the program. This is a dynamic process and must be repeated frequently.

2.10.13. Communication skills and leadership qualities

Emergency medicine teaching is incomplete without the communication and leadership skills. The nature of the specialty demands high level of communication skills from the trainee. The difficulty of work environment, the pressure of work and the dynamics of clinical work expect from the physician to be an expert in averting any issues or problems which arise at shop floor. Looking at the diversity of problems and conditions which are expected to use emergency department as a gateway to the hospital, lack of good communication skills and leadership qualities will add on the disposition time of patient and would add to length of the stay in the department.

2.10.14. Administration and management skills

These skills are important to be taught during the training program. We have seen that the emergency departments are getting bigger and busier all over the world. Emergency departments are used more and more as walk-in facility where patients come to get opinion about their problems and issues. Lack of rapidly expanding primary care setup, readily access to health information on internet and social media, improving public awareness about health are the reasons for more patients visiting emergency department. They need quick answer to their questions and they visit the emergency department with expectations and fixed ideas. This leads to overcrowding in the department. With the overcrowding, we face problems of space, delay and increased length of stay, diagnostic and therapeutic errors, improper disposition and unnecessary investigations. Thus, it is important that we teach administrative and management skills to our trainee to deal with all these issues.

Strong administrative and management qualities help the candidates to deal with issues of overcrowding, bed crisis, long waiting time, complaints and litigations and difficult and aggressive patients. This skill will help physicians to find out solutions for the problem.

3. Conclusion

To establish a good teaching program, all the important aspects of teaching and training need to be addressed. The trainer needs to be trained to deliver the best emergency medicine training and expertise to the trainer. It requires lot of faculty development programs and training of the trainer. Different tools need to be developed to keep a strict eye on the quality of the program so that timely interventions are done if there is any deficiency in the outcome.

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