

CASE REPORT

Workplace-based assessment: how to use it in the ICU

The CoBaTrICE collaboration

Details of individual contributions are presented in the Appendix.

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Abstract - Purpose: To provide trainers and trainees with narrative guidance and critical evaluation of techniques and processes for Workplace-Based Assessment (WPBA) of competence in intensive care medicine. **Methods:** An expert group identified barriers to and facilitators of the assessment of competence in the clinical environment. A focussed literature review was then undertaken, centred on the main challenges raised and linking assessment techniques to training outcomes. **Results:** Three main themes emerged: the need to link intensive care training to educational research; improved understanding of the strengths and weaknesses of the WPBA instruments; and the desire for guidance in implementing ICM training and assessment programmes. **Conclusions:** The pressured environment of the critical care unit demands a structured and efficient approach to WPBA, which integrates educational activities with the delivery of high quality clinical care. Adequate resourcing of education, training for trainers, and engagement of all staff in education and assessment are key elements for success.

Keywords - Workplace-based assessment, intensive care, training, assessment, guidelines, critical care

Introduction

CoBaTrICE (Competency-Based Training in Intensive Care in Europe) is an international collaboration managed by the European Society of Intensive Care Medicine's division of Professional Development, and endorsed by the European Board of Intensive Care Medicine and the national training organisations of 28 European countries. The partnership uses survey and consensus techniques, combined with expert opinion and external consultation, to develop the component parts of an international competency-based training programme for intensive care medicine [1-3]. A recent survey of the training environment for ICM in Europe undertaken by the collaboration [3], found substantial variations in methods of quality assurance of training programmes. A key finding was that half of member states reported that they had no formal system for assessing and documenting competence in ICM by the end of specialist training [2]. Informal discussions with trainers demonstrated considerable uncertainty about the most appropriate methods for assessment in the often-pressured critical care environment. To assist trainers and trainees, and to harmonise standards for the assessment of competence, we therefore convened a two-day workshop on the evaluation of workplace-based methods of assessment (WPBA), with the aim of producing guidance, which took into account the barriers to, and facilitators of WPBA in this environment.

Methods

An expert group of eight members was convened from within the CoBaTrICE collaboration, representing medical critical care specialists, trainees, educationalists, and intensivists with responsibility for local and national training programmes. All members were national coordinators (NC) and trainees involved in CoBaTrICE with personal interest and/or practical expertise with WPBA. The group was moderated by an intensivist (WvM). Medical education expertise was contributed by a trained medical doctor, now full time professor of medical education (LS). During a two-day workshop in June 2008, the members discussed the currently used WPBA methods, whether they fulfilled current needs, put the results in the context of the available literature, and subsequently reached consensus regarding selection of methods from the available arsenal. The workshop was completed discussing the organisational requirements and restraints. Themes emerging from the discussion were used to anchor the subsequent narrative review, and were developed following the meeting by the group working electronically to develop practical guidance for trainers and trainees.

Results

Three main themes emerged during discussion. These were a need to link intensive care training to educational research in terms of best educational practice, lack of information on practical aspects of the most frequently used WPBA instruments, and the desire for tips and guidelines for constructing or improving ICM training assessment programmes. We have formulated these themes as questions below.

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1. What can intensive medicine programmes learn from recent developments in medical education?

Some knowledge about consistent research findings in the field of medical education in general and assessment in particular is useful in understanding why certain changes in the training have been proposed. An overview is provided in **Table 1** (findings numbered 1 to 9). The most important items are discussed in the sections below.

First, one of the dilemmas in developing an assessment programme for a *competency-based* training programme is the distinction between competence and performance [4] (number 5 in **Table 1**). ‘Competence’ refers to what people do in staged settings to demonstrate the best of their ability; ‘performance’ means what people do on a day-to-day basis in practice. Of course performance is what is ultimately important for patient care, but competence is often what the assessment measures. The distinction between competence and performance is made to emphasise two important facts: that the act of assessment can change behaviour; and that individual performance is influenced by the context in which the doctor works. This implies that an assessment programme must consist of many ‘assessment moments’ and that important

decisions about the candidate can only be made on the basis of a collation of assessments over a longer period of time. This does not mean that a complete assessment programme should only be based on observation in practice. A robust finding in the literature is that factual knowledge is a requirement for successful problem solving [5] (number 2 in **Table 1**). Consequently, knowledge-orientated assessment is important, but this needs to take place in a realistic context as this emphasises the practical value of knowledge acquisition, leads to better retention, and is a more

Table 2. Rules for effective feedback [28, 29]

The feedback should be aimed at observed behaviour
The feedback should be provided immediately after the observation
The feedback should be concrete
The feedback should contain positive as well as negative feedback
The feedback should be accompanied by concrete learning goals and plans for follow-up

Table 1. Highlights in medical education research relevant for workplace-based assessment in the ICU

NO.	FINDING IN MEDICAL EDUCATION RESEARCH	CONSEQUENCES FOR WPBA IN THE ICU
1.	Learning and application of knowledge are more efficient when they take place within a relevant context	The practical environment is ideal for the assessment of competence of the trainees through structured observation of performance.
2.	There is also a place for knowledge-oriented assessment	Typically short cases linked with questions aimed at decision processes pertaining to <i>that specific</i> case illicit more knowledge application than questions that do not require a case.
3.	Deliberate practice leads to higher levels of expertise than unstructured practice experience	Direct observation, detailed feedback, and well-defined tasks with sufficient opportunity to perform tasks repeatedly can improve aspects of performance.
4.	Providing feedback is an integral part of workplace-based assessment	Ideally all observations of trainees, whether only for teaching or for assessment, are followed by a short feedback session in which strengths and weaknesses are reviewed and <i>concrete</i> learning goals identified.
5.	There is a difference between competence and performance	A comprehensive assessment programme ideally consists of many assessment moments. Important decisions about a candidate should always be made on the basis of a collation of assessment over a period of time.
6.	Reliability and validity are important aspects of assessment methods	The assessment system should not rely on short tests and a small number of observations.
7.	Judgement bias can be reduced	Care should be taken to ensure the maximum variety in number of observations and assessors. The number of criteria on which the examiner scores should be limited and qualitative feedback provided. Examiners should be free to give their <i>honest</i> judgement.
8.	Assessment training of the staff is essential	Training of staff in WPBA should be undertaken. After an initial training, repeated feedback on how the staff are doing, inter-individual evaluation sessions (in which notes are compared, difficult cases are discussed, and workshops with an assessment expert are to be recommended.
9.	Feasibility is important	More expensive (and time consuming) methods are not always better. Long observations are neither useful nor efficient. Feedback sessions need to be short.

valid assessment approach [6,7], for example, by using case-based discussion (number 1 in **Table 1**).

The further educational concept is that of 'deliberate practice', which (in the context of WPBA) means observing the trainees regularly, providing them with immediate detailed feedback in conjunction with concrete *suggestions* on how to improve, providing the trainee with *opportunities* to improve, and finally re-assessment [8] (number 3 in **Table 1**). Here the learning, teaching and assessment become intertwined. Providing good feedback encourages trainees to demonstrate weaknesses, as long as they have the impression that they can learn from it and become better doctors (number 4 in **Table 1**). There is general agreement on what constitutes effective feedback (see **Table 2**).

Trainers are often concerned about generalisability and reliability of judgements between observers (numbers 6 and 7 in **Table 1**). In assessment we try to determine from particular observations in the clinical environment how the trainee will perform in the whole spectrum of possible clinical encounters. The larger the 'sample' is, the higher the generalisability and reliability will be. So making the observation more objective - for example, through detailed

checklists - is not necessarily the solution to low reliability. Even subjective judgements can become reliable if there are enough of them, dispersed in time, occasions and observers. In general, having multiple - subjective - judgements is better than only a few - objective - scores.

Apart from reliability, assessment tools in general should preferably also meet the criteria of validity, impact on learning, feasibility and acceptability (to all stakeholders) [9,10]. The 'utility' or usefulness of an instrument is a function of the combination of these factors. Feasibility is another important aspect to consider seriously [9,11]. The cost aspect is an important element of feasibility, and has an inverse relationship with practical utility [9]. Since the real world is never ideal, in daily practice a trade-off exists between these utility criteria, but it is safe to suggest that the impact on education and learning is of high importance [9,11] (number 9 in **Table 1**).

Practical key messages for establishing WPBA programmes are that multiple short observations with feedback and learning goals are better than long or complex assessments; and the responsibility of assessment should be spread over many members of the clinical team, including nurses and other professionals. Furthermore,

Table 3. Overview of tools for workplace-based assessment

NO.	TOOL	WHAT IS IT?	WHAT DOES IT LOOK LIKE?
1.	Mini-Clinical Evaluation Exercise (mini-CEX)	See text	See text
2.	360-degree/ multi-source feedback	See text	See text
3.	Key-feature approach case-based testing and extended-matching items	The key-feature approach assessment (developed for the Medical Council of Canada) and extended-matching items (developed for the National Board of Medical Examiners in the US) are based on short cases with questions asking for decisions to be made in each specific case. They thus focus on medical decision making or clinical reasoning.	In key-feature assessment a large number of short cases (roughly 30 per hour of testing time) are presented to the assessee. In such cases, typically a patient problem is described, the setting in which the patient is seen, the role of the assessee ("You are a registrar in surgery. At the emergency you see Mr. Johnson..."). The description further contains relevant elements from history taking and from physical examination, and – if relevant – from additional diagnostics. Only few questions (1 to a maximum of 5) are asked, all aiming at essential decisions, namely those decisions that determine whether the case will be managed successfully or not. Different question formats may, however, be used. The advantage is the large sample of different clinical situations that can be tested per hour of testing time, which leads to much higher reliabilities per hour of testing time. This of course goes at the expense of depth.
4.	Objective Structured Assessment of Technical Skills (OSATS)	OSATS is an assessment procedure that is specifically designed to assess the technical skills of a registrar. It is based on the procedure of an Objective Structured Clinical Examination (OSCE). In this procedure the assessee rotates through a series of rooms in each of which there is an examiner with a checklist or rating scale, an assignment for the assessee and a manikin or simulated patient. Such rooms are typically called 'stations'. This way a series of independent observations can be collected and collated to arrive at a decision about the assessee's skills.	In an OSATS each examiner has two forms: one is a checklist on the specific procedure to be tested in that station, the other is a more generic rating scale for the generic skills. In each station both forms are completed.

the inclusion of non-physician evaluators could capture a more complete account of resident competency [12], although this is still relatively uncommon in daily practice [13]. In our and others' experience, nurses and physician assistants can for example, excellently judge communication skills, compassion, and team working ability [12,14]. Being an assessor or examiner does not come naturally to everybody. Trainers should ensure they acquire formal skills in assessment, teaching and feedback by accessing teacher training programmes (number 8 in **Table 1**).

After having completed multiple assessment using multiple tools by preferably many different assessors with the provision of feedback (formative assessment or assessment *for* learning), the data should be aggregated and a summative assessment (resulting in a 'pass/fail' or 'go/no-go' decision', or assessment of learning) given to the assessee. Most frequently this is the departmental chair's or training coordinator's responsibility.

2. What assessment methods and instruments are available?

There is little evidence that one particular assessment method is better than another, though they may differ in the resources required for their implementation [9,15]. Any one single measure alone is not sufficient [16], therefore a combination (triangulation) of various instruments is necessary to assess performance over a wide range of competencies [17]. Any assessment tool will always provide information about more than one competency and a competency can only be assessed completely by using different methods [18]. With observation-based assessment tools, the quality of the assessment is almost entirely dependent on the user and not on the form. The currently available WPBA methods are (mildly) structured, but still the important role of the user (the assessor) should be emphasised. An overview of currently available methods is provided in **Table 3**. Extensive information on the tools can be found on www.cobatrace.org. Additional information is provided in publications by the Academy of Medical Royal Colleges [19] and the Postgraduate

Table 3. Overview of tools for workplace-based assessment (continued)

NO.	TOOL	WHAT IS IT?	WHAT DOES IT LOOK LIKE?
5.	Direct observation procedural skills (DOPS)	DOPS was developed by the Royal College of Physicians in the UK. It is a method similar to the mini-CEX; based on the direct observation of procedural skills (e.g. intubation, inserting a central line, etc.) and a generic rating scale to be completed by the examiner.	Like mini-CEX it is a rating form with a number of generic criteria on a six-point scale. Criteria are: <ul style="list-style-type: none"> - Demonstrates understanding of indications, relevant anatomy, technique of procedure - Obtains informed consent - Demonstrates appropriate preparation pre-procedure - Appropriate analgesia or safe sedation - Technical ability - Aseptic technique - Seeks help where appropriate - Post procedure management - Communication skills - Considerations of patient/professionalism - Overall ability to perform procedure Some room for qualitative feedback is added
6.	Case-based orals	Case-based orals (in the North American literature: chart stimulated recall) were developed to assess clinical judgement, decision-making and the application of medical knowledge in the context of practical patient care. It should be based on those patient cases the registrar or fellow has been directly responsible for.	The oral is structured using a criteria list. The oral is set up as a discussion between the examiner and the registrar/fellow. The content focuses on what has happened and the reasons for actions (or relevant background knowledge). Not only the medical technical content may be discussed but also ethical and medico-legal issues pertaining to that specific case may be touched upon. The criteria on the form are: <ul style="list-style-type: none"> - Medical record keeping - Clinical assessment - Investigation and referrals - Treatment - Follow-up and future planning - Professionalism - Overall clinical judgement
7.	Critical appraisal of the literature or topic (CAL/CAT)	A critically appraised topic (CAT) or literature (CAL) is a short summary of evidence on a topic of interest, usually focussed around a clinical question. The assessee starts from the clinical question and then seeks and selects relevant published studies that help him to answer the question. A CAT can be seen as a shorter and less rigorous version of a systematic review, summarising the best available research evidence on a topic. The assessee performs the CAT and then reports the findings and defends the specific decision to be made or action to be taken in the original clinical case.	There is no single one form used everywhere to score a CAT, but most forms are in the form of a rating scale with criteria about: <ul style="list-style-type: none"> - the central question - the collection of the relevant literature/search - the analysis of the literature - relationship between the outcome of the literature and the clinical question - presentation.
8.	Portfolio	See text	See text

Medical and Training Board [20]. The three most commonly used instruments, the mini-CEX, multi-source feedback and portfolio, will be discussed more in depth in the next paragraphs.

Mini-Clinical Evaluation Exercise (mini-CEX)

The mini-CEX is used to rate performance through direct observation of a clinical encounter using a form containing a list of criteria and room for qualitative feedback leading to specific learning goals. Observations can be kept brief, after which a short feedback session is included. Judgements pertain only to the observed performance. The form is not standardised; adaptations to make it fit local needs are allowed, but some experience and training in the use of the instrument is recommended. In general 7 – 10 independent observations suffice for a reliable judgement [21]. An example is provided in *Figure 1*.

Figure 1. An example of a mini-CEX form

Mini-Clinical Evaluation Exercise (CEX)										
Evaluation: _____					Date: _____					
Student: _____					Clinical Attachment: _____					
Patient Problem/Dx: _____										
Patient:	Age: _____	Sex: _____	<input type="checkbox"/> New		<input type="checkbox"/> Follow-up					
Setting:	<input type="checkbox"/> Ambulatory		<input type="checkbox"/> In-patient		<input type="checkbox"/> Other					
Complexity:	<input type="checkbox"/> Low		<input type="checkbox"/> Moderate		<input type="checkbox"/> High					
Focus:	<input type="checkbox"/> Data Gathering		<input type="checkbox"/> Diagnosis		<input type="checkbox"/> Therapy		<input type="checkbox"/> Counselling			
1. Medical Interviewing Skills (<input type="checkbox"/> Not Observed)										
1 2 3 UNSATISFACTORY			4 5 6 SATISFACTORY			7 8 9 SUPERIOR				
2. Physical Examination Skills (<input type="checkbox"/> Not Observed)										
1 2 3 UNSATISFACTORY			4 5 6 SATISFACTORY			7 8 9 SUPERIOR				
3. Humanistic Qualities/Professionalism (<input type="checkbox"/> Not Observed)										
1 2 3 UNSATISFACTORY			4 5 6 SATISFACTORY			7 8 9 SUPERIOR				
4. Clinical Judgment (<input type="checkbox"/> Not Observed)										
1 2 3 UNSATISFACTORY			4 5 6 SATISFACTORY			7 8 9 SUPERIOR				
5. Counselling Skills (<input type="checkbox"/> Not Observed)										
1 2 3 UNSATISFACTORY			4 5 6 SATISFACTORY			7 8 9 SUPERIOR				
6. Organisation/Efficiency (<input type="checkbox"/> Not Observed)										
1 2 3 UNSATISFACTORY			4 5 6 SATISFACTORY			7 8 9 SUPERIOR				
7. Overall Clinical Competence (<input type="checkbox"/> Not Observed)										
1 2 3 UNSATISFACTORY			4 5 6 SATISFACTORY			7 8 9 SUPERIOR				
Mini-Cex Timer: Observations _____ Mins Providing Feedback _____ Mins										
Evaluator Satisfaction with Mini-CEX										
Low	1	2	3	4	5	6	7	8	9	High
Student Satisfaction with the Mini-Cex										
Low	1	2	3	4	5	6	7	8	9	High
Comments:										

360 degree, multi-source or multi-rater feedback

Multi-source feedback accesses the opinions of multiple observers from different backgrounds on specific aspects of the individual being assessed, using a simple rating scale. The assessee often first completes the questionnaire him/herself to aid reflective learning in comparison with the forms returned from (usually 10-12) assessors, who may include peers, supervisors, paramedical staff, nurses, administrative staff and patients or relatives. Ideally administrative personnel take care of the distribution and collection. The results are collated before they are fed back to the assessee (e.g. in an appraisal session). There are many examples of multi-source feedback forms. An example is shown in *Figure 2*.

Portfolio

A portfolio is a collection of evidence of training, which includes reflections on strengths and weaknesses. It can be seen as analogous to a clinical case record, documenting symptoms, investigations, working diagnoses, progress over time, and outcomes. Recent reviews confirm that portfolios record day-to-day performance, and can be used in the production of a well-founded summative judgement. Careful implementation is crucial, and good mentoring regarding portfolio development is the single most decisive success factor. Also, the portfolio must be smart and lean, to prevent it from becoming unmanageable. Considerable resistance can arise when learners are forced to stick to a rigidly prescribed format [22-26]. The best approach to portfolio development in the specialty training setting is a dossier of evidence for competence acquisition (e.g. mini-CEX forms, multi-source feedback, results of knowledge and knowledge application assessment, with reflective learning, informal observations and deliberations). Self-reflection is an important element as it encourages the trainee to take personal responsibility for formulating learning goals, and provides a brief record of meetings between the trainee and trainer.

IT systems and e-portfolios have the potential to minimise the burden of documentation, and to provide a portable record of a trainee's progress over time and across different training environments (for example, the UK's NHS e-portfolio [27]). These systems are still at an early stage in development. On the principle that 'assessment drives learning', such electronic instruments should provide a clear link between competencies and assessment processes. The CoBaTrICE collaboration is developing an e-portfolio for free international use by National Training Organisations.

What are the key issues in implementing and organising workplace-based assessment?

Designing a sophisticated and extensive plan for WPBA without addressing aspects of feasibility and acceptability will almost certainly result in failure of the newly introduced assessment programme. In order to maximise the chances of success, it would be best to properly address several aspects early in the developmental phase. These aspects are not based on comparative implementation research but are combined experiences from successful prior implementations. The flowchart in *Figure 4* provides an overview at a glance with regard to these steps. Guidelines for developing and implementing an assessment system are discussed below.

Identify the lead person

One person must be nominated as the local lead trainer or supervisor for the assessment system. If everyone is made responsible then nobody will feel responsible. Preferably this is someone with the necessary authority to ensure quality assurance of the training programme. This position must be distinguished from the role of individual trainers or assessors a task which should be shared by many clinicians and not just one person.

Provide administrative support

Administrative and secretarial support (distributing 360-degree appraisal forms, archiving, sending out reminders, arranging educational meetings, maintaining records of progress etc.) allows clinical staff to focus their skills effectively on educational and assessment activities. Administrative support can be shared across disciplines.

Build assessment into the daily clinical routine

For the majority of circumstances and for most trainees, the assessment processes can be incorporated into the daily routine and patient care. It is better to start with short and simple assessments (for example, clinical examination during the ward round), and move to longer or more complex assessments (case-based discussions, or integrating activities such as leading a daily ward round) at a later stage.

Adapt (externally validated) forms to the specific needs of your local situation

The instruments available for practice-based assessment are not immutable; reliability and validity of the measurement lie more in the use and user of the instrument than in the instrument itself. So do not be afraid to adapt a form if it does not suit your needs entirely. Keep in mind that some criteria, sufficient room for feedback and good documentation of what has been observed are essential. The rest is of secondary importance.

Figure 2. An example of a multi-source feedback form, the mini-PAT

ISCP INTERCOLLEGIATE SURGICAL CURRICULUM PROGRAMME

Self Mini-PAT (Peer Assessment Tool)

Please complete the questions using a cross: ☒ Please use black ink and CAPITAL LETTERS

Your forename:

Your surname:

Your GMC number: Hospital:

Trainee level: ST1 ☐ ST2 ☐ ST3 ☐ ST4 ☐ ST5 ☐ ST6 ☐ ST7 ☐ ST8 ☐ Other

Specialty: ☐ Cardio ☐ General ☐ Neuro ☐ O&M ☐ Otol ☐ Paed ☐ Plast ☐ T&O ☐ Urology

How do you rate yourself in your:

Standard: The assessment should be judged against the standard expected at completion of this level of training. Levels of training are defined in the syllabus

	Below expectations	Borderline	Meets expectations	Above expectations	U/C ¹
	1	2	3	4	5
Good Clinical Care					
1. Ability to diagnose patient problems					
2. Ability to formulate appropriate management plans					
3. Awareness of own limitations					
4. Ability to respond to psychosocial aspects of illness					
5. Appropriate utilisation of resources e.g. ordering investigations					
Maintaining good medical practice					
6. Ability to manage time effectively/prioritise					
7. Technical skills (appropriate to current practice)					
Teaching and Training, Appraising and Assessing					
8. Willingness and effectiveness when teaching/training colleagues					
Relationship with Patients					
9. Communication with patients					
10. Communication with carers and/or family					
11. Respect for patients and their right to confidentiality					
Working with colleagues					
12. Verbal communication with colleagues					
13. Written communication with colleagues					
14. Ability to recognise and value the contribution of others					
15. Accessibility/Reliability					
Overall					
16. Overall, how do you compare yourself to a doctor ready to complete this level of training?					

¹ U/C Please mark this if you feel unable to comment.

Acknowledgements: Mini-PAT is derived from SPRAT (Sheffield Peer Review Assessment Tool)

PTO:

Anything going especially well?

Please describe any areas that you think you should particularly focus on for development. Include an explanation of any rating below 'Meets expectations'.

Trainee satisfaction with self mini-PAT

Not at all	1	2	3	4	5	6	7	8	9	Highly
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Have you read the mini-PAT guidance notes? ☐ Yes ☐ No

Use many short observations rather than a few long ones

The subjectivity of assessment, and the reliability of judgements, will be improved by increasing the sample size and the number of observers. Decisions about a trainee that are based on only one or a few observations will lack validity, and will be difficult to justify in the event of complaints or concerns about performance.

Clarify which responsibilities belong to the trainee and which to the supervisor

It is the trainer's responsibility to provide a supportive and functional educational environment with adequate opportunities to acquire the required competencies. It is the trainee's responsibility to make full use of those opportunities and to document his or her progress and the evolution of growth in competence.

Collaborate in the production and use of educational materials

Typically we re-invent the wheel in our institutions. In countries without a formal national or local structure for training and assessment processes, centres should share their materials and experiences, thus gaining in experience, harmonising practices, and developing the basis for cost-effective local training collaborations.

Provide assessor training

With assessment instruments such as multiple-choice tests, it does not matter who distributes the exam papers or who scores the answers. Reliability and validity are built in. Precisely the reverse is the case in observation-based assessment. The form is reasonably unimportant but the person who uses it is essential. Reliability and validity need to be more or less built into the examiner. This cannot be done without careful teacher training, as discussed above. National training organisations have an important role in providing this resource for their trainers.

Develop a supportive learning environment

Effective feedback and learning depend on mutual respect and trust between all members of the clinical team. Role models are powerful drivers of behaviour, and good training will not be delivered in units with suboptimal standards of clinical practice. A firm focus on the needs of patients and relatives should motivate equally high standards of training, requiring trainers and trainees to expect and require mutually respectful critiquing and feedback. This is not a unidirectional process: trainers should subject themselves to multi-source feedback in the same way as trainees, and training programmes should seek the views of trainees on the quality of teaching.

Dealing with the failing trainee: clear timetable of remedial activities with firm deadlines

Persistent poor performance by a trainee, supported by triangulated evidence, requires a remediation plan containing unambiguous objectives and a timetable, agreed with the trainee and training supervisors. Deadlines that are not met *must* have negative consequences for the trainee, proportionate to the nature of the infringement. In the event of serious failures or dispute, legal considerations will include clarity of training guidelines, objective

evidence of failure despite a supportive training environment, adequacy of information, fair remedial processes, and a firm focus on patient safety. So far, guidelines for postgraduate training regarding the process of remediation, tools to be used for this purpose, the sequence and timing of their use, and associated deadlines are lacking, making it an ill-defined process with uncertainty in outcome. The Professionalism Working Group on Professionalism of the Dutch Society for Medical Education (NVMO) is currently reviewing the literature, and will attempt to propose practical guidelines on this particular topic. In case consensus on the existence, nature and/or consequences of resident's dysfunctioning fails to be achieved by repeated dialogue between the department's chair and the resident, a formal procedure facilitated by the Royal Dutch Society for Medicine (KNMG) is the ultimate refugium. A proper framework for this purpose has been implemented.

An example of successful WPBA implementation

The Maastricht University Medical Centre in the Netherlands is a tertiary-referral, 26-bed general ICU with bed occupancy over 90%, 90 nurses, 11.1 fulltime-equivalent senior medical staff, 7 ICM senior trainees and two office managers. The ICU training and assessment programmes were newly developed in 2005 by an ICU Taskforce on Education and Training composed of three staff members, a fellow, office manager and the department's chair and an expert educationalist.

First, content analysis of the existing ICM training and assessment programme was performed. This involved for example, discussing the admissions, number of staff members, number of fellows, and categories of patients admitted. Second, new developments in medical education were taken into account: specifically, deliberate practice and the learning in an authentic context. The ICU context was found highly suitable for WPBA, but a complementary formal teaching and assessment programme was deemed necessary. Keeping the initial assessment programme 'simple and practical' was the starting-point. Three pillars thus supported the training and assessment programme: working in daily patient care in the ICU, formally structured plenary educational and teaching sessions, and portfolio based evaluation and assessment. Figure 4 provides a visualisation of the programme.

Each fellow is assigned a mentor, with whom planned meetings are scheduled to review progress, disappointments, expectations, and difficulties throughout their training. The trainees evaluate the bedside teaching abilities of staff, and results are fed back. The trainees' performance is assessed by senior staff using a locally adapted version of the mini-CEX after having observed, for example, a meeting between the trainee and a patient's relatives, or a technical procedure. Feedback is provided directly after the assessment, both written and verbally. The trainees are responsible for collecting judgements on different competency domains by different supervisors, and to identify those aspects not previously covered. The minimum frequency of mini-CEX is once each month. Forms are provided and subsequently stored in the portfolio.

The formal teaching and assessment activities are scheduled daily from 08.00 – 8.30 hours to facilitate attendance, four times a week, centred on a weekly, pre-determined topic. Each week is organised

by a staff member according to a yearly schedule as prepared by the office manager. The standard format is as follows: Journal Club by a resident, Critical Appraisal of the Literature or Topic (CAL or CAT) by a trainee, invited external speaker, and guidelines proposition (by senior staff member). Every Wednesday afternoon a PACT module (or a case-based) discussion is scheduled. The coordinating staff member formally assesses the CATs/CALs for scientific content, layout, presentation, duration, appraisal, response to questions etc. The rating on paper, as well as the feedback provided is discussed with the presenter directly at the end of the presentation.

In addition, the secretary electronically sends multi-source feedback forms to all staff members, and the completed forms are returned by mail. The form used is a local adaptation of the mini-PAT form. The mentor is not asked for his/her opinion, since guidance and assessment are sometimes incompatible. The final opinion on a fellow is thereby never formed by a single assessment or by only one assessor.

Further evaluation of the trainees is performed during three-monthly, formal, scheduled meetings with the chair of the department. A fellow-maintained portfolio includes proof (including mini-CEXs, MSF) to support acquired competencies, analysis of strengths and weaknesses supported by the evidence/proof provided, learning goals for the next period in their training programme, and learning plans how to achieve these goals within this time frame (to form the basis for the next meeting). Again feedback is provided during these three-monthly meetings. Feedback during the meeting comes not as a surprise since it has already been given during the individual assessment moments. Finally a decision regarding continuation of training is made.

Conclusions

We have combined expert opinion with a focussed literature review to identify key issues in developing workplace-based assessment for ICM training programmes. Given the pressured environment of the critical care unit and the challenges for maintaining continuity of interaction between trainers and trainees, a structured and efficient approach to WPBA is needed which integrates educational activities with the delivery of high quality clinical care. Adequate resourcing of education, training for trainers, and engagement of all staff in education and assessment are key elements for success.

Appendix

Contributors to the CoBaTrICE Collaboration

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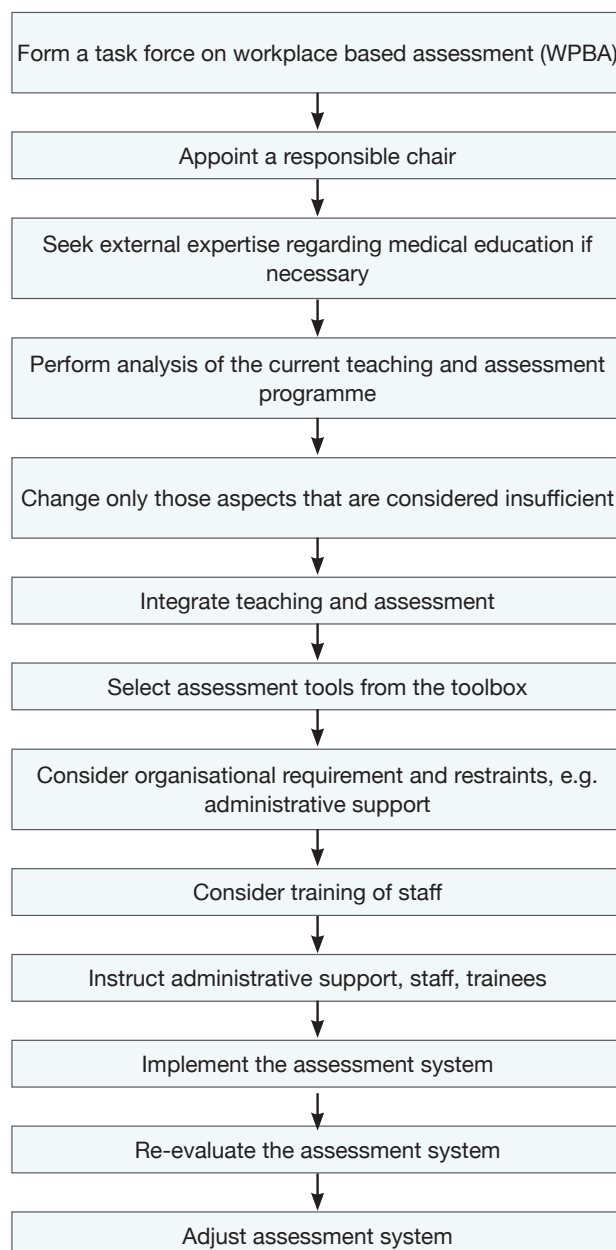
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Figure 3. Implementation of a workplace-based assessment programme in the ICU



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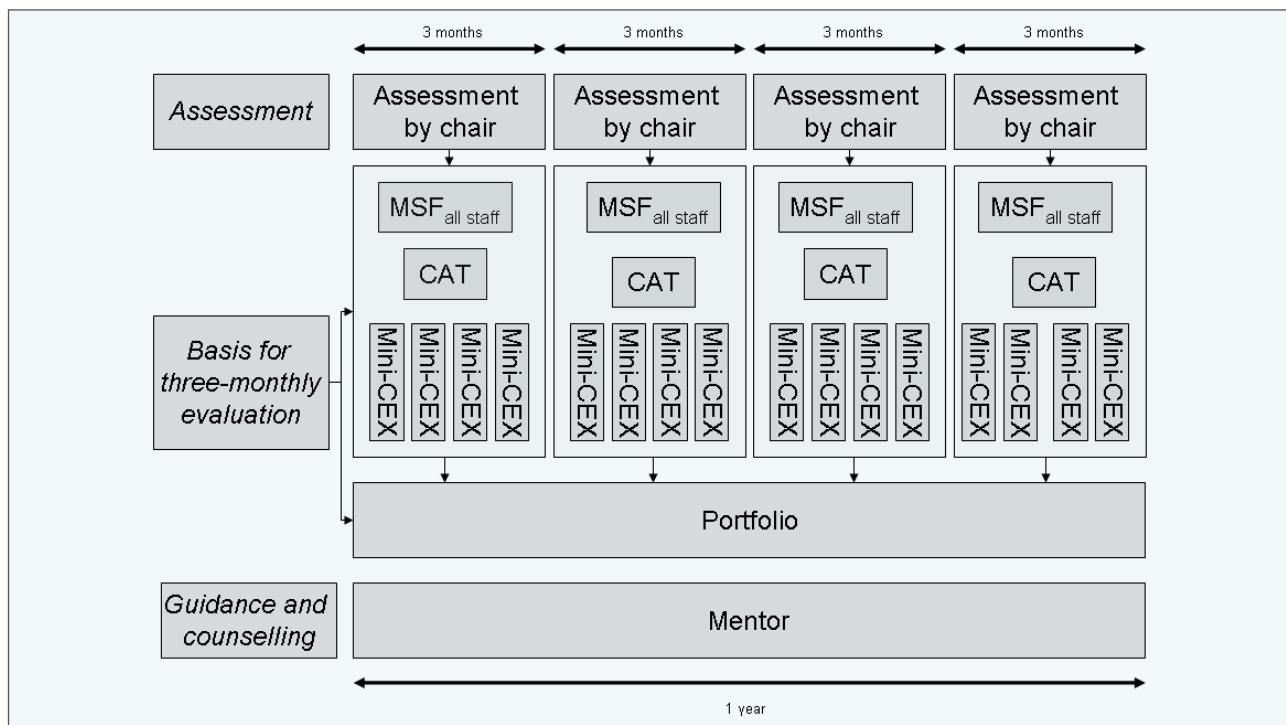
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Figure 4. Overview of the Maastricht University Medical Centre Intensive Care Medicine assessment programme



CAT = critical appraisal of topic

Mini-CEX = mini-clinical examination exercise

MSF = multi-source feedback

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