

WEB PAPER

Building a competency-based workplace curriculum around entrustable professional activities: The case of physician assistant training

HANNEKE MULDER¹, OLLE TEN CATE¹, RIENEKE DAALDER² & JOSEPHINE BERKVEN²

¹University Medical Center Utrecht, The Netherlands, ²University of Applied Sciences Utrecht, The Netherlands

Abstract

Background and aim: Competency-based medical education (CBME) is increasingly dominating clinical training, but also poses questions as to its practical implementation. There is a need for practical guidelines to translate CBME to the clinical work floor. This article aims to provide a practical model, based on the concept of entrustable professional activities (EPAs) to make this translation, derived from curriculum building for physician assistants (PAs).

Method: For the training of PAs at the Utrecht University of Applied Sciences, a three-step model was developed to guide competency-based curriculum development, teaching and assessment. It includes specific guidelines for the identification, systematic description and planning of EPAs.

Results: The EPA concept appeared to be a useful tool to build competency-based clinical workplace curricula. Implementation of the curriculum requires use of trainee portfolios and progress interviews, statements of rewarded responsibility and training of supervisors. The individualised approach and flexibility that true CBME implies is brought into practice with this model.

Discussion: The model may also be transferred to other domains of clinical training, among which postgraduate training for medical specialties.

Introduction

In many countries, healthcare professionals and educators are involved in restructuring clinical workplace curricula. This process, motivated by changes within the profession as well as by political and societal developments, impacts upon undergraduate and postgraduate medical education as well as the training of nurses and allied health workers. This restructuring roughly has two objectives. First, it aims at widening the scope of training, to include a broader spectrum of roles to be fulfilled. The influential Canadian Medical Education Directions for Specialists (CanMEDS) framework, for instance, stresses the role of the medical expert as central, but adds six other roles that are considered essential: communicator, collaborator, manager, health advocate, scholar and professional. Second, the current restructuring of curricula seeks to make the outcome of training more explicit: attained competence is considered more important than time spent in training. The concept of competency-based education, for example, as in the CanMEDS, Accreditation Council for Graduate Medical Education (ACGME) and similar frameworks, has been broadly adopted as an approach to serve these two goals (ACGME 2007; Frank et al. 2005).

In the Dutch context, the CanMEDS model is introduced, but the seven CanMEDS 'roles' are rather referred to as 'domains of competence'. For example, the role of

Practice points

- CBME is widely used and recommended but not always easy to implement.
- There is a need to better link competencies to what happens at the workplace.
- The concept of EPAs can serve to provide this link.
- The PA course in Utrecht applied a feasible CBME model using EPAs, that may be applicable more widely.

'communicator' is referred to as the 'communication' domain of medical competence in the Dutch model.

The introduction of competency-based medical education (CBME) has met with mixed appreciation. Next to broad support, there also is concern about how exactly these new roles must be taught and whether the whole concept of competency-based training will become a bureaucratic burden rather than a much needed improvement of the quality of clinical training (Grant 1999; Talbot 2004; Brooks 2009). There is clearly a gap to bridge between theory and practice. This article offers a practical approach to the application of competency-based training. In constructing a clinical workplace curriculum, CanMEDS is used as an example but can be substituted by any other competency-based healthcare

Correspondence: H. Mulder, University Medical Center Utrecht, PO Box No. 85500, 3508 GA Utrecht, The Netherlands. Tel: 31 88 755 3466; fax: 31 88 755 3409; email: h.mulder-2@umcutrecht.nl

training framework. We follow a train of thought set out by Ten Cate (2005) and Ten Cate and Scheele (2007) and apply this to an example derived from physician assistant (PA) training in The Netherlands. PAs in Dutch healthcare are allied health workers, trained by medical specialists to take over parts of clinical care. The example can just as well be replaced with postgraduate medical training – the approach should basically be the same.

Using entrustable professional activities as a key to competency-based training

Competency-based training has been defined as an outcome-based approach to the design, implementation, assessment and evaluation of a medical education programme using an organizing framework of competencies (Frank et al. 2010). For the purpose of this article, we define a competency as the ability, based on the integration of specific knowledge, skills and attitude, to perform a professional task at a level sufficient for unsupervised practice (Ten Cate et al. 2010).

To bridge the gap between the theory of competency-based education and clinical practice, the concept of ‘entrustable professional activities (EPAs)’ has been introduced. An EPA is ‘a critical part of professional work that can be identified as a unit to be entrusted to a trainee once sufficient competence has been reached’ (Ten Cate 2005; Ten Cate & Scheele 2007). Competence is thus translated and made manageable in terms of the tasks or activities that can be safely entrusted to someone who has shown the required ability.

Workplace curricula can be structured along a range of EPAs that a trainee must have mastered after training has been completed. These EPAs can be linked to an organizing competency-framework by pointing out which specific domains of competence are considered most relevant for each EPA. For instance, if one EPA is to ‘perform a lumbar puncture’, the trainee should (1) be familiar with relevant protocols, have good manual dexterity, have a thorough knowledge of local anatomy and of instruments to be used; (2) be able to organise; (3) be able to collaborate with assistants; and (4) be able to communicate professionally with the patient. In terms of the CanMEDS framework, this EPA requires particular competence in (1) medical expertise, (2) management, (3) collaboration, (4) communication and (5) professionalism.

The EPA concept is helpful in two ways. First, it invites curriculum builders to identify and select the important, representative or critical tasks that should be mastered, thus starting from clinical practice and focusing on the desired outcomes of training. Second, the concept implies that each task is linked explicitly to those domains of competence that are most crucial to this task, thus creating a base for observation and assessment of competencies as they manifest themselves in clinical practice. The set of EPAs identified when building a workplace curriculum should be a valid coverage of the profession and all domains of competence should receive attention in a well-balanced way.

In our EPA model, we distinguish two phases:

- I. Curriculum design: ‘Building an individual workplace curriculum around EPAs’
In this phase, three questions must be answered:
 - how should EPAs for clinical training be selected?
 - how should they be described to form a solid base for training and assessment?
 - how should the learning and assessment be planned in order to achieve a well-structured programme?
- II. Curriculum implementation: ‘Putting the workplace curriculum into practice’
In this phase, three aspects of curriculum implementation must be dealt with:
 - introducing a developmental portfolio and progress interviews
 - introducing statements of awarded responsibility and an attainments portfolio
 - training of supervisors

Figures 1 and 2 summarize this model.

To illustrate our model, it is helpful to expand on the training of PAs, as was recently reorganized in one school in The Netherlands to fit with the EPA concept.

The case of PA training

The training of PAs offers an excellent context to illustrate the applicability, possibilities and limitations of the EPA. The PA is a new profession in The Netherlands, meant to take over specific, well-defined medical tasks. PAs work largely independently, but under formal, mostly backstage, supervision of a physician. The selection of tasks that are delegated to a PA depends both on the specialty and specific demands of the workplace, and on the training received. This makes the professional profile of a PA highly individual. It is therefore necessary to specify for each individual PA which tasks may be entrusted, based on the training received. Workplace curricula for PAs thus are individualized and a transparent documentation of their competence is crucial.

Since 2001, the University of Applied Sciences (UAS) in Utrecht, The Netherlands, offers a 2.5-year Masters programme for PAs: part time at school and part time at the workplace. Students applying have a background in nursing or an allied health profession and at least 2 years of work experience in healthcare. This accounts for a wide variety in applicants. Training places are offered by clinical departments and general practitioner (GP) practices that are in need of specified medical support for which a PA could be suitable.

While the theoretical part of the UAS programme has been clearly structured and described from the start, this was, until recently, not the case for the workplace curriculum. A proper, well-structured description of the workplace curriculum was required to answer to the needs of students and supervisors as well as the programme management. Guidelines for supervisors were to be generated, offering a general framework, tools and criteria to design individual workplace curricula for PA students under their supervision. On the one hand, for the

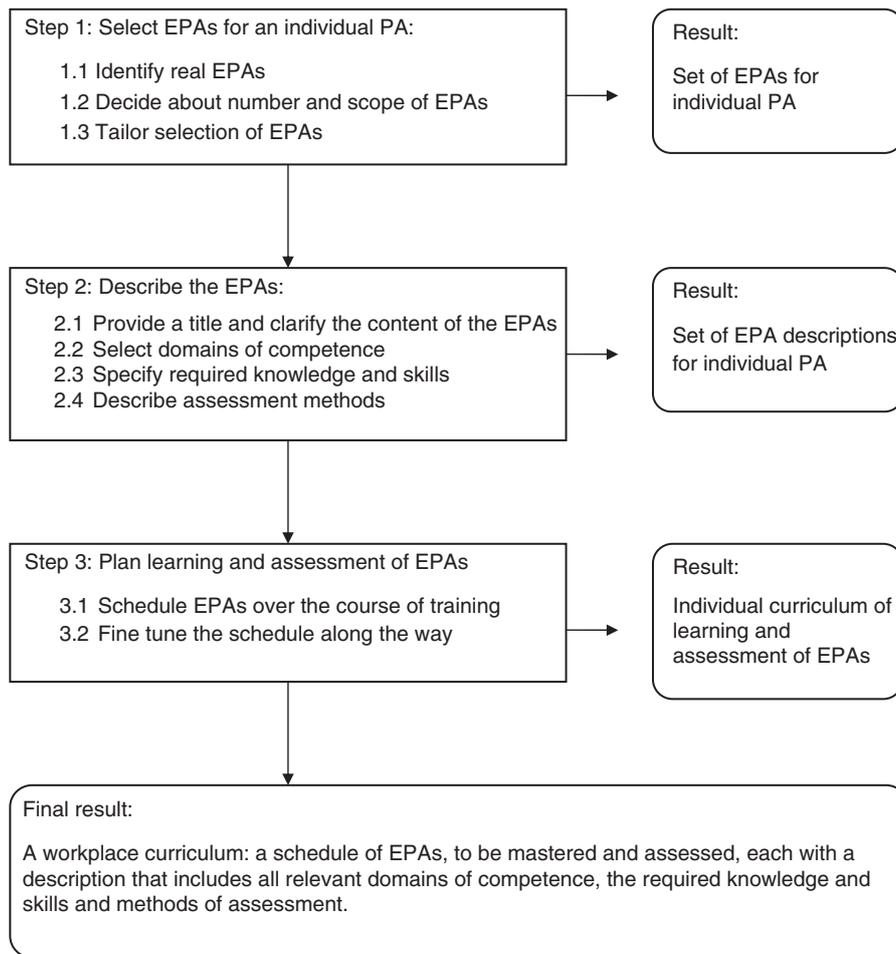


Figure 1. Building an individual workplace curriculum around EPAs.

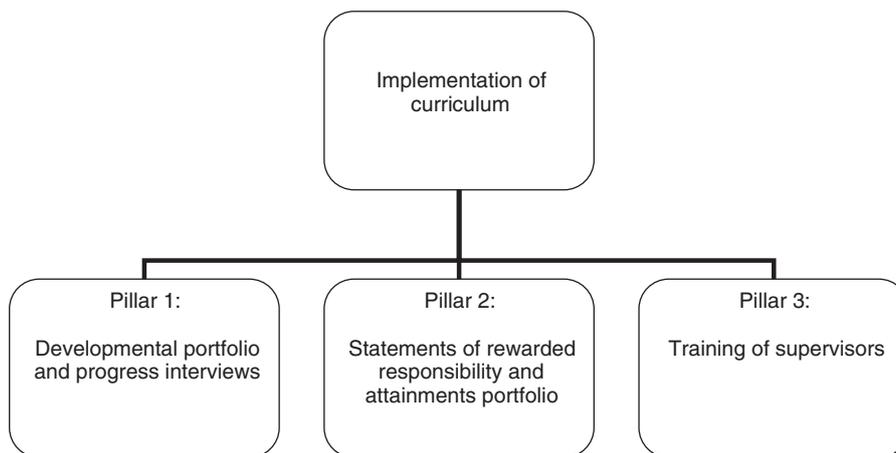


Figure 2. Putting the workplace curriculum into practice: implementation.

sake of the identity of the PA profession, the safety of patient care and the quality of education, these guidelines should define general rules applicable to all individual PA curricula, regardless of their specialty or specific working context. On the other hand, they should account for individual variety.

Building an individual workplace curriculum around EPAs

We recommend that three steps are taken to build an EPA-based curriculum: selection, description and planning of EPAs.

Step 1: Select EPAs for an individual PA

The backbone of each individual workplace curriculum consists of the EPAs for which the PA is trained and that will be delegated once he or she has finished the training. This set of EPAs constitutes the major, individualised, guideline for training and assessment and strongly determines the resulting individual professional profile. The first assignment for the supervisor therefore is to identify the tasks the PA in training should learn to carry out.

1.1. *Identify real EPAs.* In selecting EPAs, clinical supervisors must be aware that (1) an EPA is an authentic professional activity that can be entrusted to someone, and (2) that EPAs require competence, that is: integration of knowledge, skills and attitude. ‘Performing a lumbar puncture’ is a good example of an EPA. It is an authentic professional act that may be delegated to someone. It requires competence in different domains, underpinned by knowledge, skills and attitude. Supervisors sometimes have difficulty to distinguish EPAs from general learning objectives or skills, for example, ‘working sterile’ or ‘communicating properly’. As a tool to identify genuine EPAs that meet criteria 1 and 2, we urge to complete the sentence ‘Tomorrow you will be allowed to... [e.g. perform the lumbar puncture of patient X]’. This sentence rules out general learning objectives. It clearly does not make much sense to allow trainees to ‘work sterile’ or ‘communicate properly’ tomorrow: criterion 1 is not met because there is no circumscribed activity that can be entrusted. Moreover, the verb ‘allows’ challenges the supervisor to think about significant tasks that require real competence (criterion 2).

1.2. *Decide about number and scope of EPAs.* EPAs can vary in level and scope. On one end of the spectrum, one might consider ‘measuring blood pressure’ an EPA, while on the other end ‘running a specialized outpatient clinic’ could be an EPA. Both can be conveyed to trained professionals. It is obvious that these two EPAs are incomparable in scope and complexity. Clearly, a curriculum that describes ‘small’ EPAs requires many more than one that describes broad EPAs. Broad EPAs usually include several smaller ones. To answer the question, how many EPAs should constitute the curriculum, one should primarily think of requirements at graduation. Most supervisors have in mind which tasks they would like to convey to PAs, once they would be trained properly. Think of a job description for a personnel advertisement. This will

typically list anywhere from 5 to 15 EPAs, being not too detailed.

Table 1 gives the five EPAs that were agreed upon for a particular PA to be trained on a neurology department in one non-academic hospital.

The EPAs listed are broad responsibilities that may include smaller ones. As an example, the care for CTS patients includes providing steroid injections and applying electromyography. These two smaller EPAs are components of the ‘CTS’-EPA and must be mastered previously during the training period. This illustrates that one comprehensive EPA can be viewed as consisting of smaller, more elementary EPAs. If the final target is “running a specialized outpatient clinic,” one could unravel this complex EPA into separate smaller EPAs that might be learned, assessed and entrusted separately at earlier stages of training. During training, trainees progress to attain broader EPAs. The breadth of the EPAs can be linked to the stage of training. In this way, the training can be structured in a transparent and stimulating way.

1.3. *Tailor selection of EPAs.* PAs in training start with various competencies. From the virtual list of all EPAs fit for PAs in their specialty, supervisors should tailor a selection for each individual PA in training. This set of EPAs will guide workplace learning for this PA in training. In other words, when constructing the individual workplace curriculum, the supervisor must (1) determine the applicant’s starting level and (2) decide for which new tasks, responsibilities or activities he or she is to be trained.

Step 2: Describe the EPAs

The next challenge for the supervisor is to describe the selected EPAs in a specific and systematic way in order to create a solid base for training and assessment.

2.1. *Provide a title and clarify the content of the EPAs.* Each EPA should be given an informative title. This title usually contains a verb that specifies the kind of medical activity and often defines the particular group of patients referred to by this EPA.

Next, the EPA should be summarized in 20–50 words. This clarification should give the PA and others, e.g. future employers, a general idea of its content and scope. It should make clear the limitations of the PA’s responsibility, authority and autonomy and should refer to standards and protocols if possible.

Table 1. Five EPAs, founding the workplace curriculum of a neurology PA in training in one non-academic hospital, and required abilities in CanMEDS competency domains as two dimensions in an EPA-competency roles matrix.

		Medical expertise	Communication	Collaboration	Scholarship	Health advocacy	Management	Professionalism
1	Taking first history and physical of neurology patients	X	X				X	X
2	Performing lumbar punctures	X		X			X	
3	Care for stroke patients		X	X		X		X
4	Care for patients with lumbosacral radicular complaints		X	X		X	X	X
5	Care for patients with a carpal tunnel syndrome (CTS)	X	X	X	X		X	

This description might refer to smaller EPAs that are part of a more complex EPA and must be mastered at earlier stages.

2.2. *Select domains of competence.* To achieve an individual programme that meets general requirements, a balanced attention to all relevant domains of competence, for example, based on the CanMEDS framework, is necessary. Some EPAs might be excellent to demonstrate competence in organizational matters, whereas other EPAs offer the opportunity to illustrate cooperation or health advocacy. A well-chosen set of EPAs, linked to well-selected domains of competence, leads to a balanced individual workplace curriculum. An EPA-versus-competence domains matrix, as illustrated in Table 1, should be used to justify the way all domains of expected competence are addressed using the specified EPAs. This matrix is an essential element in every individual workplace curriculum.

2.3. *Specify required knowledge and skills.* As competence is underpinned by knowledge and skills, specific underlying knowledge and skills necessary to perform each EPA should be described. This description might also refer to manuals, instruction booklets and protocols.

2.4. *Describe assessment methods.* In a competency-based curriculum, assessment should explicitly take into account how knowledge, skills and attitude integrate in the performance of authentic tasks. **Therefore, observations of clinical activities, on Miller's 'does' level (Miller 1990), are vital in the assessment programme. Even beyond the 'does' level, the outcome or result of performance is relevant to the question: can we entrust independent task execution to this trainee? Next to observed behaviour, the quality of the student's functioning over a longer period should be captured.**

For the assessment of each EPA, the supervisor must make a choice from a set of assessment tools, such as a series of short observations or mini-CEX (mini clinical examination) of the performance of (a part of) an authentic task, followed by structured written and oral feedback (Norcini & Burch 2007).

An additional tool is multisource feedback (MSF), which may be used as an instrument to capture the quality of the students functioning over a longer period as seen from the perspectives of staff members, colleagues and patients. Whereas mini-CEXs are based on short, isolated and identifiable observations, MSF is based on more casual observations that are not announced or pinpointed in time and thus may add a dimension to the evaluation of the student. Although MSF is not a proper instrument to assess separate EPAs, it certainly provides information about the general competence of the student and as such is relevant as an assessment tool in a workplace curriculum (Murphy et al. 2009).

Notwithstanding the importance of observation-based assessment in clinical practice, separate evaluation of knowledge, on Miller's 'knows' en 'knows how' level, might also be an important aspect of the assessment of EPAs. The assessment of knowledge may take place as part of the workplace curriculum or at school and may be oral, computer-based or written, e.g. in the form of assignments or knowledge tests. One other way of testing knowledge that we encountered was the observation of a PA teaching others.

What goes for the assessment of knowledge also holds for the assessment of separate skills, on Miller's 'shows how' level: this kind of evaluation fits in perfectly in a competency-based curriculum and may be indispensable in the assessment of certain EPAs. Skills assessment may take place in the clinic or at school and may take different forms, e.g. using high or low fidelity computer simulation, standardized patients, OSCE or OSATS formats (objective-structured clinical examination or objective-structured assessment of technical skills) at a skills centre.

When a supervisor has completed the selection and description of EPAs as summarized in step 1 and 2, he will have produced a set of systematically described EPAs for an individual PA in training. Table 2 is an example of one EPA description.

Table 2. Form, used to describe EPAs, with example from neurology.

Discipline	Neurology
Title of the EPA	Care for stroke patients
Short description	Care for non-complicated stroke patients after initial diagnosis until release from the hospital, including selecting, requesting and interpreting diagnostic tests and taking subsequent measures; recognition of complications; communicating with family and colleagues; chairing focused multidisciplinary meetings; and handling correspondence with the patient's family doctor
Occurrence frequency	One or more times per day
Most important CanMEDS domains of competence	Communication, collaboration, health advocacy, professionalism
Knowledge and skills required	<ul style="list-style-type: none"> • Knowledge of neuroanatomy, including vascularization areas • Knowledge of pathology related to stroke symptoms: TIA, bleeding CVA, ischaemic CVA, insult • Knowledge and management skills concerning common complications: pneumonia, UG infection • Knowledge and skill to interpret diagnostic tests: CT, duplex, MRI, MRA, labtests, ECG • Knowledge of medication policy with hospitalized patients with stroke symptoms • Knowledge of secondary prevention measures of patient hospitalized for stroke • Knowledge and skill to deal with the local health care organization and rules • Knowledge of counter-indicated treatments for hospitalized stroke patients • Ability to do a focused history and phys ex skills, including investigating consciousness, cranial nerves, locomotion, sensibility, reflexes and coordination • Ability to chair multidisciplinary meetings • Ability to communicate well with family other health care workers about diagnosis, treatment, prognosis and secondary prevention
Assessment procedure	<ul style="list-style-type: none"> • Detailed observation or shadowing of the whole process a number of times • Structured interviewing about procedural knowledge

Table 3. Scheduling the training and mastering of EPAs in the course or 2.5 years or 10 block periods of 10 weeks each.

	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7	Block 8	Block 9	Block 10
EPA 1: Taking first history and physical of neurology patients	2	2	2	3	3	4				
EPA 2: Performing lumbar punctures	1	2	3	4						
EPA 3: Care for stroke patients	1	2	3	3	3	4				
EPA 4: Care for patients with lumbosacral radicular complaints			1	2	3	3	4			
EPA 5: Care for patients with a carpal tunnel syndrome						1	2	3	3	4

Notes: Increasing numbers refer to decreasing levels of supervision: 1, has insufficient knowledge and skills to perform; 2, may perform an activity under full supervision; 3, may perform an activity under limited supervision; 4, may perform an activity with back stage supervision; and 5, may provide supervision to others.

Step 3: Plan learning and assessment of EPAs

To complete the learning and assessment plan for the individual PA student, the supervisor should make visible when each EPA is planned to be mastered during the training.

3.1. *Schedule EPAs over the course of training.* For each student, a global planning for the training and assessment of EPAs is made. EPAs can be trained simultaneously or sequentially. Simple EPAs should of course be trained and assessed before the more comprehensive EPAs can be assessed.

3.2. *Fine tune the schedule along the way.* The global planning can be fine-tuned by using levels of competency, related to levels of supervision (Ten Cate & Scheele 2007):

Level 1: has acquired knowledge and skills, but insufficient to perform

Level 2: may perform an activity under full, proactive supervision: the supervisor decides about the intensity of supervision

Level 3: may perform an activity under qualified, reactive supervision: the student asks for supervision

Level 4: may perform an activity with back stage, mainly formal supervision

Level 5: may provide supervision to others

Level 4 is the threshold level of competence. Once this level is reached, the activity may be safely entrusted to the student. Growth of competency after reaching this threshold is likely as a result of further deliberate practice.

When fine-tuning the individual planning of EPAs, the supervisor should take into account the entrance level of the student. This level determines the number and nature of EPAs that this student can attain at level 4. As the trainee progresses through the course, the schedule may be adapted, according to the actual progress made.

Table 3 gives examples.

Putting the workplace curriculum into practice: Implementation

Steps 1–3 generate a paper version of the individual workplace curriculum. More is needed to implement the curriculum. The supervisor guides the student through the consecutive levels of competence by instruction and role modelling, assigns the student appropriate and instructive tasks, gives targeted

feedback and assesses timely. This process may be supported by three pillars.

Pillar 1: The developmental portfolio and progress interviews

The tools of workplace learning and assessment are underpinned by the use of a developmental portfolio. In this portfolio, students document their progress by collecting observation and feedback forms, test results and reflections. The portfolio is a central element in the regular, e.g. quarterly, progress interviews. During these interviews, the supervisor and the student analyse to what extent planned goals have been achieved and, given the final targets, which EPAs or domains of competence deserve special attention in the next period. Progress interviews may also lead to adjustments of the overall plan (Dekker et al. 2009).

Pillar 2: Statements of awarded responsibilities and the attainments portfolio

If observations and assessments as collected in the portfolio lead the supervisor to the conclusion that a specific EPA is mastered on level 4, he or she will consider to grant the student a so-called statement of awarded responsibility (STAR). Before actually granting a student this STAR, the supervisor asks at least two other ‘committed’ physicians to confirm this judgment and to co-sign the STAR form.

STARs are granted only during formal progress interviews. Once the student has obtained a STAR for a specific EPA, he or she is qualified to perform this activity with only background supervision. STARs will be assembled in a so-called *attainments portfolio*. This portfolio shows, for example, to a new employer, what this PA is capable of doing and acts as an extended curriculum vitae (CV).

Pillar 3: Training of supervisors

The task of the supervisor includes not only the design of the individual workplace curriculum for the trainee, but also the implementation of the curriculum. To prepare supervisors for this multifaceted task, they should be offered a tailor-made training. Depending on their prior knowledge, this training might consist of an introduction and clarification of the EPA concept, an exercise in using this concept in curriculum building, and workshops about short structured observations

such as mini-CEX, feedback, skills training and preparing, and conducting progress interviews.

Discussion

We described a model of structured workplace training, based on EPAs. The training of PAs, as described, has only recently started and we cannot report from extensive experience. However, the approach was much welcomed by the UAS management and by clinical supervisors, when asked for their opinions in workshops held in 2008, 2009 and 2010. Spenkeliink-Schut et al. (2008) received favourable reactions about the EPA concept for PAs in a survey among urologists. A project involving EPAs in the building of a postgraduate public health curriculum for physicians in 2006 has been successful (Wijnen-Meijer & Ten Cate 2006). The concept was also applied in several Dutch postgraduate specialty curricula, which currently face a major restructuring at a national level (Scheele et al. 2008). However, none of these earlier examples were carried out in such a structured and detailed way as the current PA workplace curriculum model.

We believe that this approach can result in true CBME. One feature of CBME (Frank et al. 2010) is that it is not time-based but outcome-based. Trainees' qualities should be acknowledged because of attained competence, and not because of specified time spent in training. The EPA concept allows just for this: timely acknowledgement of attained competence for specific responsibilities. Our example of PA training serves as an excellent domain to implement CBME, as the great variety of entrance qualifications of applicants, their diverse aptitude, their speciality of choice and locally desired workforce in clinical departments almost demand the individualized approach that is so characteristic of CBME. Our approach makes this feasible, while at the same time it is highly structured.

This project might be a starting point for restructuring and streamlining workplace curricula for PAs in a broader context, for example, on the level of specialties or even on a national level of PA training. Specialty associations could define sets of generic EPAs that are suitable for PAs in their specialty and from which set any individual physician could make a selection for his or her PA. In urology, the execution of circumcisions, transurethral microwave thermotherapy (TUMT) of the prostate procedures, supra-pubic catheter placement and sterilizations are but a few examples of procedures that have been taken over by PAs (Broersen 2009). It seems just a matter of time before specified tasks, suitable for PAs, are defined on a national level. It also seems very well possible to extend the approach to postgraduate medical training.

The major conclusion for this article is that building a competency-based clinical workplace curriculum on EPAs is a feasible, inspiring and promising process.

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Notes on contributors

H. MULDER, PhD is a senior staff member of the Center for Research and Development of Education at University Medical Center Utrecht.

OLLE TEN CATE, PhD is a professor of medical education and the director of the Center for Research and Development of Education at University Medical Center Utrecht.

RIENEKE DAALDER, MD is a senior staff member for Master PA training at UAS Utrecht.

JOSEPHINE BERKVEN, MD is a coordinator of Master PA training at UAS Utrecht.

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