



**CRITERIA FOR ACCREDITATION OF ERS EUROPEAN TRAINING CENTRES
IN PAEDIATRIC RESPIRATORY MEDICINE**



Preamble	3
Introduction	3
Section 1: Training centre, training network and training site	5
[1] Definitions	5
Section 2: Minimum components for a full training programme in paediatric respiratory medicine	5
[1] Trainee selection	5
[2] Duration of training	5
Section 3: Content of clinical experience	6
Section 4: Content of educational experience	7
Section 5: Content of research / scientific experience	10
Section 6: Infrastructure and support for trainees	10
[1] Educational facilities	10
[2] Clinical support facilities	10
[3] Clerical support.....	10
Section 7: Organisation of training programme	10
[1] Programme director	11
[2] Teaching faculty.....	11
[3] Other organisational issues	12
[4] Multidisciplinary approach	13
Section 8: Requirements for specific facilities	14
[1] Indicative numbers for Module B: pulmonary function testing.....	15
[2] Indicative numbers for other procedures	15
[3] Indicative numbers for Module X: additional diagnostic tests (optional module)	16
Appendix 1 - Assessments in medical education: Definitions	18
1. Assessment tools, level and environment	18
2. Assessment of 'Knows' and 'Knows How' (Levels 1 & 2)	18
3. Assessment of 'Shows How' (Level 3)	19
4. Assessment of 'Does' (Level 4)	19

Preamble

The accreditation phase of the Paediatric HERMES (Harmonising Education in Respiratory Medicine for European Specialists) project was launched to ensure that training centres in Paediatric Respiratory Medicine in and across Europe have the opportunity to be awarded a certification of excellence for their educational programmes in paediatric respiratory medicine training. To implement an accreditation process successfully specific development areas were considered necessary:

1. Documented minimum criteria
2. Requirements for the accreditation process
3. Supporting documentation to determine if prerequisites are met

The ERS Criteria for Accreditation document of ERS European Training Centres in Paediatric Respiratory Medicine marks the first step of this project phase. Titles and structures outlined within the document as well as indicative numbers presented are likely to be country specific and may vary. The document should be used as a guideline for best practice and is intended to provide training centres with descriptions of functions and roles important for achieving high-quality training of paediatric respiratory specialists.

Following WFME recommendations [1] and the method successfully implemented for the European Accreditation of Training centres in Adult Respiratory Medicine [2, 3], criteria were divided into two different levels:

- **Basic standards:** these standards **must** be met and fulfilment demonstrated during the evaluation of the training programme, including at the visual inspection stage
- **Standards for quality development:** are standards in accordance with international consensus regarding best practice for postgraduate medical education. Fulfilment of – or initiatives to fulfil – some or all of such standards should be documented.

If fully developed by the ERS and EBAP, the accreditation of Paediatric Respiratory Medicine Training Centres will follow the process in place for Adult Respiratory Medicine, as described below:

When assessing centres, both at the qualification phase and during the site visit, the review teams assess if the training centres meet all criteria.

Part 1: Qualification (review of application form)

The training centres may only proceed to part 2 (site visit) if they have successfully passed part 1, i.e. if based on their application they comply with all the basic standard criteria.

The training centres receive a full report from the review teams outlining areas of improvements to be implemented prior to the site visit.

Part 2: Site visit [4]

During the site visit, the review team has two opportunities to assess in person whether criteria have been met

1. During the visual inspection of the facilities
2. During the interviews with the key stakeholders in the training programme, including faculty and trainees

To guarantee fairness in the process, the same standardized and systematic assessment sheets are used by all of the review teams in all accreditation requests. Each review team provide their recommendations to an independent Accreditation Committee responsible for granting accreditation.

Introduction

This document provides a series of recommendations outlining minimum conditions to ensure appropriate clinical and educational experience for all trainees enrolled in the training programme.

Benefits for the training centre in implementing criteria for accreditation:

- a. Proof of excellence
 - b. Higher visibility
 - c. Quality label / enhanced reputation
 - d. Increasing attractiveness for trainees
 - e. Incentive for sufficient dimension of staff, room and equipment including the full spectrum of diagnostic and therapeutic techniques, according to the curriculum
 - f. Improved opportunities for better funding and better grants for research
 - g. Leverage to request financial support at national level
-

Section 1: Training centre, training network and training site

[1] Definitions

Training centre, training network and training site definitions

A **training centre** is defined as a centre that provides all mandatory modules as prescribed in the curriculum for paediatric respiratory medicine, as well as specific resources allowing trainees to fully complete their training at that centre. The training centre may be formally linked to a training site as defined below.

A **training network** can be composed of a training centre and any number of participating training sites or a network of formally linked participating training sites that provides any part of the required training. A training network consisting of training sites requires, formal letters of agreement defining roles and responsibilities between all training sites. Training centres networks should demonstrate that the trainees are able to rotate in different training sites within the training centre network during their training period.

A **training site** is defined as a site which provides a specific part of the required training, specific training resources and allows trainees to rotate through each training site in order to reach the educational goals as defined in the curriculum.

Section 2: Minimum components for a full training programme in paediatric respiratory medicine

[1] Trainee selection

- a. Trainee selection **should** be performed, in accordance with national rules and customs within EU countries in accordance with EU regulations.
- b. The training centre / network **should** provide at least one full time equivalent (FTE) position for each year of the training duration, averaged out over the whole training duration (i.e. 1 FTE position for a 3-year training programme).

[2] Duration of training

- a. **Duration of training**
 - i. Duration of training **should** comply with the conditions set in accordance with national rules and customs and for EU countries in accordance with EU regulations.
 - ii. Trainees who enter specialty training **should** complete general paediatric training according to national rules.
- b. **Optional training (elective training)**
 - i. The training centre / network **should** set up a mechanism to allow trainees to go out of the programme, where appropriate, and do elective training or research over an agreed period of time. This elective training **should** take place in addition to the recommended duration of specialty training according to national guidelines.

Section 3: Content of clinical experience

The training centre / network **must** ensure that the training programme provides trainees with a balanced mix of clinical experience and educational opportunities.

a. Outpatient services

- i. An indicative minimum of 100 new outpatients and 300 follow-up patients per year and per trainee, averaged over the whole training period **are recommended**.

b. Provision for special outpatient services

The training centre / network **must** be able to provide a wide range of outpatient services, *for example*:

- i. Asthma and wheezing disorders
- ii. Congenital malformations
- iii. Bronchopulmonary dysplasia
- iv. Rare lung diseases – (Interstitial lung diseases, bronchiolitis obliterans, surfactant disorders, lung tumours)
- v. Cystic fibrosis
- vi. Non cystic fibrosis bronchiectasis
- vii. Respiratory infections including tuberculosis
- viii. Respiratory disorders during sleep
- ix. Oxygen treatment and home ventilation

In the event that a training centre or network does not provide one of the above service, it is highly recommended that a partnership with other centre(s) or network(s) guarantees the appropriate exposure of the trainee.

c. Inpatient services

- i. The training centre / network **must** be able to provide a sufficient number of patients to cover the spectrum of respiratory diseases defined in the mandatory modules of the syllabus [5].
- ii. An indicative minimum of 300 inpatients per year per trainee, averaged over the whole training period is **recommended**.

d. Logbook/Portfolio

- i. It is mandatory that trainees keep a logbook / portfolio that should be regularly signed by the educational and / or clinical supervisor. The patient data collected in the logbook **must** be kept anonymous.
- ii. The portfolio **should** be used for providing feed-back to trainees.

e. Referrals

- i. The training centre / network **must** ensure trainer availability for discussion with trainees for each referral in order to ensure education and clinical governance.
- ii. Consultations on respiratory patients from other clinical services **must** be accessible in a timely manner.

Section 4: Content of educational experience

a. Educational goals

- i. The training centre / network **must** provide educational standards and appropriate setting to fully prepare trainees to enter into practice as a paediatric respiratory medicine specialist
 1. The training centre / network **must** support and encourage professional development of faculty members in key areas of teaching and learning
 2. Trainees **must** be supported in their professional development and critical self-assessment
 3. The training centre / network **must** provide a learning environment to develop the roles required of the medical expert as a communicator, collaborator, manager, health advocate, scholar and professional [6].
 4. Trainees must learn about the theory and practice of developing health literacy, enabling shared decision-making, and supporting self-management.

b. Educational Strategies

- i. The educational goals outlined above **must** be accomplished by proscribing the learning outcomes, providing a range of educational methods and relevant assessment methods, as well as ensuring an appropriate level of supervision, supporting faculty development, and providing the infrastructure to support the educational setting.

c. Competencies

- i. The programme **must** be able to deliver the knowledge, skills, attitudes and behaviours described in the national syllabus and curriculum.

d. Learning environment

- i. The training centre / network **should** encourage a culture in which trainees feel safe and are willing to receive feedback.

e. Educational methods

- i. With reference to the paediatric HERMES Curriculum [7], teaching in the clinical setting requires a learning partnership between supervisor and trainee based on modern workplace based learning. Key considerations for the educator would be:
 1. Ensuring that trainees actively observe others in clinical settings in order to see, analyse and interpret all that occurs.
 2. Helping trainees to engage in clinical practice at a level appropriate to their experience and needs.
 3. Ensuring an ongoing dialogue, both within and outside the clinical setting, between educator and trainee.
 4. Encouraging problem solving by the trainee in a range of different clinical settings.

- ii. The full range of modern educational methods **should** be considered. The following list sums up methods that are most used, but other methods can be

considered as well. It is suggested that each training centre has a list of all methods used, with their definitions.

Educational methods
Bedside / ward teaching
Case-based discussion
E-Learning
Feedback on letters: assessment instrument for letters
Grand rounds / departmental meetings / teaching seminars
Morning rounds
Operating theatre environments
Out-patient clinics
Peer-based learning
Self-directed learning
Patient presentations / testimonies to trainees
Simulations (simulator use for technical skills, simulation of clinical scenarios, etc.)

f. Assessment methods

- i. These serve a public function of accrediting a doctor's practice and their results can be used in three important ways according to the Paediatric HERMES Curriculum [6] rationale.
 - 1. For monitoring progress in learning (also known as *formative assessment*).
 - 2. For accreditation (*summative assessment*).
 - 3. For selection (e.g. into a training programme, to determine progression through a training programme, and for posts following completion of a training programme).
- ii. The full range of modern assessment methods **should** be considered. The following list sums up methods that are most used, but other methods can be considered as well. It is suggested that each hospital has a list of all methods used, with their definitions.

Assessment toolbox (*)
Written assessments (Knowledge tests, MCQs, short essay questions etc.)
Audit

Case based discussion
Direct observation of practical skills (DOPS)
Feedback on letters: assessment instrument for letters
Mini-clinical evaluation exercise (MiniCEX)
Multi source feedback
Objective structured clinical examination (OSCE)
Oral examination
Other options for example simulation and standardised patients
Feedback from patients
Portfolio (electronic, paper-based)

- iii. It is recommended that the training centres / network consider the educational methods and formative assessments as described in the assessment tools, level and environment model proposed in Appendix 1. Another useful guide that could be considered by paediatric training centres is the *Guide to formative and summative assessment for Paediatric Trainees and Trainers* issued by the Royal College of Paediatrics and Child Health (RCPCH) [8]
- iv. Training centres should encourage their trainees to **consider** the HERMES as an exam that would satisfy a component of the knowledge based element of assessment.
- v. It is **mandatory** that the trainee undergoes an annual review of her / his progress with educational and clinical supervisor and / or programme director which should be within a structured framework that includes feedback from the director.
- vi. The training centres / network **should** have a method in place to receive feedback from patients on the quality of the interaction with trainees.

g. Level of supervision

- i. The training centre / network **must** ensure that, over the course of their training period, trainees assume increasing clinical responsibility, appropriate to their overall level of competence.
- ii. The training centre / network **must** be of a sufficiently high standard to allow trainees to attain the levels of supervision / independence set forth in the syllabus.
 - 1. **Level 1** Awareness sufficient to recognise and know when to refer.
 - 2. **Level 2** Knowledge sufficient to manage with supervision (or refer).
 - 3. **Level 3** Advanced knowledge sufficient for independent specialist practice.

*See appendix 1 – Assessments in Medical Education: Definitions

Section 5: Content of research / scientific experience

- a. The training centre / network **should** provide a list of its 5 best publications in the last 5 years and evidence of continuous research or scientific activities.
- b. Trainees **should** be encouraged to take part in audit, research and publication.
- c. The training centre / network **should** provide opportunities for trainees to plan, conduct, evaluate and publish audit and / or research (e.g. each trainee should have presented at least one oral poster in an international congress by the end of training).
- d. At least one faculty or management member **should** have taken part in a CME activity or event accredited by the UEMS / EBAP, either as a participant, speaker, chair or member of the scientific / organising committee.

Section 6: Infrastructure and support for trainees

The training centre / network **must** ensure the availability of adequate resources for trainee education:

[1] Educational facilities

a. Space and equipment

- i. There **must** be adequate space and equipment to cope with the requirements of the educational programme, including meeting rooms, computers with internet access, visual and other educational aids, and work / study space. Easy access to desks and computing facilities **must** be available.
- ii. The training centre / network **must** provide adequate and timely access to specialty-specific medical information and other appropriate print, electronic and web-based reference materials. This **must** include local protocols and guidelines.

[2] Clinical support facilities

a. The training centre / network **must ensure the availability of adequate resources to support trainees' clinical experience, in both in- and out-patient settings:**

- i. The trainees **must** have access to relevant medical records, including imaging (images from chest X-rays, CT scans, nuclear scans, MRI etc.), laboratory and pathological reports for both inpatient and ambulatory care patient population.
- ii. When trainees are assigned night duty or on call, they **must** be provided with facilities according to national regulations.

[3] Clerical support

a. The training centre / network **must ensure secretarial and administrative support to meet the needs and demands as judged by the trainee, teaching faculty and programme director.**

Section 7: Organisation of training programme

This section describes functions and roles in the organisation of a training programme important for achieving high quality training. Exact structure and titles can vary from country to country.

Positions can carry other names. Furthermore, numerous responsibilities can be attributed to a single position depending on the size and structure of the local programme.

Each programme **must** be supervised by a single programme director with authority and accountability for the operation of the entire programme. The programme **must** ensure adequate numbers of both educational and clinical supervisors.

[1] Programme director

- a. Qualifications **must** include:
 - i. Certification in Paediatrics and recognition by relevant national authority.
 - ii. Certification as a paediatric respiratory medicine specialist or in countries without such recognition he / she must be undertaking practice that is predominantly in paediatric respiratory medicine.
- b. In addition, the programme director **should**:
 - i. Have a scientific background
 - ii. Have produced original research
 - iii. Have peer-reviewed research publications
- c. Administrative responsibilities **must** include the following:
 - i. Overseeing and ensuring the efficient management and quality of the training programme.
 - ii. Supervising and guaranteeing quality of didactic and clinical education.
 - iii. Approving the educational supervisor of the training centre or at each participating site of the training centre network.
 - iv. Ensuring the quality of educational and clinical supervisors.
 - v. Coordinating the monitoring of trainee supervision.
 - vi. Ensuring there is a mechanism to review trainees at least once a year, through a formative assessment with written feedback to the trainee.
 - vii. Ensuring that there are mechanisms for the resolution of trainees' grievances.

[2] Teaching faculty

- a. **Educational Supervisor**
 - i. Qualifications **must** include:
 1. Certification in Paediatrics and being a practising specialist.
 2. Strong interest and commitment to post-graduate medical education.
 3. Commitment to keeping up to date and maintaining CME / CPD as per national requirements.
 - ii. Responsibilities **should** include the following:
 1. Overseeing the progress of the trainee throughout the entire training programme.

2. Conducting regular formal and documented appraisals with the trainee.
3. Commenting on the educational progress of the trainee in the trainee's portfolio.
4. Providing feedback on assessments and general progress of the trainee.
5. Reviewing of trainee appraisals and overall progress, and for those trainees experiencing difficulty, liaise with colleagues including the clinical supervisor to address concerns and provide additional professional support to the trainee where necessary.
6. Overseeing the personal and professional development of the trainee.

b. Clinical Supervisor

- i. Qualifications of the clinical supervisor **must** include:
 1. Certification in paediatric respiratory specialist and being a practicing specialist, or in countries without such recognition undertaking practice that is predominantly in paediatric respiratory medicine.
 2. Commitment to keeping up to date and maintaining CME / CPD as per national requirements.
- ii. Clinical supervisor responsibilities **must** include the following:
 1. Responsibility for the continuous observation of trainee's assigned clinical work.
 2. Ensuring assigned trainees abide with best practice in safety and clinical standards of care.
 3. Delegating appropriate levels of responsibility and ensure adequate supervision and support is available.
 4. Identifying any concerns or problem areas relating to the trainee and if necessary follow up with educational supervisor.
 5. Monitoring and recording progress and soliciting feedback on a regular basis to ensure practice improvement and ongoing professional development.
 6. Providing progress reports as requested or scheduled by the educational supervisor or programme director.

NB: Depending on the size and structure of the training programme, educational supervisor's and clinical supervisor's roles can be shouldered by one and the same person.

[3] Other organisational issues

a. Minimum numbers of training personnel

- i. The training centre / network **must** provide at least 2 full time equivalents (FTE) of certified specialists or consultants working in paediatric respiratory medicine and involved in medical training.

b. Minimum number of trainees

- i. The training centre / network **must** provide one FTE position for the entire training duration.

c. Duty hours and personal responsibility

- i. Duty hours **must** conform to the local regulations of the host country.
- ii. Trainees **must** be made aware of their responsibilities with regards to continuity of care of patients.

d. Other educational opportunities

- i. The training centre / network **must** provide other educational activities such as rounds (colloquia), conferences, journal club, mortality and morbidity reviews, X-rays and multidisciplinary meetings.
- ii. Trainees **must** be given opportunity to take part in teaching activities and external educational activities.

[4] Multidisciplinary approach

- a. The training centre **must** ensure smooth collaboration with other units, such as:

1. General Paediatrics
2. Anaesthesiology
3. Biochemistry
4. Immunology
5. Lung transplantation
6. Microbiology
7. Neurology
8. Oncology
9. Ophthalmology
10. Otorhinolaryngology
11. Palliative care
12. Pathology
13. Physical medicine
14. Radiology
15. Rehabilitation
16. Sleep
17. Thoracic Surgery
18. Intensive care

- b. The training centre / network **must** ensure smooth collaboration with other professionals, such as:

- i. Allied health care professionals including:
 1. Nurse specialists
 2. Nutritionists
 3. Speech therapists
 4. Psychologists
 5. Physiotherapists
 6. Respiratory technicians

- ii. Other specialists
- c. The training centre / network **must** ensure smooth collaboration with other care units such as:
 - 1. Primary care paediatricians
 - 2. Home care / early discharge
 - 3. Psycho-social care
 - 4. Other health care units

Section 8: Requirements for specific facilities

The training centre / network **must** provide all facilities necessary to ensure that trainees experience adequate clinical experience and first-hand exposure to a wide range of techniques and procedures, as listed below.

Please refer to the paediatric HERMES syllabus [5] and HERMES curriculum [7]

Techniques and procedures	Curriculum modules
Imaging techniques	D
Pulmonary function testing	B
Endoscopy	C
Therapeutic interventions such as oxygen supplementation, non invasive ventilation, and long term care	P
Intensive care and high-dependency care (intermediate care including weaning)	P
Sleep-related disorders	M
Palliative care	I, P

a. Indicative numbers

- i. Practical experience and first-hand exposure are crucial in the learning of techniques. The below tables provide training centres with guidelines **on the expected minimum number of procedures, a learner should be exposed to during the entire duration of his / her paediatric respiratory medicine training to attain the required level of competence.**
- ii. In completing the prescribed numbers it is recognised that trainees will go through a varied process of observation, simulation, supervised and independent practice of the procedure in order to advance from novice to competent practitioner during the training period.
- iii. It is however recognised that in some countries, the stated numbers may be difficult to achieve for some techniques due to the organisation of care and availability of facilities. However, trainee rotation through reference training centres and training centre networks offers an opportunity for most trainees in Europe to achieve these aims.
- iv. It is recommended that exposure to these procedures should be documented in the trainees' portfolios.

[1] Indicative numbers for Module B: pulmonary function testing

Procedures	Indicative numbers
Flow volume curves	>50
Lung volumes measurements	>30
Reversibility testing	>30
Bronchial provocation testing	>15
Exercise testing	>15
Blood gas analysis	>30
6-min walking tests	>10

[2] Indicative numbers for other procedures

Modules	Procedures	Indicative numbers
Module A Evaluation of respiratory symptoms and signs	No procedure identified specifically for this module	
Module B Pulmonary function tests	Pulse oximetry / overnight sleep screening	>15
Module C Airway endoscopy	Flexible bronchoscopy, +/- Biopsy +/- Bronchoalveolar lavage	>50 ^(*)
Module D Imaging techniques	Radiography Computed tomography Magnetic resonance imaging Ultrasonography Isotope imaging (knowledge)	Imaging techniques including ultrasound and conventional radiology >100 CT/MRI > 10/year
Module E Acute and chronic lung infections	No procedure identified specifically for this module, however exposure is necessary	
Module F Tuberculosis	In vivo and in vitro diagnostic tests (intracutaneous tests)	>20
Module G Bronchial asthma and other wheezing disorders	Refer to procedures under Module B: <i>Pulmonary function testing</i>	
Module H Allergic disorders	In vivo and in vitro diagnostic tests	>20
Module I Cystic fibrosis	No procedure identified specifically for this module, however exposure is necessary	
Module J Congenital malformations	No procedure identified specifically for this module, however exposure is necessary	

Module K Bronchopulmonary dysplasia	No procedure identified specifically for this module, however exposure is necessary	
Module L Rare diseases	Ciliary biopsies Pleural drainage	>5 > 10 chest drains
Module M Sleep	Polysomnography (EEG) Cardio-respiratory monitoring	>5 >20
Module N Rehabilitation in chronic respiratory diseases	No procedure identified specifically for this module, however exposure is necessary	
Module O Inhalation therapy	No procedure identified specifically for this module, however exposure is necessary	
Module P Technology dependent children	Long-term oxygen therapy Tracheostomy care Non-invasive ventilation Invasive ventilation Airway clearance	>10 >10 >10 >5 >10
Module Q Epidemiology and environmental health	No procedure identified specifically for this module, however exposure is necessary	
Module R Management and leadership	No procedure identified specifically for this module, however exposure is necessary and should be recorded in portfolio	
Module S Teaching	Involvement in an active teaching programme. This should be documented in the portfolio	
Module T Research	Active participation in relevant on-going research as outlined in sections 1 and 5	
Module U Communication	No procedure identified specifically for this module, however exposure is necessary	
Module V Rigid and interventional bronchoscopy	Rigid bronchoscopy Interventional bronchoscopy Foreign body removal	Optional module
Module W Post lung transplant management	Transbronchial biopsy	Optional module

(*) figure including supervised scopes

[3] Indicative numbers for Module X: additional diagnostic tests (optional module)

Procedures	Indicative numbers
Exhaled nitric oxide measurements	>20
Induced sputum tests	>5
Forced oscillation measurements	>5
Lung function tests	No prescribed numbers

Ventilation homogeneity tests	No prescribed numbers
Cardio-pulmonary exercise testing	>5

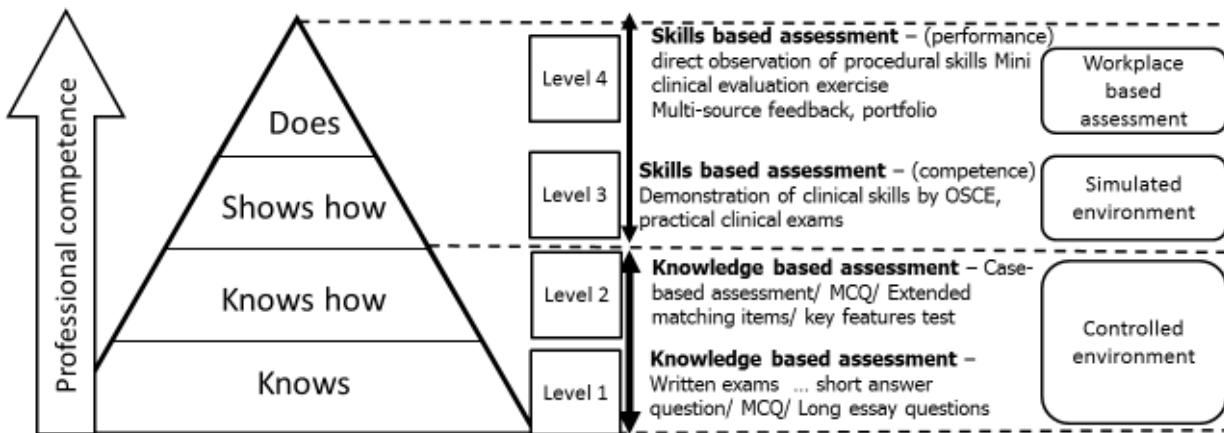
References

1. van Niekerk DV, Christensen L, Karle H, et al. WFME Global Standards in Medical Education: status and perspectives following the 2003 WFME World Conference, *Medical Education* 2003; 37(11): 1050-1054.
2. Sutter S, Mitchell S, Verbraecken J et al, HERMES: European Accreditation of Training Centres in Adult Respiratory Medicine – Criteria validation and revision, *Breathe* 2016 (in press); DOI: 10.1183/20734735.000116
3. Loddenkemper R, Séverin T, Mitchell S, et al. Adult HERMES: criteria for accreditation of ERS European training centres in adult respiratory medicine. *Breathe* 2010; 7 (2): 170-188.
4. Union Européenne Des Médecins Spécialistes / European Union Of Medical Specialists. UEMS Charter on visitation of training centres, 1997. http://www.uems.eu/_data/assets/pdf_file/0013/1480/179.pdf. Last accessed 30 November 2015
5. Gappa M, Noël JL, Séverin T, et al. Paediatric HERMES: a European Syllabus in Paediatric Respiratory Medicine, *Breathe* 2009; 5 (3): 237-247.
6. Frank JR, Snell L, Sherbino J, editors. *Can Meds 2015 Physician Competency Framework*. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015
7. Gappa M, Noël JL, Séverin T, et al. Paediatric HERMES: European Curriculum Recommendations for Training in Paediatric Respiratory Medicine. *Breathe* 2010; 7: 72–79.
8. Royal College of Paediatrics and Child Health. An informative guide to formative and summative assessment for Paediatric Trainees and Trainers, August 2015. [http://www.rcpch.ac.uk/system/files/protected/page/Assessment%20Guide%202nd%20Ed%202015%20\(JOK%20HB%20DE%20Revised%20v3\)_2.pdf](http://www.rcpch.ac.uk/system/files/protected/page/Assessment%20Guide%202nd%20Ed%202015%20(JOK%20HB%20DE%20Revised%20v3)_2.pdf) . Last accessed 04.02.2016
9. Miller GE. The assessment of clinical skills/competence/performance. *Academic Medicine* (Supplement) 1990; 65; 863-S7
10. Amin Z, Seng CY, Eng KU, *Practical Guide to Medical Student Assessment*. Singapore. World Scientific Publishig Co.Pte.Ltd. 2006.
11. Page G, Bordage G. The Medical Council of Canada's key features project: A more valid written examination of clinical decision making skills. (1995) *Academic Medicine* 70 (2). 104 -110
12. Amin Z., Khoo HE. *Basics in Medical Education*. World Scientific Publishing Co. Pte. Ltd., Singapore, 2003
13. Friedman BD, Davis MH, Harden RM, et al. *Portofolio as a method of student assessment*, AMEE Education Guide 24 (Association of medical Education in Europe, Dundee, UK), 2001

Appendix 1 - Assessments in medical education: Definitions

1. Assessment tools, level and environment

Below are provided the assessment levels as described by Miller [9].



2. Assessment of 'Knows' and 'Knows How' (Levels 1 & 2)

We list, for each assessment level, the corresponding assessment tools [10]. Any skill however requires to be assessed by multiple assessment tools.

a. Oral examination

In an oral examination, a candidate faces one or more examiners who ask questions. Examiners must use a blueprint to select content area and a structured marking scheme. Often, oral examinations are conducted in conjunction with long and short cases.

b. Long essay questions (LEQ)

Typically, a long essay is a piece of prose that varies in length from several paragraphs to several pages. The question stem often contains a phrase such as: 'Describe the management of ...'.

c. Short answer question (SAQ)

A practical alternative to the long essay question, the short answer question is an open ended, semi-structured question format. A structured, pre-determined marking scheme improves objectivity. The questions can incorporate clinical scenarios. A similar format is known as modified essay question (MEQ) or constructed response question (CRQ).

d. Multiple choice questions (MCQs)

The MCQ is a restricted response, objective assessment instrument. It contains:

1. A stem or a description of a problem
2. Lead-in or the question, and
3. Option list

e. Extended matching items (EMI)

EMI is a relatively new format of objective testing which is somewhat similar to the MCQ, except that is based on a single theme and has a long option to avoid cuing. It is also known as extended matching question (EMQ).

f. Key features test (KF)

The KF, initially developed by the Medical Council of Canada (MCC), for its licensing examination, is a clinical scenario-based paper and pencil test. A description of the problem is followed by a limited number of questions, usually two to three, which focus only on critical, challenging actions and decisions [11]. Both write-in and short-menu formats can be used in the answer scripts. In the MCC licensing examination, the KF is implemented along with the more conventional MCQ.

3. Assessment of 'Shows How' (Level 3)

a. Long case

Involves the use of a non-standardized real patient. The candidate is usually assessed on one long case and three to four short cases with oral examination. The candidate may or may not be observed during the examination.

b. Short case

Involves the use of three to four non-standardized real patients with one to two examiners. Usually there is a common marking scheme for all the cases.

c. Objective structured clinical examination (OSCE)

OSCE consists of multiple stations (usually 15-20) where each candidate is asked to perform a defined task such as taking a focused history or performing a focused examination of a particular system. A standardised marking scheme specific for each case is used.

4. Assessment of 'Does' (Level 4)

a. Mini clinical evaluation exercise (Mini-CEX)

Mini-CEX is a rating scale developed by the American Board of Internal Medicine (ABIM) in the 1990's to assess six core competencies of residents. These are:

1. Medical intervention skills
2. Physical examination skills
3. Humanistic qualities/professionalism
4. Clinical judgement
5. Counselling skills
6. Organisation and efficiency
7. Direct observation of procedural skills (DOPS)

DOPS is a structured rating scale for assessing and providing feedback on practical procedures. DOPS is similar to Mini-CEX except that the domains of interest are related to practical problems.

b. Clinical work sampling (CWS)

CWS is an in-trainee evaluation method. Like the Mini-CEX and DOPS, the CWS addresses the issue of system and rater biases by collecting data on observed behaviour at the time of actual performance and by using multiple observers and occasions. Like the Mini-CEX and DOPS, there is an opportunity to provide feedback to the student and trainee.

c. Checklist

Checklists are commonly used in assessments to capture an observed behaviour or action of a student. Generally, rating is by a five to seven point Likert scale. Checklists are usually used at the end of clinical rotations.

d. 360-Degree evaluation or Multi Source Feedback (MSF)

A 360-Degree evaluation consists of measurement tools completed by multiple individuals in a person's sphere of influence. Usually, it assesses how frequently a behaviour or an action is performed by a candidate using a rating scale. The observation is done by several individuals, and generally includes the supervising physicians, peers, nurses and sometimes patients. The domain of competency assessed by this evaluation is generally restricted to aspects of observable behaviour such as communication skills, interpersonal relationship and other from a similar sphere.

e. Logbook

The candidate keeps a track record of the patients seen or procedures performed either in a book or in a computer. The program may or may not have a defined target (e.g. number of procedures to be performed, types and number of cases to be seen) for the candidate.

f. Portfolio

A portfolio is a collection of one's professional and personal goals, achievements, and methods of achieving these goals [12]. It may contain items such as one's best essays, written or research projects, logbooks, letter of reflection and evidence of professional growth, to support individual accomplishment and progression [13]. It can also be used to collect assessment forms and exam results.