

## Regulations for Faculty Pre-hospital Care Accreditation of Level 8 Practitioners in Pre-hospital Emergency Medicine (Consultant)

### 1. Background

- 1.1 Pre-hospital Emergency Medicine (PHEM) is approved by the General Medical Council (GMC) as a medical sub-specialty of the existing specialties of Emergency Medicine, Anaesthetics, Acute Internal Medicine and Intensive Care Medicine. GMC approved training programmes in PHEM started to become available in mid-2012.
- 1.2 Although the Faculty of Pre-hospital Care, in initiating the PHEM sub-specialty development process, supports the continued expansion of the range of specialties in which sub-specialty registration in PHEM can be gained, it is anticipated that the work currently underway for other CCT specialties, including General Practice, will take some years to come to fruition.
- 1.3 UK based doctors who are active in PHEM are currently only eligible for PHEM to be added to their entry on the Specialist Register if they hold a CCT or Certificate of Equivalence in Specialty Training (CESR), or historical equivalent, in Emergency Medicine, Anaesthetics, Acute Internal Medicine or Intensive Care Medicine **and** have undertaken training in PHEM as part of a GMC approved training programme. Given that training programmes have only recently commenced and that there is currently no mechanism for the award of a CESR for a sub-specialty, there is, consequentially, no mechanism for doctors who are currently active in PHEM at consultant level to have PHEM sub-specialty accreditation added to their entry on the Specialist Register.
- 1.4 Similarly, experienced qualified pre-hospital practitioners from paramedic and nursing backgrounds have been unable to have their experience and expertise formally recognised as being equivalent to sub-specialist clinical practice.
- 1.5 The Faculty of Pre-hospital Care, in collaboration with the Intercollegiate Board for Training in Pre-hospital Emergency Medicine (IBTPHEM), has therefore developed a process by which CCT or CESR holders in any specialty (including General Practice), and senior nurses or paramedics practising at a consultant level, may apply for recognition of their PHEM experience and Faculty Accreditation as a Consultant (Level 8) Practitioner in PHEM. These regulations outline the Faculty Accreditation application and assessment processes.
- 1.6 A practitioner operating at the consultant level is expected to have a high degree of expertise in a specific area of work or across a substantial breadth of service delivery and/or programmes. They are also accountable for work across organisational boundaries and have leadership responsibility and autonomy. Skills for Health state: *“People at level 8 of the career framework require highly specialised knowledge, some of which is at the forefront of knowledge in a field of work, which they use as the basis for original thinking and/or research. They are leaders with considerable responsibility, and the ability to research and analyse complex processes. They have responsibility for service improvement or development. They may have considerable clinical and/or management responsibilities, be accountable for service delivery or have a leading education or commissioning role.”*

1.7 Faculty Accreditation therefore represents significant professional recognition of consultant level practice. In relation to doctors and nurses, the GMC have previously indicated their willingness to acknowledge the Faculty Accreditation process but there is currently no guarantee, for regulatory reasons, that Faculty Accreditation will result in the addition of PHEM on an individual's entry in the Specialist Register. Similarly, neither the Nursing and Midwifery council or the Health and Care Professions Council currently have a mechanism for sub-specialty recognition. In practical and professional terms however, Faculty Accreditation will be regarded as being the equivalent to sub-specialty registration and consultant level practice.

1.8 There are two separate steps to Faculty Accreditation. Step 1 is the award of the Fellowship in Immediate Medical Care (FIMC). This can be achieved by examination, through the PHEM trainee group. Step 2 of Level 8 accreditation is submission and satisfactory assessment of a portfolio of clinical and operational experience that reflects (a) the content of the GMC approved PHEM Curriculum and (b) the domains of the Current Skills for Health descriptors for the Level 8 (Consultant) practitioner.<sup>1</sup>

## **2. Requirements for Faculty Accreditation**

2.1 The requirement for Level 8 Faculty Accreditation is the award of the Fellowship in Immediate Medical Care (FIMC) by examination (this can be achieved through the PHEM trainee pathway or by via any of the recognised routes. Applicants who hold the FIMC can proceed directly to applying for the Level 8 Accreditation.

## **3. Faculty Accreditation of Level 8 Practitioner**

3.1 This is the formal application for Faculty Accreditation. It comprises a structured review of a single professionally presented and bound portfolio of clinical and operational experience that reflects (a) the GMC approved PHEM Curriculum and (b) the domains of the historical Skills for Health descriptors for the level 8 (Consultant) practitioner.

3.2 The criteria for Faculty Accreditation reflect the expertise and experience of consultant level practitioners. Applicants must:

- a) Be a member of the Faculty of Pre-hospital Care in good standing
- b) Hold the Fellowship in Immediate Medical Care RCSEd
- c) Submit a single electronic copy of the content of the physical portfolio. Once approved, a single professionally bound Physical Portfolio must be given to the office at least two weeks before the interview panel date

3.3 Guidance on preparation of the portfolio of clinical and operational experience

Candidates should submit a portfolio of clinical and operational experience that reflects the content of the GMC approved PHEM Curriculum and (b) the domains of the Skills for Health descriptors for the Level 8 (Consultant) practitioner. The portfolio should be constructed and presented as described in this detailed guidance. The Faculty of Pre-hospital Care will assess the portfolio against the PHEM curriculum and also against the Skills for Health level 8 descriptors.

The portfolio should be presented as a single volume with clearly delineated sections arranged as described in the regulations and listed below. All pages must be numbered sequentially. More detailed description of the sections of the portfolio is available in paragraph 3.4

- Section 1 - Details of current professional practice
- Section 2 - Evidence of level 8 practice
- Section 3 – Evidence of current working / operational practice in emergency medical systems

- Section 4 – Evidence of providing pre-hospital emergency medical care
- Section 5 – Evidence of using pre-hospital equipment
- Section 6 – Evidence of supporting rescue and extrication
- Section 7 – Evidence of supporting safe patient transfer
- Section 8 – Evidence of supporting emergency preparedness and response
- Section 9 – Evidence of team resource management training and practice
- Section 10 – Evidence of clinical governance activity

(a) Portfolio formatting.

- The portfolio must be presented as a single volume with a title page, a contents page and organised sections as per paragraph 3.3
- The hardbound portfolio should be stitched rather than glued. The cover may be any colour but there should be gold coloured lettering on the spine with the initials and surname of the applicant and the month and year of application.
- The front should have gold coloured lettering that reads: Faculty Accreditation of Consultant (Level 8): Portfolio of Clinical and Operational Experience.
- Text within the portfolio should generally be one and a half spacing with paragraph justification. Text should be Arial 14 point for headings, 12 point for subheadings (both in bold) and 11 point for the body.
- Vancouver referencing conventions should be used throughout. Where other documents, such as letters, are included in the portfolio, these should be legible and have the correct sequence of page numbering applied.
- Every page must also clearly state the applicant's name in a header or footer.

(b) The Faculty Accreditation process mirrors, in terms and standards of evidence, the GMC's processes for application for Sub-specialty Recognition. Portfolio content that relates to evidence of qualifications, education or clinical or operational experience must be authenticated or validated, translated where necessary and appropriately anonymised.

(c) Portfolio Evidence

- i. Documentary evidence pertaining to training and/or clinical and operational experience must be validated by someone in a medical supervisory position who works within the relevant organisation where the training or experience took place and who can confirm that the evidence presented is a true reflection of clinical experience.
- ii. Employment letters and job descriptions can be validated by administrative personnel responsible for human resources at the organisation the evidence relates to. Validation should include the organisation's details, the validator's name, the validator's job title, and the validator's original signature or e-signature and email address.
- iii. Original letters and testimonials, if these are on headed paper and contain an original signature or e-signature, may be included in the portfolio.
- iv. Any evidence not correctly validated will be returned. The Faculty retains the right to contact any validator.

(d) All patient identifying details, details of patients' relatives and details of colleagues involved in direct clinical care must be anonymised. This means removal of names (first and last), addresses, contact details such as phone numbers or email addresses, NHS numbers, other individual patient numbers, including hospital or unit numbers and GMC numbers. Gender and age do not need to be anonymised. Redaction software is recommended as this ensures information remains anonymised through the scanning and review process. If identifiable personal information is found, the portfolio will be returned for anonymisation.

(e) Any documents that are not in English must be accompanied by a complete and accurate translation. The translation must be from a court/council appointed translator or reputable commercial translation service. Translated documents must bear the contact details of the translation service or translator. A copy of the document that has been translated should be

attached to the translation and stamped and signed by the translation service.

3.4 The portfolio of evidence for Faculty Accreditation must be presented with clearly delineated sections arranged as described in the following paragraphs:

(a) **Section 1 - Details of professional practice.** This section should contain:

- i. Basic information (name, date of birth, GMC number, primary medical, nursing or paramedic qualification and university, main post-graduate medical qualification, college affiliations, details of substantive NHS or military medical posts and full work address).
- ii. Appraisal information (evidence of appraisal within a substantive NHS or military medical service post or equivalent).  
PHEM specific information (place(s) of work for PHEM activity, name of clinical lead(s) for PHEM service, year of commencing PHEM activities)

(b) **Section 2 - Evidence of level 8 practice.** This section should illustrate how the applicant's professional practice encompasses the domains of the Skills for Health descriptors for the level 8 (Consultant) practitioner. There should be narrative accounts of examples with reference to where evidence can be found to support the account. This section should be limited to a maximum of 4000 words. The portfolio need not contain the physical evidence but it should cover all of the following domains:

- i. Knowledge, Skills, Training and Experience. The applicant should demonstrate in-depth and advanced specialist knowledge of the clinical and operational practice of PHEM across the PHEM curriculum. The applicant should demonstrate experience and competence in delivery of PHEM clinical care.
- ii. Supervision. The applicant should demonstrate substantial leadership, innovation and independence in the context of the delivery of PHEM clinical services. Being qualified as a Clinical or Educational Supervisor in PHEM Training Programme would be an example of practice at this level.
- iii. Professional and vocational competence. The applicant should demonstrate sustained commitment to development of PHEM as a specialist area of clinical practice. They should demonstrate promotion of social/ethical advancement at all levels of PHEM clinical practice.
- iv. Analytical / Clinical Skills and Patient Care. The applicant should demonstrate highly specialist clinical, technical PHEM skills and/or provision of advice. The applicant should demonstrate their ability to act as an expert in PHEM.
- v. Organisational Skills and Autonomy/Freedom to Act. The applicant should demonstrate that they direct and influence commissioning and/or PHEM service provision **OR** that they are accountable for the direct delivery of a PHEM clinical service/s.
- vi. Planning, Policy and Service Development. The applicant should demonstrate that they develop and implement policy and PHEM service developments which impact beyond their own area of responsibility and beyond their organisation.
- vii. Financial, Administration, Physical and Human Resources. The applicant should demonstrate that they are responsible for delivery of PHEM teaching and training programmes **OR** are a budget holder for one or more PHEM services and are responsible for physical assets.

- viii. Research and Development. The applicant should demonstrate that they implement wider research and development findings into PHEM clinical practice **AND** provide supervision for trainees undertaking research and development work **OR** initiate, develop and/or manage PHEM research, development and/or service evaluation programmes with external impact.
- (c) **Section 3 – Evidence of working in emergency medical systems and of current operational practice.** In addition to summarising experience within Theme 1 of the Curriculum, this section should include evidence of at least 8 years of operational pre-hospital activity using summarised logbook data and/or operational activity records. The focus should be on the operational aspects of experience rather than direct clinical care. Anonymised example cases of the applicant's personal pre-hospital treatment of a child, an adult and an injured patient should be included. The format in Annex A can be used to guide the description of example cases. Applicants who have applied for exemption from FIMC may use one of their previously submitted Expanded Case summaries to illustrate this section.
- (d) **Section 4 – Evidence of providing pre-hospital emergency medical care.** This section should focus on logbook experience in relation to direct clinical care. This section should also include evidence of continued professional development in basic and advanced newborn, paediatric and adult life support. The actual logbooks or logbook details should not be included. Instead there should be a detailed breakdown of the distribution of patients and their outcomes together with discussion of areas of the PHEM curriculum where there has been limited clinical exposure and/or experience. It is not necessary for applicants to have seen every clinical presentation in the curriculum but it is necessary to be able to demonstrate what range of presentations and conditions have been managed. The format in Annex A can be used to guide the description of example cases. Applicants who have applied for exemption from FIMC may use their previously submitted Expanded Case Summaries to illustrate this section provided they have not been used elsewhere in the portfolio.
- (e) **Section 5 – Evidence of using pre-hospital equipment.** This section should focus on evidence of continued professional development in the operation of medical and non-medical pre-hospital equipment as well as evidence of involvement in pre-hospital equipment governance. An anonymised example case where pre-hospital equipment was specifically used within the patient's management can be used as evidence. The format in Annex A can be used to guide the description of an example case. Applicants who have applied for exemption from FIMC may use their previously submitted Expanded Case Summaries to illustrate this section provided they have not been used elsewhere in the portfolio.
- (f) **Section 6 – Evidence of supporting rescue and extrication.** This section should focus on evidence of formal training in rescue and extrication and evidence of continued professional development with rescue services. An anonymised example case where pre-hospital extrication was utilised can be used as evidence. The format in Annex A can be used to guide the description of an example case. Applicants who have applied for exemption from FIMC may use their previously submitted Expanded Case Summaries to illustrate this section provided they have not been used elsewhere in the portfolio.
- (g) **Section 7 – Evidence of supporting safe patient transfer.** This section should focus on evidence of experience of primary and/or secondary transfer and evidence of continued professional development in retrieval and transfer. An anonymised example case of patient transfer which demonstrates safe pre-hospital transport and safe inter-hospital transport can be used as evidence. The format in Annex A can be used to guide the description of an example case. Applicants who have applied for exemption from FIMC may use their previously submitted Expanded Case Summaries to illustrate this section provided they have not been used elsewhere in the portfolio.
- (h) **Section 8 – Evidence of supporting emergency preparedness and response.** This section

should focus on evidence of direct involvement with emergency preparedness and response activities. The format in Annex A can be used to guide the description of an example case. Applicants who have applied for exemption from FIMC may use their previously submitted Expanded Case Summaries to illustrate this section provided they have not been used elsewhere in the portfolio.

- (i) **Section 9 – Evidence of team resource management training and practice.** This section should provide evidence of continuous professional development in crew or team resource management. An anonymised example case of a patient’s pre-hospital management that demonstrates the application of team resource management principles can be used to demonstrate experience. The format in Annex A can be used to guide the description of an example case.
  
- (j) **Section 10 – Evidence of clinical governance activity.** This section should provide evidence of involvement at independent practitioner level with structured and managed clinical governance processes across the three domains of:
  - i. Patient safety
  - ii. Clinical Effectiveness
  - iii. Patient experience

- 3.3 The regulations are prescriptive regarding the structure and content for the portfolio of clinical and operational experience in order that applications from a diverse range of professional backgrounds are consistent in their presentation and content. Applicants should be aware that specialist plagiarism detection software will be applied to the electronic submission of the portfolio file. Any suspected cases of plagiarism will be investigated.
  
- 3.4 Applications for Faculty Accreditation must be submitted using the Application Form for Faculty Accreditation of Consultant (Level 8) in Pre-hospital Emergency Medicine. The electronic PDF version of the portfolio should be submitted first for approval before the Production of the Hardbound Portfolio. The PDF file may be submitted on hard media (a memory stick or DVD) or as an electronic upload (Link Share). The Faculty office will provide applicants with details of how to access the electronic upload portal.
  
- 3.5 Applications are considered by the Faculty of Pre-hospital Care quarterly. Dates for submission deadlines will be published by the Faculty. The application process will typically take three months.
  
- 3.6 All applications must follow the format outlined in these regulations and include all the relevant supporting documentation. Incomplete applications will be rejected and returned for re-submission at a later date.
  
- 3.7 An application fee must accompany the application. Details of the required fee will be available from the Faculty of Pre-hospital Care. Applicants who are unsuccessful will not be entitled to a refund. If an applicant withdraws their application before it has been considered by a panel (and before any administrative arrangements have been finalised), they will be entitled to a full refund less 10% administrative costs.
  
- 3.8 The application and portfolio review will be undertaken by a panel of three assessors. The panel shall comprise of a chairperson who is the Level 8 Accreditation Lead or an Office Bearer of the Faculty, and two other Faculty members who are current FIMC examiners or Level 8 Accredited Practitioners, one of whom is from the same professional background of the candidate wherever possible.

- 3.9 All applicants for Faculty Accreditation are required to be interviewed by the panel in person on the date that the panel meets. The Faculty will confirm the venue, date and time for the panel meeting six weeks in advance. No travel or subsistence allowances are available for panel attendance. Applicants who are unable to attend the panel should provide an explanation in writing and should expect that their application will be deferred to the next panel.
- 3.10 A decision letter will be sent to all applicants within 21 days of the panel meeting. There are two outcomes from an application for Faculty Accreditation:
- a) Criteria for Faculty Accreditation have been fully met.
  - b) Criteria for Faculty Accreditation have **not** been met.
- 3.11 Successful applicants are entitled to describe themselves as a Faculty of Pre-hospital Care Accredited Consultant (Level 8) in Pre-hospital Emergency Medicine (PHEM). They will receive a certificate of Faculty Accreditation and their name will be added to the register of Consultant (Level 8) Practitioners.
- 3.12 The Faculty will write to the registration body of each successful applicant to inform them of the Faculty Accreditation and request that this be recognised and/or acknowledged in the applicant's professional registration records. The Faculty will validate every page the physical portfolio in accordance with GMC's evidence standards.<sup>1</sup>
- 3.13 Unsuccessful applicants are entitled to appeal using the process described in section 4.

#### **4. Appeals process**

- 4.1 If an applicant is dissatisfied with the outcomes at step 1 or 2 and wishes to challenge the points set out in the decision letter, he/she may submit an Appeal to the Faculty. The Appeal must be accompanied by the required fee (details available from the Faculty) and must be received within two months of the date of the decision letter.
- 4.2 The Faculty will confirm receipt in writing and advise the Appellant of a date by which an Appeal Panel will be appointed, which will not be more than three calendar months after the date of receipt of the appeal. At the time the appeal is lodged, the Appellant can request a meeting with a senior member of the Faculty who is not involved in the initial assessment or the appeal, to discuss the processes. The senior member of the Faculty will be nominated by the Faculty Executive. The content of this meeting cannot be used as further evidence towards the case of the Appellant or the Faculty. After this meeting, the Appellant may withdraw his/her application and, providing it is prior to the final date set for the appointment of the Appeal Panel, receive a full refund of the fee.
- 4.3 The appeal panel will consist of two members of the Faculty Executive who have not previously been involved at any time in the assessment of the Appellant's application or his/her Review, and a Chairman, who will have no formal connection with the Faculty. The Appeal hearing date will be set by the Faculty. The panel shall proceed to hear the appeal in accordance with Royal College of Surgeons of Edinburgh regulations for appeals. It shall allow adequate periods of notice to both parties, an opportunity for the Appellant to be present in person and to be represented, and an opportunity for the Appellant, or his/her representative, to present the Appeal and to respond to any answer the Faculty may make.
- 4.4 At the conclusion of the proceedings the panel shall reach its findings. The findings a panel may make shall be as follows:
- 4.4.1 That the Appeal is dismissed; no further appeal may be considered.

4.4.2 That the Appeal is justified in whole or in part but that the matter does not justify further action.

4.4.3 That the Appeal is justified and either that:

(a) the decision at Step 1 or 2 shall be appropriately corrected and, if the consequence of such correction so requires, that the Appellant shall be declared successful in their application; or

(b) the result of the Appellant's application shall be declared void and that he/she shall be allowed to re-apply for Faculty Accreditation without payment of any fee.

4.5 The Chairman of the panel shall have the power to decide whether all, part of or none of the Appeal fee will be returned. In announcing its findings the panel shall give reasons for its decision in writing.

## **5. Maintaining Faculty Accreditation**

5.1 Faculty Accreditation will be valid for 5 years from the date of Accreditation. To remain on the Faculty Accreditation Register, the applicant must:

- a) Remain a member of the Faculty of Pre-hospital Care in good standing.
- b) Maintain their relevant professional registration, and for doctors, a license to practice.
- c) Return a five year summary confirming their continued professional practice in PHEM.

5.2 This return should be in the form of a letter from the applicant's medical or clinical director which confirms that the applicant:

- a) Continues to practice PHEM at consultant level within their organisation or service
- b) Participates in this five year appraisal (which includes their PHEM practice)

5.3 If the applicant is a medical or clinical director of their service, then the letter should be from the applicant's Responsible Officer or equivalent.

5.4 After 5 years an application for re-accreditation is required along with evidence of on-going activity and personal professional development in PHEM. Regulations approved by Faculty Executive, March 2020.

<sup>1</sup> See GMC guidance for evidence at [www.gmc-uk.org/doctors/24769.asp](http://www.gmc-uk.org/doctors/24769.asp)

## **Annex A to Regulations for Faculty Accreditation of Consultant (Level 8) in Pre-hospital Emergency Medicine**

### *Guidance on preparation of expanded case studies*

A1. Applicants for Faculty Accreditation are required to submit eight detailed 'Expanded Case Studies' related to the PHEM curriculum themes.

A2. Expanded Case Studies provide pre-hospital clinicians with an opportunity to demonstrate their experience and knowledge by describing interesting, important or memorable cases, and their wider significance, in a structured and detailed manner. The expanded case studies are formally assessed and this document provides guidance on their expected number, content, structure and standard.

A3. The case chosen within each of the themes should be one that demonstrates the application of relevant aspects of the PHEM curriculum.

A4. Each case study should be 750 to 1500 words long. Across the eight expanded cases this should represent around 10,000 words. The following formatting should be applied:

- A cover page with the name of the applicant and a statement of word count, excluding titles, figures, tables and legends should be prepared for each case study.
- English language.
- Portrait format.
- One and a half spaced type.
- Sequential numbering on each page.
- Text should be Arial 14 point for headings, 12 point for subheadings (both in bold) and 11 point for the body.
- 3 cm left hand margin and a 2 cm right hand margin.
- Abbreviations should be defined the first time they are used.
- SI units should be used throughout.
- A superscript number should be inserted in the text at the point where a source of information is referred to or cited. A consecutive number should be allocated to each source as it is referred to for the first time. Use superscript numerals *outside* periods and commas and *inside* colons and semicolons.
- When more than 2 references are cited at a given place in the manuscript, use hyphens to join the first and last numbers of a closed series; use commas without space to separate other parts of a multiple citation.
- References should be in Vancouver style and listed numerically at the end of the body of work (single line spacing may be used). Journal titles are to be abbreviated.

A5. The cases should use the following format:

- (i) Title - informs the reader of the theme and situation.
- (ii) Introduction - explains succinctly why the case has been chosen and how it relates to the PHEM curriculum theme and any directly relevant curriculum units.
- (iii) Clinical description - succinctly and anonymously describes relevant aspects of the incident, clinical care and overall management of the case together with the outcome.
- (iv) Discussion - analyses the important learning points of the case, demonstrating the use of up to date and relevant information on the subject. Recognising limitations of the review.
- (v) Conclusion – a summary of how the learning points from this case will inform the clinician's future activity.

- (vi) References - in Vancouver style, including at least four but no more than ten relevant references considered *essential* reading.

A6. If photographic or radiological images, or equivalent, are used to illustrate the expanded case summary, care must be taken to ensure that they are (a) effectively anonymised or, (b) where they relate to a specific patient or show identifiable features of patients (whether the focus of the case study or not) have been included with the full informed consent of the patient.

A7. Case studies will be assessed against 5 domains according to the case study structure described above. These domains are (1) Title and introduction, (2) Clinical description, (3) Discussion, (4) Conclusion, (5) References.

## **A9. Example of an expanded case study**

### **The management of eclampsia in the pre-hospital domain**

#### **1. Introduction**

Exposure of pre-hospital clinicians to maternal complications of pregnancy is limited. This case raises a number of interesting management issues and learning opportunities: (1) The differential diagnosis of seizures in women of menstruating age, (2) the risk/benefit assessment for pre-hospital emergency anaesthesia, (3) the specific treatment of eclamptic seizures, (4) The benefit of anticipating the patient's clinical course, (5) the multidisciplinary on going management of eclampsia. The curriculum theme covered in this case study is 'providing pre-hospital emergency medical care'. The curriculum elements that are relevant are: 2.1.2a,h; 2.1.3g; 2.1.7; 2.1.10; 2.1.11; 2.1.13; 2.1.15; 2.1.16; 2.2.7; 2.2.10; 2.4.9a,m; 2.6.7c; 2.6.13d; 2.7.3c; 2.7.8c.

#### **2. Clinical description**

An 18 year old, 110kg woman had two days of headache and fever, with blurred vision. She had a generalized tonic-clonic seizure and her parents called an ambulance. Whilst waiting for the ambulance she vomited and became cyanosed. The paramedic ambulance team cleared her airway with suction and supported her ventilation with bag-valve-mask and oxygen. On arrival of the pre-hospital enhanced care team, she was fitting and hypoxic. The team divided up roles to achieve parallel activity including obtaining a history. An oropharyngeal airway was placed and a C-circuit ventilating bag was used to support her oxygenation. This achieved saturations in the low 90's. Blood pressure, ECG and pulse oximetry were applied. Intravenous access was obtained and a blood sugar and blood samples were taken. Intravenous cefotaxime and intravenous midazolam were given. She had strong peripheral pulses and there were no rashes, her pupils were equal and reactive. On abdominal examination, a mass was palpable up to the xiphisternum – presumed to be the uterine fundus. In support of the diagnosis of eclamptic seizures, the cuff blood pressure was 160/95. The parents did not previously know of the pregnancy and a member of the team was assigned to manage their emotional response to this finding and explain the on-going management of their daughter.

A decision to intubate and ventilate her was made on the grounds of difficult oxygenation, continued seizures and anticipated clinical course of emergency caesarian section and intensive care.

She was tilted to the left side to reduce vena-caval compression. She was anaesthetized with thiopentone and suxamethonium and intubated and ventilated. Maintenance of anaesthesia and muscle relaxation was achieved with a propofol infusion and bolus rocuronium. She was packaged for transport and given 4g of magnesium sulphate intravenously over 15 minutes. A pre-alert call was made to the local teaching hospital for neonatology, obstetrics and intensive care to be ready in the emergency department. On admission, ultrasound confirmed a 36/40 singleton pregnancy and the magnesium infusion was continued. Invasive arterial blood pressure was 195/140 and a labetalol infusion was commenced. Emergency Caesarian section was completed and she was further treated for hypertension over a 7 day ICU admission.

She and her baby made full recoveries. They have both been discharged from follow up.

### **3. Discussion**

#### **3.1 Severe pre-eclampsia and eclampsia**

Pre- eclampsia is pregnancy-induced hypertension in association with proteinuria (> 0.3 g in 24 hours) ± oedema and virtually any organ system may be affected. Symptoms of severe headache, visual disturbance, epigastric pain and/or vomiting may occur and she had each of these features. Eclampsia is defined as the occurrence of one or more convulsions superimposed on severe pre-eclampsia.<sup>1</sup> Severe pre-eclampsia and eclampsia are relatively rare but serious complications of pregnancy, with around 5/1000 maternities in the UK suffering severe pre-eclampsia and 5/10 000 maternities suffering eclampsia.<sup>2</sup> In eclampsia, the case fatality rate has been reported as 1.8% and a further 35% of women experience a major complication.<sup>2</sup> 44% of eclamptic seizures occur post-natally, up to 1 month after delivery, most within the first 4 days post-partum.<sup>3</sup> This raises the need to search for a history of pregnancy. The etiology of pre-eclampsia and eclampsia remains poorly understood, but it is postulated to result from impaired trophoblastic invasion of the maternal spiral arteries, leading to widespread endothelial dysfunction and placental ischaemia.

#### **3.2 The differential diagnosis of seizures in menstruating women**

The differential diagnosis of a women presenting in this manner include hypoglycaemia, infection (meningo-encephalitis, brain abscess), subarachnoid haemorrhage, intra-cerebral haemorrhage, sagittal sinus venous thrombosis, thrombotic phenomena, intracranial neoplasm, head trauma, epilepsy and hypertensive encephalopathy (renal disease, eclampsia, vascular disease). The diagnosis of pregnancy related medical disease must also always be part of the differential diagnosis in children and women who are menstruating. Pre-

hospital management of fitting patients focuses on resuscitation, beginning anti-convulsant treatment, considering antibiotics and safe transport to hospital for ongoing management. The diagnosis was not initially clear for this patient and this generic safe management plan was applied to her care. The specific diagnosis aided her ongoing process into hospital care, but did not change the approach to her management.

### **3.3 Risk assessment for pre-hospital anaesthesia**

This patient had resuscitation requirements of airway management and adequate oxygenation relating to her seizures and aspiration of vomit. She had a high potential of further aspiration given her significant respiratory support. Her seizures need to be controlled and her ongoing clinical course was to emergency surgery. These factors were balanced against the risk of pre-hospital anaesthesia in an obese, pregnant, fitting patient. A decision was discussed and made by the attending team to carry out anaesthesia, as the risks from her disease were considered greater than those from the intervention given that all necessary equipment, monitoring and personnel were immediately available.

### **3.4 The specific treatment of eclamptic seizures**

Three large randomised control trials have established magnesium sulphate as the drug of choice for the prevention and control of maternal seizures in patients with severe preeclampsia or eclampsia. The collaborative eclampsia trial recruited 1687 women with eclampsia into an international multicentre randomised trial comparing magnesium sulphate to diazepam and phenytoin.<sup>4</sup> Administration of magnesium sulphate to patients with severe pre-eclampsia reduced the risk of seizures by 52% and 67% compared to treatment with diazepam and phenytoin respectively.

The possible anticonvulsant activity of magnesium may be related to its role as an *N*-methyl-D-aspartate (NMDA) receptor antagonist. Seizures are thought to be mediated at least in part by stimulation of glutamate receptors, such as the NMDA receptor. Therapeutic serum magnesium levels cause cerebral vasodilation; this may reverse the ischemia produced by cerebral vasospasm during an eclamptic episode.

The dose of magnesium used is 4g over 10 minutes, then 1g per hour for a further 24 hours. Recurrent seizures are treated with a further bolus of 2g magnesium sulphate and an increase in the background infusion to 1.5 or 2g/hour. Magnesium sulphate is excreted mainly in the urine. Magnesium causes a loss of deep tendon reflexes and respiratory depression. Calcium gluconate can be given to acutely reverse respiratory depression.

Although magnesium is widely used across the world for eclamptic seizures, there is controversy about whether it actually stops the seizures or simply reduces the motor manifestations through neuro-muscular blockade.<sup>5</sup> Fisher et al showed on going EEG seizure activity in the face of magnesium-related neuromuscular blockade and accompanying cessation of visible myoclonus.<sup>6</sup> Despite these EEG concerns, Cochrane reviews of magnesium versus phenytoin and magnesium versus diazepam concluded that magnesium is substantially more effective for the treatment of eclamptic seizures.<sup>7,8</sup>

Magnesium is a simple drug to carry in the pre-hospital domain and can be used for ventricular tachyarrhythmias, severe asthma, severe pre-eclampsia and eclampsia management. The use of infusion pumps enables accurate delivery of infused drugs over controllable time frames.

### **3.5 The multidisciplinary in-hospital management of eclampsia**

Within the hospital setting, women with eclampsia are treated by a multi-disciplinary team, including obstetrics, neonatology, anaesthesia and intensive care. The team is lead by obstetrics and the focus of treatment is stabilisation of the mother's seizures and blood pressure and then progress onto caesarian section to deliver the baby and placenta.<sup>9</sup> Invasive blood pressure monitoring and intravenous infusions of anti-hypertensives are used to control blood pressure. Our patient received this type of team care and rapidly flowed through the emergency department to theatre and then onto the intensive care unit.

### **3.6 The benefit of anticipating the patient's clinical course**

Knowledge of the multi-disciplinary, complex and time critical management provided to women with eclamptic seizures enables a specific pre-alert to the receiving emergency department requesting the presence of a multi-disciplinary team. A single handover of the pre-hospital management of the patient can then be achieved, greatly improving the efficiency of ongoing team care.

## **4. Conclusion**

This case has highlighted to me the need to include pregnancy as a cause of disease in the differential diagnosis of all menstruating girls and women presenting to pre-hospital care clinicians. Management focuses on resuscitation and attention to treatable disease, explicit pre-alert and safe transport to an obstetric and neonatal receiving hospital. In my future pre-hospital activity, I will use this case to reinforce the need to maintain a wide differential diagnosis in all critically ill patients whilst attending to immediately life threatening physiological derangements.

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