SUBARACHNOID HAEMORRHAGE STUDY

National Confidential Enquiry into Patient Outcome and Death (NCEPOD)

ORGANISATIONAL QUESTIONNAIRE

CONFIDENTIAL

Name of Trust: ______________________________

Name of Hospital: ______________________________

Who completed this questionnaire?

Name: ______________________________

Position: ______________________________

What is this study about?

The aim of this study is to explore remediable factors in the process of care of patients admitted with the diagnosis of subarachnoid haemorrhage, looking both at patients that underwent a procedure and those managed conservatively

Inclusions

All hospitals within a Trust that admit patients as an emergency or that treat patients with subarachnoid haemorrhage

This form should be completed by the Chair of the Medical Audit Committee, the Medical Director, the Clinical Lead or Clinical Governance Lead, the NCEPOD Ambassador or someone nominated by them who would have the knowledge to complete it or be able to seek help in order to do so.

A list of definitions is provided on the back page of the questionnaire. Free space is also provided for your comments.

A separate questionnaire should be completed for each hospital within a Trust

Thank you for taking the time to complete this questionnaire. The findings of the full study will be published in late 2013.

How to complete the form:

This form will be electronically scanned. Please use a black or blue pen. Please complete all questions with either block capitals or a bold cross inside the boxes provided e.g.

Does this hospital have a policy for End of Life Care?

☒ Yes ☐ No

If you make a mistake, please "black-out" the incorrect box and re-enter the correct information, e.g.

■ Yes ☒ No

Unless indicated, please mark only one box per question.

Please return the completed questionnaire and relevant policy documents to NCEPOD in the SAE provided (or to the address below).

NCEPOD
Ground Floor, Abbey House
74-76 St John Street
London EC1M 4DZ

Questions or help?

If you have any queries about the study or this questionnaire, please contact NCEPOD at:

sah@ncepod.org.uk

Telephone: 0207 251 9060

FOR NCEPOD USE ONLY ☐☐☐☐☐☐

Please note that one form should be completed for each hospital within a Trust.
Sections A to C are to be completed by all hospital types.

A. THE HOSPITAL

1. Please select the category that best describes this hospital:

- ☐ District general hospital: ≤500 beds
- ☐ District general hospital: >500 beds
- ☐ University teaching hospital
- ☐ Specialist Neurosciences/ Neurosurgical Centre (SNC)
- ☐ Other (please state) [ ]

2. Who contributed to the completion of this questionnaire? (answers may be multiple)

☐ CEO ☐ Medical Director ☐ NCEPOD Local Reporter ☐ NCEPOD Ambassador ☐ Clinical Governance Lead

☐ Clinical Director (please state specialty) [ ]

☐ Other (please state) [ ]

B. NETWORKS OF CARE

3a. Is this hospital/ Trust part of a FORMAL regional care network (see definitions) for subarachnoid haemorrhage (SAH) ? ☐ Yes ☐ No

b. If YES, is there formal funding for this? ☐ Yes ☐ No

c. If YES, please give details: [ ]

4a. If NO to Q3a, is this hospital part of an INFORMAL regional care network for SAH i.e. does the hospital have links with and refer patients to a specific SNC? ☐ Yes ☐ No ☐ NA- SNC on-site

b. If a SNC is part of this hospital, do you have links with and always receive patients from specific hospitals? ☐ Yes ☐ No ☐ NA- No SNC on-site

5a. If YES to 3a or 4, are there more than two Trusts included in the formal or informal network? ☐ Yes ☐ No

b. If YES, how many Trusts are included in the network? [| |]

c. If YES to 3a or 3c, does the network undertake regular multidisciplinary review and audit?

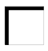
☐ Yes: meetings once per month or more frequently

☐ Yes: meetings twice per year ☐ Yes, meetings once per year ☐ No ☐ Unknown

C. FACILITIES

6. Please complete with respect to the availability of the following investigations in this hospital:

a) CT scan
- ☐ Available on-site at this hospital 24 hours per day /7 days per week
- ☐ Available on-site at this hospital- limited hours
- ☐ Available at another hospital within this Trust 24 hours per day /7 days per week
- ☐ Available at another hospital within this Trust- limited hours
- ☐ Not available at any hospital in this Trust, patient would be transferred to other trust



b) CT angiogram (CTA, see definitions)

- [ ] Available on-site at this hospital 24 hours per day /7 days per week
- [ ] Available on-site at this hospital- limited hours
- [ ] Available at another hospital within this Trust 24 hours per day /7 days per week
- [ ] Available at another hospital within this Trust- limited hours
- [ ] Not available at any hospital in this Trust, patient would be transferred to other trust

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c) MRI (see definitions)

- [ ] Available on-site at this hospital 24 hours per day /7 days per week
- [ ] Available on-site at this hospital- limited hours
- [ ] Available at another hospital within this Trust 24 hours per day /7 days per week
- [ ] Available at another hospital within this Trust- limited hours
- [ ] Not available at any hospital in this Trust, patient would be transferred to other trust

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d) MR Angiogram (MRA,see definitions)

- [ ] Available on-site at this hospital 24 hours per day /7 days per week
- [ ] Available on-site at this hospital- limited hours
- [ ] Available at another hospital within this Trust 24 hours per day /7 days per week
- [ ] Available at another hospital within this Trust-limited hours
- [ ] Not available at any hospital in this Trust, patient would be transferred to other trust

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e) Lumbar puncture with CSF spectroscopic analysis

- [ ] Available on-site at this hospital 24 hours per day /7 days per week
- [ ] Available on-site at this hospital- limited hours
- [ ] Available at other hospital within this Trust 24 hours per day /7 days per week
- [ ] Available at other hospital within this Trust- limited hours
- [ ] Not available at any hospital in this Trust, patient would be transferred to other trust

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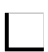
f) Digital Subtraction Angiography (DSA, see definitions)

- [ ] Available on-site at this hospital 24 hours per day /7 days per week
- [ ] Available on-site at this hospital- limited hours
- [ ] Available at another hospital within this Trust 24 hours per day /7 days per week
- [ ] Available at another hospital within this Trust- limited hours
- [ ] Not available at any hospital in this trust, patient would be transferred to other trust

7a. If answered part E that lumbar punctures can be performed at this hospital, is there guidance on who can perform lumbar punctures? ☐ Yes ☐ No



7b. If YES, please state minimum grade specified? ☐ Unknown

c. If YES, please state specialties specified? ☐ Unknown

8. Do departments or specialties responsible for the care of patients with SAH have a written policy or protocol for end of life care for appropriate patients? ☐ Yes ☐ No

9a. Do critical care units at this hospital have a policy of suggesting organ donation where this is appropriate? ☐ Yes ☐ No

b. Is there a member of the critical care team (nursing or other health professional) who facilitates organ donation when this is appropriate? ☐ Yes ☐ No

c. Is there a written protocol that covers: (please select all that apply, answers may be multiple) ☐ Suitable donors ☐ Other (please state)

☐ Methods of contacting transplant coordinator ☐ The grade and specialty of the doctor that discusses this option with the patient's family

D. SECONDARY /ACUTE CARE

Please complete section D if this hospital offers secondary/acute care to patients with subarachnoid haemorrhage. If this hospital does NOT provide any secondary/acute care, please proceed to section E.

10a. Does this hospital have an Emergency Department (ED)? ☐ Yes ☐ No

b. If YES, is it open 24 hours/day, 7 days/week? ☐ Yes ☐ No

10c. If YES, is there a consultant in Emergency Medicine available: ☐ 24 hours/day, 7 days/week ☐ Limited hours + on-call outside the hospital ☐ Limited hours

11a. If YES to 10a, does your ED have standard protocols/ guidelines for the management of acute/ severe headache? ☐ Yes ☐ No ☐ Unknown

b. If YES to Q11a, are these included in the induction for new medical staff? ☐ Yes ☐ No

c. If YES to Q11a, are these included in the induction for new nursing staff? ☐ Yes ☐ No

12. Is there a standard protocol for the management of patients with a suspected diagnosis of SAH presenting to the ED? ☐ Yes ☐ No

If YES, does this include:

a) Non-contrast CT-head as soon as diagnosis is proposed? ☐ Yes ☐ No

b) A lumbar puncture if the scan is negative? ☐ Yes ☐ No

c) Immediate discussion with neurosurgical unit if the scan is positive for subarachnoid blood? ☐ Yes ☐ No

d) If appropriate, arranging transfer to nearest specialist neurosciences/ neurosurgical centre (or on-site SNC if available)? ☐ Yes ☐ No

e) Active control of blood pressure? ☐ Yes ☐ No

f) Administration of nimodipine? ☐ Yes ☐ No

g) The determination of clinical severity using World Federation of Neurological Surgeons (WFNS) -see definitions)? ☐ Yes ☐ No

h) If not WFNS, please state scale used:

i) Other not mentioned

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13a. Are patients routinely cared for in the ED or MAU (or equivalent) until a decision on transfer to the neurosurgical unit has been made? ☐ Yes ☐ No

b. If NO, where are patients usually cared for? [ ]

14. In which of the listed areas that patients are cared for prior to transfer to the neurosurgical centre, would their stay be recorded as an 'admission' in the Trust's HES/PAS data records?

If patient remains in ED only ☐ Yes ☐ No ☐ NA

MAU or equivalent ☐ Yes ☐ No ☐ NA

Other (please state) [ ] ☐ Yes ☐ No ☐ NA

15a. What level(s) of care (see definitions) can you offer subarachnoid haemorrhage patients pre-transfer (please select all that apply, answers may be multiple)? ☐ Level 0 ☐ Level 1 ☐ Level 2 ☐ Level 3

b. Is level 3 care available in the emergency department? ☐ Yes ☐ No

16.a. Is there a policy specifying who should be responsible for the immediate care of SAH patients (in secondary care)? ☐ Yes ☐ No

b. If YES, which specialties are responsible? (please select all that apply, answers may be multiple)

☐ Medical staff in A&E ☐ Acute Medicine Physician ☐ Neurologist ☐ Care of the Elderly

☐ Other (please state) [ ] ☐ Stroke Physician

c. Is the responsible clinician from the same specialty in all cases? ☐ Yes ☐ No

d. If NO, what dictates the choice of responsible doctor? (please select all that apply, answers may be multiple)

☐ Conscious state ☐ Severity of haemorrhage ☐ Age of Patient

☐ Other (please state) [ ]

17. How far away is your nearest specialist neurosciences/neurosurgical centre (SNC)?

a. Distance (miles) [| |] b. Average journey time in middle of the day (minutes) [| |] ☐ Not applicable- SNC is on site

18. Are all subarachnoid haemorrhage patients discussed with the nearest SNC (or on-site SNC if applicable) before a decision on conservative management/ transfer is made? ☐ Yes ☐ No

19a. Are there written guidelines for identifying patients who are to be transferred for treatment and those who should be managed conservatively? ☐ Yes ☐ No

b. If YES, does this decision depend upon: (please select all that apply, answers may be multiple)

☐ Suitablity of underlying cause of SAH for neurosurgical intervention

☐ Co-morbidities ☐ Conscious state ☐ Age ☐ Pre-morbid independence

☐ Pre-morbid cognitive function ☐ Severity of bleed as determined by a validated scale

[ ] ☐ Other (please state)

20a. Are there guidelines for the transfer of urgent patients with SAH? ☐ Yes ☐ No ☐ NA

b. If YES, do these cover the following: (answers may be multiple, please mark all that apply) ☐ time to transfer ☐ staff to accompany the patient ☐ Intubation

☐ Other (please state) [ ]

21. Have these guidelines (in Q19 & 20) been agreed with your nearest neurosurgical centre (or on-site neurosugical unit if applicable)? ☐ Yes ☐ No

22a. Following surgery or endovascular coiling in the specialist neurosurgical centre, do patients return to secondary care at this hospital for convalescence and rehabilitation? ☐ Yes ☐ No ☐ Unknown

b. If YES, who is routinely responsible for their care? (please select all that apply, answers may be multiple)

☐ Specialist Neurorehabilitation Service ☐ Specialist Neurology Service ☐ Physicians on a General Ward

☐ Other (please specify) [ ]

c. If YES to Q22a, what support is available to patients during their admission, post-intervention ? (answers may be multiple, please list all that apply)

☐ Specialist rehabilitation nurse ☐ Physiotherapy (inpatient) ☐ Occupational therapy (inpatient)

☐ Other (please state) ☐ Specialist rehabilitation consultant ☐ Psychology/ Neuropsychology

[ ]

23. If YES to Q22a, what support is available to patients post-discharge from this hospital? (answers may be multiple, please list all that apply)

☐ Hospital at home ☐ Specifically assigned case worker ☐ Physiotherapy (inpatient) ☐ Occupational therapy (inpatient)

☐ Specialist rehabilitation Nurse ☐ Specialist rehabilitation consultant ☐ Physiotherapy (outpatient) ☐ Occupational therapy (outpatient)

☐ Other (please specify) ☐ Psychology/ Neuropsychology ☐ Physiotherapy (domicillary) ☐ Occupational therapy (domicillary)

[ ]

24. If NO to Q22a, are patients transferred to a regional rehabilitation centre (if clinically appropriate), following discharge from the neurosurgical centre? ☐ Yes ☐ No ☐ Unknown

25a. Is there a network or regional audit/MDT meeting (including this hospital and your nearest neurosurgical centre) that discusses the management of patients with SAH? ☐ Yes ☐ No ☐ Unknown

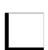
b. If YES, how frequently does it take place? ☐ Once per year ☐ Twice per year ☐ More frequently ☐ Unknown

26. If YES to Q25a, does this audit and discuss:

a. Misdiagnosis? ☐ Yes ☐ No ☐ Unknown

b. Problems related to transfer? ☐ Yes ☐ No ☐ Unknown

c. Outcomes for patients managed conservatively? ☐ Yes ☐ No ☐ Unknown



26d. Outcomes for patients undergoing surgery or endovascular coiling? ☐ Yes ☐ No ☐ Unknown

e. Complications of management of SAH ☐ Yes ☐ No ☐ Unknown

27a. If NO to Q25a, are patients with SAH included in an audit/Mortality & Morbidity meeting within the hospital? ☐ Yes ☐ No ☐ Unknown

b. If YES, is this done by the Emergency Department? ☐ Yes ☐ No ☐ Unknown

c. If NO, who does assess outcomes for these patients?

28a. Is there a specialist neurosurgical centre at this hospital? ☐ Yes ☐ No

b. **If YES, please continue to section E, otherwise, if NO, please proceed to section F**

E. TERTIARY / SPECIALIST NEUROSURGICAL CARE

29a. Is there a formal policy for discussing and accepting patients from other hospitals/ other departments within your hospital? ☐ Yes ☐ No

If YES, please could you send a copy to NCEPOD in the SAE provided

b. If NO, who makes the decision to accept a patient for transfer?

☐ Neurosurgical registrar

☐ On-call consultant neurosurgeon

☐ Other (please state)

30a. What factors determine acceptance for transfer? (answers may be multiple)

☐ Age ☐ Neurological grade of SAH ☐ Co-morbidities ☐ Conscious state

☐ Suitablity of underlying cause of SAH for neurosurgical intervention

☐ Pre-morbid independence ☐ Pre-morbid cognitive function

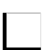
☐ Availability of beds ☐ Availability of staff ☐ Unknown

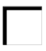
☐ Other (please state)

31a. Is a record kept of patients who were referred but not accepted for transfer? ☐ Yes ☐ No

b. If YES, how many patients were not accepted for transfer between 30th September 2010 and 1 April 2011

c. How many patients were accepted during this period?





32. Following transfer of patients to this specialist neurosurgical unit, is there a written protocol which defines the pre-operative management of subarachnoid haemorrhage patients? ☐ Yes ☐ No

If YES, please could you send a copy to NCEPOD and state if the policy determines the following:

a. The level of care to which a patient is admitted? (see definitions) ☐ Yes ☐ No

b. If YES, to which level of care are patients routinely first admitted? ☐ Level 0/1 ☐ Level 2 ☐ Level 3

c. The type of further investigation required? ☐ Yes ☐ No

d. If YES what does this include? (answers may be multiple, please select all that apply) ☐ MRI ☐ CT ☐ CTA ☐ DSA ☐ MRA

☐ Other investigation (please state) ______

e. Routine adjuvant therapy? ☐ Yes ☐ No

f. If YES what does this include? (answers may be multiple, please select all that apply)

☐ Nimodipine ☐ Antifibrinolytics ☐ Anticonvulsants ☐ Statins

☐ Other adjuvant therapy (please state) ______

g. The monitoring techniques to be used? ☐ Yes ☐ No

h. If YES what does this include? (answers may be multiple, please select all that apply)

☐ Pulse oximetery ☐ CVP ☐ Trans-cranial doppler ☐ Intra-arterial BP

☐ Other monitoring technique (please state) ______

33. Is the management of patients with subarachnoid haemorrhage normally discussed at an MDT? ☐ Yes ☐ No ☐ Unknown

34a. Are there written guidelines or protocols for deciding on appropriate intervention (surgery or endovascular treatment) for patients with aneurysmal SAH ☐ Yes ☐ No

b. **If YES, please could you send a copy to NCEPOD in the SAE provided**

c. If NO, what are the criteria for choosing open clipping or endovascular treatment? (answers may be multiple, please select all that apply)

☐ Age ☐ Neurovascular anatomy ☐ Availabiliy of interventional radiologist ☐ Availabiliy of neurosurgeon ☐ Availiability of equipment

☐ Vascular access ☐ Availiability of Nursing staff ☐ Other (please state) ______

35a. Is there a written policy on the timing of treatment (surgery or endovascular) that is applied to patients with SAH? ☐ Yes ☐ No

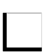
b. **If YES, please could you send a copy to NCEPOD in the SAE provided**

c. If NO, when does this NSC usually intervene in:

Good grade patients (WFNS 1 & 2) ______

Poorer grade patients (WFNS 3 & 4) ______

Poor grade patients (WFNS 5) ______



36a. How frequently are MDT meetings at this SNC? ☐ Daily ☐ Weekly ☐ Fortnightly

☐ Monthly ☐ Unknown ☐ Other (please state) [ ]

b. Who normally attends? ☐ Consultant neurosurgeon ☐ Consultant interventional neuroradiologist

☐ Consultant neurologist ☐ Other (please state) [ ]

37. Please state the number of level 3 beds allocated to the SNC [ ][ ]

38. Please state the number of level 2 beds allocated to the SNC [ ][ ]

39. Please state the number of operating sessions per week (1 session = 1/2 day) allocated to the SNC [ ][ ][ ]

40. What is the availability of the following clinicians:

	24 hours/ 7 days / week	24 hours / Monday-Friday	Daytime hours/ Monday-Friday	More limited hours
Consultant neurosurgeon	☐	☐	☐	☐
Consultant interventional neuroradiologist	☐	☐	☐	☐
Consultant neuroanaesthetist	☐	☐	☐	☐
Consultant intensivist	☐	☐	☐	☐
Consultant neurologist	☐	☐	☐	☐
Neurosurgical operating theatre staff	☐	☐	☐	☐
Neurosurgical registrar	☐	☐	☐	☐
Neurology registrar	☐	☐	☐	☐
Neurosurgical nursing staff	☐	☐	☐	☐
Staffed recovery unit	☐	☐	☐	☐
Ward staff	☐	☐	☐	☐

41. Following intervention (barring any complications) to which level of care would patients usually be transferred to:

a. After surgery? ☐ Level 3 care (see definitions) ☐ Level 2 care (see definitions)

☐ Level 1 care (see definitions) ☐ Level 0 care (see definitions)

b. After endovascular treatment? ☐ Level 3 care (see definitions) ☐ Level 2 care (see definitions)

☐ Level 1 care (see definitions) ☐ Level 0 care (see definitions)

c. Are there written protocols covering the immediate post-operative management of subarachnoid haemorrhage patients in this hospital that have undergone an intervention or surgery?

☐ Yes ☐ No ☐ Unknown **If YES, please could you send a copy to NCEPOD in the SAE provided**

41. Are there protocols in place to identify patients with:

Secondary ischaemia?	☐ Yes	☐ No	☐ Unknown
Rebleeding?	☐ Yes	☐ No	☐ Unknown
Hydrocephalus?	☐ Yes	☐ No	☐ Unknown

If YES, please could you send a copy of these protocols to NCEPOD in the SAE provided

42. Which of the following investigations do patients routinely undergo post-operatively? (see definitions, answers may be multiple, please select all that apply)

☐ CT scan ☐ DSA ☐ CTA ☐ None ☐ Other (please state)

43. Which of the following methods of monitoring are routinely employed post-operatively? (answers may be multiple, please select all that apply)

☐ Pulse oximetry ☐ CVP measurement ☐ ICP
☐ Trans-cranial doppler ☐ Cardiac output ☐ CFM/EEG
☐ Other (please state) ☐ Intra-arterial BP ☐ Non-invasive BP

44. Following treatment for subarachnoid haemorrhage are patients routinely returned to the referring hospital for post-treatment monitoring and convalescence? ☐ Yes ☐ No ☐ Unknown

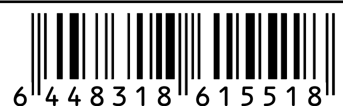
45. Is a specialist rehabilitation service routinely available in this SNC for patients following treatment of subarachnoid haemorrhage? ☐ Yes ☐ No ☐ Unknown

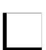
b. If YES do they include the following: (answers may be muliple,please mark all that apply):

☐ Physiotherapy (inpatient) ☐ Occupational therapy (inpatient) ☐ Specialist rehabilitation nurse
☐ Other (please state) ☐ Psychology/ Neuropsychology ☐ Specialist rehabilitation consultant

46. What support is available to patients post-discharge from your Trust? (answers may be multiple, please list all that apply)

☐ Hospital at home ☐ Specifically assigned case worker ☐ Physiotherapy (inpatient) ☐ Occupational therapy (inpatient)
☐ None listed ☐ Specialist Nurse ☐ Physiotherapy (outpatient) ☐ Occupational therapy (outpatient)
☐ Other (please state) ☐ Psychology/ Neuropsychology ☐ Physiotherapy (domicillary) ☐ Occupational therapy (domicillary)





F. COMMENTS

47. Do you have any specific comments or anything you wish to highlight about the care of patients with aneurysmal SAH at this hospital? ☐ Yes ☐ No

If YES, please write in the box below:

Thank you for taking the time to complete this questionnaire, your contribution is much appreciated.

DEFINITIONS

CTA: Computerised tomographic angiography, also called CT angiography combines the technology of a conventional CT scan with that of traditional angiography to create detailed images of the blood vessels.

DSA: Digital subtraction angiography (DSA) intra-arterial catheter angiography.

Fisher Grade: The Fisher Grade classifies the appearance of subarachnoid hemorrhage on CT scan.
Grade 1: None evident; Grade 2: Less than 1 mm thick; Grade 3: More than 1 mm thick; Grade 4: Diffuse or none with intraventricular hemorrhage or parenchymal extension.

Level of ward care: LEVEL 0: Patients whose needs can be met through normal ward care in an acute hospital. LEVEL 1: Patients at risk of their condition deteriorating, or those recently relocated from higher levels of care whose needs can be met on an acute ward with additional advice and support from the critical care team. LEVEL 2: (e.g. HDU) Patients requiring more detailed observation or intervention including support for a single failing organ system or post operative care, and those stepping down from higher levels of care. (NB: When basic respiratory and basic cardiovascular support are provided at the same time during the same critical care spell and no other organ support is required, the care is considered to be Level 2 care). LEVEL 3: (e.g. ICU) Patients requiring advanced respiratory support alone or basic respiratory support together with support of at least two organs. This level includes all complex patients requiring support for multi-organ failure. (NB: basic respiratory and basic cardiovascular do not count as two organs if they occur simultaneously (see above under Level 2 care), but will count as Level 3 if another organ is supported at the same time).

MRI, MRA: Magnetic Resonance Imaging/ Angiography

Networks of care: Formal network: "A linked group of health professionals and organisations from primary, secondary and tertiary care and social care and other services working together in a coordinated manner with clear governance and accountability arrangements". (Department of Health Collaborative, 2004); Informal network: "A collaboration between health professionals and/or organisations from primary, secondary and/or tertiary care, and other services, aimed to improve services and patient care, but without specified accountability to the commissioning organisation".

Primary Care: Defined by the World Health Organisation as “essential health care; based on practical, scientifically sound, and socially acceptable method and technology; universally accessible to all in the community through their full participation; at an affordable cost; and geared toward self-reliance and self-determination.” In the UK this typically refers to care provided by General Practitioners.

Secondary Care: Medical care provided by specialists (consultants) in a particular field of medicine, whether in a hospital or community setting. Patients are referred to these specialists by another doctor, commonly a General Practitioner.

Tertiary Care: More specialised medical centres offering specialist care in a particular field, in a centre with special facilities for investigation and treatment and often covering a much wider area than primary or secondary care services.

WFNS gradeThe World Federation of Neurosurgeons (WFNS) classification uses Glasgow coma score (GCS) and focal neurological deficit to gauge severity of symptoms : Grade 1: GCS 15 FND= Absent; Grade 2: GCS 13–14, FND= Absent; Grade 3: GCS 13–14, FND=Present; Grade 4: GCS 7–12, FND=Present or absent; Grade 5: GCS <7 , FND=Present or absent

Funding for this study was provided by The Healthcare Quality Improvement Patnership (HQIP) as part of The Clinical Outcome Review Program into medical and surgical care.

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