1. Global cerebral edema?

Yes

No

1. Brain stem herniation?

Yes

No

1. Brain stem herniation date of occurrence:
2. \*\*Rebleeding?

Yes

No

1. Rebleeding date of occurrence:
2. Hydrocephalus?

Yes

No

1. Hydrocephalus date of occurrence:
2. \*\*Clinical deterioration and/or cerebral infarction due to delayed cerebral ischemia (DCI)?

Yes

No

1. \*\*Clinical deterioration due to delayed cerebral ischemia (DCI)?

Yes

No

1. Clinical deterioration date of occurrence:
2. \*\*Cerebral infarction due to DCI?

Yes

No

1. Clinical deterioration or cerebral infarction due to causes other than DCI?

Yes

No

If Yes:

Infarction directly attributable to aneurysm occlusion treatment

Other, specify:

1. Electroencephalographic seizure(s) within 21 days after ictus:

Yes

No

1. Clinical seizure(s) within 21 days after ictus:

Yes

No

1. Seizure(s) date of occurrence:
2. Meningitis/ventriculitis?

Yes

No

1. Meningitis/ventriculitis date of occurrence:

## General Instructions

This CRF Module is recommended to collect information on neurological complications for subarachnoid hemorrhage (SAH) studies.

Some elements on this CRF are classified as Supplemental – Highly Recommended, as indicated by asterisks below:

\*\*Element is classified as Supplemental – Highly Recommended

All remaining elements are classified as Supplemental.

Specific Instructions

Please see the Data Dictionary for definitions for each of the data elements included in this CRF Module.

* Global cerebral edema: Diagnosed when both of the following are present: (1) complete or near-complete effacement of the hemispheric sulci and basal cisterns, and (2) bilateral and extensive disruption of the hemispheric gray-white matter junction at the level of the centrum semiovale, either due to blurring or diffuse peripheral “finger-like” extension of the normal demarcation between gray and white matter.
* Brain stem herniation: Clinical deterioration consistent with brain shifting, manifesting as progressive reduction in level of consciousness associated with motor posturing and either pupillary abnormalities, gaze abnormalities, or autonomic instability (HR, BP, RR)
* Brain stem herniation date: Day after SAH on which the neurological complication 'Brain stem herniation' first occurred (day of ictus = day 0)
* Rebleeding: Sudden clinical deterioration with signs of increased hemorrhage on CT scan compared with previous CT imaging or found at autopsy, or a sudden clinical deterioration suspect for rebleeding with fresh blood in the ventricular drain in which no CT scan or autopsy was obtained
* Hydrocephalus is defined by:
  + Hydrocephalus on CT or MRI, defined as a bicaudate index above the 95th percentile based on age: 0.16 for patients 30 years or younger, 0.18 for patients 31-50 years, 0.19 for patients 51-60 years, 0.21 for patients 61-80 years, and 0.25 for patients 81-100 years.
  + And one of the following:
    - CSF drainage by lumbar puncture, lumbar drainage, ventricular drainage
    - A decrease in the level of consciousness of at least 2 points lasting for ≥ 1 hour
* Hydrocephalus date: Day after SAH on which the neurological complication 'Hydrocephalus' first occurred (day of ictus = day 0)
* Clinical deterioration due to DCI: The occurrence of focal neurological impairment (such as hemiparesis, aphasia, apraxia, hemianopia, or neglect), or a decrease of at least 2 points on the Glasgow Coma Scale (either on the total score or on one of its individual components [eye, motor on either side, verbal]). This should last for at least 1 hour, is not apparent immediately after aneurysm occlusion, and cannot be attributed to other causes by means of clinical assessment, CT or MRI scanning of the brain, and appropriate laboratory studies.
* Clinical deterioration date of occurrence: Day after SAH on which the neurological complication 'Clinical deterioration due to delayed cerebral ischemia' first occurred (day of ictus = day 0)
* Cerebral infarction due to DCI: The presence of cerebral infarction on CT or MR scan of the brain within 6 weeks after SAH, or on the latest CT or MR scan made before death within 6 weeks, or proven at autopsy, not present on the CT or MR scan within 48 hours after early aneurysm occlusion, and not attributable to other causes such as surgical clipping or endovascular treatment. Hypodensities on CT imaging resulting from ventricular catheter or intraparenchymal hematoma should not be regarded as cerebral infarctions from DCI.
* Seizure date of occurrence: Day after SAH on which the neurological complication 'Seizure(s)' first occurred (day of ictus = day 0)
* Meningitis/ventriculitis depends on
  + A positive cerebrospinal fluid culture
  + In addition to one of the following:
    - Fever > 38˚C
    - Increased white blood cells, elevated protein or decreased glucose in cerebrospinal fluid
    - Positive Gram stain of cerebrospinal fluid
* Meningitis/ventriculitis date of occurrence: Day after SAH on which the neurological complication 'Meningitis/ventriculitis' first occurred (day of ictus = day 0). This date can precede the date on which the CSF culture yielded a micro-organism.

References

Frontera JA, Fernandez A, Schmidt JM, Claassen J, Wartenberg KE, Badjatia N, Connolly ES, Mayer SA. Defining vasospasm after subarachnoid hemorrhage: what is the most clinically relevant definition? Stroke. 2009;40(6):1963–1968.

Horan TC, Andrus M, Dudeck MA. CDC/NHSN surveillance definition of health care-associated infection and criteria for specific types of infections in the acute care setting. Am J Infect Control. 2008;36(5):309–332. Erratum in: Am J Infect Control. 2008;36(9):655.

van Gijn J, Hijdra A, Wijdicks EF, Vermeulen M, van Crevel H. Acute hydrocephalus after aneurysmal subarachnoid hemorrhage. J Neurosurg. 1985;63(3):355–362.

Vergouwen MD, Vermeulen M, van Gijn J, Rinkel GJ, Wijdicks EF, Muizelaar JP, Mendelow AD, Juvela S, Yonas H, Terbrugge KG, Macdonald RL, Diringer MN, Broderick JP, Dreier JP, Roos YB. Definition of delayed cerebral ischemia after aneurysmal subarachnoid hemorrhage as an outcome event in clinical trials and observational studies: proposal of a multidisciplinary research group. Stroke.

2010;41(10):2391–2395.