**New Application: Neuroendovascular Intervention**

**Review Committees for Neurological Surgery, Neurology, or Diagnostic Radiology**

**ACGME**

**Sponsoring Institution**

1. Does the Sponsoring Institution also sponsor ACGME-accredited programs in the following specialties? [PR I.B.1.a)]

Child Neurology  YES  NO

Diagnostic Radiology  YES  NO

Neurological Surgery  YES  NO

Neurology  YES  NO

Neuroradiology  YES  NO

If NO to any of the above, explain how the program will be jointly administered by programs in these specialties. Limit response to 300 words.

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1. Indicate the amount of dedicated time and support the program director will be provided for the administration of the program [PR II.A.2.a] # % FTE

**Program Personnel and Resources**

**Program Director**

1. Does the program director have the following qualifications?
2. Special expertise in neuroendovascular interventions [PR II.A.3.a).(1)]  YES  NO
3. Appointment to the faculty in the departments of radiology, neurological surgery, and child neurology or neurology [PR II.A.3.c)]  YES  NO

If NO to any of the above, provide an explanation. Limit response to 300 words.

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1. Does the program director devote at least 50 percent of their practice to neuroendovascular intervention? [PR II.A.3.d)]  YES  NO

If NO, provide an explanation. Limit response to 300 words.

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**Faculty**

1. Is there at least one faculty member available to the program with expertise in open cerebrovascular surgery and a teaching appointment in the departments of child neurology, neurological surgery, neurology, or radiology? [PRs II.B.1.a) and II.B.1.a).(1)]  YES  NO

If NO, provide an explanation. Limit response to 300 words.

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**Facilities and Space**

1. Indicate whether the following resources are available to the program.

|  |  |
| --- | --- |
| **Resource** | **Available to program?** |
| Neuroendovascular intervention procedure rooms with physiological monitoring and resuscitative equipment  [PR I.D.1.a).(2)] | YES  NO |
| Radiographic-fluoroscopic room  [PR I.D.1.a).(2).(a).(v)] | YES  NO |
| Facilities for storing catheters, guidewires, contrast materials, embolic agents, and other supplies that are adjacent to or within procedure rooms  [PR I.D.1.a).(3)] | YES  NO |
| Space for image display and interpretation, and for consultation with other clinicians  [PR I.D.1.a).(4)] | YES  NO |
| Laboratory facilities to support research projects pertinent to endovascular therapies  [PR I.D.1.a).(6)] | YES  NO |

Indicate whether each site has the following facilities available. [PR I.D.1.a).(5)] Participating site listings should correspond to their listings in ADS throughout the application document.

|  | **Site #1** | **Site #2** | **Site #3** | **Site #4** |
| --- | --- | --- | --- | --- |
| Inpatient | YES  NO | YES  NO | YES  NO | YES  NO |
| Outpatient | YES  NO | YES  NO | YES  NO | YES  NO |
| Emergency | YES  NO | YES  NO | YES  NO | YES  NO |
| Intensive Care | YES  NO | YES  NO | YES  NO | YES  NO |

**Equipment**

Indicate whether each site has the following equipment available: [PR I.D.1.a).(2).(a)]

|  | **Site #1** | **Site #2** | **Site #3** | **Site #4** |
| --- | --- | --- | --- | --- |
| Magnetic resonance imaging (MRI) scanner equipped with high-speed gradients, and perfusion capability |  |  |  |  |
| Computed Tomography (CT) Scanner(multi-detector) capable of CT angiography and CT perfusion |  |  |  |  |
| Biplane digital subtraction angiography with roadmap and three-dimensional imaging capability |  |  |  |  |
| Ultrasound |  |  |  |  |
| Radiographic-fluoroscopic room(s) |  |  |  |  |

**Patient Data [PR I.D.4.a)]**

|  |  |  |
| --- | --- | --- |
| Reporting Period (Most recent 12-month period): | From: Click here to enter a date. | To: Click here to enter a date. |

1. Capacity

|  | **Site #1**  **(Primary Teaching Site)** | **Site #2** | **Site #3** | **Site #4** |
| --- | --- | --- | --- | --- |
| Hospital Bed Capacity | # | # | # | # |
| Hospital Admissions (total) | # | # | # | # |
| Adult | # | # | # | # |
| Pediatric | # | # | # | # |
| Number of Neurological Surgery Admissions | # | # | # | # |
| Number of Neurology Admissions | # | # | # | # |
| Diagnostic Radiology Examinations | # | # | # | # |
| Adult | # | # | # | # |
| Pediatric | # | # | # | # |

1. Neuroendovascular Interventional Cases [PR I.D.4.b] - I.D.4.b).(10)]

|  | **Site #1** | | | **Site #2** | | | **Site #3** | | | **Site #4** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Total** | **Treated Surgically** | **Treated by NEI Approach** | **Total** | **Treated Surgically** | **Treated by NEI Approach** | **Total** | **Treated Surgically** | **Treated by NEI Approach** | **Total** | **Treated Surgically** | **Treated by NEI Approach** |
| Aneurysms | # | # | # | # | # | # | # | # | # | # | # | # |
| Atherosclerotic disease of the cervical vessels | # | # | # | # | # | # | # | # | # | # | # | # |
| Brain, Pial Arteriovenous fistulas (e.g. Vein of Galen) | # | # | # | # | # | # | # | # | # | # | # | # |
| Brain Dural arteriovenous fistulas | # | # | # | # | # | # | # | # | # | # | # | # |
| Tumors: | | | | | | | | | | | | |
| Cerebral parenchymal | # | # | # | # | # | # | # | # | # | # | # | # |
| Dural, extradural (including meningioma) | # | # | # | # | # | # | # | # | # | # | # | # |
| Microcatheter Drug Delivery (i.e., intra-arterial chemotherapy) | # | # | # | # | # | # | # | # | # | # | # | # |
| Occlusive vascular disease and acute infarction | # | # | # | # | # | # | # | # | # | # | # | # |
| Angioplasty procedures: | | | | | | | | | | | | |
| Intracranial (Atherosclerosis) |  | # | # | # | # | # | # | # | # | # | # | # |
| Extracranial | # | # | # | # | # | # | # | # | # | # | # | # |
| Strokes: | | | | | | | | | | | | |
| Arterial recanalization | # | # | # | # | # | # | # | # | # | # | # | # |
| Hemorrhagic | # | # | # | # | # | # | # | # | # | # | # | # |
| Venous Sinus Recanalization | # | # | # | # | # | # | # | # | # | # | # | # |
| Stent Procedures: | | | | | | | | | | | | |
| Intracranial | # | # | # | # | # | # | # | # | # | # | # | # |
| Extracranial | # | # | # | # | # | # | # | # | # | # | # | # |
| Vasospasm: | | | | | | | | | | | | |
| Drug infusion | # | # | # | # | # | # | # | # | # | # | # | # |
| Balloon Dilation | # | # | # | # | # | # | # | # | # | # | # | # |
| Neoplasms of the spine | # | # | # | # | # | # | # | # | # | # | # | # |
| Spinal Pial arteriovenous malformations | # | # | # | # | # | # | # | # | # | # | # | # |
| Spinal dural arteriovenous fistulae | # | # | # | # | # | # | # | # | # | # | # | # |
| Primary & metastatic spinal tumors (intraspinal and vertebral separately) | # | # | # | # | # | # | # | # | # | # | # | # |
| Spinal biopsy and percutaneous interventions, including vertebroplasty | # | # | # | # | # | # | # | # | # | # | # | # |
| Traumatic vascular lesions of the CNS, head, neck, and spine | # | # | # | # | # | # | # | # | # | # | # | # |
| Other | # | # | # | # | # | # | # | # | # | # | # | # |
| Total Major NEI Procedures | # | # | # | # | # | # | # | # | # | # | # | # |

3. Head and Neck [PR I.D.4.b).(6) - I.D.4.b).(10)]]

|  | **Site #1** | | | **Site #2** | | | **Site #3** | | | **Site #4** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Total** | **Treated Surgically** | **Treated by NEI Approach** | **Total** | **Treated Surgically** | **Treated by NEI Approach** | **Total** | **Treated Surgically** | **Treated by NEI Approach** | **Total** | **Treated Surgically** | **Treated by NEI Approach** |
| Vascular anomalies of the head and neck | # | # | # | # | # | # | # | # | # | # | # | # |
| Head and neck vascular malformation | # | # | # | # | # | # | # | # | # | # | # | # |
| Head and Neck Neoplasms | # | # | # | # | # | # | # | # | # | # | # | # |
| Epistaxis | # | # | # | # | # | # | # | # | # | # | # | # |

1. Diagnostic [PR I.D.4.]

|  | **Site #1** | **Site #2** | **Site #3** | **Site #4** |
| --- | --- | --- | --- | --- |
| Cerebral angiograms procedures | # | # | # | # |
| ICA | # | # | # | # |
| ECA | # | # | # | # |
| Vertebral artery | # | # | # | # |
| Intraoperative | # | # | # | # |
| Venograms | # | # | # | # |
| Spinal angiography | # | # | # | # |
| Arterial balloon occlusion tests | # | # | # | # |
| Physiological functional angiography (including WADA tests) | # | # | # | # |

**Other Learners**

1. If there are programs in the institution in any of the following areas, provide the data indicated:

[PR I.E.1.a]

|  |  |  |  |
| --- | --- | --- | --- |
|  | **# of Faculty** | **# of Residents** | **# of Subspecialty Fellows** |
| Child Neurology | # | # | # |
| Diagnostic Radiology | # | # | # |
| Interventional Radiology | # | # | # |
| Neurocritical Care | # | # | # |
| Neuroradiology | # | # | # |
| Neurological Surgery | # | # | # |
| Neurology | # | # | # |
| Vascular Neurology | # | # | # |

1. How will it be ensured that the subspecialty program in Neuroendovascular Intervention will not have an adverse impact, as by dilution of the available clinical material, on the education of the child neurology, diagnostic radiology, interventional radiology, neurocritical care, neurological surgery, neurology, or vascular neurology residents and fellows in the institution? [PR I.E.1.a)]

Limit response to 300 words.

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**Fellow Appointments**

**Fellow Eligibility**

1. If the fellow is from a diagnostic radiology background, describe the experience of the radiology resident in patient care skills, including outpatient evaluation and care of pre- and post-procedure endovascular patients, and management of patients in the neurointensive care environment. [PR III.A.1.a).(1) - III.A.1.a).(4).(d)]

Limit response to 300 words.

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1. If the fellow is from a neurological surgery background, describe the experience of the neurosurgical resident in basic radiological skills, including the fundamentals of imaging physics and radiation biology. [PR III.A.1.a).(5) - III.A.1.a).(5).(b).(v)]

Limit response to 300 words.

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1. If the fellow is from a neurology background, describe the experience of the neurology resident in basic radiologic skills, including the fundamentals of imaging physics and radiation biology.  
   [PR III.A.1.a).(6) - III.A.1.a).(6).(c).(v)]

Limit response to 300 words.

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**Educational Program**

**Competencies**

Briefly describe the planned fellow experiences in each of the following.

1. Signs and symptoms of disorders amenable to diagnosis and treatment by neuroendovascular intervention techniques [PR IV.B.1.b).(1).(b).(i)]

Limit response to 300 words.

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1. Recognition and management of indications for and contraindications to neuroendovascular intervention procedures [PR IV.B.1.b).(1).(b).(ii)]

Limit response to 300 words.

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1. Preoperative and postoperative management of endovascular patients [PR IV.B.1.b).(1).(b).(iii)]

Limit response to 300 words.

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1. Neurointensive patient care management [PR IV.B.1.b).(1).(b).(iv)]

Limit response to 300 words.

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1. Clinical and technical aspects of neuroendovascular intervention procedures [PR IV.B.1.c).(1).(a)]

Limit response to 300 words.

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1. Fundamentals of imaging physics and radiation biology [PR IV.B.1.c).(1).(b)]

Limit response to 300 words.

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1. Interpretation of neuroangiographic studies pertinent to the practice [PR IV.B.1.c).(1).(c)]

Limit response to 300 words.

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1. Medical and surgical alternatives to neuroendovascular intervention procedures [PR IV.B.1.c).(1).(d)]

Limit response to 300 words.

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1. Pathophysiology and natural history of relevant neurological disorders [PR IV.B.1.c).(1).(e)]

Limit response to 300 words.

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**Patient Care and Procedural Skills**

Indicate the settings and activities in which fellows will demonstrate proficiency in each of the following areas of patient care. Also indicate the method used to evaluate competency.

| **Competency Area** | **Settings/Activities** | **Method Used to Evaluate Fellow Competency** |
| --- | --- | --- |
| Providing consultations under the supervision of neuroendovascular intervention practitioners [PR IV.B.1.b).(1).(a)] | Settings/Activities. | Evaluation method(s) |
| Performing and analyzing a broad spectrum of endovascular procedures [PR IV.B.1.b).(2).(a).(i)] | Settings/Activities. | Evaluation method(s) |
| Managing patients with neurological disease, performing neuroendovascular intervention procedures, and integrating neuroendovascular intervention therapy into the clinical management of patients [PR IV.B.1.b).(2).(a).(ii)] | Settings/Activities. | Evaluation method(s) |
| Performing clinical pre-procedure evaluations of patients, and their preliminary diagnostic studies, and consulting with clinicians on other services [PR IV.B.1.b).(2).(a).(iii)] | Settings/Activities. | Evaluation method(s) |
| Performing diagnostic and therapeutic neuroendovascular intervention procedures [PR IV.B.1.b).(2).(a).(iv)] | Settings/Activities. | Evaluation method(s) |
| Performing physical examinations to evaluate patients with neurological disorders [PR IV.B.1.b).(2).(a).(v)] | Settings/Activities. | Evaluation method(s) |
| Performing neurological examinations to evaluate patients with neurological disorders [PR IV.B.1.b).(2).(a).(vi)] | Settings/Activities. | Evaluation method(s) |
| Generating procedural reports [PR IV.B.1.b).(2).(a).(vii)] | Settings/Activities. | Evaluation method(s) |
| Providing short-term and long-term follow-up care, including neurointensive care [PR IV.B.1.b).(2).(a).(viii)] | Settings/Activities. | Evaluation method(s) |

**Medical Knowledge**

1. Indicate the settings and activities in which fellows will develop competency in their knowledge of each of the following areas. Also indicate the method used to evaluate competency.

| **Competency Area** | **Settings/Activities** | **Method Used to Evaluate Fellow Competency** |
| --- | --- | --- |
| **Anatomical and physiologic basic knowledge** | | |
| Arterial and venous angiographic anatomy of the brain, spine, spinal cord, and head and neck [PR IV.B.1.c).(2).(a).(i)] | Settings/Activities. | Evaluation method(s) |
| Autoregulation [PR IV.B.1.c).(2).(a).(i).(a)] | Settings/Activities. | Evaluation method(s) |
| Cerebral blood flow [PR IV.B.1.c).(2).(a).(i).(b)] | Settings/Activities. | Evaluation method(s) |
| Collateral circulation [PR IV.B.1.c).(2).(a).(i).(c)] | Settings/Activities. | Evaluation method(s) |
| Dangerous anastomosis [PR IV.B.1.c).(2).(a).(i).(d)] | Settings/Activities. | Evaluation method(s) |
| Variants of anatomy [PR IV.B.1.c).(2).(a).(i).(e)] | Settings/Activities. | Evaluation method(s) |
| Vascular distributions and supply/drainage [PR IV.B.1.c).(2).(a).(i).(f)] | Settings/Activities. | Evaluation method(s) |
| Related bony and soft tissue anatomy and physiology  [PR IV.B.1.c).(2).(a).(ii)] | Settings/Activities. | Evaluation method(s) |
| Brain, neck, face, and spine soft tissue anatomy and physiology [PR IV.B.1.c).(2).(a).(ii).(a)] | Settings/Activities. | Evaluation method(s) |
| Ligamentous, articular, and muscular anatomy [PR IV.B.1.c).(2).(a).(ii).(b)] | Settings/Activities. | Evaluation method(s) |
| Vertebral, face, and skull bony anatomy [PR IV.B.1.c).(2).(a).(ii).(c)] | Settings/Activities. | Evaluation method(s) |
| **Pharmacology of the CNS and vasculature and relevant brain physiology** | | |
| Agents used in provocative testing [PR IV.B.1.c).(2).(b).(i)] | Settings/Activities. | Evaluation method(s) |
| Coagulation cascade, including anticoagulants, antiaggregants, and thrombolytics [PR IV.B.1.c).(2).(b).(ii).(a)-(c)] | Settings/Activities. | Evaluation method(s) |
| Contrast agents [PR IV.B.1.c).(2).(b).(iii)] | Settings/Activities. | Evaluation method(s) |
| Vasodilators and constrictors [PR IV.B.1.c).(2).(b).(iv)] | Settings/Activities. | Evaluation method(s) |
| **Embolic, sclerosing, ablative, and bone stabilization agents** | | |
| Allergic reaction control [PR IV.B.1.c).(2).(c).(i)] | Settings/Activities. | Evaluation method(s) |
| Blood pressure control [PR IV.B.1.c).(2).(c).(ii)] | Settings/Activities. | Evaluation method(s) |
| Heart rate control [PR IV.B.1.c).(2).(c).(iii)] | Settings/Activities. | Evaluation method(s) |
| Infection [PR IV.B.1.c).(2).(c).(iv)] | Settings/Activities. | Evaluation method(s) |
| Stroke risk reduction [PR IV.B.1.c).(2).(c).(v)] | Settings/Activities. | Evaluation method(s) |
| **Technical aspects of neuroendovascular intervention** | | |
| Catheter and delivery systems [PR IV.B.1.c).(2).(d).(i)] | Settings/Activities. | Evaluation method(s) |
| Collateral network manipulations, flow diversion [PR IV.B.1.c).(2).(d).(ii)] | Settings/Activities. | Evaluation method(s) |
| Complications of angiography and embolization [PR IV.B.1.c).(2).(d).(iii)] | Settings/Activities. | Evaluation method(s) |
| Direct access/therapeutic injection techniques, including biopsy and aspiration [PR IV.B.1.c).(2).(d).(iv)] | Settings/Activities. | Evaluation method(s) |
| Electrophysiology [PR IV.B.1.c).(2).(d).(v)] | Settings/Activities. | Evaluation method(s) |
| Embolic, sclerosing and stabilizing agents in cerebral, spinal and head and neck embolization [PR IV.B.1.c).(2).(d).(vi)] | Settings/Activities. | Evaluation method(s) |
| Flow controlled navigations and embolization [PR IV.B.1.c).(2).(d).(vii)] | Settings/Activities. | Evaluation method(s) |
| Imaging of the vascular system [PR IV.B.1.c).(2).(d).(viii)] | Settings/Activities. | Evaluation method(s) |
| Provocative testing [PR IV.B.1.c).(2).(d).(ix)] | Settings/Activities. | Evaluation method(s) |
| Stents, balloons, and revascularization devices [PR IV.B.1.c).(2).(d).(x)] | Settings/Activities. | Evaluation method(s) |

1. Indicate the settings and activities in which fellows will demonstrate knowledge of the classification, clinical presentation, imaging appearance, natural history, epidemiology, hemodynamic and physiologic basis for disease and treatment, indications and techniques for treatment, contraindications for treatment, treatment alternatives, combined therapies, risks of treatment, and complication management for each of the disease states listed below. Also indicate the method(s) that will be used to evaluate competency.

| **Competency Area** | **Settings/Activities** | **Method(s) Used to Evaluate Fellow Competency** |
| --- | --- | --- |
| Arteriopathies [PR IV.B.1.c).(3).(a)] | Settings/Activities. | Evaluation method(s) |
| Arteriovenous malformations and fistulae [PR IV.B.1.c).(3).(b)] | Settings/Activities. | Evaluation method(s) |
| Hemorrhage and epistaxis [PRIV.B.1.c).(3).(c)] | Settings/Activities. | Evaluation method(s) |
| Other vascular malformations and lesions [PR IV.B.1.c).(3).(d)] | Settings/Activities. | Evaluation method(s) |
| Stroke and cerebral ischemia [PR IV.B.1.c).(3).(e)] | Settings/Activities. | Evaluation method(s) |
| Tumors [PR IV.B.1.c).(3).(f)] | Settings/Activities. | Evaluation method(s) |
| Vascular trauma [PR IV.B.1.c).(3).(g)] | Settings/Activities. | Evaluation method(s) |
| Vertebral fracture and degeneration (PR IV.B.1.c).(3).(h)] | Settings/Activities. | Evaluation method(s) |

1. Describe how the program director will ensure that the continuity of care experience is of sufficient duration to ensure that the fellow is familiar with the outcome of all neuroendovascular intervention procedures. [PR IV.B.1.b).(2).(a).(viii).(a)]

Limit response to 300 words.

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**Didactics**

1. Enter the schedule of planned formal teaching conferences for the program. Provide specific titles of lectures/sessions. Add rows as needed. [PR IV.C.4.a) - IV.C.4.a).(1)]

|  |  |
| --- | --- |
| **Topic** | **Title** |
| Topic | Title |
| Topic | Title |
| Topic | Title |
| Topic | Title |

1. List the conferences that neuroendovascular intervention fellows will attend.

a) Journal club [PR IV.C.4.a).(3)]

b) Morbidity and mortality [PR IV.C.4.a).(4)]

c) Neuropathology conferences [PR IV.C.4.b).(2)]

d) Neuroanatomy dissection [PR IV.C.4.a).(2)]

e) Neurology or neurological surgery and radiology conferences [PR IV.C.4.a).(4).(a)]

f) Interdepartmental conferences [PR IV.C.4.b).(2)]

g) Others (specify):

Limit response to 250 words.

|  |
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1. Will fellows be required to maintain a personal case log of their clinical experiences? How often will the program director review the logs with the fellows?  
   [PR IV.C.5.b)]

Limit response to 250 words.

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**Scholarly Activities**

1. Describe fellow education in the basic principles of research, including how research is conducted, evaluated, explained to patients, and applied to patient care. [PR IV.D.3.a)]

Limit response to 400 words.

|  |
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1. How will the program director ensure that fellows participate in scholarly activity? [PR IV.D.3.b)]

Limit response to 400 words.

|  |
| --- |
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1. Describe how fellows will participate in research activities with residents and staff members in other related specialties. [PR IV.D.3.c)]

Limit response to 400 words.

|  |
| --- |
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**Night Float**

1. What will be the maximum number of consecutive weeks fellows are assigned night float?   
[PR VI.F.6.a)] [ # ] consecutive weeks

2. How many months per year will fellows be assigned night float? (PR VI.F.6.a)) [ # ] months/year