

The logo for Hemispheres 2.0 features a large black curved line arching over the text. On the left side of the arch is a red star. The text "Hemispheres 2.0" is in a large, bold, black font, with "2.0" in red. Below this, the words "STROKE COMPETENCY SERIES" are written in a bold, red, sans-serif font. A registered trademark symbol (®) is located at the end of the arch.

Hemispheres 2.0
STROKE COMPETENCY SERIES

Course Description and Outline



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Level I – Brain Anatomy and Physiology

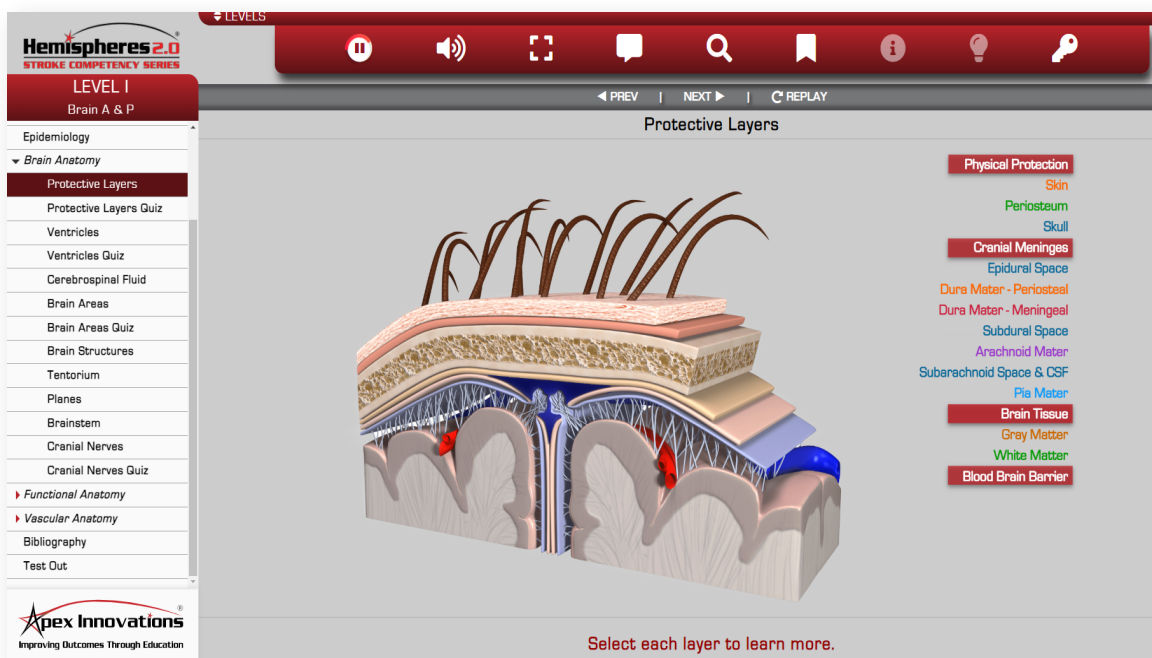
Course Description

Level I of Hemispheres 2.0® provides a foundational look at basic brain anatomy, its supporting structures, and brain physiology. This educational experience presents anatomy, cranial nerves, and cerebral circulation using 3D interactive graphics to enhance your learning experience. Learn brain areas, sensory-motor function and blood vessels, which supply these areas. Test your knowledge throughout the course with quizzes to reinforce learning.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Recognize anatomical structures of the brain.
2. Explain the functions of each major area of the brain.
3. Describe brain physiology, including motor and sensory functions.
4. List the bodily functions controlled by specific cranial nerves.
5. Identify structures of the cerebrovascular circulation.
6. Correlate cerebral vasculature with anatomical structures of the brain.



Level II – Stroke Pathophysiology

Course Description

Level II of Hemispheres 2.0® stroke pathophysiology, presents cerebral circulation with an emphasis on ischemic and hemorrhagic stroke. Thrombotic, embolic, and lacunar strokes are graphically depicted for review, as well as subarachnoid and intracerebral hemorrhage. Learn about cerebral aneurysms, typical stroke locations, stroke syndromes, and associated deficits. Interactive functionality supports all learning styles and requires active participation by the learner.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Describe the pathophysiology of ischemic and hemorrhagic stroke.
2. Correlate cerebral vasculature with area of brain affected by stroke.
3. Recall major stroke syndromes and associated deficits.
4. Identify stroke location based on symptomatology.
5. Describe types of hemorrhagic stroke and common locations.
6. Explain the etiology of ischemic and hemorrhagic stroke.

Hemispheres 2.0
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LEVEL II
Pathophysiology

Prior to Beginning
Course Overview
Course Objectives
▶ Pathophysiology
▶ Ischemic Stroke
Transient Ischemic Attack
Lacunar Stroke
▼ Hemorrhagic Stroke
 Subarachnoid Hemorrhage
 Intracerebral Hemorrhage
Cerebral Aneurysm
Cerebral Aneurysm Sites
▶ Stroke Syndromes
▶ Stroke Vascular Syndromes
Venous Pathophysiology
Bibliography
Test Out

Subarachnoid Hemorrhage

Subarachnoid hemorrhage (SAH) occurs when a blood vessel in the subarachnoid space ruptures, causing blood to leak into this space surrounding the brain.

Causes of Subarachnoid Hemorrhage

- Cerebral aneurysms **[aSAH]**
- Vascular malformations **[AVM]**
- Trauma

Typical symptoms of a subarachnoid hemorrhage include:

- Severe headache
- Neck pain
- Neck stiffness
- Photophobia (painful sensitivity to light)
- Nausea/vomiting
- Decreased level of consciousness
- Cranial nerve palsy
- Hemiparesis

Select the bold blue text for additional information.

Level III – Emergency Response to Stroke

Course Description

Level III of Hemispheres 2.0® addresses the stroke chain of survival from “time last seen normal” through to EMS, emergency department, and disposition. Guideline based, time-sensitive best practices provide current and crucial aspects of emergent stroke care in a comprehensive and logical manner. Learn neurological assessment, stroke treatment modalities, and complications. Interactive graphics encourage exploration and enhance the learning experience. Imaging basics related to CT and MRI, endovascular interventions and possible complications are presented. Periodic quizzes throughout the lesson reinforce presented information.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Explain the components of the stroke chain of survival, including the time sensitive goals and critical actions required for the care of the acute stroke patient.
2. Distinguish typical and atypical signs and symptoms of an acute stroke and conditions that mimic stroke.
3. Summarize pre-hospital assessments and interventions for the acute stroke patients.
4. Identify assessments and interventions for the acute stroke patient in the ED.
5. Describe the comprehensive neurological examinations for patients with an altered level of consciousness.
6. Explain the diagnostic tests utilized in the diagnosis of acute stroke.

The screenshot displays the Hemispheres 2.0 interface. On the left is a navigation menu with sections for 'LEVEL III Emergency Response', 'Goal', 'Third Party Model', 'Neuro Assessment', 'Eye Assessment', 'Case Study', and 'Test Out'. The main content area is titled 'Third Party Model' and contains the following text: 'In the Third Party model, a remote/ community hospital will contact neurology expertise, who may or may not be associated with the hub hospital.' Below this text is a diagram illustrating the workflow. It features three main components: 'Spoke Hospital Rural/Community' (top), 'Spoke Hospital Rural/Community Hospital' (center), and 'Neuro Expertise Consultants' (right). The 'Spoke Hospital Rural/Community Hospital' box lists three steps: 1. Receives a patient suspected of having a stroke and activates the telestroke system. 2. Initiates two way communication (audio/visual) with neuro expertise, via an interactive device, (computer, webcam, robot) connected to the internet. 3. Ensures stroke workup and emergent CT are in progress. Arrows indicate communication between the Spoke Hospital and the Neuro Expertise Consultants, and between the Spoke Hospital and the Hub Hospital Primary/Comprehensive Stroke Center (bottom left). A red banner at the bottom of the diagram reads 'Select each button for additional information.'

Level IV – In-Hospital Ischemic Stroke

Course Description

Level IV of Hemispheres 2.0® admission of the ischemic stroke patient, begins with a multidisciplinary team approach to achieve specific goals, namely to avoid complications, restore function, and improve outcomes. Stroke best practices for needed assessments, diagnostics, interventions, education, nutrition, activity, and consults are presented. These are chronologically organized into therapeutic, personal, psychosocial, and safety needs. In addition, learn to correctly perform a dysphagia screen and modified Rankin scale. Care notes, teaching tips and other helpful patient-caretaker education are incorporated into the course.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Recall key elements of the plan of care in the post ischemic stroke patient.
2. Explain diagnostic tests utilized in the inpatient evaluation of acute ischemic stroke.
3. Describe guideline-based interventions used in the inpatient management of acute ischemic stroke.
4. Identify potential complications and best practice interventions in the inpatient care of acute ischemic stroke.
5. Summarize the role of the multidisciplinary team in the care of the ischemic stroke patient.

The screenshot displays the Hemispheres 2.0 educational interface. At the top, there is a navigation bar with icons for play, volume, zoom, search, and other controls. Below this, the course title 'LEVEL IV Ischemic Stroke' is visible. A sidebar on the left lists various topics, with 'Interventions' currently selected. The main content area is titled 'Interventions' and features a central corkboard graphic. On the corkboard, there are three main sections: 'Therapeutic', 'Indwelling urinary catheter', and 'Safety'. The 'Indwelling urinary catheter' section contains a list of bullet points: 'If possible, the placement of indwelling bladder catheters should be avoided due to the increased risk of UTI.', 'If an indwelling catheter was required during the acute phase, discontinue as soon as stable.', 'External catheters and the use of incontinence pants may lessen risk of infection.', and 'Intermittent catheterization every 4-6 hours (or based on post voiding residuals) may be needed.' The 'Safety' section is titled 'Interventions per protocol or as ordered:' and lists: 'Post tPA bleeding prevention', 'Limit use of indwelling urinary catheter', 'Exercise to prevent venous thromboembolism (VTE)', 'Dysphagia screen (aspiration)', 'Gag reflex, cough on demand', 'Seizure precautions', 'Modified Rankin Scale - ADL ability', 'Fall precautions', and 'Smoking cessation (if smoker)'. At the bottom of the interface, there is a red button labeled 'Therapeutic' and a red button labeled 'Safety'. A footer at the bottom of the screen reads 'Select each button and bold blue text to learn more.'

Level V – In-Hospital Hemorrhagic Stroke

Course Description

Level V of Hemispheres 2.0® presents hemorrhagic stroke, specifically, subarachnoid and intracerebral hemorrhage. Clinical grading scales provide valuable information and are used as outcome predictors. As outcomes are affected by etiology, interventions received, and any subsequent complications of hemorrhage, we will review these in relation to best practice guidelines. We look at management of increased intracranial pressure, blood pressure, and brain supportive therapies. Common complications such as hydrocephalus, vasospasm, and rebleeding are also addressed. Throughout the course, pharmacological, surgical, and endovascular interventions are graphically and interactivity presented to enhance the learning experience.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Identify and describe the clinical grading scales used in the evaluation of patients with subarachnoid and intracerebral hemorrhage.
2. Describe the management and rationales in the care of patients with subarachnoid hemorrhage.
3. Describe the management and rationales in the care of patients with intracerebral hemorrhage.
4. Explain key measures and rationales for the prevention of complications in patients with hemorrhagic strokes.
5. Summarize the treatment of complications in patients with subarachnoid and intracerebral hemorrhage.

The screenshot displays the Hemispheres 2.0 educational platform interface. The top navigation bar includes a 'LEVELS' dropdown, a play button, a speaker icon, a search icon, a magnifying glass, a bookmark icon, an information icon, a lightbulb icon, and a key icon. Below the navigation bar, the 'LEVEL V Hemorrhagic Stroke' menu is visible on the left, with 'SAH Interventions' selected. The main content area is titled 'SAH Interventions' and contains the following text:

Patients with an aneurysmal subarachnoid hemorrhage should have the aneurysm secured urgently by endovascular coiling or microsurgical clipping, ideally within 24 to 48 hours. An endovascular approach is preferred for those patients eligible for either treatment.

The decision to clip or coil an aneurysm should be made jointly by a qualified cerebrovascular surgeon and an endovascular specialist at the time of the diagnostic angiogram. If possible, the endovascular procedure could be performed at the time of the angiogram in order to reduce treatment time and the risk of rebleeding. After any aneurysm repair, immediate cerebrovascular imaging is generally recommended to identify remnants or recurrence of the aneurysm that may require treatment.

Two red buttons labeled 'Surgical Clip' and 'Coiling' are positioned below the text. Below these buttons, a red-bordered box contains the following text:

Surgical clipping of a cerebral aneurysm is a procedure performed under general anesthesia by a neurosurgeon. A craniotomy is performed, making an opening in the skull to expose the brain. The brain is gently retracted to visualize the aneurysm. A small titanium clip is placed across the base or neck of the aneurysm to isolate the weakened wall of the aneurysm from the rest of the circulation.

Advantages of early clipping:

- Decreased risk of rebleeding
- Allows aggressive management of vasospasm
- Reduces the incidence of medical complications such as DVT or pneumonia due to early mobilization

Disadvantages of early clipping:

- More difficult surgical approach secondary to cerebral edema
- Higher risk of intraoperative aneurysmal rupture

An anatomical illustration of a brain with a surgical clip applied to an aneurysm is shown on the right side of the text. At the bottom of the interface, a red button labeled 'Select each button for more information.' is visible. The Apex Innovations logo is located in the bottom left corner.

Level VI – Stroke Prevention

Course Description

Level VI of Hemispheres 2.0™ addresses stroke prevention in relation to non-modifiable and modifiable factors. Modifiable factors are categorized into lifestyle risk factors (due to poor choices), and pathology risk factors (due to medically related conditions). The approach to each modifiable risk factor is through primary and secondary strategies presented in a fun, interactive learning environment. The goal of each strategy is to minimize the risk of a future or recurrent stroke. Current best practice recommendations for lifestyle modifications, pharmacological interventions, and potential invasive options are presented and can be shared with patient-caretakers.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Differentiate modifiable and non-modifiable risk factors for stroke.
2. Explain risk management strategies for reduction of primary stroke risk.
3. Summarize modifiable risk management strategies for the reduction of secondary or recurrent stroke.
4. Identify recommended drug therapies for modifiable risk factors that can reduce the risk of recurrent stroke.
5. List pathophysiological conditions which can lead to stroke.

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STROKE COMPETENCY SERIES

LEVEL VI
Stroke Prevention

Prior to Beginning
Course Overview
Course Objectives
Non-Modifiable Factors
Modifiable Risk Factors
Primary/Secondary Prevention
▼ Modifiable Factors - Lifestyle
Alcohol Abuse
Drug Abuse
Oral Contraceptives
Physical Inactivity
Poor Nutrition / Obesity
Smoking
► Modifiable Factors - Pathology
Bibliography
Test Out

Smoking

STROKE RISK

Smoking and exposure to secondhand smoke are known, major risk factors for stroke.

- Smokers have more than twice the risk of stroke than nonsmokers, and the risk increases with the number of cigarettes smoked per day.
- Stroke risk is higher for women smokers than men.
- Stroke risk decreases significantly after two years of smoking cessation and is at the level of nonsmokers after five years.

Cigarette smoking increases:

- Atherosclerosis risk by reducing beneficial HDL cholesterol
- Arterial wall stiffness and decreases vessel distension and compliance
- Thrombus formation risk due to increased fibrinogen and platelet aggregation

Primary
Avoid Development

Secondary
Avoid Progression or Repeat Stroke

Recommendations:
Smoking and tobacco cessation for all current smokers and family members.
Healthcare team role:

- Inquire about your patient's history of smoking, tobacco use, and exposure to secondhand smoke
- Advise every patient who has smoked in the past year to quit smoking and abstain from tobacco use
- For hospitalized stroke patients

Apex Innovations
Improving Outcomes Through Education

Level VII – Excellence in Stroke Care

Course Description

Level VII of Hemispheres 2.0® presents current best practices and key strategies to support those wishing to provide excellence in stroke care. Stroke center designations, whether acute stroke ready, primary or comprehensive, provide advantages to the organization and the communities they serve. Learn the specific infrastructure, personnel, and quality initiatives which are required to support the certification process. Meet the pre-hospital, emergency department and inpatient stroke multidisciplinary team. Review reportable stroke core measures and their supporting rationale and recommendations. A helpful comprehensive list of stroke resources is linked directly from the course. This interactive program utilizes active participation to make learning fun and complements the learning experience.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Explain key strategies for pre-hospital care of acute stroke patients.
2. Identify best practice strategies recommended for ED personnel in the care of the acute stroke patient.
3. Summarize the roles of the multidisciplinary stroke team for different stroke center designations.
4. Define stroke core measures which must be collected and reported for acute in-patient stroke.
5. Describe useful strategies associated with certification of stroke centers.
6. List the CMS quality of care initiatives that impact hospital reporting and reimbursement.

The screenshot displays the Hemispheres 2.0 interactive course interface. The top navigation bar includes a 'LEVELS' dropdown, a play button, a volume icon, a full-screen icon, a chat icon, a search icon, a bookmark icon, an information icon, a lightbulb icon, and a key icon. Below the navigation bar, the course title 'LEVEL VII Excellence in Stroke Care' is shown, along with a table of contents. The main content area is titled 'ED Stroke Metrics' and features a central text box with the following text: 'Emergency Department stroke-specific time goals and metrics facilitate the care of the acute stroke patient. Data is collected and compared to these benchmarks in order to:' followed by a bulleted list: '• validate compliance', '• review and change practice', and '• improve outcomes'. Below this text is a red 'EMERGENCY' button. The interface is flanked by two vertical panels of red buttons: the left panel contains 'Physician Evaluation', 'Neurologic Expertise', 'Scan Initiated', and 'Scan Interpretation'; the right panel contains 'Thrombolytic', 'Symptom Onset', 'Neurosurgical Expertise', and 'Monitored Bed'. A central text box between the panels reads: 'Door to physician evaluation. A candidate for acute intervention should have initial physician evaluation within 10 minutes of arrival at the ED.' At the bottom of the interface, a red banner states: 'Select each button for additional information.'

Level VIII – NIHSS

Course Description

The **NIH Stroke Scale Training** is a 11-item neurological examination used to quantify the effects of acute cerebral ischemia on levels of consciousness, vision, motor function (facial and extremities), cerebellar function, sensation, language, and extinction or inattention. This course consists of the NIH Stroke Scale Training and Certification.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Explain the significance of the NIH Stroke Scale and the importance of proper assessment of the stroke patient.
2. Describe the measurement scale for quantifying neurological deficits in stroke patients.
3. Consistently recognize and appropriately assess neurological deficits in stroke patients.

The screenshot shows a video player interface for the 'NIHSS Introduction' video. On the left is a navigation menu with the following items: NIH Stroke Scale, Prior to Beginning, Course Overview, Course Overview & Objectives, NIHSS Information, NIHSS Introduction (highlighted in red), Tips for Scoring, Significance - Stroke Scale, Relevance to Medical Specialties, Instruction, Demonstration Patient A, Demonstration Patient B, NIHSS Certification, Credits, and Bibliography. The main video area shows a man in a suit and glasses, identified as **JOHN R. MARLER, M.D.**, Associate Director for Clinical Trials at the National Institute of Neurological Disorders and Stroke. Below the video are controls for 'Switch Video Player' with options for 'Vimeo' and 'HTML5'. A note at the bottom states: 'Audio capability is required on your computer to hear audio instructions and patient demonstrations on how to administer and score the NIH Stroke Scale.' At the very bottom, a disclaimer reads: 'No modifications or edits may be made to the NIH Stroke Scale training videos by anyone other than the National Institute of Neurological Disorders and Stroke (NINDS).'

Hemispheres 2.0

Continuing Education Information

	Levels	Testing Min.	CNE	CME	CPE	CEH	FL CEH	CCH	CE
I	Brain A&P	60	5.00	5.00	2.00	4.00	4.50	5.00	4.00
II	Stroke Patho.	60	5.00	5.00	2.00	4.00	4.50	5.00	3.50
III	Emergency Response to Stroke	60	6.50	6.50	3.50	5.50	6.00	6.50	4.50
IV	In-Hospital Ischemic Stroke	60	4.50	4.50	2.50	4.00	4.00	4.50	2.00
V	In-Hospital Hemorrhagic Stroke	45	4.00	4.00	2.00	3.50	3.50	4.00	3.00
VI	Stroke Prevention	45	4.00	4.00	2.00	3.25	3.50	4.00	2.00
VII	Excellence in Stroke Care	45	4.00	4.00	2.00	3.75	3.50	4.00	2.50
VIII	NIH Stroke Scale	Untimed	3.00	3.00	3.00	--	3.00	3.00	3.00
	TOTAL	375	36.00	36.00	19.00	28.00	32.50	36.00	24.50

JA. In support of improving patient care, Apex Innovations is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC) to provide continuing education for the healthcare team.

36 CNE. Apex Innovations designates this enduring material for 36 ANCC contact hours for nurses.

36 CME. Apex Innovations designates this enduring material activity for a maximum of 36 *AMA PRA Category 1 Credits*[™]. Physicians should claim only credit commensurate with the extent of their participation in the activity.

19 CPE. Apex Innovations designates this knowledge-based enduring material for 19 ACPE contact hours for pharmacists.

28 CEH. This CE activity is accredited for 28 CEH by Apex Innovations, an organization accredited by Commission on Accreditation for Prehospital Continuing Education (CAPCE).

32.5 FLCEH. Apex Innovations has been approved by the Florida Emergency Medical Services as an educational provider for EMS and Paramedics continuing education hours and have course completion roster and tracking number available on the CE Broker website.

36 CCH. Apex Innovations is recognized by the Physical Therapy Board of California as an approved reviewer and provider of continuing competency courses for The State of California.

24.5 CE. Apex Innovations is recognized by the Ohio Physical Therapy Association as an approved CE sponsor for this activity.

24.5 CE. Apex Innovations has received CE course approval by the Pennsylvania State Board of Physical Therapy for this educational activity.