



Update: Prevention of Stroke in Nonvalvular Atrial Fibrillation

Case Presentation Part 1: Emergency Department Consultation

A 65-year-old right-handed man presents to the emergency department (ED) with sudden-onset neurologic symptoms, including right-sided weakness.

The patient is evaluated in the presence of his wife, who provides most of the medical history. He was in his usual state of health this afternoon. He was talking to his wife at their home when he suddenly collapsed to the ground. His wife noticed that his speech was slurred and he had a right facial droop. He was not moving his right arm or leg. She immediately called emergency services. The emergency medical technicians documented that the patient had a normal finger-stick glucose. In the ED, a stroke alert was paged. As the covering neurologist, you now evaluate the patient approximately 40 minutes after the start of his symptoms. According to his wife, there was no seizure activity.

His past medical history is notable for hypertension, sleep apnea, and hyperlipidemia. Five years before, he had a gastrointestinal bleed from a duodenal ulcer. There is no history of recent head trauma, stroke, intracranial surgery, intraspinal surgery, pericarditis, abnormal bleeding, or surgical procedures. He has no history of prior hypertension or intracranial hemorrhage.

He takes hydrochlorothiazide, aspirin, and simvastatin. He does not take oral anticoagulants.

He has no known drug allergies.

He does not smoke tobacco, drink alcohol, or use illicit substances. He is a retired mortgage loan officer. His wife is his health care proxy.

There is no family history of neurologic diseases, including stroke.

In addition to what is noted above, a complete 14-topic review of systems was obtained from his wife and was unremarkable.

On physical examination, he is a well-developed and well-nourished man lying on a hospital stretcher.

He is afebrile. His blood pressure is 160/80, pulse is 90, and respiratory rate is 16. His oxygen saturation on room air is 99%.

His heartbeat is irregular. His lungs are clear. No bruits are heard over his neck.

He is globally aphasic and cannot follow commands, repeat, or name. The remainder of the neurologic examination is difficult due to his aphasia. The few words he does produce are slurred.

Cranial nerve testing reveals PERRL. He has a left gaze deviation. Blink to threat is decreased on the right. He has a right facial droop.

Motor strength is significantly impaired in the right arm and leg, and he cannot even hold the extremities up (they fall straight to the bed when the examiner lifts and releases them). However, there is some slight movement visible. He moves the left arm and leg spontaneously with good power.

Sensory examination is difficult due to his aphasia. However, he does not withdraw on the right even when the nurses place an intravenous line.

Reflexes are 2/4 on the left and 3/4 on the right. Plantar responses are flexor on the left and extensor on the right.

Coordination and gait cannot be tested.

His National Institutes of Health (NIH) Stroke Scale score is 20.

Telemetry recording in the ED shows atrial fibrillation (AF). His serum chemistries, coagulation studies, and complete blood count are normal. His Head CT is reviewed and shows no hemorrhage. However, you suspect there might be a hyperdense middle cerebral artery sign.

You discuss with the patient and his wife that the patient has suffered a stroke possibly caused by an embolus related to AF. You explain that a stroke occurs when there is disruption of blood to areas of the brain. When this happens the brain is damaged, which causes symptoms as he has. In his case, this disruption is likely due to a blood clot from his irregular heartbeat. As he presented within the appropriate time frame and meets the appropriate inclusion criteria (and no exclusion criteria), he is a candidate to receive intravenous tissue plasminogen activator (tPA). You discuss that patients who receive this medicine have better functional outcomes. However, this medicine does confer risks, including potential fatal intracerebral bleeding. After some questions are answered, the patient's wife consents to the tPA.

The tPA is started in the ED approximately 70 minutes after symptom onset. He is transferred to the neurologic intensive care unit (ICU), where his blood pressure and neurologic status are followed very closely.

Case Presentation Part 2: ICU Follow-up

You visit with the patient and his family the next morning in ICU. His family feels he may have more movement on his right side. He may be following commands better as well.

On examination, his blood pressure is 145/80 and pulse is 72. He is resting comfortably. His NIH Stroke Scale is 15, with improved language, extraocular movements, and right-sided weakness. The echocardiogram had been completed and was normal.

You review the patient's presentation, hospital course, and mechanism of stroke with his son whom you are meeting for the first time. The patient's son has been reading about AF and has many questions about how his father can prevent future strokes. You review the recently published AAN evidence-based guideline "Update: Prevention of stroke in nonvalvular atrial fibrillation."¹ The patient and his family are advised that there are multiple medication choices to reduce the risk of cardioembolic stroke in AF, including warfarin, and newer medications, including apixaban, dabigatran, and rivaroxaban. The benefits and risks of all the medications are discussed. They are counseled that the newer agents have the convenience of not requiring laboratory monitoring and have a more favorable intracranial-bleeding profile than warfarin. After some further discussion, they elect to proceed with apixaban, which you indicate will be started when the patient is no longer at risk of a cerebral hemorrhagic conversion.

Questions

1. Which of the following increases the risk of recurrent stroke?

- A. Paroxysmal AF
- B. Persistent AF
- C. AF and prior history of stroke or TIA
- D. All of the above

The correct answer is D. Recurrent stroke risk may be highest in patients with AF and recent stroke or TIA, but regardless of duration, AF increases cardioembolic stroke risk.²

2. The cutoff age for administration of oral anticoagulants in patients with AF and history of stroke or TIA is 85 years old.

- A. True
- B. False

The correct answer is B. Clinicians should routinely offer anticoagulation to patients with NVAf and a history of transient ischemic attack or stroke, including elderly patients (aged > 75 years) if there is no history of recent unprovoked bleeding or intracranial

hemorrhage, to reduce these patients' subsequent risk of ischemic stroke (Level B recommendation).¹

3. Clinicians might offer oral anticoagulation to patients with NVAf who have dementia or occasional falls.

- A. True
- B. False

The correct answer is A. Occasional falls should not be an impediment to the administration of oral anticoagulants. Falls should be prevented before withdrawal or discontinuation of oral anticoagulants. However, clinicians should counsel patients or their families that the risk–benefit ratio of oral anticoagulants is uncertain in patients with NVAf who have very frequent falls (Level B recommendation).¹

Diagnosis Coding

In both ICD-9-CM³ and ICD-10-CM⁴ official guidelines instruct to list not only the code for the stroke itself, but also the manifestations of stroke. Though important in ICD-9-CM, it will be even more important in ICD-10-CM to document specifically to choose the proper code, or to have the proper code chosen by a coder or electronic program.

These are the characteristics to be documented for coding acute stroke in ICD-10-CM:

1. Infarction or non-traumatic hemorrhage as primary cause
2. If non-traumatic hemorrhage: subarachnoid, intracerebral, subdural, extradural, and for subarachnoid list arterial origin
3. If infarct: thrombotic (occlusion or stenosis) or embolic
4. If infarct: arterial distribution
5. Location of hemorrhage or laterality of vessel involved when subarachnoid hemorrhage or infarct
6. Manifestations with laterality (and dominant or non-dominant when applicable). Also, plegia/paresis codes require if spastic, flaccid, or unspecified.
7. Associated conditions that will affect quality reporting and risk-adjustment, or in this case decisions based on guidelines

Though some of the specificity may not be known in admission, most of these details are easily known and documented by the time the patient is discharged. What's most important is that the neurologist documents these details together in a diagnostic statement at least one time in the record.

It's difficult to know what the neurologist of the case report would have written in the diagnostic statement in the record. Assuming some level of certainty based on the observations in the case, the admission and second day problem lists with good documentation would be:

1. Acute left middle cerebral artery embolic infarction
2. Aphasia
3. Right (dominant side) flaccid hemiparesis
4. Atrial fibrillation

ICD-9-CM coding for this problem list:

434.11	Cerebral embolism with infarction
784.3	Aphasia
342.01	Hemiplegia (<i>hemiparesis</i>), flaccid, affecting dominant side
427.31	Atrial fibrillation

ICD-10-CM coding for this problem list:

I63.412	Cerebral infarction due to embolism of left middle cerebral artery
R47.01	Aphasia
G81.01	Flaccid hemiplegia (<i>hemiparesis</i>) affecting right dominant side
I48.91	Unspecified atrial fibrillation

Hypertension, sleep apnea, and hyperlipidemia could also be listed, especially if addressed as stroke risk factors in the plans for this patient's care. The personal history of duodenal ulcer might be listed, as it impacted the choice of medication. Currently, the hospital will want to list all of these codes for its billing purposes. Medicare and most payers will allow only four ICD-9-CM codes for physician billing. When ICD-10-CM is implemented there will be room to report up to 12 diagnosis codes, but we do not know as yet which payers will accept what number of codes at the time of transition to ICD-10-CM on October 1, 2014.

E&M Level/Coding⁵

t-PA Administration

37195 Thrombolysis, cerebral, by intravenous infusion

This code is intended to reflect the administration of the medication and does not involve an E/M service. Physicians will not generally use this code, therefore. If the appropriate key components of an E/M service are met, a level of E/M may be reported in addition to code 37195. Possibilities, depending on the circumstances, include:

1. Emergency care services
2. Initial inpatient care
3. Subsequent inpatient care

4. Critical care services
5. Prolonged care services
7. Initial and subsequent care consultation codes

1. Culebras A, Messe SR, Chaturvedi S, Kase CS, Gronseth G. Summary of evidence-based guideline update: Prevention of stroke in nonvalvular atrial fibrillation. Report of the Guideline Development Subcommittee of the American Academy of Neurology. *Neurology*® 2014;82:716–724.
2. Hohnloser SH, Pajitnev D, Pogue J, et al.; ACTIVE W Investigators. Incidence of stroke in paroxysmal versus sustained atrial fibrillation in patients taking oral anticoagulation or combined antiplatelet therapy: an ACTIVE W Substudy. *J Am Coll Cardiol* 2007;20:2156–2161.
3. Centers for Disease Control and Prevention. International classification of diseases, ninth revision, clinical modification (ICD-9-CM). www.cdc.gov/nchs/icd/icd9cm.htm.
4. Centers for Disease Control and Prevention. International classification of diseases, tenth revision, clinical modification (ICD-10-CM). www.cdc.gov/nchs/icd/icd10cm.htm.
5. CPT © 2014 American Medical Association. All rights reserved. CPT is a registered trademark of the American Medical Association.

This AAN guideline is endorsed by the World Stroke Organization.

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