



Strokes

Introduction

Making sense of how ICD-10-CA classifies strokes contributes to the quality of coding by focusing attention on only the details required to assign the most accurate and specific code possible.

This job aid will examine the different types of strokes and how they are categorized in order to appreciate what facts must be collected from the documentation to assign the best code.

Stroke definition

Broadly, there are 2 types of stroke: ischemic and hemorrhagic. Ischemic stroke is more common than hemorrhagic stroke.

An ischemic stroke is the sudden dysfunction and — over time (hours) — death of brain cells in a localized area due to inadequate blood flow. A stroke occurs when blood flow is interrupted to part of the brain. Without blood to supply oxygen and nutrients, and to remove waste products, brain cells quickly begin to die. An ischemic stroke is also sometimes called a brain infarct or a cerebrovascular accident (CVA) lasting more than 24 hours.

A hemorrhagic stroke (either intracerebral hemorrhage or subarachnoid hemorrhage) is the sudden dysfunction and — over time (hours) — death of brain cells in a localized area due to the toxicity of extravascular blood.

Strokes are classified to categories I60, I61, I63 and I64 in ICD-10-CA. Note that conditions in I62 are not considered acute strokes and thus are not included in this discussion.

The overall arrangement of these 4 categories corresponds to the 2 major types of strokes: hemorrhagic and ischemic.

Hemorrhagic stroke

A hemorrhagic stroke occurs when blood from a ruptured or leaking vessel collects within the brain tissue (intracerebral hemorrhage) or between the inner and outer layers of the tissue covering the brain (subarachnoid hemorrhage).



I60 Subarachnoid haemorrhage

Category I60 classifies spontaneous hemorrhagic strokes within the subarachnoid space.

The most common cause of a subarachnoid hemorrhage is a ruptured aneurysm on one of the arteries as it enters the base of the brain; blood flows into the cerebrospinal fluid-filled space between the arachnoid mater and the pia mater. However, about 10% of the time, there is no evidence of an aneurysm.

Most of the subcategories in I60 are organized by which artery the blood is coming from.

ICD-10-CA code	ICD-10-CA code title
I60.0	Subarachnoid haemorrhage from carotid siphon and bifurcation
I60.1	Subarachnoid haemorrhage from middle cerebral artery
I60.2	Subarachnoid haemorrhage from anterior communicating artery
I60.3	Subarachnoid haemorrhage from posterior communicating artery
I60.4	Subarachnoid haemorrhage from basilar artery
I60.5	Subarachnoid haemorrhage from vertebral artery
I60.6	Subarachnoid haemorrhage from other intracranial arteries <ul style="list-style-type: none"> • This code includes specified arteries not listed above and involvement of multiple intracranial arteries when 2 or more distinct arteries give rise to the subarachnoid hemorrhage.
I60.7	Subarachnoid haemorrhage from intracranial artery, unspecified <ul style="list-style-type: none"> • When the site is an artery but there is insufficient detail to classify it elsewhere, I60.7 is assigned. • A berry aneurysm is one that is located on a major artery at the base of the brain. Berry aneurysm is included here because we know an artery is involved but not which one. • The communicating artery is included here because the description “communicating artery” is not specific enough. There is an anterior communicating artery and a posterior communicating artery, but not a communicating artery.
I60.8	Other subarachnoid haemorrhage <ul style="list-style-type: none"> • This code includes terms describing a subarachnoid hemorrhage that are not particular to an arterial source. A meningeal hemorrhage can mean hemorrhage from an artery or from a vein, and rupture of a cerebral arteriovenous malformation involves both the arterial system and the venous system.
I60.9	Subarachnoid haemorrhage, unspecified <ul style="list-style-type: none"> • When there is insufficient detail to classify the subarachnoid hemorrhage any more specifically, I60.9 is assigned.



I61 Intracerebral haemorrhage

Category I61 classifies spontaneous hemorrhagic strokes within the brain tissue.

A hemorrhage within the brain tissue is called an intracerebral hemorrhage. The brain is very sensitive to bleeding, and damage to nearby brain tissue occurs rapidly. The effect may also be felt remotely from reduced blood flow to tissue normally supplied by the ruptured blood vessel (but this is very uncommon). Any associated infarction is included in the hemorrhage code.

The code selection within this category is by the anatomic area of the bleed, not the specific vessel.

ICD-10-CA code	ICD-10-CA code title
I61.0	Intracerebral haemorrhage in hemisphere, subcortical <ul style="list-style-type: none"> • If the site of the hemispheric hemorrhage is a structure <i>below</i> the cortex, subcortical is assigned. • Some of the subcortical structures of the brain include the basal ganglia, thalamus and amygdala. • Deep intracerebral hemorrhage is an inclusion here because subcortical structures are below the surface of the cortex.
I61.1	Intracerebral haemorrhage in hemisphere, cortical <ul style="list-style-type: none"> • If the site of the hemispheric hemorrhage is a structure <i>within</i> the cortex, cortical is assigned. • The main cortical structures are the 4 cerebral lobes: frontal, parietal, temporal and occipital. • If the hemorrhage is within a single lobe or overlaps lobes, I61.1 is assigned. • Superficial intracerebral hemorrhage is an inclusion here because the cortex is on the surface of the cerebrum.
I61.2	Intracerebral haemorrhage in hemisphere, unspecified <ul style="list-style-type: none"> • The cerebrum is divided into 2 hemispheres (left and right). If all that is known is that the hemorrhage is within 1 or the other of the hemispheres, I61.2 is assigned.
I61.3	Intracerebral haemorrhage in brain stem
I61.4	Intracerebral haemorrhage in cerebellum (also known as cerebellar)
I61.5	Intracerebral haemorrhage, intraventricular <ul style="list-style-type: none"> • The ventricles are cerebrospinal fluid-filled chambers within the brain. • Hemorrhage within 1 or more of the ventricles is classified to I61.5. • The use of this code is restricted to primary intraventricular hemorrhage, one where the bleeding is in the ventricular system only.
I61.6	Intracerebral haemorrhage, multiple localized <ul style="list-style-type: none"> • When there are 2 or more distinct, separate intracerebral hemorrhages at the same time, I61.6 is assigned (e.g., multiple hemorrhages within a single lobe, discrete hemorrhages in the brainstem and in the cerebellum). • This code is not used when there is extension of a single hemorrhage into other sites (see the section Multiple hemorrhage codes below).



ICD-10-CA code	ICD-10-CA code title
I61.8	Other intracerebral haemorrhage <ul style="list-style-type: none"> When a site that is specified is not compatible with the other subcategories, I61.8 is assigned. For example, the posterior fossa is indexed here. This portion of the skull houses both the brainstem and the cerebellum; therefore, it cannot be classified elsewhere.
I61.9	Intracerebral haemorrhage, unspecified <ul style="list-style-type: none"> When the site of the intracerebral hemorrhage is not identified at all, I61.9 is assigned.

To assign stroke codes accurately, you need a solid grasp of brain anatomy or a good dictionary nearby! As the alphabetical index is not extensive, it is important to look up a term if you do not know where a given structure is located.

Multiple hemorrhage codes

Multiple hemorrhage codes can be assigned in the following cases:

- When discrete, concurrent hemorrhages occur, codes from separate categories can be selected. For example, if a ruptured berry aneurysm results in a subarachnoid hemorrhage and the patient also has an intracerebral hemorrhage due to hypertension, the code assignment is I60.7 *Subarachnoid haemorrhage from intracranial artery, unspecified* with I61.9 *Intracerebral haemorrhage, unspecified*.
- A clearly documented rebleed of a ruptured aneurysm or a second discrete hemorrhage can also be coded separately.

Note: An extension of a single hemorrhage from one area to another area either inside or outside of the brain is classified only to the site of origin of the hemorrhage.

Ischemic stroke

An ischemic stroke is the result of a blockage or narrowing in a blood vessel supplying the brain, leading to diminished blood flow and death of neighbouring tissue.

Ischemic strokes are classified to 1 of 9 codes from category I63 *Cerebral infarction*. The codes are organized primarily by the etiology of the infarction (thrombosis, embolism, other occlusion, stenosis) and next by the site involved (precerebral arteries, cerebral arteries, cerebral venous system).

- A code for cerebral infarction includes any associated hemorrhage during the natural progression of the infarct and includes a stroke in evolution. It is common for ischemic stroke to evolve with minor hemorrhage. For example, a 24-hour CT or MRI brain scan report may state that there is evidence of petechial hemorrhage into the region of infarction. This is normal and part of the evolution of ischemic stroke; no additional coding of hemorrhage is required.
- “Old” or “remote” infarctions are not classified here. This category includes acute or subacute infarctions only.

Let’s examine how etiology and site play a role in classifying ischemic strokes.



Thrombus

A thrombus is a blood clot that develops within an artery or vein. The thrombus can arise in a

- Precerebral artery — one that leads to the brain (extracranial) such as basilar, carotid and vertebral artery; or
- Cerebral artery — one that lies *within* the brain (intracranial) such as anterior, middle and posterior cerebral arteries. *All* arteries within the brain, big or small, are considered cerebral arteries.

ICD-10-CA code	ICD-10-CA code title
I63.0	Cerebral infarction due to thrombosis of precerebral arteries
I63.3	Cerebral infarction due to thrombosis of cerebral arteries

Embolism

A cerebral embolism is a blood clot that has formed elsewhere and travelled to the precerebral or cerebral arteries and lodged there (e.g., a blood clot that developed in the heart and travelled to one of the cerebral arteries).

ICD-10-CA code	ICD-10-CA code title
I63.1	Cerebral infarction due to embolism of precerebral arteries
I63.4	Cerebral infarction due to embolism of cerebral arteries

Unspecified nature

The following codes are assigned when the nature of the occlusion or stenosis is something other than a thrombus or embolus (e.g., an arterial dissection) or if it is not identified at all. While these code titles mention only unspecified occlusion or stenosis, *other* occlusion or stenosis is also included here as reflected in the index look-ups.

ICD-10-CA code	ICD-10-CA code title
I63.2	Cerebral infarction due to unspecified occlusion or stenosis of precerebral arteries
I63.5	Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries <ul style="list-style-type: none"> • Lacunar infarcts are classified to I63.5 as they are caused by occlusion of the deep penetrating arteries of the brain. The term “lacunar” reflects how these infarcts look on imaging — there is an empty space — not what they are.



Cerebral venous thrombosis

ICD-10-CA code	ICD-10-CA code title
163.6	Cerebral infarction due to cerebral venous thrombosis, nonpyogenic <ul style="list-style-type: none"> • While a thrombus can also be present in a vein or venous sinus, this is a relatively uncommon occurrence compared with arterial thrombosis.

Other and unspecified

ICD-10-CA code	ICD-10-CA code title
163.8	Other cerebral infarction <ul style="list-style-type: none"> • Includes only stroke terms that specify an etiology other than occlusion or stenosis.
163.9	Cerebral infarction, unspecified <ul style="list-style-type: none"> • An ischemic stroke without any further specification or that cannot be classified elsewhere is assigned to 163.9. • Includes occipital lobe infarction, thalamic infarction and posterior circulation infarction because there is not enough detail in these statements to know the etiology of the infarction.

General guidelines to apply when selecting a code from category I63

- If a specific *artery* of the brain is identified, assign I63.0 to I63.5.
- If the etiology is a cerebral venous thrombosis, assign I63.6.
- If a specific *region* of the brain is identified, assign I63.9.
- If an etiology other than occlusion or stenosis is identified, assign I63.8.

Multiple ischemic codes

A clearly documented second ischemic stroke can be coded separately. For example, if a patient experiences a second infarction while in hospital, 2 codes from category I63 *Cerebral infarction* are selected:

I63.9 (M) *Cerebral infarction, unspecified*

I63.9 (2) *Cerebral infarction, unspecified*



I64 Stroke, not specified as haemorrhage or infarction

A stroke without any specification whatsoever is assigned to I64.

There are very few circumstances when the use of I64 is valid, because when a patient presents with stroke symptoms, the first priority is to establish the type of stroke so that the proper treatment can be initiated as soon as possible. Circumstances when the use of I64 is valid include

- When diagnostic imaging has not yet been performed and the patient has since been transferred to another facility, admitted from the emergency department or died;
- When a patient is transferred back to the local facility and the transfer information does not indicate the type of stroke; and
- When the facility does not have diagnostic imaging capacity for strokes (CT scan/MRI). For facilities repatriating patients after having them transported for diagnostic imaging outside their facilities, stroke specification is required.

Stroke Tool

The *Stroke Tool and Review Process* handout is available in the Resources section of this course and is intended to assist with gathering facts from the documentation. It will help you assess what you already know about the stroke and what you still need to find out in order to establish the most accurate and specific stroke code.

The starting point is where you know nothing. To move forward, you need to know if the stroke is hemorrhagic or ischemic.

If it is a hemorrhagic stroke, you first need to know whether it is within the brain tissue or within the subarachnoid space. If it is *within* the brain tissue (intracerebral), you then need to know the gross anatomical site. If the hemorrhage is within the subarachnoid space, you need to establish whether the source is arterial or other.

If it is an ischemic stroke, you first need to know the etiology. Is an occlusion or stenosis causing the infarction? If yes, is it arterial or venous in nature? If arterial, is it thrombotic, embolic, or another or unspecified type of occlusion or stenosis? If the etiology of the ischemic stroke is known and is something other than occlusion or stenosis, the code for “other” is selected. If there is not enough detail to assign a more specific code, “unspecified” is the best code that can be assigned.

To demonstrate, if the diagnostic statement is “thalamic hemorrhage,” we know that this is a hemorrhagic stroke . . .

. . . and we know that the thalamus is within the brain tissue . . .

. . . and that the thalamus is a subcortical structure . . .

. . . thus the code assignment is I61.0 *Intracerebral haemorrhage in hemisphere, subcortical*.



Note that this code can also be located by the following index look-up.

Hemorrhage, hemorrhagic R58

– cerebral, cerebrum (see also Hemorrhage, intracerebral) I61.9

– intracerebral (nontraumatic) I61.9

– – in

– – – hemisphere I61.2

– – – – subcortical I61.0

Review process

A diagnostic statement alone does not always provide the level of detail required to assign the stroke code as accurately and specifically as possible. In this case, you must gather as much of the missing information as possible from the documentation. Having an efficient and effective process for reviewing the documentation facilitates this task.

1. Focus exclusively on the stroke code.

When you are coding a stroke case, first, focus exclusively on assigning the stroke code; that is, the code from category I60, I61, I63 or I64. This will prevent you from being distracted by other details in the record until this code has been selected.

2. Code from a complete chart.

Always code from a complete chart. Only the final product can provide all of the necessary details for accurate and specific code assignment.

3. Assess the final diagnosis for specificity.

Start with the final diagnosis on the discharge summary. Is the final diagnosis detailed enough to assign the stroke code as accurately and specifically as possible? If yes, assign the stroke code.

4. Review the body of the discharge summary for specificity.

If there is insufficient detail in the final diagnosis, review the body of the discharge summary for the missing details. Is the statement as specific as possible now? If yes, assign the stroke code.

5. Review the impression on relevant consultations for specificity.

If no to the above, next review the impression on relevant consultations. Relevant consultations include neurology or neurosurgery consults and rehabilitation consults. It is not necessary to review the entire consultation report. Is the statement as specific as possible now? If yes, assign the stroke code.



6. Review the conclusion on relevant diagnostic imaging reports for specificity.

If no to the above, turn to the conclusion on relevant diagnostic imaging reports. Relevant imaging reports include CT scans and MRIs. Coders are not expected to review and interpret the complex radiological findings in the body of imaging reports. Is the statement as specific as possible now? If yes, assign the stroke code.

Your facility may have other useful records that contain the required details, such as a summary sheet or face sheet. The records identified here are just a guideline, but the overall message is important. Review only the key components of the record and of any given report. More often than not, you will find that this is all you need.

There are far too many variables with diagnostic statements and documentation for stroke cases to cover all of them in this course. However, you now have the Stroke Tool and a process that, when thoughtfully applied, should produce the desired result: determining the most accurate, specific stroke code as quickly as possible.

Dos and don'ts

Do continue to use the alphabetical index and tabular list in ICD-10-CA.

The *Stroke Tool and Review Process* handout is not intended to serve as a strict substitute for the alphabetical index or tabular list in ICD-10-CA. The alphabetical index will direct you to the proper code if used wisely and in concert with the tabular list and your knowledge of stroke coding. The Stroke Tool is just that — a tool to assist, temporarily or permanently, in understanding and applying the variables when classifying strokes.

Don't confuse risk factors and underlying conditions with etiology when assigning stroke codes.

A risk factor or underlying condition is something that increases the chance of having a stroke; it does not tell you anything about the actual cause of the stroke.

Assigning a separate code for risk factors (such as family history) and for underlying conditions (such as atrial fibrillation) is subject to the usual diagnosis typing definitions in the coding standards.

Do follow the *Unconfirmed Diagnosis* coding standard to capture a description of the etiology of a cerebral infarction that is qualified as “likely” or “probably.”

When a confirmed diagnosis (e.g., middle cerebral artery infarction) is recorded as the final diagnosis with unconfirmed specificity (e.g., probably cardioembolic), assign only the unspecified code for the diagnosis (I63.5 *Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries*).



Don't be misled by ambiguous or contradictory documentation about the stroke.

When the documentation is confusing or conflicting, use the most conclusive documentation or another suitable means to validate the diagnosis.

For example, if the final diagnosis on the discharge summary is “stroke” and an initial consultation says “TIA,” the statement on the discharge summary takes precedence because it takes into account all of the clinical and diagnostic findings for the entire episode of care.

Do assign a separate code for significant complications of a stroke.

When the documentation identifies complications resulting from the stroke, consider each complication separately — does it meet the requirements for a comorbid condition as outlined in the coding standards?

For example, we do *not* assign a separate code for intraventricular hemorrhage when it is an extension of a hemorrhage at another site. However, if the intraventricular hemorrhage leads to hydrocephalus, which is managed by a ventricular shunt, the hydrocephalus is coded separately as a significant diagnosis type.

Lastly, do assign a code for ischemic stroke if hemorrhagic stroke has been ruled out.

We discussed that there are very few circumstances when the use of I64 *Stroke, not specified as haemorrhage or infarction* is valid, because when a patient presents with stroke symptoms, the first priority is to establish the type of stroke so that the proper treatment can be initiated as soon as possible.

When the type of stroke is hemorrhagic, this will usually be very clear from the diagnostic statement. When the diagnostic statement does not represent a hemorrhagic stroke, review the documentation for details that support that the stroke is ischemic. If there is absolutely no indication whatsoever in the documentation that the stroke is ischemic, a diagnostic imaging report that clearly rules out hemorrhagic stroke is sufficient to assign a code for ischemic stroke.

This guideline, of course, must be applied with due diligence. It is founded on the premise that stroke patients spend many days in hospital and that the clinicians will know what type of stroke it is that they are treating. If a hemorrhagic stroke has been ruled out, it is an ischemic stroke.



help@cihi.ca

© 2022 Canadian Institute for Health Information

How to cite this document:

Canadian Institute for Health Information. *Strokes* [job aid]. Ottawa, ON: CIHI; 2022.