INTRODUCTION:

Cerebral perfusion computed tomography (CT) is a relatively new imaging technique that provides quantitative evaluation of cerebral perfusion by generating maps of cerebral blood flow, cerebral blood volume and mean transit time. It may assist in the identification of ischemic regions of the brain. It is useful in the assessment not only of patients with acute stroke but also a wide range of patients with other cerebrovascular diseases. It may provide the information needed to assess the most effective procedures or treatments for the conditions. Cerebral perfusion CT is less invasive than CT angiography and is fast and available for most standard spiral CT scanners equipped with the appropriate software.

INDICATIONS FOR CEREBRAL PERFUSION CT:

- For noninvasive diagnosis of cerebral ischemia and infarction and for evaluation of vasospasm after subarachnoid hemorrhage.
- For assessment of cerebrovascular reserve by using acetazolamide challenge in patients with intracranial vascular stenosis who are potential candidates for bypass surgery or neuroendovascular treatment.
- For the evaluation of patients undergoing temporary balloon occlusion to assess collateral flow and cerebrovascular reserve.
- For the assessment of microvascular permeability in patients with intracranial neoplasms.
- For the assessment of cerebral blood flow after carotid artery stent placement in patients with severe carotid artery stenosis.
- For early detection of acute cerebral ischemia.

ADDITIONAL INFORMATION RELATED TO CEREBRAL PERFUSION CT:

Request for a follow-up study - A follow-up study may be needed to help evaluate a patient’s progress after treatment, procedure, intervention or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed for the type and area(s) requested.

Cerebral Ischemia and Infarction and Evaluation of Vasospasm after Subarachnoid Hemorrhage – Cerebral perfusion CT measures cerebral blood flow, cerebral blood volume and mean transit time which can be useful in identifying patients at risk for cerebral ischemia or infarction and for evaluation of vasospasm after subarachnoid hemorrhage. This information may be useful in identifying urgent medical or endovascular treatment.
Cerebrovascular Reserve - Cerebral perfusion CT in conjunction with acetazolamide challenge in patients with intracranial vascular stenoses can evaluate cerebrovascular reserve capacity and help in estimating the potential risk of stroke. It may help to identify candidates for bypass surgery and endovascular treatment to increase cerebral blood flow.

Temporary Balloon Occlusion – Temporary balloon occlusion along with a quantitative analysis of cerebral blood flow may be useful in identifying patient who may not tolerate permanent or prolonged occlusion.

Intracranial tumors – Cerebral perfusion CT generates permeability measurements in images of brain tumors depicting areas of different blood flow within tumors and the surrounding tissues. This may allow for diagnosis and grading of tumors and may help to monitor treatment.

Carotid Artery Stent Placement – Cerebral perfusion CT provides a quantitative evaluation of cerebral perfusion and helps in the assessment of the hemodynamic modifications in patients with severe carotid stenosis. It provides valuable information for a more thorough assessment in the follow-up of patients after they have undergone carotid stent placement.

Acute Cerebral Ischemia (Stroke) – Cerebral perfusion CT can quantitatively distinguish the extent of irreversibly infarcted brain tissue (infarct core) from the severely ischemic but salvageable tissue (penumbra), providing a basis for the selection of acute stroke patients that are most likely to benefit from thrombolytic treatment.
REFERENCES


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