

# Rapid NCCT Stroke

**Computer-aided Triage and  
Notification for Measurement of  
Intracranial Vessel Flow**

**RAPID**AI



# Presenters:

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# Background

- Approximately 800,000 strokes occur each year in the United States
- About 87% of these strokes are ischemic, about 10% are primary hemorrhages, and 3% are subarachnoid hemorrhages.
- Large vessel occlusions (LVOs), the most disabling strokes, account for approximately 1/3 of acute ischemic strokes and treatment of these strokes has the largest therapeutic benefit.
- Treatment is highly effective; *greatest efficacy with early diagnosis*
- A major predictor of clinical outcome is time to treatment. Treatment delays are associated with an increase in post-stroke disability.

# Background Continued

- NCCT is the initial brain imaging obtained for potential stroke patients.
- Radiologists can identify ICH with high sensitivity and specificity on NCCT, but urgent radiology review is often not available.
- Radiologists can only identify about 45% of LVOs on a non-contrast CT; a CT Angiogram is required to confirm LVO is present and to identify the remaining 55% of LVOs that are not visible on NCCT
- CTAs are often delayed by 30 minutes or more to allow radiologic assessment of the initial NCCT

# Rapid NCCT Stroke

- Rapid NCCT Stroke integrates three complementary approaches to determine the suspicion of stroke (ICH or LVO).
- The software evaluates the NCCT scan using the ICH, ASPECTS and HVS indications with a ruleset (outlined in the attached document) to determine:

Suspicion of ICH and then,  
Suspicion of LVO from NCCT findings

- NCCT scans in suspected stroke patients are automatically sent to the Rapid server.
- The data are automatically processed by the software and the results are sent to the relevant health care providers for review on mobile, email and PACS. Time to notification for ICH is typically 1 minute; 5 min for LVO.

# Workflow

The typical workflow for Rapid NCCT Stroke is:

- Patient presents at the Emergency Department
- If symptoms are suspicious for stroke a NCCT is ordered
- Rapid NCCT Stroke assesses the NCCT for the suspicion of hemorrhagic stroke (ICH) as well as ischemic stroke with a large vessel occlusion (LVO)
- Results are rapidly available and help expedite a definitive diagnosis the use of urgent surgical or medical therapies.

Workflow improvement allows a single scan to prioritize patients with suspected LVO for urgent evaluation for thrombectomy and/or other reperfusion therapies.

Suspected ICH patients are immediately identified for emergent therapies.

# Performance (N=254)

## ICH determination

**Rapid**

**Sensitivity: .96**

**Specificity: .97**

## Identification of LVO from NCCT

**Radiologists**

**Sensitivity: .46**

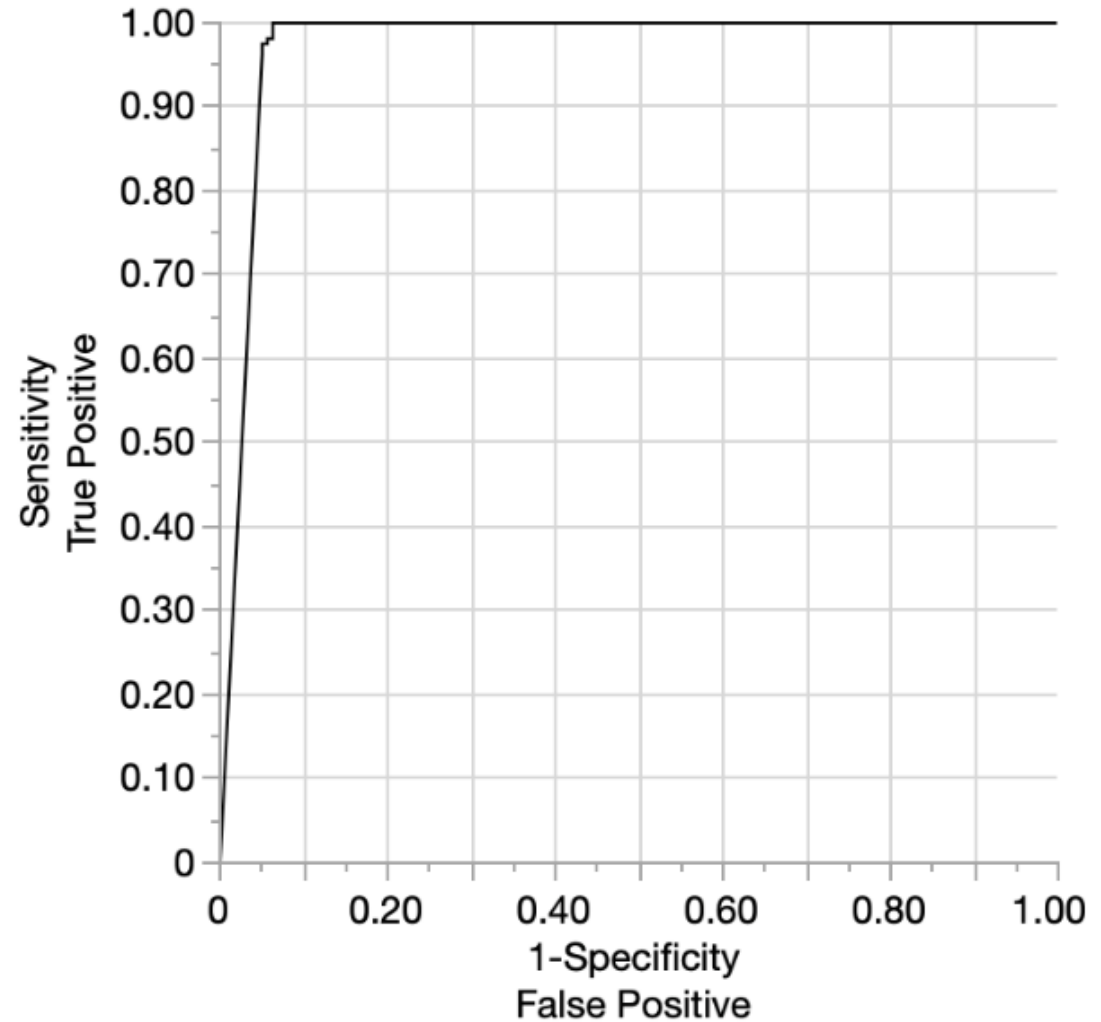
**Specificity: .91**

**Rapid**

**Sensitivity: .64**

**Specificity: .95**

AUC of 0.8 for identification of LVO on NCCT



# Documentation, Setting, and Indications

- Rapid NCCT Stroke is documented in the CT report, physician notes, Emergency Department (ED) Orders and/or ED notes
- Rapid NCCT Stroke is typically used in the ED setting for suspected stroke pts.
- Rapid NCCT Stroke is a radiological computer aided triage and notification software indicated for use in the analysis of nonenhanced head CT (NCCT) images. The device is intended to assist hospital networks and trained radiologists in workflow triage by flagging and communicating suspected positive findings of (1) head CT images for Intracranial Hemorrhage (ICH) and (2) NCCT large vessel occlusion (LVO).



# Processing / Adverse Events

- Rapid NCCT Stroke uses an artificial intelligence algorithm to analyze images and highlight cases with detected (1) ICH or (2) NCCT LVO on the Rapid server on premise, or in the cloud in parallel to the ongoing standard of care image interpretation.
- There have been no associated complications/sequela/adverse events with Rapid NCCT Stroke

# Summary

- There is currently no code available to report the use of the interpretation of nonenhanced head CT imaging procedures that flag and communicate suspected positive findings of both Intracranial Hemorrhage (ICH) and large vessel occlusion (LVO).
- RapidAI requests the creation a new ICD10-PCS code to uniquely identify the use of this new technology