UCSD Stroke Code Communication/Flow/Documentation updated 5/24/2023

1. **Contact the operator to be added to the 2 different pager lists:**
   - **On-call Stroke: Hillcrest**
   - **On-call Stroke: JMC/THH/VA**

   when you are covering Neuro CT at Hillcrest or MR, Night Float, or ERPM.
   You can remove yourself from the list at the end of your rotation(s).

   A Stroke Code triggers an initial page (noting that patient may still be en route to hospital). Page will also be sent to end stroke code.

   First year residents – this gives you a heads up to locate your covering faculty or a fellow so interpretations are not delayed.

   ER PM shift - please alert the CT technologists at the start of your shift as to who will be reading the head CT to avoid delays. Please give them your direct extension(s).

2. **Contact Nhan Pham (nhp007@health.ucsd.edu) to receive access for the *viz.AI* mobile app (if you haven't already) for LVO detection alerts and CT perfusion results.** See appendix.

3. **Stroke code window:** 24 hours post-onset or last known normal within 24 hours. These patients will be accompanied to the CT scanner and managed by the Stroke Team.

4. **All acute stroke codes (ER, Inpatient, en route to hospital) get a non-con head CT first.**
   There is no direct path to MRI without a non-con head CT (NCHT).
   The CT tech should call the reading room when the NCHT is done with Stroke Code Leader on the line (if not, have the tech get Leader on phone). Obtain patient's symptoms from Stroke Leader: Right, Left, Posterior circulation or non-focal to help your evaluation.

5. **The Stroke Code Leader is the point person to decide/communicate re: CT Angiogram, CT Perfusion, or contact MRI.**
   Please do not engage the Neurology resident/fellow/faculty in a detailed conversation; they are juggling multiple issues.

   CT Perfusion (CTP) is typically only done in patients with a documented ICA/proximal MCA clot on CTA who awoke with symptoms or are presenting 6-24 hours from onset. Stroke Code Leader communicates CTP eligibility to the tech, and data is sent from the scanner to **viz.AI** servers. CTP maps come back to **PACS** and to the **viz.AI mobile app**; the Stroke Team knows how to access the data they need.

   Dictation template for CTP is in fluency with the Stroke CTA (see appendix).

   Please see Neuro Conf presentation on CTP use with example cases:
   http://radres.ucsd.edu/documents/Neuro/Stroke%20CTP%20Fazeli%202018.pdf

6. **There is no expedited contrast pre-medication option for contrast allergies in the setting of a stroke code; MRI is the non-contrast option.**

7. **Prelim Radiology reports for Head CT, CTA and MRI should be documented at the time of the Stroke Code (prelim report via Fluency, like when on call).**

    Please include presence or absence of:
    1. Intracranial hemorrhage.
    2. Acute infarct or hyperdense vessel (Please overcall rather than undercall)
    3. Mass effect, midline shift, herniation, and/or hydrocephalus.
    4. Arterial contrast cutoff suggesting thrombus or high-grade stenosis.
    5. Intracranial/intraorbital metal or pacemaker that would contraindicate MRI
    6. Whom you spoke with (CTRM:2001 macro in Fluency)

8. **Stroke MRI:** In certain cases, an abbreviated MRI is appropriate for patients in the 6-24 hour or wake-up stroke window. The following steps must be taken:
    1. Stroke team must put in "Acute Stroke Brian MRI" and MRA orders (if vessel imaging not performed by CTA); protocol these accordingly.
    2. Screen head CT for intracranial/intraorbital metal (and pacemaker if imaging available).
    3. **Have Stroke Leader <u>CALL MRI</u> to discuss ETA and logistics**.
    4. **Please call MRI yourself,** give them a heads up and what you've screened for metal.
    5. *No discussion between radiology faculty/trainee and stroke team is required.*

    <u>For safety reasons, under no circumstances should Stroke team/patient show up unannounced to MRI. Current MR patient may also need to be pulled off table and this cannot happen for all exams (see appendix for exams that take priority over stroke MRI).</u>

9. **Stroke MRI Protocol**: DWI, T2*GRE/SWAN, FLAIR and ASL perfusion imaging. MRA head or MRA Neck only if patient did not have CTA and is stable to continue. No additional sequences will be added. If the patient is moving during the DWI, the exam will not continue. *We do not do contrast MR perfusion for stroke codes.*

10. **REMEMBER: you may be the first person to recognize a patient is having a stroke.**
    Patients may be "found down", have non-specific findings, or come in via trauma service. Do not rely on the histories/indications. Be on the lookout for a hyperdense vessel sign and gray-white obscuration on all head CTs.

11. **Please see UCSD Stroke Code Protocol Flowchart (and other useful Guidelines/Protocols):**
    https://pulse.ucsd.edu/departments/stroke-center/Pages/Stroke-Resources.aspx

If there are cases where there are disagreements or significant diversions from protocol, please email Div Bolar (dbolar@ucsd.edu) the MR# and we will address as appropriate.

THANK YOU FOR ALL YOU DO.

APPENDIX I:

MRI exams we **do NOT pull off the table** for acute stroke MRI:

- Contrast has been given and dynamic imaging (e.g. timing sensitive) is being performed (e.g. liver, breast, TRICKS, contrast MRV, etc.)
- Anesthesia is involved in the case
- Intubated patients
- Pacemaker patients
- Cardiac cases
- Fetal/neonatal cases
- MR pump not available (and needed for TPA)
- Breast MRI

Only limited personnel can enter MRI Zone III (i.e. the control room with MRI tech) for safety reasons. All Stroke Team members will be verbally screened for MRI safety prior to entering Zone III. Only the Stroke Code Leader and Stroke RN will remain in Zone III – all other Stroke team members will be asked to wait in Zone I at Thornton or Zone II at Hillcrest.

APPENDIX II: viz.AI, LVO detection, and CT perfusion.

Please make sure you should have already been added to a control list for the ***viz.AI*** mobile app. Viz.AI has replaced RAPID at UCSD for post-processing of CT perfusion data. Their app can be downloaded from the Apple or Android App store (optional):

You can download the app by searching for Viz.ai (not training) in the Apple App or Google Play store.

- Please use your email address (all lowercase) as your username.
- Select **Next** and the Reset Password link at first login
- Select to deliver by Text Message to create your password.

Every time a stroke code CTA head and neck is performed, viz.AI will use its engine to detect a large vessel occlusion in the anterior circulation (it is by no means infallible). You can use the app to see if one is detected on your current case. Contact dbolar@ucsd.edu if you would like the user manual.

If CTP is performed for a case with an LVO, the data are also sent to viz.AI for processing. Results will be visible **on the app** and as a **series on PACS**. The relevant values that should be reported (also printed in the stroke CTA template in fluency):

CBF <30% volume (ml)
Tmax >6.0s volume (ml)
Mismatch volume (ml)
Mismatch ratio (unitless)

These values can help the team decide if a patient should go to IR for mechanical thrombectomy.

Only report values for viz.Ai; do *NOT* report values for RAPID (which is still run for trials, etc).