CVICU orientation

Overview: 4 residents, PGY2-3. No APPs or interns. There will be 1 fellow during the weekdays, typically on for 4 weeks straight, and a weekday night fellow. These 2 typically split the weekend calls. The staff are on service for 1 week at a time and switch on Friday evenings. The census is variable, but typically between 5-10 patients. The fellow and staff run the service, but often do not assign the admissions – it is usually expected the residents will know who is taking which admission.

Schedule: Q4 28-hour shifts, with 4 days off per 4 week rotation (approx. 1 day per week). Schedule is pre-call, on-call, post-call, post-post call. Your day off will be a post-post call day typically, but it is sometimes possible to take a different day off if arranged in advance with your co-residents. There can never be 2 people off on the same day, and you should **not take a Tuesday off due to "TAVR Tuesday"**, unless there are no TAVRs scheduled for that day for some reason (would be very unusual). Think about your days off right when you start the rotation and sign up for them on the calendar in the workroom.

Typical workflow

Non-call days: Arrive by 0700 to receive signout and pre-round. Rounds are variable and staff dependent, but 0900 is most common. You will take new admissions until 3 pm, with the goal being to protect the call person from early admissions as much as possible. Signout is typically at 5 pm, but it is sometimes possible to sign out earlier if your patients are stable and the call person is OK with it. Sometimes you may need to stay past 5 if your patients are very active to help. Prior to signing out please ensure any AM labs are placed, and CXRs for AM on patients with swans or balloon pumps. Many vented patients will need CXR as well.

On call: Arrive by 0800, rounds as above. You will typically cover the post-call person's patients for the day when they leave after rounds, and may also be covering patients for someone who is off for the day (see below). You will be responsible for admitting new patients that come after 3 pm until 0700 the following day (and often starting before then if things are busy). Sign out for Cards teaching team is between 530 – 6 pm. You will cover those patients until 0700 the next morning. The call room is to the left when you enter the CV and has badge access. Ensure your badge works on day 1 to avoid unpleasant 2 AM lockout scenarios. Primary communication with nursing is via Voalte while on call, see below.

Post call: see all your patients and try to do as much of the notes as you can before rounds. Goal is to be out quickly afterwards. Please be sure to give a good sign out to the on call person, as well as to whomever will cover your patients if you will be off on your post-post call day.

Rounds: Involves entire team and should involve nursing and pharmacy as well. There are cows for use in the team room. There should always be at least one cow on rounds to allow whomever is not presenting to place the orders, and look up labs/EKG/imaging, etc to maximize efficiency. Due to how much cross coverage occurs, please listen to everyone's presentations.

Coverage: About half the days there will be someone who is off, and the post-call person leaves after rounds each day and does not cover anyone's patients but their own. This means a lot of the time there

are just the pre-call and on-call person present to cover patients, which creates a lot of handoffs. Anticipate who will cover which patients on which days, and ensure this is communicated well.

Pre-rounding tips:

- Always review telemetry in addition to the standard labs, imaging etc.
- Talk to the nurse about any concerns. They usually know about any overnight issues too.
- If your patient has a Swan catheter you should ensure you have the most recent set of numbers printed out (the nurse can send them to the Pod 3 printer if you ask them). Typically numbers and ScVO2 are obtained Q4 hours. There is a link to Swan tutorial below.
- Pay particular attention to I/O
- Discuss your plan with the fellow prior to rounds when possible
- Know the current dosing of any relevant meds such as pressors, inotropes, afterload reduction, beta blockers, etc as well as the trends
- Does your patient have any lines or catheters that can be removed?
- Does your patient have appropriate PT/OT, diet, GI/VTE prophylaxis and activity orders?
- If ventilated are they appropriate for weaning/extubation?

Admissions:

- Will be announced overhead as they arrive during the day. Try to be there to receive handoff from whomever brought them
- Often you will know they are coming in advance and can have note and orders pended
- Use “CVICU admission” order set. There are also sets for ACS admissions, CVICU mechanical ventilation, and IABP
- Pharmacy may give you an orientation about common meds when you start
- Please update the “first contact” on admission

Transfers out of CVICU: Work differently than when transferring out of MICU. You will first contact the appropriate team to discuss, then place the transfer order once accepted and let the charge nurse know. ATC does not typically need to be involved.

- Transfers will almost always go to either Cards Teaching, cardiomyopathy team, or CV hospitalist
- Ask staff which team they should be triaged to
- If Cards Teaching: contact the staff for that team
- If CMP team: must be accepted by the heart failure staff, then contact the CMP hospitalist service.
- If CV hospitalist: contact the hospitalist team directly
- Ensure there is an accurate, complete and updated ICU course summary in your progress note

Voalte phone: It is recommended that everyone be signed into one each day under your own name and use that to communicate with nursing. There is a also a “CVICU Med Res” login that the call person should use. You should bring your own Voalte when possible, but they are also available at the nurses station outside the workroom.

TAVR Tuesday: Transcatheter aortic valve replacements are performed each Tuesday, typically 3-4 per day. Each of these patients is admitted to CV afterward for monitoring and are usually simple admissions. The interventionalist will either give you handoff directly following procedure, or will tell the fellow. They are often discharged the following day if doing well. There is a dot phrase in Epic if desired (under Alissa Kauffman) for checklist in assessment/plan, and the pre-op note from clinic will typically have most of the info you need to know about them. There are some resources for learning about TAVR below. For each patient, please note the following:

- Presenting complaints of severe AS (i.e. just dyspnea vs fainting, heart failure, etc). This will be in the preop note and needs to be in H&P as well for billing.
- Home medications, especially if history of heart failure
- Any complications during the case
- Use of pressors or drips during case or post-procedure
- Type of anesthesia (usually MAC)
- If the temp pacemaker was removed after the case or left in place
- Access sites (there will typically be a "large" femoral sheath for valve deployment and a "small" one on the other groin or radially) and if the sheaths were removed prior to transfer or will need removal later. These should be carefully monitored for bleeding/hematoma
- Type and size of valve (i.e. Edwards Sapien 26 mm)
- Intra-procedural echo (primarily looking for effusion and paravalvular leak)
- LVEDP (a surrogate marker for volume status) during the case
- If Lasix was given during case or should be given based on LVEDP
- What is the anticoagulation plan? Example: ASA/Eliquis, ASA/Plavix etc. This will be in the preop note and/or under global care in Epic but should be confirmed and ordered.
- There is a post-TAVR order set that will usually be placed by the TAVR team. If they do not do it, you should ensure each patient has EKG following procedure, and a CXR and EKG the following morning. Flat bedrest for 6 hours following sheath removal. Diet can be advanced once they are able to sit up.

Common complications from TAVR

- **TIA/Stroke** (can get emboli from valve calcifications or instrumentation-related thrombi)
- **Access site** complications: bleeding, infection
- **Heart block**: common, as valve deployment can place pressure on conduction system. Can be BBB or AVB, or occasionally other arrhythmias. Temp pacemaker is used during the case and may be left in place if there is concern. Some patients require a perm pacer placed prior to DC. Patients are monitored with telemetry for 24-48 hours.
- **TAVR valve issues**: improper deployment, paravalvular leak causing AI, or pericardial effusion which can cause tamponade if significant. Intraprocedural echo is obtained to assess immediately following placement, and CXR the day after.
- **AKI**: due to contrast and/or hemodynamic shifts
- **MI**: due to coronary occlusion with valve deployment

Education materials:

For info on a number of key cardiology topics including acute coronary syndromes and arrhythmias, see MedHub folders for CVICU. For videos/readings on most commonly seen key topics not covered there:

Cardiogenic shock and mechanical circulatory support:

https://ccforum.biomedcentral.com/articles/10.1186/s13054-019-2368-y

Swan-Ganz (PA) catheters:

https://www.pcipedia.org/wiki/Right_heart_catheterization

IABP (intra-aortic balloon pump):

https://www.youtube.com/watch?v=mADxD7C8jBw

Impella:

https://www.dicardiology.com/videos/video-demonstration-impella-percutaneous-hemodynamic-support-device

Pressors and inotropes:

https://www.ncbi.nlm.nih.gov/books/NBK482411/

Severe aortic stenosis and TAVR:

Up-To-Date has excellent articles on indications, contraindications, complications, etc

For post-TAVR ICU care: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3752734/

Video animation of procedure: https://www.youtube.com/watch?v=yMRYT8zXtxc