Nurse led Sedation

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Improving Access Through Nurse led Sedation

- In 2018, we were having difficulties with efficiency within our hybrid lab due to the sheer volume of structural procedures and our ongoing backlog.
  - Integrated healthcare system with employed cardiologists and private anesthesiologists
  - Increased need for anesthesia services across our service lines (structural, EP, PV, OHS)
  - Delayed room turnover due to several factors: Pre-procedural evaluation, arterial line placement, intubation, extubation
  - Constraints on what days we could schedule structural procedures
  - Increased ICU utilization and increased Length of Stay (cost/financial impact)

Our Journey

- As we learned of our issues, we began to tackle them in a systematic format
  - Met and learned from other institutions about what they were doing
  - Developed story around how society historically transitioned from CABG to PCI (waning surgical back-up)
  - Met with hospital leadership, med staff, service line leadership, and clinical enterprise leadership
  - Developed a proposal with plan metrics to follow and react to
    - Adverse outcomes
    - ICU utilization
    - Emergent conversion to surgical
    - LOS
    - 30-day events

Implementing Nurse led sedation to Improve Patient Access

- Stepwise fashion:
  - Removed most general anesthesia services (some remain for needed situations) and switched to nurse led sedation
  - Removed ‘back-up’ surgical staff
  - Decreased unused inventory
  - Removed primed bypass pump
  - Streamlined process to increase efficiency within the hybrid lab
  - Continue to refine the process

Initial metrics from Nurse led sedation

- Dramatic decrease in post-op recovery and ICU utilization
- Positive financial impact
- Decreased LOS
- No signal for adverse events
- No increase in surgical staff or inventory utilization
- No increase in 30-day adverse events

Expanding Access to Timely TAVR Care

- Have been able to increase days we perform TAVRs (decrease back log from 2-3 months to less than 4 weeks)
- Have been able to more easily add on inpatient TAVRs and other urgent structural procedures
- Because of this success, we have been able to increase efficiencies in other areas (timing of CT TAVRs, dental clearance)
- Free up anesthesia for other structural/EP/OHS procedures

Optimizing the Care Pathway to Expand Timely Patient Access

- Transitioning appropriate TAVR cases to RN-led sedation can reduce dependence on anesthesia and perfusion availability, helping the program **increase scheduling flexibility, expand procedural capacity, and provide patients with more timely access to treatment.**
- At approximately **525 TAVRs annually**, preliminary estimates suggest direct procedural savings of **$2,000 to $3,500 per appropriate case**, or approximately **$1.31 million annually** using a conservative midpoint of $2,500 per case.
- These efficiencies extend beyond procedural savings. Reduced recovery time, ICU utilization, and length of stay, along with better allocation of anesthesia and perfusion resources, can help **improve throughput, accommodate urgent patients, and optimize the patient care pathway.**

Key improvements and lessons learned

- Development of standardized work and a detailed RN sedation protocol to ensure consistency across the team.
- Clear communication expectations between the physician and sedation RN throughout the procedure.
- Defined escalation pathways and emergency response processes to support patient safety.
- Improved procedural efficiency and decreased dependence on anesthesia scheduling.
- A successful RN-led sedation model that could potentially be expanded to additional structural heart procedures.

Standard Work

Campus: Riverside **Department:** CVL **Work Standard:** TAVR without Anesthesiologist

Step No.	Work Standard	Key Points
1	**Documenting RN**	• Confirm patient is ready in EPIC • Confirm information has been entered in XPER • Vocera PCU to alert them we will be over to get patient in next 10 minutes and ask them to take patient to restroom • Start antibiotic in PCU prior to bringing to HVL • Scan equipment packages from bin when convenient within your own documenting process • Notify Interventional Cardiologist & surgeon when drape being applied • Monitor vitals throughout procedure • Call post unit with report • Transport patient post procedure
2	**Circulating RN**	• Assist RTs with room and sterile tray set up • Assist RTs with chest prep • Manage pacer throughout procedure • Obtain additional equipment throughout procedure as needed • Obtain pressures as needed throughout procedure • Monitor vitals throughout procedure • Vocera PSA when procedure complete to assist with room turnover and transport patient to post unit with documenting RN
3	**Medicating RN**	• Obtain medication bin from office • Connect A and V lines prior to start of procedure • Give medications per verbal order from physician • Document medications given in EPIC • Draw ACT/verbally report result to team during procedure • Monitor vitals throughout procedure • Restock medication bin • Restock intubation/emergent supplies bin
4	**RTs**	• Set up room according to procedural access • Pull equipment needed for procedure • Load injector • Set up sterile tray /Assist with opening product for sterile tray • Place packages for equipment in bin for documenting RN to scan in CIMS • Prep patient for procedure including chest prep with assistance of circulating RN • Provide medicating RN the A and V lines prior to start of procedure • One RT will assist physician with procedure /one RT will load the valve • When procedure complete, manage access site and tear down sterile field

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TAVR RN Sedation Protocol

- **MD Communication**
  - The interventional cardiologist is intended to be the communicator for the RN at the head of the bed
  - If there are two interventional cardiologists involved in the procedure, clarify who will be the medication MD communicator with the sedation RN throughout the procedure prior to the start of the case.
- **Conscious Sedation**
  - Discuss with physician during Time Out on initial medications for sedation
    - Typically 1mg Versed, 50 mcg Fenantyl as for LHC/PCI
  - During procedure monitor for ongoing need for sedation due to pain/agitation
- **Medication Choice / Escalation for hypotension**
  - 1st line choice for RNs – 100mcg IVP Neosynephrine
    - MDs are to communicate when they want this administered. In some instances, as the RN if you notice the pressure decrease before the MD does – you can make the statement, "is it okay to give some Neo?" – the physician will respond to your ask and confirm the medication
    - We are looking to ensure our RNs are not acting as prescribers, but are working with the MDs on the correct medication choice, dose, timing, etc.
  - Levophed and Dopamine
    - These drips are to be administered on a case-by-case basis and only at the clear discretion of the physician.
  - Epinephrine
    - If Epinephrine is given by the MD at the table, it will be clearly communicated to the medicating RN so we do not have a doubling up of vasopressors being administered.
    - ***RNs are to push Epi IVP *ONLY IN THE INSTANCE OF ACLS/CODE SITUATIONS**** (not to be used in the way Neo is used IVP)
- **RN Communication**
  - As noted above, there may be some instances where RNs note vitals/hemodynamic changes, etc. before the MD does. Please do not hesitate to communicate any concern, question to the MDs. Two-way communication will be essential to ensure we're providing each patient the most optimal medication delivery.