Michigan Structural Heart Consortium

TAVR Peri-Procedural Care Pathway

TAVR procedural readiness begins with patient and family education. Discharge readiness begins with education and expectation setting prior to the procedure. Education and structured touch points can lead to decreased hospital length of stay and readmissions.

Pre-Procedure Education

1. Define goals of care
    a. Expectations of mobility, walking within 4 hours
    b. Length of stay 1 – 2 days
    c. Follow up appointments at the hospital with the structural heart team are required at 30 days and 1 year at least emphasizing the required completion of the KCCQ-12
    d. Focused PT pre-assessment for patients felt to be at risk who might benefit from prehab, strengthening, ROM, learn DC exercises and expectations of cardiac rehab, assess for mobility or care devices that would be beneficial

2. Define patient care Coach and responsibilities
    a. Attend pre-procedure appointments
    b. Learn how to take BP and pulse, regular rhythm
    c. Document physical activity, meds, VS, progress
    d. Stay with patient for a set time, or communicates with patient/caregiver for at least 3 days post-discharge

3. Procedural education
4. Smoking cessation
5. Focused Nutrition assessment for patients with evidence of malnutrition
6. 5 meter walk and grip strength
7. Focused Geriatric assessment for >70 year old – cognitive function, nutritional state, frailty index, mobility impairment, predisposition to delirium, social demographics (1.)

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Peri-Procedural TAVR recommendations to decrease length of stay

1. Minimize use of: ICU, central lines, foley, general anesthesia, SCDs
2. Consider moderate anesthesia care for shorter procedural turn-over time and decreased post-operative sedation
3. Use PACU instead of ICU post-procedure, transfer to telemetry bed for inpatient monitoring
4. Mobilize patient within 4 hours of TAVR procedure
5. 12-lead ECG within the 2 hours following the TAVR procedure, daily and the day of discharge
   *see ECG pathway below for direction of abnormal results
6. Cardiac Rehab Liaison education

Activities Prior to Discharge

1. Document weight, systolic and diastolic BP, medications, NYHA class
2. Medication review: Heart failure meds, Beta blocker, ACEI, ARB
   Anti-platelet, Anticoagulant. Resume? Have scripts filled prior to DC.
3. Labs: GFR, Hgb, INR as needed, creatinine
4. TTE – must be done prior to discharge, preferably within 12 hours
5. Schedule follow up appointment, schedule 30 day echo, ECG, labs, Cardiac Rehab appointment
6. Schedule follow up nurse phone call 48 -72 hours post-discharge
7. Schedule virtual visit @ 1 week post-discharge

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ECG Pathway

The 2-hour post procedure ECG, peri-procedural rhythm abnormalities, and pre-existing conduction abnormalities will determine the pathway below.

No ECG Changes Immediately (2 Hours) Post Procedure

No new ECG changes refers specifically to PR and QRS increase < 20 ms on the ≤ 2-hour post-op ECG compared to the pre-procedure ECG.

Without Pre-Existing RBBB:

- Temporary pacing wires can be removed within 2 hours of the TAVR index procedure with continuous telemetry for 24 hours post-op.
- If there are no new changes between the ECG done 24 hours post-op compared to the 2-hour post-op ECG done, then the subject is eligible to be discharged 1-day post op.
- Consider pacemaker implantation or electrophysiology consult if there is an occurrence of HAVB/CHB any time during the post-TAVR period.

Pre-Existing RBBB:

- Maintain temporary pacing until after 24 hours post the TAVR index procedure.
- If there are no changes between the ≤ 2-hour post-op ECG compared to the 24-hour postop ECG, then the temporary pacing wire can be removed. Continue telemetry for 1 day and if there continues to be no new ECG changes then the patient is eligible to be discharged 2 days post index procedure.
- If there are ECG changes of at least ≥ 20 ms in the PR or QRS duration compared to the ECG 2-hour post-op, then refer to instructions for New ECG changes.
- Consider pacemaker implantation or electrophysiology consult if there is an occurrence of HAVB/CHB any time during the post-TAVR period.

ECG Changes (Increase of PR or QRS ≥ 20 ms) in patients with pre-existing conduction disturbance

If there are ECG changes of ≥ 20 m/s in the PR or QRS duration on the ≤ 2-hour post op ECG compared to the ECG done pre-procedure, and subjects have pre-existing RBBB, LBBB, IVCD with QRS ≥ 120 ms or 1st degree AVB pre-procedure, then temporary pacing must be maintained until 24 hours post the TAVR index procedure.

- If ECG changes resolve (regression to baseline value, irrespective of QRS/PR interval duration), OR there are no further changes between the ≤ 2-hour post-op ECG compared to the 24-hour post-op ECG and QRS ≤ 150 ms and PR ≤ 240 ms, then the temporary pacing wire can be removed. Continue telemetry for 1 day. If there are no further ECG changes and/or bradyarrythmias, the patient is eligible to be discharged.

- If there are ECG changes of ≥ 20 ms in the PR or QRS duration OR the QRS > 150 ms or PR >240 ms, then maintain temporary pacing for an additional 24 hours.

If ECG changes resolve (regression to baseline value, irrespective of QRS/PR interval duration), OR no further ECG changes and QRS ≤ 150 ms and PR ≤ 240 ms then temporary pacing wire can be removed; continue telemetry for 1 day. If there are no further ECG changes and/or bradyarrythmias, the patient is eligible to be discharged.

If there are no further ECG changes, but QRS >150 ms or PR >240 ms OR further ECG changes of ≥20 ms in the PR or QRS duration consider one of the following:

- Invasive EP study to guide the decision about pacemaker implantation
- Continuous ECG monitoring until the 30-day follow-up visit
- Pacemaker implantation (not in patients with PR >240 ms but QRS <120ms)

Proceed with pacemaker implantation if there is an occurrence of HAVB/CHB any time during the post-TAVR period.

New Onset LBBB Post Procedure

Maintain temporary pacing until after 24 hours post the TAVR index procedure.

- If there are no changes between the ≤ 2-hour post-op ECG compared to the 24-hour postop ECG or the LBBB is resolved, then the temporary pacing wire can be removed and continue telemetry for 1 day.

- If there continues to be no new ECG changes or arrythmias and the LBBB resolves, then the patient is eligible to be discharged 2 days post index procedure without continuous monitoring.

- If the LBBB continues and QRS ≤ 150 ms and PR ≤ 240 ms compared to the 24-hour post-op ECG then the patient is eligible to be discharged 2 days post index procedure with a continuous ECG monitoring. The patient should maintain the continuous ECG monitoring system until the 30-day follow-up visit.

- If the LBBB continues and QRS > 150 ms or PR > 240 ms then consider one of the following:
    - Invasive EP study to guide the decision about pacemaker implantation
    - Continuous ECG monitoring until the 30-day follow-up visit
    - Pacemaker implantation

If there are further ECG changes of at least ≥ 20 ms in the PR or QRS duration between the 2-hour post-op ECG compared to the 24-hour post-op ECG, then maintain temporary pacing for an additional 24 hours.

If no further ECG changes compared to 24-hour ECG (PR or QRS increase < 20 ms) or LBBB is resolved, then refer to instruction noted above.

If the ECG changes do not resolve and there is further ≥ 20 ms changes in the PR or QRS duration, then consider one of the following:

- Invasive EP study to guide the decision about pacemaker implantation
- Continuous ECG monitoring until the 30-day follow-up visit
- Pacemaker implantation

Proceed with pacemaker implantation if there is an occurrence of HAVB/CHB any time during the post-TAVR period.

HAVB/CHB (transient or persistent) during the TAVR procedure

Maintain temporary pacing until after 24 hours post the TAVR index procedure.

- If the patient continues to experience HAVB/CHB then proceed with implanting a permanent pacemaker.
- If the HAVB/CHB resolves and there is not recurrent heart block, then the temporary pacing wire can be removed and continue telemetry for 1 day.

If the HAVB/CHB reoccurs then proceed with implanting a permanent pacemaker.

If the HAVB/CHB does not re-occur and there are no new ECG changes compared to the 24-hour post op ECG, then the patient is eligible to be discharged 2 days post index procedure. Refer to instructions above for any changes to the ECG.

References

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