

Pulmonary Artery Wedge Pressure, Minimizing Risk When Assisting

Site Applicability

PHC: Critical care areas (CICU, CSICU, ICU, PACU)

Practice Level

Advanced Competency:

- Only Registered Nurses who have completed a recognized post-graduate critical care course, or equivalent education and experience, may care for and manage pulmonary artery (PA) catheters

Requirements

Critical care nurses are **not** responsible for obtaining a pulmonary artery wedge pressure (PAWP). Critical Care nurses may only provide assistance with initial wedge pressure on catheter insertion by the inserting Physician. Any PAWP from a pulmonary artery catheter in place will be completed by the attending physician following review of this guideline.

Chest X-Ray (CXR) is required daily for senior resident or attending physician to verify PA catheter placement.

Need to Know

- PAWP is an indirect measurement of left ventricular end-diastolic pressure.
- PAWP monitoring may aid in the differential diagnosis of pulmonary hypertension, and may be beneficial in complex shock states.
- Wedging a PA catheter can have significant or even fatal complications (although rare), including pulmonary artery rupture or infarction.
- There is increased risk for pulmonary artery rupture in patients with:
 - age over 60 years
 - pulmonary hypertension
 - improper catheter placement (more than 55 cm via internal jugular OR more than 80 cm via femoral)
 - post cardiopulmonary bypass
 - receiving anticoagulation
 - mitral valve disease
 - hypothermia
- In many cases, the pulmonary artery diastolic pressure (PAD) may be used in place of the PAWP

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to calculate pulmonary vascular resistance (usual difference between PAD and PAWP is 1 to 4 mmHg with PAD being higher than PAWP).

Protocol

1. Critical care nurses do not obtain a pulmonary artery wedge pressure (PAWP) as part of a comprehensive nursing assessment.
2. The physician who inserts the PA catheter obtains the initial wedge pressure(s). Subsequent wedge pressures are obtained by the attending physician if required.
3. Inflation syringe must remain attached to the balloon port, with air expelled, and the gate valve left **OPEN**.
4. The PA catheter Safety Checklist for Team must be completed during patient care rounds (minimum of BID) for all patients with a PA catheter before PAWP may be obtained (See [Appendix A](#)).
5. Attending physician must review daily CXR prior to any wedge pressure measurement.
6. Critical Care nurse to monitor PA waveform for spontaneous wedging or catheter migration. Document status of waveform q4h. (See [Appendix B](#)).
7. The PA catheter must never be flushed when the balloon is wedged in the pulmonary artery.
8. The PA catheter balloon must never be inflated for more than 10 seconds or 2 to 3 respiratory cycles.
9. Do not fast flush the catheter for longer than 2 seconds (to avoid pulmonary artery injury).
10. IV fluids should never be infused via the distal lumen.
11. Blood products (including albumin) should never be infused through any port of the PA catheter.

Interventions

As per Pulmonary Artery Catheter Insertion (Assisting) and Monitoring – CE, Obtaining PAOP in:

1. [Elsevier Skills](#) electronic resource (Use Google Chrome and search “Pulmonary artery catheter”)

Documentation

1. **Pulmonary Artery Catheter dynamic group:** PCWP Waveform, Balloon Volume to Wedge, any Unexpected Events during or after procedure. Add comment for completion of PA catheter checklist prior to wedging.
2. **Critical Care Quick View:** Hemodynamic parameters, including PAWP.
3. **ECG Strip Flowsheet** (Form ID - 2892): PAWP waveform recording.

Related Documents

- [B-00-13-10017](#) – Physical Assessment: Critical Care Areas, protocol
- [B-00-12-10009](#) – Pulmonary Artery Catheter Insertion (Assisting)
- [B-00-13-10035](#) – Pulmonary Artery Catheter Removal, practice standard

References

1. Edwards Life Sciences Corporation (2018). Advanced Hemodynamic Monitoring. Swan-Ganz Pulmonary Artery Catheter. Irvine, CA. Retrieved Oct 31, 2023 from www.edwards.com.
2. Pulmonary Artery Catheter Insertion (Assisting) and Monitoring. Elsevier Skills (2023). St Louis, Missouri. Elsevier. Retrieved October 3, 2023, from www.elsevierskills.com
3. Weinhouse, G.L. (2023). Pulmonary artery catheterization: Indications, contraindications, and complications in adults. In UpToDate, Waltham, MA. (Retrieved October 3, 2023).

Appendices

- [Appendix A: PA Catheter Safety Checklist for Team](#)
- [Appendix B: PA Catheter Waveforms & Positioning](#)

Appendix A: PA Catheter Safety Checklist for Team

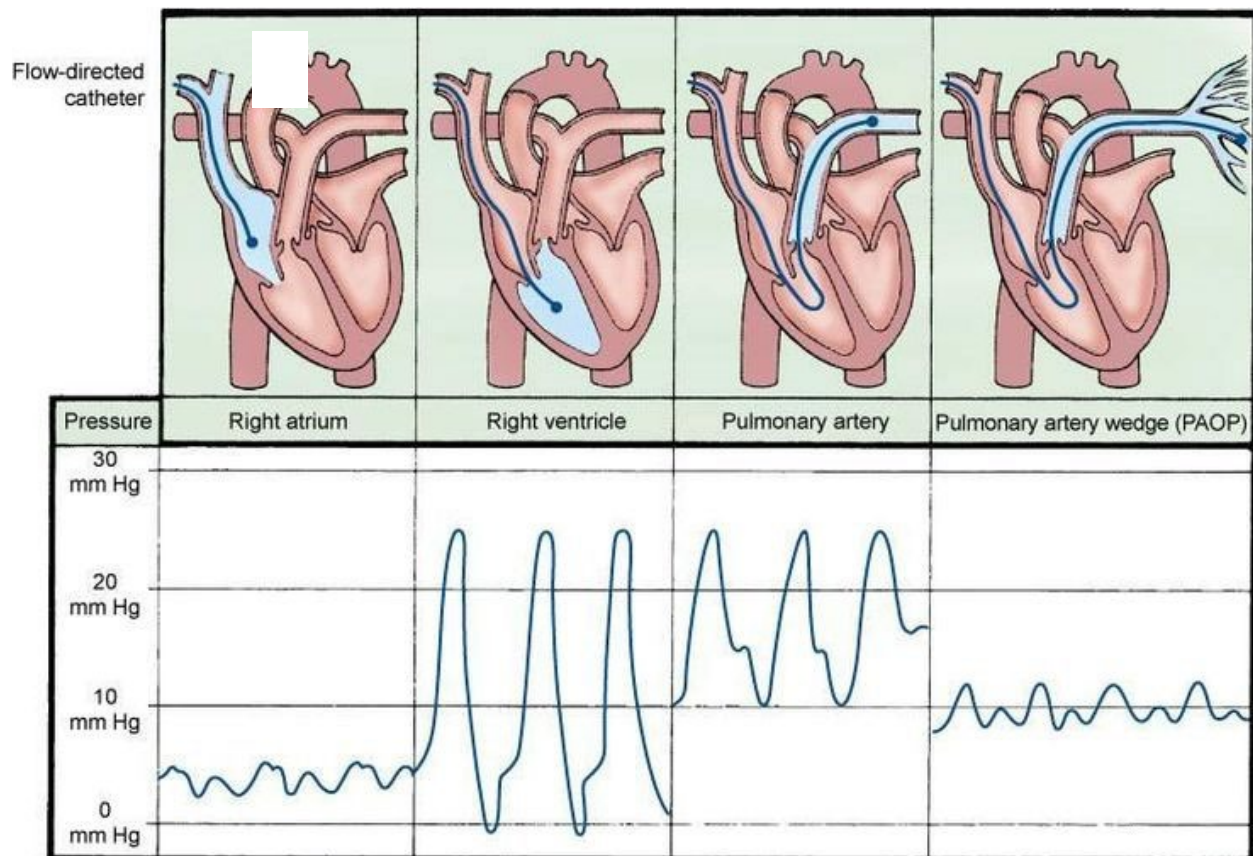
☐ 1. Can the PA catheter be removed?

☐ 2. Has a daily CXR been completed?

No PA wedge pressure should be obtained before the following have been answered:

☐ 3. Is the PA diastolic pressure sufficient, instead of PA wedge pressure, for hemodynamic assessment?

☐ 4. Has today's CXR been reviewed by the attending physician?



Appendix B: PA Catheter Waveforms & Positioning



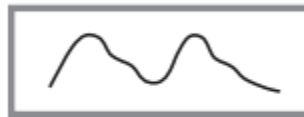
**Appropriate "a" and
"v" waves noted**



**Over inflation of balloon
Note waveform rise**



**Catheter too distal
Overdamping
of tracing**



**Catheter
spontaneous wedging
Wedge type tracing
with balloon deflated**

Advanced hemodynamics Swan-Ganz Catheter Brochure. 2018 Edwards Lifesciences Corporation

Persons/ Groups Consulted

Clinical Nurse Specialist, Cardiology

Clinical Nurse Educator, CSICU

Clinical Nurse Educator, ICU

Medical Director, CICU

Medical Director, ICU'

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