

# Swan-Ganz Catheters: Quick Reference for the PICU Nurse

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# Thermodilution (Swan-Ganz) Catheter Supplies

## Equipment :

- trilogy pump
- IV pole
- 2 pressure modules
- 2 pressure cables
- 1orange Cardiac Output Module
- 1Cardiac Output temperature cable (long silver probe)
- SVO2 monitor

## Supplies:

- 2 Arterial Line Transducers
- Armboard
- Straight IV tubing (no buretrol)
- 3 stopcocks
- 6 or 12 cc syringe (depends on pt. size and Cardiac Output volume)
- Maintenance solution ( to keep open “ Introducer”)
- 250 cc bag of NS for Cardiac Output measurements

## Pharmacy:

- 1or 2 bags of 250 NS with 1unit Heparin/cc (Can double spike single bag )to keep open distal and proximal I ports of Swan.

## Central Supply

First determine- Do you want a Pacing Catheter or Oximetry Catheter???

- Appropriate Size and Type of Thermodilution Catheter
- Appropriate Size of “Introducer” (Dialator and guidewire)

## Thermodilution Catheter Set Up

1. Put pressure modules in monitor with connected pressure cables.
2. Put “Orange” cardiac output (CO) module in monitor with Connected “Orange” CO cable.
3. Connect CO Temperature cable (long silver probe cable) to “Orange” CO cable.
4. Take opposite end of cable (long silver probe end) and tape to 250cc bag of normal saline. Hang this bag on nearby IV pole
5. Set up both transducers: Prime tubing with Normal Saline with 1 unit of Heparin/cc. Exactly the way current practice is for a peripheral arterial line.
6. One transducer is for the Pulmonary Artery (Yellow Distal) Lumen Of the Swan. The end of this tubing does not need any stopcocks. Set trilogy pump for 2cc per hour. Label transducer, monitor module, and tubing “**PA**”. Use **yellow** tape.
7. The second transducer will be for the Right Atrial (blue proximal) lumen of the Swan. The end of this tubing needs at least 2 stop cocks. One to attach the CO Normal Saline tubing. One to attach the 6 or 12 cc syringe. An additional stopcock can be added if a line is needed for an intermittent infusion. Label transducer, monitor module and tubing “**CVP**”. Use **blue** tape.

# Thermodilution Catheter Insertion

## Assisting with Placement:

- You may be asked to open the “outerbox” and present the sterile catheter tray to the inserting MD.
- The “Pamphlet- Insert” is very important. Keep. Need in order to set up cardiac output information.
- The inserting MD will open the sterile catheter tray and present the distal, proximal and thermister ports to you.
- Using sterile normal saline- flush through the distal and proximal ports of Swan.
- Connect **Yellow “distal”** port to “PA” transducer tubing.
- Connect **Blue “proximal”** port to “CVP” transducer tubing.
- While MD holds distal tip of Swan Catheter at the phlebostatic axis, zero/calibrate both transducers.
- Inflate the swan balloon (less than or equal to 1 cc) to test integrity of balloon prior to insertion. Deflate balloon.

## The MD can now begin insertion.

- Monitor “PA” wave form and EKG during insertion.
- As the tip of the swan enters the subclavian, vena cave and RA the “characteristic CVP waveform” is apparent.
- At this time the MD will ask you to inflate the balloon.
- As the catheter enters the RV the waveform will change drastically due to closure of the tricuspid valve. you should see the systolic pressures rise. It is at this point ventricular ectopy can be noted. Goal for the inserter is to either continue to advance out of the ventricle or withdraw back into the RA to eliminate the noxious stimuli to the RV. **Remember- If the MD withdraws the Balloon must be deflated to avoid damage to the tricuspid valve.**

When the distal tip of the catheter enters the PA the waveform will show an increase in diastolic pressure. As the tip floats into a small branch of the PA- the Pulmonary artery occlusion pressure PAOP aka "wedge" is seen. This waveform is measured as a mean pressure and is similar in value to the PA diastolic. In cases without obstructive lung disease the Wedge should approximate Left ventricular end diastolic pressure.

- When the balloon is deflated the waveform should return to the characteristic PA waveform. If not the catheter needs to be pulled back by the MD until the PA waveform is apparent.

- Obtain CXR
- Occlusive dressing
- Secure Catheter
- Keep "balloon syringe" deflated while connected to catheter and not measuring "wedge" pressure.

- Ensure fluids are running through "Introducer" to Keep open. Introducer is a very good line for volume resuscitation due to relative size, but often is used for vasoactive infusions.

- Never put vasoactive drips into blue proximal "CVP" port

**•Always monitor continuous PA waveform. Be alert for migration into wedge or right ventricle. Notify MD if changes in waveform suggest this.**

# Shooting a Cardiac Output

1. Obtain “ Pamphlet Insert” you saved earlier.
2. Find chart in Insert that outlines (based on size and type of catheter) amount of injectate “fluid” you will Use to shoot an output. This may be 5 or 10cc.

Note:

**Computation Constant. Tape the chart to the bedside monitor for future reference.**

3. On the “Orange” Cardiac Output Module press CO enter the computation constant, patient’s height and weight.
4. Open stopcock to Normal Saline tubing attached at the blue proximal port. Draw up appropriate volume of NS injectate.
5. Close stopcock off to the fluid and open to the patient.
6. **Press START** on the “orange CO” module. When “inject now” appears and when patient is at end expiration inject saline in a rapid, continuous smooth fashion (within 4 seconds)
7. Assess washout curve that appears as you inject. It should show a rapid uptake and slow descent.
8. Shoot a total of 3 outputs (add to I & O)
9. Press edit CO to average 3 outputs. Confirm to store values.