Pulmonary Artery (Swan-Ganz) catheter: insertion of the catheter

Progress of insertion

In the SVC and the right atrium
The introducer sheath goes in first
Before the PA catheter is threaded in, the distal lumen is connected to a CVP transducer, so the pressure wave can be observed.

The pressure here will be 1-6mmHg.

Atrial fibrillation may be encountered at this stage as the catheter tip tickles the atrium.

In the right ventricle
Once you are past the tricuspid valve, you suddenly get a nice oscillating waveform, which is the right ventricular contraction. The systolic pressure here should be between 15 and 30mmHg.
The diastolic should be same as right atrial pressure – 1-6mmHg
Mitrail regurgitation may give a large v-wave, which may be confused for a pulmonary atrial wave
This waveform may come and go, as the catheter tip flicks in and out of the ventricle. Its not a common place occurrence, but ventricular arrhythmias may be expected to happen here.
As soon as you are in the RV, and are seeing the pulse waveform, you can inflate the balloon with air. The volume is 1.5ml.

In the pulmonary artery
Past the pulmonary valve, one can now see the PA waveform, which resembles the waveform of any other artery.

At this stage the diastolic pressure rises to about 6-12mmHg (due to flow resistance in the pulmonary arterial network)
This is the fabled PA diastolic pressure, the PADP, which maintains a stable and reliable relationship with the PAWP.

Now, we wedge
The catheter is advanced further, until the PA waveform disappears, and a venous-looking waveform appears. This is the wedge waveform. It indicates that the pulmonary artery is occluded.

The pressure here should also be 6-12 mmHg, like the PA diastolic pressure. If it is different, it shouldn’t be far off (about 5mmHg) and this relationship should persist for some hours, so you can just use the PADP (this way you don’t have to wedge repeatedly). Once you have found this wedging point, deflate the balloon passively, and fix the catheter in position.
DO NOT KEEP IT INFLATED. Bad things will happen.

How far to the right atrium?
- 10-15cm from the subclavian vein, 15-20cm from the jugular vein, 30-40cm from the femoral vein
- The right ventricle is another 10cm, and the pulmonary artery is another 10 cm after that.

From Bersten and Soni’s "Oh’s Intensive Care Manual", 6th Edition, as well as the PA catheter section from The ICU Book by Paul L. Marino (3rd edition, 2006)