

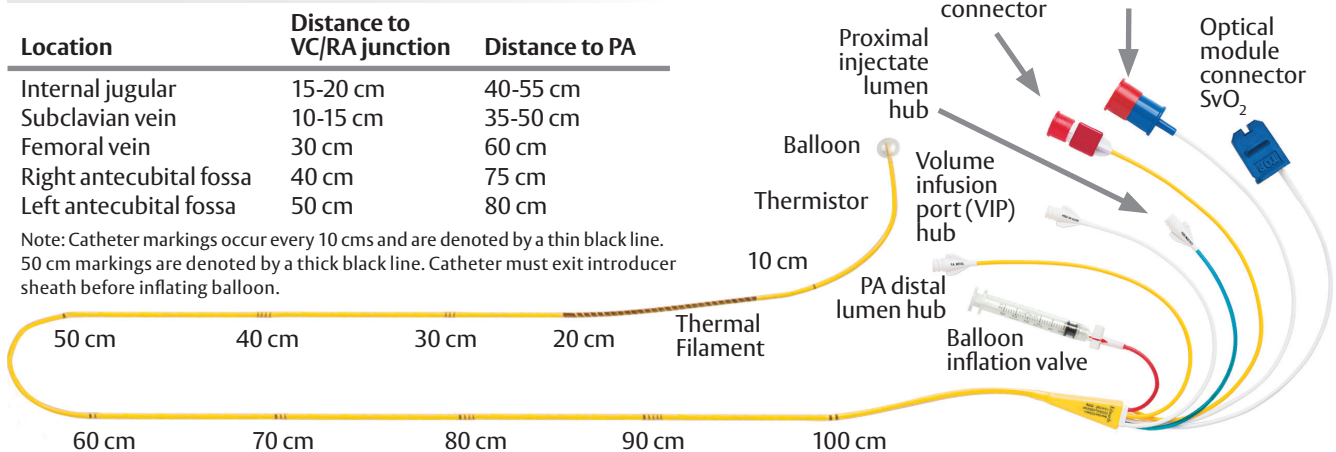
Advanced Hemodynamic Monitoring Swan-Ganz Pulmonary Artery Catheter

Swan-Ganz CCO catheter

Thermodilution continuous cardiac output catheter

Continuous cardiac output measurements are made by periodically warming the blood in the right atrium or ventricle with a known quantity of heat. The catheter thermistor detects the small change in blood temperature downstream, and the compatible cardiac output computer computes a dilution curve via a modified Stewart-Hamilton indicator dilution equation.

Catheter insertion distance markings



Applications and contraindications

Clinical applications for Swan-Ganz pulmonary artery catheters

- Acute heart failure
- Severe hypovolemia
- Complex circulatory situations
- Medical emergencies
- Acute respiratory distress syndrome
- Gram negative sepsis
- Drug intoxication
- Acute renal failure
- Hemorrhagic pancreatitis
- Intra and post-operative management of high risk patients
- History of pulmonary or cardiac disease
- Fluid shifts (e.g., extensive intra-abdominal operations)
- Management of high-risk obstetrical patients
- Diagnosed cardiac disease
- Toxemia
- Premature separation of placenta
- Cardiac output determinations
- Differential diagnosis of mitral regurgitation and ventricular septal rupture
- Diagnosis of cardiac tamponade

Relative contraindications for Swan-Ganz pulmonary artery catheterization

- There are no absolute contraindications to the use of a pulmonary artery catheter; risk-benefit must be assessed for each patient
 - Things to consider before use include*:
 - Left bundle branch block
 - Patients with tricuspid or pulmonic heart valve replacements
 - Presence of endocardial pacing leads
- *Not an exhaustive list. Please see contraindications, precautions and complications sections within the IFU.

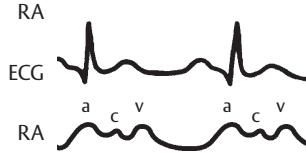
Swan-Ganz catheter insertion waveforms

Right atrial/central venous pressure (RA/CVP)

2-6 mmHg

Mean 4 mmHg

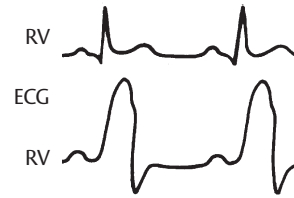
- a = atrial systole
- c = backward bulging from tricuspid valve closure
- v = atrial filling, ventricular systole



Right ventricle

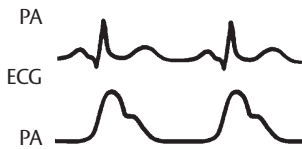
- Systolic pressure (RVSP) 15-25 mmHg

- Diastolic pressure (RVDP) 0-8 mmHg



Pulmonary artery

- Systolic pressure (PASP) 15-25 mmHg
- Diastolic pressure (PADP) 8-15 mmHg
- Mean pressure (MPA) 10-20 mmHg



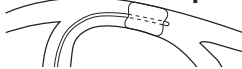
Pulmonary artery occlusion pressure (PAOP)

Mean 6-12 mmHg

- a = atrial systole
- v = atrial filling, ventricle systole



Proper wedge



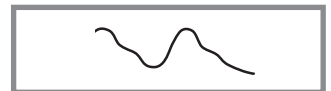
Appropriate "a" and "v" waves noted



Over inflation of balloon
Note waveform rise



Catheter to distal
Overdamping of tracing



Catheter spontaneous wedging, wedge type tracing with balloon deflated

Normal parameters

Parameter	Normal range	Parameter	Normal range
CO	4.0 - 8.0 L/min	PAOP	6-12 mmHg
CI	2.5 - 4.0 L/min/m ²	PAD	8-15 mmHg
SV	60 - 100 mL/beat	RVEF	40-60%
SVI	33 - 47 mL/beat/m ²	RVEDVI	60-100 mL/m ²
SVR	800 - 1200 dynes - sec/cm ⁵	PVR	<250 dyne-sec/cm ⁵
SVRI	1970-2390 dynes - sec/cm ⁵ x m ²	RVSWI	5-10 g-m/m ² /beat
SVO ₂	60-80%		

For professional use. CAUTION: Federal (United States) law restricts this device to sale by or on the order of a physician. See instructions for use for full prescribing information, including indications, contraindications, warnings, precautions and adverse events.

Edwards Lifesciences devices placed on the European market, meet the essential requirements referred to in Article 3 of the Medical Device Directive 93/42/EEC, and bear the CE marking of conformity.

Edwards, Edwards Lifesciences, the stylized E logo, CCombo, CCombo V, Swan-Ganz, and VIP are trademarks of Edwards Lifesciences Corporation. All other trademarks are property of their respective owners.

© 2018 Edwards Lifesciences Corporation. All rights reserved. E8676/10-18/CC

Edwards Lifesciences • Route de l'Etraz 70, 1260 Nyon, Switzerland • edwards.com