

# Getting Ready for Surgery: Checklist for the Pulmonary Hypertension Patient

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Pulmonary hypertension (PH) patients who undergo surgical procedures are at increased risk for complications.<sup>1</sup> Patients need a comprehensive medical team approach involving not only the surgeon, but also the PH specialist, the nurse coordinator, the anesthesiologist, and the medical consult physician.

1. Consider referral to a PH center to provide comprehensive medical care and services, including:
  - PH specialist [Information to provide includes: type of surgery, mode of anesthesia, length of surgery, elective or urgent]
  - Medical consult for surgical risk stratification for all comorbidities<sup>2</sup> [Including coronary artery disease/evaluation for ischemia, diabetes, thyroid disorder, hypertension]
  - Cardiac anesthesiologist [Especially relevant in patients with PAH on advanced treatments, including availability of nitric oxide or inhaled prostacyclins]
  - Postoperative ICU care with physicians, registered nurses, and respiratory therapists with experience in managing
  - Immediate availability of PH medications onsite [Including intravenous prostacyclin (ie, epoprostenol) and oral therapies (ie, sildenafil)]

2. Schedule patient to see a PH specialist for comprehensive evaluation, including consideration of the following:
  - Echocardiogram [Reassess and compare right ventricular size and function, left ventricular function, pericardial effusion, valvular function]
  - Right heart catheterization [More relevant for patients on advanced PH therapies, recent decompensation and/or unstable clinical course]
  - Pulmonary function tests
  - Comprehensive laboratory evaluation including complete blood count, comprehensive metabolic panel, coagulation studies, brain natriuretic peptide
  - 6-minute walk and/or cardiopulmonary exercise test to reassess functional status
  - Optimize medication regimen prior to surgery
  - Careful monitoring and optimization of volume status
  - Provide question and answer discussion and support to the patient and family
  - Confirm code status and health care proxy
  - Discussion of the risk/benefit balance with consideration for the scheduled procedure and

patient's underlying medical conditions

3. Schedule patient to see an anesthesiologist for preoperative evaluation, with special consideration for the following:
  - Anticoagulation—bridging with low molecular weight heparin prior to surgery as appropriate
  - Strongly consider consulting cardiac anesthesiologist for management of PH medications [Use of invasive hemodynamics during surgery as needed, best managed with PH physician/team]<sup>3</sup>
  - Discuss the most appropriate method of anesthesia for the planned surgery [If general anesthesia considered, discuss possibility of alternative methods whenever possible]
  - Clarify “morning of surgery” medication regimen, with recommendation toward continuing all medications for PH as appropriate

With vigilant evaluation and assessment, medical providers can promote positive surgical outcomes for patients with PH.

## References

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3. Subramaniam K, Yared JP. Management of pulmonary hypertension in the operating room. *Semin Cardiothorac Vasc Anesth.* 2007;11(2):119-136.

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