



Intraoperative Acute Pulmonary Embolism: A Simulation Case for Anesthesiology Residents

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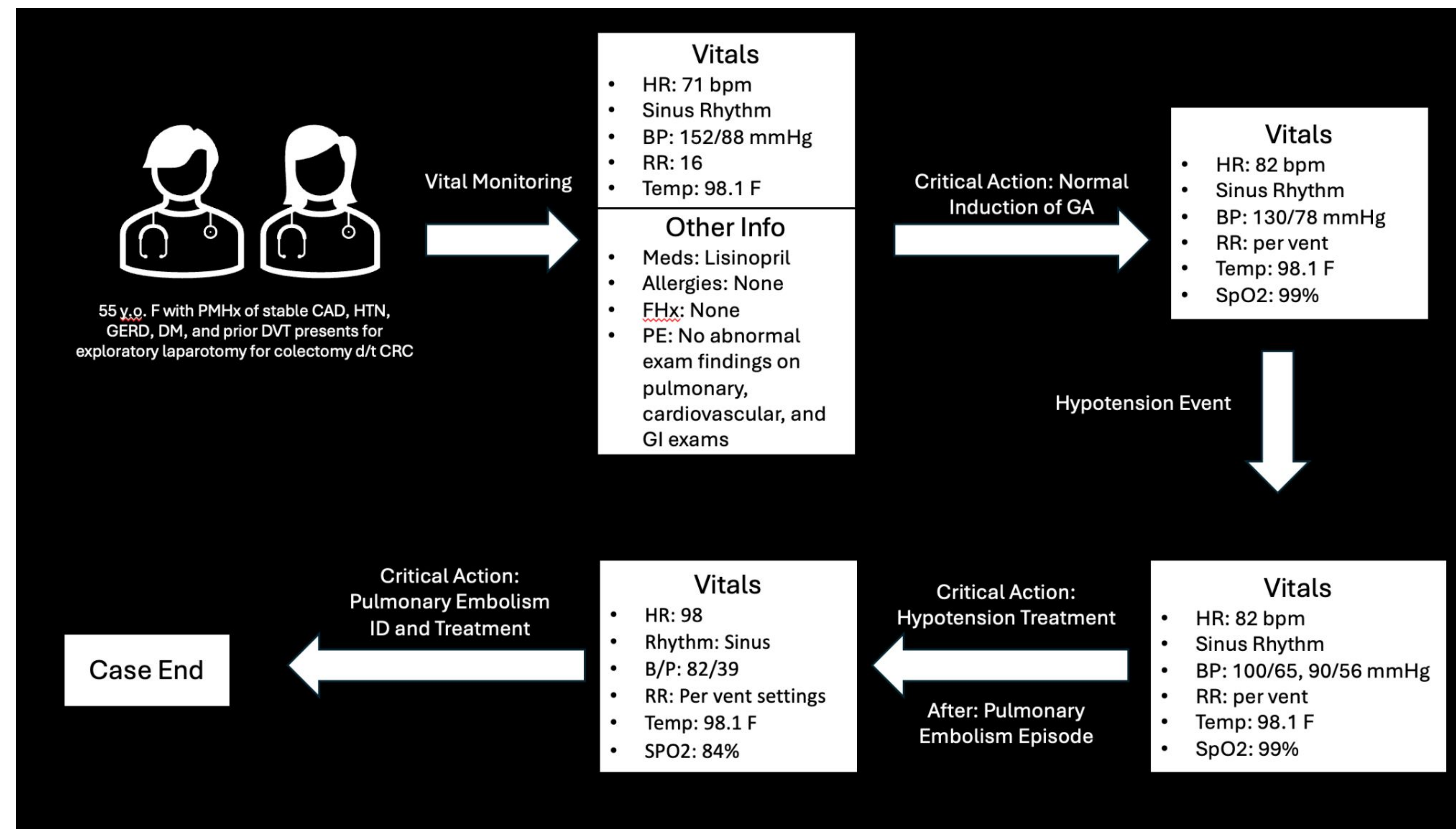
Introduction

- Diagnosis of acute pulmonary embolism (APE) during surgery can be challenging because typical symptoms of APE are absent or difficult to discern in patients under general anesthesia¹
- Intraoperative transesophageal echocardiography (TEE) can provide strong evidence of APE^{2,3}
- Thus, TEE-guided diagnosis of APE should be part of anesthesiology training programs
- Intraoperative APE is rare and simulation may be ideal teaching method
- There are currently no intraoperative APE simulation studies published in common simulation journals

Methods

- Designed high fidelity simulation for PGY2-PGY4 anesthesiology residents
- Simulation occurred at an academic medical center in a simulated operating room
- Following the simulation, held a debriefing that included further education on management
- Assessed simulation efficacy with five-point Likert scale survey, before & after confidence in:
 - Diagnosis
 - Management
 - Identifying relevant consultants
- Analyzed results with two-tailed paired t-test

Simulation



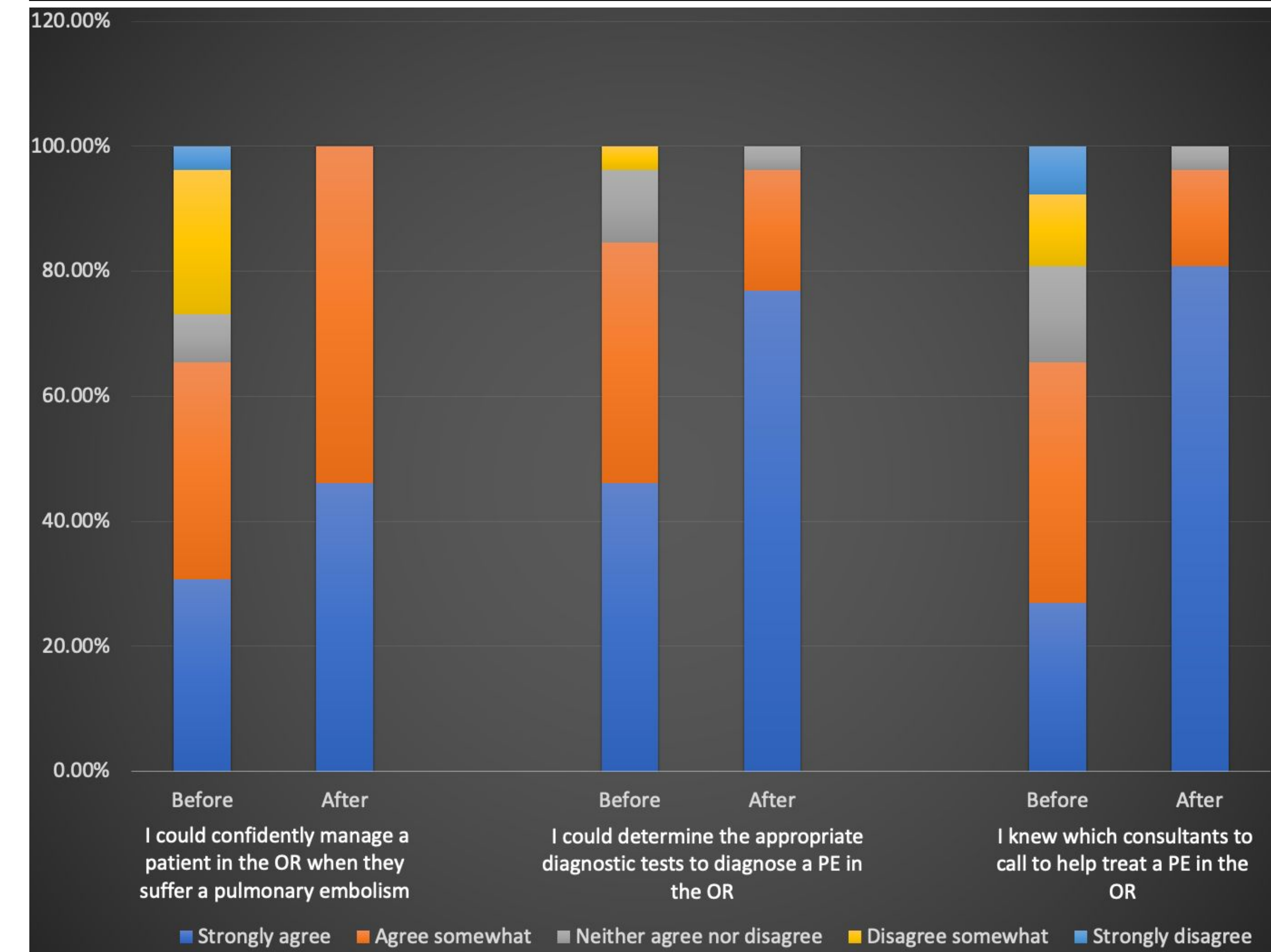
Critical Actions Include:

- Successful induction of general anesthesia
- Identification, management, and treatment of initial/severe hypotension
- Successful diagnostic evaluation, identification, and management of pulmonary embolism

Conclusion

- Simulation seems to be an optimal training tool for APE
- Anesthesiologist training programs may consider implementing this simulation
- Limitation: solely self reported measures, future research could use objective performance measures

Results



N = 26 over 2 days

References

1. Desciak, Matthew C., and Donald E. Martin. "Perioperative pulmonary embolism: diagnosis and anesthetic management." *Journal of Clinical Anesthesia* 23.2 (2011): 153-165.
2. Aiping, Yang, et al. "Management of intraoperative acute pulmonary embolism in a patient with subarachnoid haemorrhage undergoing femoral fracture repair." *Journal of International Medical Research* 47.10 (2019): 5307-5311.
3. Mao, Yuanyuan, et al. "Management of intra-operative acute pulmonary embolism during general anesthesia: a case report." *BMC anesthesiology* 17 (2017): 1-4.