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## Contemporary Treatment Options for Pulmonary Embolism

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## Purpose

Provide RNs education on the classifications of PEs and new catheter directed treatment options.

## Significance

- PE remains a common and lethal entity.
- PE is the 3<sup>rd</sup> leading cause of cardiovascular death in hospitalized patients (60,000-100,000 per year).
- 150,000-250,000 PE related hospitalizations per year.
- RNs must be knowledgeable of the classifications of PEs and catheter directed therapies to promote positive patient outcomes.
- Prior to catheter directed therapies, submassive PE's had a mortality rate up to 20% at 3 months and were traditionally treated with IV heparin, or oral anticoagulant therapy.

## Dissemination of Knowledge

- 2020: Float Pool Pick 4 Education
- 2020 Educational email to Telemetry Staff
- 2021: Presentation at Virtual AACN National Teaching Institute
- Standard curriculum content for RN CICU orientation

## Catheter Directed Therapies for PE

### Mechanical Thrombectomy

- FDA approved in 2018 for treatment of PE.
- 20 or 24 French venous catheter inserted into the femoral vein to the pulmonary arteries.
- Clot is extracted via a 60 ml syringe attached to the end of the catheter.
- Eliminates need for thrombolytics and critical care stay.
- Bed for 4 hours post procedure.
- May be discharged the next day.



### Catheter Directed Ultrasound Assisted Thrombolytics

- FDA approved in 2014 for treatment of PE.
- Treatment catheters are positioned in the pulmonary arteries (via 6 French femoral sheath) and delivers thrombolytics along with simultaneously delivering ultrasound waves to help unwind and thin fibrin strands.
- Transfers to critical care post procedure.
- Total thrombolytic dose is 12-24 mg over 6-12 hrs. (standard IV dose is 100 mg, without catheter)



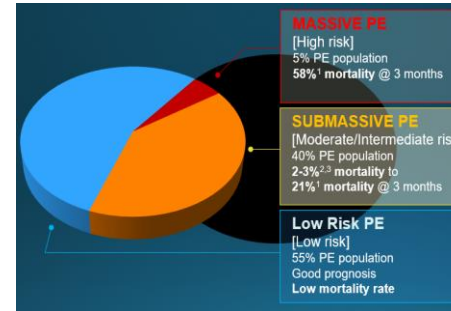
**CentraCare™**  
INTERVENTIONAL CARDIOLOGY

**Catheter Directed Ultrasound Assisted Thrombolytics**

- 58 patients since October 2018

**Mechanical Thrombectomy**

- 57 patients since January 2, 2019



## Classifications of PE

Patient risk stratification (per AHA Scientific Statement 2011)		
Massive PE	Submassive PE	Minor/Nonmassive PE
High risk	Moderate/intermediate risk	Low risk
<ul style="list-style-type: none"> <li>- Sustained hypotension (systolic BP &lt;90 mmHg for &gt;15 min)</li> <li>- Inotropic support</li> <li>- Pulselessness</li> <li>- Persistent profound bradycardia (HR &lt;40 bpm with signs or symptoms of shock)</li> </ul>	<ul style="list-style-type: none"> <li>- Systemically normotensive (systolic BP ≥90 mmHg)</li> <li>- RV dysfunction</li> <li>- Myocardial necrosis</li> </ul>	<ul style="list-style-type: none"> <li>- Systemically normotensive (systolic BP ≥90 mmHg)</li> <li>- No RV dysfunction</li> <li>- No myocardial necrosis</li> </ul>
<b>RV dysfunction</b> <ul style="list-style-type: none"> <li>- RV/LV ratio &gt; 0.9 or RV systolic dysfunction on echo</li> <li>- RV/LV ratio &gt; 0.9 on CT</li> <li>- Elevation of BNP (&gt;90 pg/mL)</li> <li>- Elevation of NTpro-BNP (&gt;500 pg/mL)</li> <li>- ECG changes: <ul style="list-style-type: none"> <li>- new complete or incomplete RBBB</li> <li>- anteroseptal ST elevation or depression</li> <li>- anteroseptal T-wave inversion</li> </ul> </li> </ul>		

### Key Take Aways

**Massive PE = hemodynamic instability + RV dysfunction.** It DOES NOT necessarily mean large clot burden or saddle PE. Only 5% of all PE's.

**Submassive PE = hemodynamically stable with RV dysfunction.** Can have large clot burden. Makes up 40% of PE population.

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