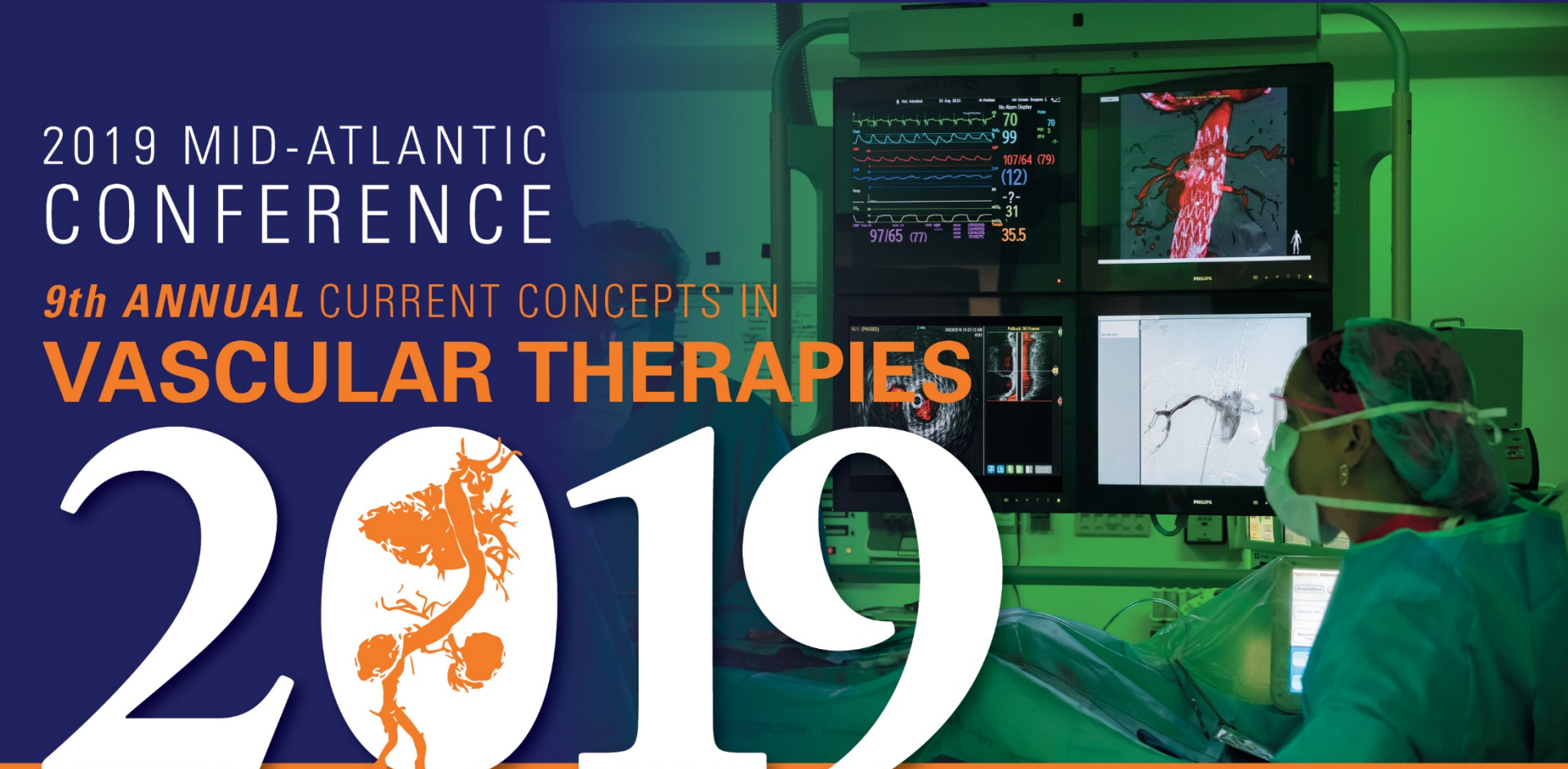
2019 MID-ATLANTIC
CONFERENCE

***9th ANNUAL*** CURRENT CONCEPTS IN

# VASCULAR THERAPIES

# 2019



Hilton Virginia Beach Oceanfront
Virginia Beach, Virginia

**MAY 2-4**

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# VASCULAR THERAPIES

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# PULMONARY EMBOLISM RESPONSE TEAM

Jessica Buchner, MD
Critical Care Medicine
Cardiac Surgical Intensive Care Unit Medical Director
Norfolk General Hospital

# PE RESPONSE TEAM

- Objectives:
  - Establish the need
  - Standardize definitions
  - Identify team components
  - Review outcome data
  - Identify future directions

# Establishing the Need

- Acute PE: 3rd most common cardiovascular cause of death in US
  - -1-2/1000 adults/year
- 90-day mortality data: massive 50%, submassive 15%
- Complex diagnosis: Qualifiers “massive,” “submassive,” and “nonmassive” vary in the literature
  - scoring systems and guidelines vary among different associations
- Multiple services diagnose and manage
- Sparse and unclear data for intermediate and high risk PE management
- Performance of early prognostication improves mortality

# Establishing the Need

- PERT allows improved access to advanced therapies, streamlined individual patient care, and data collection
- 5% of submassive PE patients experience clinical decompensation
- Challenges traditional silo mentality
  - collaboration avoids bias in setting of clinical equipoise
- Published registries suggest thrombolytic therapy is underused:
  - EMPEROR registry: 2% of PE overall and 9% of massive treated with lytics
  - ICOPER 13% of PE treated with lysis
- Data suggests PERT reduces non-ICU cardiopulmonary arrest and may decrease total hospital mortality
- Need to protocolize diagnosis and decision making to improve efficiency

# Standardized Definitions

- Massive PE:
  - sustained hypotension (SBP<90 mmHg for at least 15 min or requiring inotropic support, not due to a cause other than PE)
  - pulselessness
  - persistent profound bradycardia (HR<40 bpm with signs or symptoms of shock)

# Standardized Definitions

- Submassive PE: acute PE without systemic hypotension but with either RV dysfunction or myocardial necrosis
- Outcomes are based on risk stratification
  - Clinical score: Geneva and PESI
  - Echocardiography: RV dysfunction, multiple ways
  - CT scan: RV: LV diameter ratio >0.9 in apical view vs septal bowing
  - Troponin leak: I >0.4ng/mL or T >0.1ng/mL
  - NT-BNP >500pg/mL
  - EKG: S1Q3T3, new RBBB, sinus tach, atrial arrhythmias

# Standardized Definitions

- Nonmassive/Low-risk PE:
  - Acute PE and absence of the clinical markers of adverse prognosis that define massive or submassive PE

# Team components

- Vascular Surgery
- Interventional Cardiology
- Cardiothoracic Surgery
- Pulmonary and Critical Care Medicine
- Emergency Medicine
- Hematology
- Echocardiography
- Radiology
- Born from heart teams (ischemic heart disease interventions), stroke teams, and rapid response systems

# Protocolized Response

- Mechanisms to identify at-risk patients
- Criteria to trigger the PERT
- Means to quickly notify and activate the response team
- Swift decision making and action by the team
- Administrative support and infrastructure
- Quality improvement based on data collection

# Challenges

- Only 1 physician typically examines
- 24 hour coverage
- Potential overuse of invasive technologies
- Liability concern
- Primary team ceding control
- Deskilling other physicians
- Paucity of data regarding cost efficiency and outcome improvement
- Team members must be gathered for discussion
  - i.e. video conference

# MGH Experience

- Team: cardiology, CTS, pulmonary, critical care, radiology, vascular surgery
- 24-h phone number
- Monthly PERT clinic follow up (multidisciplinary)
- PERT group meets bimonthly for journal club and case review
- Community outreach

# MGH experience

- First 30 months: 394 PERT consults
  - 60% from ER and 20% in ICU
- Team activations increased by 16% every 6 mo
- Demographics: age 61, 54% male, Charlson Comorbidity Index score 2.6
- 46% submassive, 25% massive
- Median time from consult to meeting: 107 min
- Treatment:
  - AC alone: 69%
  - Catheter-directed thrombolysis: 9%
  - Systemic IV thrombolysis: 5%
  - Surgical Embolectomy: 3%
  - Suction thrombectomy 0.3%
  - ECMO 2%

# MGH experience

- Massive PE without contraindication to lysis: 62% systemic lysis alone
- Patients undergoing systemic or catheter-directed lysis had lower comorbidity index than those receiving AC alone
- 30 day mortality: 12.2% low risk, 2.6% submassive, 25.3% massive
  - ICOPER: 90-day mortality for massive 53%, 15% for rest
- No difference in bleeding complications among catheter-directed thrombolysis and AC alone (4%)

# Cornell experience

- Pulm/cc takes all calls and activates rest of consultants
- Team activation for intermediate and high risk only
- 87 total activations
  - Increased number of diagnosed cases by 50% over first 20 months
- sPESI score for prognostication
- CDT in 29%
  - no significant difference in baseline factors between CDT, lysis and AC alone patients
- Median overall LOS 6-7 days
  - literature-based 5-11 day estimate
- 13.7% overall mortality rate

# Kentucky experience

- 2016-2017: 77 patients activated
- Compared to pre-PERT team: no difference in demographics, severity of illness, mortality
- PERT group significant lower ICU LOS and overall LOS

# Future Direction

- Longer-term outcome data needed
- Cost effectiveness and quality improvement data
- Avoid overutilization of novel therapies
- Societal recommendations?

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