

The Rajan Laddu Memorial Lecture

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HARVARD
MEDICAL SCHOOL
TEACHING AFFILIATE

Outline

- Rajan: An extraordinary young man who packed a lot of living, goodness, and talent into his tragically foreshortened 25 years of life
- His legacy requires us to examine what we know and what we have to learn about PE in young adults
- Pay attention to the psychological impact of PE
- We have new tools to treat massive PE
- Paths for future investigation of PE await our research and discovery

Rajan Laddu

September 30, 1995 to November 8, 2020



Background of Rajan

Throughout his life, Rajan faced physical health challenges. He decided to help others by going into the healthcare field. Rajan also had a passion for Latin and Greek, film, and piano. He is survived by his mother Vaishali, father Prashanta, and two brothers— Devan and Shaan Laddu. He is also survived by his maternal grandfather and paternal grandmother and grandfather (Atul).



Rajan Laddu- Main Title
from "Ben-Hur"

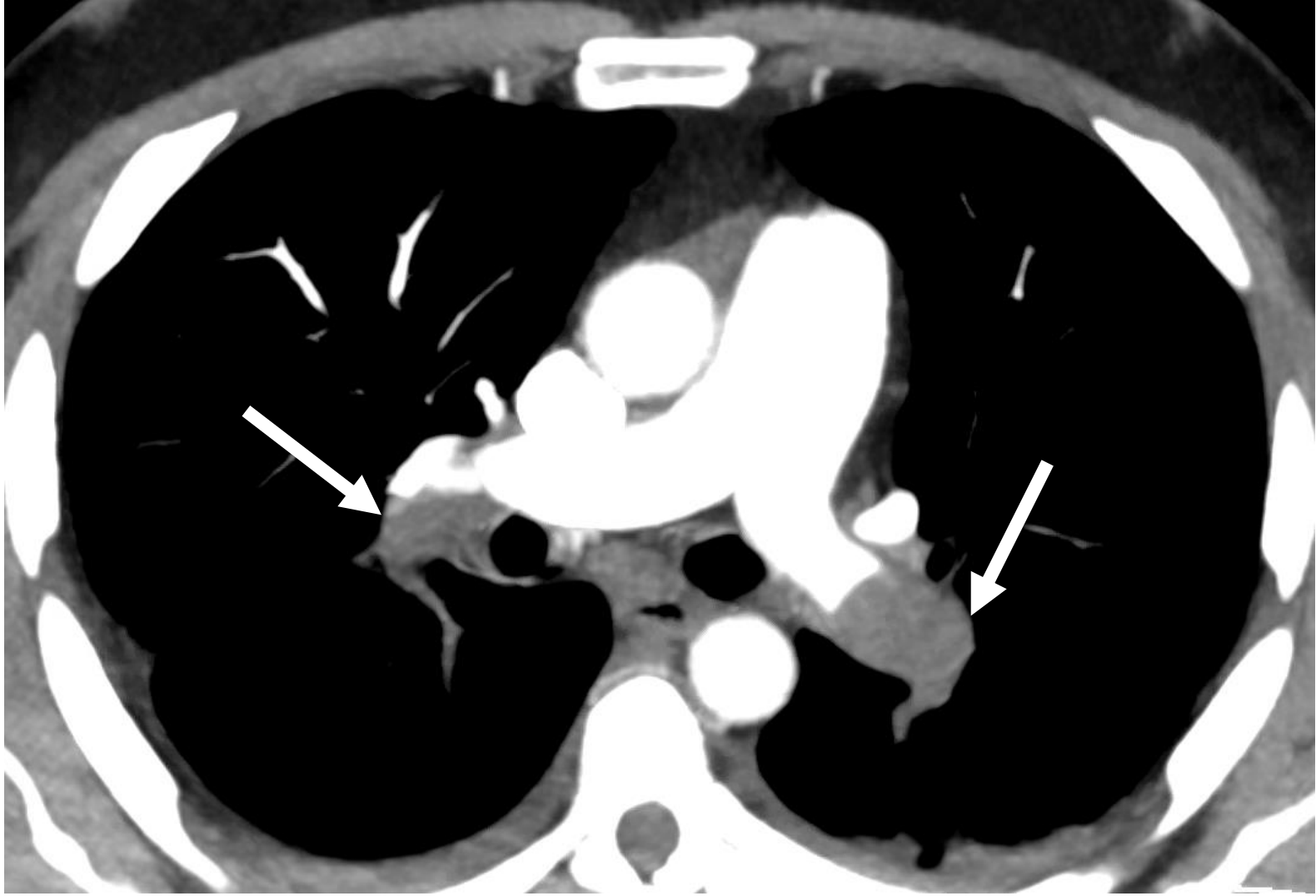


Rajan Laddu - Pianist and Singer Rocket Man

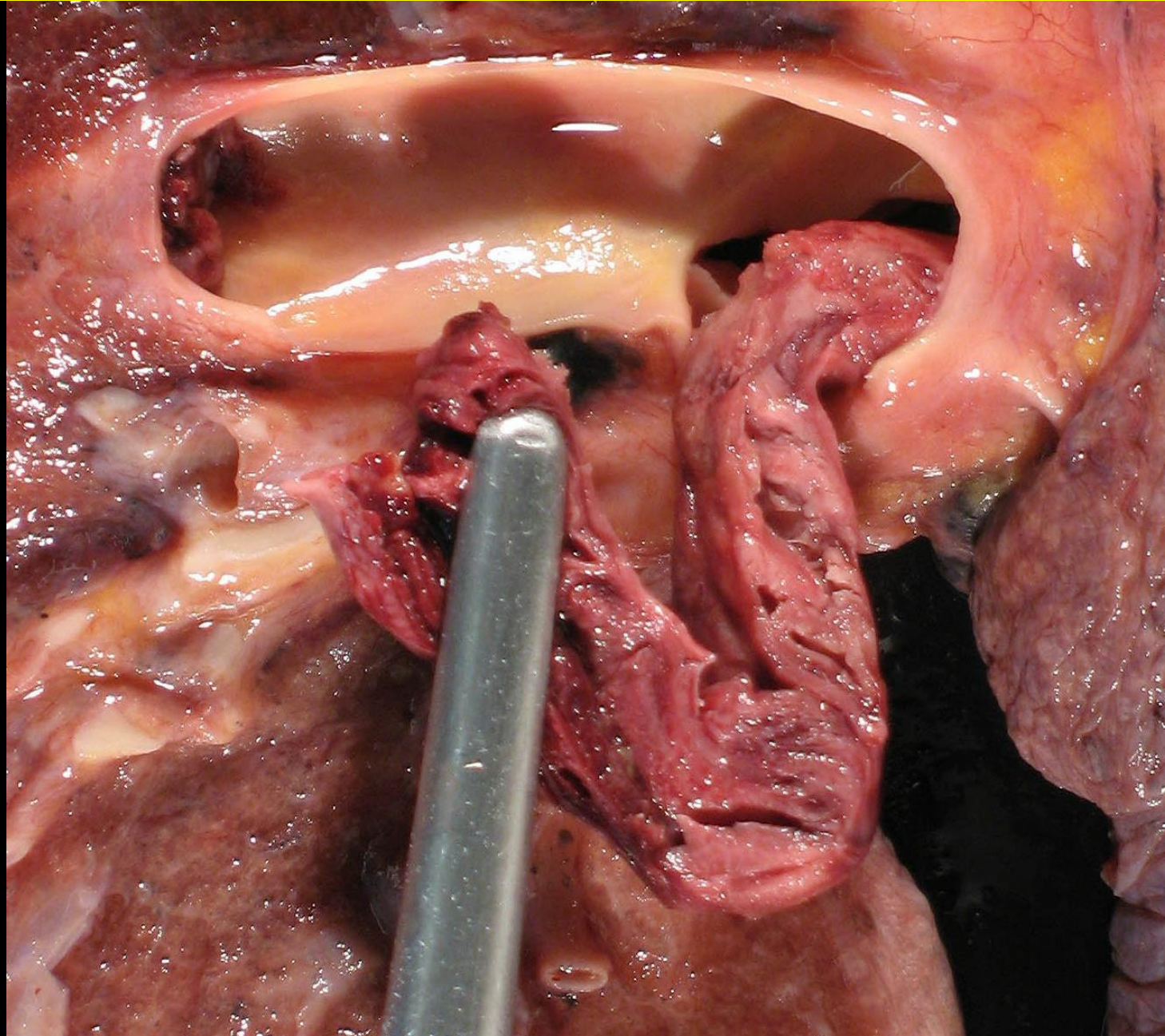


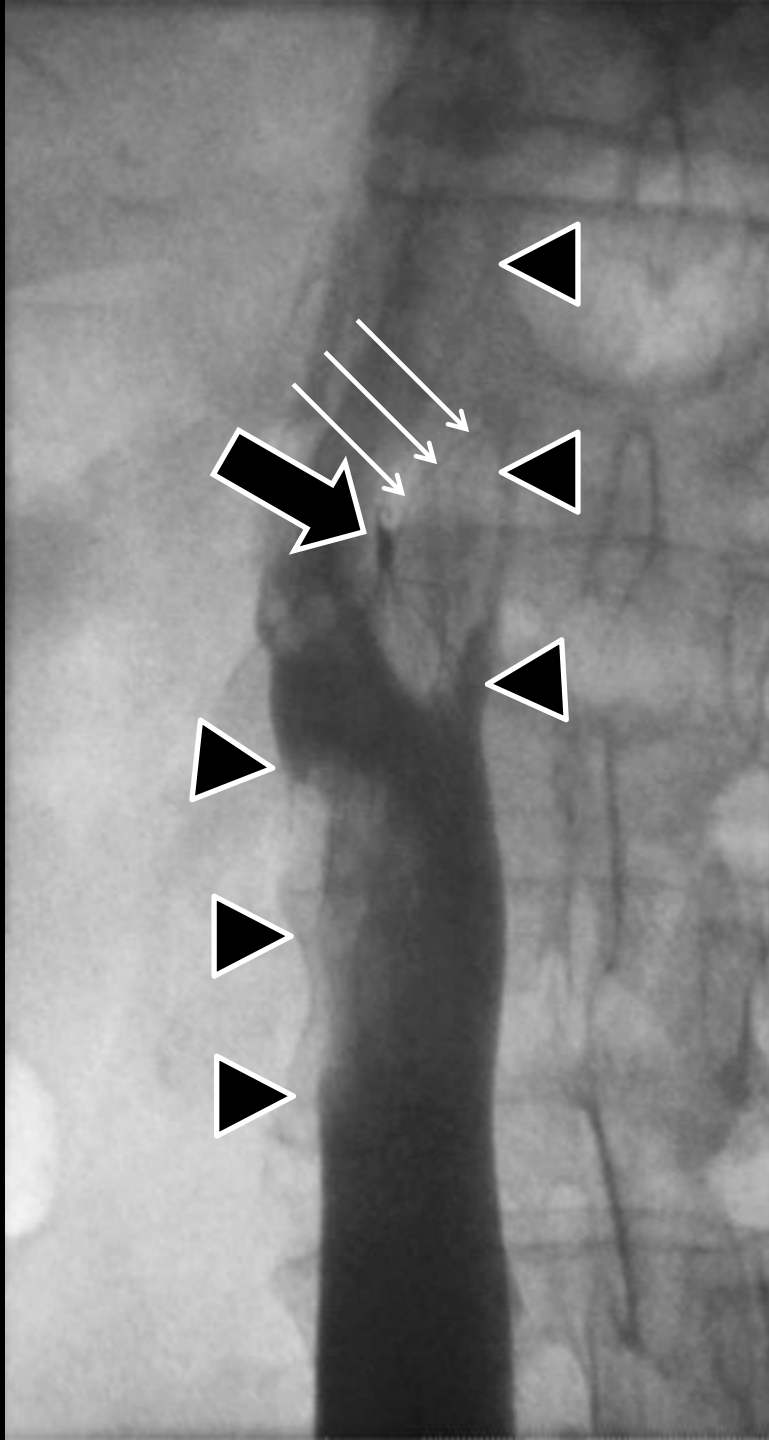
Rajan Laddu - Pianist and Singer Rocket Man - YouTube.html

<https://www.youtube.com/watch?v=E4xiR7J2rSs>



FATAL SADDLE PE: Autopsy

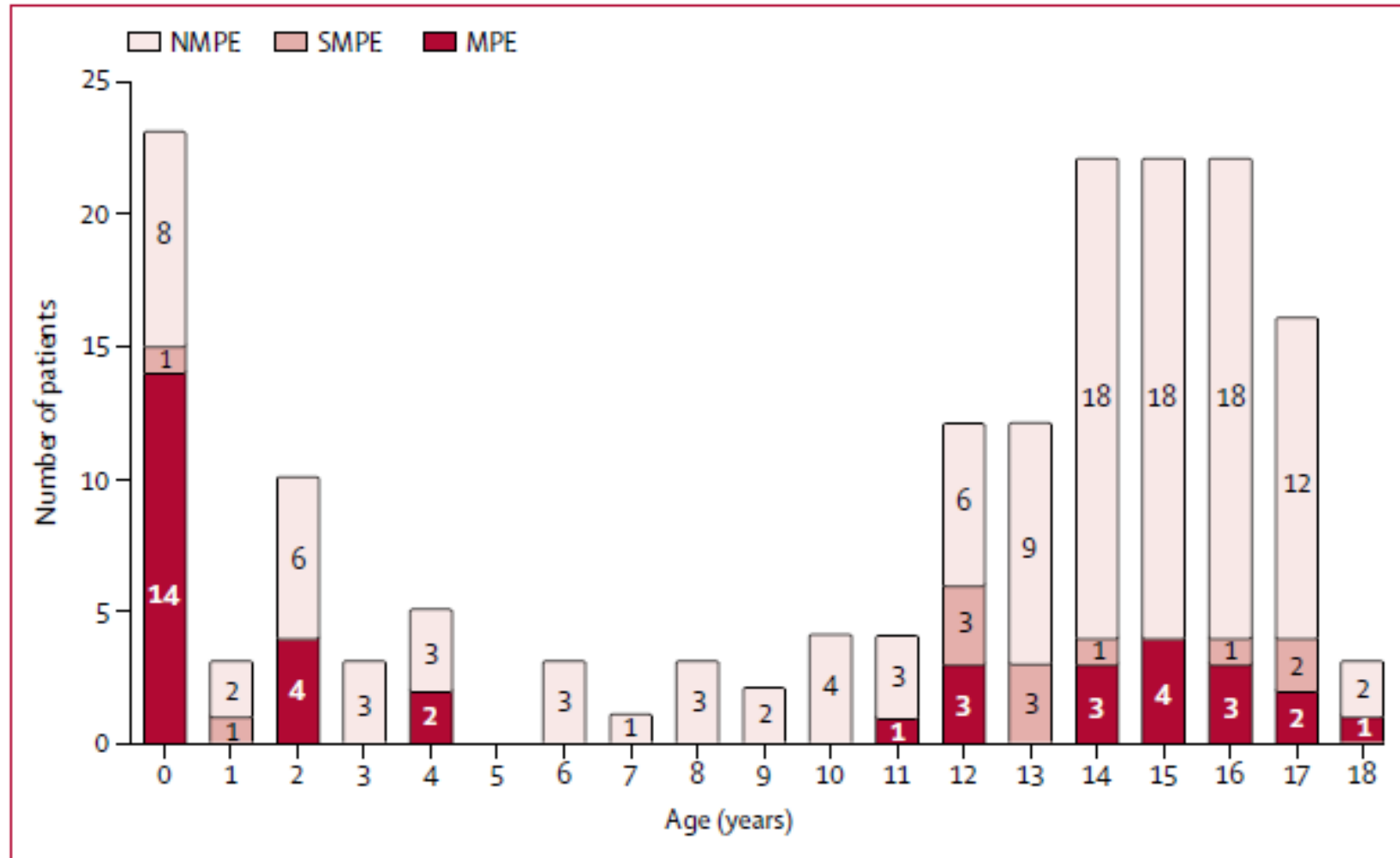




Pulmonary Embolism

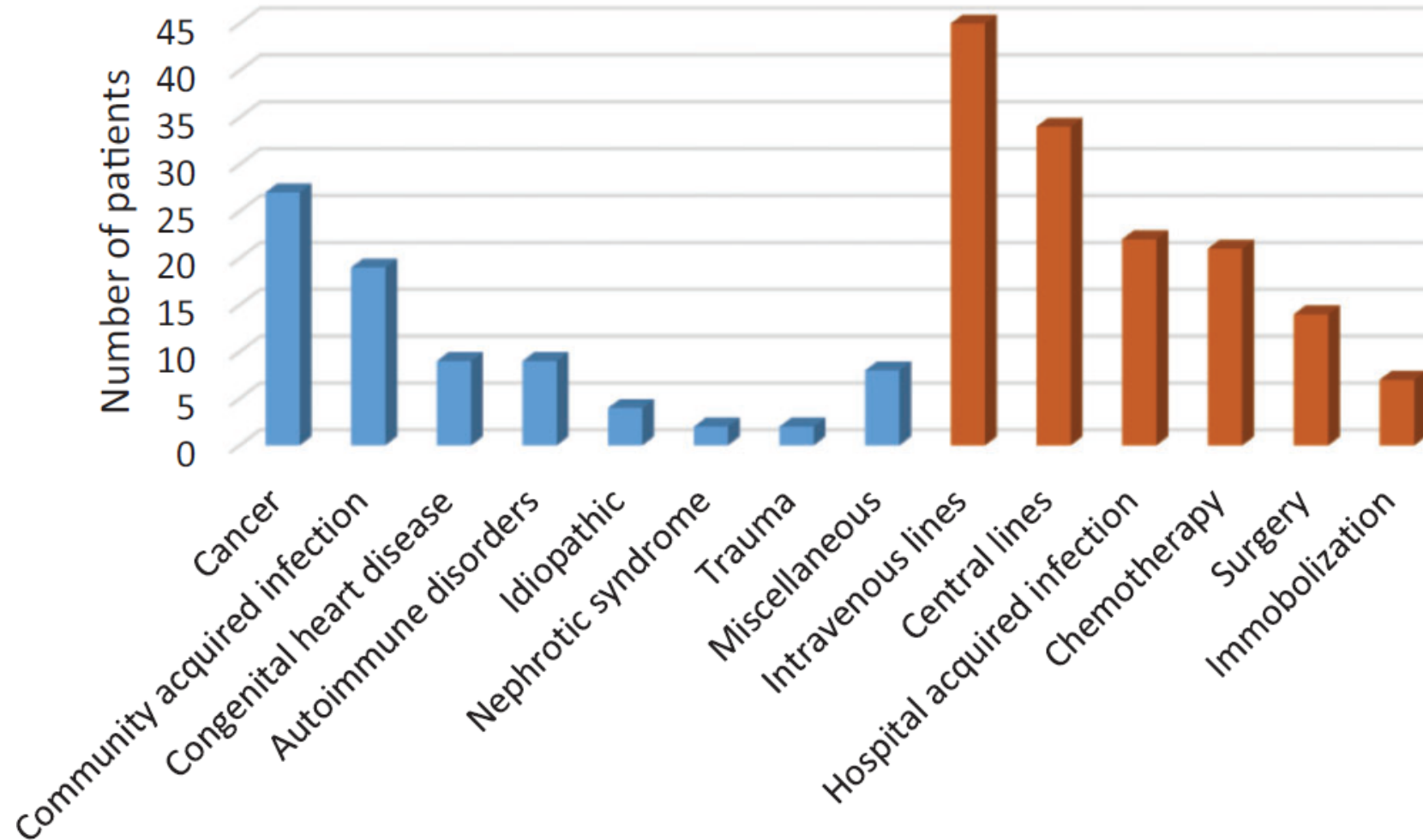
Epidemiology

Age Distribution of PE, Ages 0-18



(Lancet Haematol 2019;6: e144–53)

Risk Factors for PE, Ages 0-18

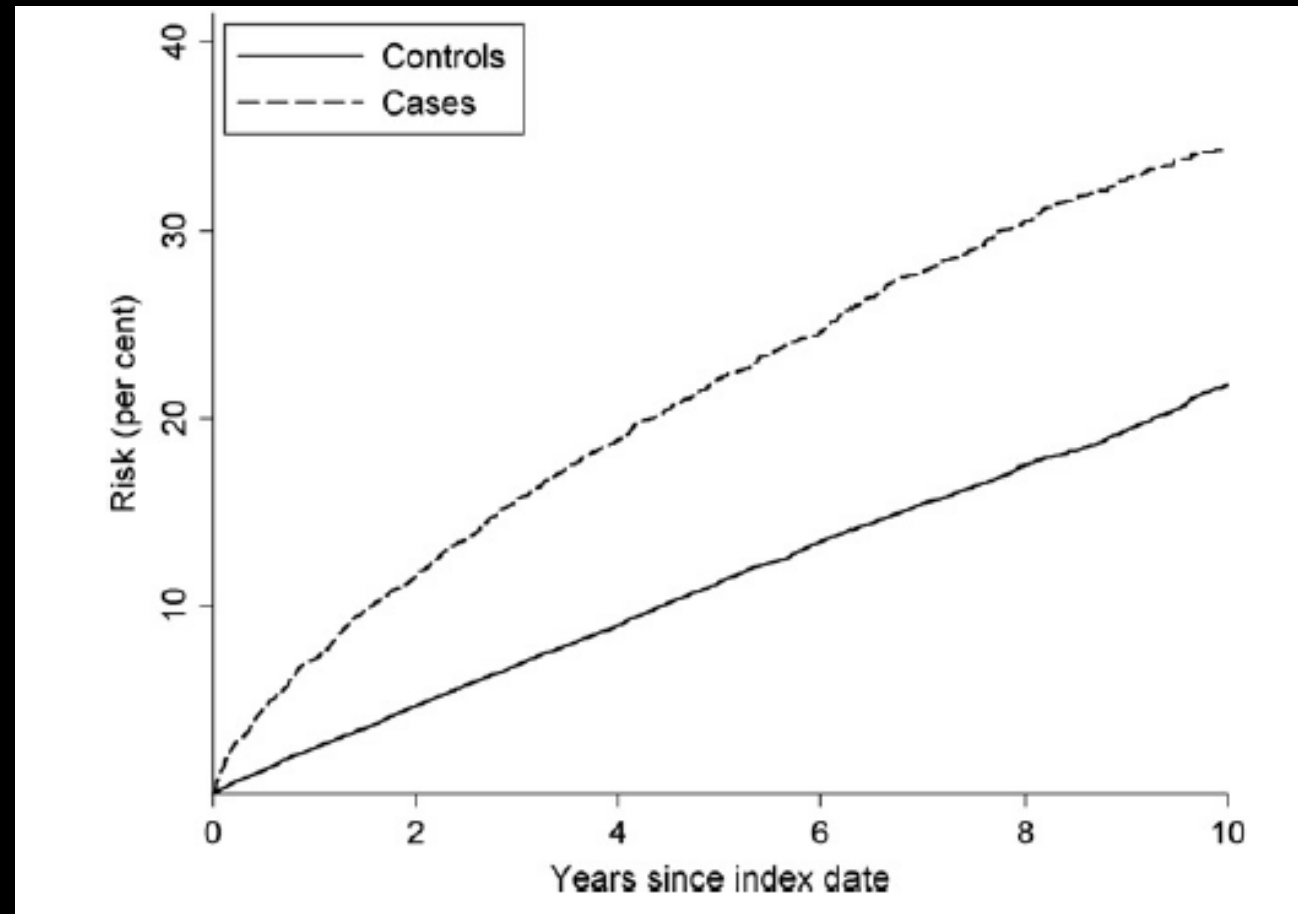


(Clinical and Applied Thrombosis/Hemostasis; 2021; 27: 1-8)

PE AND DVT:

PSYCHOLOGICAL
IMPACT AND LACK
OF PUBLIC
AWARENESS

RX OF ANTIPSYCHOTIC, ANXIOLYTIC, SEDATIVE, AND ANTIDEPRESSANT DRUGS TO VTE PATIENTS



(Hojen AA. Thrombosis Research 2015; 135: 643-647)

THEMES FROM OUR PE SUPPORT GROUP (patients regionally referred)

- Anger at delay in diagnosis
- Feeling well, looking well, yet harboring a major illness
- Yearning for an answer to “why me?”
- Protection of family members
- Optimal duration of anticoagulation
- NOAC versus VKA

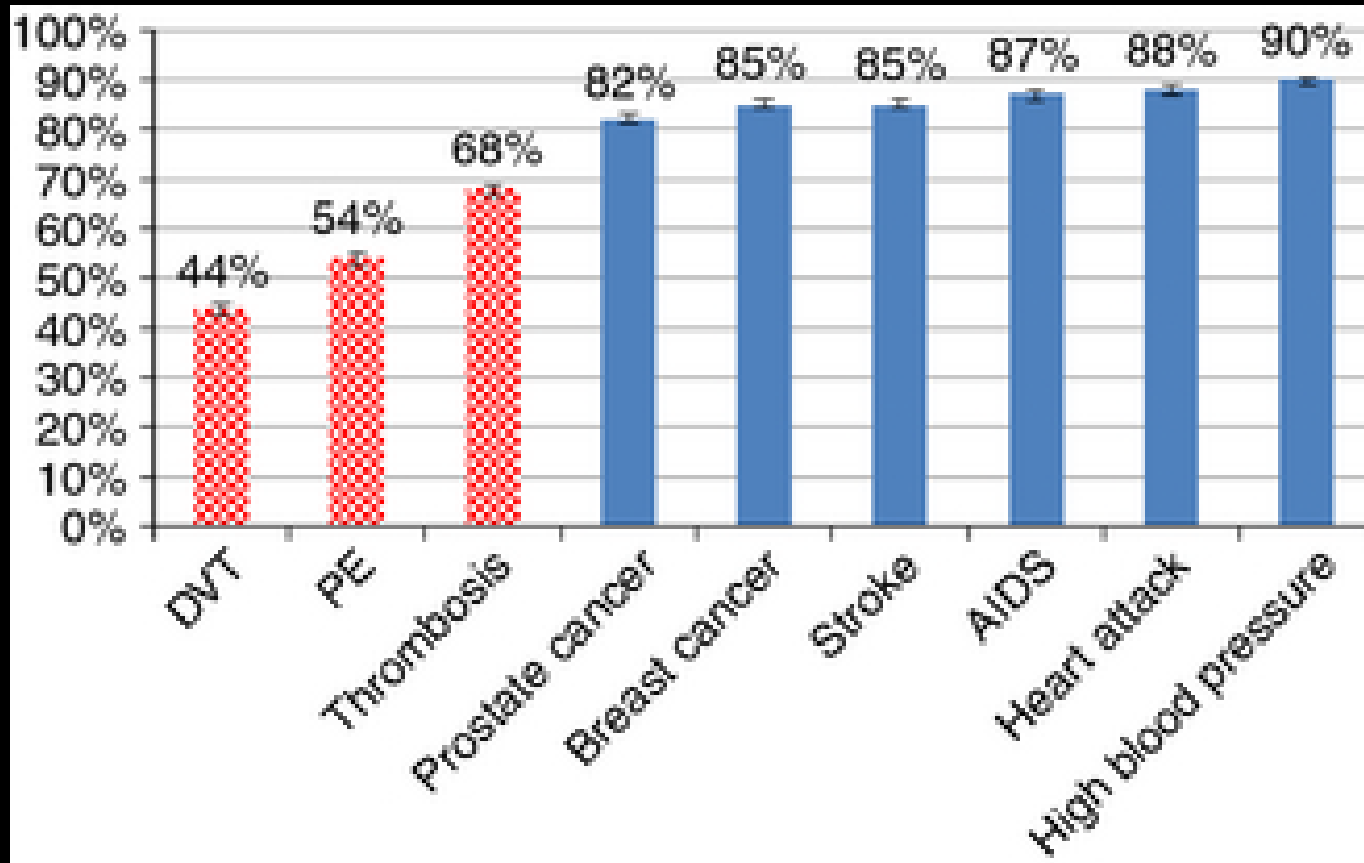
Rajan Speaks

“I will not allow my health problems to become an obstacle, nor will I be defined by my health. I spoke to my entire high school on the dangers of deep venous thrombosis and pulmonary embolism (PE). My most rewarding experience was establishing a PE Support Group in Orlando. I look forward to helping people in the future and making a difference in the lives of others. This is the beginning of a new road in my life.”

A Tribute to Rajan (crafted by Dr. Steve Ober)



PUBLIC AWARENESS: DVT/PE



(J Thromb Haemostasis 2015; 13: 1365-71)

ADVANCED THERAPY

BEYOND

ANTICOAGULATON

Algorithm to Treat PE in a Pediatric/ Young Adult Population

Journal Pre-proof

"Acute Management of High- and Intermediate-Risk Pulmonary Embolism in Children: A Review"

Catherine Ross, MD, Riten Kumar, MD, MSc, Marie-Claude Pelland-Marcotte, MD, Shivani Mehta, BA, Monica E. Kleinman, MD, Ravi R. Thiagarajan, MBBS, MPH, Muhammad B. Ghbeis, MD, Christina J. VanderPluym, MD, Kevin G. Friedman, MD, Diego Porras, MD, FAAP, Francis Fynn-Thompson, MD, Samuel Z. Goldhaber, MD, Leonardo R. Brandão, MD, MSc

PII: S0012-3692(21)04057-5

DOI: <https://doi.org/10.1016/j.chest.2021.09.019>

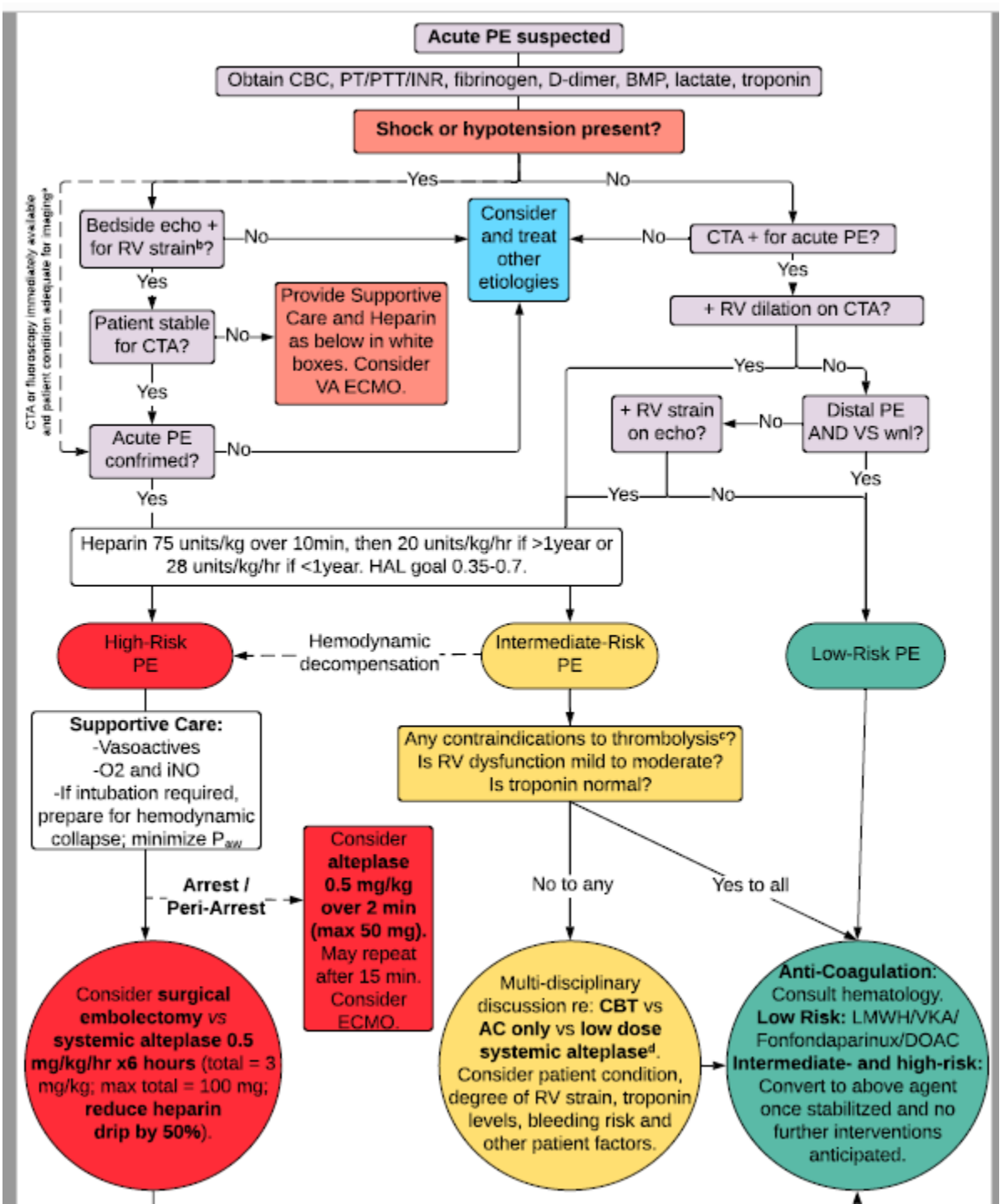
Reference: CHEST 4626

To appear in: CHEST

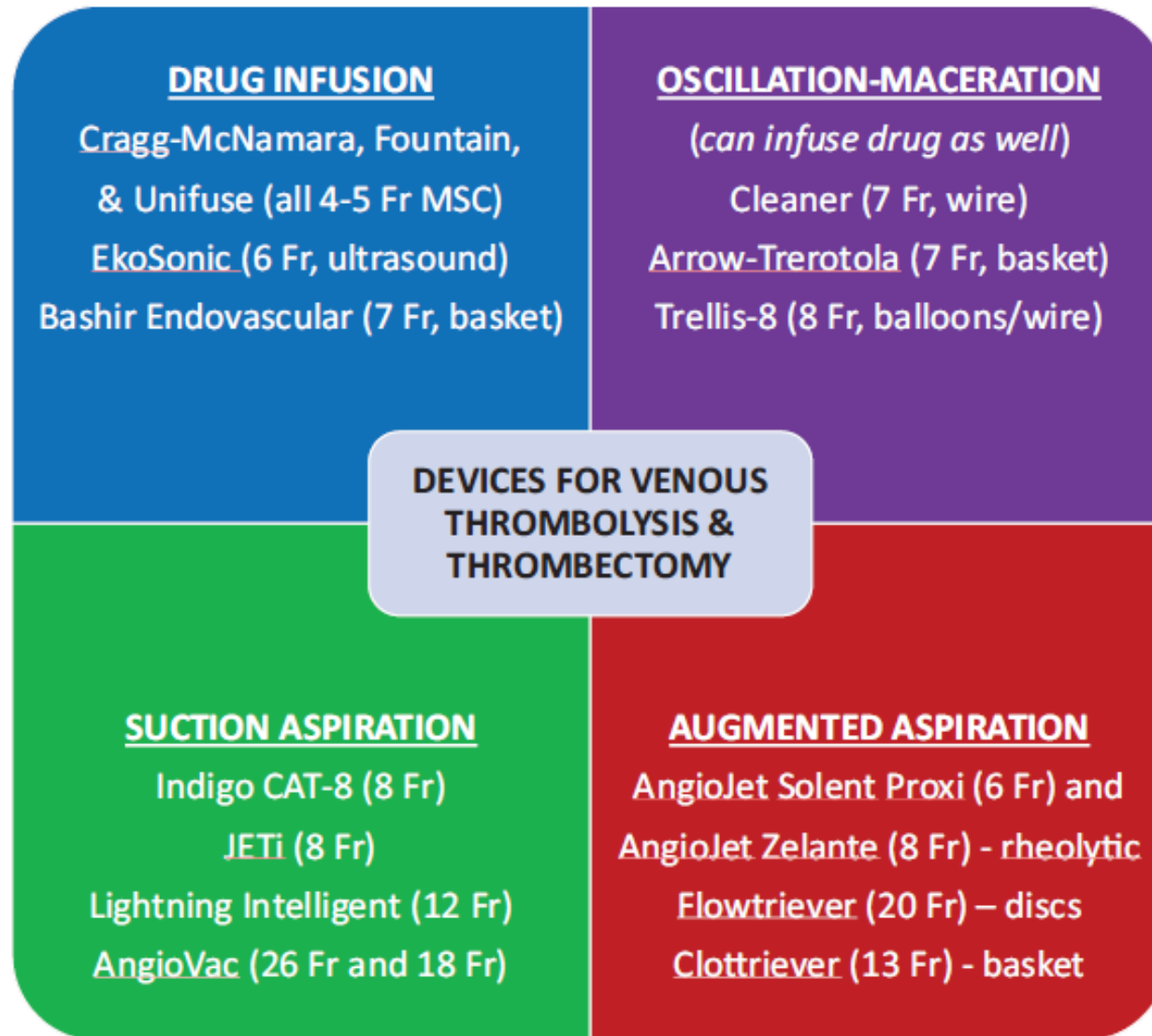
Received Date: 21 June 2021

Revised Date: 9 September 2021

Accepted Date: 20 September 2021



Thrombolysis and Thrombectomy Devices



(Goldhaber SZ. Vascular Medicine 2021; October 4)

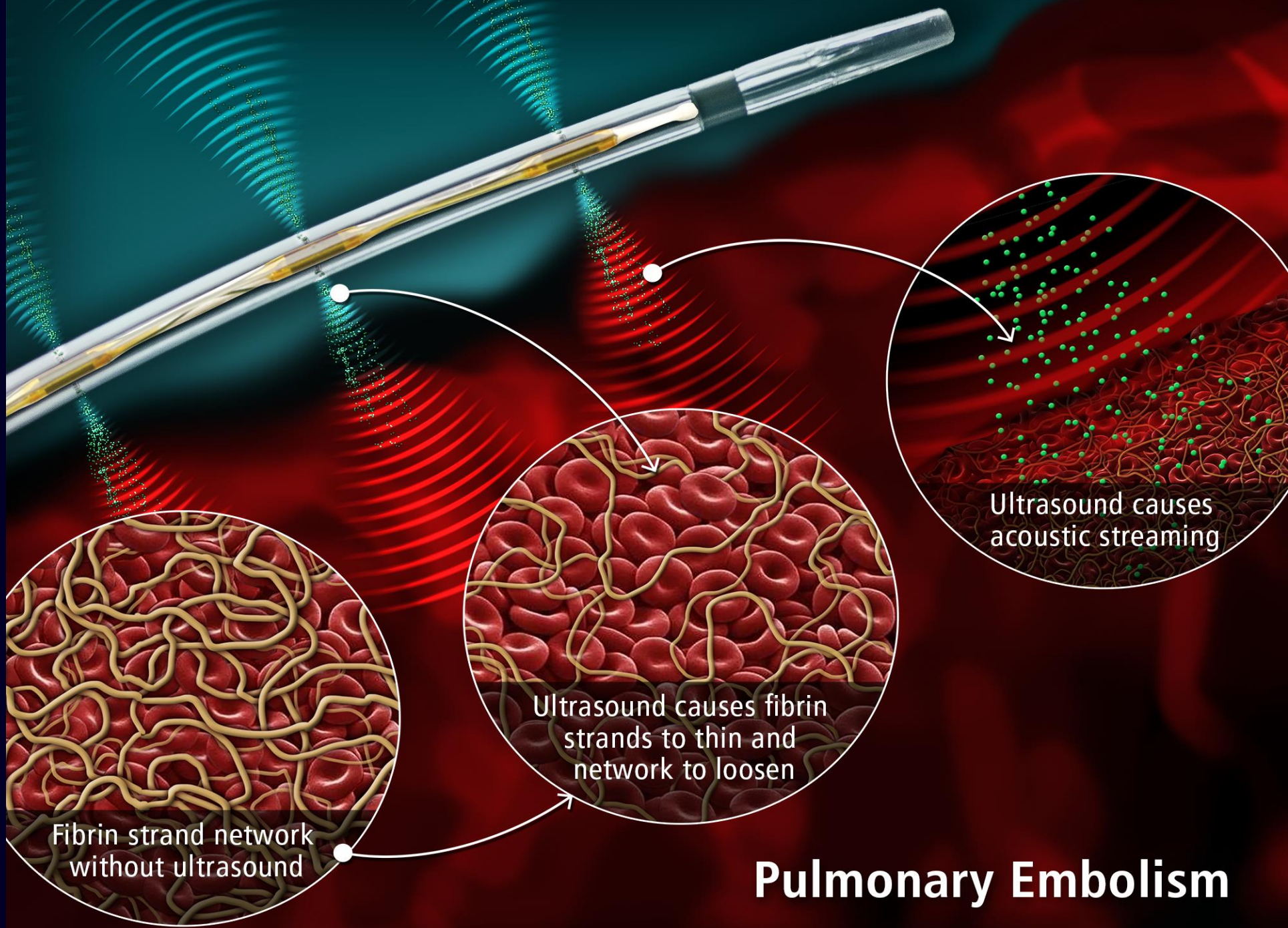
Drug Delivery Catheter

EKOS

Sideholes for Delivery of
Fibrinolytic Agent

Ultrasound Core Catheter

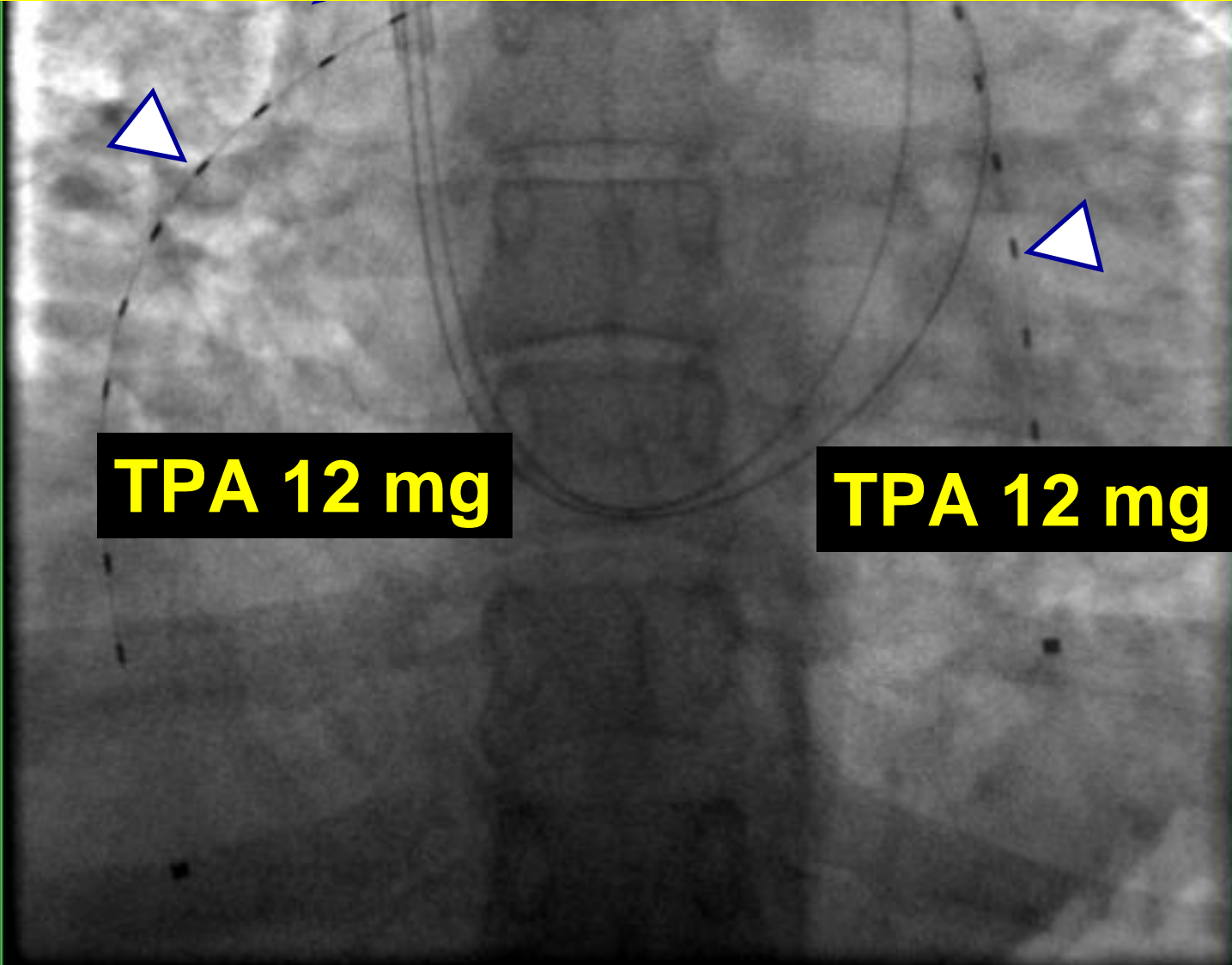
High Frequency, Low Power
Ultrasound Transducers



Pulmonary Embolism



TPA 24 mg/12h = total TPA
dose

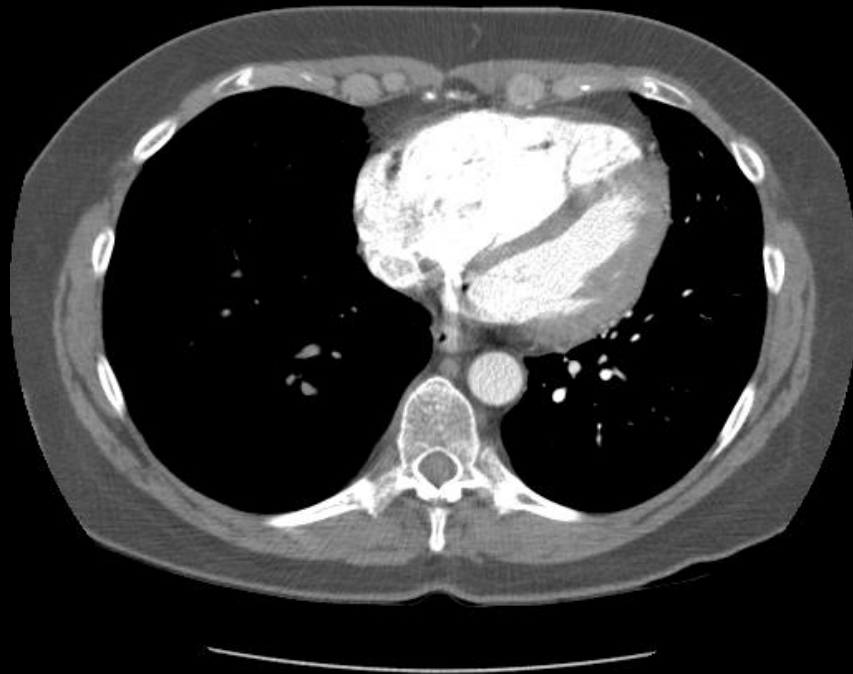


TPA 12 mg

TPA 12 mg

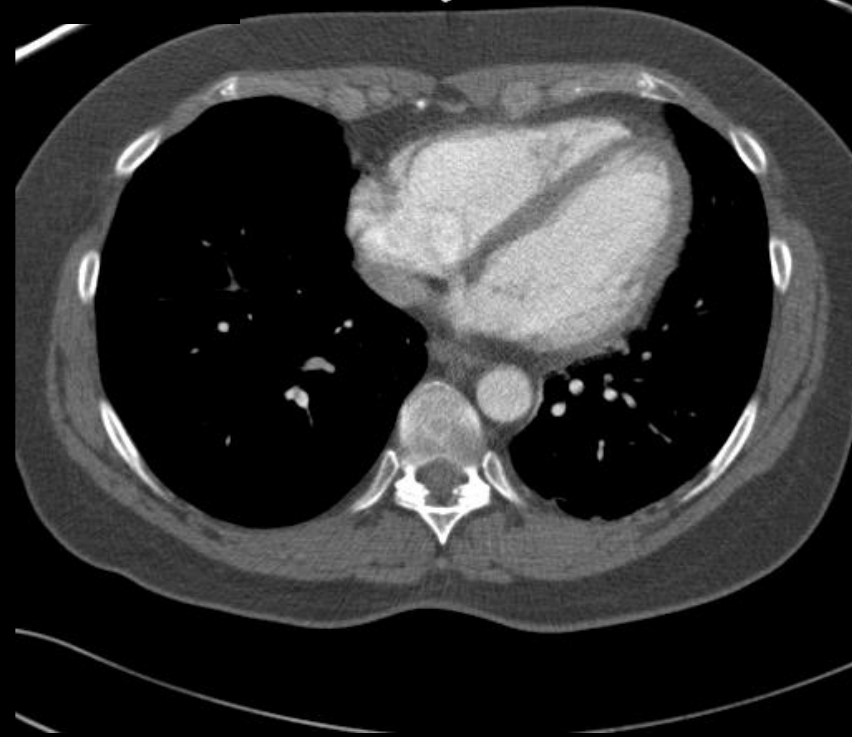
RV/LV Ratio: Pre- and Post-Procedure

Pre



$RV/LV = 2.5$

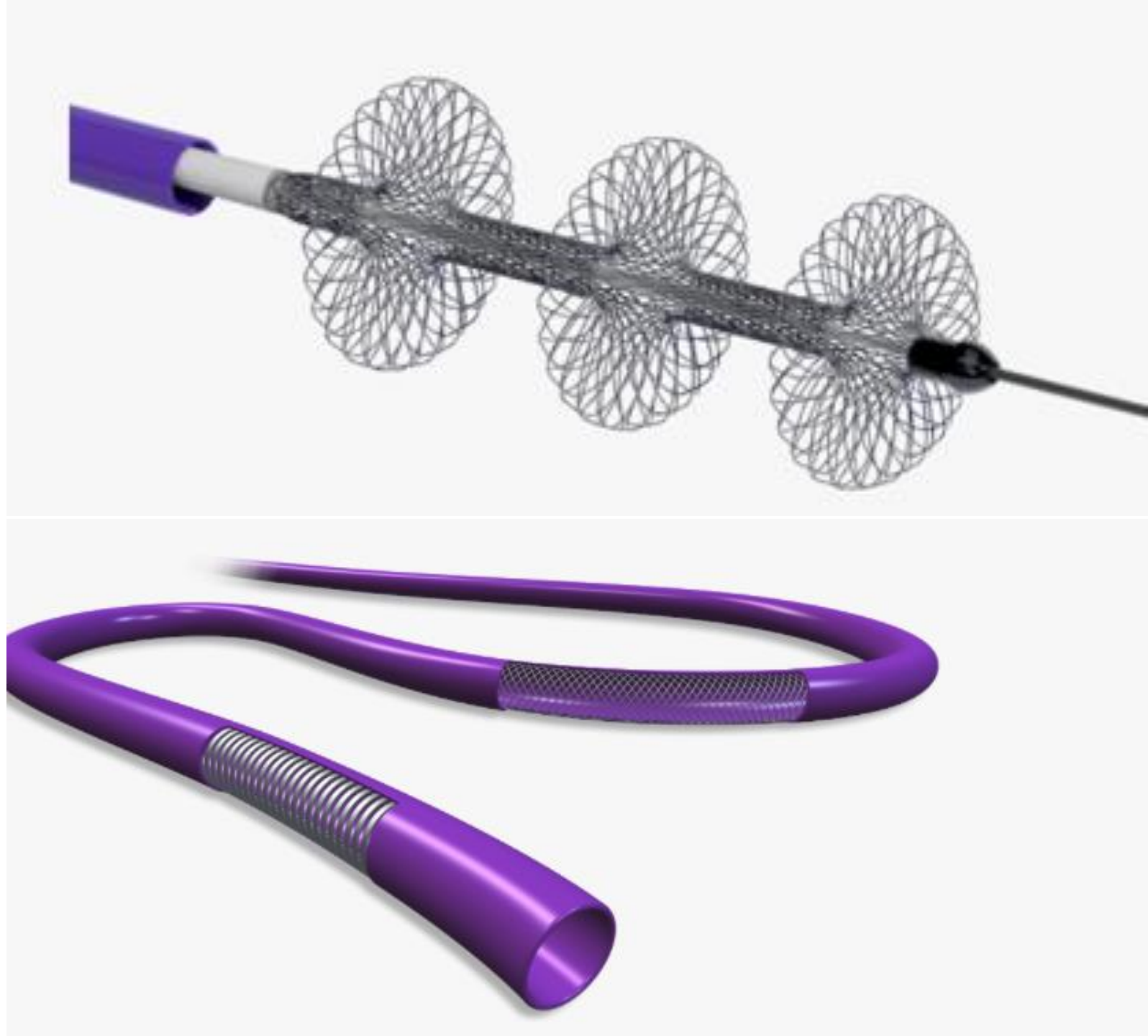
Post



$RV/LV = 0.7$

(Courtesy of Keith M. Sterling, MD)

FlowTrievers:
20F—No TPA



BWH FlowTriever Pulmonary Embolectomy #1—Drs. Bergmark and Shah



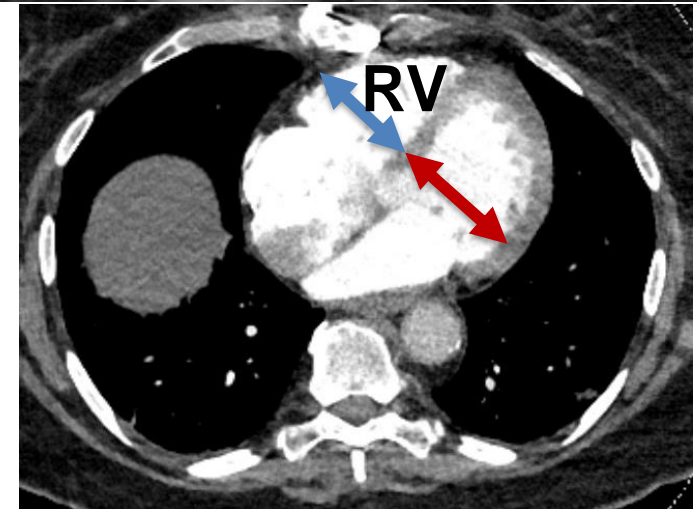
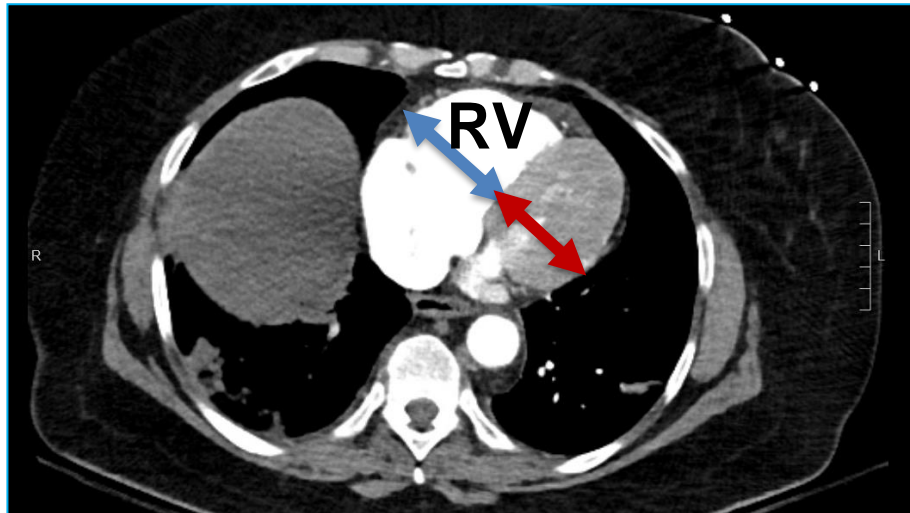
BWH Surgical Embolectomy: 2020



July 23, 2020



September 1, 2020



Paths for Future PE Investigation

Optimizing RV-to-LV hemodynamic relationships

- Goal-directed volume management
- Diuretic therapy

Distal pulmonary artery reperfusion

- Fibrinolytic-based therapies



Pulmonary artery vasodilation

- Pulmonary vasodilator therapy
- Ultrasound-mediated vasodilation

Other

- Anti-inflammatory therapy

(Piazza G 2021; European Heart J—Acute Cardiovascular Care)

Take Home Messages

- Embrace life with passion, gusto, and purpose
- Stay well rounded
- If you reach a fork in the road, ask yourself:
“Which path would Rajan take?”
- Stay fit and pursue a heart-healthy lifestyle
- Follow Rajan’s example and educate others about prevention and treatment of PE