

# Fixed-dose, ultrasound-assisted, catheter-directed thrombolysis (USAT) for acute PE

Short- and long-term outcome data from a single-center study

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# Conflicts of interest

- No personal conflict of interest
- Funding: unrestricted grant from Boston Scientific

# Reperfusion treatment for intermediate-high PE patients

- We need a better definition of stable, at-risk patients
- Safer reperfusion strategies
- Focus also on long-term outcomes

# Patients and Methods

## USAT for intermediate-high and high risk PE

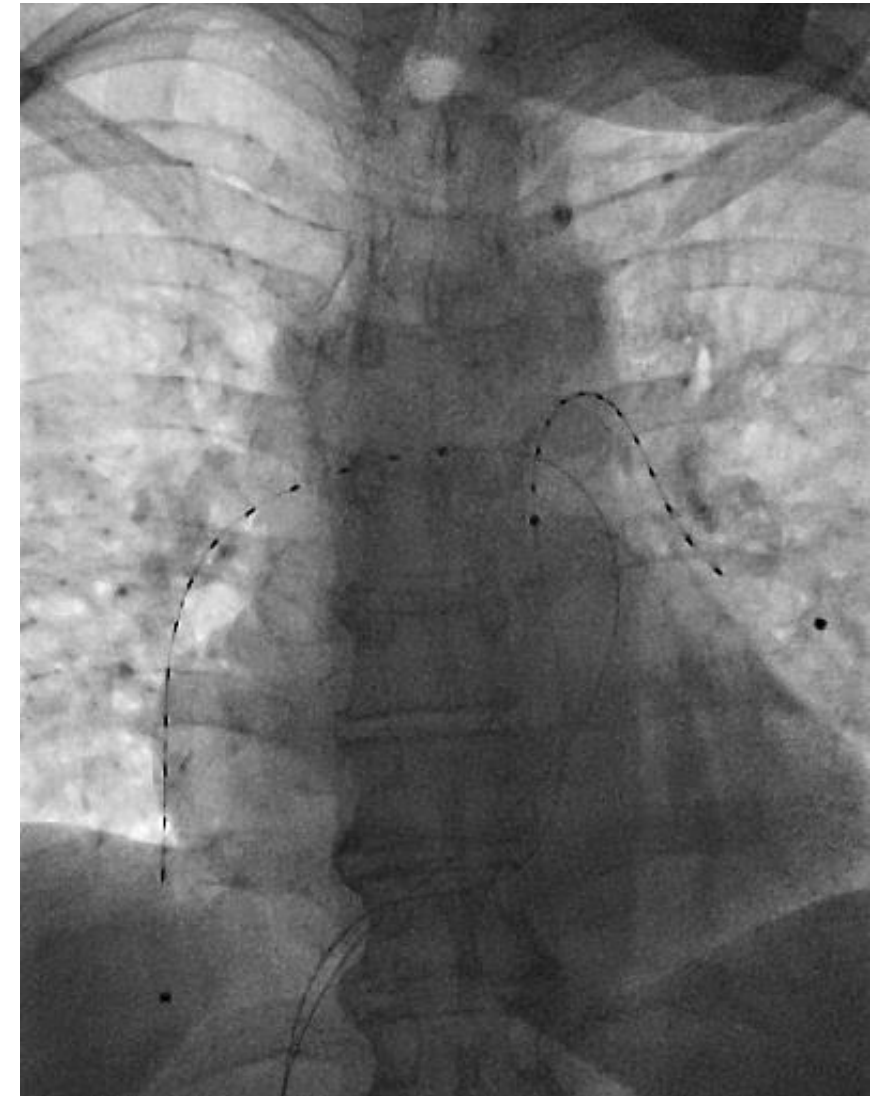
University Hospital Zurich, 2018-2022

## Enriched definition of intermediate-high risk PE

RVD, troponin, lactates, vital signs, respiratory parameters, signs of chronicity/anatomy of PE, velocity of early deterioration/progression, ...

## USAT scheme

- Alteplase 10mg pro catheter over 15 hours
- Weight-adapted UFH
- Monitoring of fibrinogen and aXa activity



# Study Outcomes

## Short-term (30 days):

- mPAP
- median NEWS
- hemodynamic decompensation and death
- major bleeding

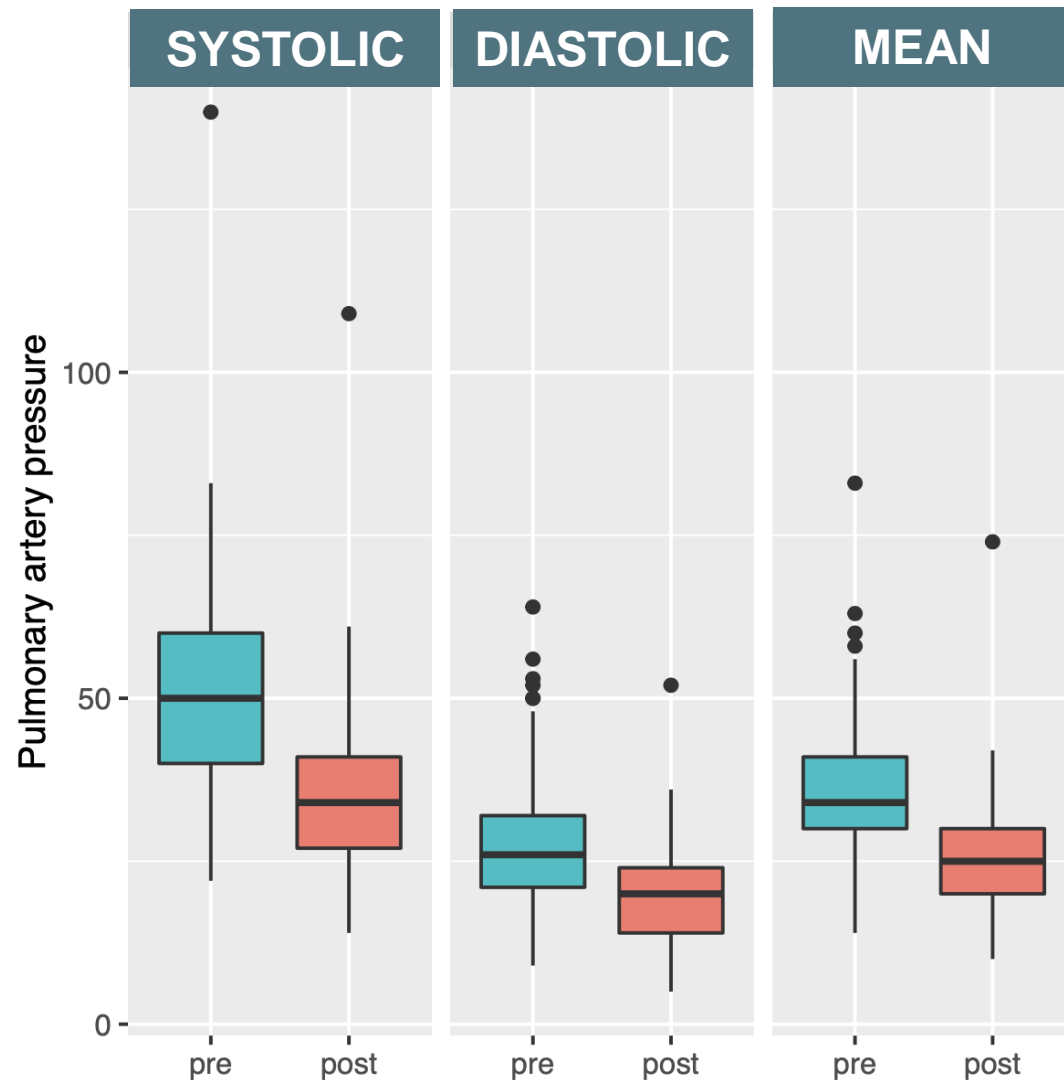
## Long-term (3-6 months):

- persistent symptoms (dyspnea) and echocardiographic abnormalities\*
- CTEPH
- PE recurrence

# USAT for severe PE in Zurich: 2018-2022

<b>Baseline characteristics</b>	<b>N=161</b>
Men, n/N (%)	96/161 (59.6)
Age (years), mean (SD)	67.8 (14.6)
Cancer, n (%)	20 (12.4)
Surgery in the last 30 days, n (%)	10 (6.2)
Concomitant DVT, n (%)	110 (68.3)
PE location, n (%)	Central: 151/161 (93.8)
ESC high-risk class, n (%)	20/161 (12.4)
RV/LV ratio by CT, mean $\pm$ SD	1.3 (0.2)
Troponin I (ng/ml), median (Q1, Q3)	68 (38.5-161)

## Results: Invasively measured pulmonary arterial pressure (PAP)



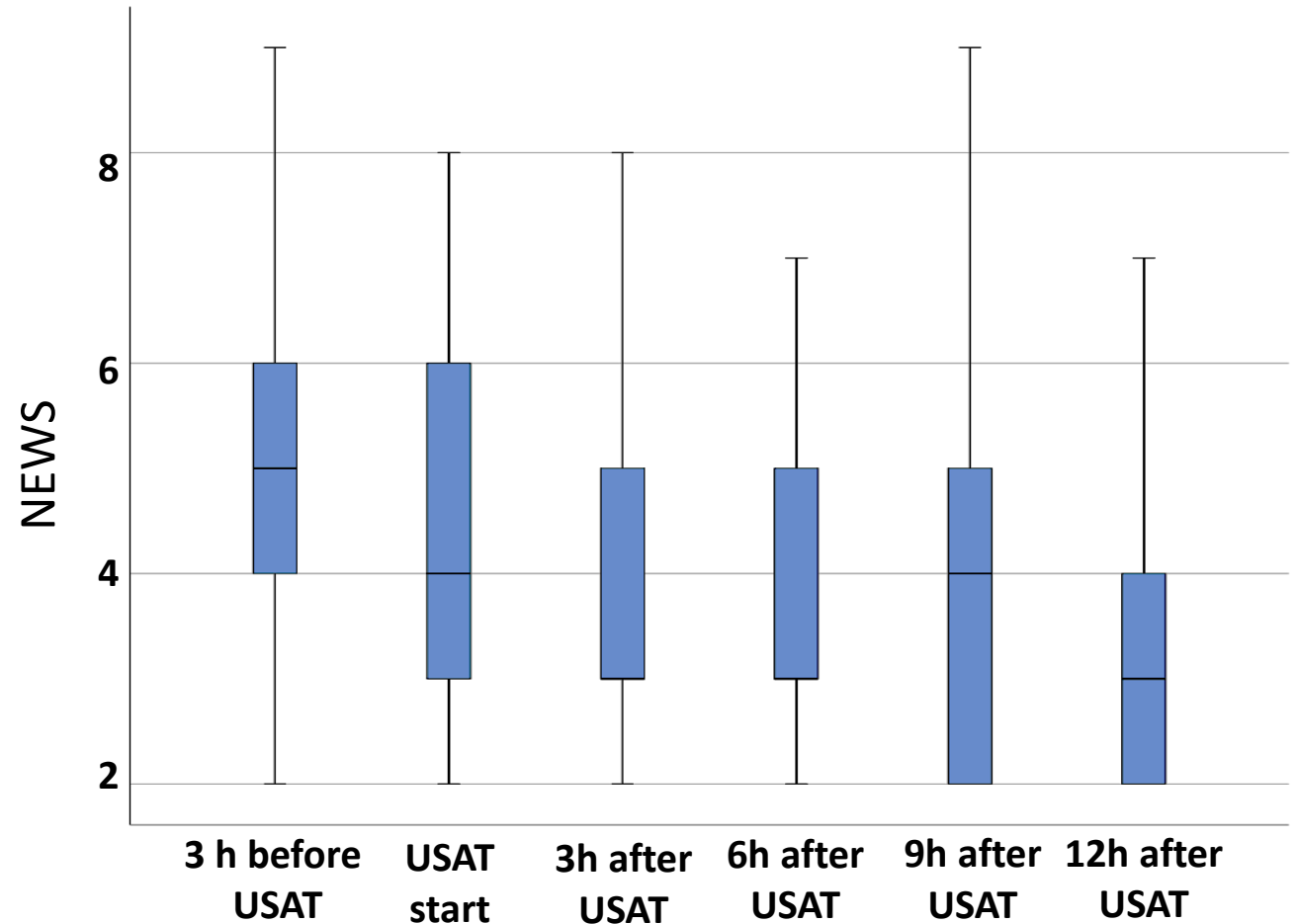
**Average mPAP decreased from 35.6 mmHg to 25.6 mmHg**

resulting in a mean difference of 10.5 mmHg (95%-CI: 9.0-11.5;  $p < 0.001$ )

# Results: National Early Warning Score (NEWS)

**Median NEWS improved from 5 to 3 points within 12 hours after the procedure start**

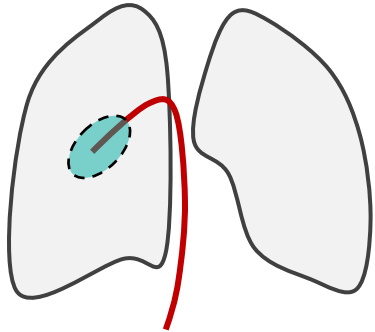
(-2 reduction; 95%-CI: 1.5-2.5;  $p < 0.001$ )





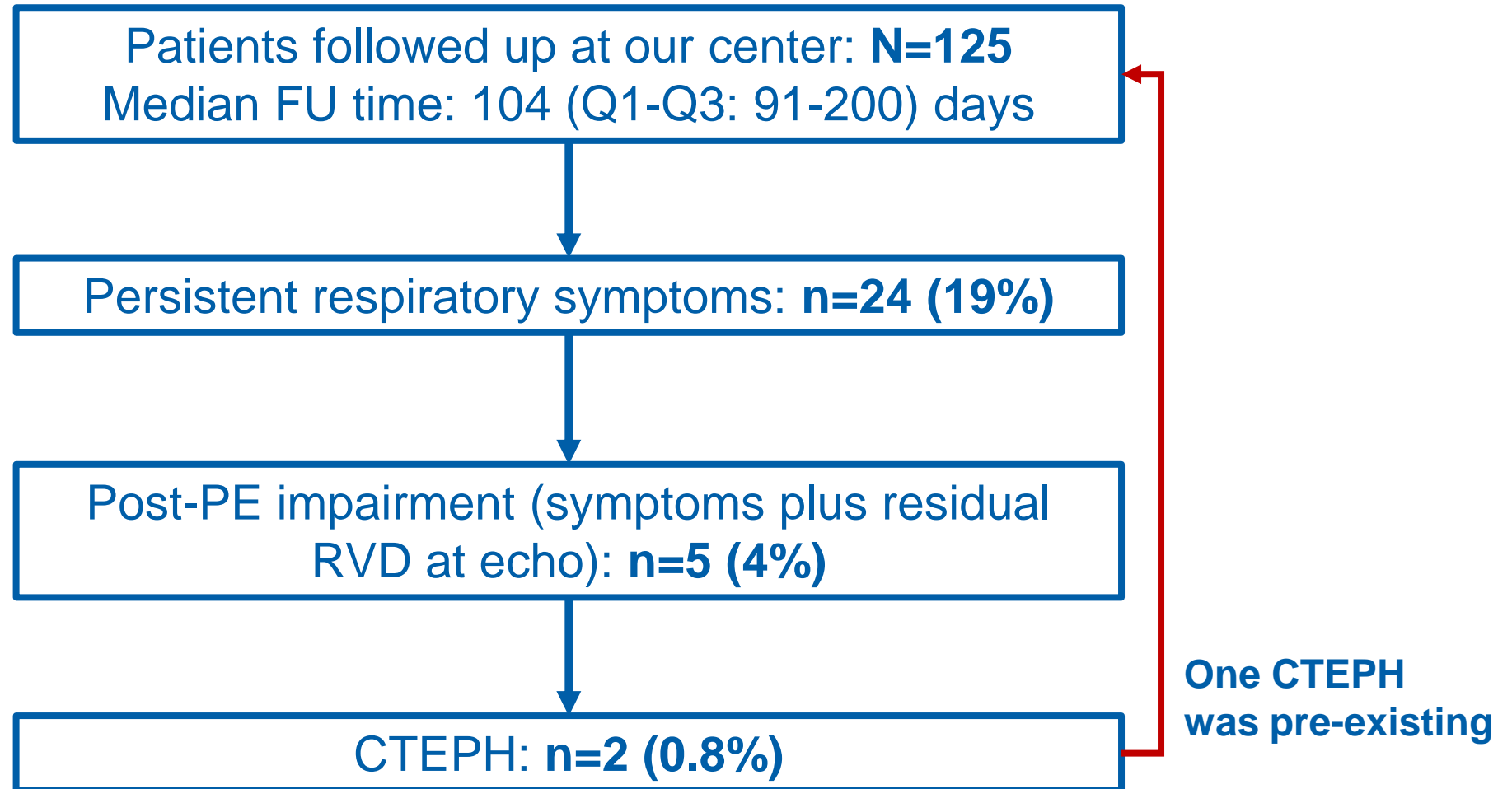
## Results: Short-term (30-day) clinical outcomes

Catheter-directed  
ultrasound-accelerated  
local thrombolysis (USAT)



- No cases of hemodynamic decompensation
- Two (1.2%) major bleeding events
- One (0.6%) death due to ICH

## Results: Long-term clinical outcomes



## Conclusion

- In this experience, fixed-dose USAT was an effective and safe approach for severe PE patients
- Data on long-term outcomes is promising

# Thanks for your attention

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