Pulmonary Embolism Rule-out Criteria - Is it good enough?

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GENERAL SECRETARY

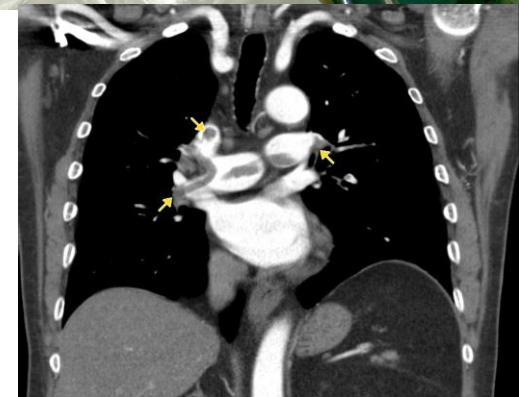**SOCIETY FOR EMERGENCY MEDICINE INDIA**

2 days ago

Internal Ethics Committee Meeting

Massive Pulmonary Embolism

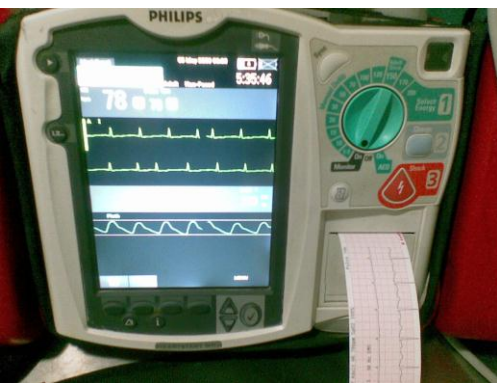**Classical Signs and Symptoms**

- Severe shortness of breath
- Chest pain
- Distress
- ECG changes
- ECHO findings

Such patients easily trigger investigations/ consults/resuscitative treatment

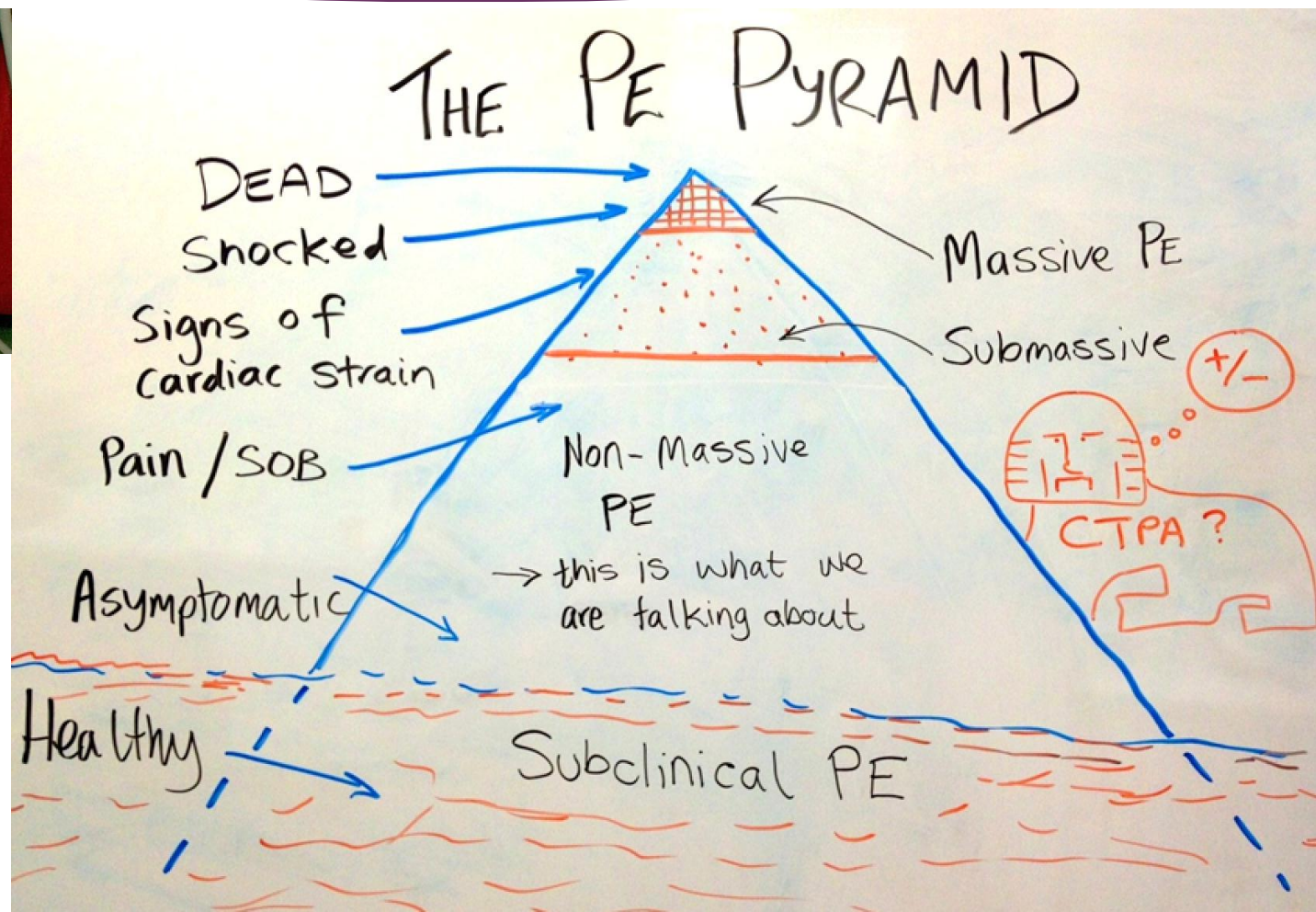# What is difficult to identify

No shock
No chest pain
Minimal SOB
Mild discomfort

Vitals normal
No symptoms

Undiagnosed PE – The Silent Killer

"1 in 1000 patients has venous thromboembolism"

"400000 patients present with DVT / PE every year in USA"

"10000 patients die each year with DVT / PE"

"Half of the cases are never diagnosed"

No data

Main Stay of Treatment

Clinical suspicion

Point-of-care / Bedside tests

D-Dimer

CT angiography

Confirmation of diagnosis

Thrombolysis / Anticoagulation

Hospitalization

Scores used to identify / risk stratify PE

- **Well's Score**
- **Modified Well's Score**
- **Simplified Well's Score**
- **BMJ Simplified Well's Score**
- **Geneva Score**
- **Revised Geneva Score**
- **Simplified version of Geneva Score**
- **PERC**

Pulmonary Embolism Rule-out Criteria - PERC

Clinical diagnostic rule designed to exclude PE.

PE can be RULED OUT _if all 8 criteria are met_ –

>**Age < 50**
>
>**Pulse < 100**
>
>**SaO2 >95%**
>
>**No hemoptysis**
>
>**No estrogen use**
>
>**No surgery or trauma in 4 weeks**
>
>**No previous venous thromboembolism**
>
>**No unilateral leg swelling**

8 PERC CRITERIA

Case

- 30 year old man
- Healthy, no risk factors
- Exercises daily
- Vague lower back pain, after a workout session
- Redness and mild swelling of right thigh

- Color doppler
- CT angiography

NO scoring systems used on this patient

Clinical Experience / Decision Making

▶ **Also known as CLINICAL GESTALT**

"Gut instinct"

"Expert's calculated risk"

▶ **Very important component in assessment of a patient suspected to have PE.**

▶ **Since clinical experience varies, scoring systems are used to achieve a certain standard of care.**

▶ **Objective criteria or gestalt clinical assessment may be used to risk stratify patients. – ACEP**

Advantages of PERC

Rapid and easy

Avoids unnecessary investigations

Avoids risks related to CT radiation and contrast injection

Saved costs (D-dimer, CT angio, consults)

Avoided inter-hospital / higher hospital transfers

Returns focus on alternate diagnoses

Problems with PERC

Scoring will fail where -

Tachycardia is masked (beta blockers)

Leg swelling cannot be detected (obese patients)

Long standing hypoxemia (ILD)

History is unreliable (No family with patient)

Evidence Supporting PERC

- **PERC alone cannot safely identify very low risk patients – Hugle et all, 2011**

- **In patients with low probability of PE, use PERC to exclude diagnosis – ACEP, Level B Recommendation**

- **PERC is currently being validated in various settings.**

Comparison with other scores

Modified Well's Score

▶ **Used to assess the clinical probability of PE.**

▶ **To determine whether PE is likely or unlikely.**

Revised Geneva Score

▶ **Low / Intermediate / High probability**

8-point PERC

▶ **Is only used a rule-out criteria**

Ideal Suggestion

Risk Stratify → PERC → Clinical Decision

Summary

American College of Physicians - 2015

- **Categorize the risk – Well's Score or Revised Geneva Score.**

- **If patient is at low risk – Use the PERC. If patient meets all 8 criteria, no further testing is needed** (Risks of testing are greater than the risk of embolism).

- **If patient at intermediate risk or PERC not met – D-Dimer test should be initial investigation.**

- **If D-Dimer < 500ng (upto 50yrs age) - then no imaging needed.**

- **For high risk patient – Perform CT angiography directly**

Take Home Points

▶ **Subclinical pulmonary embolism is difficult to identify.**

▶ **Start tracking your patient data.**

▶ **PE scoring systems must be supported by the clinical decision of senior EM physician.**

▶ **PERC is simple and rapid way to rule out PE in low risk patients.**

▶ **Await results of ongoing trials validating PERC** (Eg: PROPER).

PERC is good enough! – To rule out only. And not for all patients.

Thank you for your time

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