

Procalcitonin: A Successful Clinical Formula in the Emergency Department?

Presenter: Agampodi Umanda De Thabrew FY2 Doctor a.dethabrew@nhs.net



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۲	What i	s PCT?	
	Procalcitonin – normally an intermediate product in Calcitonin synthesis		EHMA European Health Management Association The Princess
	PCT in healthy subjects is produced in the thyroid	and immediately processed to calcitonin	NHS Trust
	(pro)Calcitonin Synthesis	Release occurs in the form of the posttranslational processed hormone Calcitonin	
•	Thyroid	Golgi apparatus	
<b>)))</b>	Thursoyes Thursoy		
	c-ceis → Calcitonin	Regulated secretion	shutterstock.com • 154381466
۲	PCT correlates with the severity of the infection	Linscheid P. et al., Endocrinology 2003 Müller B. et al., JCEM 2001	
420. 420.	PCT reflects better the efficacy of initiated therapy	PCT allows a better differentiation of bacteri infection from non infectious causes of inflamm	ation #EHMA2020

# **Aims and Measurements**



- Increasing recognition and early management of sepsis
  - Optimal use of antibiotics

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Reduction in mortality and morbidity

- Length of stay
- Admission to ITU
- Mortality rate
- Readmission rate
- Antibiotic usage
- Cost difference

### **Admissions Criteria**

NEWS  $\geq$  3 and QSOFA  $\geq$  2

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OR

NEWS≥ 3 and 1 QSOFA plus one of:

- Lactate >/= 2.5

Temp >/= 38 degrees or </= 36 degrees</li>
Urine output <0.5ml/kg/hr</li>
WBC >/=12 or </= 4x109/L</li>

- Chemotherapy in last 6 weeks

#### • QSOFA:

- Respiratory rate ≥ 22
- Systolic BP ≤ 100mmHg
- Altered mental state or GCS ≤ 13



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SEPSIS SIX + Procalcitonin - Start Sepsis 6 and request sepsis panel(included procalcitonin)

- Complete Sepsis 6 pro-forma

- Clamp the laminate over the clinical folder





**PDSA 2 – 278** 

Patient sex is 1:1











- PCT in ED ≤0.2 crude mortality rate 9.7%
- PCT in ED ≥0.3 crude mortality rate 19.4%
  - P value <0.001
  - Actual mortality rate 13.5%

# **ICU Admissions**

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- ICU admissions median PCT 0.4
- Non admission median PCT 0.2



## What Does the Data Tell Us?

#### Mortality and ICU Rates

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्र य्ट्रेण  Demonstrate a group of high risk patients with PCT ≥0.3 who NEED to be reviewed by a consultant in ED

#### **Demographic Spread**

- Neutropenic sepsis group was disproportionate
- Further evaluation in PDSA 3
- Larger dataset may inform further

#### Antibiotic Usage

 PCT has potential to facilitate earlier discontinuation of antibiotics and therefore lessen cost and side effects





(Wirz et al., 2018)

### Procalcitonin Guided Antibiotic Therapy (PGAT) Excluding

neutropenic sepsis patients

at ED

1st PCT

≥0.3

1st

1st and 2<sup>nd</sup>

PCT≤0.2

PCT≤0.2

- +ve triage for sepsis deliver sepsis 6 + take PCT blood Patient sample presents
  - Registrar or consultant review in ED within 1 hour
  - Continue with antibiotics as per antibiotic policy
  - Order repeat PCT for 24-36 hours
    - Continue with antibiotics as per antibiotic policy
- Order repeat PCT for 24-36 hours PCT≤0.2

• Reconsider diagnosis of bacterial infection or sepsis: a) convert antibiotics from IV to oral and complete course b) Stop antibiotics as bacterial sepsis excluded

•Continue with antibiotics as per antibiotic policy 1<sup>st</sup> PCT ≥0.3 and 2<sup>nd</sup>











Project Lead: Dr Andrea Annoni ED Consultant

Dr Marie Parsons - Consultant Clinical Scientist and Laboratory Lead

Miss Helen Pardoe -Sepsis and AKI Lead at PAHT, Associate medical director of QI and Colorectal Consultant

Dr Georgia Lucas GP ST1 & Deputy Sepsis Lead at PAHT

Dr Angela Bartolf GP ST1 Project analysis - Nicholas Kroll Dr Umanda De Thabrew FY2 ED Dr Zoya Murtaza ACCS-EM ST2 Dr Siddarth Kumar IMT Dr Abrar Gani FY3 Surgery Project support- Robbie Ayers







### Thank you





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