



UWTASP
tele-antimicrobial stewardship program



July 10th, 2018

Chloe Bryson-Cahn MD

Marisa D'Angeli, MD

Zahra Escobar, PharmD

Rupali Jain, PharmD

John Lynch, MD, MPH

Natalia Martinez-Paz, MA, MPA

Paul Pottinger, MD

Agenda

- Chloe Bryson-Cahn:
PCT in Specific Scenarios
- Case Discussions
- Open Discussion

Procalcitonin in Specific Scenarios

Chloe Bryson-Cahn, MD
Harborview Medical Center
chloebc@uw.edu

July 10th, 2018

Do you have procalcitonin testing available at your site currently?

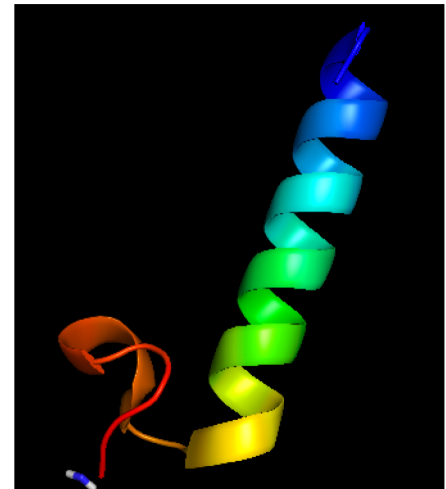
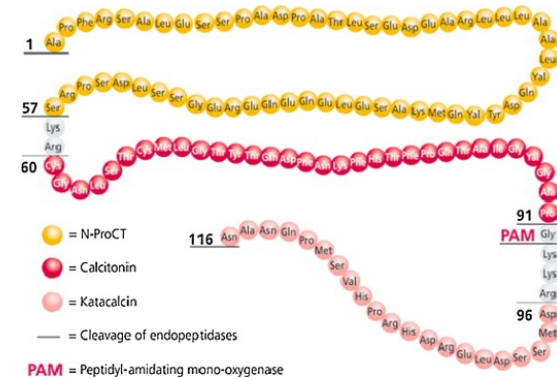
- A) Yes
- B) No
- C) Don't know

Are providers using procalcitonin testing for conditions other than respiratory tract infections and sepsis?

- A) Yes
- B) No
- C) Don't know

Procalcitonin

- Precursor of calcitonin
- Usually expressed in neuroendocrine cells only
- In bacterial infection, secreted into the blood
- Serum levels peak at 6 hours
- ? Clearance in CKD



Assays and Issues

- 2 FDA-approved assays
- BRAHMS
 - Platforms:
 - bioMerieux
 - Roche
 - Siemens
 - DiaSorin
- Diazyme
 - Platforms:
 - Abbot
 - Siemens
 - Roche
 - Beckman Coulter

UW not using Diazyme due to published & internal data reproducibility/reliability issues

Specific Scenarios

Evidence for PCT Use to guide abx in:

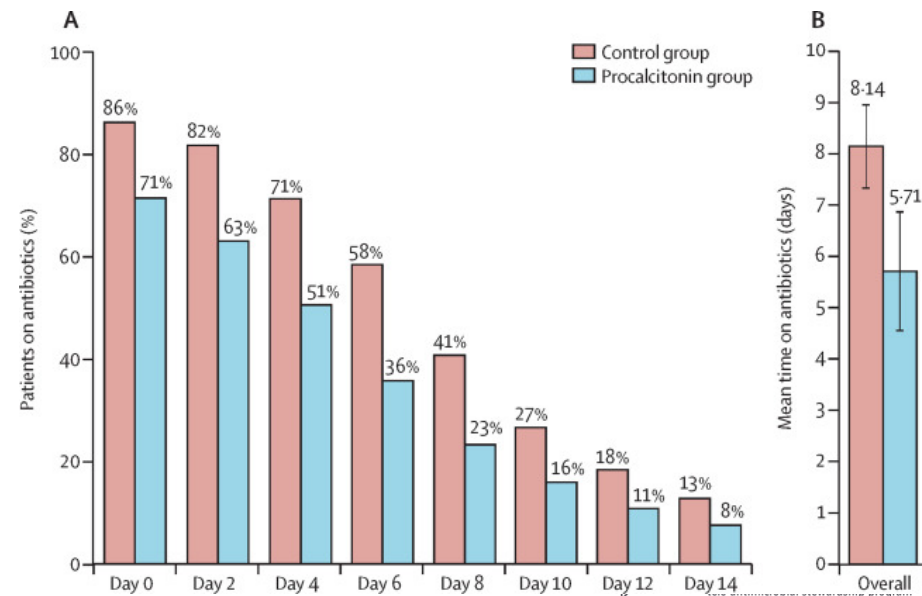
- Respiratory Infections
- Sepsis/Critically ill

Other scenarios:

- UTI
- Intra-abdominal infections
- Meningitis

PCT in Acute Respiratory Infections

- Patient level meta-analysis, 26 RCTs, 7k pts, 12 countries
 - CAP in 40%, most in ED or ICU
 - Recs similar – initiate or continue abx based on cut-off PCT value
- Outcomes:
 - 30 day mortality:
 - 9% in PCT vs. 10% controls*
 - Reduced abx days: 2.4*
 - Reduced abx AEs: OR 0.68*
- Limitations:
 - 1/26 studies done in the US

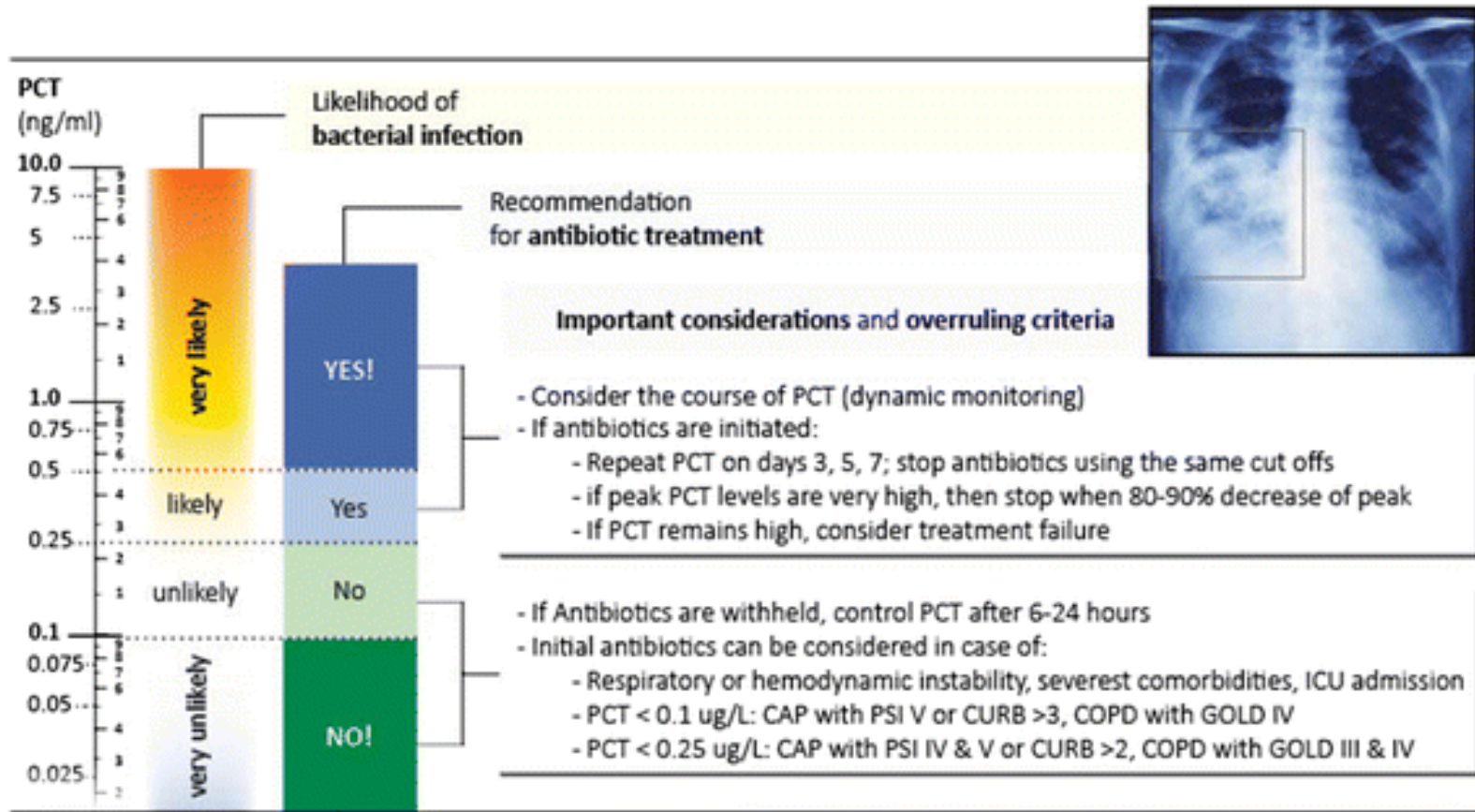


Other Meta-Analyses of PCT in ARI

| | Abx Reduced | Abx Days | Mortality Diff | Treatment failure Diff | Other adverse outcomes diff? | Source |
|--------------|-------------|----------|----------------|------------------------|------------------------------|----------|
| ED/Outpt | YES | -3* | No | No | | Cochrane |
| ICU | Maybe | -1.4 | No | No | | Cochrane |
| Primary Care | Maybe | -2 | No | | No | AHRQ |

* Statistically significant difference

PCT Algorithm



ProACT Trial

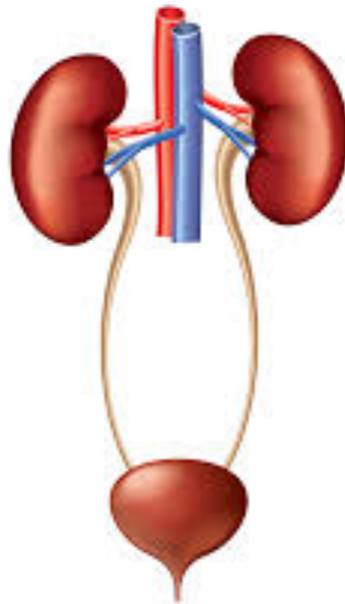
- Randomized trial, 14 US hospitals
- Adult patients with acute LRTI
 - PCT group (826): PCT at admission (rapid assay), repeated on day 1, 3, 5 and 7
 - Usual care group (830)
- Outcomes (at 30 days post enrollment)
 - Total # antibiotic days
 - Safety (composite)
- **Outcomes similar between the groups**

Evidence for PCT in Sepsis/Critically Ill

- Many trials, all with methodological limitations
- Cochrane review, 10 trials: sepsis - septic shock
 - Non-significant decrease in abx days, ICU stay, mortality
- Meta Analysis - PCT guided management in critically ill
 - 15 studies included
 - PCT to guide cessation: -1.3 abx days*
 - All trials: No overall difference in mortality nor abx duration

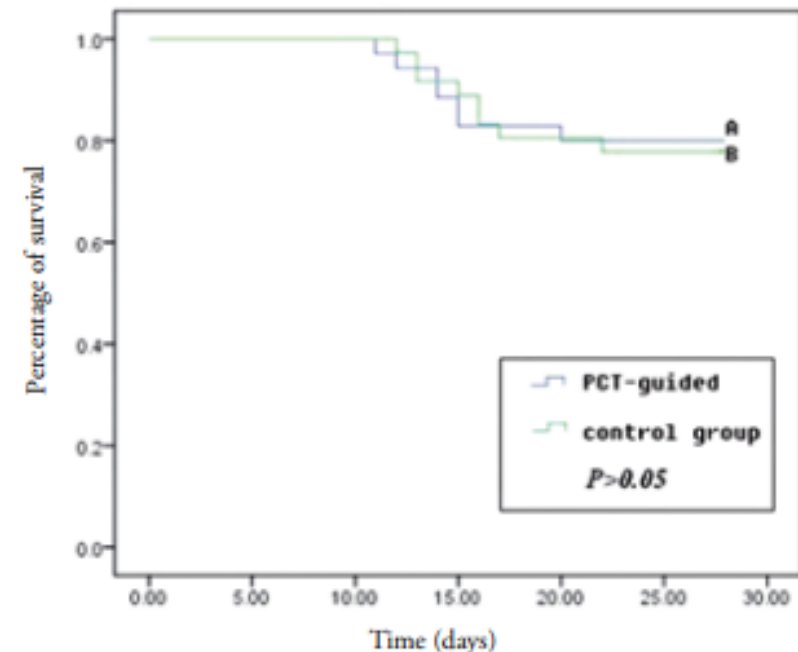
PCT in UTI?

- An area of growing interest
- Cut-off value not yet known, some have proposed 1.16
- Single RCT using PCT and quantitative pyuria
 - Showed reduction in abx (-3d) in PCT group



PCT for Abdominal Infections?

- Serum PCT shown to predict bacterial infections
- Retrospective data in secondary bacterial peritonitis showing decreased abx days, no mortality difference
- RCT in severe pancreatitis (n=71)
 - Abx duration -5 days*, decrease in LOS and ICU LOS
 - No difference in mortality



PCT in Meningitis?

- Serum PCT highly accurate for diagnosing bacterial meningitis and has been shown to differentiate from viral
- Evidence for PCT to guide antibiotic treatment is lacking



PCT in Patients with Cancer

- Sepsis and bloodstream infection = leading cause of death in these patients
- Baseline PCT elevated in cancer (dose response)
- PCT to guide abx in this population?

Take Aways

- Good news:
 - PCT guided antibiotic decisions appear safe (ARTI, Sepsis/ICU)
 - Perhaps with mortality and abx reduction
- Bad news:
 - Data are difficult to interpret
 - Lagging for other conditions
 - How to translate this into the real world

Additional REFERENCES

- Sager R, Kutz A, Mueller B, Schuetz P. Procalcitonin-guided diagnosis and antibiotic stewardship revisited. BMC medicine. 2017 Dec;15(1):15.
- DynaMed
<http://search.ebscohost.com/login.aspx?direct=true&db=dme&AN=474234&site=dynamed-live&scope=site>