

# Evaluation of antibiotic practice in a Danish regional hospital emergency department – a clinical quality assurance study

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## Background

It is estimated that 20-50% of hospital-administered antibiotics in Denmark is either unnecessary or inappropriate<sup>1</sup>.

A national antibiotic stewardship project, *Learning- and QualityTeam-antibiotics* (LKT-antibiotika)<sup>1</sup>, has been implemented to improve adherence to guidelines<sup>2</sup> and to reduce overall consumption of antibiotics, in particular broad-spectrum antibiotics, without compromising patient-outcome.

Compared to C-Reactive Protein (CRP), procalcitonin (PCT) is more specific for bacterial etiology. And because PCT also has a faster response-profile with less lag, procalcitonin can *guide* antibiotics-use as a surrogate biomarker for disease-progression/therapeutic effectiveness.<sup>3</sup>

## Aim

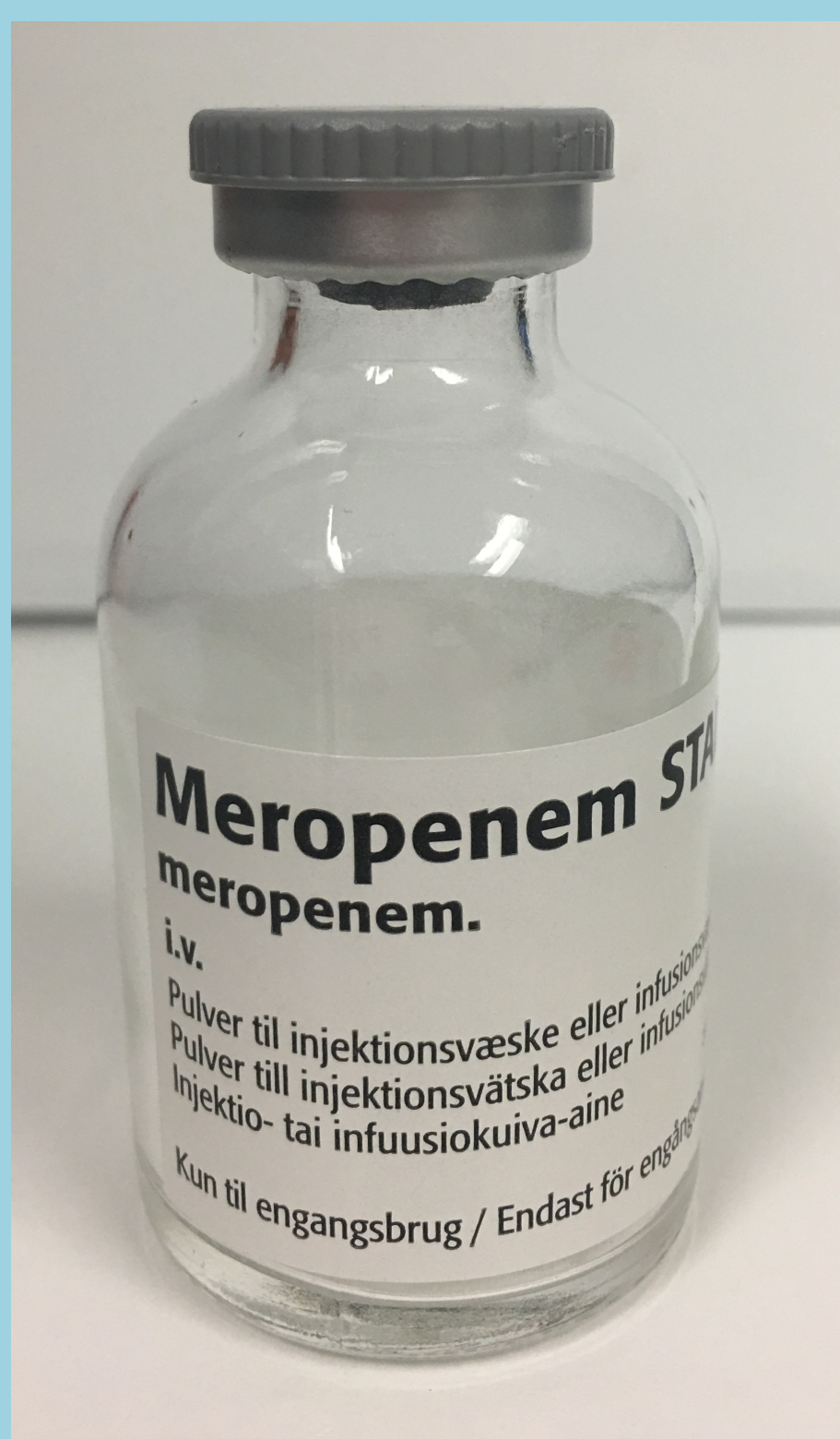
The aim of this clinical quality assurance study is to audit the current antibiotic practice in the hospital setting, as well as to evaluate the clinical utility of procalcitonin as a possible biomarker for bacterial infections.

### Keywords:

Antibiotics; Procalcitonin; PCT; Bacterial infection; LKT-antibiotika; antibiotic stewardship; discriminatory power; clinical utility; biomarker; ICD-10; ATC; Denmark

## Methods

All patients admitted via the emergency department at North Denmark Regional Hospital, from 1/6 to 1/8 2018 were included in the study as either a surgical patient with an acute abdomen or as an internal medicine patient requiring a blood culture procedure within the first 24 hours of admission. PCT analysis (blinded) was then performed for each study participant.



The following time-stamped, key study parameters are applied: tentative- and epicrisis-diagnosis (ICD-10) as indication for antibiotic treatment; selected antibiotic regimen (ATC, dosage and duration) and follow-up clinical evaluation.

Study data will be collected and managed using REDCap (Research Electronic Data Capture) hosted at Region Nordjylland.<sup>5</sup>

## Outcomes

### Primary:

—was initiation/non-initiation of antibiotic therapy *truly* indicated?

### Co-primary:

—was PCT on admission correlated to *truly indicated* initiation of antibiotic therapy?

### Secondary:

—detailed analysis of adherence to prescription-guidelines, incl. reasons for non-adherence

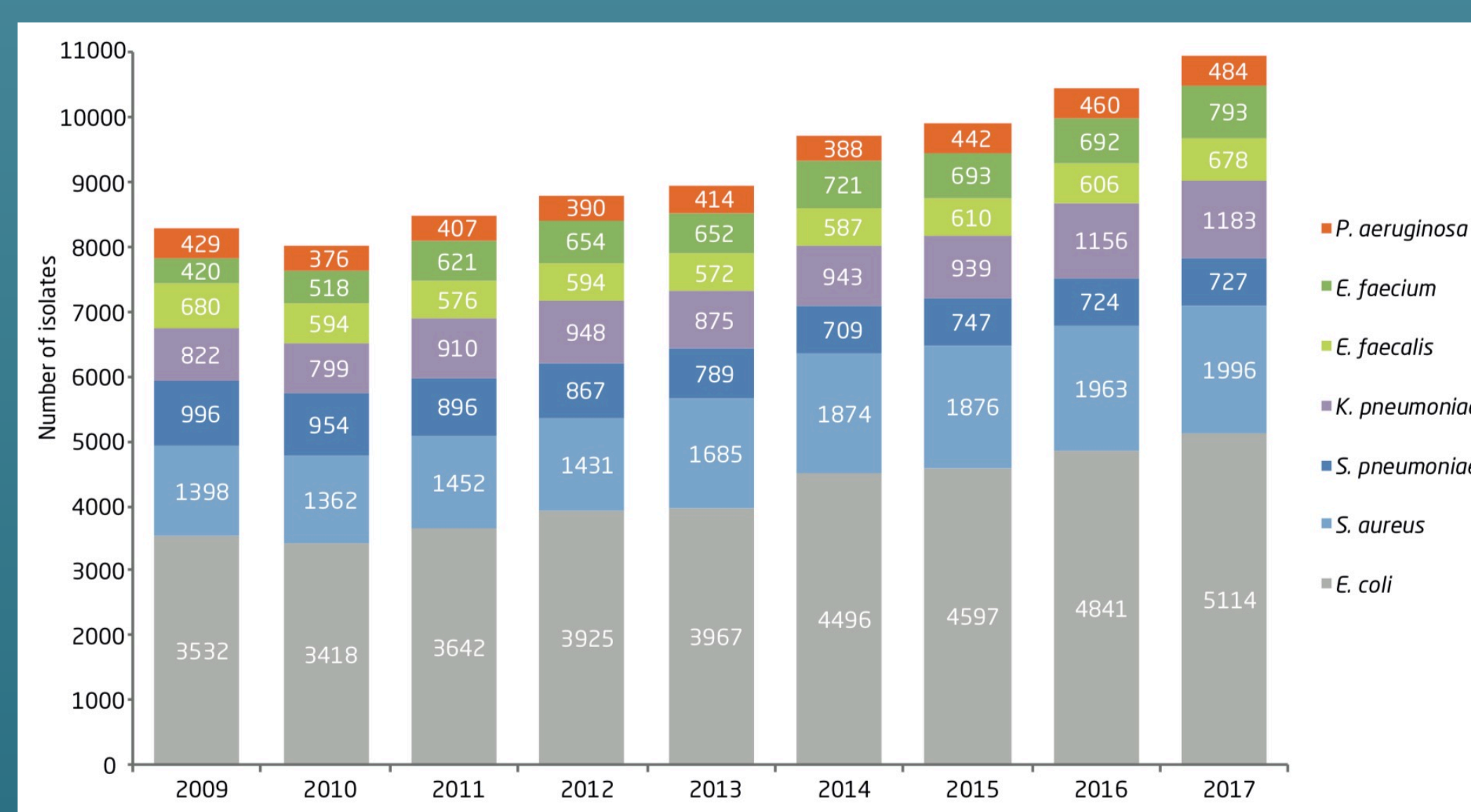


Fig. 1 Number of submitted invasive isolates (2009-2017) per species under surveillance. (DANMAP 2017, p. 98)<sup>4</sup>

## Results

More than 1500 patients have been included in the study: >1000 surgical patients and >500 internal medicine patients. Study results are pending.

## Perspectives

We expect that the study will provide previously unavailable information about antibiotic practice on *patient-level* in the emergency department.

Moreover, PCT will be evaluated as a potential decision support biomarker in future activities supporting the national antibiotic stewardship project in Denmark.

### References:

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