

# The fight against sepsis

Sepsis is one of the world's biggest killers, but doctors have been limited by slow and laborious testing methods. *Practical Patient Care* talks to Dr Gorm Lisby from the Hvidovre Hospital in Copenhagen, and Jonas Jarvius, CEO of **Q-linea**, about how the medical profession is fighting sepsis and how the Swedish company is helping to save

## How big a problem is sepsis, from a health and economic point of view?

**Dr Gorm Lisby:** Sepsis is a severe clinical syndrome. A large number of different invasive bacteria and fungi can facilitate development of a cascade of immunological events that leads to clinical sepsis. There are an estimated 30 million sepsis cases annually, with 6 million worldwide deaths per year. It is a leading cause of mortality in the US associated with an annual cost exceeding \$20 billion. In Europe, 300,000–500,000 of reported severe sepsis cases a year cost a total of around €20 billion annually.

## What are the downsides of fighting the illness with broad-spectrum antibiotics?

**GL:** Although empirical antimicrobial regimens are considered to be broad-spectrum, the coverage rate is only 60–80% against sepsis-causing microorganisms. Thus, currently 20–40% of patients with sepsis will initially be without antimicrobial coverage. Using even more broad-spectrum antimicrobials empirically would not be a sustainable solution, as the literature clearly has demonstrated the direct relationship between antimicrobial use and emergence of antimicrobial resistance. Moreover, as the pipeline for new antimicrobials has almost dried out and as resistance has developed against all new antibiotics so far, overcoming antimicrobial resistance by developing new antimicrobials is not considered to be a potential successful strategy.

## What benefits do targeted antibiotics offer instead, and how is speed of the essence in the process?

**GL:** Currently, less use of broad-spectrum antimicrobials – in other words, targeted antimicrobial treatment – is considered the only sustainable strategy for ensuring efficient antimicrobials for future use. To implement this strategy, faster microbial identification and susceptibility testing will be necessary, which will allow the clinicians to faster optimise the individual patient treatment. Faster optimisation will allow faster escalation of antimicrobial therapy where needed as well as faster de-escalation of antimicrobial therapy where possible. Escalating antimicrobial treatment for the patients not covered by the empirical antimicrobial treatment will improve individual patient outcome. This is important, as the literature has documented that for every hour a covering antimicrobial treatment is delayed for septic shock, the survival decreases significantly.

Faster microbial identification and susceptibility testing will also allow clinicians to de-escalate antimicrobial treatment for patients receiving too broad-spectrum antimicrobials, thus reducing future antimicrobial resistance.

## How do Q-linea's diagnostic systems improve on traditional platforms?

**Jonas Jarvius:** Currently, the time to receive information from an antibiotic susceptibility test (AST) is usually 2–3 days. This is due to slow traditional technologies involving several manual steps. In response, Q-linea are developing ASTar™, a system that can perform a fully automated phenotypic AST analysis using a dedicated instrument and single-use consumables. This means that the user at the microbiology laboratory only needs to load the sample and consumables in the ASTar instrument, then press start to receive a comprehensive AST report within three to six hours – more than 24 hours quicker than the traditional technologies. Meanwhile, ASTar has been developed to run up to 50 tests every day, with the capacity to analyse up to 48 different antimicrobials in each.

“Faster administration of effective antimicrobial treatment could dramatically improve survival of septic patients.”

– Jonas Jarvius

## What advantages does using Q-linea's expertise offer patients and doctors?

**JJ:** ASTar enables doctors to administer targeted treatment more than a day faster than today. Faster administration of effective antimicrobial treatment could dramatically improve survival of septic patients.

For the hospital, more accurate treatment increases efficiency and saves money. For microbiology laboratories, increased automation enable them to increase the number of tests performed with the same staff. A fully automated system enables less experienced personnel to perform analysis, for instance, during nightshifts. ■

### Further information

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