

Real-life experience of EUCAST RAST disk diffusion

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RAST at Karolinska University Hospital, Solna

- Introduction of RAST from pos blood culture bottles in Nov 2019
- Blood cultures from three hospitals in Region Stockholm
 - Karolinska University Hospital, Solna (NKS)
 - Danderyd Hospital (DS)
 - Norrtälje Hospital
- 2 different ID clinics (NKS + DS)
- 1 Clin microbiologist/Clin bacteriologist handles up to 60 pos blood cultures per day

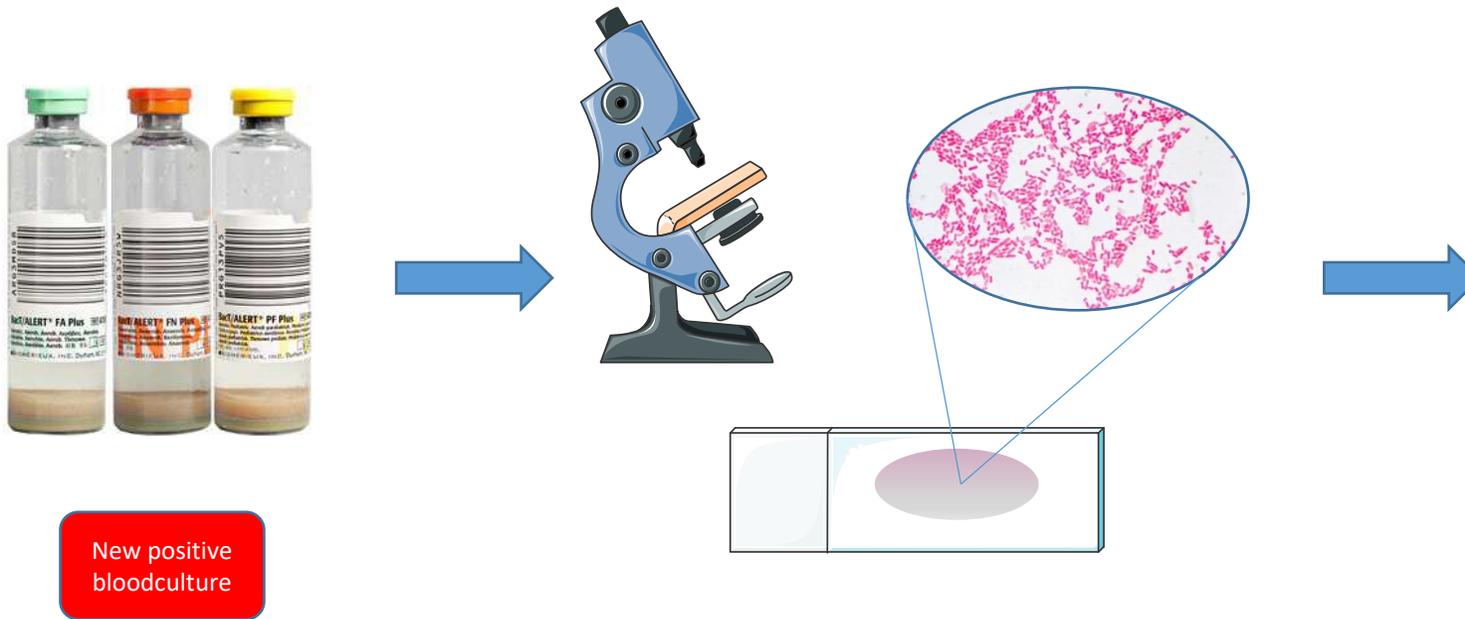
What did we want?

- A pragmatic model that needed to be practical to perform in a setting with many pos blood cultures every day and limited staff
- We wanted to achieve as much effect on the patient antibiotic care with a minimum effort from our side
- The goal was a clinical approach with the purpose to warn the clinicians only IF the empirical treatment did not work
- We did not want to replace the EUCAST 18 h disk diffusion method with RAST

Our considerations

- **Which antibiotics to include?**
 - What are the empirical antibiotics used for suspected sepsis in Sweden/Stockholm according to national/local guidelines:
 - **Cefotaxim, piperacillin-tazobaktam, meropenem/imipenem**
- **Which species to include?**
 - Where is our problem with the empirical treatment?
 - **Gram-negatives!**
 - ESBL: 10% of our blood cultures (E.coli/K. pneumoniae)
 - Resistance among P.aeruginosa and A. baumannii-complex is on the rise (but are rare in blood cultures)
 - **Gram-positives??**
 - S.aureus- MRSA ca 2% in blood cultures. Too many CoNS each day to be worth the effort
 - E. faecalis/E. faecium: Identification to species level more important than RAST

Initial approach EUCAST RAST – Gram negative rods



RAST before 11.00 AM

Cefotaxime
Pip-taz
Meropenem
Ciprofloxacin
Ceftazidim

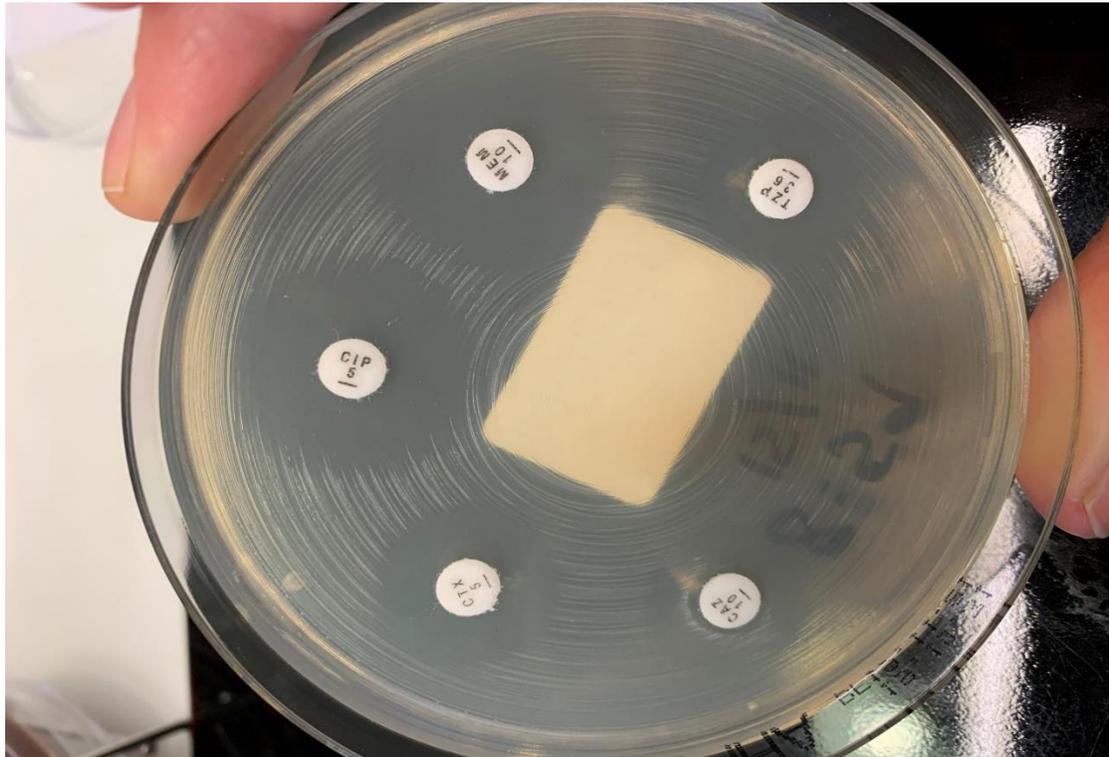
E.coli
K.pneumoniae
P.aeruginosa
A.baumannii-
group

- Reading and recording zones +/- 5 minutes, reincubate < 10 min
- Phone call + answer in LIS only if the empirical treatment was wrong or ESBL was found

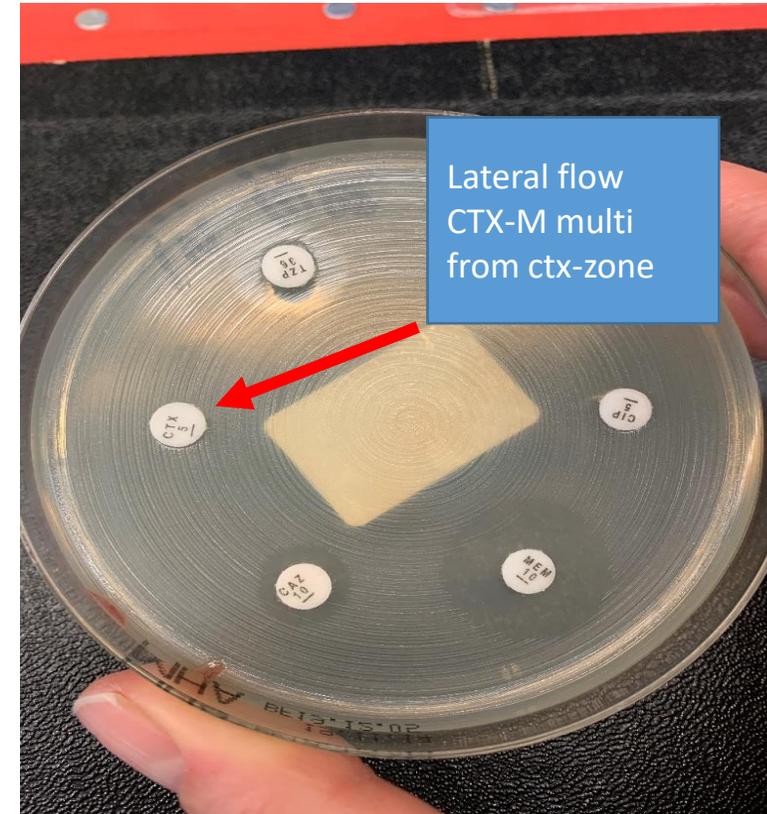
Conclusions after 6-12 months

- All except 3 patients had received cefotaxime, pip-tazo or meropenem as empirical treatment
- Piperacillin-tazobactam results almost always ended up in the ATU
- We found approximately 4-6 ESBLs per week with RAST which lead to improved antibiotic treatment for critically ill patient who had empirically received cefotaxime
- The approach with not sending answers for all WT isolates was very much appreciated by our ID clinicians

Conclusions after 6-12 months



Standard *E. coli* after 4 h. Pip-tazo ATU



E. coli with suspected ESBL after 4 h

And then the 24/7 blood culture project came along...

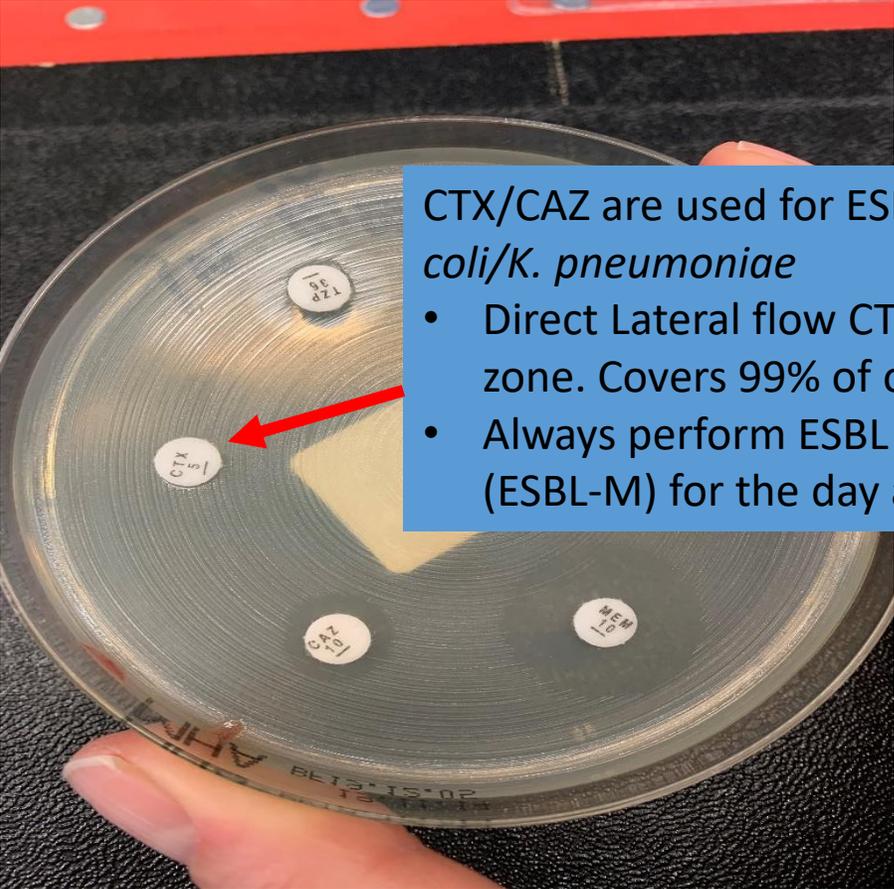
- Reading of plates and AST with EUCAST 18 h disk diffusion 3 times daily at 08-10, 11.00 and 15:30
- RAST performed at 03 and between 8-11
- Introduction of an even more pragmatic way to handle RAST
 - "No" reading of zones
 - Record if WT or not/of right treatment or not
 - Ctx/Caz used for ESBL-screening
 - Mem used for ESBL-carba screening

Batchning och flöde positiva flaskor VARDAG

Uttagstid	KI 00-08	KI 08-14	KI 14-16	KI 16-20	KI 20-23 (Inga flaskor ur skåp 23-00)
Märkning mikroskopilista	Mikroskopilista "NATT 1" osv + datum	Mikroskopilista "DAG" + NR + datum	Mikroskopilista "DAG" + NR + datum	Mikroskopilista "KVÄLL" + NR + datum	Mikroskopilista "NATT" + NR + datum
Snabb-Maldiplattor	Snabb-Maldiplatta	Snabb-Maldiplatta	Snabb-Maldiplatta	Snabb-Maldiplatta	Snabb-Maldiplatta
Basplattor	Basplattor → Primärställ 00-08 RÖD.	Basplattor → Primärställ 08-16 GULGRÖN	Basplattor → Primärställ 08-16 GULGRÖN	Basplattor → Primärställ 16-20 BLÅ	Basplattor → Primärställ 20-23 GRÅ
Resistensbestämning	EJ DIR-RES från flaska – res görs från Prim-H-platta kl 14 → Primärställ ORANGE avläses kl 08-10. (Även basplattor flyttas till Primärställ ORANGE).	EJ DIR-RES från flaska – res görs från flaska kl 14 → Primärställ GULGRÖN avläses kl 08-10	DIR-RES från flaska → Primärställ GULGRÖN avläses kl 08-10	DIR-RES från flaska → Primärställ BLÅ avläses kl 11	DIR-RES från flaska kl 23 → Primärställ GRÅ avläses kl 15.30
RAST	RAST kl 03 på nya G-stavar från DS-transport kl 02 och KS-flaskor ur skåp tidigast kl 00	RAST kl 08-09 på nya G-stavar från DS-transport kl 05 och KS-flaskor ur skåp tidigast kl 04. Ev ytterligare RAST kl 10.30-11.30 efter överenskommelse			
Övrigt	Förbereda RAST på nya G-stavar från transport kl 05 och KS-flaskor ur skåp tidigast 04 → placera i RAST-ställ				

- Alla RAST-plattor märks med tid och placeras på avsedd plats i inkubator B Luft. Antal och starttid noteras på avsedd plats på blodtavlan.

The new RAST approach = ESBL-screening



CTX/CAZ are used for ESBL-screening in *E. coli*/*K. pneumoniae*

A petri dish containing several antibiotic discs. A red arrow points to a disc labeled 'CTX'. Other discs are labeled 'CAZ', 'MEM', and 'TIP'. The dish is held by a hand.

- Direct Lateral flow CTX-M Multi from CTX-zone. Covers 99% of our ESBLs
- Always perform ESBL DDST plus ceftioxin (ESBL-M) for the day after



MEM is used for carbapenemase-screening in *E. coli*/*K. pneumoniae*/*A. baumannii*

A petri dish containing several antibiotic discs. A red arrow points to a disc labeled 'MEM'. Other discs are labeled 'CAZ', 'TIP', and 'MEM'. The dish is held by a hand.

- Direct detection using Eazyplex Carba Basic/Expert/acineto-kit depending on species
- *E. coli*/*K. pneumoniae*: NDM, VIM, KPC, OXA-48

To be continued...

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Evaluation of a rapid combination disc test (RCDT) for direct phenotypic detection of extended-spectrum β -lactamase production in *E. coli* from positive blood culture bottles

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