

Early dynamics of microbial load, persistent bacteremia and prognosis in patients with endocarditis

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ESCMID Course „Improving the Diagnosis of Bloodstream
Infections“

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Conflict of interest

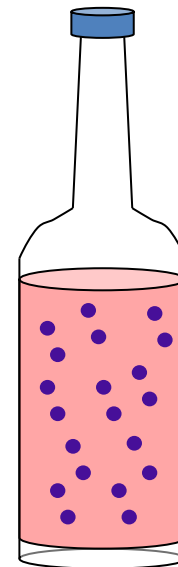
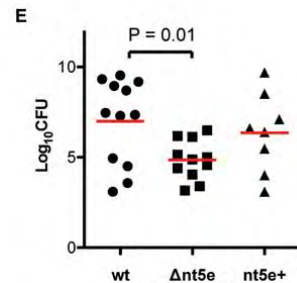
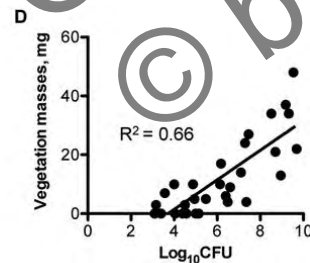
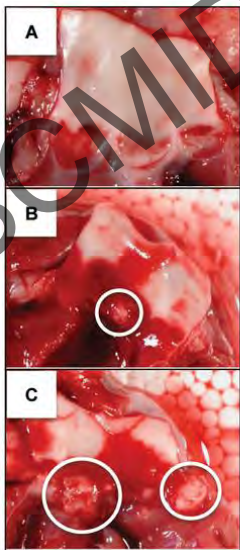
No conflicts within past 3 years

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- Microbial load
- Persistent bacteremia
- Prognosis

How to measure microbial load?

- Directly: experimental endocarditis
- Indirectly: BC time to positivity
- Qualitative: BC becomes sterile vs. persistent bacteremia



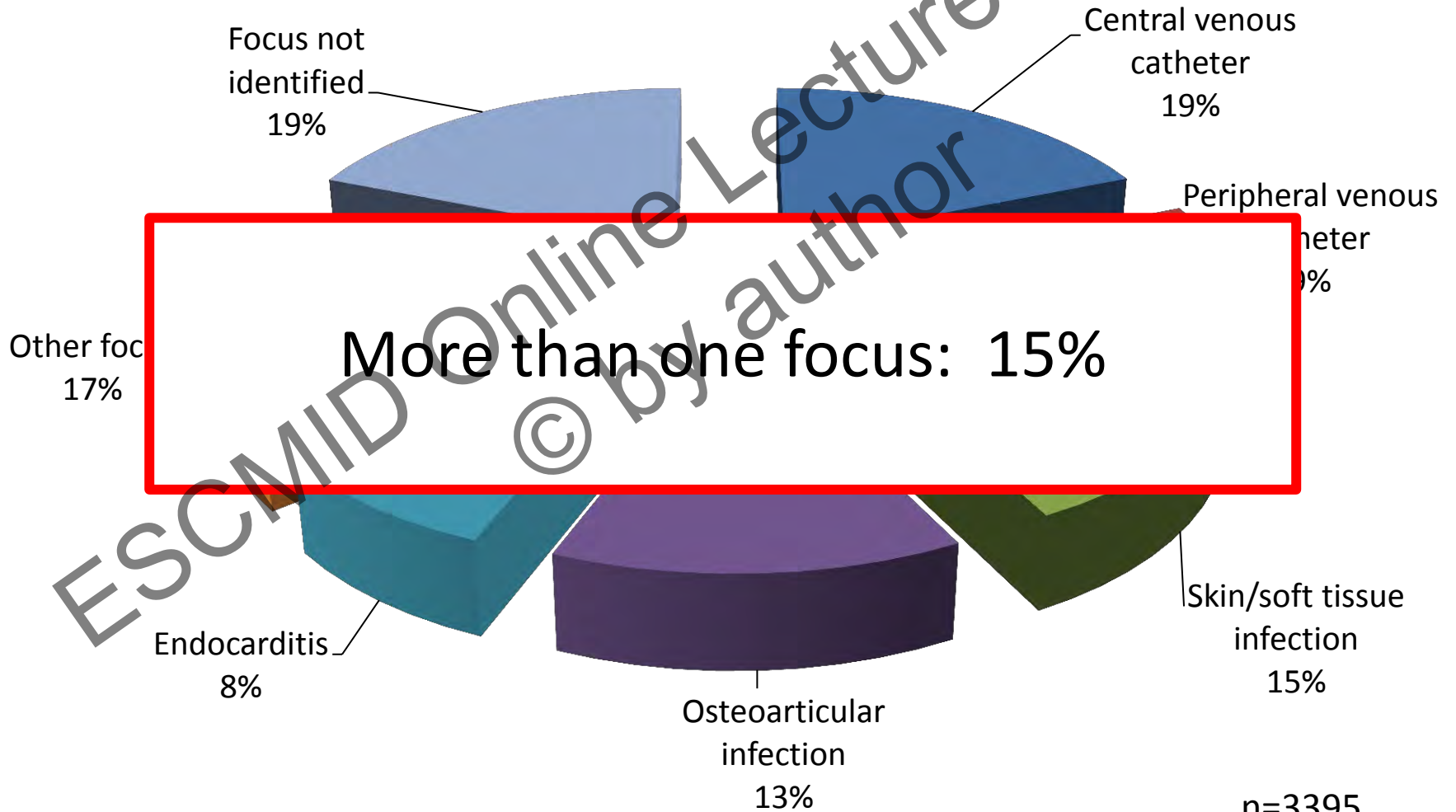
Definitions

- Prolonged Bacteremia
 - Positive FUBC more than 4 days (sometimes starting from appropriate antibiotic therapy)
 - Persistent Bacteremia
 - Positive FUBC after 7 days or more
- Intravascular focus, foreign bodies
Drug resistance, other foci

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How quickly do blood cultures become sterile in infectious endocarditis?

Dominant Infective Focus

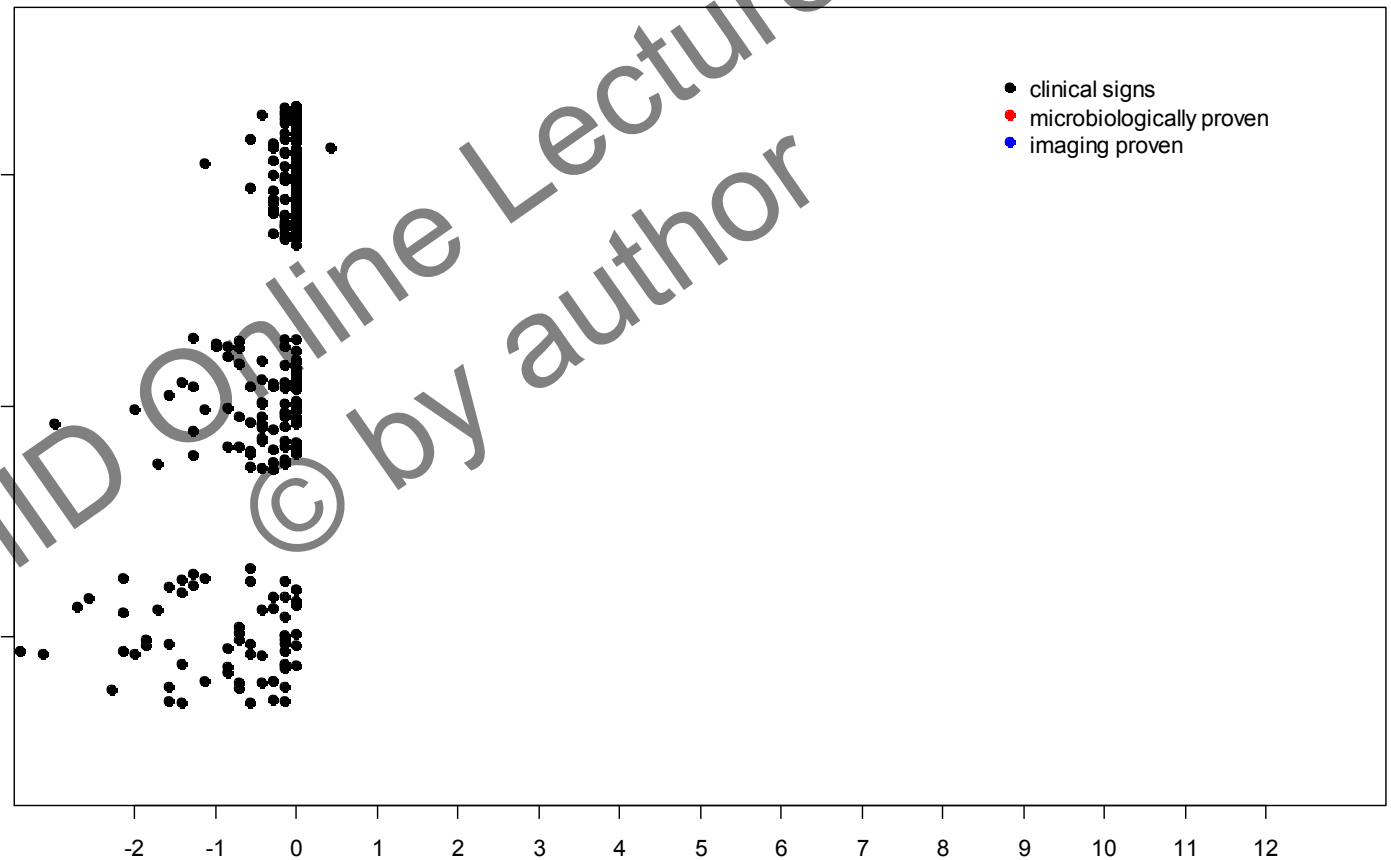


Start of clinical symptoms

Short-term
venous catheter
(n=175)

Endocarditis
(n=104)

Vertebral
Osteomyelitis
(n=74)



weeks

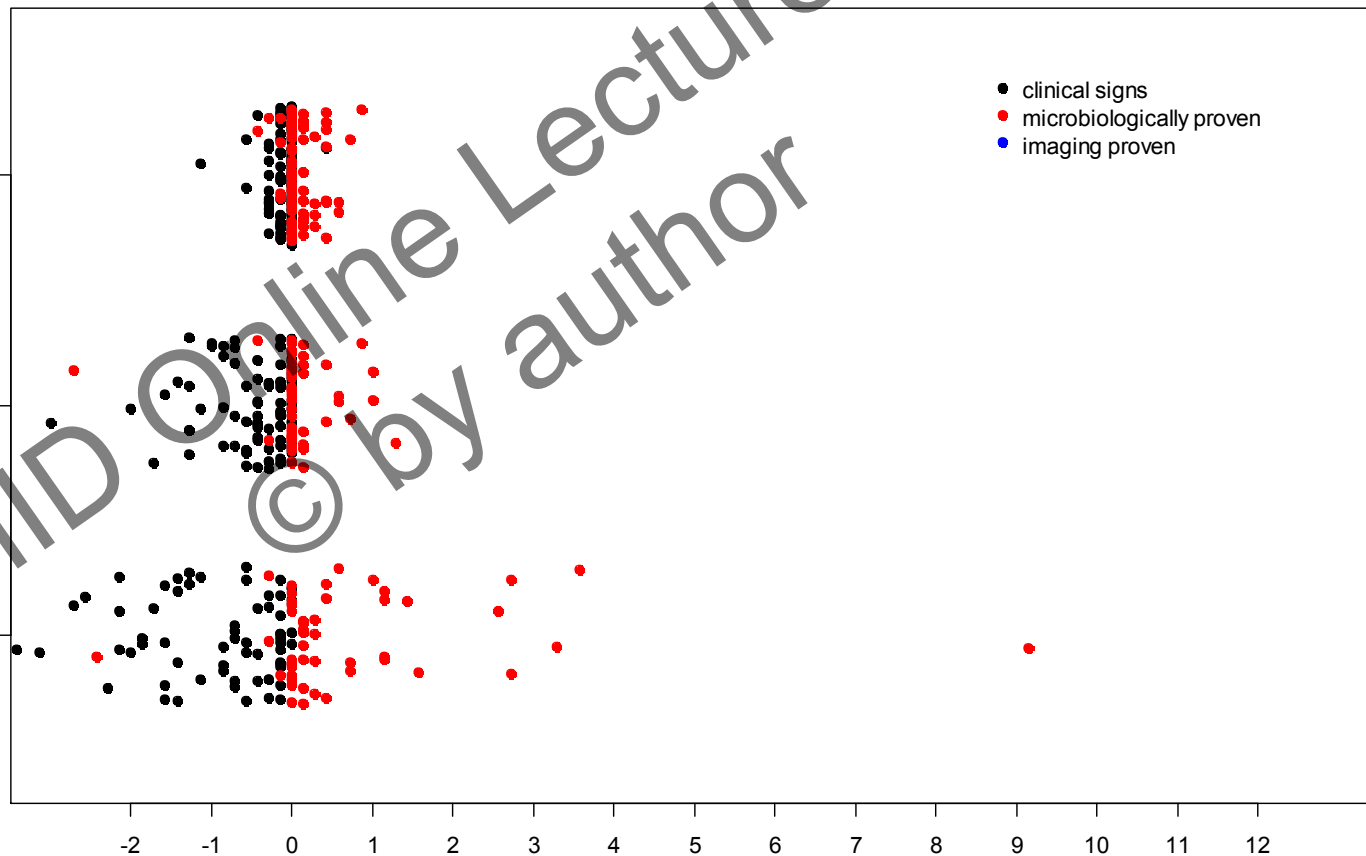
INSTINCT study
N=1056

Microbiological proof

Short-term
venous catheter
(n=175)

Endocarditis
(n=104)

Vertebral
Osteomyelitis
(n=74)



weeks

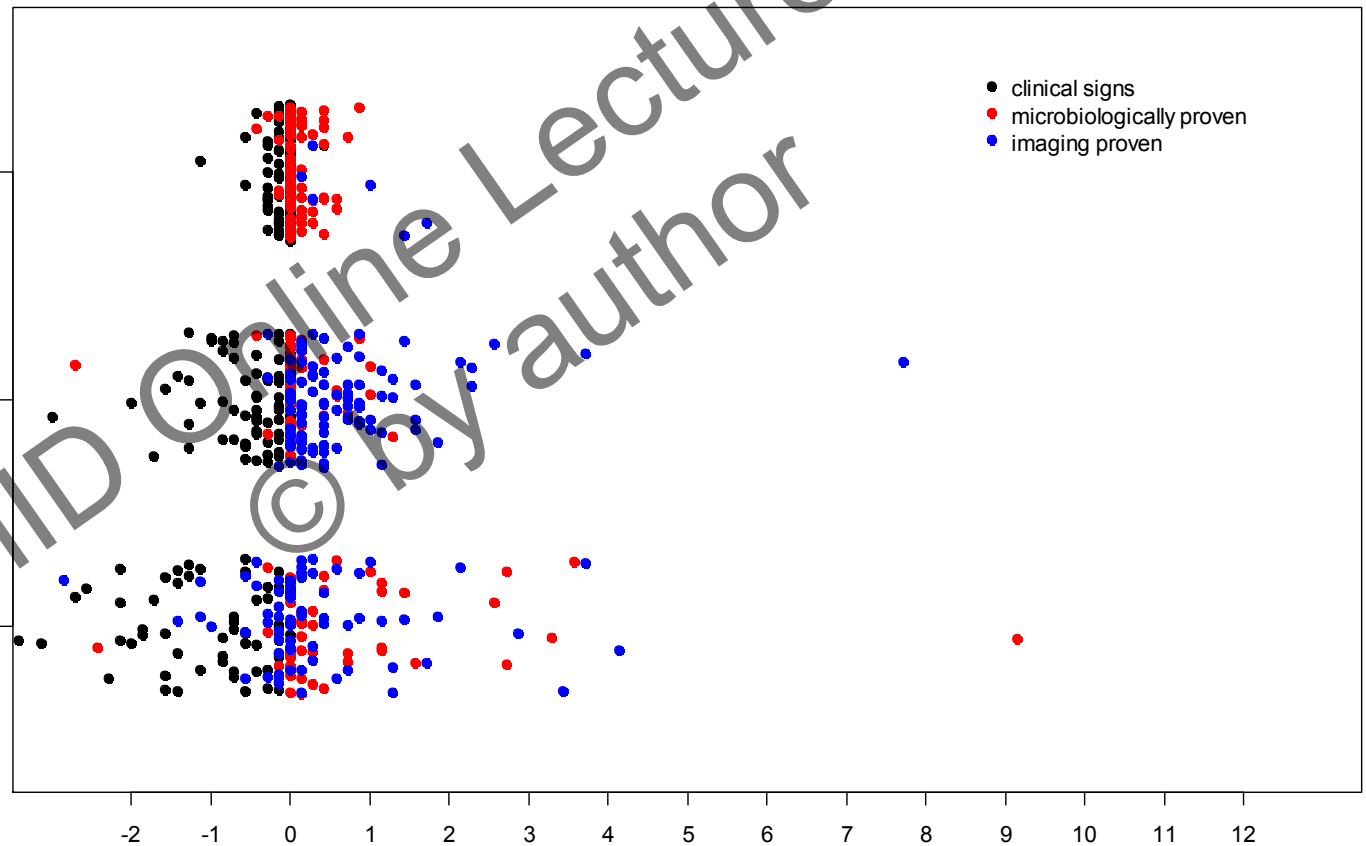
INSTINCT study
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Imaging

Short-term
venous catheter
(n=175)

Endocarditis
(n=104)

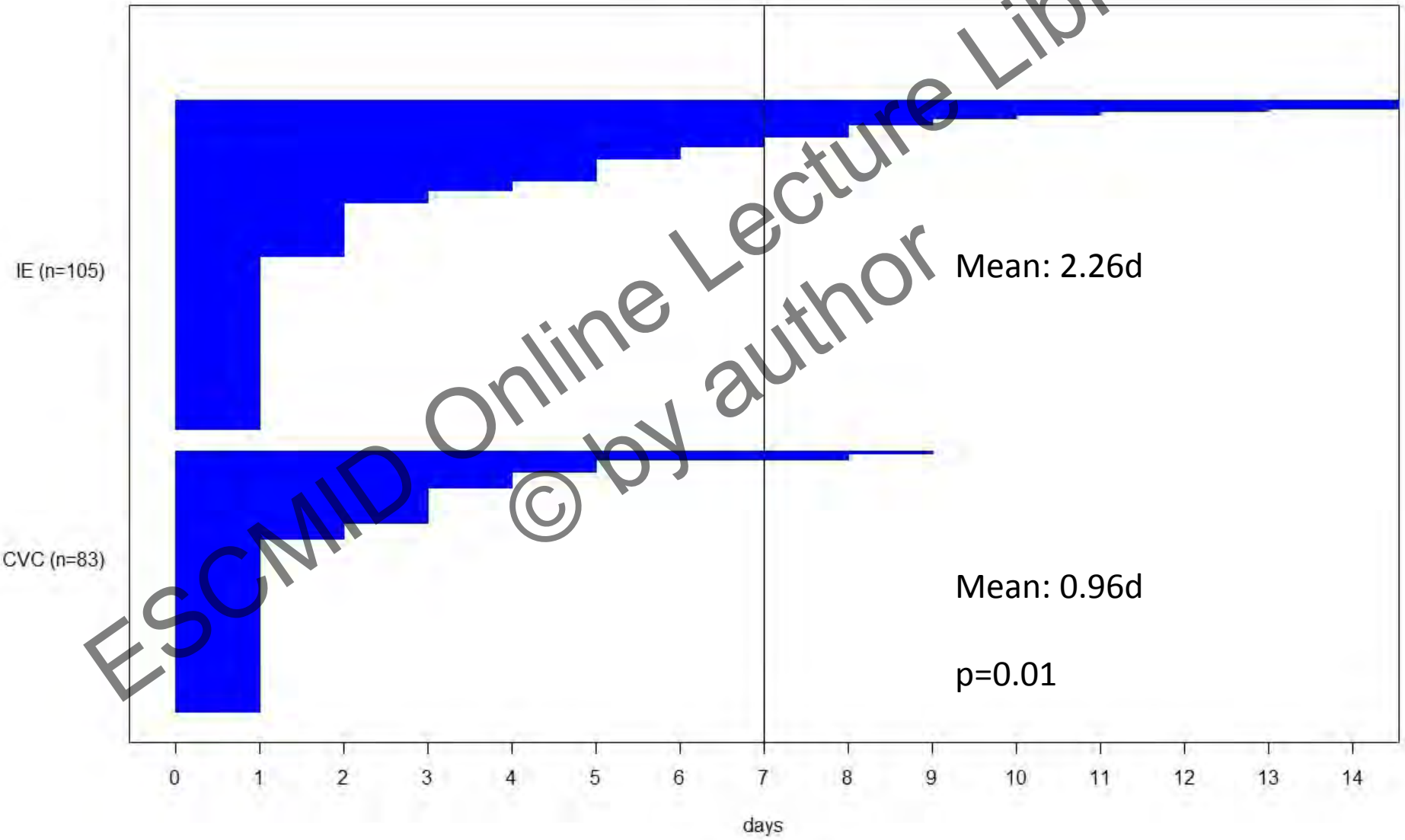
Vertebral
Osteomyelitis
(n=74)



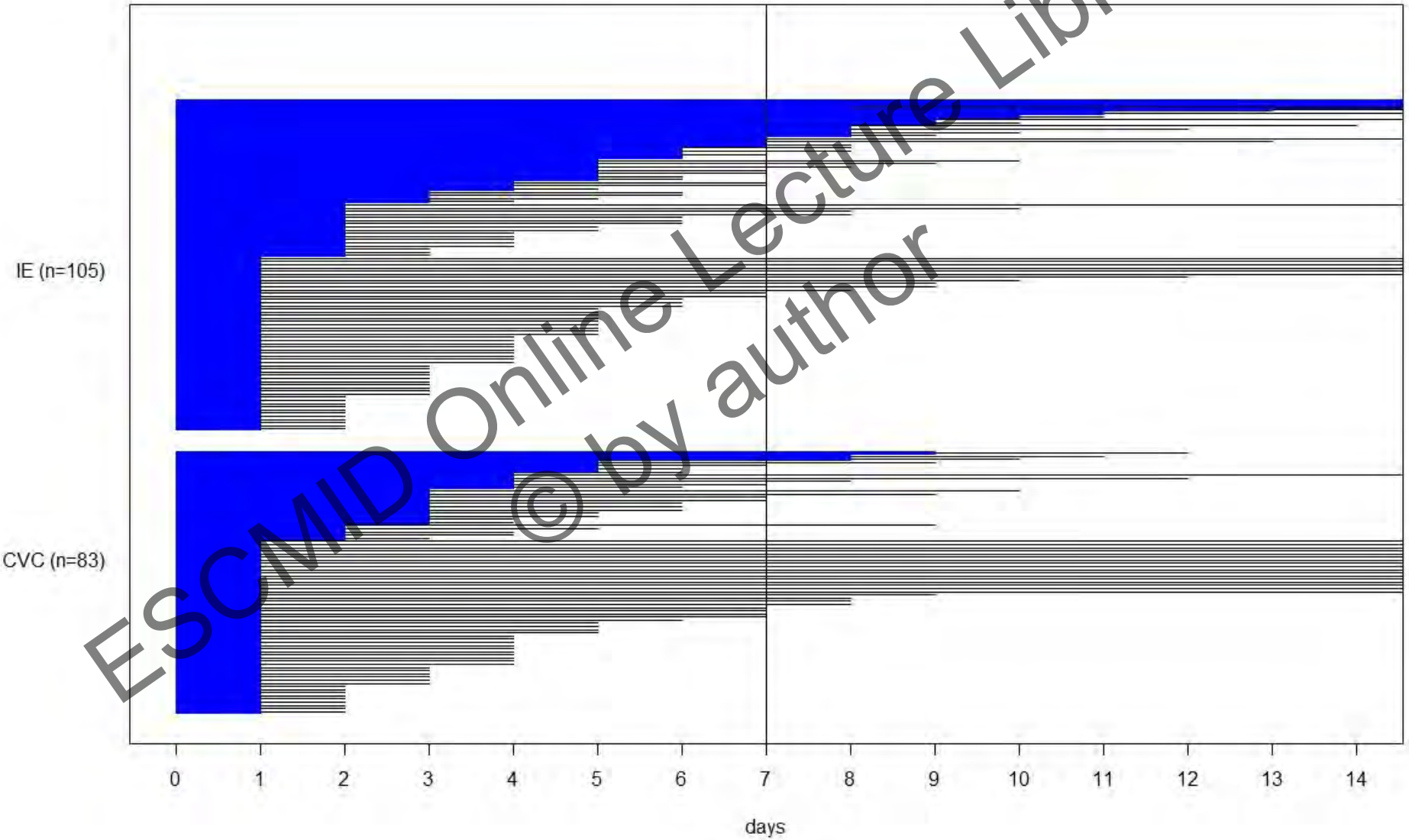
weeks

INSTINCT study
N=1056

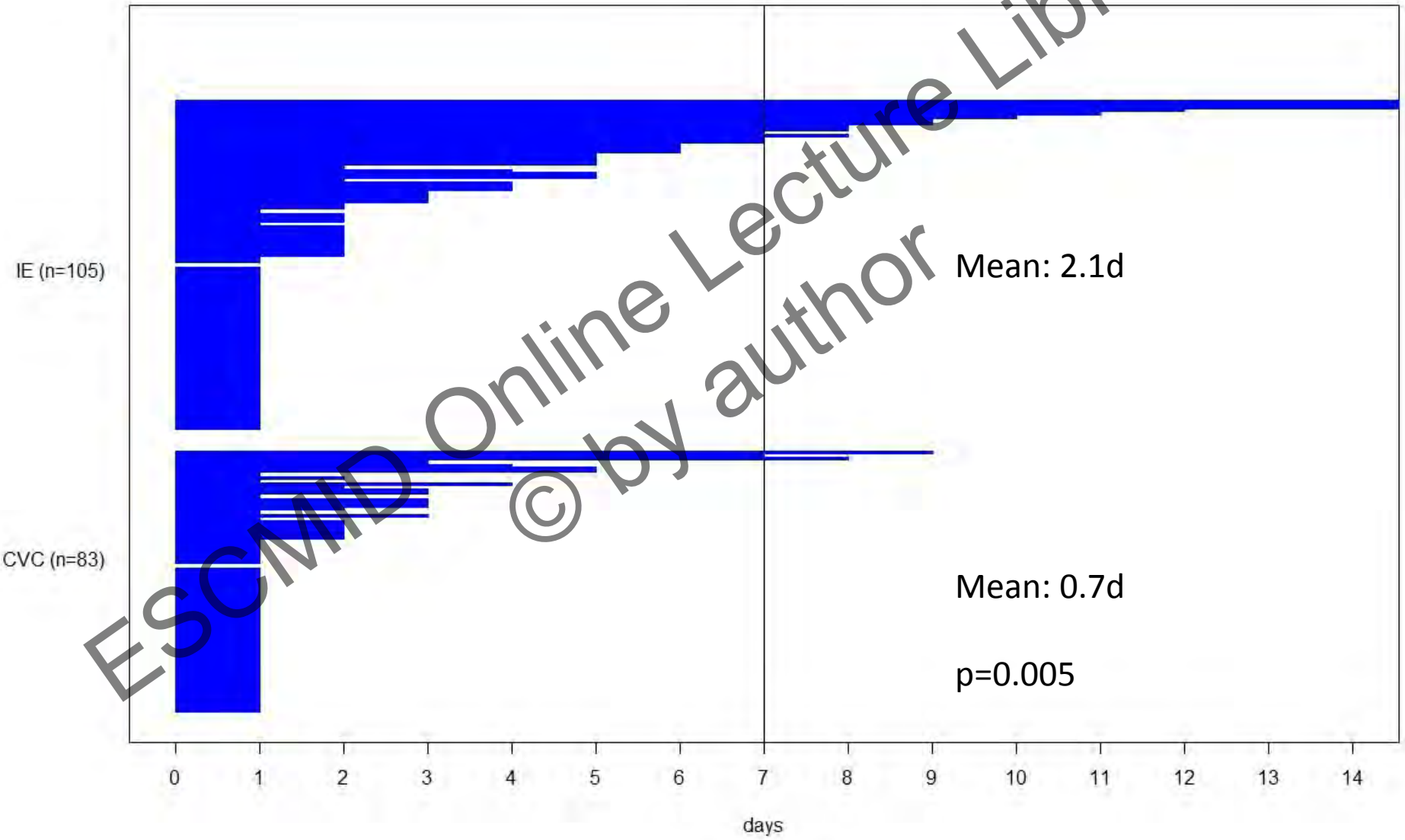
Time to last pos BC



Time to last pos BC and first neg BC



Bacteremic days under adequate Therapy

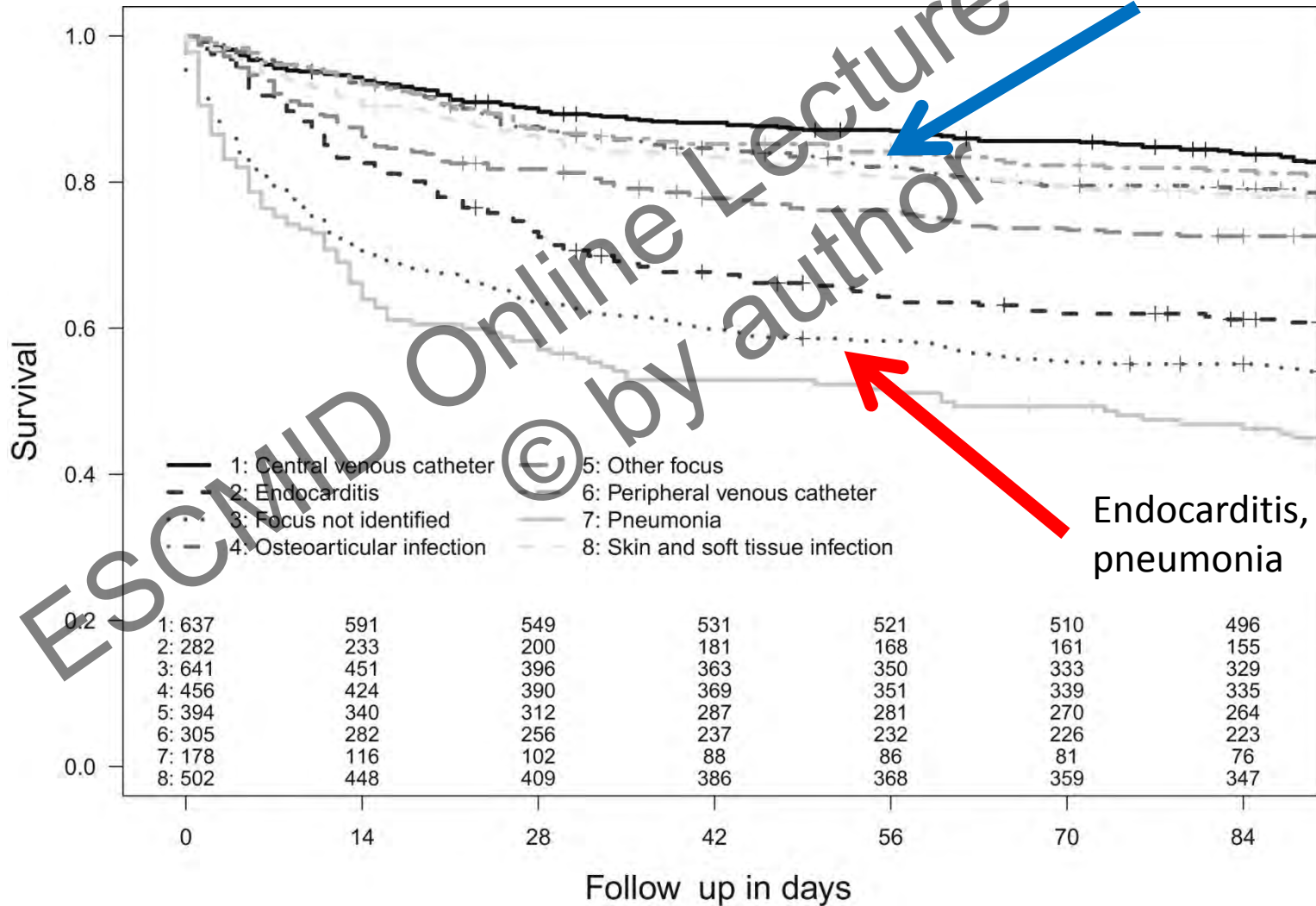


Does persistent bacteremia influence
the prognosis?

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Infective Focus

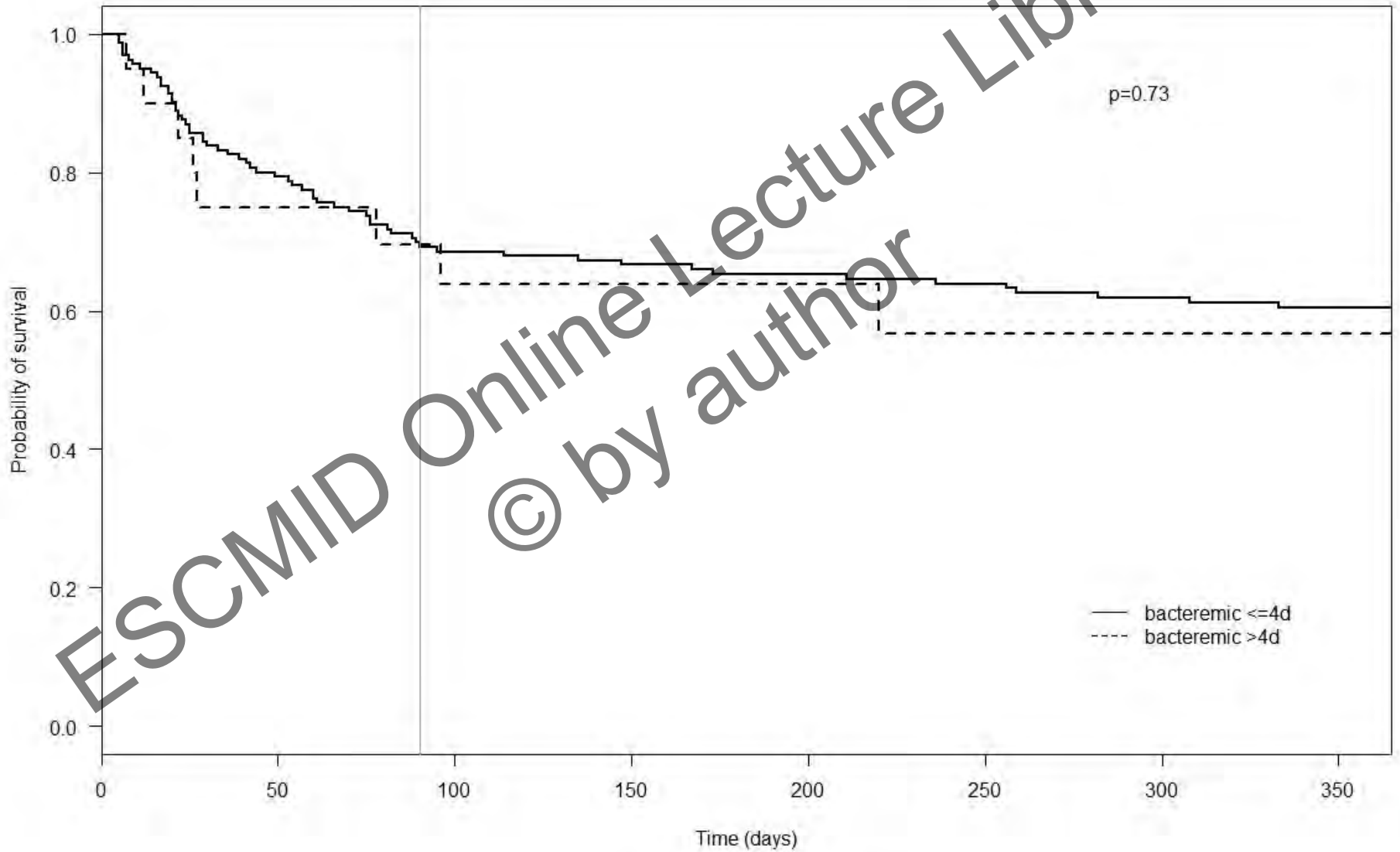
CVC, PVC, SST, osteoart.



Endocarditis, unknown pneumonia

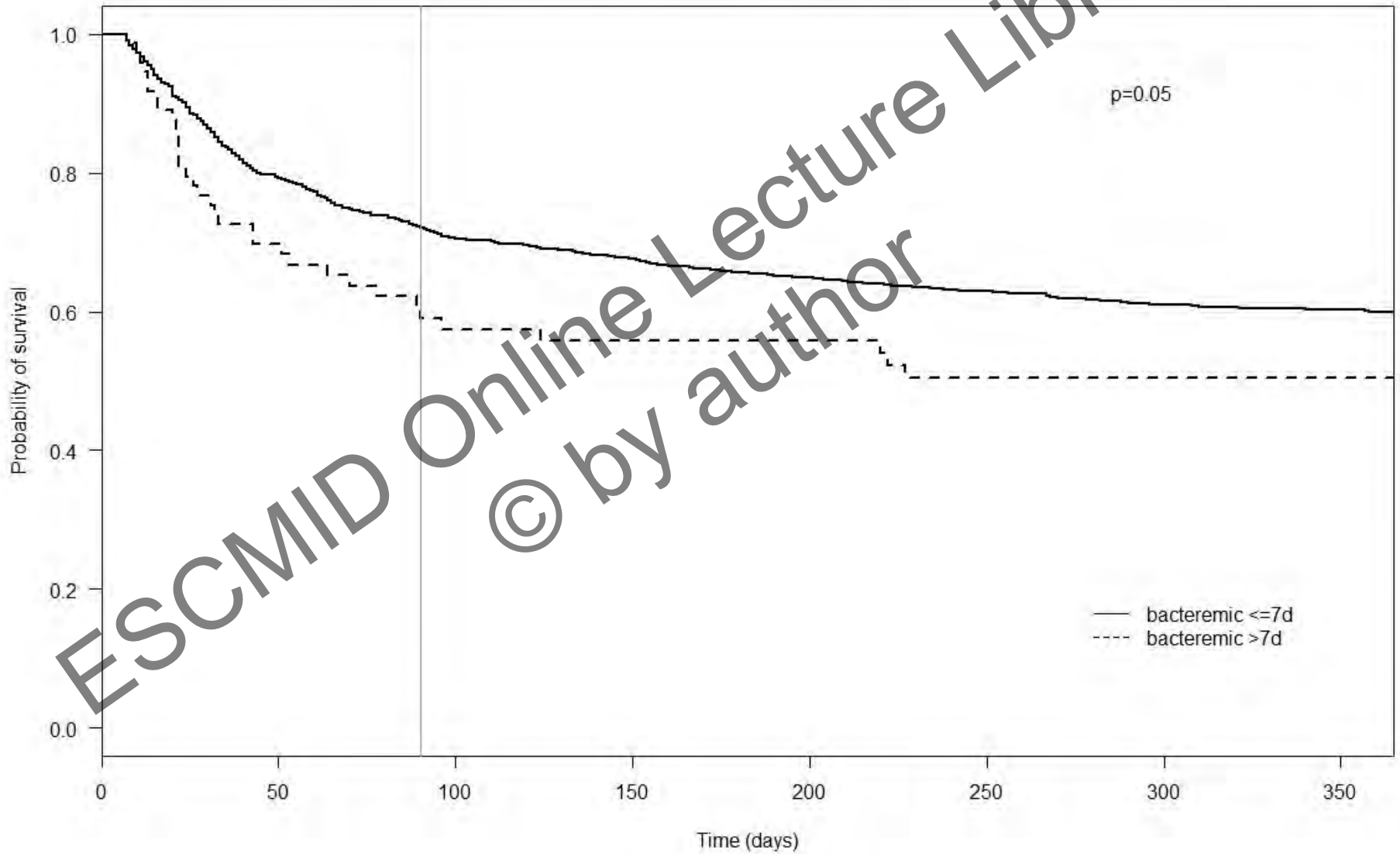
1: 637	591	549	531	521	510	496
2: 282	233	200	181	168	161	155
3: 641	451	396	363	350	333	329
4: 456	424	390	369	351	339	335
5: 394	340	312	287	281	270	264
6: 305	282	256	237	232	226	223
7: 178	116	102	88	86	81	76
8: 502	448	409	386	368	359	347

Survival and duration of bacteremia after adequate therapy in IE



INSTINCT cohort (n=1240)

Survival and duration of bacteremia after adequate therapy in patients with SAB that survived 7 days



INSTINCT cohort (n=1240)

Does a change in time-to-positivity
predict prognosis?

Reference	Design	n	Comments
Hsu 2014 CMI	Prosp.	87	Sequential time to positivity can be a predictor of prognosis in persistent SAB. Patients with an increase of TTP of less than 1.5 after 48h have a worse outcome
Choi 2012 EJCMID	Retrosop.	41	Decreasing Time to positivity is associated with mortality or secondary foci in patients with persistent <i>Staphylococcus aureus</i> bacteremia (87% vs. 26%)
Khatib 2005 CID	Retrosop.	376	Shorter TTP (≤ 14 h) is associated with endovascular source, delayed clearance and complications
Willmann 2013 Jol	Retrosop.	74	Shorter Time to positivity (TTP < 18 h) in <i>Pseudomonas aeruginosa</i> bloodstream infection was associated with worse outcome (HR 3.8)

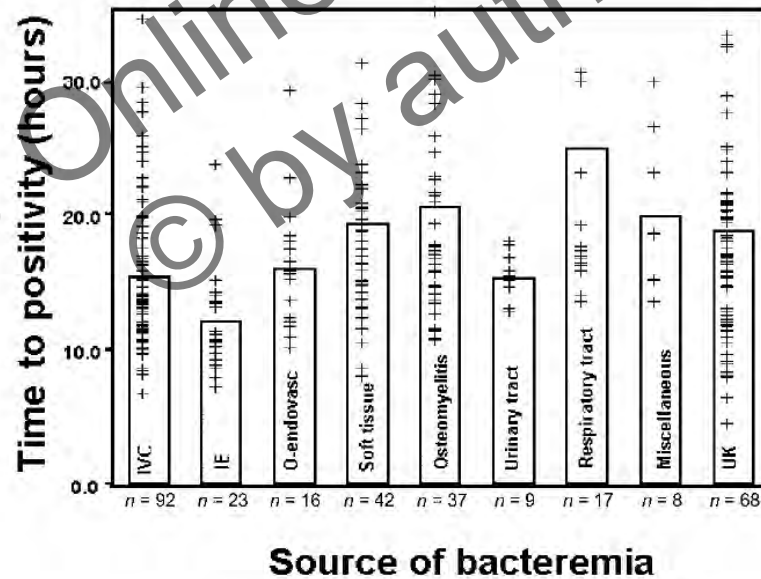


Figure 1. Time to positivity stratified according to infection source. See Methods for the definition of time to positivity. IE, infective endocarditis; IVC, intravascular catheter; O-endovasc: other endovascular source; UK, unknown. *Top of bars*, mean values; +, individual isolates.

Conclusions

- Little is published on microbial dynamics
- Prolonged/persistent bacteremia is typical for *S. aureus* infective endocarditis
- Shorter TTP or an increase of less than 1.5x in follow-up BC may indicate therapy failure (?)

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preSABATO Studie

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