

23. Birsecker Herzfortbildung Endokarditis: Wichtiges in der Praxis - Update

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Fallbeispiel

- 82-jähriger Patient
- St. n. AKBP und Bio-AKE (Perimount Magna Ease 23mm) 2011
- St. n. TAVI (Portico 23mm) 2018 bei Restenose der Bioprothese
- cvRF: art HT, DM Typ 2
- 12/2024: Panaritium Dig I Fuss re, Entleerung von Pus
- Niereninsuffizienz (GFR 46 ml/min/m²)
- fortgeschrittene Demenz

Fallbeispiel

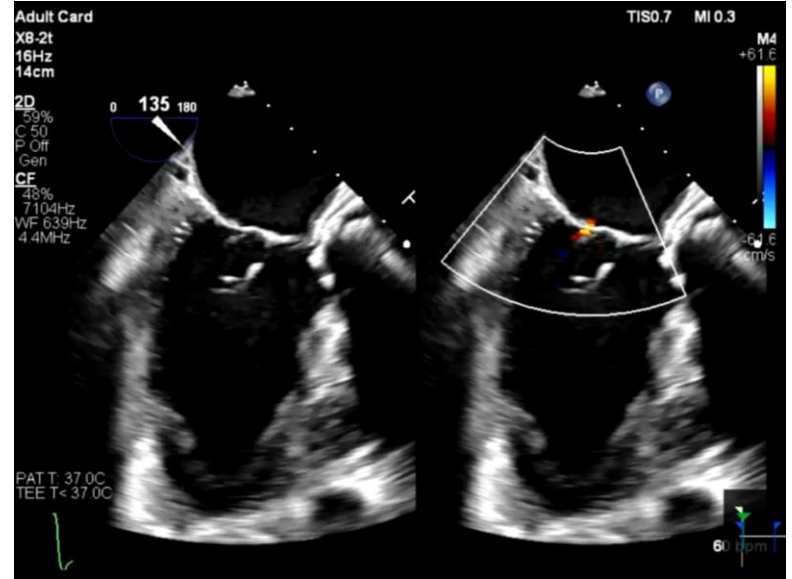
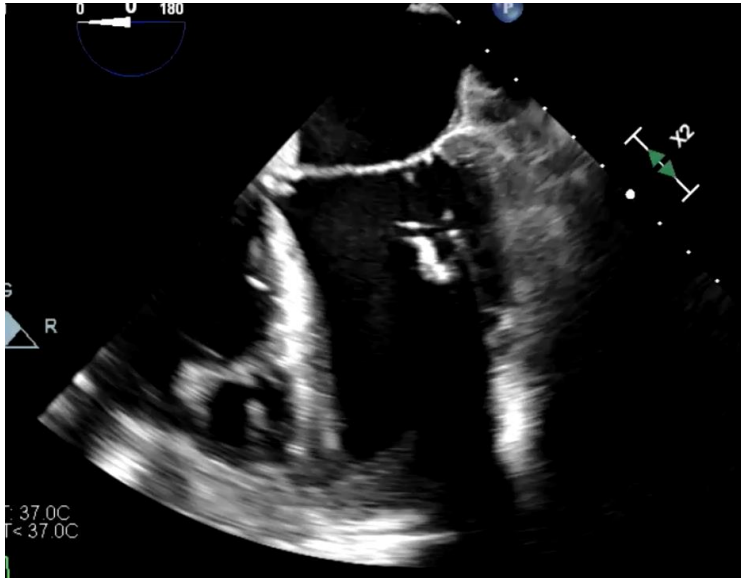
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• 01/2025: AV-Block III → DDD PM

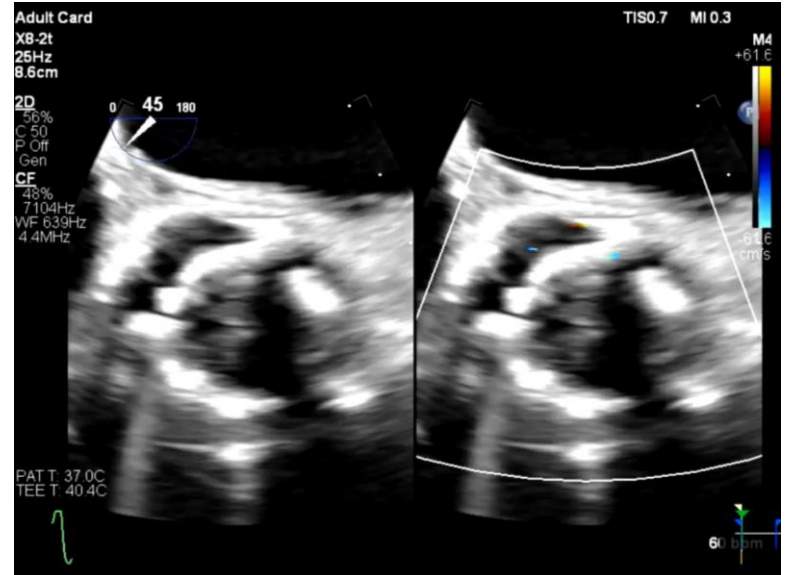
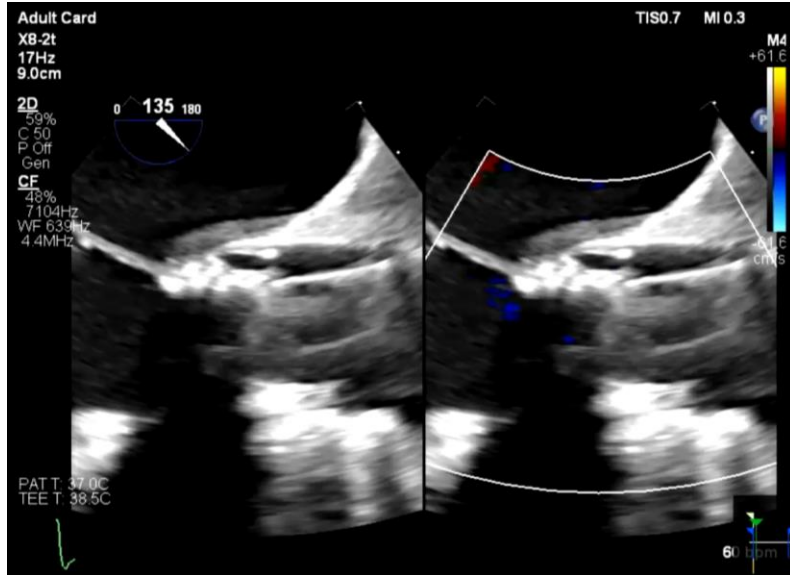


• 5 Tage nach PM-Implantation Fieber, 2x2 BK pos. mit S. aureus

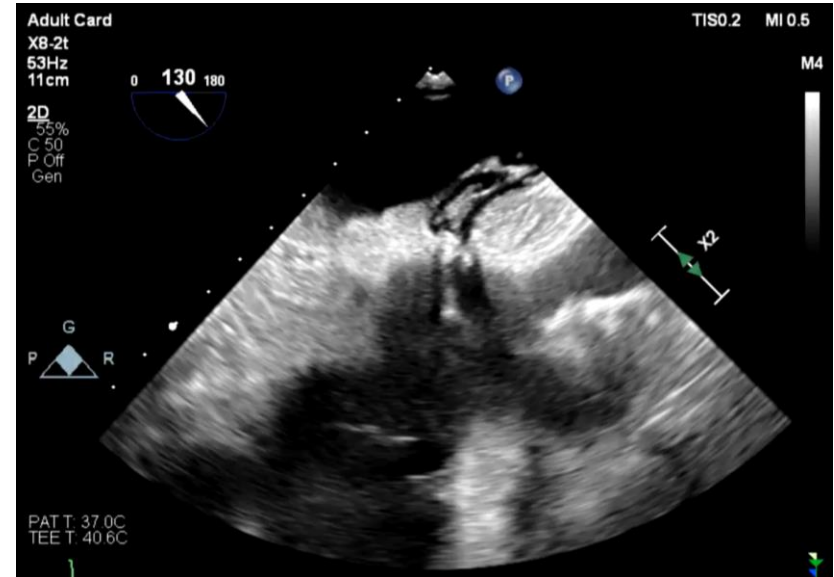
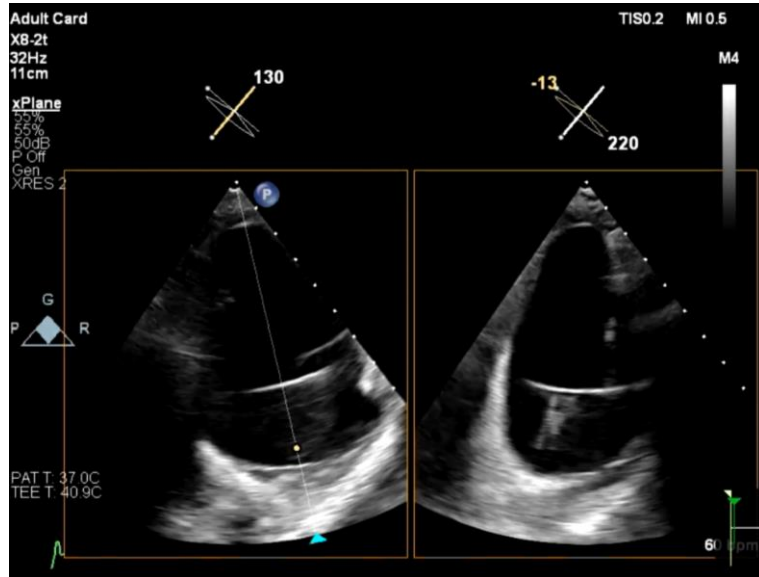
Fallbeispiel - TEE



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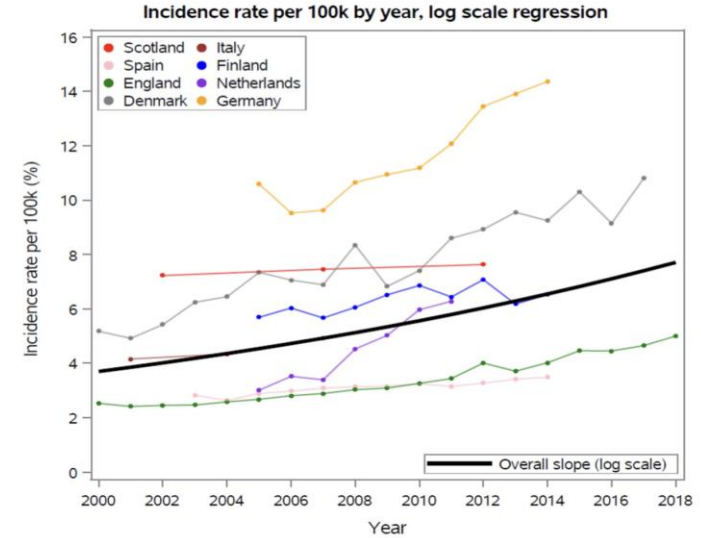
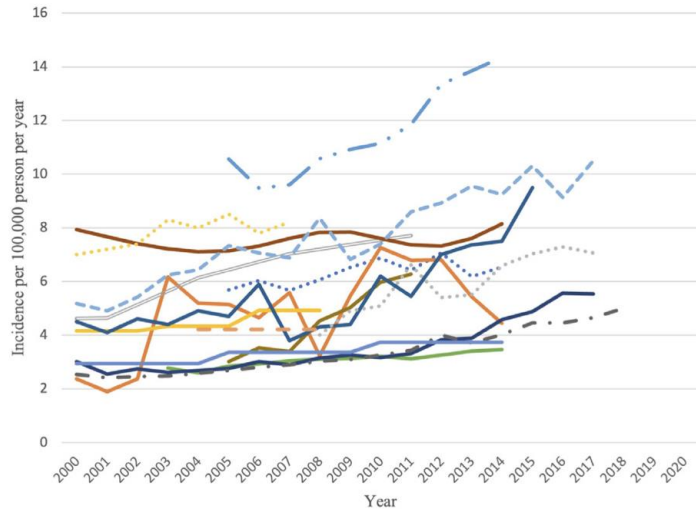
Fallbeispiel - TEE



Fallbeispiel – wie weiter?

- Kontroll-TEE in 10 Tagen
- Herz-CT
- Leukozyten-Szintigraphie
- ^{18}F -FDG PET/CT
- MALDI-TOF MS

Infektiöse Endokarditis - Inzidenz



Diagnosis – Clinical presentation

EURO-ENDO Registry

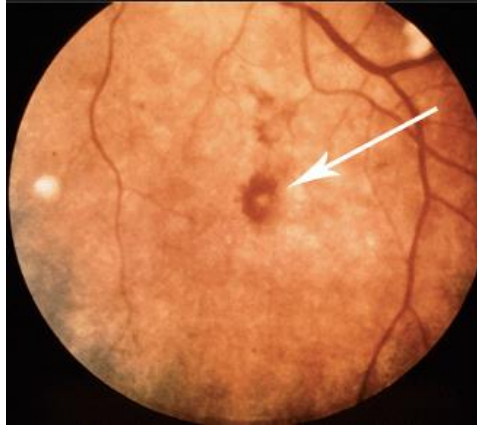
- **Fever in 80%**
- **Heart murmur in 65%**
- **Congestive heart failure**
- **Embolic complications in 25%**
- **Cardiac conduction abnormalities 12%**
- **Peripheral stigmata are increasingly uncommon**

Infektiöse Endokarditis – Periphere Stigmata

Seltener – frühere Diagnose?



**Splinter
Hämorrhagien**



Roth spots



**Janeway
Läsionen**



**Osler
Knoten**

Infectious endocarditis - microbiology

	Prosthesis+Repair	Native	PM/ICD
Methi-S Staphylococcus aureus	17.9%	24.3%	39.5%
Methi-R Staphylococcus aureus	4.7%	8.4%	6.9%
Methi-S Staph coagulase negative	8.2%	4.9%	12.0%
Methi-R Staph coagulase negative	10.2%	4.0%	6.9%
Streptococcus viridans	10.2%	15.1%	2.6%
Enterococcus	21.7%	13.4%	13.3%
Streptococcus gallolyticus	6.0%	7.6%	3.9%
Gram negative bacillus	2.4%	3.6%	5.6%
Coxiella burnetii IgG anti phase I	1.1%	0.9%	0.0%

Increasing incidence of IE caused by E. faecalis and coagulase negative staphylococci

Modified Duke Criteria for the Diagnosis of Infective Endocarditis

- **Major criteria**

1. Microorganisms consistent with infective endocarditis from 2 separate blood cultures (including *E.faecalis*)
2. Imaging positive for infective endocarditis
 - Evidence of endocardial involvement with positive echocardiogram
 - **Cardiac CT**
 - **¹⁸F-FDG PET/CT**

- **Minor criteria**

1. Predisposing factor (known cardiac lesion, recreational drug injection)
2. Fever >38°C
3. Embolic vascular dissemination (arterial emboli, pulmonary infarcts, Janeway lesions, conjunctival hemorrhage, intracranial hemorrhage) (including those asymptomatic detected by imaging only, e.g. brain CT)
4. Immunological phenomena (glomerulonephritis, Osler's nodes, rheumatoid factor)
5. Positive blood culture (that does not meet a major criterion) or serological evidence of infection

Modified Duke Criteria for the Diagnosis of Infective Endocarditis

Definite:

- 2 major criteria.
- 1 major criterion and at least 3 minor criteria.
- 5 minor criteria.

Possible:

- 1 major criterion and 1 or 2 minor criteria.
- 3–4 minor criteria.

Rejected:

- Does not meet criteria for definite or possible at admission with or without a firm alternative diagnosis.

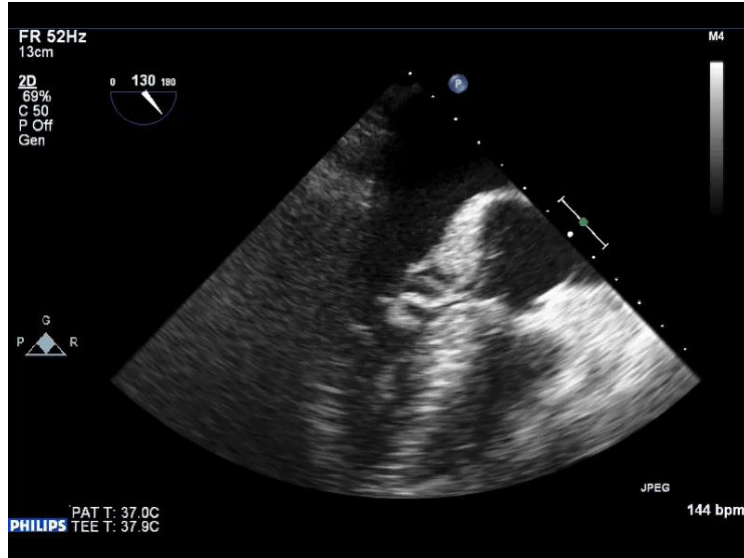
Modified Duke Criteria for the Diagnosis of Infective Endocarditis

Evidence of endocardial involvement with positive echocardiogram

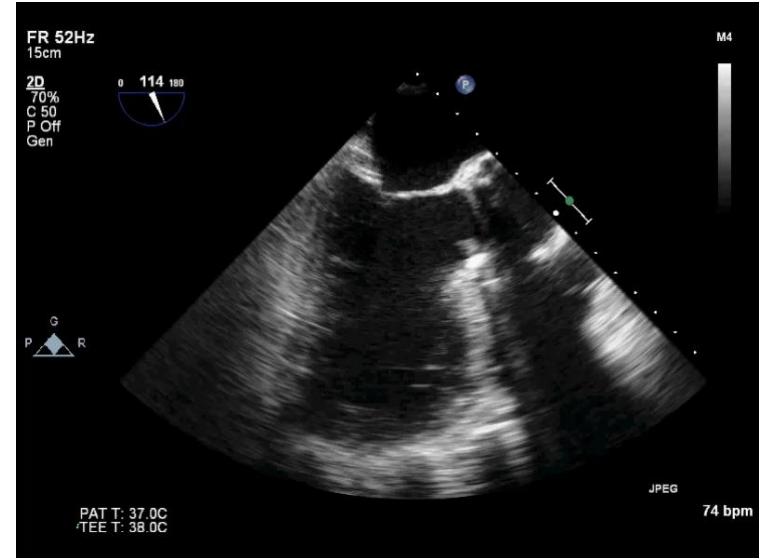
- Vegetation = Oscillating intracardiac mass on valve or supporting structures, in the path of regurgitant jets, or on implanted material in the absence of an alternative explanation, or
- Abscess, or
- New partial dehiscence of a prosthetic valve or new valvular regurgitation

Modified Duke Criteria for the Diagnosis of Infective Endocarditis: Echo

Vegetation - large

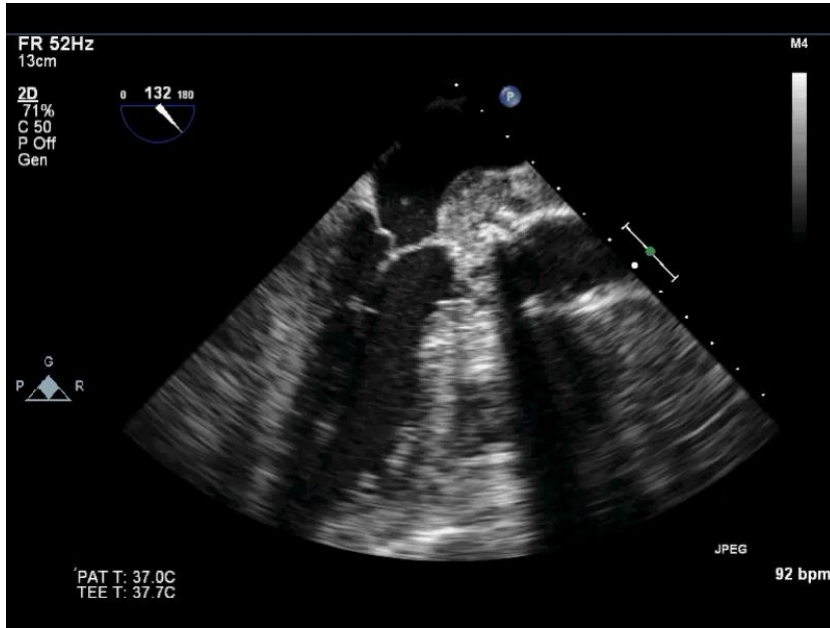


Vegetation - small

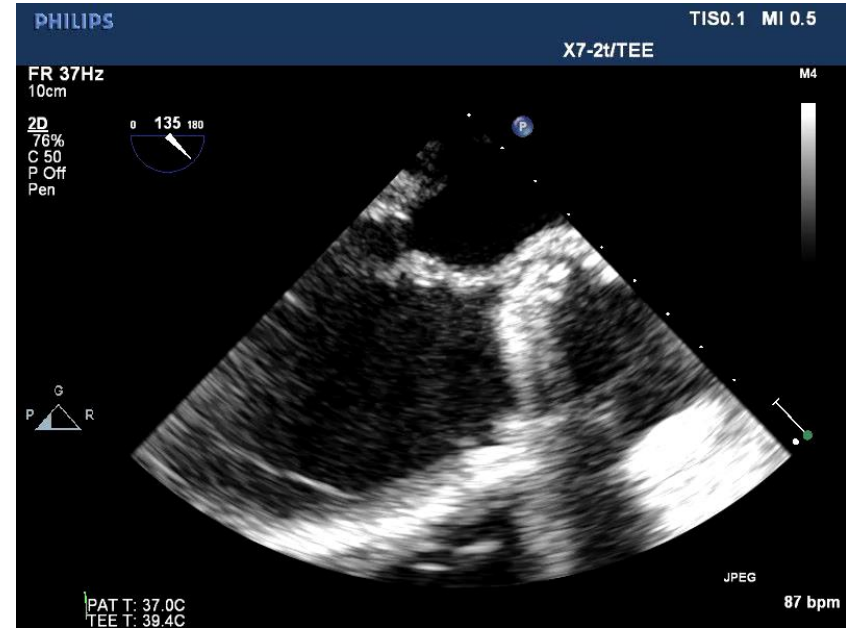


Modified Duke Criteria for the Diagnosis of Infective Endocarditis: Echo

Abscess



Valve dehiscence



Fallbeispiel: Modified Duke Criteria for the Diagnosis of IE

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Modified Duke Criteria for the Diagnosis of Infective Endocarditis: Brain CT

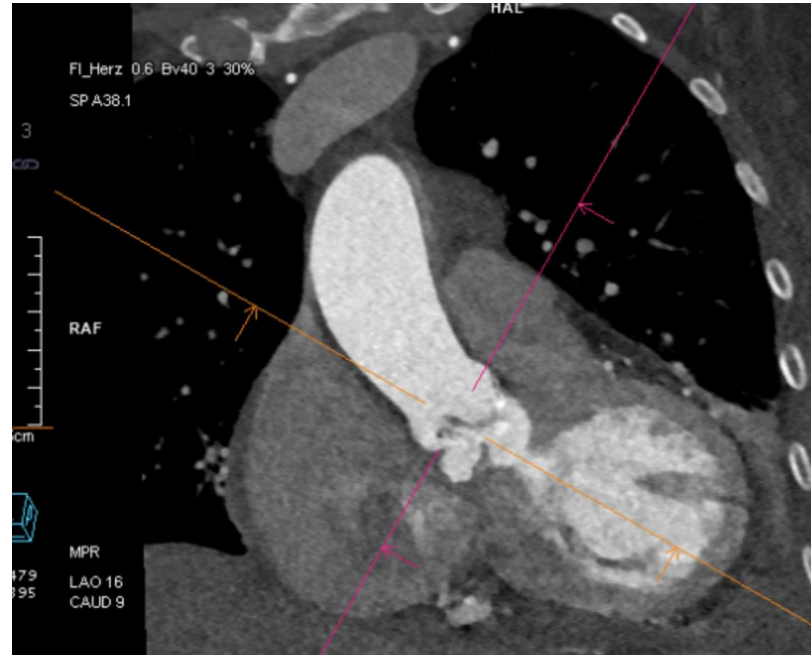


No intracerebral bleeding
No ischemic lesions

Endokarditis – Sensitivität der Echokardiographie

- Transthorakale Echokardiographie (TTE): $\approx 50\%$
 - Transösophageale Echokardiographie (TEE): $\approx 90\%$
(kleine Vegetationen $< 5\text{mm}$, Klappenprothesen)
- ➔ Eine negative Echokardiographie schliesst eine Endokarditis nicht aus!

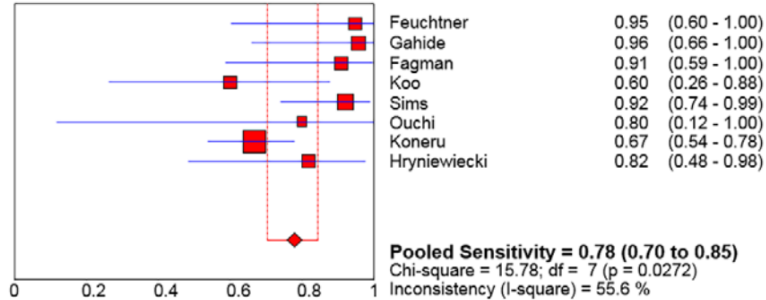
Endokarditis – Kardiales CT



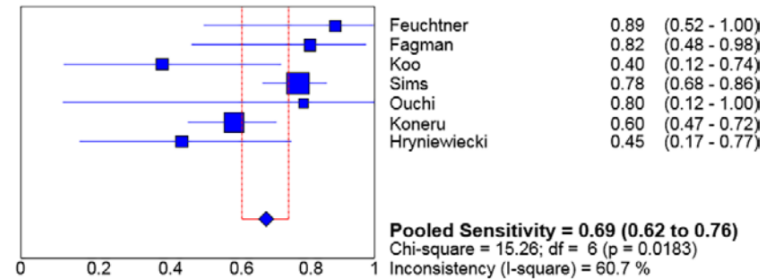
Komplikationen: paravalvulärer Abszess

Endokarditis – Kardiales CT vs. TEE

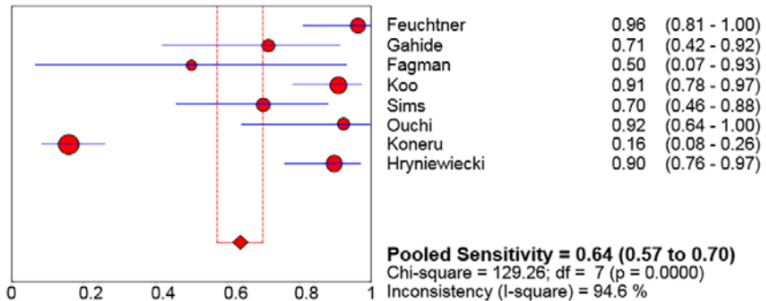
CT – Abscess/Pseudoaneurysm
Sensitivity (95% CI)



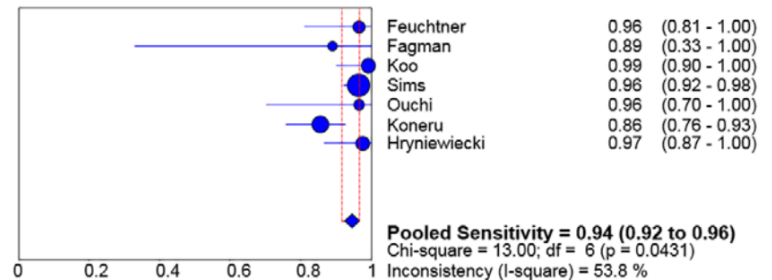
TEE – Abscess/Pseudoaneurysm
Sensitivity (95% CI)



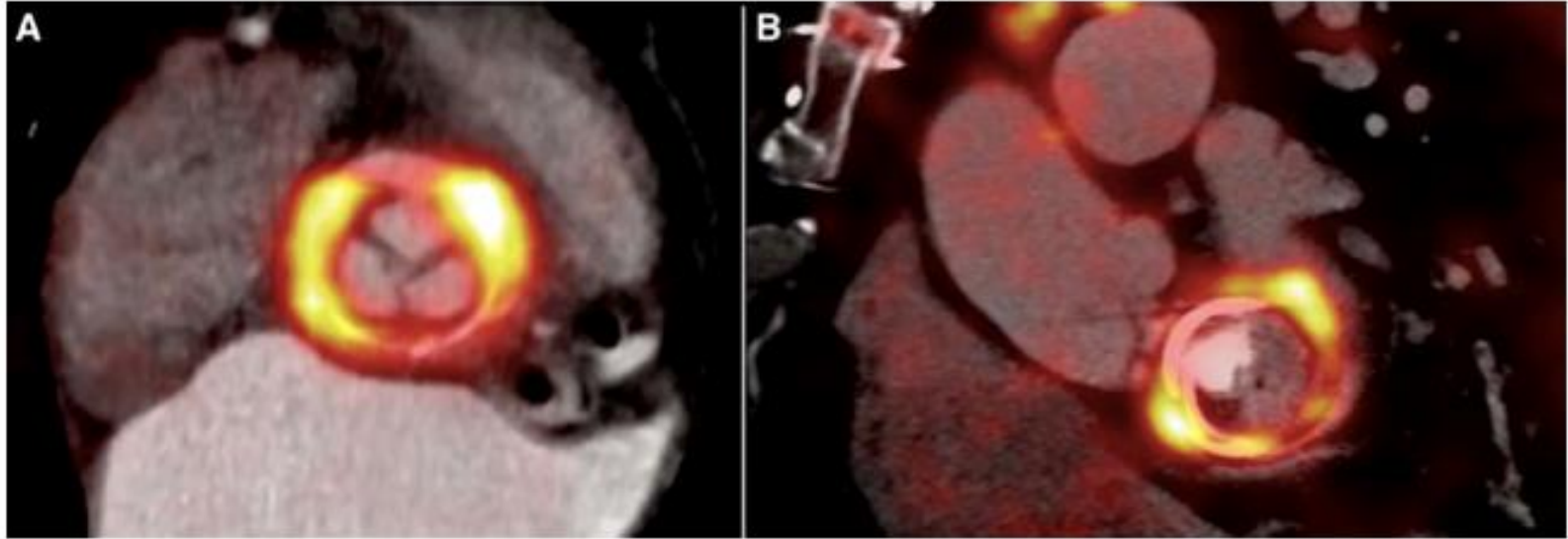
CT – Vegetation
Sensitivity (95% CI)



TEE – Vegetation
Sensitivity (95% CI)



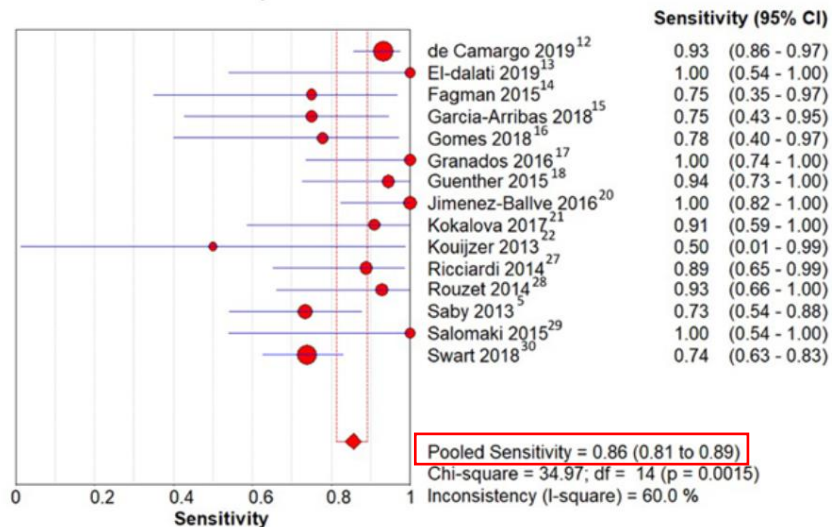
Endokarditis – ^{18}F -FDG PET/CT



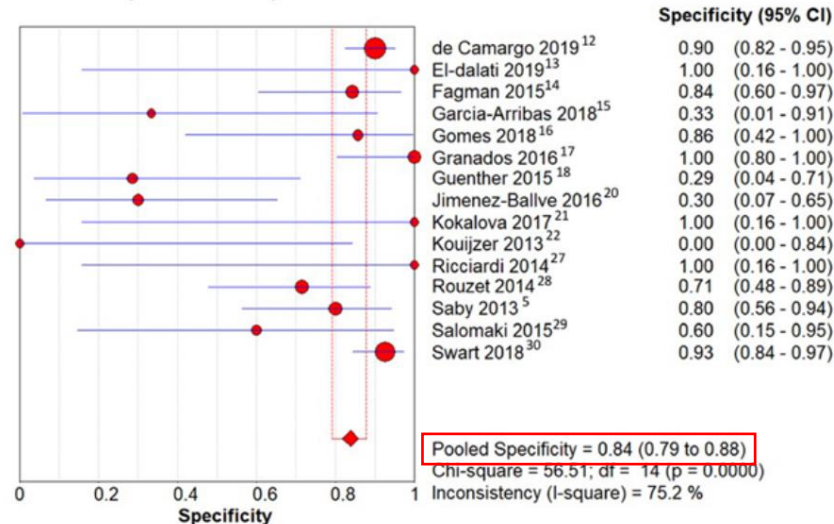
^{18}F Fluorodesoxyglukose Positron Emissionstomographie/Computertomographie
V.a. bei Klappenprothesen!

Endokarditis – ^{18}F -FDG PET/CT for Prosthetic valve endocarditis

C PVIE sensitivity



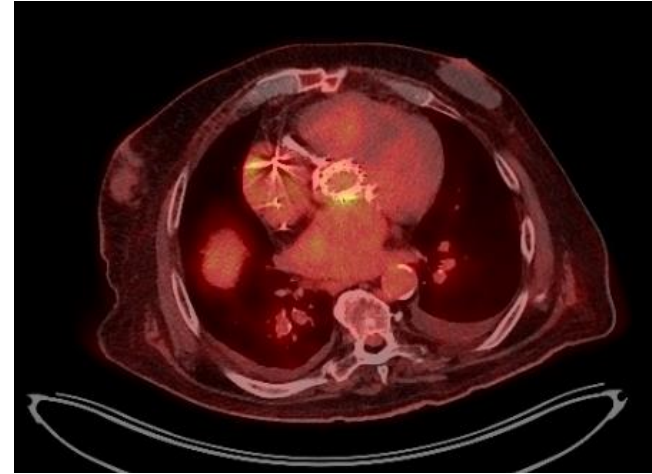
D PVIE specificity



Fallbeispiel – wie weiter?

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Fallbeispiel: ^{18}F -FDG PET/CT



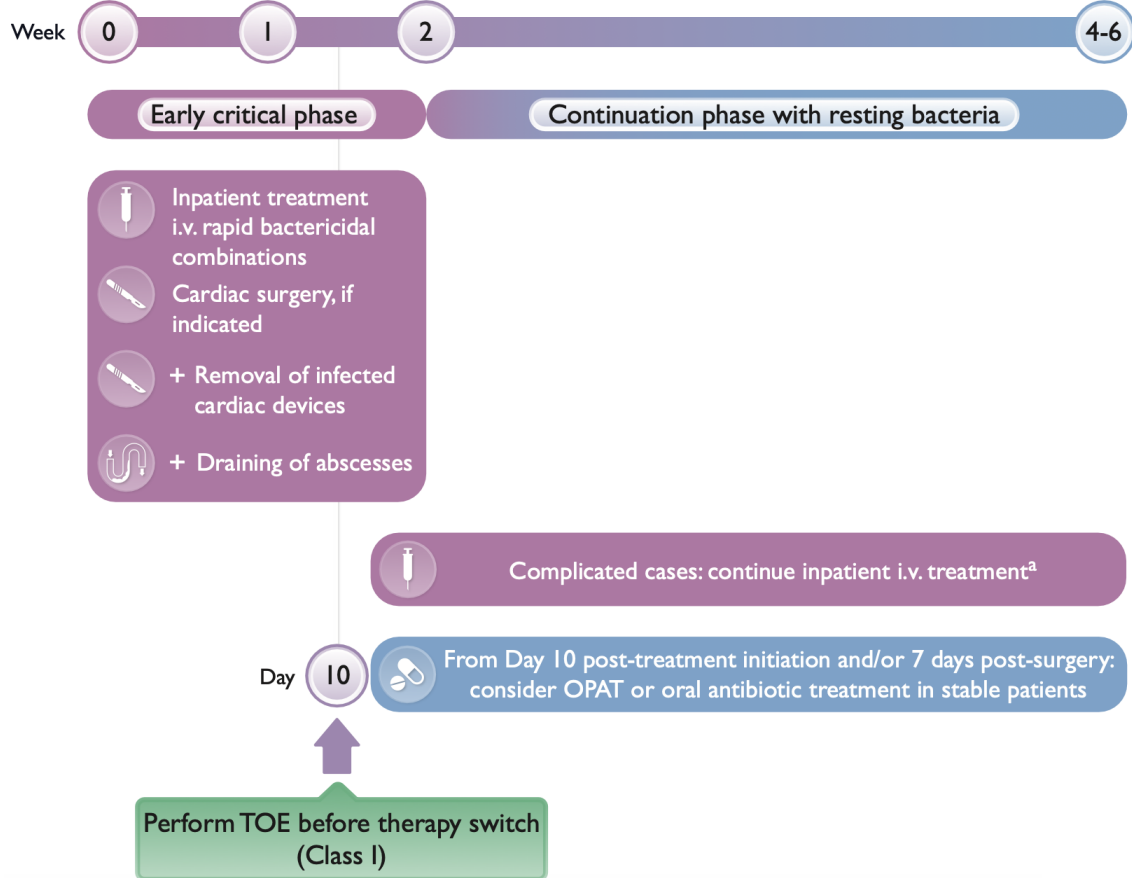
Stoffwechselsteigerung in der Umgebung der Aortenklappenprothese

→ 2x2 BK mit *S. aureus*

→ ^{18}F -FDG PET/CT positiv

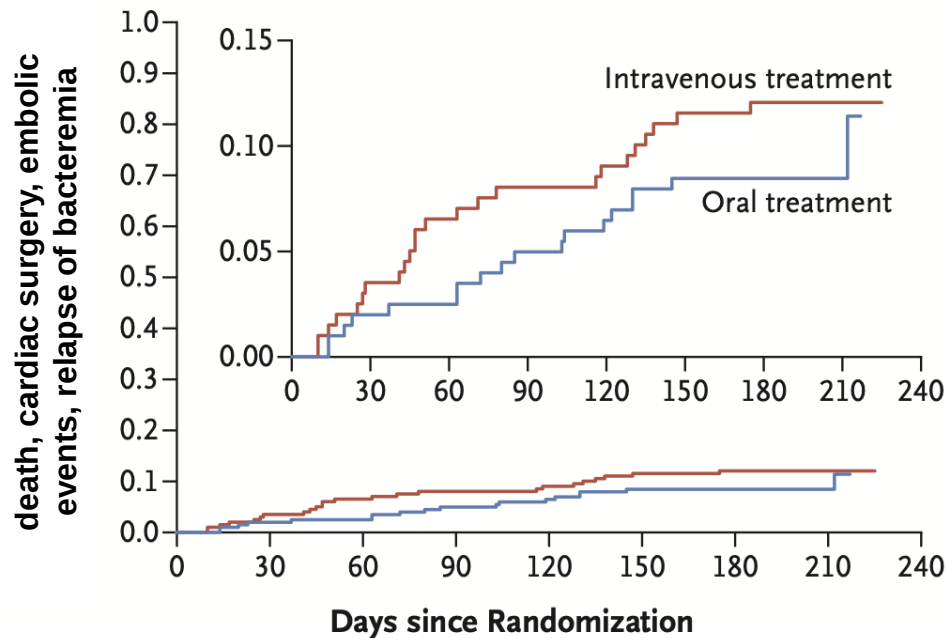
= 2 major Kriterien = **Klappenprothesenendokarditis**

Infectious Endocarditis: Phases of antibiotic therapy



Partial Oral versus IV Antibiotic Treatment of Endocarditis

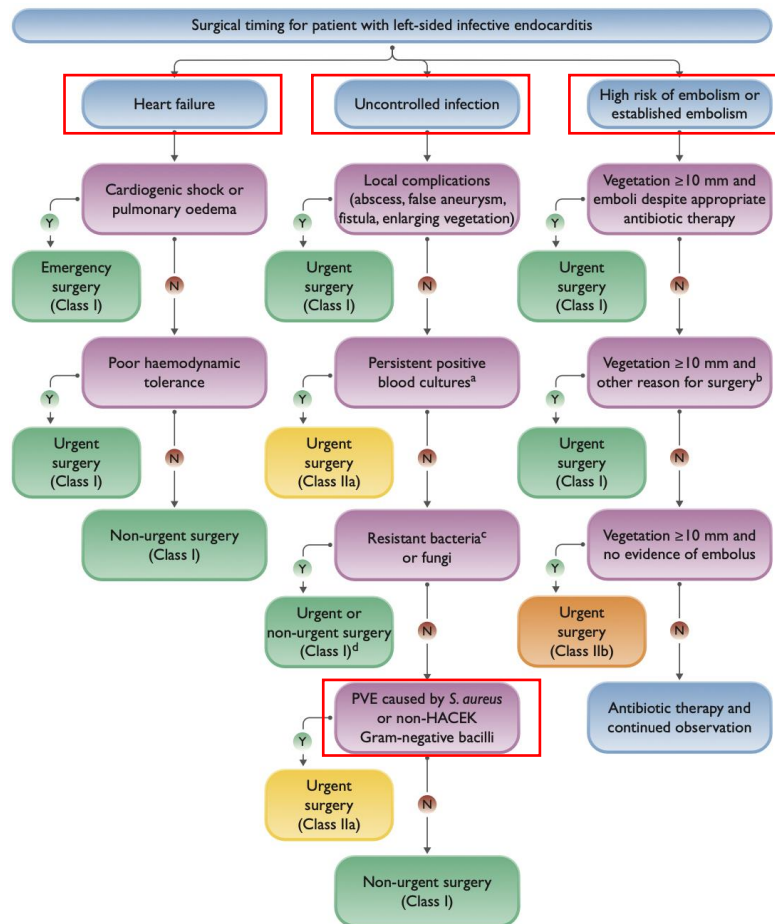
n= 400 patients with uncomplicated left sided IE randomized to 6 weeks iv vs. 10 days iv followed by switch to po



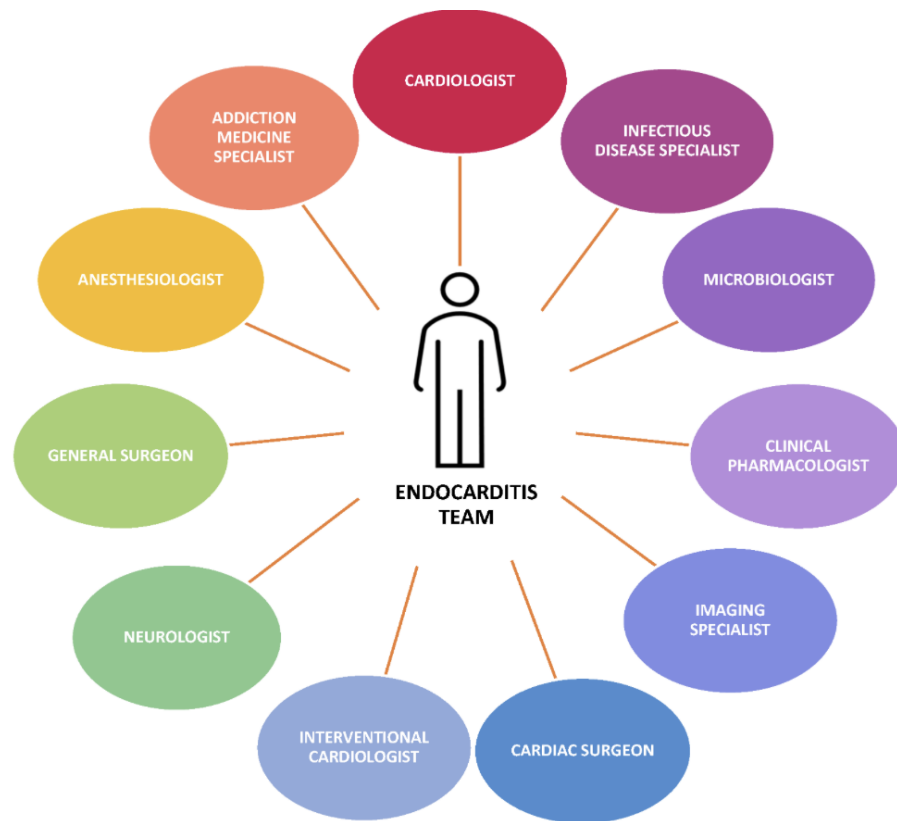
No. at Risk

Intravenous treatment	199	192	186	183	181	176	174	28	0
Oral treatment	201	197	196	191	188	184	183	36	0

Infectious endocarditis: Indications for surgery



Endokarditis Team



Outcome data of 292 patients with native valve endocarditis according to the period of observation and treatment

Variable	Period 1 (1996–2002), n = 102	Period 2 (2003–2009), n = 190	p Value
Heart failure	32 (31%)	70 (37%)	0.60
Embolic phenomena	28 (27%)	41 (21%)	0.31
Metastatic infections	17 (17%)	28 (15%)	0.73
Multiorgan failure	14 (14%)	17 (9%)	0.23
Worsened renal function	59 (58%)	71 (37%)	0.001
Failed antibiotic therapy	23 (22%)	35 (18%)	0.44
Medical therapy	70 (69%)	108 (57%)	0.059
Surgery during hospitalization	32 (31%)	82 (43%)	0.06
Urgent surgery	0	28 (15%)	<0.001
Surgical mortality	15 (47%)	11 (13%)	<0.001
Early postsurgical recurrence	0	1	1
Elective surgery	29 (28%)	18 (9%)	<0.0001
Recurrence	2 (2%)	1 (0.5%)	0.28
Overall in-hospital mortality	29 (28%)	25 (13%)	0.02
3-yr mortality	35 (34%)	31 (16%)	0.0007

Endokarditis Team - Fallbeispiel

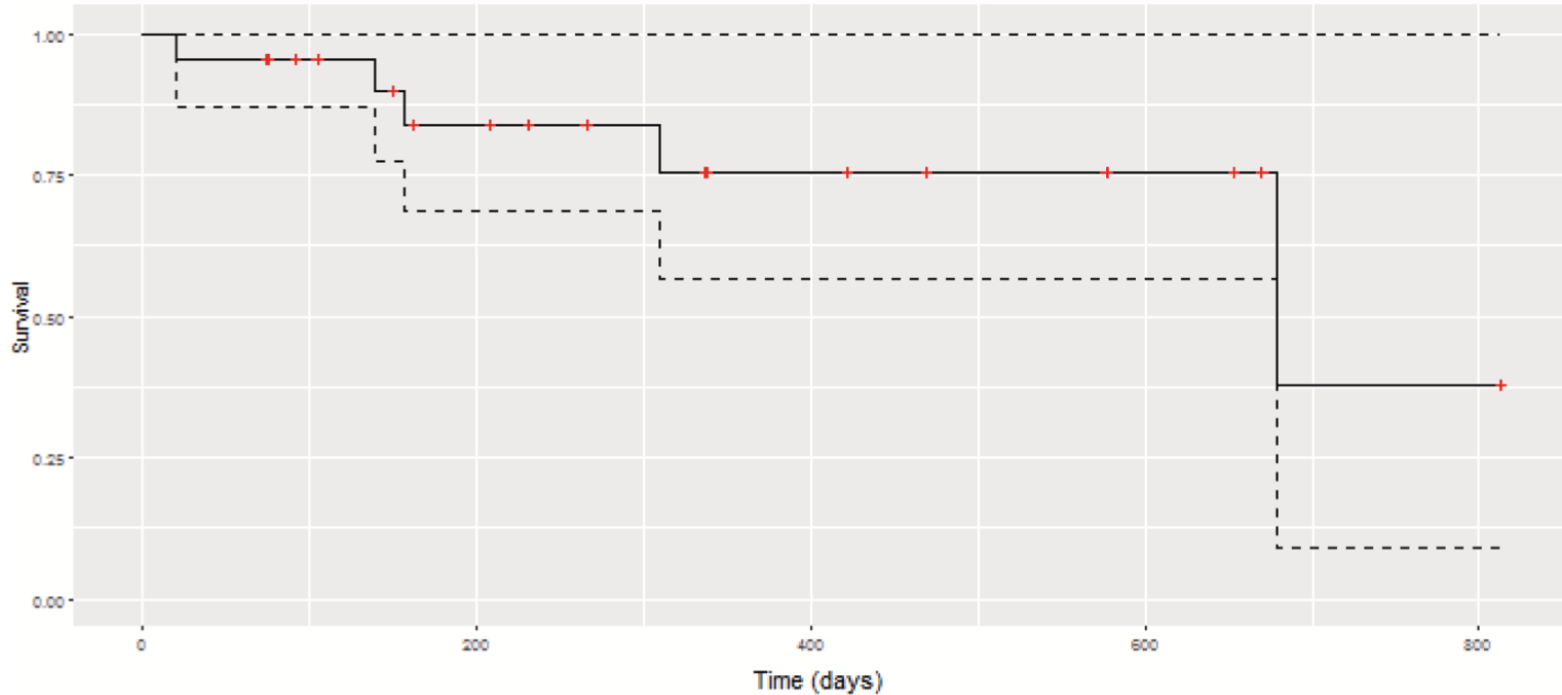


Betagter, multimorbider Patient
Demenz
Re-Operation

→ **konservative Therapie**
(resistengerechte Antibiose,
anschliessend
Suppressionstherapie)

Endokarditis Team - Fallbeispiel

Suppressionstherapie - Ueberleben



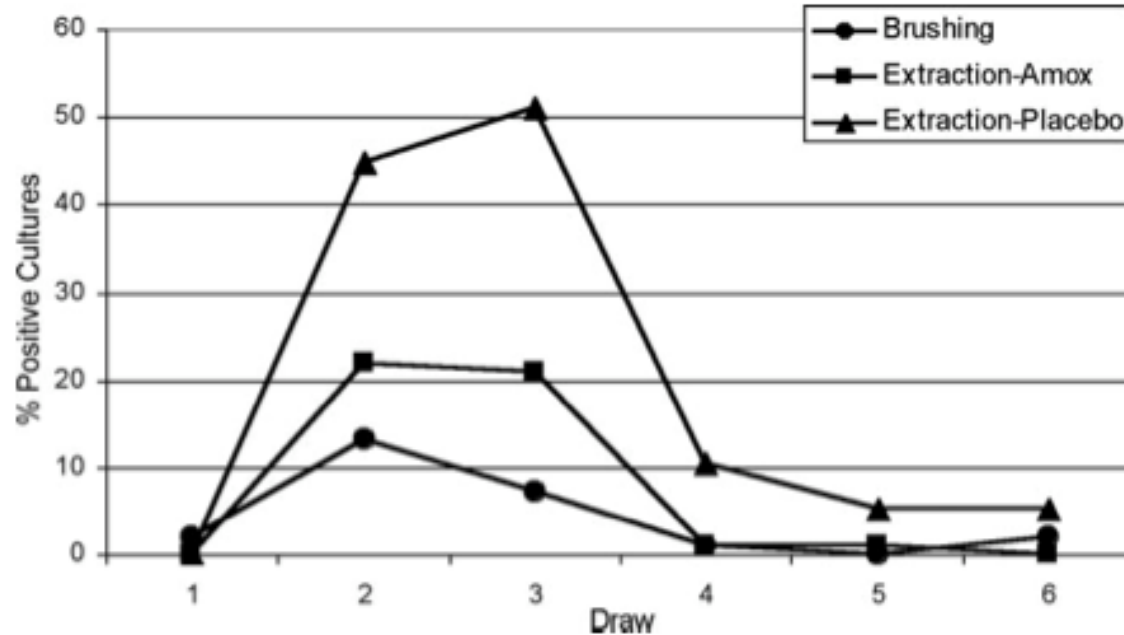
Thank you for your attention

beat.kaufmann@usb.ch



Bacteremia associated with toothbrushing

n=290 patients with the need for the extraction of a tooth



23% bacteremias with endocarditis causing species associated with toothbrushing
>200 bacteremias per year

Endokarditisprophylaxe – Wann?

Eingriffe bei Patienten mit Risiko die zu transienter Bakteriämie führen!

Zähne, Kiefer	Manipulationen des gingivalen Sulcus oder der periapikalen Region der Zähne
	Perforation der oralen Schleimhaut
	Eingriffe bei aktiver Infektion
Respirationstrakt	Tonsillektomie, Adenektomie; Inzision/Biopsie Mukosa
	Eingriffe bei aktiver Infektion
Magendarmtrakt	Eingriffe bei aktiver Infektion
Urogenitaltrakt	Eingriffe bei aktiver Infektion
Gynäkologie	Eingriffe bei aktiver Infektion
Haut	Inzision von Furunkeln, Abszessen

Endokarditisprophylaxe – bei wem?

Patienten mit einem hohen Risiko für eine Endokarditis!

1. Patientinnen und Patienten mit einer früher durchgemachten **Endokarditis**
2. Patientinnen und Patienten mit jeglicher Form einer **Klappenprothese**
(mechanisch oder biologisch inklusive Transkatheterklappen-Implantation oder Fremdmaterial zur Klappenrekonstruktion)
3. Patienten mit **angeborenen Vitien**
 - a) Jegliche Form von zyanotischen angeborenen Herzfehlern
 - b) korrigierte Vitien mit implantiertem Fremdmaterial während der ersten 6 Monate nach chirurgischer oder perkutaner Implantation
 - c) korrigierte Vitien mit Residualdefekten an oder nahe bei prothetischen Patches oder Prothesen (Verhinderung der Endothelialisierung)
4. Keine Evidenz, die den Nutzen einer Prophylaxe nach **Herztransplantation** aufzeigt
individuelle Entscheidung

Prävention – 5 Jahres Risiko für IE oder IE assoziierten Tod

