EuroValve

October 28- 29, 2021

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Prophylaxis for Infective Endocarditis

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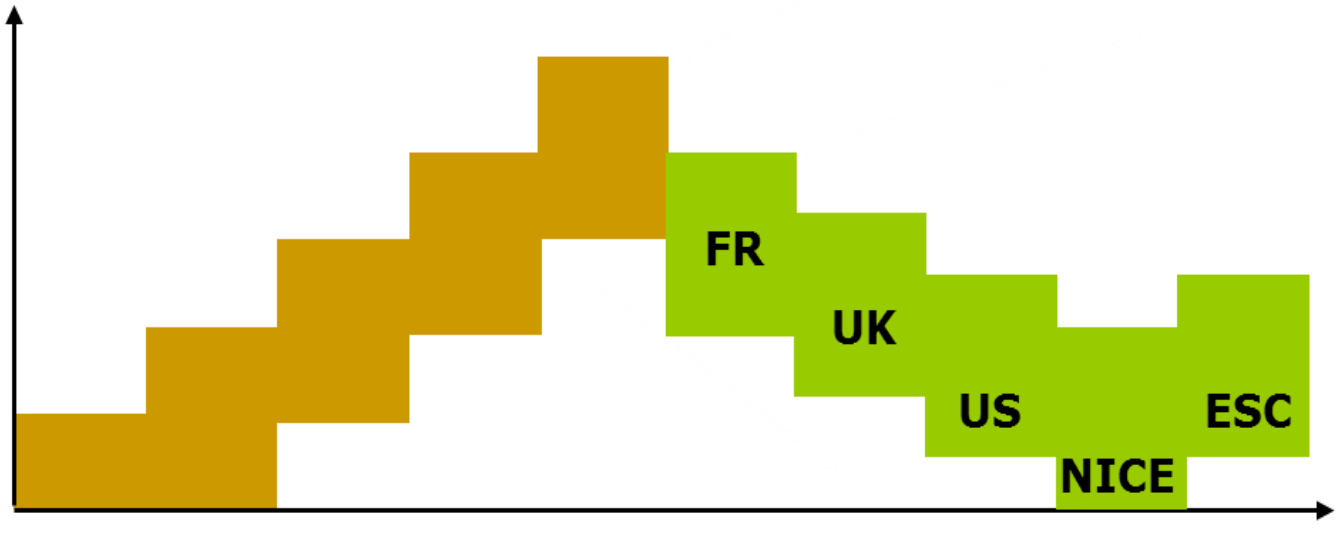
Disclosures

- None

Antibiotic Prophylaxis in Infective Endocarditis

Expert guidelines & consensus conferences

- USA (AHA): 1954, 1965, 1977, 1984, 1990, 1998, **2007, 2020**
- UK (BSAC): 1982, 1986, 1990, 1992, **2006, 2008 (NICE)**
- Switzerland : 1984, 2000
- ESC : 2004, **2009, 2015**
- France : 1992, **2002**



All types of procedure in any patient at risk

All types of procedure, optional in intermediate-risk patients

All types of dental care in any patient at high risk

Only certain dental care procedures in any patient at high risk

Cumulated vs. Transient Bacteraemia

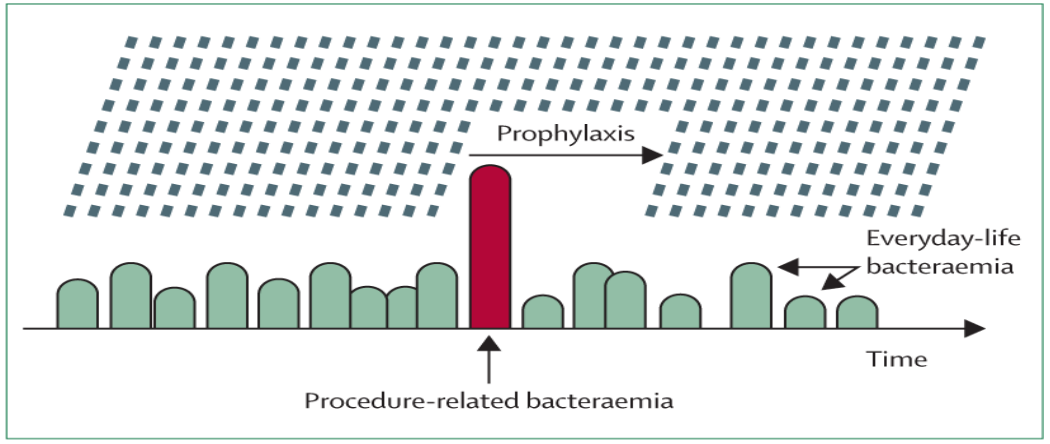
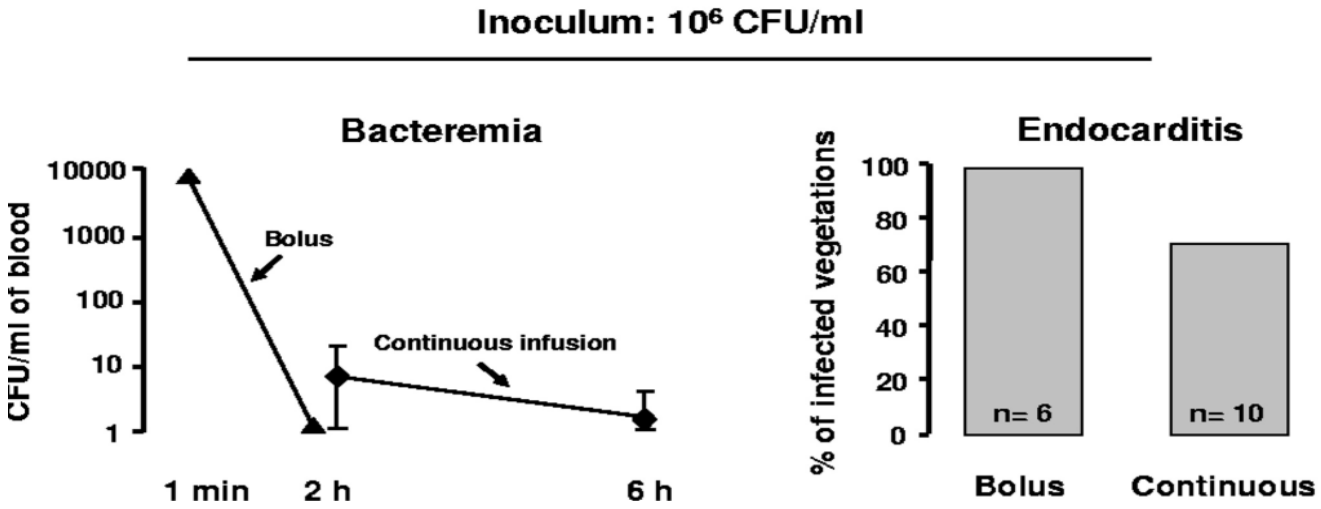


Figure 1: **Current concept of the limited role of antibiotic prophylaxis against everyday versus procedures related bacteraemia**
Adapted from reference 15.

(Duval et al. Lancet Infect Dis 2008;8:225-32)

Rats inoculated with the same Strep intermedius inoculum:

either by **bolus** 1ml in 1 min or by **continous infusion** over 10 h



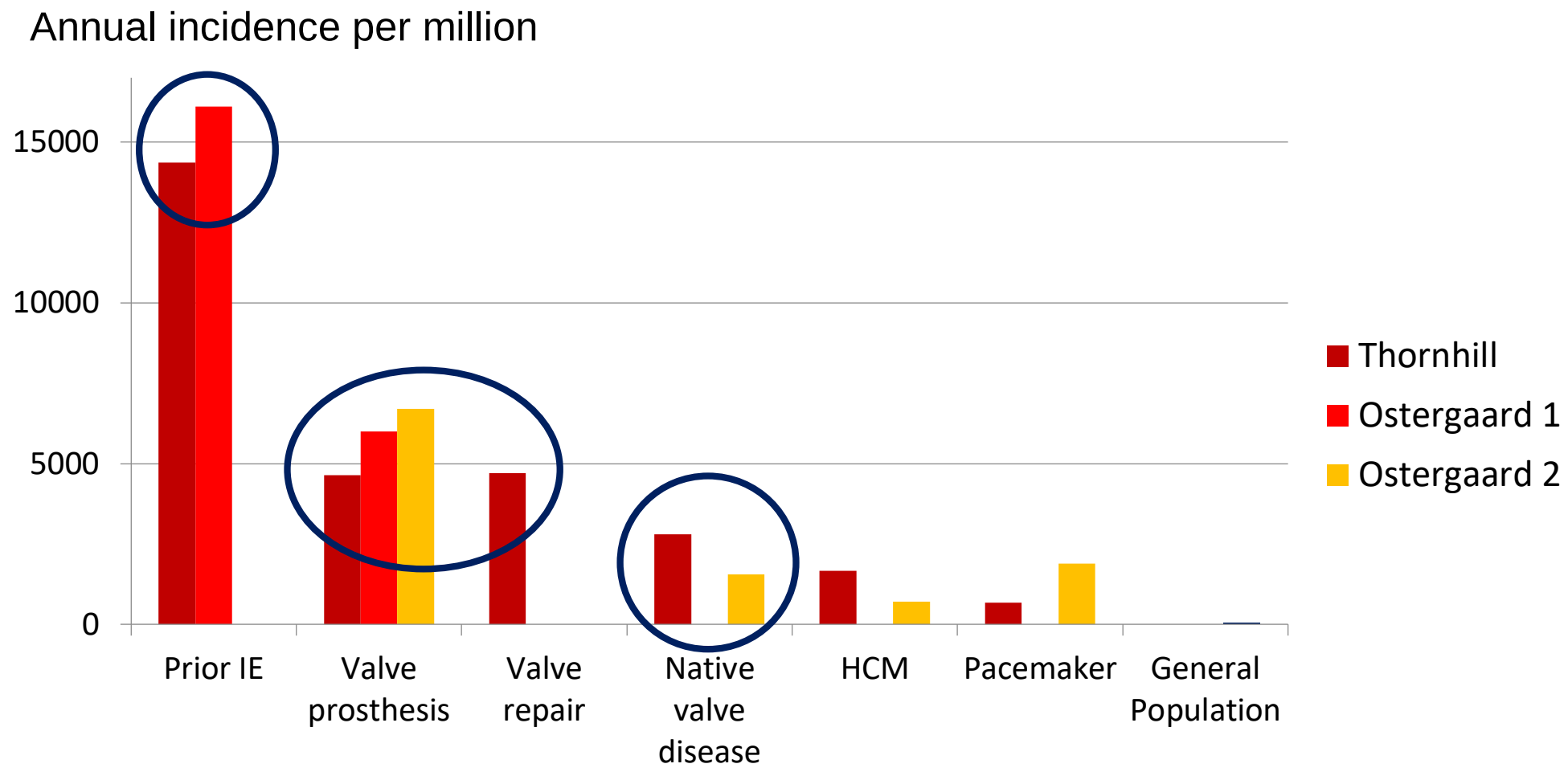
(Veloso et al. Infect Immun 2011;79:2006-11)

Cardiac conditions at highest risk of endocarditis

Recommendations	Class	Level
Antibiotic prophylaxis should only be considered for patients at highest risk of IE: 1. Patients with a prosthetic valve, including transcatheter valve, or a prosthetic material used for cardiac valve repair. 2. Patients with previous IE. 3. Patients with congenital heart disease. a. any cyanotic congenital heart disease b. congenital heart disease repaired with prosthetic material whether placed surgically or by percutaneous techniques, up to 6 months after the procedure or lifelong if there remains residual shunt or valvular regurgitation.	IIa	C
Antibiotic prophylaxis is not recommended in other forms of valvular or congenital heart disease.	III	C

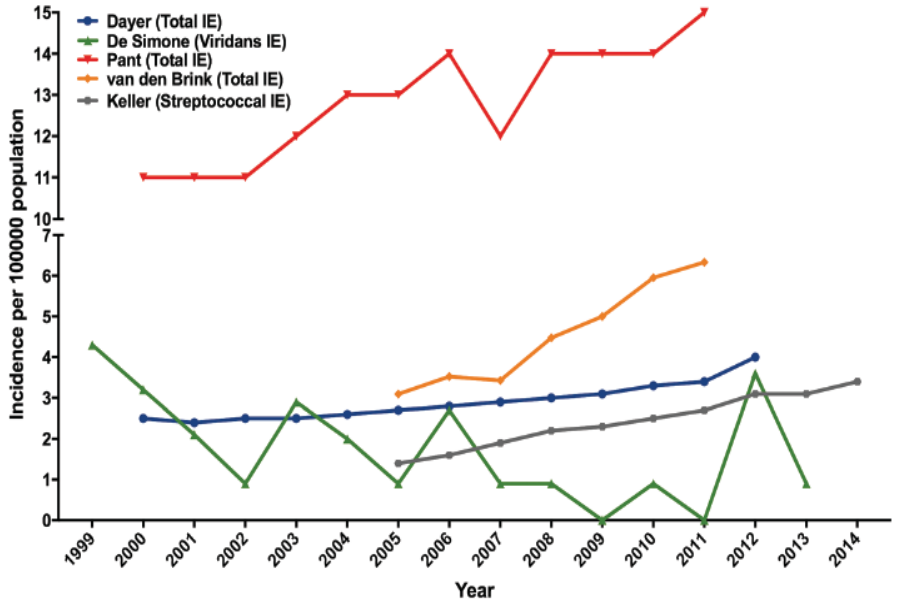
European Heart Journal (2015) doi:10.1093/eurheartj/ehv319

Incidence of Endocarditis / Predisposing Conditions

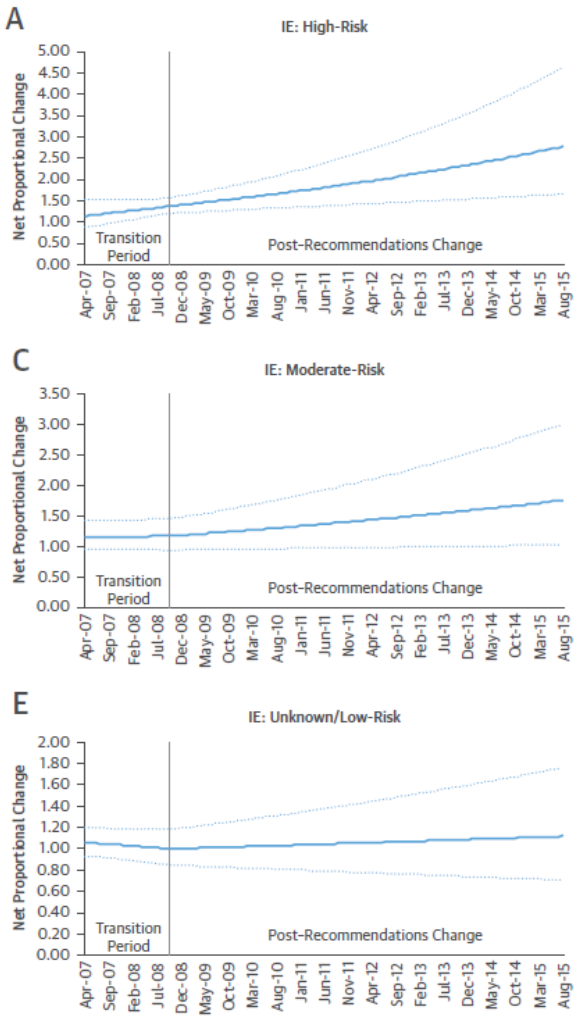


(Thornhill et al. Eur Heart J 2018;39:586-95
Østergaard et al. Eur Heart J 2018;39:623-9
Østergaard et al. Eur Heart J 2019;40:1355-61)

Temporal Trends in the Incidence of Infective Endocarditis



(Cahill et al. Heart 2017;103:937-44)



(Thornhill et al. J Am Coll Cardiol 2018;72:2443-54)

Prophylaxis in highest-risk patients according to the type of procedure at risk

Recommendations	Class	Level
A. Dental procedures • Antibiotic prophylaxis should only be considered for dental procedures requiring manipulation of the gingival or periapical region of the teeth or perforation of the oral mucosa.	IIa	C
• Antibiotic prophylaxis is not recommended for local anaesthetic injections in non-infected tissues, treatment of superficial caries, removal of sutures, dental X-rays, placement or adjustment of removable prosthodontic or orthodontic appliances or braces, or following the shedding of deciduous teeth or trauma to the lips and oral mucosa.	III	C
B. Respiratory tract procedures • Antibiotic prophylaxis is not recommended for respiratory tract procedures, including bronchoscopy or laryngoscopy, transnasal or endotracheal intubation.	III	C
C. Gastrointestinal or urogenital procedures or TOE • Antibiotic prophylaxis is not recommended for gastroscopy, colonoscopy, cystoscopy, vaginal or caesarean delivery or TOE.	III	C
D. Skin and soft tissues procedures • Antibiotic prophylaxis is not recommended for any procedure.	III	C

European Heart Journal (2015) doi:10.1093/eurheartj/ehv319

Prophylaxis for dental procedures at risk

Situation	Antibiotic	Single-dose 30-60 minutes before procedure	
		Adults	Children
No allergy to penicillin or ampicillin	Amoxicillin or Ampicillin[a]	2 g orally or i.v.	50 mg/kg orally or i.v.
Allergy to penicillin or ampicillin	Clindamycin	600 mg orally or i.v.	20 mg/kg orally or i.v.

[a]Alternatively, cephalexin 2 g i.v. for adults or 50 mg/kg i.v. for children, cefazolin or ceftriaxone 1 g i.v. for adults or 50 mg/kg i.v. for children.

"Cephalosporins should not be used in patients with anaphylaxis, angio-oedema, or urticaria after intake of penicillin or ampicillin due to cross-sensitivity".

European Heart Journal (2015) doi:10.1093/eurheartj/ehv319

Non-specific prevention measures

These measures should ideally be applied to the general population and particularly reinforced in high-risk patients.
• Strict dental and cutaneous hygiene. Dental follow-up should be performed twice a year in high-risk patients and yearly in others.
• Disinfection of wounds.
• Eradication or decrease of chronic bacterial carriage: skin, urine.
• Curative antibiotics for any focus of bacterial infection.
• No self-medication with antibiotics.
• Strict asepsis control measures for any at-risk procedure.
• Discourage piercing and tattooing.
• Limit the use of infusion catheters and invasive procedures when possible. Favour peripheral over central catheters, and systematic replacement of the peripheral catheter every 3–4 days. Strict adherence to care bundles for central and peripheral cannulae should be performed.

European Heart Journal (2015) doi:10.1093/eurheartj/ehv319

Portal of Entry

Systematic search of portal of entry in 318 patients with IE

➢ Identified in 238 pts (74%):

- Cutaneous 40%
  41% healthcare-associated, 22% due to IV drug abuse
- Oral or dental 29% (69% *streptococci*)
  (59% infectious foci, 12% dental procedure)
- Gastrointestinal 23%
- Genitourinary 4%
- Other 3%

(Delahaye et al. J Am Coll Cardiol 2016;67:161-8)

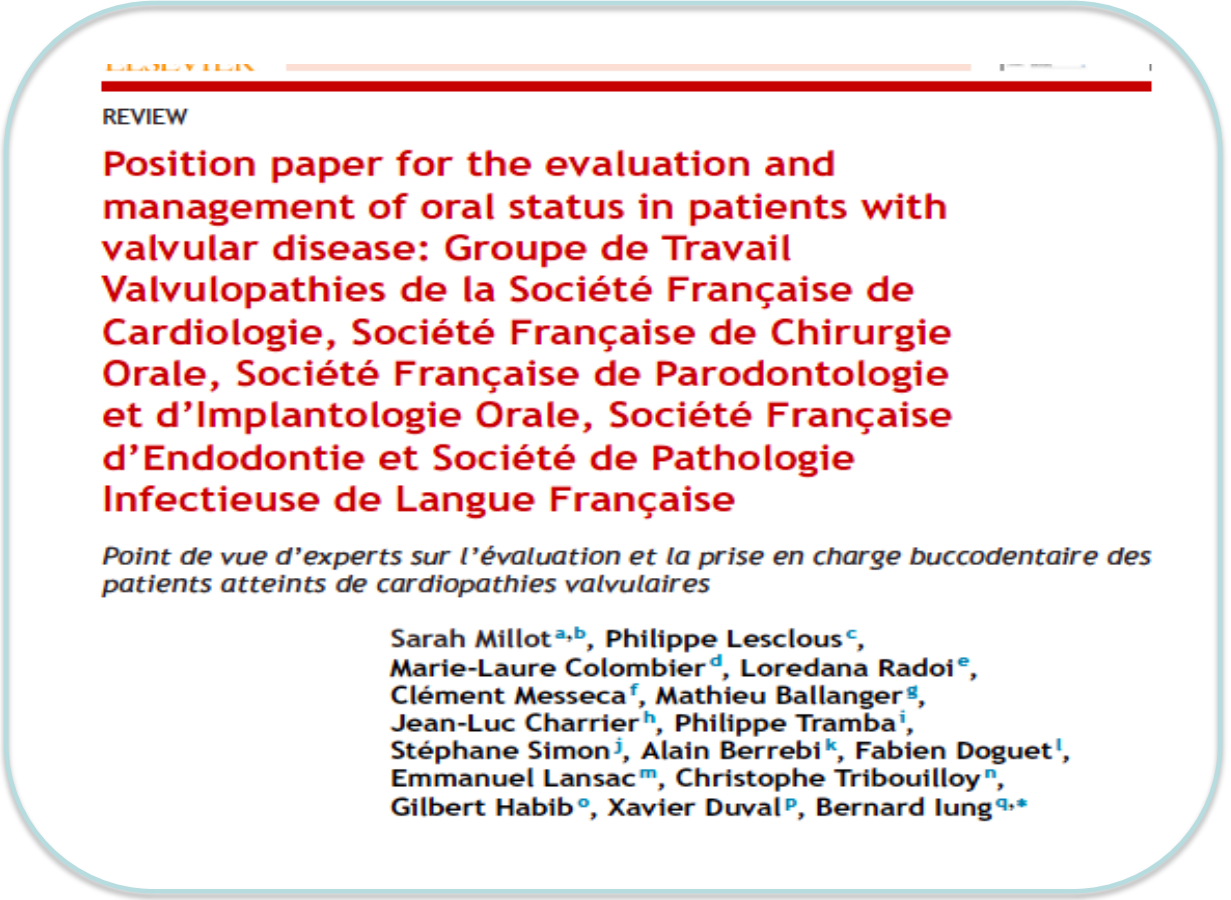
Oral Status Management in Valvular Disease

Evaluation of oral status

- Clinical evaluation
  (GP, cardiologist / specialist)
- Imaging techniques

Tailored Management

- Restorative dentistry
- Use of dental implants



REVIEW

Position paper for the evaluation and management of oral status in patients with valvular disease: Groupe de Travail Valvulopathies de la Société Française de Cardiologie, Société Française de Chirurgie Orale, Société Française de Parodontologie et d'Implantologie Orale, Société Française d'Endodontie et Société de Pathologie Infectieuse de Langue Française

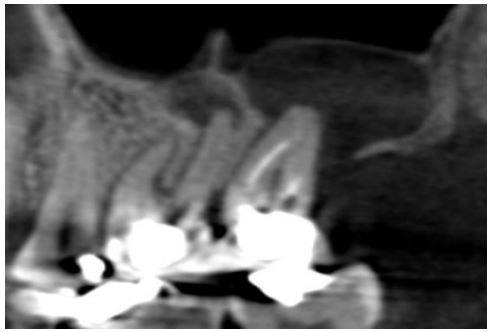
Point de vue d'experts sur l'évaluation et la prise en charge buccodentaire des patients atteints de cardiopathies valvulaires

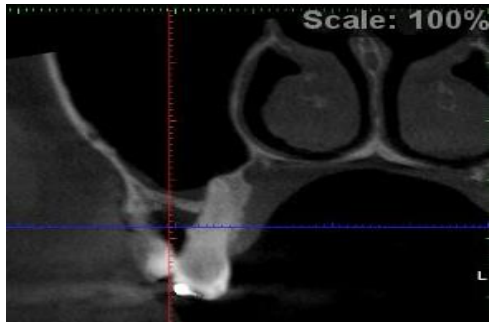
Sarah Millot[a,b], Philippe Lesclous[c], Marie-Laure Colombier[d], Loredana Radoi[e], Clément Messeca[f], Mathieu Ballanger[g], Jean-Luc Charrier[h], Philippe Tramba[i], Stéphane Simon[j], Alain Berrebi[k], Fabien Doguet[l], Emmanuel Lansac[m], Christophe Tribouilloy[n], Gilbert Habib[o], Xavier Duval[p], Bernard Iung[q,*]

(Millot et al. Arch Cardiovasc Dis 2017;110:482-54)

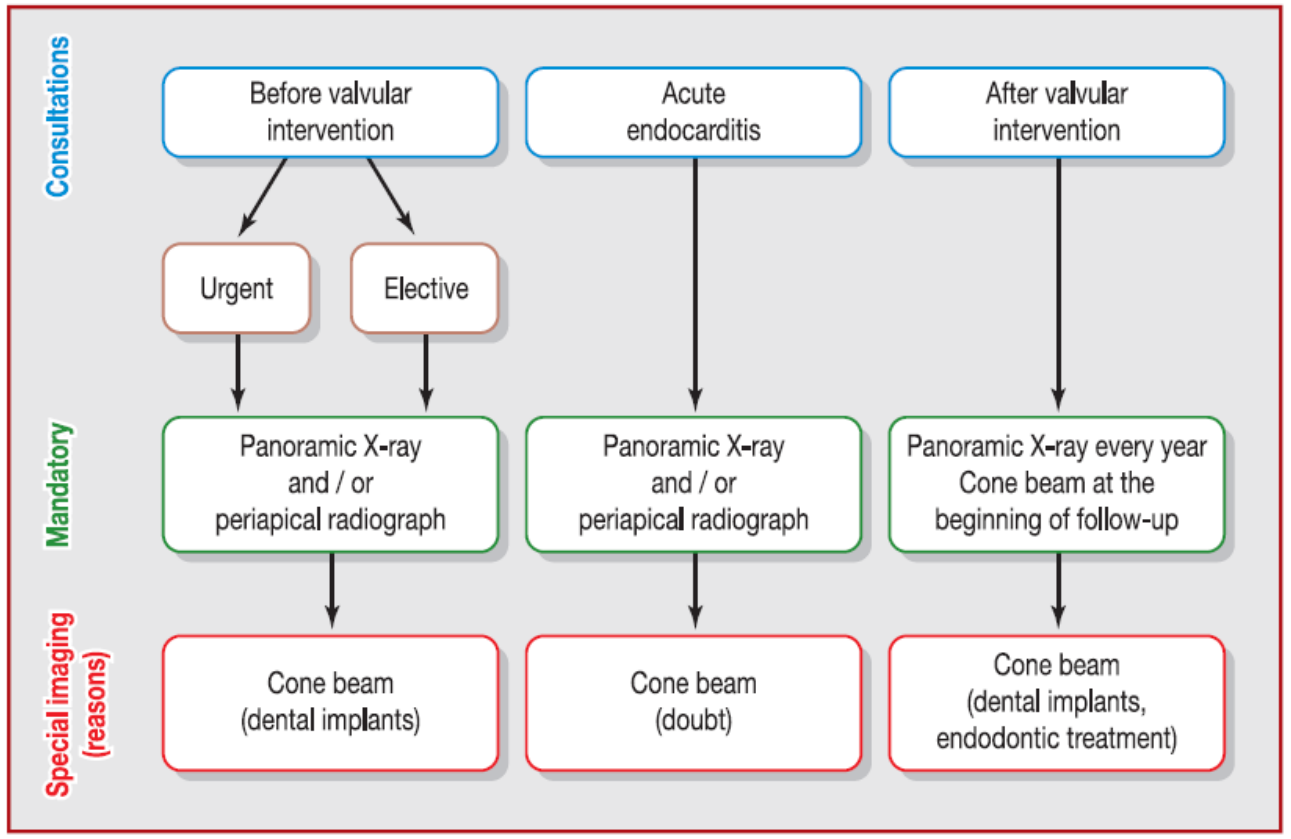
Imaging for the Detection of Oral Infectious Foci

Panoramic X-ray: Sensitivity 28%





Cone beam: Sensitivity 100%



Indications for imaging according to the context

(Millot et al. Arch Cardiovsc Dis 2017;110:482-94)

Specific Dental Therapies

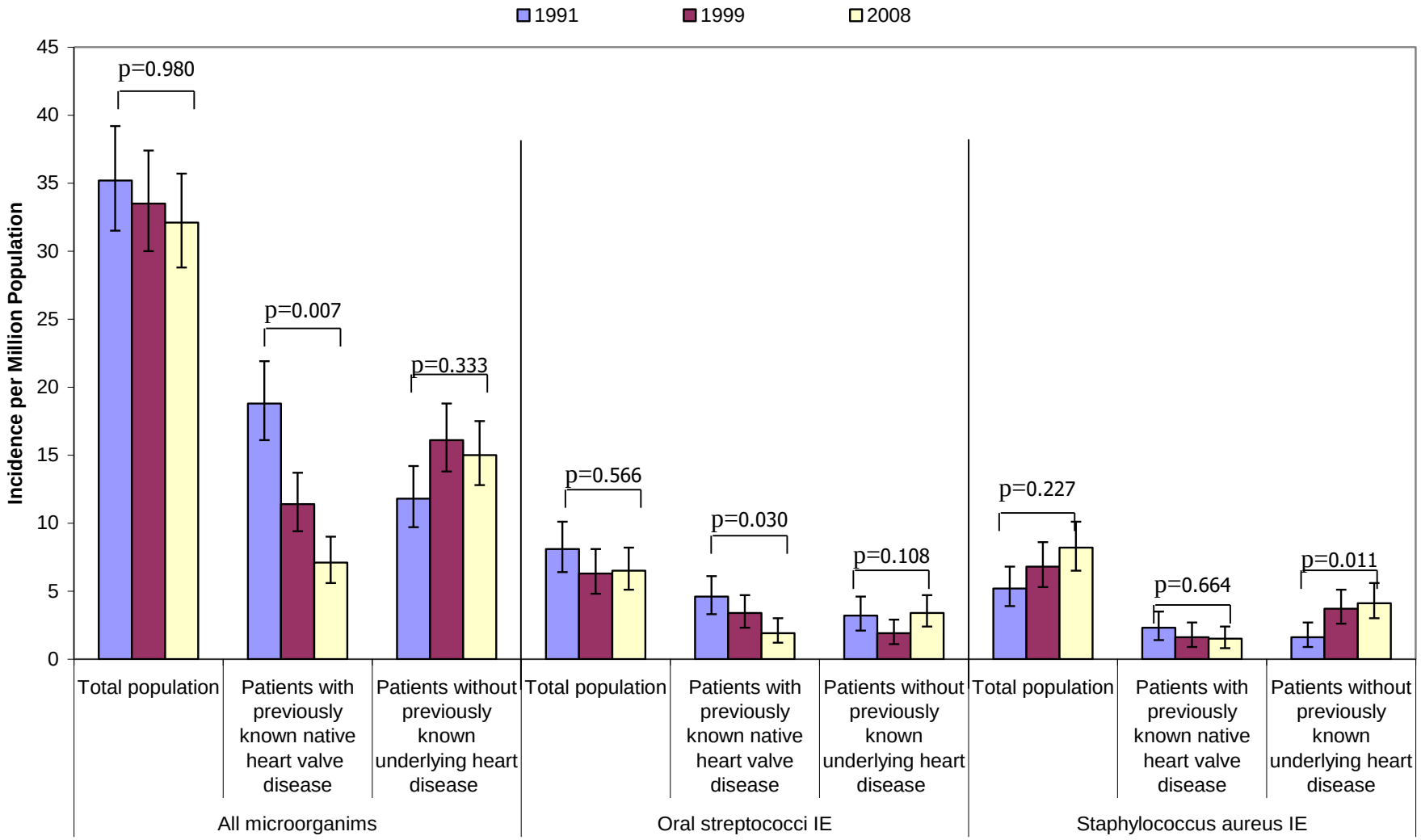
- **Restorative dentistry and endodontic surgery**
  - Favoured if no need for urgent management
  - Individualized imaging and treatment

- **Dental implants**
  - Low risk of bacteraemia at implantation
    (*Bolukbasi et al. 2012, Pineiro et al. 2010, Stacchi et al. 2016)*
  - Late peri-implantitis
    2% to 50% of implants, after 5-10 years
    complex management, no consensus
    (Renvert et al. 2015, Lee et al. 2017)

- Feasible even in high-risk patients
- Contra-indication maintained if active smoking, uncontrolled diabetes, prior endocarditis

(Millot et al. Arch Cardiovsc Dis 2017;110:482-94)

Incidence of IE
French surveys on IE 1991,1999,2008



(Duval et al. J Am Coll Cardiol 2012;59:1968-76)

Knowledge and Implementation of Guidelines

- Questionnaires to 123 patients at risk of IE (71% at high risk)
- 42% had education on IE

	Patients	
	High risk* (n = 87)	Low risk** (n = 36)
Cannot name heart condition	75 (86%)	28 (78%)
Unable to provide minimal definition of IE	41 (47%)	27 (75%)
Potential serious risks of the disease unknown	44 (51%)	29 (81%)
Correct wallet card lacking or not given	11 (13%)	8 (22%)
No knowledge of her/his risk group	65 (75%)	15 (42%)
Insufficient knowledge of measures to prevent IE	32 (37%)	14 (39%)
Unaware of antibiotics needed before dental procedures	38 (44%)	17 (47%)
Dentist not seen in the last year	15 (17%)	7 (19%)
Dentist not seen in the last 2 years	22 (25%)	9 (25%)
Did not inform dentist of heart problem	18 (21%)	8 (22%)
Did not recall education by a physician	56 (64%)	29 (81%)

* Mechanical and bioprosthetic valve, previous infective endocarditis, complex cyanotic heart disease
** Degenerative aortic stenosis/regurgitation, bicuspid aortic valve, mitral valve prolapse with relevant valvular regurgitation, hypertrophic obstructive cardiomyopathy

(Stucki C, Mury R, Bertel O. Swiss Med Wkly 2003;133:155-9)

Knowledge and Implementation of Guidelines

National survey in 243 French cardiologists

- Identification of invasive dental procedure: 61%
- High-risk conditions
  - Identification: 92%
  - Antibioprophylaxis prescription: 93%
- Moderate-risk conditions
  - Identification: 68%
  - Antibioprophylaxis prescription: 20-30%
- Correct identification of the risk of 7 dental procedures: 25%
- Correct schedule of amoxicillin prescription : 47%

(Cloitre et al. Int J Cardiol 2020;299:222-7)

Conclusions

- Current guidelines maintain indictaions of antibiotic prophylaxis restricted to selected dental care in patients at high risk of endocarditis.
- Non-specific hygiene measures are emphasized
  - All healthcare procedures
  - Improved preventive and therapeutic management of oral infective foci
- Particular awreness in high-risk patients (prior endocarditis)
- Need for evaluation of implementation of preventive measures

- Current guidelines maintain indications of antibiotic prophylaxis restricted to selected dental care in patients at high risk of endocarditis.
- Non-specific hygiene measures are emphasized:
  - All healthcare procedures
  - Improved preventive and therapeutic management of oral infective foci
- Particular awareness in high-risk patients (prior endocarditis)
- Need for evaluation of implementation of preventive measures

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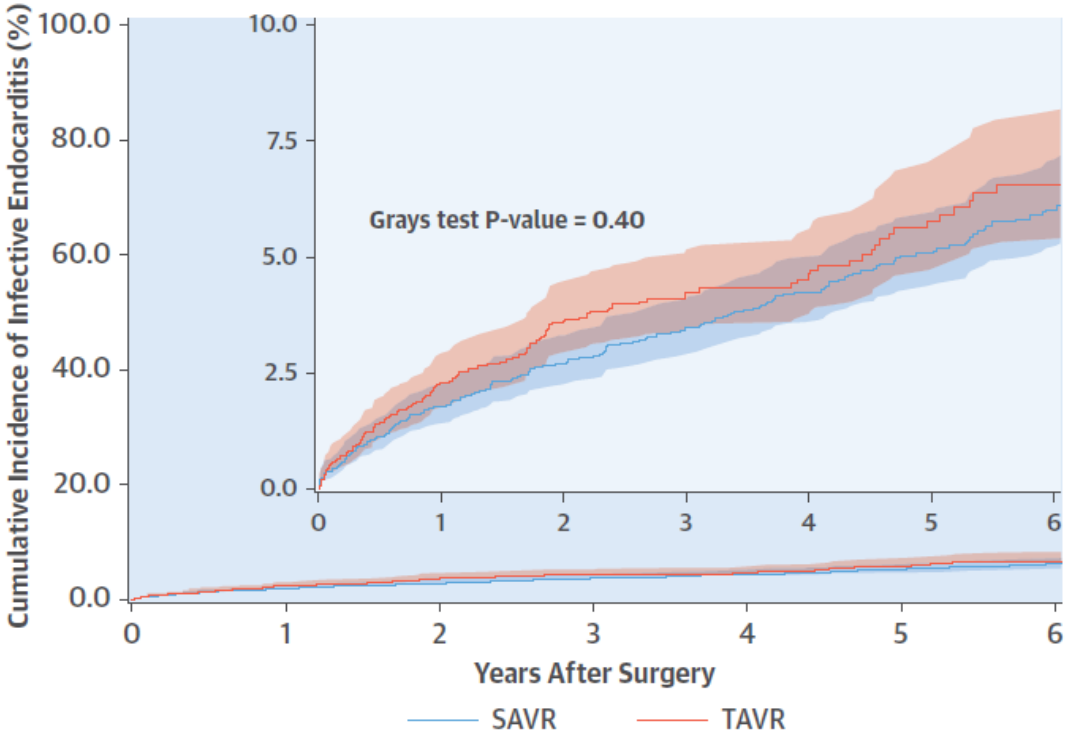
Incidence of Infective Endocarditis after SAVR/TAVI

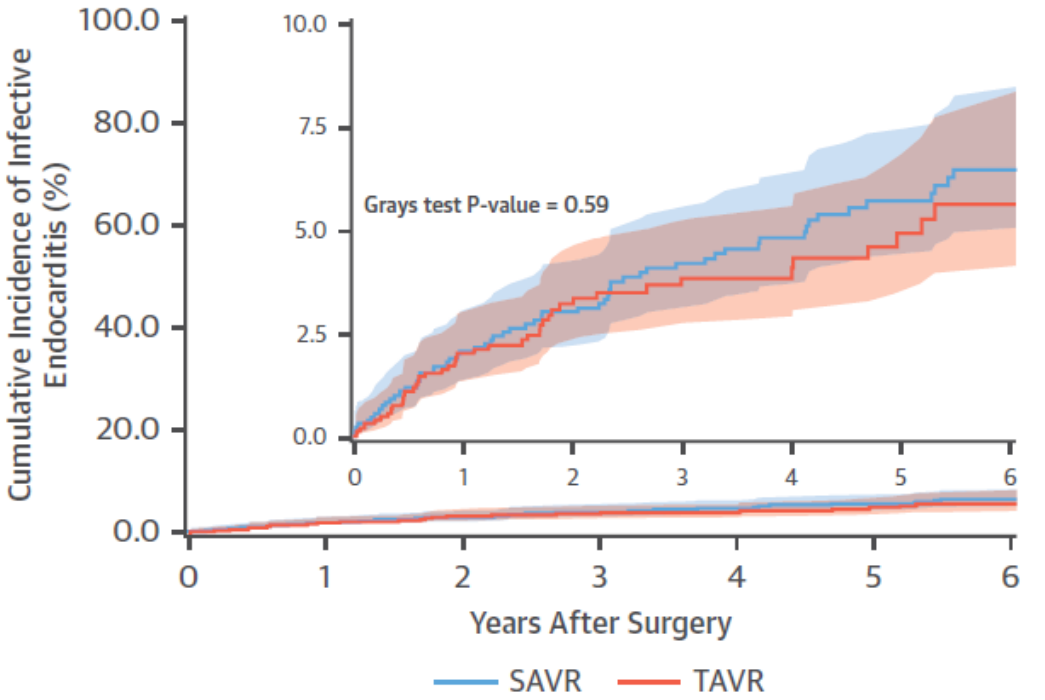
3777 patients with prior SAVR and 2632 with TAVI (Danish registry 2008-2016)
Annual incidence : 1.6% after TAVI and 1.2% after SAVR

Overall population



Patients at risk							
SAVR	3,777	3,457	2,936	2,452	1,896	1,394	955
TAVR	2,632	2,083	1,401	950	625	373	200

Matched samples



Patients at risk							
SAVR	1,151	1,056	915	759	595	448	305
TAVR	1,151	940	639	433	304	196	112

(Butt et al. J Am Coll Cardiol 2019;73:1646-55)