Prevention of infective endocarditis

2023 ESC Guidelines for the management of endocarditis

On Behalf of the Task Force for the 2023 Infective Endocarditis Guidelines

Stefano Caselli, MD, PhD, FESC

25 August 2023

ESC
European Society of Cardiology

Declaration of interest

- Consulting/Royalties/Owner/ Stockholder of a healthcare company : Proctor for Abbott medical

Epidemiology

- Rare condition but a major public health challenge
- Incidence: 13.8 / 100.000 / Year
- Mortality: 0.9 / 100.000 / Year
- 1,723,590 Disability Adjusted Life Years in 2019

Pathophysiology

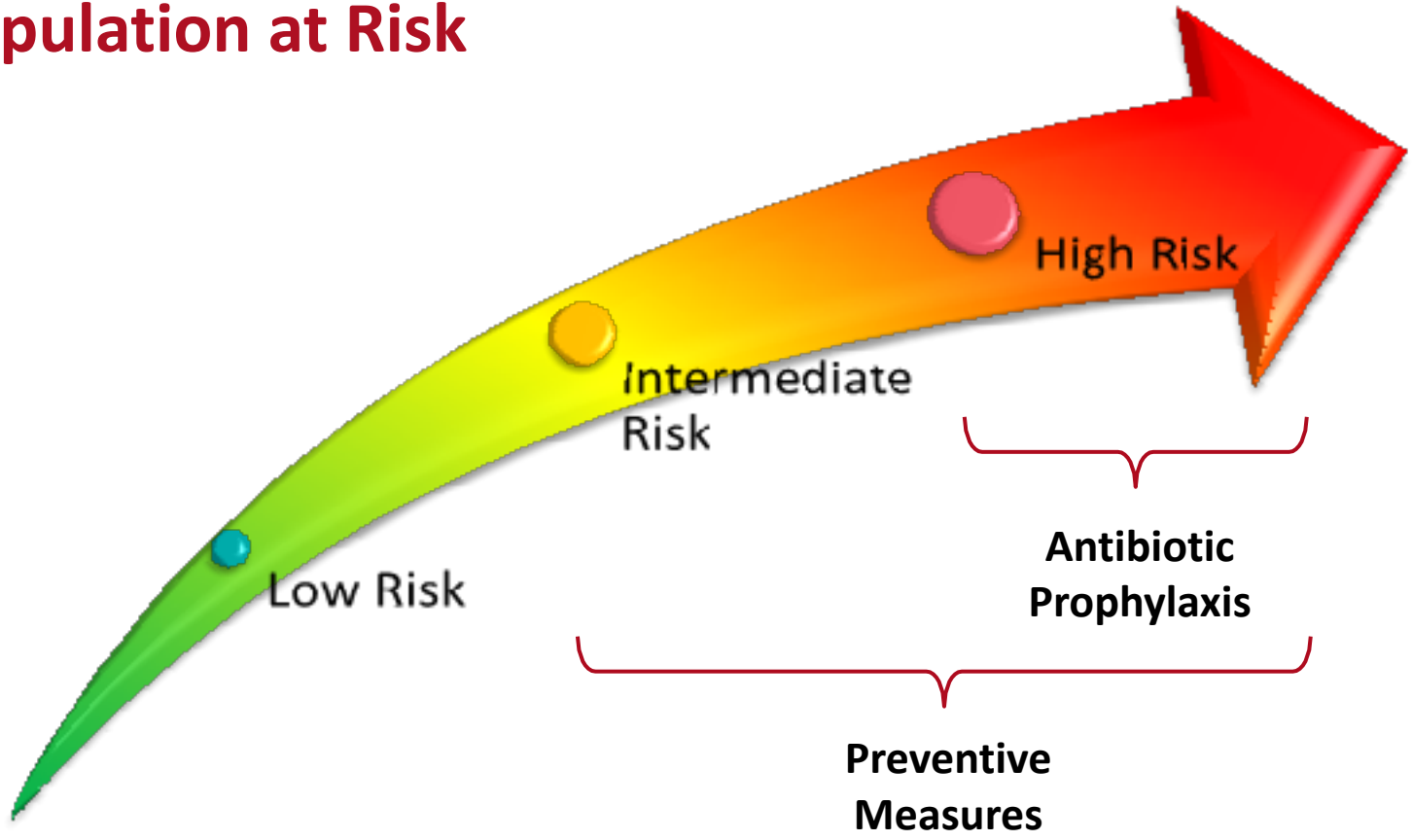
Portal of Entry of the Pathogens :

- Oral cavity
- Infections of the skin
- Direct inoculation
- Healthcare exposure

Chapter 3 on prevention of endocarditis.

- 3.2 Population at Risk of infective Endocarditis
- 3.3 Situation and procedures at Risk
- 3.4 Patient’s Education

Population at Risk



Population at Risk

ESC European Society of Cardiology
European Heart Journal (2018) 39, 586–595
doi:10.1093/eurheartj/ehx655
CLINICAL RESEARCH
Prevention and epidemiology

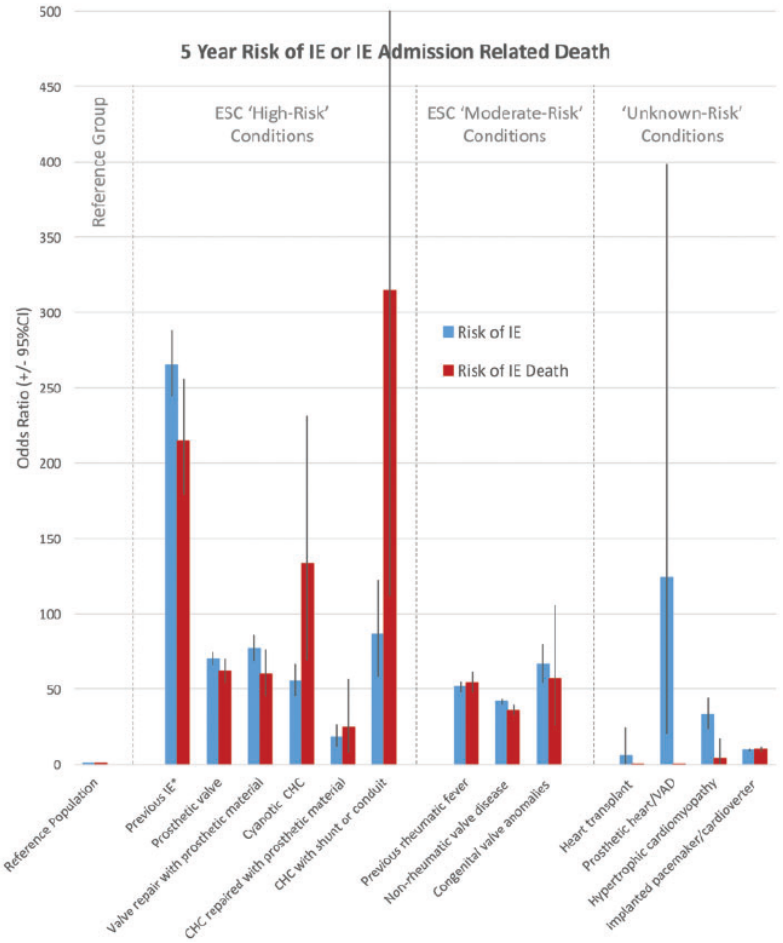
Quantifying infective endocarditis risk in patients with predisposing cardiac conditions

Martin H. Thornhill[1,2]*, Simon Jones[3,4], Bernard Prendergast[5], Larry M. Baddour[6], John B. Chambers[5], Peter B. Lockhart[2], and Mark J. Dayer[7]

Reference incidence of IE in UK 3.6/100,000/year

Intermediate Risk: 280/100,000/year

High Risk: 497/100,000/year



High Risk Patients

1. Patients with previous IE
2. Patients with prosthetic valves
3. CHD: untreated cyanotic or those treated with post-operative palliative shunts, conduits or other prostheses
4. Patients with VAD as destination therapy

Intermediate Risk Patients

1. Rheumatic heart disease
2. Non-rheumatic degenerative valve disease
3. Congenital valve abnormalities
4. Cardiovascular implanted electronic devices
5. Hypertrophic cardiomyopathy

Recommendations for antibiotic prophylaxis in patients with cardiovascular diseases undergoing oro-dental procedures at increased risk for IE (1)

Recommendations	Class	Level	
General prevention measures are recommended in individuals at high and intermediate risk for IE.	I	C	New
Antibiotic prophylaxis is recommended in patients with **previous IE**.	I	B	Revised
Antibiotic prophylaxis is recommended in patients with surgically implanted **prosthetic valves and with any material used for surgical cardiac valve repair**.	I	C	Revised
Antibiotic prophylaxis is recommended in patients with **transcatheter implanted** aortic and pulmonary valvular prostheses.	I	C	Revised
Antibiotic prophylaxis is recommended in patients with **untreated cyanotic CHD**, and **patients treated with surgery or transcatheter procedures with post-operative palliative shunts, conduits, or other prostheses**. After surgical repair, in the absence of residual defects or valve prostheses, antibiotic prophylaxis is recommended only for the first 6 months after the procedure.	I	C	Revised

2023 ESC Guidelines for the management of endocarditis
(European Heart Journal; 2023 – doi: 10.1093/eurheartj/ehad193)

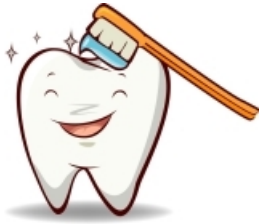
Recommendations for antibiotic prophylaxis in patients with cardiovascular diseases undergoing oro-dental procedures at increased risk for IE (2)

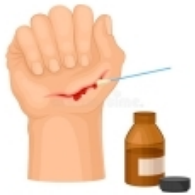
Recommendations	Class	Level	
Antibiotic prophylaxis is recommended in patients with **ventricular assist devices**.	I	C	New
Antibiotic prophylaxis should be considered in patients with **transcatheter mitral and tricuspid valve repair**.	IIa	C	Revised
Antibiotic prophylaxis may be considered in recipients of **heart transplant.**	IIb	C	New
Antibiotic prophylaxis is not recommended in other patients at low risk for IE.	III	C	

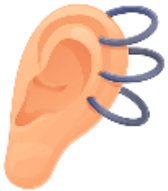
2023 ESC Guidelines for the management of endocarditis
(European Heart Journal; 2023 – doi: 10.1093/eurheartj/ehad193)

Prevention measures

Patients should be encouraged to maintain twice daily tooth cleaning and to seek professional dental cleaning and follow-up at least twice yearly for high-risk patients and yearly for others
Strict cutaneous hygiene, including optimized treatment of chronic skin conditions
Disinfection of wounds
Curative antibiotics for any focus of bacterial infection
No self-medication with antibiotics
Strict infection control measures for any at-risk procedure
Discouragement of piercing and tattooing
Limitation of infusion catheters and invasive procedures when possible. Strict adherence to care bundles for central and peripheral cannulae should be performed





2023 ESC Guidelines for the management of endocarditis
(European Heart Journal; 2023 – doi: 10.1093/eurheartj/ehad193)

Prophylactic antibiotic regime for high-risk dental procedures

Situation	Antibiotic	Single-dose 30–60 min before procedure	
		Adults	Children
No allergy to penicillin or ampicillin	Amoxicillin	2 g orally	50 mg/kg orally
	Ampicillin	2 g i.m. or i.v.	50 mg/kg i.v. or i.m.
	Cefazolin or ceftriaxone	1 g i.m. or i.v.	50 mg/kg i.v. or i.m.
Allergy to penicillin or ampicillin	Cephalexin	2 g orally	50 mg/kg orally
	Azithromycin or clarithromycin	500 mg orally	15 mg/kg orally
	Doxycycline	100 mg orally	<45 kg, 2.2 mg/kg orally >45 kg, 100 mg orally
	Cefazolin or ceftriaxone	1 g i.m. or i.v.	50 mg/kg i.v. or i.m.

2023 ESC Guidelines for the management of endocarditis
(European Heart Journal; 2023 – doi: 10.1093/eurheartj/ehad193)

Procedures at Risk

1. Dental procedures

2. Non-dental procedures

3. Cardiac procedures

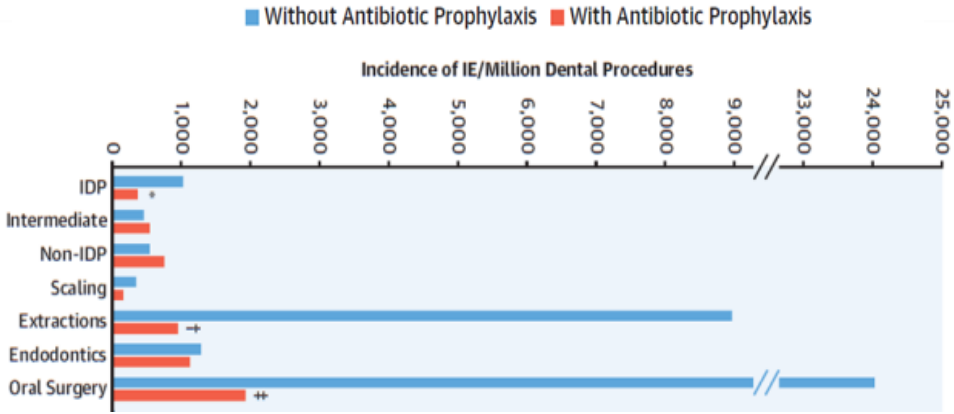
Dental Procedures

- Case-crossover Study in almost 8million US subjects.
- Invasive dental procedures significantly associated with the incidence of endocarditis.
- Antibiotic-prophylaxis before invasive dental procedures was associated with reduced incidence of Endocardits.

ORIGINAL INVESTIGATIONS

Antibiotic Prophylaxis Against Infective Endocarditis Before Invasive Dental Procedures

Martin H. Thornhill, MBBS, BDS, PhD,[a,b] Teresa B. Gibson, PhD,[c] Frank Yoon, PhD,[c] Mark J. Dayer, MBBS, PhD,[d] Bernard D. Prendergast, BM, BS, DM,[e] Peter B. Lockhart, DDS,[b] Patrick T. O'Gara, MD,[f] Larry M. Baddour, MD[g]



2023 ESC Guidelines for the management of endocarditis
(European Heart Journal; 2023 – doi: 10.1093/eurheartj/ehad193)

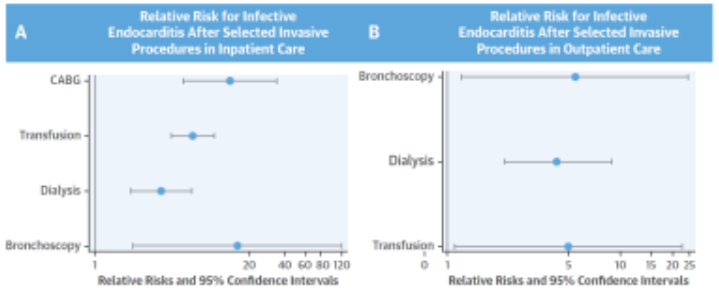
Non-Dental Procedures

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY
© 2018 BY THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION
PUBLISHED BY ELSEVIER
VOL. 71, NO. 24, 2018

Invasive Procedures Associated With the Development of Infective Endocarditis

Imre Janszky, MD, PhD,[a,b] Katalin Gémes, PhD,[c] Staffan Ahnve, MD, PhD,[c] Hilmir Asgeirsson, MD, PhD,[d,e] Jette Möller, PhD[f]

CENTRAL ILLUSTRATION Relative Risks for Infective Endocarditis After Selected Procedures: Logarithmic Scale

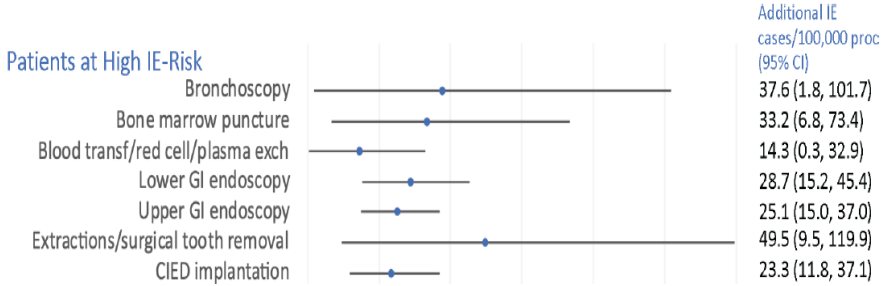


Janszky, I. et al. J Am Coll Cardiol. 2018;71(24):2744-52.

Original research

Temporal association between invasive procedures and infective endocarditis

Martin H Thornhill ,[1,2] Annabel Crum,[3] Richard Campbell,[3] Tony Stone,[3] Ellen C Lee,[3] Mike Bradburn,[4] Veronica Fibisan,[3] Mark Dayer ,[5] Bernard D Prendergast ,[6] Peter Lockhart,[2] Larry Baddour ,[7] Jon Nicoll[3]



Recommendations for infective endocarditis prevention in high-risk patients

Recommendations	Class	Level	
Antibiotic prophylaxis is recommended in dental extractions, oral surgery procedures, and procedures requiring manipulation of the gingival or periapical region of the teeth.	I	B	Revised
Systemic antibiotic prophylaxis may be considered for high-risk patients undergoing an invasive diagnostic or therapeutic procedure of the respiratory, gastrointestinal, genitourinary tract, skin, or musculoskeletal systems.	IIb	C	New

2023 ESC Guidelines for the management of endocarditis
(European Heart Journal; 2023 – doi: 10.1093/eurheartj/ehad193)

Cardiac Procedures

Recommendations	Class	Level	
Pre-operative screening for nasal carriage of *S. aureus* is recommended before elective cardiac surgery or transcatheter valve implantation to treat carriers.	I	A	
Peri-operative antibiotic prophylaxis is recommended **before placement of a CIED**.	I	A	
Optimal pre-procedural aseptic measures of the site of implantation is recommended to prevent CIED infections.	I	B	New
Periprocedural antibiotic prophylaxis is recommended in patients undergoing **surgical or transcatheter implantation of a prosthetic valve**, intravascular prosthetic, or other foreign material.	I	B	
Surgical standard aseptic measures are recommended during the insertion and **manipulation of catheters** in the catheterization laboratory environment.	I	C	New

Cardiac Procedures (cont.)

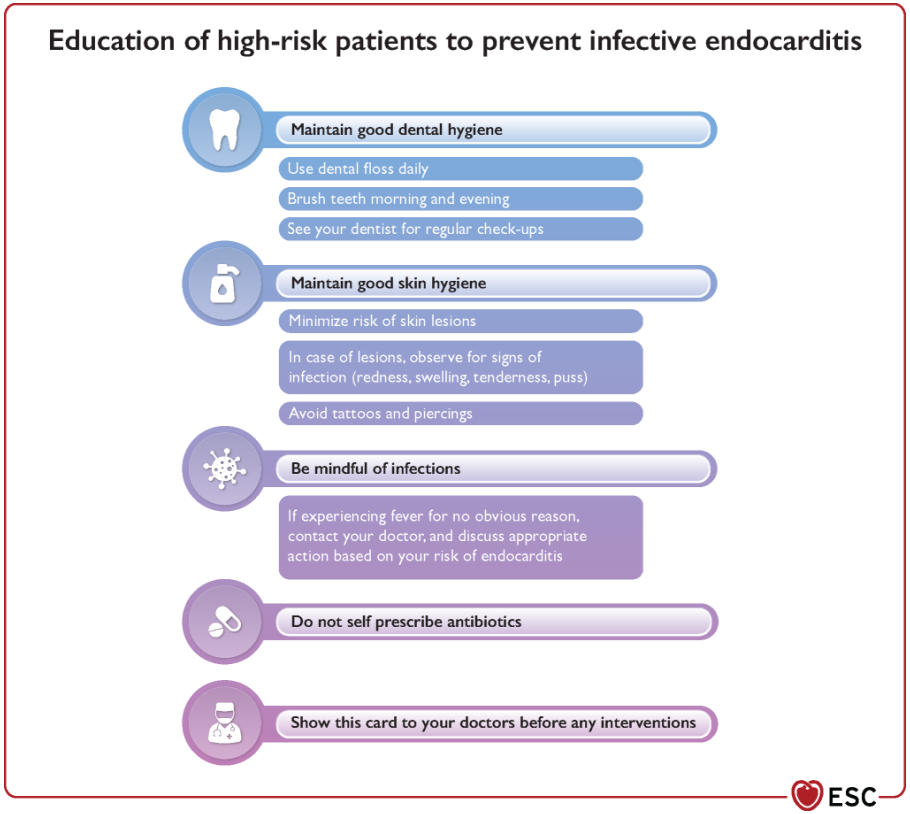
Recommendations	Class	Level
Elimination of potential sources of sepsis (including of dental origin) should be considered ≥2 weeks before implantation of a prosthetic valve or other intracardiac or intravascular foreign material, except in urgent procedures.	IIa	C
Antibiotic prophylaxis covering for common skin flora including ***Enterococcus* spp. and *S. aureus* should be considered before TAVI and other transcatheter valvular procedures**.	IIa	C
Systematic skin or nasal decolonization without screening for *S. aureus* is not recommended.	III	C

New

3.4 Patient's Education

Patients should be educated on the risks of endocarditis and on its prevention

National cardiac societies are invited to develop specific Patient's cards.



2023 ESC Guidelines for the management of endocarditis
(European Heart Journal; 2023 – doi: 10.1093/eurheartj/ehad193)

Thank you!

On Behalf of the Task Force for the 2023 Infective Endocarditis Guidelines

Stefano Caselli, MD, PhD, FESC

25 Aug 2023

ESC
European Society of Cardiology

Clinical Practice Guidelines Webinar
SEPTEMBER 2023 on ESC365

15 September 2023 18:00 CEST

REGISTER TO ACCESS

What's the latest on infective endocarditis. ESC 2023 Clinical Practice Guidelines - Webinar Series

WEBINAR

ESC

See details →

27 September 2023 18:00 CEST

REGISTER TO ACCESS

Diagnostic challenges in infective endocarditis. ESC 2023 Clinical Practice Guidelines - Webinar Series

WEBINAR

ESC

See details →

www.escardio.org/guidelines