Prevention of Infective Endocarditis;
Appropriate preactices from ESC 2023 Guidelines

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Changing Epidemiology of Endocarditis

Box 1. Predisposing risk factors for endocarditis

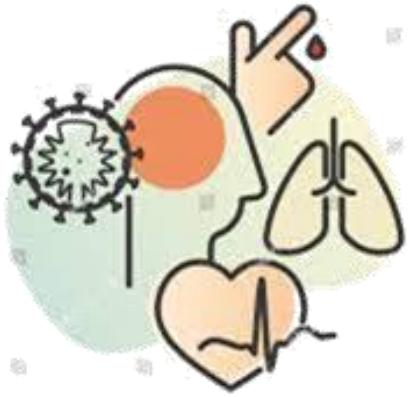
Cardiac conditions:

- bicuspid aortic valve
- mitral valve prolapse
- rheumatic valve disease
- congenital heart disease
- prior infective endocarditis
- patients with implanted cardiac devices (permanent pacemakers / implantable cardioverter-defibrillator)
- prosthetic heart valves.

Comorbidities:

- intravenous drug use
- chronic kidney disease (particularly dialysis patients)
- chronic liver disease
- malignancy
- advanced age
- corticosteroid use
- poorly controlled diabetes
- indwelling line for venous access
- immunocompromised state (including HIV infection).

Healthcare associated IE = 30% &
PWID = rising trends in IE admissions
Often, more virulent pathogens (difficult to treat)



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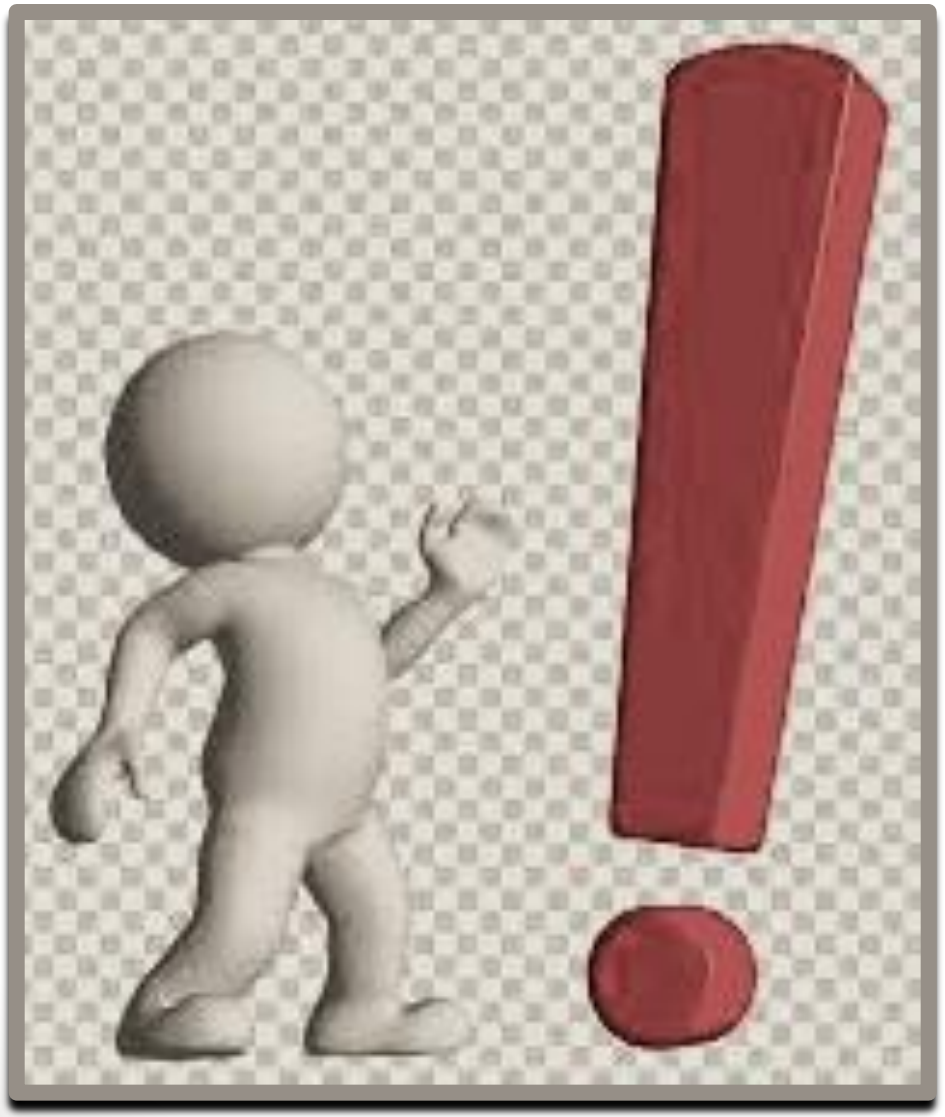
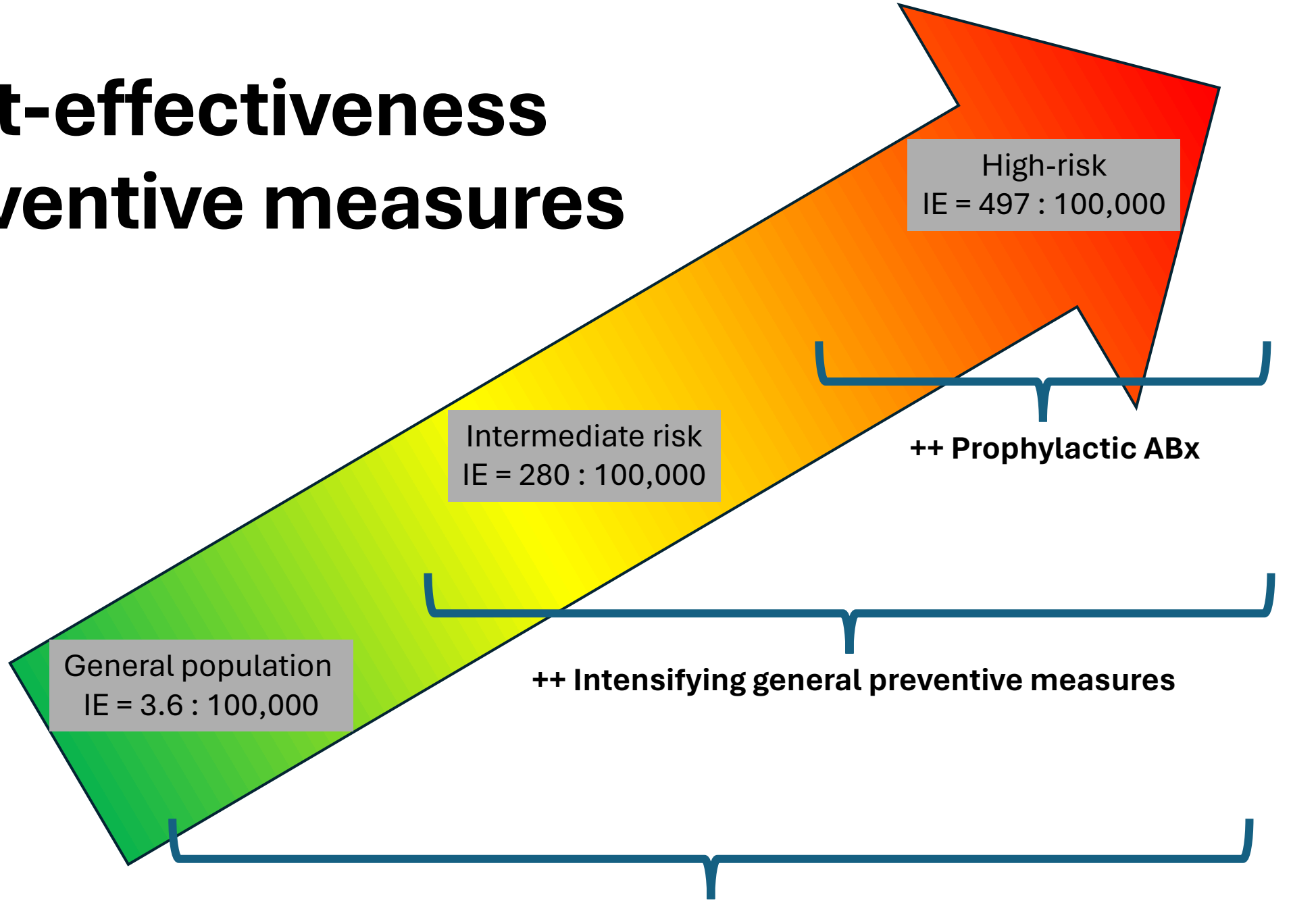
Does this mean we should change our strategies of prophylactic antiobiotics



Adequate prevention of infective endocarditis is much more than peri-procedural antibiotics

Cost-effectiveness of preventive measures



General prevention measures to be followed in patients at high and intermediate risk for infective endocarditis

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)

Messages need to be well-delivered to patients at intermediate- and high-risk for IE

Maintain good dental hygiene

- Use dental floss daily
- Brush teeth morning and evening
- See your dentist for regular check-ups

Maintain good skin hygiene

- Minimize risk of skin lesions
- In case of lesions, observe for signs of infection (redness, swelling, tenderness, puss)
- Avoid tattoos and piercings

Be mindful of infections

If experiencing fever for no obvious reason, contact your doctor, and discuss appropriate action based on your risk of endocarditis

Do not self prescribe antibiotics

Show this card to your doctors before any interventions

Even; the strength of prophylactic Abx has been revised

2015	Class	Level	2023	Class	Level
Recommendations for antibiotic prophylaxis in patients with cardiovascular diseases undergoing oro-dental procedures at increased risk for infective endocarditis					
Antibiotic prophylaxis should be considered for patients at highest risk for IE: 1. Patients with any prosthetic valve, including a transcatheter valve, or those in whom any prosthetic material was used for cardiac valve repair.	IIa	C	Antibiotic prophylaxis is recommended in patients with previous IE.	I	B
			Antibiotic prophylaxis is recommended in patients with surgically implanted prosthetic valves and with any material used for surgical cardiac valve repair.	I	C
2. Patients with a previous episode of IE. 3. Patients with CHD: (a) Any type of cyanotic CHD. (b) Any type of CHD repaired with a prosthetic material, whether placed surgically or by percutaneous techniques, up to 6 months after the procedure or lifelong if residual shunt.	IIa	C	Antibiotic prophylaxis is recommended in patients with transcatheter implanted aortic and pulmonary valvular prostheses.	I	C
			Antibiotic prophylaxis should be considered in patients with transcatheter mitral and tricuspid valve repair.	IIa	C

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Revised recommendations (3)

2015	Class	Level	2023	Class	Level
Recommendations for antibiotic prophylaxis in patients with cardiovascular diseases undergoing oro-dental procedures at increased risk for infective endocarditis (continued)					
2. Patients with a previous episode of IE. 3. Patients with CHD: (a) Any type of cyanotic CHD. (b) Any type of CHD repaired with a prosthetic material, whether placed surgically or by percutaneous techniques, up to 6 months after the procedure or lifelong if residual shunt.	IIa	C	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

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New recommendations (1)

Recommendations	Class	Level
Recommendations for antibiotic prophylaxis in patients with cardiovascular diseases undergoing oro-dental procedures at increased risk for infective endocarditis		
General prevention measures are recommended in individuals at high and intermediate risk for IE.	I	C
Antibiotic prophylaxis is recommended in patients with ventricular assist devices.	I	C
Antibiotic prophylaxis may be considered in recipients of heart transplant.	IIb	C
Recommendations for infective endocarditis prevention in high-risk patients		
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
Recommendations for infective endocarditis prevention in cardiac procedures		
Optimal pre-procedural aseptic measures of the site of implantation is recommended to prevent CIED infections.	I	B

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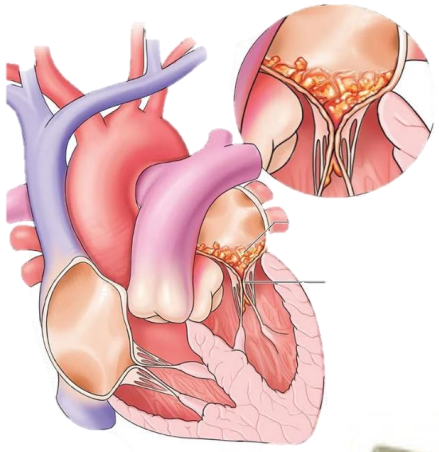
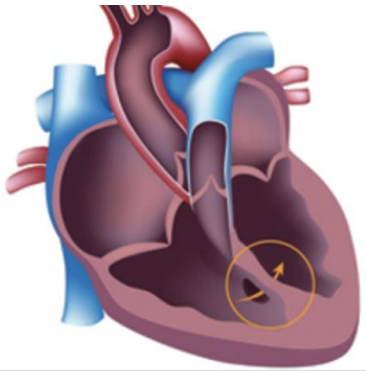
High-risk patients



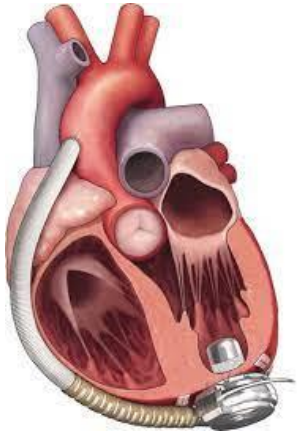
❑**Previous IE**

❑**Prosthetic valves (surgical & transcath)**



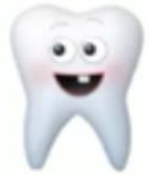
❑**Cyanotic CHD**

- Unrepaired
- Residual shunts – conduits – prothetic materials
- Repair within 6m



❑**VAD**

Dental Procedures

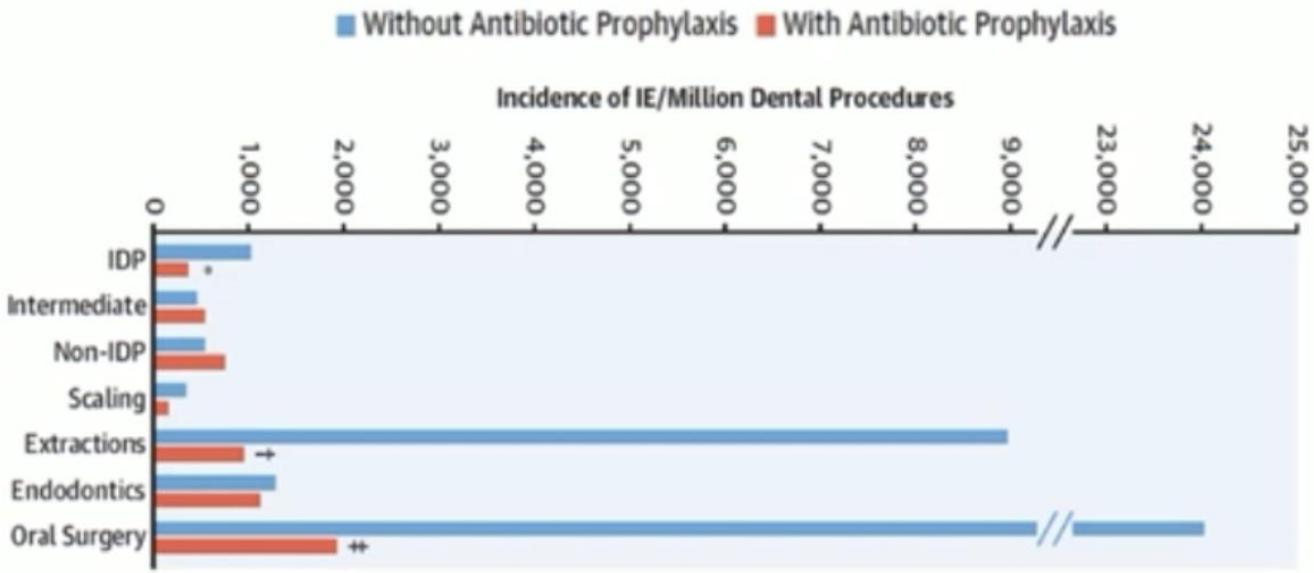


- Case-crossover Study in almost 8million US subjects.
- Invasive dental procedures significantly associated with the incidence of endocarditis.
- Antibiotic-prophylaxis before invasive dental procedures was associated with reduced incidence of Endocardits.

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]



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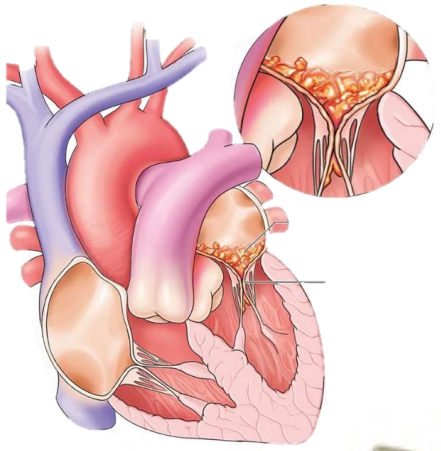
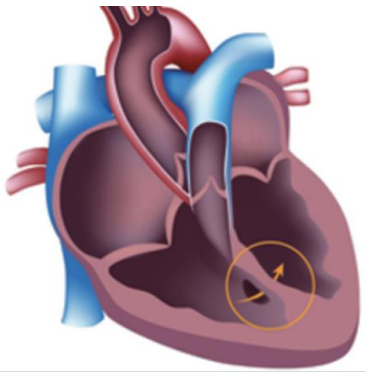
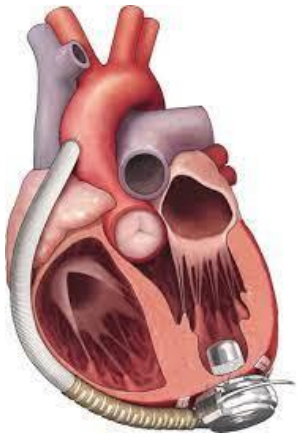






Recommendations for antibiotic prophylaxis in patients with cardiovascular diseases undergoing oro-dental procedures at increased risk for infective endocarditis

Recommendations	Class	Level
General prevention measures are recommended in individuals at high and intermediate risk for IE.	I	C
Antibiotic prophylaxis is recommended in patients with previous IE.	I	B
Antibiotic prophylaxis is recommended in patients with surgically implanted prosthetic valves and with any material used for surgical cardiac valve repair.	I	C
Antibiotic prophylaxis is recommended in patients with transcatheter implanted aortic and pulmonary valvular prostheses.	I	C
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
Antibiotic prophylaxis is recommended in patients with ventricular assist devices.	I	C
Antibiotic prophylaxis should be considered in patients with transcatheter mitral and tricuspid valve repair.	IIa	C
Antibiotic prophylaxis may be considered in recipients of heart transplant.	IIb	C
Antibiotic prophylaxis is not recommended in other patients at low risk for IE.	III	C

High-risk procedures

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

Table 4 Prophylactic antibiotic regimen for high-risk dental procedures

Antibiotic	Single-dose 30–60 min before procedure	
	Adults	Children
Situation: 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.
Situation: Allergy to penicillin or ampicillin		
Cephalexin[a,b]	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[b]	1 g i.m. or i.v.	50 mg/kg i.v. or i.m.

High-risk procedures

Recommendations for infective endocarditis prevention in 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
Periprocedural antibiotic prophylaxis is recommended in patients undergoing surgical or transcatheter implantation of a prosthetic valve, intravascular prosthetic, or other foreign material.	I	B

High-risk procedures

Recommendations for infective endocarditis prevention in cardiac procedures		
Recommendations	Class	Level
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
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

High-risk procedures

Recommendations for infective endocarditis prevention in cardiac procedures		
Recommendations	Class	Level
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

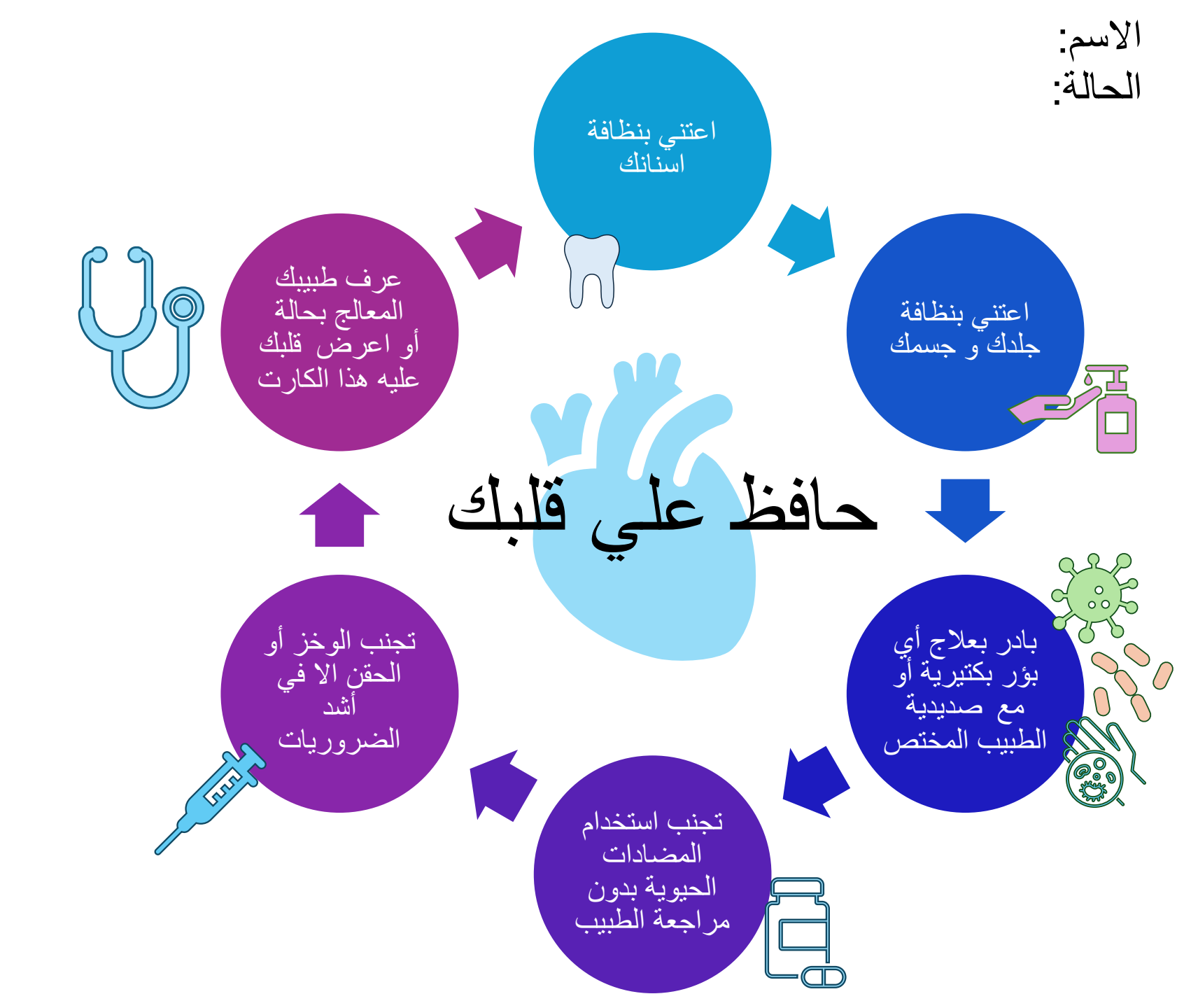
CIED, cardiac implantable electronic device; TAVI, transcatheter aortic valve implantation.

May consider in HIGH-RISK PATIENTS ONLY

Systemic antibiotic prophylaxis may be considered for high-risk[a] patients undergoing an invasive diagnostic or therapeutic procedure of the respiratory, gastrointestinal, genitourinary tract, skin, or musculoskeletal systems.	IIb	C

الاسم:
الحالة:

حافظ علي قلبك



KEY MESSAGES

IE is relatively a rare, but deadly condition with prevalent morbidity and mortality

Adequate prevention of infective endocarditis is much more than prophylactic antiobiotics

Appropriate education about dental and personal hygine should be conveyed to the general population, and is mandatory to those at intermediate- and high-risk for IE

If this is adequately practiced, prophylactic Abx would be most cost-effective in high-risk patients undergoing high-risk procedures


Thank You