

Prise en charge de l'endocardite en 2024

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Journée régionale des référents en antibiothérapie bretons

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De nouvelles recommandations



The 2023 Duke-International Society for Cardiovascular Infectious Diseases Criteria for Infective Endocarditis: Updating the Modified Duke Criteria

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2023 ESC Guidelines for the management of endocarditis

Developed by the task force on the management of endocarditis of the European Society of Cardiology (ESC)

Endorsed by the European Association for Cardio-Thoracic Surgery (EACTS) and the European Association of Nuclear Medicine (EANM)

Actualisation des critères diagnostiques d'endocardite

Journée des référents bretons 2024

Dr Jean-Philippe Talarmin

Critères de Duke

- ▶ Critères publiés en 1994 (Durack *et al.*), modifiés en 2000 (Li *et al.*) puis dans les recommandations de 2015 (Habib *et al.*)
- ▶ Modifications de l'épidémiologie (dispositifs implantables, implantation valvulaire percutanée), des techniques microbiologiques et d'imagerie
- ▶ Nécessité d'une actualisation des critères
 - ▶ Groupe de travail de l'International Society for Cardiovascular Infectious Diseases (ISCVID)

Table 1. Definitions of Infective Endocarditis According to the 2023 Duke-International Society for Cardiovascular Infectious Diseases Infective Endocarditis (IE) Criteria, With Proposed Changes in Bold Type

I. DEFINITE ENDOCARDITIS
A. Pathologic Criteria
(1) Microorganisms identified^a in the context of clinical signs of active endocarditis in a vegetation; from cardiac tissue; from an explanted prosthetic valve or sewing ring; from an ascending aortic graft (with concomitant evidence of valve involvement); from an endovascular intracardiac implantable electronic device (CIED); or from an arterial embolus
or
(2) Active endocarditis^b (may be acute^c or subacute/chronic^d) identified in or on a vegetation; from cardiac tissue; from an explanted prosthetic valve or sewing ring; from an ascending aortic graft (with concomitant evidence of valve involvement); from a CIED; or from an arterial embolus
B. Clinical Criteria
(1) 2 Major Criteria
or
(2) 1 Major Criterion and 3 Minor Criteria
or
(3) 5 Minor Criteria
II. POSSIBLE ENDOCARDITIS
A. 1 Major Criterion And 1 Minor Criterion
or
B. 3 Minor Criteria
III. REJECTED ENDOCARDITIS
A. Firm alternate diagnosis explaining signs/symptoms ^e
or
B. Lack of recurrence despite antibiotic therapy for less than 4 d.
or
C. No pathologic or macroscopic evidence of IE at surgery or autopsy, with antibiotic therapy for less than 4 d
or
D. Does not meet criteria for possible IE, as above

Endocardite certaine

- ▶ Critères pathologiques (post-opératoires / post-mortem)
 - ▶ Identification d'un microorganisme
 - ▶ Par culture, coloration, technique immunologique, biologie moléculaire, hybridation in situ
 - ▶ Ou preuve histologique d'endocardite active
 - ▶ À partir d'une végétation, de tissu cardiaque, d'un matériel explanté, d'un embole
- ▶ Critères cliniques
 - ▶ 2 critères majeurs
 - ▶ Ou: 1 critère majeur + 3 mineurs
 - ▶ Ou: 5 critères mineurs

Globalement similaire à 2015

Definite IE
Pathological criteria <ul style="list-style-type: none">• Microorganisms demonstrated by culture or on histological examination of a vegetation, a vegetation that has embolized, or an intracardiac abscess specimen; or• Pathological lesions; vegetation or intracardiac abscess confirmed by histological examination showing active endocarditis
Clinical criteria <ul style="list-style-type: none">• 2 major criteria; or• 1 major criterion and 3 minor criteria; or• 5 minor criteria

Endocardite possible

- ▶ 1 critère majeur + 1-2 mineurs
- ▶ Ou: 3-4 critères mineurs

Endocardite exclue si:

- ▶ Diagnostic alternatif fiable expliquant les signes et symptômes
 - ▶ Infectieux ou non
- ▶ Ou: absence de récurrence malgré une antibiothérapie < 4 jours
 - ▶ *En 2015: résolution des symptômes avec une antibiothérapie ≤ 4 jours*
- ▶ Ou: pas de signe d'endocardite pendant une chirurgie ou autopsie, après moins de 4 jours d'ATB
- ▶ Ou: pas de critères d'endocardite possible

Les critères cliniques

- ▶ Classés en critères majeurs et mineurs
- ▶ Trois catégories
 - ▶ Microbiologie
 - ▶ Imagerie
 - ▶ **Chirurgie**
- ▶ Versus 2 en 2015 (microbiologie et imagerie)

Microbiologie : nouveautés depuis 2015

- ▶ Bactéries ajoutées au groupe des microorganismes typiquement responsables d'endocardite
- ▶ Distinction de la pertinence des bactéries selon le contexte (matériel intracardiaque)
- ▶ Suppression de l'obligation d'obtenir des hémocultures de ponctions veineuses séparées
- ▶ Adjonction de la sérologie *Bartonella* et des techniques moléculaires pour *C. burnetii*, *Bartonella* et *T. whipplei*, comme critères majeurs des endocardites à hémocultures négatives

Critères majeurs

A. Microbiologic Major Criteria

(1) Positive blood cultures

i. Microorganisms that commonly cause IE^a isolated from 2 or more separate blood culture sets (Typical)^b

or

ii. Microorganisms that occasionally or rarely cause IE isolated from 3 or more separate blood culture sets (Nontypical)^b

(2) Positive laboratory tests

i. Positive polymerase chain reaction (PCR) or other nucleic acid-based technique^c for *Coxiella burnetii*, *Bartonella* species, or *Tropheryma whippelii* from blood

or

ii. *Coxiella burnetii* antiphase I immunoglobulin G (IgG) antibody titer >1:800 [24]^d, or isolated from a single blood culture

or

iii. Indirect immunofluorescence assays (IFA) for detection of IgM and IgG antibodies to *Bartonella henselae* or *Bartonella quintana* with immunoglobulin G (IgG) titer \geq 1:800 [24, 25]^d

Critères mineurs

Microbiologic Evidence, Falling Short of a Major Criterion

1) Positive blood cultures for a microorganism consistent with IE but not meeting the requirements for Major Criterion^f

or

2) Positive culture, PCR, or other nucleic acid based test (amplicon or shotgun sequencing, *in situ* hybridization) for an organism consistent with IE^f from a sterile body site other than cardiac tissue, cardiac prosthesis, or arterial embolus; or a single finding of a skin bacterium by PCR on a valve or wire without additional clinical or microbiological supporting evidence [51]

Bactéries fréquentes:

- *S. aureus*
- *S. lugdunensis*
- *E. faecalis*
- Tous streptocoques
 - Sauf *pneumoniae* et *pyogenes*
- *Granulicatella*
- *Abiotrophia*
- *Gemella*
- HACEK

Et aussi si matériel:

- SCN
- *Corynebacterium striatum* et *jeikeium*
- *S. marcescens*
- Pyocyanique
- *C. acnes*
- MNT (*chimaerae* ++)
- *Candida*

2015:

Major criteria

I. Blood cultures positive for IE

a. Typical microorganisms consistent with IE from 2 separate blood cultures:

- *Viridans streptococci*, *Streptococcus gallolyticus* (*Streptococcus bovis*), HACEK group, *Staphylococcus aureus*; or
- Community-acquired enterococci, in the absence of a primary focus; or

b. Microorganisms consistent with IE from persistently positive blood cultures:

- \geq 2 positive blood cultures of blood samples drawn >12 h apart; or
- All of 3 or a majority of \geq 4 separate cultures of blood (with first and last samples drawn \geq 1 h apart); or

c. Single positive blood culture for *Coxiella burnetii* or phase I IgG antibody titre >1:800

Imagerie

- ▶ Echocardiographie: reste l'imagerie de première ligne (ETO++)
- ▶ Scanner cardiaque
 - ▶ Complémentaire de l'échographie
 - ▶ Sensibilité moindre pour les végétations, mais meilleure pour les lésions paravalvulaires (pseudo-anévrysme, abcès)
 - ▶ Intéressant++ si ETO CI ou peu interprétable (calcifications, matériel)
- ▶ TEP-scanner
 - ▶ En cas de valve prothétique > 3 mois, de matériel implanté
 - ▶ Sur valve native: mauvaise Se (31%) mais excellente VPP

Critères majeurs

(1) Echocardiography and **cardiac computed tomography (CT)** imaging

i. Echocardiography and/or **cardiac CT** showing vegetation,^e valvular/leaflet perforation,^f valvular/leaflet aneurysm,^g abscess,^h pseudoaneurysm,ⁱ or intracardiac fistula^l

or

ii. Significant new valvular regurgitation on echocardiography as compared with previous imaging. Worsening or changing of preexisting regurgitation is not sufficient.

or

iii. New partial dehiscence of prosthetic valve as compared with previous imaging [52]

(2) Positron emission computed tomography with 18F-fluorodeoxyglucose ([18F]FDG PET/CT imaging)

Abnormal metabolic activity^k involving a native or prosthetic valve, ascending aortic graft (with concomitant evidence of valve involvement), intracardiac device leads or other prosthetic material^{l,m}

Critères mineurs

Abnormal metabolic activity as detected by [18F]FDG PET/CT within 3 mo of implantation of prosthetic valve, ascending aortic graft (with concomitant evidence of valve involvement), intracardiac device leads or other prosthetic material

2015:

2. Imaging positive for IE

a. Echocardiogram positive for IE:

- Vegetation;
- Abscess, pseudoaneurysm, intracardiac fistula;
- Valvular perforation or aneurysm;
- New partial dehiscence of prosthetic valve.

b. Abnormal activity around the site of prosthetic valve implantation detected by ¹⁸F-FDG PET/CT (only if the prosthesis was implanted for >3 months) or radiolabelled leukocytes SPECT/CT.

c. Definite paravalvular lesions by cardiac CT.

Nouveau: critère chirurgical

- ▶ Valeur ++ des constatations opératoires du chirurgien cardiaque
- ▶ Constatation chirurgicale d'une EI = critère majeur en l'absence d'autre élément diagnostique
 - ▶ Végétation, abcès, destruction valvulaire, désinsertion de valve prothétique,...

Surgical Major Criteria

Evidence of IE documented by direct inspection during heart surgery neither Major Imaging Criteria nor subsequent histologic or microbiologic confirmationⁿ

Critères mineurs

- A. Predisposition
- **Previous history of IE**
 - Prosthetic valve^o → **Dont TAVI**
 - Previous valve repair^o
 - Congenital heart disease^p
 - More than mild regurgitation or stenosis of any etiology
 - **Endovascular intracardiac implantable electronic device (CIED)**
 - Hypertrophic obstructive cardiomyopathy
 - Injection drug use
- B. Fever *Documented temperature greater than 38.0 °C (100.4 °F)*
- C. Vascular Phenomena *Clinical or radiological evidence of arterial emboli, septic pulmonary infarcts, **cerebral or splenic abscess**, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, Janeway lesions, purulent purpura*
- D. Immunologic Phenomena Positive rheumatoid factor, Osler nodes, Roth spots, or immune complex-mediated glomerulonephritis^q →
- E. Microbiologic Evidence, Falling Short of a Major Criterion
- 1) Positive blood cultures for a microorganism consistent with IE but not meeting the requirements for Major Criterion^f
- or*
- 2) **Positive culture, PCR, or other nucleic acid based test (amplicon or shotgun sequencing, *in situ* hybridization) for an organism consistent with IE^e from a sterile body site^e other than cardiac tissue, cardiac prosthesis, or arterial embolus; or a single finding of a skin bacterium by PCR on a valve or wire without additional clinical or microbiological supporting evidence [51]**
- F. Imaging Criteria
- Abnormal metabolic activity as detected by [18F]FDG PET/CT within 3 mo of implantation of prosthetic valve, ascending aortic graft (with concomitant evidence of valve involvement), intracardiac device leads or other prosthetic material***
- G. Physical Examination Criteria^s
- New valvular regurgitation identified on auscultation if echocardiography is not available. Worsening or changing of preexisting murmur not sufficient

- 1) Insuffisance rénale aigue + 2 critères parmi
- Hématurie
 - Protéinurie
 - Débris cellulaires à l'analyse du sédiment
 - Hypocomplémentémie
 - Cryoglobulinémie
 - Complexes immuns circulants
- 2) PBR montrant une néphropathie médiée par des complexes immuns circulants

En résumé:

- ▶ Nouveaux facteurs de risque
- ▶ Nouvelles espèces bactériennes incluses dans les critères majeurs
 - ▶ Et distinction valve native / matériel intracardiaque
- ▶ Nouvelles techniques microbiologiques (biologie moléculaire++)
 - ▶ Et retrait de l'obligation d'obtenir les hémocultures par des ponctions distinctes
- ▶ Nouvelles techniques d'imagerie
- ▶ Adjonction des constatations peropératoires

Nouvelles recommandations de prise en charge - focus sur l'antibiothérapie

Journée des référents bretons 2024

Dr Jean-Philippe Talarmin

Pourquoi de nouvelles recommandations?

- ▶ Plus de patients à risque
- ▶ Augmentation d'incidence de l'endocardite
 - ▶ Impact des changements de pratique d'antibioprophylaxie?
 - ▶ Plus d'outils diagnostiques, plus de recherche systématique
- ▶ Évolution des résistances bactériennes, des breakpoints de l'EUCAST
- ▶ Modification des pratiques d'antibiothérapie
 - ▶ OPAT, relais oral
- ▶ 95 pages, 857 références...

Gradation des recommandations

Classes of recommendations

	Definition	Wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended or is indicated
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
Class IIa	Weight of evidence/opinion is in favour of usefulness/efficacy.	Should be considered
Class IIb	Usefulness/efficacy is less well established by evidence/opinion.	May be considered
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended

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Level of evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.

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Recommandations: prévention

Patients à haut risque

- ▶ Antécédent d'endocardite
- ▶ Prothèse valvulaire
- ▶ Cardiopathie congénitale
- ▶ Assistance ventriculaire
- ▶ ± transplanté cardiaque

Risque intermédiaire

- ▶ Valvulopathie rhumatismale ou dégénérative
- ▶ Valvulopathie congénitale (bicuspidie)
- ▶ Matériel de stimulation implanté
- ▶ Cardiomyopathie hypertrophique

Éducation du patient++

- Hygiène bucco-dentaire (brossage, dentiste 1-2 fois/an)
- Hygiène cutanée (plaies, éviter piercings et tatouages)
- Avis médical si fièvre inexpliquée
- Pas d'automédication avec ATB
- Traitement des foyers infectieux bactériens
- Asepsie++ si procédure invasive

Antibioprophylaxie: patients à haut risque seulement

- ▶ Recommandée si soins dentaires à risque
 - ▶ Extractions dentaires
 - ▶ Chirurgie buccale (dont chirurgie parodontale ou implantaire, biopsies buccales)
 - ▶ Manipulation de la région gingivale ou périapicale des dents (y compris détartrage et traitement de canal)
- ▶ À discuter si procédure invasive des systèmes respiratoire, gastro-intestinal, génito-urinaire, cutané ou musculo-squelettique
- ▶ Antibioprophylaxie avant implantation de matériel cardiaque quel qu'il soit

Antibiotic prophylaxis covering for common skin flora including *Enterococcus* spp. and *S. aureus* should be considered before TAVI and other transcatheter valvular procedures.¹²¹

IIa	C
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- ▶ Dépistage + traitement du portage nasal de *S. aureus*
 - ▶ Avant chirurgie cardiaque ou implantation valvulaire transcathéter

Recommendation Table 2 — Recommendations for infective endocarditis prevention in high-risk patients

Recommendations	Class ^a	Level ^b
Antibiotic prophylaxis is recommended in dental extractions, oral surgery procedures, and procedures requiring manipulation of the gingival or periapical region of the teeth. ^{11,49,51,108}	I	B
Systemic antibiotic prophylaxis may be considered for high-risk ^c patients undergoing an invasive diagnostic or therapeutic procedure of the respiratory, gastrointestinal, genitourinary tract, skin, or musculoskeletal systems. ^{6,11}	IIb	C



Actes chirurgicaux ou interventionnels	Molécules	Dose initiale
Cardiologie structurale		
<ul style="list-style-type: none"> ▪ Bioprothèse de la valve aortique par voie artérielle transcutanée (TAVI) ou autre bioprothèse valvulaire par voie transcutanée ▪ Fermeture d'auricule par voie percutanée avec implantation de matériel ▪ Rétrécissement de l'orifice atrioventriculaire gauche (MitraClip) ▪ Fermeture de communication interatriale ou de foramen ovale perméable 	<p style="border: 1px solid red; display: inline-block; padding: 2px;">Amoxicilline/Clavulanate</p> Alternative : Céfazoline + Amoxicilline	<p style="border: 1px solid red; display: inline-block; padding: 2px;">2g IVL</p> 2g IVL 2g IVL

Modalités de l'antibioprophylaxie lors de soins dentaires

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 ^{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.

Retrait de la clindamycine (risque d'ICD)

Endocarditis Team

- ▶ Approche multidisciplinaire +++
- ▶ Équipes différentes selon le type de centre
 - ▶ Distinction entre les centres avec ou sans chirurgie cardiaque
 - ▶ Discussions régulières avec l'équipe du centre de référence et transfert en cas d'endocardite compliquée

Recommendations	Class ^a	Level ^b
Diagnosis and management of patients with complicated IE are recommended to be performed at an early stage in a Heart Valve Centre, with immediate surgical facilities and an 'Endocarditis Team' to improve the outcomes. ^{36-41,122,123,125,126}	I	B
For patients with uncomplicated IE managed in a Referring Centre, early and regular communication between the local and the Heart Valve Centre endocarditis teams is recommended to improve the outcomes of the patients. ^{36-41,122,123,125,126}	I	B

Core members	<ul style="list-style-type: none"> • Cardiologists. • Cardiac imaging experts. • Cardiovascular surgeons. • Infectious disease specialist (or internal medicine specialist with expertise in infectious diseases). • Microbiologist. • Specialist in outpatient parenteral antibiotic treatment.
Adjunct specialities	<ul style="list-style-type: none"> • Radiologist and nuclear medicine specialist. • Pharmacologist. • Neurologist and neurosurgeon. • Nephrologist. • Anaesthesiologists. • Critical care. • Multidisciplinary addiction medicine teams. • Geriatricians. • Social worker. • Nurses. • Pathologist.

Diagnostic

- ▶ Endocardite = suspicion clinique + arguments microbiologiques + visualisation de lésions à l'imagerie
 - ▶ Cf. critères de Duke
- ▶ ETT en première intention si suspicion d'EI
- ▶ ETO recommandée si ETT non concluante/négative et forte suspicion d'endocardite, et si ETT positive à la recherche de complications
 - ▶ Échocardiographie à refaire à J5-J7 si initialement négative et forte suspicion
- ▶ ETO à contrôler avant le relais oral de l'antibiothérapie
- ▶ Scanner cardiaque: plus performant que l'ETO pour les complications périvalvulaires et périprothétiques
- ▶ En cas de bactériémie à certaines espèces:

Performing an echocardiography should be considered in *S. aureus*, *E. faecalis*, and some *Streptococcus* spp. bacteraemia. ^{19,149,174}

IIa

B

Section 5. Recommendation Table 6 — Recommendations for the role of computed tomography, nuclear imaging, and magnetic resonance in infective endocarditis

Cardiac CTA is recommended in patients with <u>possible NVE</u> to detect valvular lesions and confirm the diagnosis of IE.	I	B
[18F]FDG-PET/CT(A) and cardiac CTA are recommended in <u>possible PVE</u> to detect valvular lesions and confirm the diagnosis of IE.	I	B
[18F]FDG-PET/CT(A) may be considered in possible CIED-related IE to confirm the diagnosis of IE.	IIb	B
Cardiac CTA is recommended in NVE and PVE to diagnose <u>paravalvular or periprosthetic complications</u> if echocardiography is inconclusive.	I	B
Brain and whole-body imaging (CT, [18F]FDG-PET/CT, and/or MRI) are recommended in <u>symptomatic</u> patients with NVE and PVE to detect peripheral lesions or add minor diagnostic criteria.	I	B
WBC SPECT/CT should be considered in patients with high clinical suspicion of PVE when echocardiography is negative or inconclusive and when PET/CT is unavailable.	IIa	C
Brain and whole-body imaging (CT, [18F]FDG-PET/CT, and MRI) in NVE and PVE may be considered for screening of peripheral lesions in asymptomatic patients.	IIb	B

Suspected **native** valve IE

Baseline assessment and initial classification:
clinical presentation + blood cultures + TTE + TOE^a
(Class I)

ESC 2023 DIAGNOSTIC CRITERIA after IE

DEFINITE

POSSIBLE

REJECTED

- Repeat blood cultures if negative or doubtful
- Repeat TTE/TOE within 5–7 days
- Cardiac CTA to diagnose valvular lesions (Class I)

- Add minor criteria: brain or whole-body imaging (MRI, CT, PET/CT, WBC SPECT) to detect distant lesions (Class IIa)

Suspected paravalvular complications and TOE inconclusive

Cardiac CTA (Class I)

Symptoms suggesting extracardiac complications

Brain and whole-body imaging (CT, [18F]FDG-PET/CT, and/or MRI) (Class I)

No symptoms suggesting extracardiac complications

Brain and whole-body imaging (CT, [18F]FDG-PET/CT, and/or MRI) (Class IIb)

Suspected **prosthetic** valve IE

Baseline assessment and initial classification:
clinical presentation + blood cultures + TTE + TOE^a
(Class I)

ESC 2023 DIAGNOSTIC CRITERIA after IE

DEFINITE

POSSIBLE

REJECTED

- Repeat blood cultures if negative or doubtful
- Repeat TTE/TOE within 5–7 days
- Cardiac CTA or [18F]FDG-PET/CT(A) to diagnose valvular lesions (Class I)

- WBC SPECT
- Add minor criteria: brain or whole-body imaging (MRI, CT, PET/CT, WBC SPECT) to detect distant lesions (Class IIa)

Suspected paravalvular complications and TOE inconclusive

Cardiac CTA (Class I)

Symptoms suggesting extracardiac complications

Brain and whole-body imaging (CT, [18F]FDG-PET/CT, and/or MRI) (Class I)

No symptoms suggesting extracardiac complications

Brain and whole-body imaging (CT, [18F]FDG-PET/CT, and/or MRI) (Class IIb)

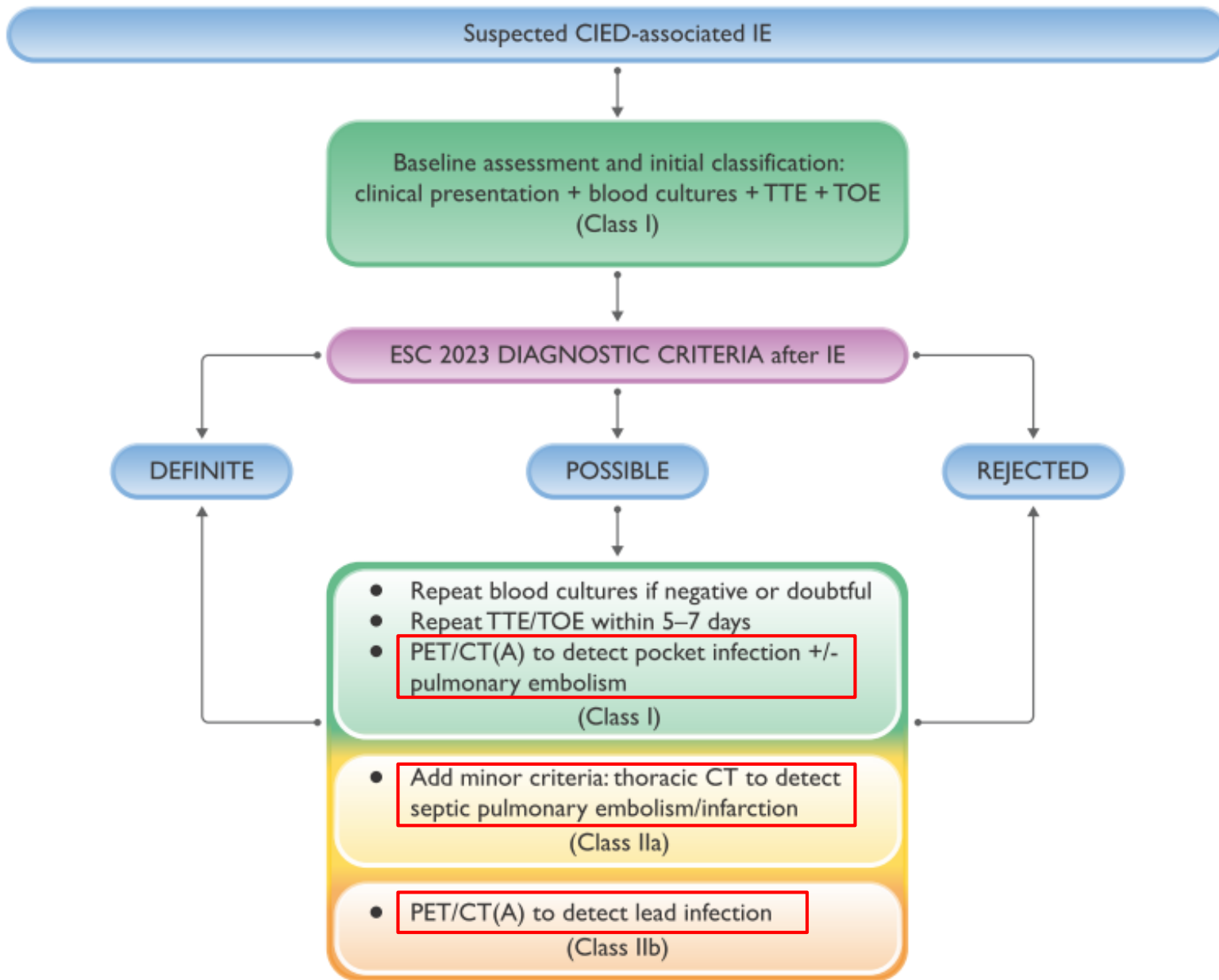


Table 10 Definitions of the 2023 European Society of Cardiology modified diagnostic criteria of infective endocarditis

Major criteria

(i) Blood cultures positive for IE

- (a) Typical microorganisms consistent with IE from two separate blood cultures:
Oral streptococci, *Streptococcus gallolyticus* (formerly *S. bovis*), HACEK group, *S. aureus*, *E. faecalis*
- (b) Microorganisms consistent with IE from continuously positive blood cultures:
 - ≥ 2 positive blood cultures of blood samples drawn >12 h apart.
 - All of 3 or a majority of ≥ 4 separate cultures of blood (with first and last samples drawn ≥ 1 h apart).
- (c) Single positive blood culture for *C. burnetii* or phase I IgG antibody titre $>1:800$.

(ii) Imaging positive for IE:

Valvular, perivalvular/periprosthetic and foreign material anatomic and metabolic lesions characteristic of IE detected by any of the following imaging techniques:

- Echocardiography (TTE and TOE).
- Cardiac CT.
- [18F]-FDG-PET/CT(A).
- WBC SPECT/CT.

Pas de délai

Minor criteria

(i) Predisposing conditions (i.e. predisposing heart condition at high or intermediate risk of IE or PWIDs)^a

(ii) Fever defined as temperature $>38^{\circ}\text{C}$

(iii) Embolic vascular dissemination (including those asymptomatic detected by imaging only):

- Major systemic and pulmonary emboli/infarcts and abscesses.
- Haematogenous osteoarticular septic complications (i.e. spondylodiscitis).
- Mycotic aneurysms.
- Intracranial ischaemic/haemorrhagic lesions.
- Conjunctival haemorrhages.
- Janeway's lesions.

(IV) Immunological phenomena:

- Glomerulonephritis.
- Osler nodes and Roth spots.
- Rheumatoid factor.

(V) Microbiological evidence:

- Positive blood culture but does not meet a major criterion as noted above.
- Serological evidence of active infection with organism consistent with IE.

IE Classification (at admission and during follow-up)

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.

Pas totalement
superposable à la
modification des
critères de Duke...

... mais performances globalement équivalentes

Evaluation of the 2023 Duke-ISCVID and 2023 Duke-ESC Clinical Criteria for the Diagnosis of Infective Endocarditis in a Multicenter Cohort of Patients With *Staphylococcus aureus* Bacteremia

Matthaios Papadimitriou-Olivgeris,^{1,6} Pierre Monney,² Michelle Frank,³ Georgios Tzimas,² Piergiorgio Tozzi,⁴ Matthias Kirsch,⁴ Mathias Van Hemelrijck,⁵ Robert Bauernschmitt,⁵ Jana Epprecht,⁶ Benoit Guery,¹ and Barbara Hasse⁶

Table 2. Performance of Different Versions of the Duke Clinical Criteria Among 1344 Patients With *S. aureus* Bacteremia

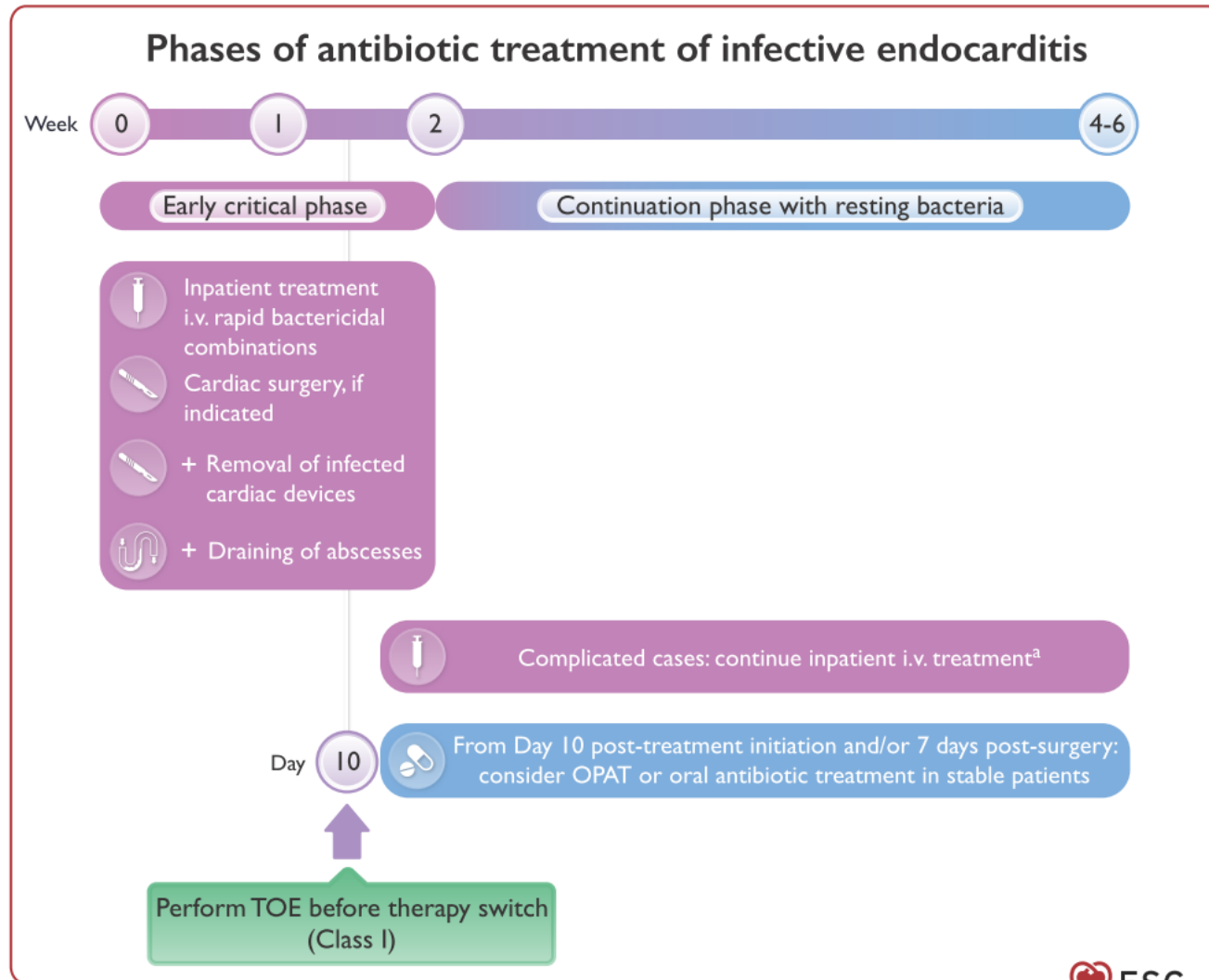
	Sensitivity % (95% CI)	Specificity % (95% CI)	PPV % (95% CI)	NPV % (95% CI)	Accuracy % (95% CI)
2015 Duke-ESC	75 (71–98)	99 (98–99)	97 (95–99)	88 (86–89)	90 (88–92)
2023 Duke-ISCVID	81 (77–84)	96 (95–97)	92 (90–95)	90 (88–91)	91 (90–91)
2023 Duke-ESC	82 (78–85)	96 (95–97)	92 (89–94)	90 (89–92)	91 (89–92)

Antibiothérapie : quelques généralités

- ▶ Préférer une antibiothérapie bactéricide
 - ▶ En association en cas de bactérie tolérante aux ATB (ex. *E. faecalis*)
- ▶ Durée \geq 6 semaines si endocardite sur prothèse, 2-6 semaines sur valve native
- ▶ Rifampicine si endocardite staphylococcique sur matériel (après J3-J5 et hémocultures stériles)
- ▶ J1 du traitement = première hémoculture stérile
 - ▶ Ou date de la chirurgie seulement si culture de la valve positive
- ▶ Relais oral / OPAT envisageable après S2
- ▶ Pas d'aminoside en cas d'endocardite staphylococcique sur valve native
- ▶ Si aminoside indiqué: max 2 semaines
- ▶ Daptomycine: à 10 mg/kg/j, en association (bêtalactamine ou fosfomycine)

Antibiothérapie : quelques généralités

- ▶ Préférer
- ▶ En as
- ▶ Durée ≥
- ▶ Rifampic
- ▶ hémocul
- ▶ J1 du tra
- ▶ Ou d
- ▶ Relais or
- ▶ Pas d'an
- ▶ Si aminc
- ▶ Daptomy



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Antibiothérapie empirique

- ▶ Si valve native ou endocardite tardive sur valve prothétique
 - ▶ Couvrir staphylocoque, streptocoque, entérocoque
 - ▶ Dont SCN si valve prothétique
- ▶ Endocardite associée aux soins ou précoce sur valve prothétique
 - ▶ Couvrir staphylocoque méti-R, entérocoque, et BGN non-HACEK
- ▶ Adaptation dès l'identification obtenue

In patients with community-acquired NVE or late PVE (≥ 12 months post-surgery), ampicillin in combination with ceftriaxone or with (flu)cloxacillin and gentamicin should be considered using the following doses.²⁵⁵

In patients with community-acquired NVE or late PVE (≥ 12 months post-surgery) who are allergic to penicillin, cefazolin, or vancomycin in combination with gentamicin may be considered using the following doses:

In patients with early PVE (< 12 months post-surgery) or nosocomial and non-nosocomial healthcare-associated IE, vancomycin or daptomycin combined with gentamicin and rifampin may be considered using the following doses.³⁹⁵

Streptocoque péni-S (oral, *gallolyticus*)

- ▶ Pénicilline G, amoxicilline, ou ceftriaxone
- ▶ 4 semaines sur valve native, 6 semaines sur prothèse

Standard treatment: 4-week duration in NVE or 6-week duration in PVE	
In patients with IE due to oral streptococci and <i>S. gallolyticus</i> group, penicillin G, amoxicillin, or ceftriaxone are recommended for 4 (in NVE) or 6 weeks (in PVE), using the following doses: ^{277,278}	
Adult antibiotic dosage and route	
Penicillin G	12–18 million ^c U/day i.v. either in 4–6 doses or continuously
Amoxicillin	100–200 mg/kg/day i.v. in 4–6 doses
Ceftriaxone	2 g/day i.v. in 1 dose
Standard treatment: 2-week duration (not applicable to PVE)	
2-week treatment with penicillin G, amoxicillin, ceftriaxone combined with gentamicin is recommended only for the treatment of non-complicated NVE due to oral streptococci and <i>S. gallolyticus</i> in patients with normal renal function using the following doses: ^{277,278}	
Adult antibiotic dosage and route	
Penicillin G	12–18 million ^c U/day i.v. either in 4–6 doses or continuously
Amoxicillin	100–200 mg/kg/day i.v. in 4–6 doses
Ceftriaxone	2 g/day i.v. in 1 dose
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 1 dose ^d

- ▶ En cas d'allergie à la pénicilline:
 - ▶ Désensibilisation si possible / ceftriaxone / vancomycine 30 mg/kg/j

Streptocoque péni F/R

Molécule	Concentrations critiques (mg/l)	
	S ≤	R >
Pénicilline G	0,25	2
Amoxicilline	0,5	2
Céfotaxime	0,5	0,5

- ▶ Incidence en augmentation
- ▶ Données cliniques issues de séries rétrospectives
- ▶ Péni G / Amox / ceftriaxone 4 (native) ou 6 (prothèse) semaines + gentamicine ≥2 semaines

In patients with NVE due to oral streptococci and <i>S. gallolyticus</i> , penicillin G, amoxicillin, or ceftriaxone for 4 weeks in combination with gentamicin for 2 weeks is recommended using the following doses: ²⁸⁵⁻²⁹⁰		I	B
<i>Adult antibiotic dosage and route</i>			
Penicillin G	24 million U/day i.v. either in 4-6 doses or continuously		
Amoxicillin	12 g/day i.v. in 6 doses		
Gentamicin	3 mg/kg/day i.v. or i.m. in 1 dose ^d		
In patients with PVE due to oral streptococci and <i>S. gallolyticus</i> , penicillin G, amoxicillin, or ceftriaxone for 6 weeks combined with gentamicin for 2 weeks is recommended using the following doses: ²⁸⁵⁻²⁹⁰		I	B
<i>Adult antibiotic dosage and route</i>			
Penicillin G	24 million U/day i.v. either in 4-6 doses or continuously		
Amoxicillin	12 g/day i.v. in 6 doses		
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 1 dose ^d		

Staphylococcus aureus et SCN méti-S

- ▶ Pas d'aminoside sur valve native
 - ▶ Uniquement sur prothèse
- ▶ Si SASM et CI aux bêtalactamines: bithérapie avec daptomycine
- ▶ En cas de valve prothétique
 - ▶ Envisager remplacement valvulaire précoce
 - ▶ Adjonction aminoside (mais une étude négative récente)
 - ▶ Adjonction rifampicine après 3-5 jours (mais faible niveau de preuve)
 - ▶ Si allergie à la pénicilline : daptomycine
 - + ceftaroline ou fosfomycine
 - Ou + gentamicine 2 semaines + rifampicine 6 semaines

Staphylococcus aureus et SCN méti-S

In patients with **NVE** due to methicillin-susceptible staphylococci, (flu)cloxacillin or cefazolin is recommended for 4–6 weeks using the following doses:^{264,314,316–318}

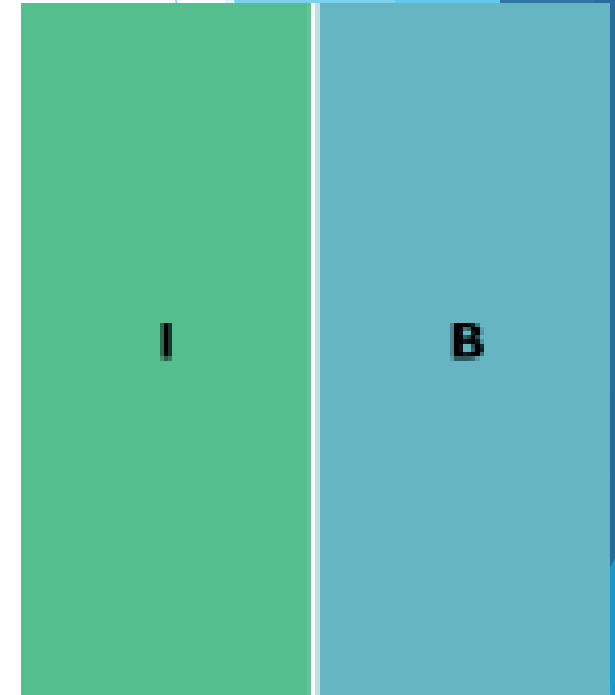
Adult antibiotic dosage and route

(Flu)cloxacillin ^c	12 g/day i.v. in 4–6 doses
Cefazolin ^c	6 g/day i.v. in 3 doses

In patients with **PVE** due to methicillin-susceptible staphylococci, (flu)cloxacillin or cefazolin with rifampin for at least 6 weeks and gentamicin for 2 weeks is recommended using the following doses:^{264,314,316–318,320}

Adult antibiotic dosage and route

(Flu)cloxacillin ^c	12 g/day i.v. in 4–6 doses
Cefazolin	6 g/day i.v. in 3 doses
Rifampin	900 mg/day i.v. or orally in 3 equally divided doses
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 1 (preferred) or 2 doses



2015:

Alternative therapy* Cotrimoxazole ² with Clindamycin	Sulfamethoxazole 4800 mg/day and Trimethoprim 960 mg/day (i.v. in 4–6 doses)	1 i.v. + 5 oral intake	IIb	C	*for Staphylococcus aureus
	1800mg/day i.v. in 3 doses	1	IIb	C	

Retiré!

Allergie aux bêtalactamines

In patients with **NVE** due to methicillin-susceptible staphylococci who are allergic to penicillin, cefazolin for 4–6 weeks is recommended using the following doses:^{322–327}

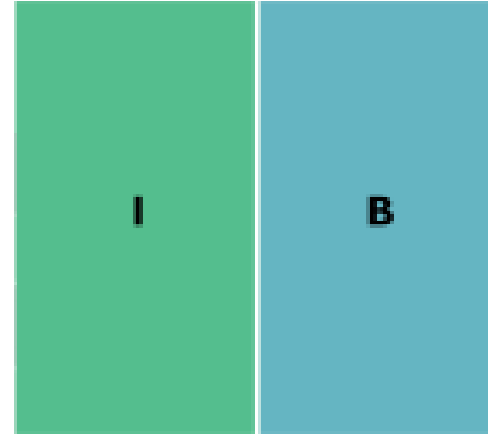
Adult antibiotic dosage and route

Cefazolin ^e	6 g/day i.v. in 3 doses
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In patients with **PVE** due to methicillin-susceptible staphylococci who are allergic to penicillin, cefazolin combined with rifampin for at least 6 weeks and gentamicin for 2 weeks is recommended using the following doses:³⁴⁴

Adult antibiotic dosage and route

Cefazolin ^e	6 g/day i.v. in 3 doses
Rifampin	900 mg/day i.v. or orally in 3 equally divided doses
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 1 (preferred) or 2 doses



In patients with **NVE** due to methicillin-susceptible staphylococci who are allergic to penicillin, daptomycin combined with ceftaroline or fosfomycin may be considered.^{322–327}

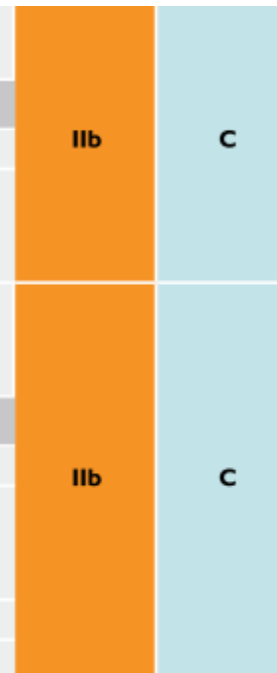
Adult antibiotic dosage and route

Daptomycin	10 mg/kg/day i.v. in 1 dose
Ceftaroline ^f	1800 mg/day i.v. in 3 doses
OR	OR
Fosfomycin ^g	8–12 g/day i.v. in 4 doses

In patients with **PVE** due to methicillin-susceptible staphylococci who are allergic to penicillin, daptomycin combined with ceftaroline or fosfomycin or gentamicin with rifampin for at least 6 weeks and gentamicin for 2 weeks may be considered using the following doses:³⁴⁴

Adult antibiotic dosage and route

Daptomycin	10 mg/kg/day i.v. in 1 dose
Ceftaroline ^f	1800 mg/day i.v. in 3 doses
OR	OR
Fosfomycin ^g	8–12 g/day i.v. in 4 doses
Rifampin	900 mg/day i.v. or orally in 3 equally divided doses
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 1 (preferred) or 2 doses



Staphylococcus aureus et SCN méti-R

In patients with **NVE** due to methicillin-resistant staphylococci, vancomycin is recommended for 4–6 weeks using the following doses:³⁴⁵

Adult antibiotic dosage and route

Vancomycin ^h	30–60 mg/kg/day i.v. in 2–3 doses
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In patients with **PVE** due to methicillin-resistant staphylococci, vancomycin with rifampin for at least 6 weeks and gentamicin for 2 weeks is recommended using the following doses:

Adult antibiotic dosage and route

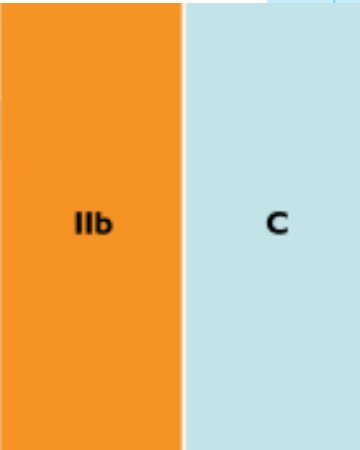
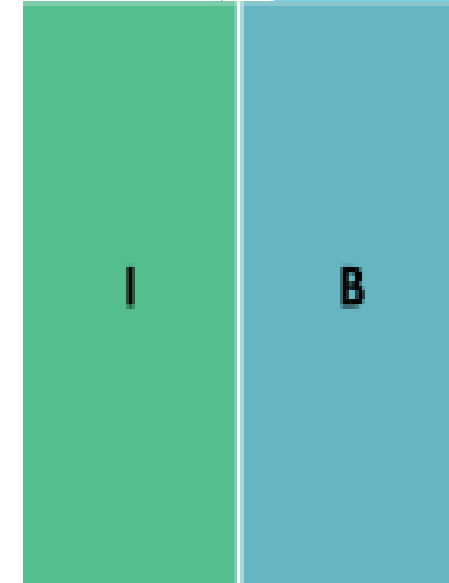
Vancomycin ^h	30–60 mg/kg/day i.v. in 2–3 doses
Rifampin	900–1200 mg/day i.v. or orally in 2 or 3 divided doses
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 1 (preferred) or 2 doses

In patients with **NVE** due to methicillin-resistant staphylococci, daptomycin combined with cloxacillin, ceftaroline or fosfomycin may be considered using the following doses:^{335,345–349}

Si CMI vanco > 1mg/l

Adult antibiotic dosage and route

Daptomycin	10 mg/kg/day i.v. in 1 dose
Cloxacillin ^c	12 g/day i.v. in 6 doses
OR	OR
Ceftaroline ^f	1800 mg/day i.v. in 3 doses
OR	OR
Fosfomycin ^g	8–12 g/day i.v. in 4 doses



Mais...

Is Rifampin Use Associated With Better Outcome in Staphylococcal Prosthetic Valve Endocarditis? A Multicenter Retrospective Study

Audrey Le Bot,¹ Raphaël Lecomte,² Pierre Gazeau,³ François Benezit,¹ Cédric Arvieux,¹ Séverine Ansart,³ David Bouteille,² Rozenn Le Berre,⁴ Céline Chabanne,⁵ Matthieu Lesouhaitier,¹ Loren Dejoies,^{6,7} Erwan Flecher,⁵ Jean-Marc Chaplain,¹ Pierre Tattevin,^{1,7,8} and Matthieu Revest^{1,7,8}; Pour le Groupe d'Epidémiologie et Recherche en Infectiologie Clinique du Centre et de l'Ouest (GERICCO)

- ▶ Pas de différence de mortalité ou de rechutes sur cette cohorte rétrospective de 180 endocardites prothétiques à *S. aureus* et SCN

Entérocoques (*E. faecalis* 90%)

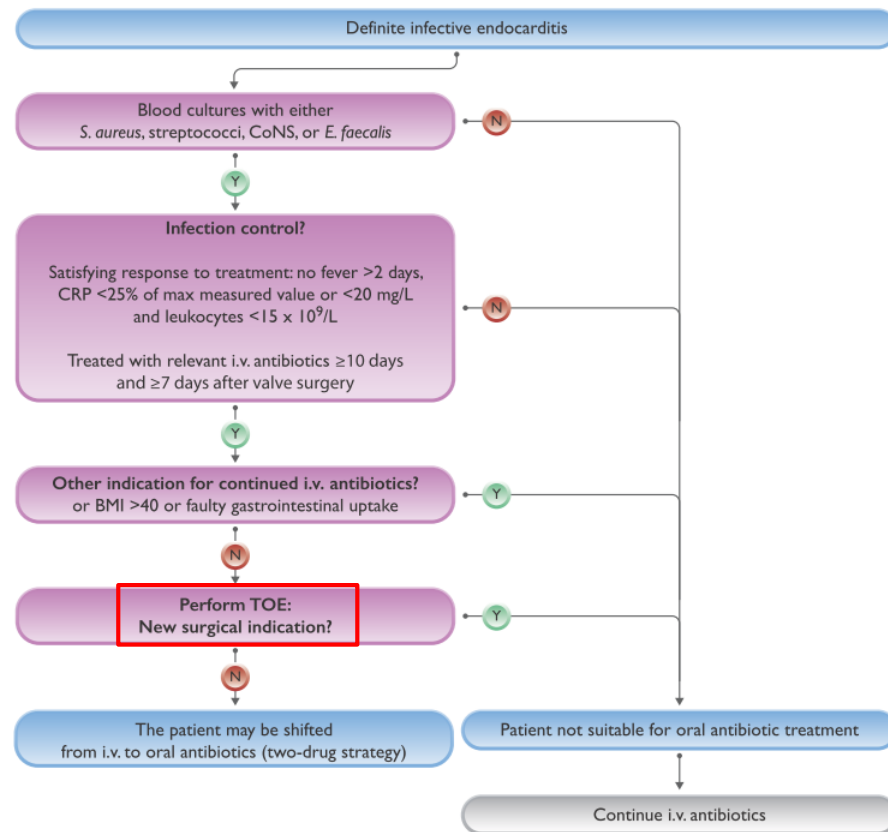
- ▶ Sur valve native ou prothétique
 - ▶ Ampicilline 12g/j ou amoxicilline 200 mg/kg/j pendant 6 semaines
 - ▶ Et: ceftriaxone 2g/12h pendant 6 semaines
 - ▶ Ou: gentamicine 3 mg/kg/j pendant 2 semaines (si pas de résistance de HN)
- ▶ Si souche résistante aux bêtalactamines (*E. faecium*)
 - ▶ Vancomycine 30 mg/kg/j pendant 6 semaines
 - ▶ Et: gentamicine 3 mg/kg/j pendant 2 semaines
- ▶ Si souche résistante à la vancomycine
 - ▶ Daptomycine 10-12 mg/kg/j
 - ▶ Et: bêtalactamine (ampicilline, ertapénem, ou ceftaroline)
 - ▶ Ou: fosfomycine

Bactéries à Gram négatif

- ▶ HACEK : ceftriaxone 2g/j pendant 4 (valve native) ou 6 (prothèse) semaines
 - ▶ Si pas de bêtalactamase: ampicilline 4-6 semaines + gentamicine 2 semaines
- ▶ Autres BGN:
 - ▶ Bêtalactamine 6 semaines + aminoside
 - ▶ Parfois quinolone ou cotrimoxazole

Deuxième phase: OPAT ou relais oral

- ▶ Chez un patient stable cliniquement, une fois l'infection contrôlée
- ▶ Après au moins 10 jours de traitement IV intra-hospitalier
- ▶ Et après 7 jours post-opératoire en cas de chirurgie



Section 7. Recommendation Table 11 — Recommendations for outpatient antibiotic treatment of infective endocarditis

Outpatient parenteral antibiotic treatment should be considered in patients with left-sided IE caused by *Streptococcus* spp., *E. faecalis*, *S. aureus*, or CoNS who were receiving appropriate i.v. antibiotic treatment for at least 10 days (or at least 7 days after cardiac surgery), are clinically stable, and who do not show signs of abscess formation or valve abnormalities requiring surgery on TOE.

IIa

A

Outpatient parenteral antibiotic treatment is not recommended in patients with IE caused by highly difficult-to-treat microorganisms, liver cirrhosis (Child–Pugh B or C), severe cerebral nervous system emboli, untreated large extracardiac abscesses, heart valve complications, or other severe conditions requiring surgery, severe post-surgical complications, and in PWID-related IE.

III

C

Quelle antibiothérapie orale?



Penicillin-and methicillin-susceptible <i>S. aureus</i> & CoNS	Methicillin-susceptible <i>S. aureus</i> & CoNS	Methicillin-resistant CoNS	<i>E. faecalis</i>	Penicillin-susceptible streptococci	Penicillin-resistant streptococci
Amoxicillin 1 g × 4 Rifampin 600 mg × 2	Dicloxacillin 1 g × 4 Rifampin 600 mg × 2	Linezolid 600 mg × 2 Fusidic acid 750 mg × 2	Amoxicillin 1 g × 4 Moxifloxacin 400 mg × 1	Amoxicillin 1 g × 4 Rifampin 600 mg × 2	Linezolid 600 mg × 2 Rifampin 600 mg × 2
Amoxicillin 1 g × 4 Fusidic acid 750 mg × 2	Dicloxacillin 1 g × 4 Fusidic acid 750 mg × 2	Linezolid 600 mg × 2 Rifampin 600 mg × 2	Amoxicillin 1 g × 4 Linezolid 600 mg × 2	Amoxicillin 1 g × 4 Moxifloxacin 400 mg × 1	Moxifloxacin 400 mg × 1 Rifampin 600 mg × 2
Moxifloxacin 400 mg × 1 Rifampin 600 mg × 2	Moxifloxacin 400 mg × 1 Rifampin 600 mg × 2		Amoxicillin 1 g × 4 Rifampin 600 mg × 2	Amoxicillin 1 g × 4 Linezolid 600 mg × 2	Linezolid 600 mg × 2 Moxifloxacin 400 mg × 1
Linezolid 600 mg × 2 Rifampin 600 mg × 2	Linezolid 600 mg × 2 Rifampin 600 mg × 2		Linezolid 600 mg × 2 Moxifloxacin 400 mg × 1	Linezolid 600 mg × 2 Rifampin 600 mg × 2	
Linezolid 600 mg × 2 Fusidic acid 750 mg × 2	Linezolid 600 mg × 2 Fusidic acid 750 mg × 2		Linezolid 600 mg × 2 Rifampin 600 mg × 2	Linezolid 600 mg × 2 Moxifloxacin 400 mg × 1	

Alternative en cas d'endocardite staphylococcique: cotrimoxazole IV + clindamycine IV pendant 1 semaine puis cotrimoxazole PO pendant 5 semaines

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

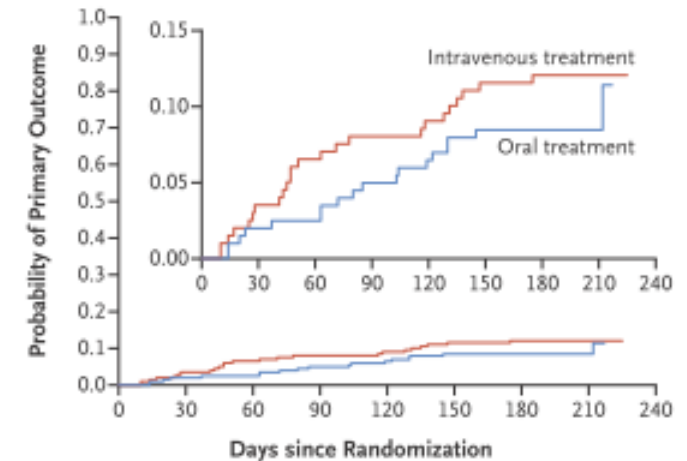
JANUARY 31, 2019

VOL. 380 NO. 5

Partial Oral versus Intravenous Antibiotic Treatment of Endocarditis

Table 2. Distribution of the Four Components of the Primary Composite Outcome.*

Component	Intravenous Treatment (N=199)	Oral Treatment (N=201)	Difference	Hazard Ratio (95% CI)
	number (percent)		percentage points (95% CI)	
All-cause mortality	13 (6.5)	7 (3.5)	3.0 (-1.4 to 7.7)	0.53 (0.21 to 1.32)
Unplanned cardiac surgery	6 (3.0)	6 (3.0)	0 (-3.3 to 3.4)	0.99 (0.32 to 3.07)
Embolic event	3 (1.5)	3 (1.5)	0 (-2.4 to 2.4)	0.97 (0.20 to 4.82)
Relapse of the positive blood culture†	5 (2.5)	5 (2.5)	0 (-3.1 to 3.1)	0.97 (0.28 to 3.33)



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

Figure 2. Kaplan–Meier Plot of the Probability of the Primary Composite Outcome.

Traitement chirurgical

▶ Trois indications principales

- ▶ Défaillance cardiaque (la plus fréquente)
- ▶ Infection non contrôlée (deuxième indication la plus fréquente)
 - ▶ Choc septique, hémocultures positives >7 jours, progression locale
- ▶ Prévention des emboles septiques
 - ▶ Risque majeur J-1 à J1, diminue jusqu'à J14

▶ Le timing:

- ▶ Chirurgie d'extrême urgence, <24h
- ▶ Chirurgie urgente, 3-5 jours
- ▶ Chirurgie non-urgente, pendant l'hospitalisation

Recommendations	Class ^b	Level ^c
(i) Heart failure		
Emergency ^d surgery is recommended in aortic or mitral NVE or PVE with severe acute regurgitation, obstruction, or fistula causing refractory pulmonary oedema or cardiogenic shock. ^{420,423,424,429,476,477}	I	B
Urgent ^d surgery is recommended in aortic or mitral NVE or PVE with severe acute regurgitation or obstruction causing symptoms of HF or echocardiographic signs of poor haemodynamic tolerance. ^{5,420-422,429}	I	B
(ii) Uncontrolled infection		
Urgent ^d surgery is recommended in locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation, prosthetic dehiscence, new AVB). ^{5,420,421,429,445}	I	B
Urgent ^d or non-urgent surgery is recommended in IE caused by fungi or multiresistant organisms according to the haemodynamic condition of the patient. ⁴²⁰	I	C
Urgent ^d surgery should be considered in IE with persistently positive blood cultures >1 week or persistent sepsis despite appropriate antibiotic therapy and adequate control of metastatic foci. ^{436,437}	IIa	B
Urgent ^d surgery should be considered in PVE caused by <i>S. aureus</i> or non-HACEK Gram-negative bacteria. ^{5,385,449}	IIa	C
(iii) Prevention of embolism		
Urgent ^d surgery is recommended in aortic or mitral NVE or PVE with persistent vegetations ≥ 10 mm after one or more embolic episodes despite appropriate antibiotic therapy. ^{451,455,457,471,478}	I	B
Urgent ^d surgery is recommended in IE with vegetation ≥ 10 mm and other indications for surgery. ^{5,460,465,466,471,478}	I	C
Urgent ^d surgery may be considered in aortic or mitral IE with vegetation ≥ 10 mm and without severe valve dysfunction or without clinical evidence of embolism and low surgical risk. ^{460,463,465,473,478}	IIb	B

Autres complications fréquentes

- ▶ Neurologiques (ischémiques majoritairement)
 - ▶ Pas d'impact de l'anticoagulation → possibilité de la poursuivre si indication
 - ▶ Un accident ischémique sans coma ne contre-indique pas la chirurgie cardiaque
- ▶ Anévrismes mycotiques cérébraux
 - ▶ Parfois traitement endovasculaire ou neurochirurgical
- ▶ Infarctus/abcès spléniques
- ▶ Myocardites/péricardites
- ▶ Troubles de la conduction
- ▶ Ostéo-arthrite, spondylodiscite
- ▶ Défaillance rénale

Section 9. Recommendation Table 15 — Recommendations for patients with musculoskeletal manifestations of infective endocarditis

MRI or PET/CT is recommended in patients with suspected spondylodiscitis and vertebral osteomyelitis complicating IE.	I	C
TTE/TOE is recommended to rule out IE in patients with spondylodiscitis and/or septic arthritis with positive blood cultures for typical IE microorganisms.	I	C
More than 6-week antibiotic therapy should be considered in patients with osteoarticular IE-related lesions caused by difficult-to-treat microorganisms, such as <i>S. aureus</i> or <i>Candida</i> spp., and/or complicated with severe vertebral destruction or abscesses.	IIa	C



Quelques situations particulières

- ▶ Endocardite précoce (<6 mois) sur prothèse valvulaire → remplacement prothétique
- ▶ Endocardite du sujet âgé: maintien du bénéfice de la chirurgie si elle est indiquée
- ▶ Endocardite sur TAVI
 - ▶ Prédominance entérocoque et *S. aureus*
 - ▶ Végétations souvent non visualisées (penser scanner, TEP)
 - ▶ Complications fréquentes, chirurgie rarement réalisée
- ▶ Endocardite sur matériel de stimulation
 - ▶ Extraction de l'ensemble du matériel si infection des sondes
 - ▶ À discuter si endocardite valvulaire sans certitude d'infection des sondes, si bactériémie/fongémie persistante ou récidivante en l'absence d'autre source
 - ▶ Extraction non recommandée si hémoculture isolée sans autre signe d'infection du matériel

Removal of CIED after a single positive blood culture, with no other clinical evidence of infection, is not recommended.⁶⁷⁵

III

C

Endocardites du cœur droit

- ▶ 5 à 10% des endocardites, principalement à *S. aureus* et SCN
- ▶ Valve tricuspide le plus souvent
- ▶ Complications périvalvulaires plus rares
- ▶ Moins grave que sur cœur gauche, traitement médical suffisant chez 90% des patients
 - ▶ Pronostic moins bon si point de départ d'un matériel de stimulation
- ▶ Traitement de 2 semaine par (cl)oxacilline IV possible si:
 - ▶ SASM + évolution favorable à H96 + végétation <20mm + absence d'embolie, d'empyème, de complication, de prothèse valvulaire, d'atteinte du cœur gauche, d'immunodépression
- ▶ Endocardite à *S. aureus* chez le toxicomane IV si pas d'abord veineux:
 - ▶ Ciprofloxacine 750mgx2 + rifampicine 300mgx2 PO

- ▶ Indications chirurgicales
 - ▶ Bactériémie persistante ≥ 1 semaine
 - ▶ Dysfonctionnement ventriculaire par régurgitation tricuspide aiguë ne répondant pas aux diurétiques
 - ▶ Insuffisance respiratoire par EP récurrentes
 - ▶ Atteinte du cœur gauche
 - ▶ Végétations résiduelles $> 20\text{mm}$ après EP récurrentes
- ▶ Privilégier la préservation avec réparation de la valve tricuspide si possible
 - ▶ Si remplacement: plutôt bioprothèse
 - ▶ Envisager pose prophylactique d'une sonde de stimulation épiscopardique en per-op
- ▶ Envisager debulking des masses septiques intra-auriculaires droites par aspiration percutanée en cas de haut risque chirurgical

En conclusion

- ▶ Finalement assez peu de nouveautés concernant l'antibiothérapie
- ▶ Pas de microbiologistes dans les auteurs, peu d'infectiologues
- ▶ Quelques interrogations
 - ▶ Maintien de la rifampicine avec un grade I.B. en cas d'endocardite staphylococcique sur prothèse
 - ▶ Et indiquée en empirique
 - ▶ Posologies des antibiotiques parfois adaptées au poids, parfois non
 - ▶ Peu de mention de la perfusion continue en dehors de l'OPAT
 - ▶ Pas de mention des dosages résiduels non plus
 - ▶ Certains schémas thérapeutiques ne correspondent pas forcément à nos habitudes, notamment par voie orale
 - ▶ Répétition de l'ETO difficile à obtenir et par forcément pertinente (avant relais oral notamment)