



# Synthèse des nouvelles Recommandations en maladies infectieuses publiées en 2023

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# PLAN

(dans l'ordre de mes préférences)

- Allergie
- Os
- Bactéries multirésistantes
- Dosages
- Antibiogramme ciblé
- Endocardite
- Lyme
- Eosinophilie
- Abscès cérébraux
- Autres





## Guidelines

## The Dutch Working Party on Antibiotic Policy (SWAB) guideline for the approach to suspected antibiotic allergy

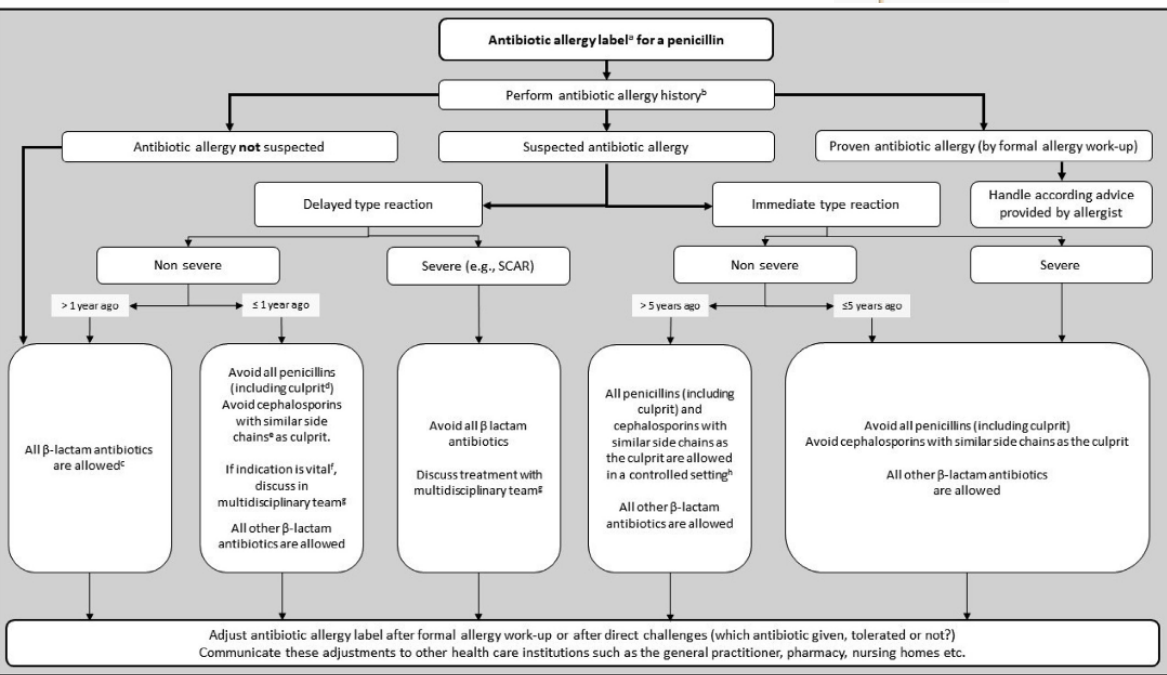
Roos Wijnakker<sup>1,15,\*</sup>, Maurits S. van Maaren<sup>2</sup>, Lonneke G.M. Bode<sup>3</sup>, Maja Bulatovic<sup>4</sup>, Bart J.C. Hendriks<sup>5</sup>, Masja C.M. Loogman<sup>6</sup>, Suzanne P.M. Lutgens<sup>7</sup>, Ananja Middel<sup>8</sup>, Chris M.G. Nieuwhof<sup>9</sup>, Eveline E. Roelofsens<sup>10</sup>, Jan W. Schoones<sup>11</sup>, Kim C.E. Sigaloff<sup>12</sup>, Aline B. Sprikkelman<sup>13</sup>, Lieke M.M. de Vrankrijker<sup>14</sup>, Mark G.J. de Boer<sup>15</sup>

## Consensus document

Management of patients with suspected or confirmed antibiotic allergy. Executive summary of guidance from the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC), the Spanish Society of Allergy and Clinical Immunology (SEAC), the Spanish Society of Hospital Pharmacy (SEFH) and the Spanish Society of Intensive Medicine and Coronary Care Units (SEMICYUC)\*,\*,\*,\*,\*

Table 2  
s reactivity in  $\beta$ -lactam antibiotics

$\beta$ -Lactam Antibiotic	Amoxicillin	Penicillin G	Penicillin V	Flucloxacillin	Feneticillin	Piperacillin	Cephalosporins	Cefazolin	Cefuroxime	Ceftriaxone	Cefepime	Ceftazidime	Ceftaroline	Ceftolozane	Meropenem	Imipenem	Ertapenem	Aztreonam
Amoxicillin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Penicillin G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Penicillin V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flucloxacillin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Feneticillin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Piperacillin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cephalosporins	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cefazolin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cefuroxime	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ceftriaxone	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cefepime	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ceftazidime	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ceftaroline	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ceftolozane	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Meropenem	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Imipenem	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ertapenem	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Aztreonam	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Consensus document

Executive summary: Guidelines for the diagnosis and treatment of septic arthritis in adults and children, developed by the GEIO (SEIMC), SEIP and SECOT\*

Natividad Benito<sup>a,b,c,g,h,i</sup>, Juan Carlos Martínez-Pastor<sup>d,1</sup>, Jaime Lora-Tamayo<sup>b,e</sup>, Javier Ariza<sup>b,f</sup>, José Baeza<sup>g</sup>, Joaquín Belzunegui-Otano<sup>h</sup>, Javier Cobo<sup>b,i</sup>, María-Dolores del-Toro<sup>b,j</sup>, Cesar G. Fontecha<sup>k</sup>, Lluís Font-Vizcarra<sup>l</sup>, Juan P. Horcajada<sup>b,c,m</sup>, Laura Morata<sup>n</sup>, Oscar Murillo<sup>b,o</sup>, Joan M. Nolla<sup>p</sup>, Esmeralda Núñez-Cuadros<sup>q</sup>, Carlos Pigrau<sup>r,s</sup>, María Eugenia Portillo<sup>t</sup>, Dolores Rodríguez-Pardo<sup>b,r</sup>, Beatriz Sobrino-Díaz<sup>u</sup>, Jesús Saavedra-Lozano<sup>b,v,1</sup>

## 10. Total duration of antimicrobial treatment in adults without endocarditis:

- For large peripheral joints after drainage, we suggest 3–4 weeks for *S. aureus* (SA) and gram-negative bacilli (GNB), 2–3 weeks for streptococcal arthritis and 1–2 weeks for gonococcal arthritis (**B-III**).
- A longer duration is recommended for SA of axial joints (6 weeks) and SA with adjacent osteomyelitis (**A-III**) and is also suggested for patients with immunosuppression or a slow/inadequate response to initial treatment (**B-III**).
- Two weeks are recommended for SA of the wrist or hand joints after surgical drainage (this recommendation may not apply to SA caused by methicillin-resistant *S. aureus* [MRSA]) (**A-I**).

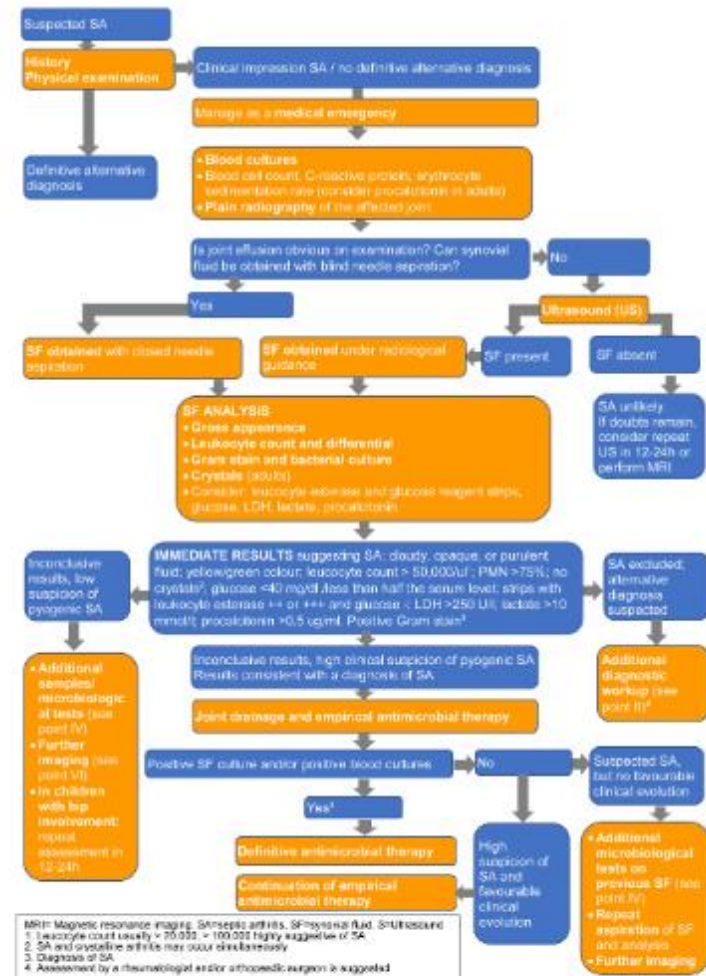


Fig. 1. Diagnostic algorithm of septic arthritis (SA).



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## Guidelines

### SPILF update on bacterial arthritis in adults and children

J.P. Stahl<sup>a,\*</sup>, E. Canoui<sup>b</sup>, P. Pavese<sup>c</sup>, A. Bleibtreu<sup>d</sup>, V. Dubée<sup>e</sup>, T. Ferry<sup>f</sup>, Y. Gillet<sup>g</sup>,  
 A. Lemaighen<sup>h</sup>, M. Lorrot<sup>i</sup>, J. Lourtet-Hascoët<sup>j</sup>, R. Manaquin<sup>k</sup>, V. Meyssonnier<sup>l,m</sup>,  
 T.-T. Pham<sup>f,n</sup>, E. Varon<sup>o</sup>, P. Lesprit<sup>c</sup>, R. Gauzit<sup>b</sup>, the reviewers<sup>1</sup>

#### Recommendations 1: Treatment durations

- *S. aureus*, and enterobacterales 6 weeks
- *Streptococcus* spp 4 weeks
- *Neisseria gonorrhoeae*: 7 days
- Early arthritis (evolution < 4 weeks), by direct inoculation of the small joints of the hands, following proper surgical hand washing: 14 days in the absence of osteolysis.



#### Recommendation 4: MSSA oral relay

- The molecule for oral relay is chosen according to antimicrobial susceptibility.
- Only with certain molecules is monotherapy possible.
- If monotherapy, clindamycin is proposed as first-line treatment in the event of sensitivity without inducible MLSb phenotype, that is to say a strain sensitive to clindamycin and erythromycin.
- The levofloxacin/rifampicin or levofloxacin/clindamycin associations may likewise be proposed as first-line treatment.
- In the event of resistance to clindamycin or of an inducible MLSb phenotype, doxycycline, an oxazolidinone (linezolid, tedizolid) or cotrimoxazole may be proposed.
- Levofloxacin and rifampicin must be used in association with one another.
- Without complications, total treatment duration is six weeks.

**Clinical Practice Guideline by the Pediatric Infectious Diseases  
Society (PIDS) and the Infectious Diseases Society of America  
(IDSA): 2023 Guideline on Diagnosis and Management of Acute**

**Bacterial Arthritis in Pediatrics**

Charles R. Woods,<sup>1</sup> John S. Bradley,<sup>2</sup> Archana Chatterjee,<sup>3</sup> Matthew P. Kronman,<sup>4</sup> Sandra R. Arnold,<sup>5</sup>  
Joan Robinson,<sup>6</sup> Lawson A. Copley,<sup>7</sup> Antonio Arrieta,<sup>8</sup> Sandra L. Fowler,<sup>9</sup> Christopher Harrison,<sup>10</sup>  
Stephen C. Eppes,<sup>11</sup> C. Buddy Creech,<sup>12</sup> Laura P. Stadler,<sup>13</sup> Samir S. Shah,<sup>14</sup> Lynnette J. Mazur,<sup>15</sup>  
Maria A. Carrillo-Marquez,<sup>5</sup> Coburn H. Allen,<sup>16</sup> and Valéry Lavergne<sup>17,18</sup>



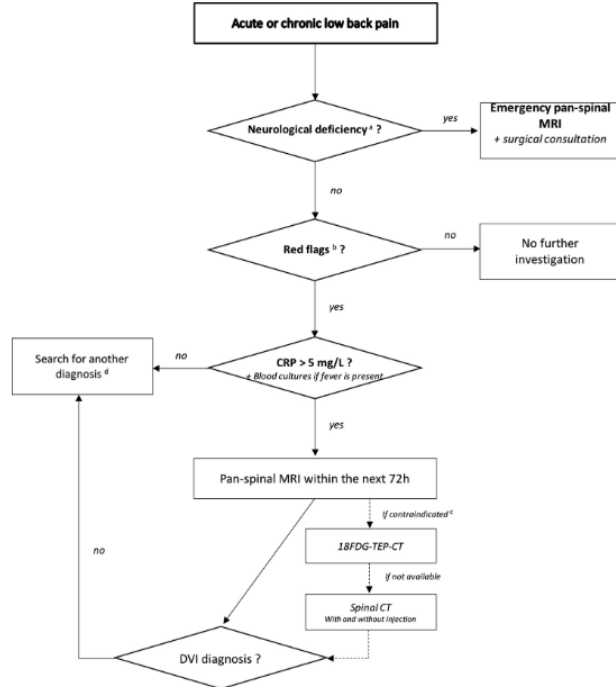


## Guidelines

## 2022 SPILF - Clinical Practice guidelines for the diagnosis and treatment of disco-vertebral infection in adults



M. Lacasse<sup>a</sup>, S. Derolez<sup>b</sup>, E. Bonnet<sup>c,\*</sup>, A. Amelot<sup>d</sup>, B. Bouyer<sup>e</sup>, R. Carlier<sup>f</sup>, G. Coiffier<sup>g</sup>, J.P. Cottier<sup>h</sup>, A. Dinh<sup>i</sup>, I. Maldonado<sup>j</sup>, F. Paycha<sup>k</sup>, J.M. Ziza<sup>l</sup>, P. Bemer<sup>m</sup>, L. Bernard<sup>n</sup>, the Review group  
 Géraldine Bart<sup>oo</sup>, Pascal Coquerelle<sup>op</sup>, Stéphane Corvec<sup>oc</sup>, Anne Cotten<sup>od</sup>, Marion Couderc<sup>oe</sup>, E. Denes<sup>of</sup>, Arnaud Dupeyron<sup>og</sup>, Sophie Godot<sup>oh</sup>, Marion Grare<sup>oi</sup>, A. Homs<sup>oj</sup>, Brigitte Lam<sup>ok</sup>, Jean Philippe Lavigne<sup>ol</sup>, V. Lemoing<sup>om</sup>, Edouard Pertuiset<sup>on</sup>, P. Ribinik<sup>oo</sup>, France Roblot<sup>op</sup>, Eric Senneville<sup>oq</sup>, Jean Philippe Talarmin<sup>or</sup>, I. Tavares Figueiredo<sup>os</sup>, Marie Titeca<sup>ot</sup>, Valérie Zeller<sup>ou</sup>



**Table 3**  
 Antibiotic therapy for documented DVI.

Microorganisms	Initial therapy			Maintenance therapy		
	Molecule (s)	Dosing (per day)	Delivery	Molecule (s)	Dosing (per day)	Delivery
MSSA <sup>1</sup> /MSCNS <sup>2</sup>	Cefazolin or Cloxacillin	100 mg/kg 150 mg/kg	IV or CII <sup>c</sup>	Levofloxacin + Rifampicin or Clindamycin alone	750 mg <sup>a</sup> + 10 mg/kg 600 to 900 mg/8h <sup>b</sup>	PO, PO PO
If beta-lactams allergy	Daptomycin or Vancomycin	10 mg/kg 30 mg/kg on loading dose then 30 mg/kg	IV or CII IV	Clindamycin alone	600 to 900 mg/12h <sup>b</sup>	PO
SARM <sup>3</sup> /MRCNS <sup>4</sup>	Daptomycin or Vancomycin	10 mg/kg 30 mg/kg on loading dose then 30 mg/kg	IV Slow IV CII	Levofloxacin + Rifampicin or Clindamycin alone or Sulfamethoxazole trimethoprim alone	750 mg <sup>a</sup> + 10 mg/kg 600 to 900 mg/12h <sup>b</sup> 320/1600 mg/12 h	PO, PO PO PO
<i>Enterococcus</i> spp	Amoxicillin + Gentamicin or Ceftriaxone	200 mg/kg + 5 mg/kg 2 g/12 h	IV, IV IV	Amoxicillin	3 g/8h	PO
If beta-lactams allergy or <i>E.faecium</i>	Vancomycin or Daptomycin + Gentamicin	30 mg/kg on loading dose then 30 mg/kg 12 mg/kg <sup>d</sup> + 5 mg/kg	Slow IV CII IV, IV	Linezolid	600 mg/12 h	PO
<i>Streptococcus</i> spp	Amoxicillin	100 mg/kg	IV	Amoxicillin or Clindamycin	2–3 g/8h <sup>e</sup> 600 to 900 mg/8h <sup>b</sup>	PO PO



## Guidelines

Clinical practice recommendations for infectious disease management of diabetic foot infection (DFI) – 2023 SPILF

**Table 4**

Antibiotic therapy for GPC osteoarticular infections.

Microorganism	1st-choice antibiotic	Alternative if allergy or intolerance	Oral relay
Hemolytic streptococcus	Amoxicillin IV	1st Clindamycin IV or oral 2nd levofloxacin oral	Amoxicillin
Methicillin susceptible Staphylococcus	Oxacillin IV Or cloxacillin IV Or cefazoline IV	Cefazoline* IV Or daptomycin IV Or vancomycin IV Or teicoplanin IV Or clindamycin IV	Infectiology advice: association or monotherapy (cf. rationale)
Methicillin resistant Staphylococcus	Daptomycin IV Or vancomycin IV Or teicoplanin IV Or linezolid oral or IV Or tedizolid oral or IV	Infectiology advice	Infectiology advice: association or monotherapy (cf. rationale)
<i>Enterococcus faecalis</i>	Amoxicillin IV	Vancomycin IV Or teicoplanin IV Or daptomycin IV Or linezolid oral or IV Or tedizolid oral or IV	Amoxicillin
<i>Enterococcus faecium</i>	Vancomycin IV Or teicoplanin IV Or daptomycin IV Or linezolid oral or IV Or tedizolid oral or IV	Infectiology advice	Linezolid Or tedizolid

\* Possible 1GC utilization if allergy to penicillin (except if cross allergy with cephalosporin or immediate hypersensitivity reaction).

**Table 8**

Antibiotherapy duration.

	Infection of the skin and soft tissues (DFI)	Osteitis (DFO) Without preliminary surgical treatment	After partial surgical treatment (residual osteitis)	After complete amputation
Antibiotherapy duration	Grade 2 infection: 7 days Grade 3 or 4 infection: 10 days <sup>a,b</sup>	6 weeks	3 weeks	5 days <sup>c</sup>





# IWGDF/IDSA Guidelines on the Diagnosis and Treatment of Diabetes-related Foot Infections (IWGDF/IDSA 2023)

Éric Senneville,<sup>1,2</sup> Zaina Albalawi,<sup>3</sup> Suzanne A. van Asten,<sup>4</sup> Zulfiqarali G. Abbas,<sup>5</sup> Geneve Allison,<sup>6</sup> Javier Aragón-Sánchez,<sup>7</sup> John M. Embil,<sup>8</sup> Lawrence A. Lavery,<sup>9</sup> Majdi Alhasan,<sup>10</sup> Orhan Oz,<sup>11</sup> Ilker Uçkay,<sup>12</sup> Vilma Urbančić-Rovan,<sup>13</sup> Zhang-Rong Xu,<sup>14</sup> and Edgar J. G. Peters<sup>15,16,17</sup>

**Table 4. Proposals for the empirical antibiotic therapy according to clinical presentation and microbiological data (from Lipsky et al.<sup>11</sup>).<sup>a</sup>**

Infection severity	Additional factors	Usual pathogen(s) <sup>b</sup>	Potential empirical regimens <sup>c</sup>
Mild	No complicating features	GPC	Semisynthetic penicillinase-resistant penicillin (cloxacillin) 1 <sup>st</sup> generation cephalosporin (cephalexin)
	β-lactam allergy or intolerance	GPC	Clindamycin; fluoroquinolone (levo/moxi-floxacin); trimethoprim-sulfamethoxazole; doxycycline
	Recent antibiotic exposure	GPC + GNR	β-lactam- β lactamase inhibitor1 (amoxicillin/clavulanate, ampicillin/sulbactam) Fluoroquinolone (levo/moxi-floxacin); trimethoprim-sulfamethoxazole
	High risk for MRSA	MRSA	Linezolid; trimethoprim-sulfamethoxazole; clindamycin; doxycycline, fluoroquinolone (levofloxacin, moxifloxacin)
Moderate or severe <sup>d</sup>	No complicating features	GPC ± GNR	β-lactam- β lactamase inhibitor1 (amoxicillin/clavulanate, ampicillin/sulbactam) 2 <sup>nd</sup> , 3 <sup>rd</sup> generation cephalosporine (cefuroxime, cefotaxime, ceftriaxone)
	Recent antibiotics	GPC ± GNR	β-lactam- β lactamase inhibitor2 (ticarcillin/clavulanate, piperacillin/tazobactam) 2 <sup>nd</sup> , 3 <sup>rd</sup> generation cephalosporine (cefuroxime, cefotaxime, ceftriaxone) group 1 carbapenem (ertapenem); (depends on prior therapy; seek advice)
	Macerated ulcer or warm climate	GNR, including <i>Pseudomonas</i> sp.	β-lactam- β lactamase inhibitor2 (ticarcillin/clavulanate, piperacillin/tazobactam) semisynthetic penicillinase-resistant penicillin (cloxacillin) + ceftazidime or ciprofloxacin group 2 carbapenem (mero/imi-penem)
	Ischaemic limb/necrosis/gas forming	GPC ± GNR ± strict anaerobes	β-lactam- β lactamase inhibitor1 (amoxicillin/clavulanate, ampicillin/sulbactam) or β-lactam- β lactamase inhibitor2 (ticarcillin/clavulanate, piperacillin/tazobactam) Group 1 (ertapenem) or 2 (mero/imi-penem) carbapenem 2 <sup>nd</sup> (cefuroxime)/3 <sup>rd</sup> (cefotaxime, ceftriaxone) generation cephalosporin + clindamycin or metronidazole
	MRSA risk factors	MRSA	Consider adding, or substituting with, glycopeptides (vancomycin, teicoplanin); lLinezolid; daptomycin; fusidic acid, trimethoprim-sulfamethoxazole; doxycycline
	Risk factors for resistant GNR	ESBL	Carbapenem (erta/mero/imi-penem); fluoroquinolone (ciprofloxacin); Aminoglycoside (amikacin); colistin

**Table 5. Duration of antibiotic therapy according to the clinical situation.**

Infection severity (skin and soft tissues)	Route	Duration
Class 2: Mild	Oral	1–2 weeks <sup>a</sup>
Class 3/4: Moderate/severe	Oral/initially iv	2–4 weeks
Bone/joint		
Resected	Oral/initially iv	2–5 days
Debrided (soft tissue infection)	Oral/initially iv	1–2 weeks
Positive culture or histology of bone margins after bone resection	Oral/initially iv	3 weeks
No surgery or dead bone	Oral/initially iv	6 weeks

Abbreviation: iv, intravenous.  
<sup>a</sup>10 days following surgical debridement.

# Infectious Diseases Society of America 2023 Guidance on the Treatment of Antimicrobial Resistant Gram-Negative Infections



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Virginie Lemiale<sup>7</sup>, Julien Maizel<sup>8</sup>, Joy Y. Mootien<sup>9</sup>, David Osman<sup>10</sup>, Marie Simon<sup>11</sup>, Arnaud W. Thille<sup>12</sup>, Christophe Vinsonneau<sup>13</sup> and Khaldoun Kuteifan<sup>9</sup>

Avibactam + Aztreonam



KPC = *Klebsiella pneumoniae* carbapenemases; MBL = metallo-beta-lactamases; NDM = New-Delhi MBL; OXA-48 = oxacillinase-48; XDR = exten

Pas de nouveauté comparativement aux reco 2022: IDSA/ECCMID/SPILF  
PK/PD:24-48h à dose pleine, perfusion prolongée discontinuée.

Journal of Microbiology, Immunology and Infection 56 (2023) 653–671



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Review Article

**Guidelines for the diagnosis, treatment, prevention and control of infections caused by carbapenem-resistant gram-negative bacilli**



Tests microbiologiques  
Colimycine en bithérapie +/- aérosols  
Cefta-avi pour KPC et Oxa  
Cefta-avi+Aztreonam pour MBL  
Interêt des aminosides et de la fosfo

## International consensus recommendations for the use of prolonged-infusion beta-lactam antibiotics: Endorsed by the American College of Clinical Pharmacy, British Society for Antimicrobial Chemotherapy, Cystic Fibrosis Foundation, European Society of Clinical Microbiology and Infectious Diseases, Infectious Diseases Society of America, Society of Critical Care Medicine, and Society of Infectious Diseases Pharmacists

I. Are there microbiologic targets for bacterial killing and resistance suppression for  $\beta$ -lactams in preclinical PK/PD models of infections?

1. Preclinical targets for reductions in CFU are 40%–70%  $fT_{>MIC}$  for SI and up to 4-h EI, and 100%  $fT_{>MIC}$  with concentrations that exceed up to four to eight times free drug over the steady-state concentration ( $fC_{ss}$ ) for CI. No absolute target guarantees suppression of resistance but exceeding the MIC by four to six times may minimize resistance (Panel vote 17-0 in favor of this consensus statement)

V. What  $\beta$ -lactam concentration or exposure should be targeted when performing TDM?

5. There is insufficient evidence to recommend a single concentration or exposure to target when performing  $\beta$ -lactam TDM; however, evidence does exist for a minimum exposure. When TDM is performed, we suggest minimum plasma exposures of at least 50%–70%  $fT_{>MIC}$  be targeted for  $\beta$ -lactams when administered as SI and EI. For  $\beta$ -lactams administered as CI, we suggest 100%  $fT_{>MIC}$  with concentrations at least four times the MIC (Panel vote 17-0 in favor of this consensus statement)



IV. Is there a role for therapeutic drug monitoring (TDM) of PI  $\beta$ -lactams?

4. We suggest that  $\beta$ -lactam TDM and personalized dosing may be considered on a patient-by-patient, indication-by-indication, and drug-by-drug basis until further evidence is available. We cannot recommend for or against routine TDM for PI  $\beta$ -lactams at this time. *Consensus recommendation* (Panel vote 17-0 in favor of this recommendation)

VII. Should PI  $\beta$ -lactam antibiotics be preferred over SI dosing in severely ill adult patients to improve mortality or clinical cure?

7. We suggest PI  $\beta$ -lactam antibiotics over SI to reduce mortality or increase clinical cure among severely ill adult patients, particularly those with gram-negative infections. *Conditional recommendation; very low certainty of evidence* (Panel vote 17-0 in favor of this recommendation)
8. We cannot recommend for or against PI  $\beta$ -lactam antibiotics over SI to reduce mortality and increase clinical cure among nonseverely ill adult patients. *Conditional recommendation; very low certainty of evidence* (Panel vote 17-0 in favor of this recommendation)

## Antibiogrammes ciblés pour les infections urinaires à Entérobactéries dans la population féminine adulte (à partir de 12 ans).



**Il est recommandé que les prescripteurs indiquent les informations cliniques et que les laboratoires mettent en place une modalité de recueil des renseignements cliniques nécessaires à l'interprétation des résultats des prélèvements urinaires.**

## 1.2. Enjeux

Les enjeux de ce travail sont de :

- sensibiliser les cliniciens au bon usage des antibiotiques, en particulier au risque que présente la prescription de certains antibiotiques en termes de résistances bactériennes avec comme corollaire la réduction de la consommation d'antibiotiques critiques ;
- favoriser la prescription des antibiotiques les plus adaptés, à spectre étroit ou à faible risque de sélection de résistances ;
- favoriser les prescriptions conformément aux recommandations ;
- optimiser la réévaluation de l'antibiothérapie curative à 48-72 h.

Les principes généraux qui se dégagent tendent notamment à recommander :

- de privilégier le rendu des molécules au spectre le plus étroit possible ;
- d'éviter de rendre les antibiotiques critiques en raison de leur spectre large et de leur capacité à sélectionner des résistances (fluoroquinolones et carbapénèmes en particulier).

### 3.1.1. Tableau décisionnel

	Sensible amoxicilline	Résistant amoxicilline	Résistant amoxicilline-acide clavulanique ET triméthoprim-sulfaméthoxazole	Résistant C3G ou BLSE
Amoxicilline				
Pivmécillinam (1)				
Fosfomycine-trométamol (1)				
Nitrofurantoïne (1)				
Triméthoprim (1) (2)				
Triméthoprim-sulfaméthoxazole (2)				
Amoxicilline-acide clavulanique (cystite)				
Amoxicilline-acide clavulanique (pyélonéphrite)				
Céfixime			(A)	
Céfotaxime, ceftriaxone			(A)	
Fluoroquinolones (ofloxacine, ciprofloxacine, lévofloxacine)				
Témocilline				
Céfoxitine				
Pinéracilline-tazobactam				
Ceftazidime				
Céfépime			(A)	
Aztréonam				
Amikacine, gentamicine				
Carbapénèmes (imipénème, ertapénème, méropénème)				(B)
Autres molécules (ex. nouvelles associations avec inhibiteurs)				(C)

Arbre différent si

- Cystite
- Pyelo



Consensus Statement | Infectious Diseases

# Guidelines for Diagnosis and Management of Infective Endocarditis in Adults

## A WikiGuidelines Group Consensus Statement

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**FINDINGS** A total of 51 members from 10 countries reviewed 587 articles and submitted information relevant to 4 sections: establishing the diagnosis of IE (9 questions); multidisciplinary IE teams (1 question); prophylaxis (2 questions); and treatment (5 questions). Of 17 unique questions, a clear recommendation could only be provided for 1 question: 3 randomized clinical trials have established that oral transitional therapy is at least as effective as intravenous (IV)-only therapy for the treatment of IE. Clinical reviews were generated for the remaining questions.

Table 2. Options for Definitive IV Therapy Regimens Presuming Organism Is Susceptible<sup>a</sup>

Organisms	Preferred primary treatment	Adjunctive agent/setting	Alternatives
Streptococci (penicillin MIC <0.5 µg/mL)	<ul style="list-style-type: none"> <li>Ceftriaxone 2 g daily</li> <li>Penicillin G 4 million U every 4 h<sup>b</sup></li> <li>Ampicillin/amoxicillin 2 g every 4 h<sup>b</sup></li> </ul>	For penicillin nonsusceptible strains (MICs 0.25–0.5 µg/mL), gentamicin 3 mg/kg/d	<ul style="list-style-type: none"> <li>Vancomycin dosed by level<sup>c,d</sup></li> <li>Linezolid 600 mg twice daily<sup>e</sup></li> </ul>
Streptococci (penicillin MIC >0.5–2 µg/mL)	<ul style="list-style-type: none"> <li>Ceftriaxone 2 g daily</li> <li>Vancomycin dosed by level<sup>c,d,f</sup></li> </ul>	For penicillin nonsusceptible strains (MICs 0.5–2.0 µg/mL), gentamicin 3 mg/kg/d <sup>g</sup>	Linezolid 600mg twice daily <sup>e</sup>
Methicillin-susceptible staphylococci	<ul style="list-style-type: none"> <li>Cefazolin 2 g every 8 h<sup>g</sup></li> <li>(Flu)cloxacillin, oxacillin, nafcillin 2 g IV every 4 h</li> </ul>	For prosthetic valve endocarditis, rifampin 600 mg daily or twice daily or 300 mg three times daily <sup>h</sup>	<ul style="list-style-type: none"> <li>Vancomycin dosed by level<sup>c</sup></li> <li>Daptomycin 6–10 mg/kg/d<sup>i</sup></li> <li>Linezolid 600mg twice daily<sup>e,j</sup></li> </ul>
Methicillin-resistant staphylococci	<ul style="list-style-type: none"> <li>Vancomycin dosed by level<sup>c</sup></li> <li>Daptomycin 6–10 mg/kg/d<sup>i</sup></li> </ul>	For prosthetic valve endocarditis, rifampin 600 mg daily or twice daily or 300 mg three times daily <sup>h</sup>	Linezolid 600 mg twice daily <sup>e,j</sup>
Enterococci non-VRE <sup>k</sup>	<ul style="list-style-type: none"> <li>Ampicillin or amoxicillin 2 g every 4 h</li> <li>Vancomycin dosed by level<sup>c,d</sup></li> </ul>	<ul style="list-style-type: none"> <li>With ampicillin or amoxicillin, ceftriaxone 2 g every 12 h or gentamicin 3 mg/kg/d<sup>g</sup></li> <li>For vancomycin, gentamicin 3 mg/kg/d<sup>g</sup></li> </ul>	NA
HACEK	Ceftriaxone 2 g daily	NA	<ul style="list-style-type: none"> <li>Levofloxacin 750 mg daily</li> <li>Ciprofloxacin 400 mg twice daily</li> </ul>
Other gram-negative bacteria	Parenteral β-lactam with in vitro activity against microorganism and good pharmacokinetics for bloodstream infection	NA	<ul style="list-style-type: none"> <li>Levofloxacin 750 mg daily</li> <li>Ciprofloxacin 400 mg twice daily</li> <li>Moxifloxacin 400 mg daily</li> </ul>

Box 1. Rational Choices of Empirical Antimicrobial Therapy Based on Likely Microbiology

This box lists reasonable options based largely on historical practice and in vitro susceptibility, with little clinical data to validate relative efficacies for most regimens. It is best practice to select regimens based on specific clinical situations and patient/local epidemiology. Please see the eAppendix 3 in Supplement 1.

**Native Valve**

**Principal Agent**

- Vancomycin: the principal agent most authors use is vancomycin, as it has the most evidence and will cover *Staphylococcus aureus*, streptococci, and most enterococci. Note that none of the principal agents may be required in native valve

endocarditis if there is minimal clinical concern for MRSA or coagulase-negative staphylococci or enterococci since monotherapy with cefazolin or ceftriaxone may suffice.

- Daptomycin: daptomycin may offer some advantages in terms of pharmacokinetics and the local net financial and clinical resources required with a similar spectrum of activity. Most authors prefer a dose of 8 to 10 mg/kg if *S aureus* is being targeted or 10 to 12 mg/kg if enterococcus is being targeted.

- Alternative, linezolid: linezolid can be an alternative for patients where there are challenges in obtaining or maintaining intravenous access, where there is reasonable concern for vancomycin-resistant organisms, or where both vancomycin and daptomycin are precluded (eg, vancomycin allergy and pneumonia).

**Second Agent**

- Ceftriaxone: ceftriaxone is preferred by some WikiGuidelines authors as a second agent since it has superior coverage for streptococcal species and HACEK organisms. Yet, there are times when *S aureus* is more likely clinically.

in vivo without evidence of increased nephrotoxicity.<sup>46</sup> For MSSA, there is observational evidence that beta-lactam therapy is superior to vancomycin therapy, and for this reason many authors prefer to include a beta-lactam with good *S aureus* activity. Most WikiGuidelines authors prefer cefazolin over anti-staphylococcal penicillins in this context due to decreased toxicity, with similar clinical efficacy described in recent observational studies.<sup>46,47</sup>

**Prosthetic Valve**

**Principal Agent**

- Vancomycin
- Daptomycin: Most authors prefer a dose of 8 to 10 mg/kg if *S aureus* is being targeted or 10 to 12 mg/kg if enterococcus is being targeted.
- Alternative, linezolid

**Second Agent**

- Early (<3 mo)
- For early prosthetic valve infection, choice of the second agent is driven primarily by the local microbiology of gram-negative bacterial infections. It may be desirable to avoid carbapenem therapy due to the need to preserve them for more resistant cases, although in some regions, empirical use may be necessary depending on local microbiology. For early prosthetic valve disease, ceftriaxone could have inferior nosocomial gram-negative coverage, depending on local microbiology.

- Cefepime
- Piperacillin-tazobactam
- Carbapenem
- Ceftriaxone
- Later (>3 months):
- Ceftriaxone
- Amoxicillin-clavulanate (IV)

Box 2. Summary of Oral Step-Down Antibiotics by Organism<sup>a</sup>

**Streptococci: penicillin-sensitive (MIC ≤0.12 µg/mL)**

- Amoxicillin 1 g 4 times daily, only for native valve infection<sup>b</sup>

- Amoxicillin 1 g 4 times daily with rifampin 600 mg once daily

- Linezolid 600 mg twice daily alone or with rifampin 600 mg once daily

- Moxifloxacin 400 mg once daily with rifampin 600 mg once daily or linezolid 600 mg twice daily

**Streptococci: penicillin-intermediate (MIC 0.25–1.00 µg/mL) or Enterococcus**

- Amoxicillin 1 g 4 times daily with rifampin 600 mg once daily or linezolid 600 mg twice daily

- Linezolid 600 mg twice daily alone or with rifampin 600 mg once daily

- Moxifloxacin 400 mg once daily with rifampin 600 mg once daily

**Streptococci: penicillin-resistant (MIC ≥2 µg/mL) or amoxicillin-resistant Enterococcus**

- Linezolid 600 mg twice daily alone or with (rifampin 600 mg once daily)

- Moxifloxacin 400 mg once daily with rifampin 600 mg once daily

**Staphylococcus spp**

- Levofloxacin 750 mg once daily with rifampin 600 mg once daily or linezolid 600 mg twice daily

- Linezolid 600 mg twice daily alone or in combination with rifampin 600 mg once daily (rifampin lowers linezolid blood levels, so whether monotherapy or combination therapy is preferred remains unclear)

- TMP-SMX 960 mg or 4800 mg daily in divided doses<sup>c</sup>

- Dicloxacillin 1 g 4 times daily plus rifampin 600 mg once daily (only for methicillin-sensitive strains)



## 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)

### Section 5. Recommendation Table 5 — Recommendations for the role of echocardiography in infective endocarditis

TOE is recommended when the patient is stable before switching from intravenous to oral antibiotic therapy.

**I****B**

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**

#### Infection control?

Satisfying response to treatment: no fever >2 days,  
CRP <25% of max measured value or <20 mg/L  
and leukocytes <15 × 10<sup>9</sup>/L

Treated with relevant i.v. antibiotics ≥10 days  
and ≥7 days after valve surgery



95 pages, 850 références

- 42 nouvelles recos
- 23 recos révisées

Urgent surgery is recommended in IE with vegetation ≥10 mm and other indications for surgery.

**I****C**

Urgent 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.

**IIb****B**

#### Complicated clinical evolution

- Unstable haemodynamic condition under pharmacological and/or respiratory support
- Severe valvular regurgitation (clinical and echocardiographic criteria)
- Prosthetic valve endocarditis with or without prosthetic valve dysfunction
- Stroke (ischaemic or haemorrhagic) with definite or possible IE
- Extravalvular complications (abscesses, fistulae, etc.)
- Positive blood cultures >7 days under appropriate antibiotic therapy
- Embolism
- CIED-related infective endocarditis
- Aggressive or difficult-to-treat microorganisms (*S. aureus*, Gram-negative bacilli, fungi)



## Consensus document

Executive summary of the consensus statement of the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC), Spanish Society of Neurology (SEN), Spanish Society of Immunology (SEI), Spanish Society of Pediatric Infectology (SEIP), Spanish Society of Rheumatology (SER), and Spanish Academy of Dermatology and Venereology (AEDV), on the diagnosis, treatment and prevention of

## Lyme borreliosis<sup>†</sup>

<sup>†</sup>treatment of Lyme borreliosis.

Lyme borreliosis Treatment	Drug	Adult dose	Child dose	Duration
Erythema migrans in the early localized phase without other associated symptoms	Doxycycline	100 mg orally BID	4 mg/kg/day orally in two divided doses (maximum 100 mg per dose)	10 days (10–21 days)
	Amoxicillin	500 mg orally TID	50 mg/kg/day orally in three divided doses	14 days (14–21 days)
	Cefuroxime axetil	500 mg orally BID	30 mg/kg/day orally in two divided doses (maximum 500 mg per dose)	14 days (14–21 days)
	Azithromycin	500 mg orally OD	5–10 mg/kg/day orally (maximum 500 mg per dose)	5 days (5–10 days)
Multiple erythema migrans in early disseminated phase with associated flu-like symptoms and/or solitary or disseminated lymphocytoma	Doxycycline	100 mg orally BID	4 mg/kg/day orally in two divided doses (maximum 100 mg per dose)	14 days (10–21 days)
	Amoxicillin	500 mg orally TID	50 mg/kg/day orally in three divided doses	14 days (14–21 days)
	Cefuroxime axetil	500 mg orally BID	30 mg/kg/day orally in two divided doses (maximum 500 mg per dose)	14 days (14–21 days)
	Azithromycin	500 mg orally OD	5–10 mg/kg/day orally (maximum 500 mg per dose)	7 days (5–10 days)
Isolated facial palsy, or involvement of other cranial nerves with or without associated meningitis or polyradiculoneuropathy without parenchymal involvement and with parenchymal involvement <sup>‡</sup>	Doxycycline	100 mg orally BID	4 mg/kg/day orally in 2 divided doses (maximum 100 mg per dose)	14 days (14–28 days)
	Ceftriaxone <sup>§</sup>	2 g intravenous OD	80 mg/kg/dia intravenous OD (maximum 2 g/day)	14 day (14–28 days)
	Cefotaxime <sup>§</sup>	2 g intravenous TID	150–200 mg/kg/day intravenous divided in 3–4 doses (maximum 6 g/day)	14 days (14–28 days)
	Penicillin G <sup>§</sup>	20 million Units intravenous and with parenchymal involvement <sup>‡</sup> divided in 6 doses	200,000–400,000 U/kg/day IV divided in 6 doses (maximum 20 million/day)	14 days (14–28 day)
Carditis in uncomplicated patient PR <300 ms and carditis <sup>§</sup> with first degree AV-B with PR >300 ms or 2/3 degree AV block or myocarditis.	Doxycycline	100 mg orally BID	4 mg/kg/day orally in two divided doses (maximum 100 mg per dose)	14 days (14–21 days)
	Amoxicillin	500 mg orally TID	50 mg/kg/day orally in three divided doses	14 days (14–21 days)
	Cefuroxime axetil	500 mg orally BID	30 mg/kg/day orally in two divided doses (maximum 500 mg per dose)	14 days (14–21 days)
	Ceftriaxone <sup>¶</sup>	2 g intravenous orally OD	80 mg/kg/day intravenous orally (maximum 2 g/day)	14 days (14–28 days)
Persistent arthritis	Doxycycline	100 mg orally BID	4 mg/kg/day orally in two divided doses (maximum 100 mg per dose)	28 days
	Ceftriaxone	2 g intravenous orally OD	80 mg/kg/day intravenous orally OD (maximum 2 g/day)	28 days
	Amoxicillin	500 mg orally TID	50 mg/kg/day orally	28 days
	Doxycycline	100 mg orally BID	4 mg/kg/day orally in two divided doses (maximum 100 mg per dose)	28 days
Acrodermatitis chronica atrophicans with or without associated polyneuropathy	Amoxicillin	500 mg orally TID	50 mg/kg/day orally in three divided doses	28 days
	Ceftriaxone	2 g intravenous orally OD	80 mg/kg/day intravenous OD (maximum 2 g/day)	28 days
	Doxycycline <sup>**</sup>	100 mg orally BID	4 mg/kg/day orally divided in two doses (maximum 100 mg per dose)	21 days (14–21 days)
Late neuroborreliosis	Doxycycline <sup>**</sup>	100 mg orally BID	4 mg/kg/day orally divided in two doses (maximum 100 mg per dose)	21 days (14–21 days)
	Ceftriaxone <sup>**</sup>	2 g intravenous OD	80 mg/kg/day intravenous OD (maximum 2 g/day)	21 days (14–21 days)

BID: one doses every 12 h; OD: one doses every 24 h; TID: one doses every 8 h.<sup>‡</sup> In case of coexistence of ACA, 28 days.

### Table 2

General recommendations to prevent Lyme borreliosis.

- Do not go off the trail when walking in areas where there are ticks.
- Use clothes that cover exposed areas of the body (cap, long trousers tucked into the socks, long sleeved shirt into the trousers and appropriate footwear).
- Wear light-colored clothing to detect ticks before they attach.
- Use tick repellents.
- Inspect the body after being in an outdoor area where ticks are abundant.
- Remove the tick with tweezers as soon as possible when detected.
- Take doxycycline in certain circumstances after tick-bite.
- Observe the site of the tick attachment for up to six weeks.

**DOXYCYCLINE+++**





POSITION STATEMENT

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# French guidelines for the etiological workup of eosinophilia and the management of hypereosinophilic syndromes

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**Box 4** Main investigations to be performed in case of persistent unexplained HE > 1.5 × 10<sup>9</sup>/L

- CBC
- Serum electrolytes, creatinine
- Complete liver function tests
- LDH, CPK
- Serum calcium and phosphorus
- Troponin, BNP
- Serum protein electrophoresis
- Serum trypsinase
- Vitamin B12
- Total IgE
- CRP
- HIV serology
- Toxocara* serology
- Other serology for parasitic infection and HTLV-1 depending on the context
- Parasitological examination of the stool (Baermann method if strongyloidiasis is suspected)
- CT of the chest, abdomen, and pelvis

In the absence of a cause and in case of persistent HE, ECG and transthoracic echocardiography should also be performed.

## Pharmacological treatments

### Antiparasitic treatment

In the absence of available studies, the usefulness of empirical antiparasitic treatment in unexplained chronic HE is disputed. However, we believe that it may be appropriate in specific situations, for the following reasons:

- Variable sensitivity of parasite serology and parasitological examination of the stool.
- Risk of severe strongyloidiasis during treatment with systemic corticosteroids.
- Excellent tolerability of antiparasitic drugs (adverse reactions are exceptional).
- Clinical experience with situations in which empirical antiparasitic treatment allowed complete and sustained normalization of otherwise unexplained HE (despite negative well-conducted parasite tests).
- Low cost.
- When effective, avoids the need for additional, potentially invasive and/or costly second-line investigations.

The initiation of antiparasitic treatment may be contra-indicated or carry a risk of complications in certain situations, including the following: acute schistosomiasis (exposure < 3 months), filariasis, neurocysticercosis or toxocariasis with ophthalmological and/or cardiac involvement. When in doubt, we recommend postponing the initiation of antiparasitic treatment and seeking specialist advice.

Situation	traitement
Taux modéré: 0,5-1,5 G/L cosmopolite	Ascaris/ oxyure: FBD ou ABD avec J1-J3 puis J15 Taenia: 1 dose d'ABD
> 1,5 G/L cosmopolite	Toxocara, trichinose: ABD « HD » 15j
Voyage en pays endémique ( Afrique, Asie SE, Amérique du sud), Caraïbes, Inde, Pacifique > 20 ans	J1: ivermectine puis J5 (anguillule) J2: PZQ (Bilharziose) J3-J18: ABD (Toxocara, ascaris)

# Guidelines for the management of *Toxoplasma gondii* infection and disease in patients with haematological malignancies and after haematopoietic stem-cell transplantation: guidelines from the 9th European Conference on Infections in Leukaemia, 2022



Robina Aerts, Varun Mehra, Andreas H Groll, Rodrigo Martino, Katrien Lagrou, Christine Robin, Katia Perruccio, Nicole Blijlevens, Marcio Nucci, Monica Slavin, Stéphane Bretagne, Catherine Cordonnier, on behalf of the European Conference on Infections in Leukaemia group\*

## Recommendations for the treatment of toxoplasma disease

- |      |                                                                                                                                                                                                                                                                                                                                                                                      |          |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| (1)  | Pyrimethamine (200 mg single loading dose followed by 50–75 mg/day orally) plus folinic acid (10–25 mg/day) is the most effective agent for toxoplasma disease and should always be used in combination with a second active agent                                                                                                                                                   |          |
| (1a) | With sulfadiazine 4–6 g/day                                                                                                                                                                                                                                                                                                                                                          | A, II, t |
| (1b) | With clindamycin 600 mg four times per day (orally or intravenously), in patients intolerant to sulfadiazine                                                                                                                                                                                                                                                                         | A, II, t |
| (1c) | With atovaquone (1500 mg/day orally) if intolerant to other regimens                                                                                                                                                                                                                                                                                                                 | C, II, t |
| (2)  | Trimethoprim–sulfamethoxazole (10–20 mg/kg per day and 50–100 mg/kg per day, respectively, orally or intravenously) with or without clindamycin (600 mg three to four times per day) can be used as an alternative regimen in settings where either pyrimethamine is not available or oral route is not feasible, irrespective of previous trimethoprim–sulfamethoxazole prophylaxis | A, II, t |
| (3)  | Atovaquone might also be used in combination with sulfadiazine (daily doses above)                                                                                                                                                                                                                                                                                                   | C, II, t |
| (4)  | Minimum duration of therapy is 6 weeks or until clinical resolution, or both, and two negative PCR tests in blood, 7 days apart, or one qPCR negative in a previously qPCR-positive cerebrospinal fluid; longer courses might be required if clinical disease or radiological findings are extensive or response is incomplete at 6 weeks                                            | B, II, t |
| (5)  | Lowering or discontinuation of immunosuppression is recommended, when possible                                                                                                                                                                                                                                                                                                       | C, III   |
| (6)  | Steroids can be carefully considered in patients with severe ocular toxoplasmosis or CNS disease with radiological midline shift, progression within 48 h of treatment or elevated intracranial pressure                                                                                                                                                                             | C, III   |



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## Guidelines

## European society of Clinical Microbiology and Infectious Diseases guidelines on diagnosis and treatment of brain abscess in children and adults

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**Table 4**

Recommendations for empirical antimicrobial treatment of brain abscess

Case characteristic	Empirical treatment	
	Standard	Alternatives
Community-acquired	3rd-generation cephalosporin <sup>a</sup> and metronidazole	Meropenem
Severe immuno-compromise (i.e. haematological malignancies, organ transplant recipients)	3rd-generation cephalosporin <sup>a</sup> and metronidazole combined with voriconazole and TMP-SMX	Meropenem combined with voriconazole and TMP-SMX
Post-neurosurgical	Meropenem and vancomycin or linezolid	Ceftazidime and linezolid, cefepime and linezolid

**Table 5**

Recommendations for duration of antimicrobial treatment for brain abscess

Case characteristic	Duration of IV treatment <sup>a</sup>
Aspirated brain abscess	6–8 wk
Excised brain abscess	4 wk <sup>b</sup>
Conservatively treated brain abscess	6–8 wk

<sup>a</sup> Certain difficult-to-treat pathogens such as nocardiosis, toxoplasmosis, tuberculosis, and fungi should follow principles of treatment already established elsewhere.

<sup>b</sup> Expert opinion.

**Pour les modalités thérapeutiques: Diaporama SPILF 2023**

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Clinical Infectious Diseases

IDSA GUIDELINES



## Hepatitis C Guidance 2023 Update: American Association for the Study of Liver Diseases– Infectious Diseases Society of America Recommendations for Testing, Managing, and Treating Hepatitis C Virus Infection

Debika Bhattacharya,<sup>1,\*</sup> Andrew Aronson,<sup>2</sup> Jennifer Price,<sup>3</sup> and Vincent Lo Re III<sup>4</sup>; the American Association for the Study of Liver Diseases–Infectious Diseases Society of America HCV Guidance Panel<sup>†</sup>

Last updated June 26, 2023 and posted online at [www.idsociety.org/COVID19guidelines](http://www.idsociety.org/COVID19guidelines).  
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### Infectious Diseases Society of America Guidelines on the Treatment and Management of Patients with COVID-19

Adarsh Bhimraj,<sup>1</sup> Rebecca L. Morgan,<sup>2,3</sup> Amy Hirsch Shumaker,<sup>3,4</sup> Lindsey Baden,<sup>5</sup> Vincent Chung Cheng,<sup>6</sup> Kathryn M. Edwards,<sup>7</sup> Jason C. Gallagher,<sup>8</sup> Rajesh T. Gandhi,<sup>9</sup> William J. Muller,<sup>10</sup> Mari M. Nakamura,<sup>11</sup> John C. O'Horo,<sup>12</sup> Robert W. Shafer,<sup>13</sup> Shmuel Shoham,<sup>14</sup> M. Hassan Murad,<sup>15</sup> Reem A. Mustafa,<sup>16</sup> Shahnaz Sultan,<sup>17</sup> Yngve Falck-Ytter<sup>3,4</sup>

### Guidelines

ESCMID/EUCIC clinical practice guidelines on perioperative antibiotic prophylaxis in patients colonized by multidrug-resistant Gram-negative bacteria before surgery

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Merci pour votre attention