



Choc septique

Hamid MERDJI, MD, PhD

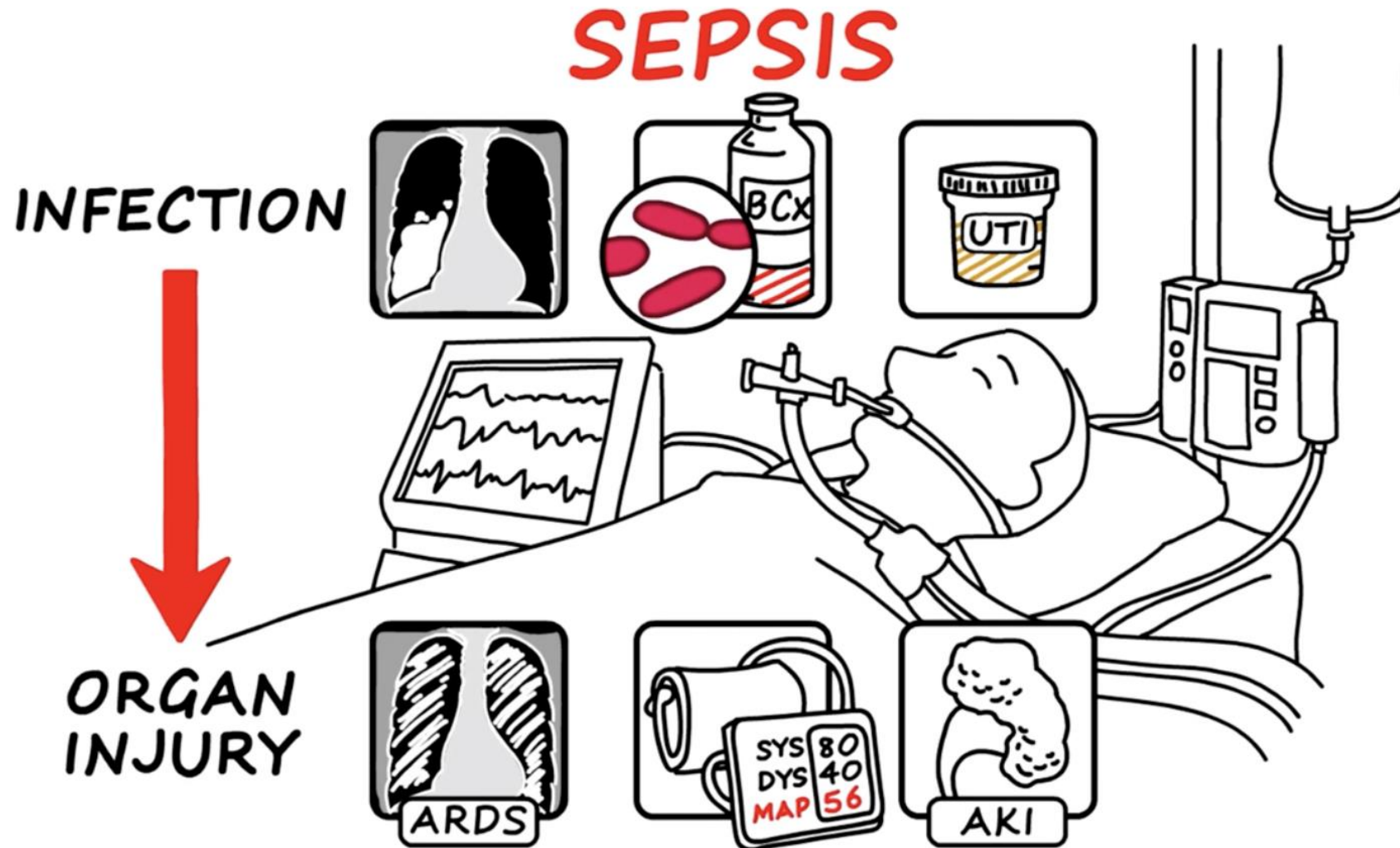
- Médecine Intensive - Réanimation
- Hôpitaux Universitaires de Strasbourg
- France



Epidemiology

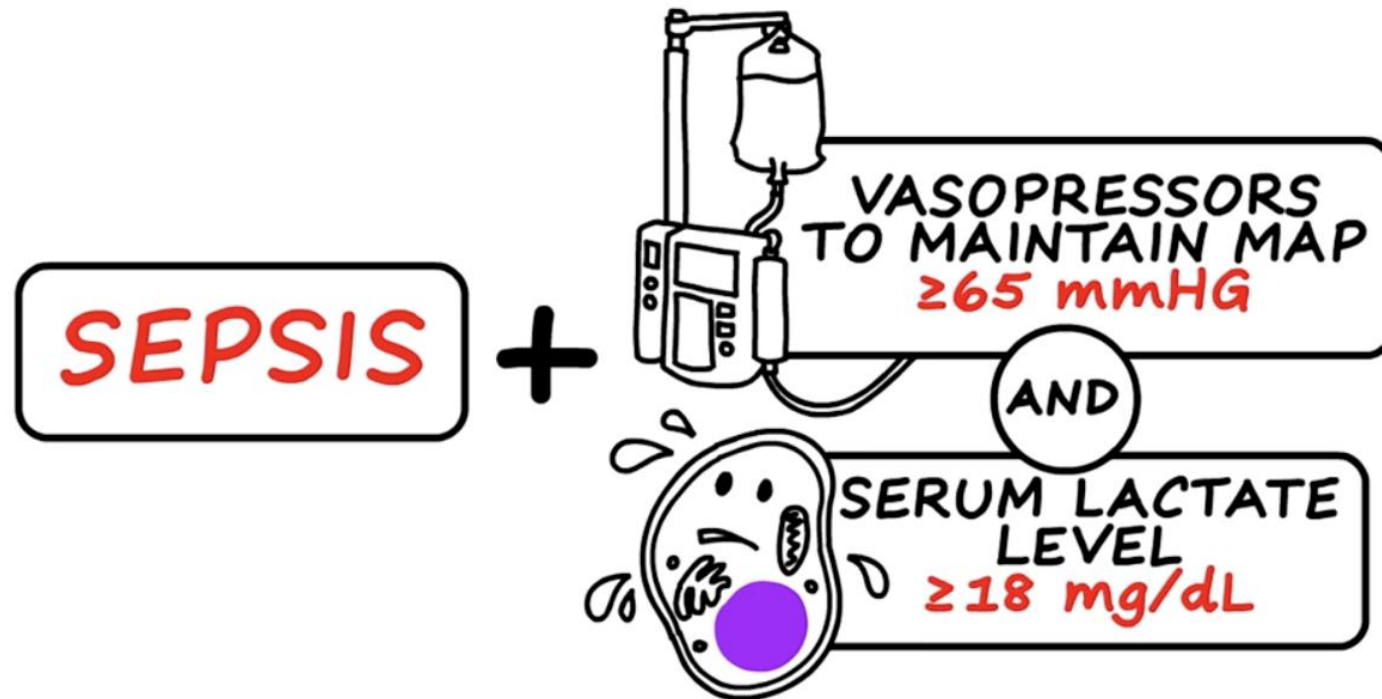
Definition & Epidemiology |

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)



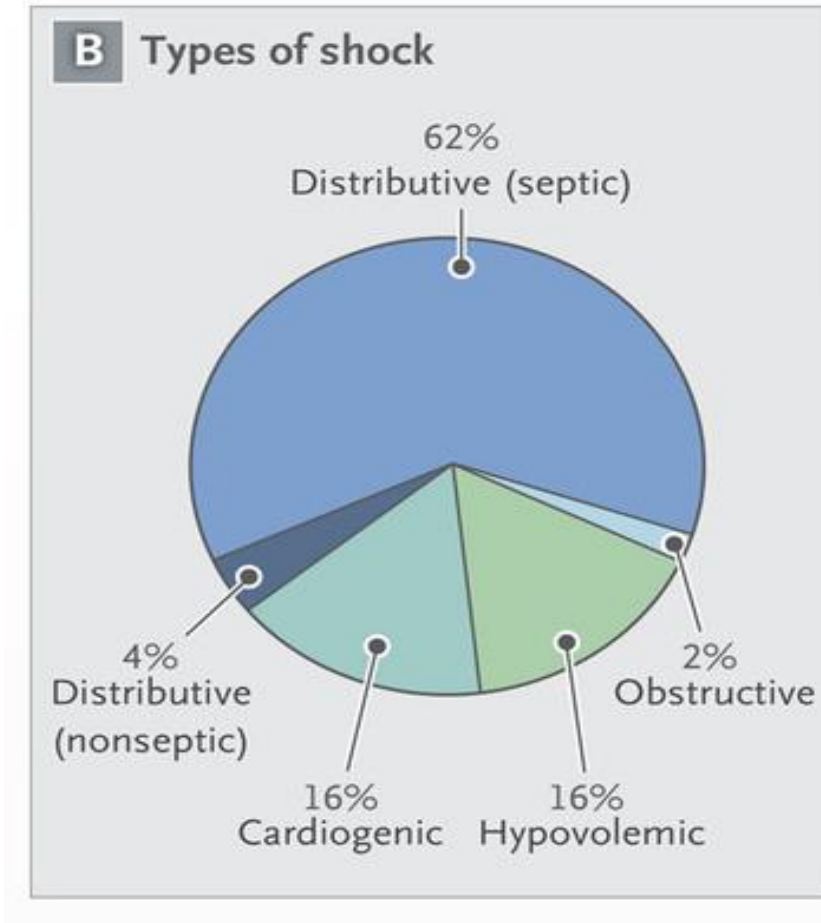
The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)

SEPTIC SHOCK



IN THE ABSENCE OF HYPOVOLEMIA

Epidemiology



Epidemiology



- **En France (2015) :**
 - Sepsis \approx 134 000
 - Choc septique \approx 94 000
- Létalité du :
- Sepsis \approx 10 %
 - choc septique \approx 44 %



Traitements |



Antibiotiques |



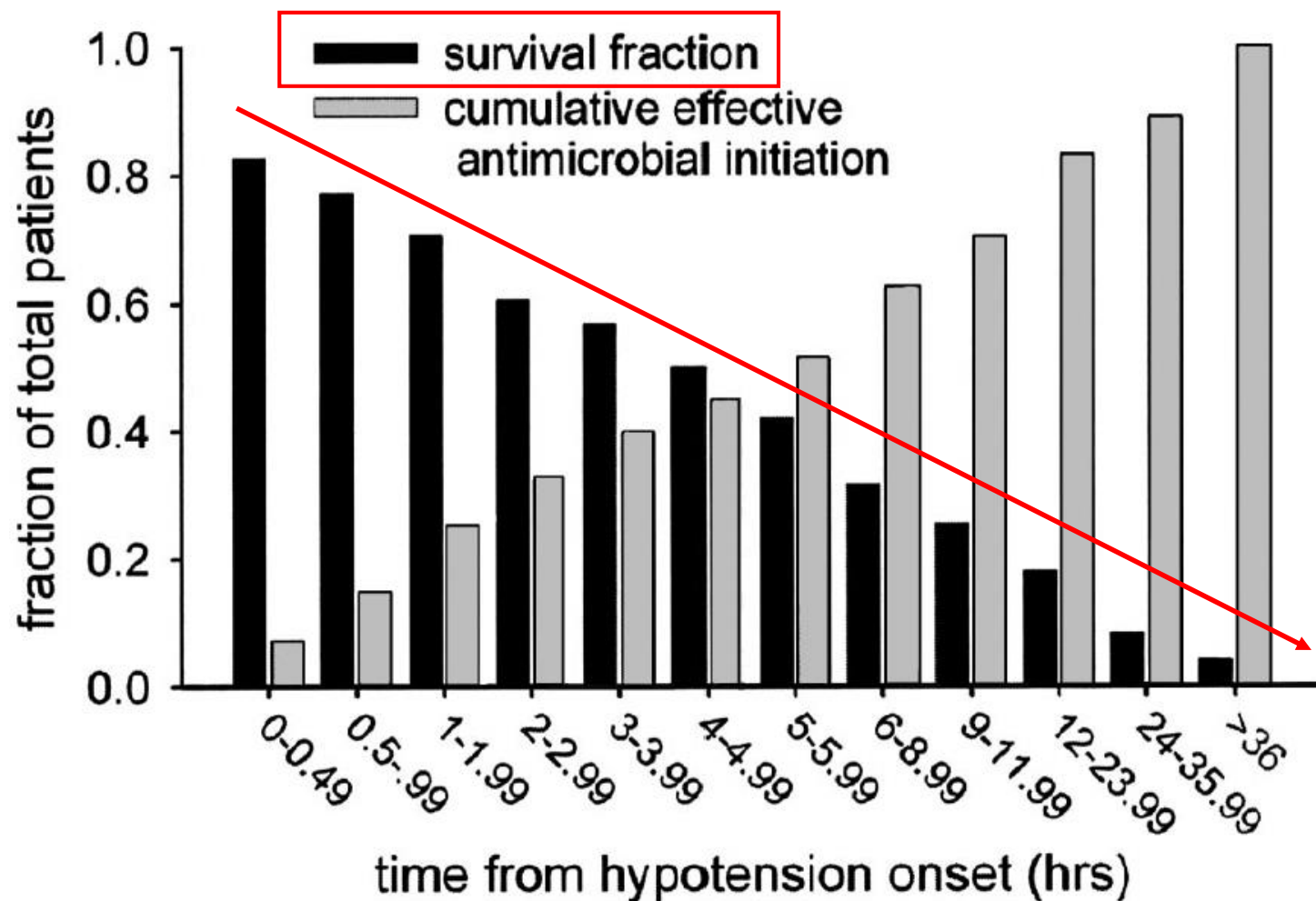
Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021

*« Nous recommandons que les prélèvements microbiologiques appropriés soient réalisés **avant de débiter les ATB** chez les patients suspects de sepsis et choc septique, si ça ne retarde pas la mise en place des ATB, à savoir **< 45 min** ».*

As a best practice statement, we recommended that appropriate routine microbiologic cultures (including blood) should be obtained before starting antimicrobial therapy in patients with suspected sepsis and septic shock if it results in no substantial delay in the start of antimicrobials (i.e. < 45 min). This recommendation has not been updated in this version but remains as valid as before.

Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock

- Retrospective observationnal / 2731 patients
- Multicentric: USA, Canada
- Primary endpoint: To determine the prevalence and impact on mortality of delays in initiation of effective antimicrobial therapy from initial onset of recurrent/persistent hypotension of septic shock



Diminution moyenne de la survie de 7.6% pour chaque heure de retard de l'initiation des ATB



Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021

*« Pour les adultes avec un choc septique possible ou une haute probabilité de sepsis, nous recommandons d'administrer les antibiotiques **immédiatement, idéalement dans un délai < 1h après mise en évidence/suspicion** ».*

Time to antibiotics

Recommendations

12. For adults with possible septic shock or a high likelihood for sepsis, we **recommend** administering antimicrobials immediately, ideally within 1 h of recognition

Strong recommendation, low quality of evidence (Septic shock)

Strong recommendation, very low quality of evidence (Sepsis without shock)

Delayed Second Dose Antibiotics for Patients Admitted From the Emergency Department With Sepsis: Prevalence, Risk Factors, and Outcomes

- Retrospective / 828 patients
- Monocentric: USA
- All patients admitted from the emergency department with sepsis or septic shock during 10 month
- Endpoint: determine association between delays and patient-centered outcomes

TABLE 1. Observed Prevalence and Magnitude of Delays in Second Administration of Antibiotics

Cohort	Measure	Precision
Entire cohort		
<i>n</i>	828	—
Patients with major delay ($\geq 25\%$ of recommended time) ^a	272 (32.9%)	CI: 29.6–36.2%
Median administration-to-recommendation ratio ^b	0.98	IQR: 0.67–1.14
Patients with recommended second dose interval 360 min (6 hr)		
<i>n</i>	157	—
Patients with major delay ($\geq 25\%$ of recommended time) ^a	113 (72.0%)	CI: 64.5–78.4%
Median time to second dose administration (min)	573	IQR: 424–729
Patients with recommended second dose interval 480 min (8 hr)		
<i>n</i>	251	—
Patients with major delay ($\geq 25\%$ of recommended time) ^a	117 (46.6)	CI: 40.5–52.8%
Median time to second dose administration (min)	576	IQR: 397.5–812.5

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TABLE 3. Summary of Adjusted Regression (Exploratory) Analyses Evaluating Major Delay in Second Antibiotic Administration as a Predictor of Patient Outcomes

Parameter	Regression Type	Model Fit	Model Output	Effect Size	95% CI	p
Primary outcome						
<u>Mortality^a</u>	Logistic	$\chi^2 = 5.9; p = 0.65$	<u>OR</u>	1.61	1.01–2.57	<u>0.046</u>



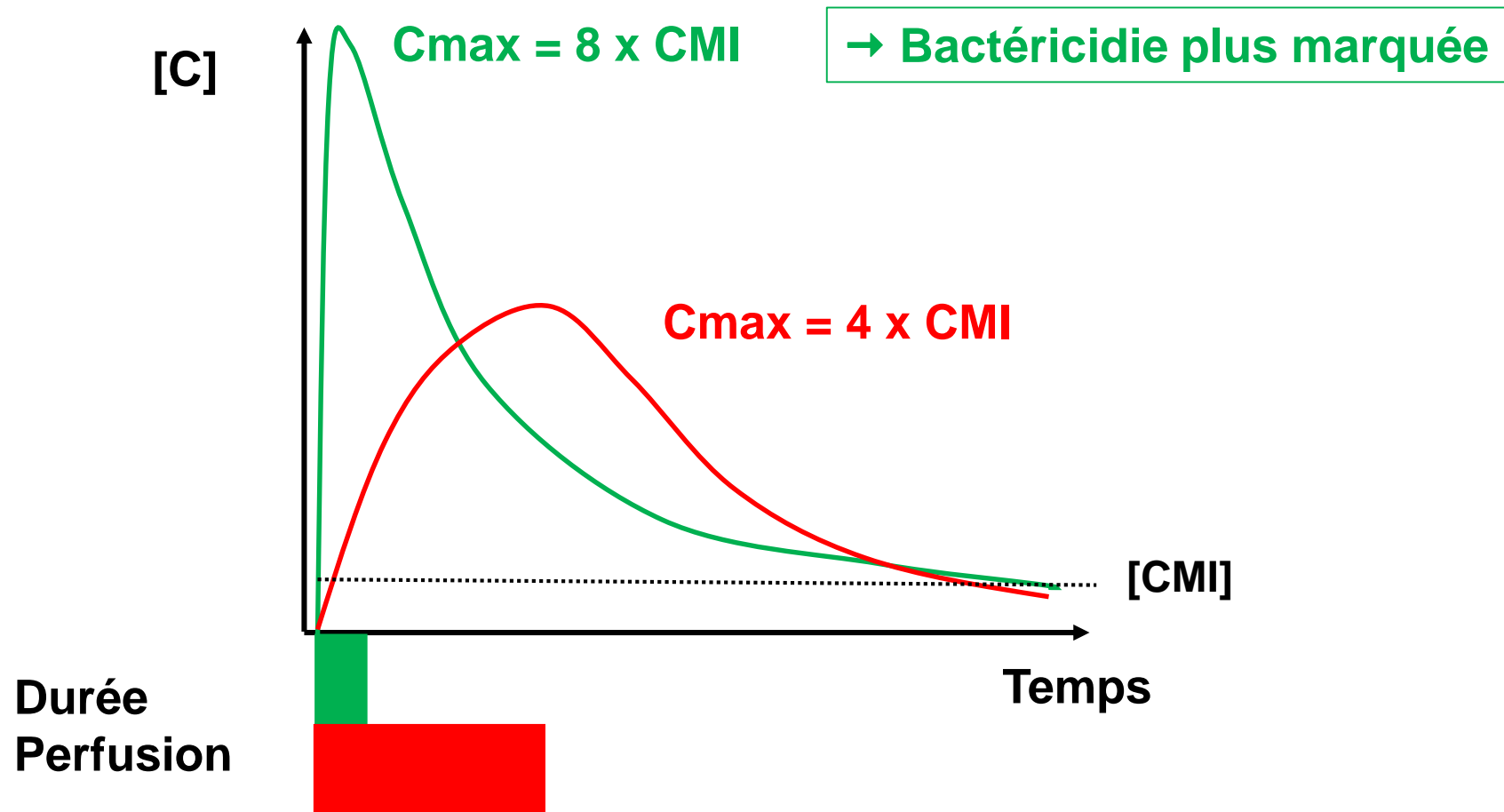
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Table 3 Guidance for PK/PD-based dosing for specific drug classes

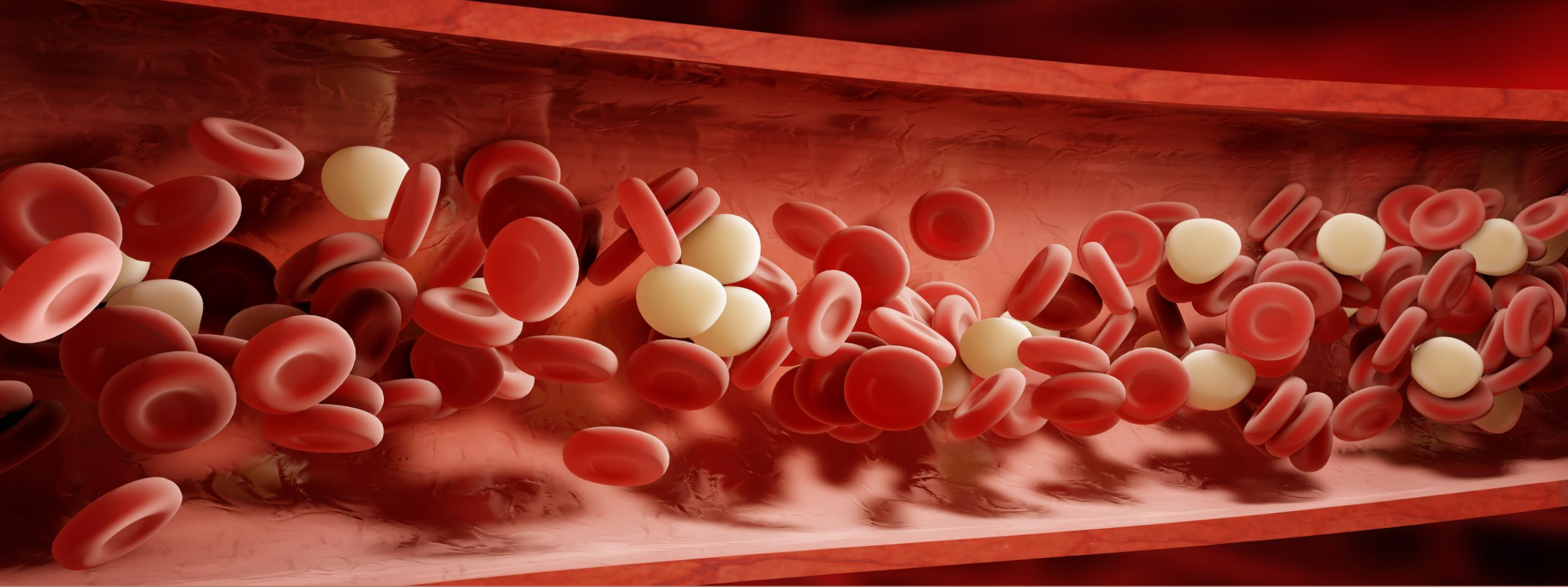
Drug or drug class	PK/PD index associated with bacterial killing or efficacy	Drug concentration target	Considerations for optimised dosing ^a
Antibacterials			
<u>Aminoglycosides</u>	$AUC_{0-24}/MIC; C_{max}/MIC$	$AUC 70-100$ $C_{max}/MIC 8-10$	Use extended interval dosing with patient weight and kidney function

ATB concentration dépendants

- Les ATB **concentration-dépendant** doivent être administrés rapidement pour générer des concentrations de pic plus élevées.

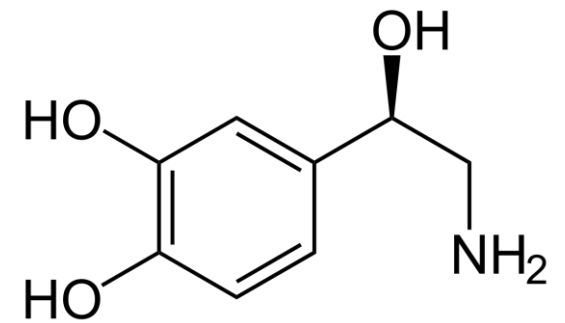


- Aminosides :**
- Amikacine
 - Gentamicine



Vasopresseurs |

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« Pour les adultes en choc septique, nous recommandons d'utiliser la **Noradrénaline comme agent de premier choix** ».

Vasoactive agents

Recommendations

37. For adults with septic shock, we **recommend** using norepinephrine as the first-line agent over other vasopressors. *Strong recommendation*

Safety of peripheral administration of vasopressor medications: A systematic review

- Sytematic review / 7 studies / 1382 patients.
- Evaluates the safety of delivering vasopressor medications via peripheral intravenous catheters

TABLE 3. Vasopressor administration protocols†

	Number of infusions	Dilution	Effective dose/mL	Peak dose	Duration (h)	Extravasation
Overall	1436				22 (8–36)	38 events (3.4%; 95% CI 2.5–4.7%)

Tian, Aust Coll Emer Med., 2019

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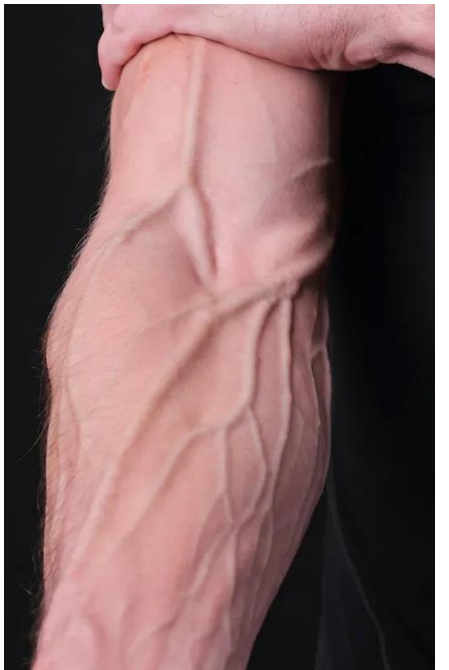
Safety of peripheral administration of vasopressor medications: A systematic review

- Sytematic review / 85 studies / 270 patients.
- Endpoint: Collect and describe all published reports of local tissue injury or extravasation from vasopressor administration via either peripheral IV or central venous catheter.

Long-term sequelae		
Mortality—unrelated to pressor event	56 (27.5)	17 (14.9)
Minor disability from pressor event	36 (17.6)	1 (0.9)
Major disability from pressor event	9 (4.4)	3 (2.6)
Mortality—pressor event contributed	4 (2.0)	1 (0.9)
No long-term sequelae	77 (37.7)	90 (78.9)
Not reported	22 (10.8)	2 (1.8)



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« Nous suggérons de débiter les vasopresseurs sur VVP pour restaurer la PAM plutôt que de différer l'initiation une fois qu'une VVC est en place (sécurisée) »

44. For adults with septic shock, we **suggest** starting vasopressors peripherally to restore MAP rather than delaying initiation until a central venous access is secured

Weak recommendation, very low quality of evidence

Remark

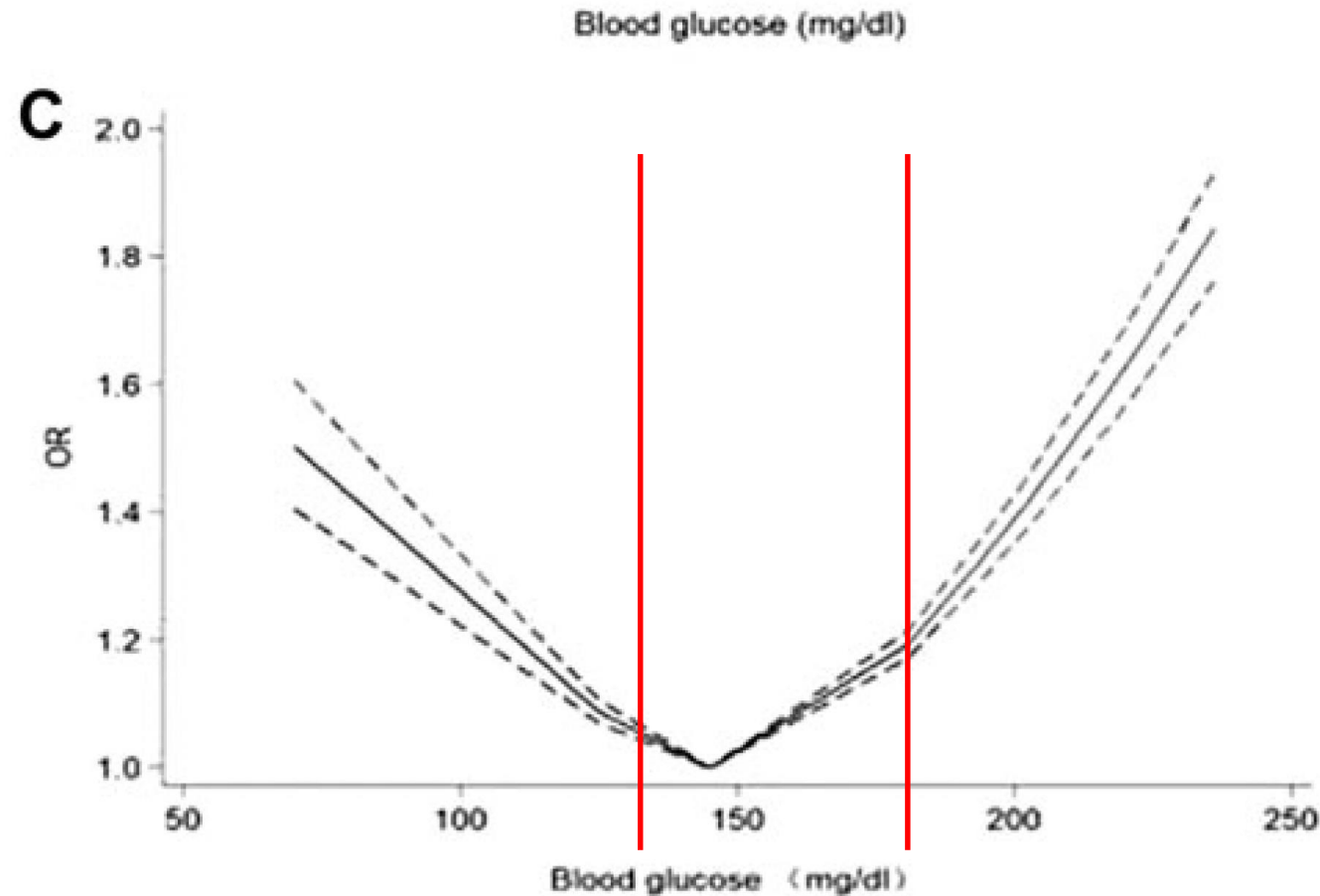
When using vasopressors peripherally, they should be administered only for a short period of time and in a vein in or proximal to the antecubital fossa



Hyperglycémie de stress |

Blood Glucose Levels and Mortality in Patients With Sepsis: Dose-Response Analysis of Observational Studies

- Meta-analyse / 26429 patients
- 10 cohort studies reporting the association between blood glucose and mortality in patients with sepsis (ICU and non-ICU patients)
- Primary endpoint: death from any cause within 90 days





Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021

« *Nous recommandons d'initier de l'insuline à partir d'un seuil de 1,8 g/L.*

→ *Objectifs 1,44 – 1,8 g/L »*

Glucose control

Recommendation

69. For adults with sepsis or septic shock, we **recommend** initiating insulin therapy at a glucose level of ≥ 180 mg/dL (10 mmol/L)

Strong recommendation; moderate quality of evidence

Remark

Following initiation of an insulin therapy, a typical target blood glucose range is 144–180 mg/dL (8–10 mmol/L)



Monitoring |



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6. For adults with sepsis or septic shock, we **suggest** using dynamic measures to guide fluid resuscitation, over physical examination or static parameters alone

Weak recommendation, very low-quality evidence

Remarks

Dynamic parameters include response to a passive leg raise or a fluid bolus, using stroke volume (SV), stroke volume variation (SVV), pulse pressure variation (PPV), or echocardiography, where available

Effect of a Resuscitation Strategy Targeting Peripheral Perfusion Status vs Serum Lactate Levels on 28-Day Mortality Among Patients With Septic Shock

The ANDROMEDA-SHOCK Randomized Clinical Trial

- RCT / 416 patients
- Normalizing CRT or normalizing or decreasing lactate levels at rates greater than 20% per 2 hours during an 8-hour intervention period.
- Multicentric: Argentina, Chile, Colombia, Ecuador, Uruguay
- Primary endpoint: Death at 28 days

Outcome	Peripheral Perfusion-Targeted Resuscitation (n = 212)	Lactate Level-Targeted Resuscitation (n = 212)	Unadjusted Absolute Difference (95% CI)	Adjusted Relative Measure (95% CI)	P Value
Primary Outcome					
Death within 28 d, No. (%)	74 (<u>34.9</u>)	92 (<u>43.4</u>)	-8.5 (-18.2 to 1.2) ^b	HR, 0.75 (0.55 to 1.02) ^a	<u>.06^a</u>





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« Nous recommandons d'utiliser le temps de recoloration cutané (TRC) pour guider la réanimation, comme paramètre complémentaire pour évaluer la perfusion des organes ».

8. For adults with septic shock, we **suggest** using capillary refill time to guide resuscitation as an adjunct to other measures of perfusion
Weak recommendation, low-quality evidence

A close-up, black and white photograph of a typewriter's carriage. A sheet of paper is held in place, and the word "Conclusion" is typed in a classic serif font. The typewriter's metal components, including the carriage and the paper support, are visible, showing some wear and texture. The background is a light, textured surface.

Conclusion

A solid blue background with a faint, light blue grid pattern. The word "Conclusion" is written in white, followed by a vertical line.

Conclusion |



Take home messages

- La 1^{ère} dose d'ATB est importante et doit être donnée dans l'heure
- La 2nd dose aussi est importante et ne doit pas être retardée
- Attention au temps d'infusion des ATB (concentration dépendants)
- La noradrénaline peut/doit être débutée sur une VVP

спасибо 谢谢
GRACIAS 谢谢

THANK YOU

ありがとうございました MERCI

DANKE धन्यवाद

شُكْرًا OBRIGADO