SOCIETE TUNISIENNE DE PATHOLOGIE INFECTIEUSE

5èmes RENCONTRES EN INFECTIOLOGIE

ASSOCIATION TUNISIENNE DE REANIMATION (ATR)

Evaluation des nouvelles définitions du sepsis

Pr Abdellatif Sami/ Dr Daly Foued
Service de Réanimation Médicale
CHU La Rabta de Tunis

16-17 Février 2018 - Hôtel Le Royal Hammamet

09h00-09h30

Plan

1. Introduction
2. History of sepsis
3. Définitions du sepsis
4. Validation du sepsis-3
5. Les points forts
6. Les points faibles
7. Conclusions

2015

ICU costs in the United States

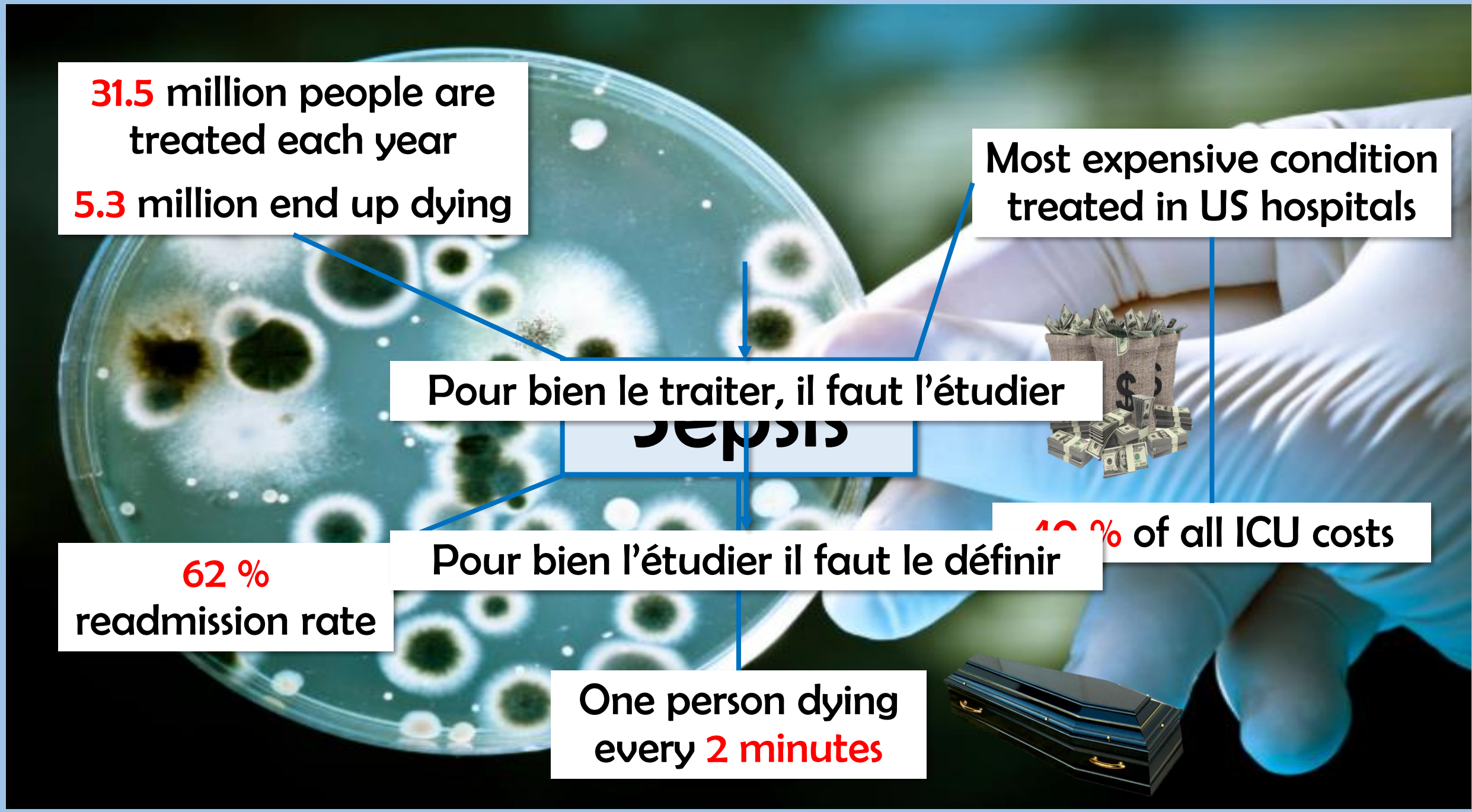
t expensive condition treated in US hospitals

40 percent of all ICU costs

Six times greater than that for ICU patients that do not have sepsis

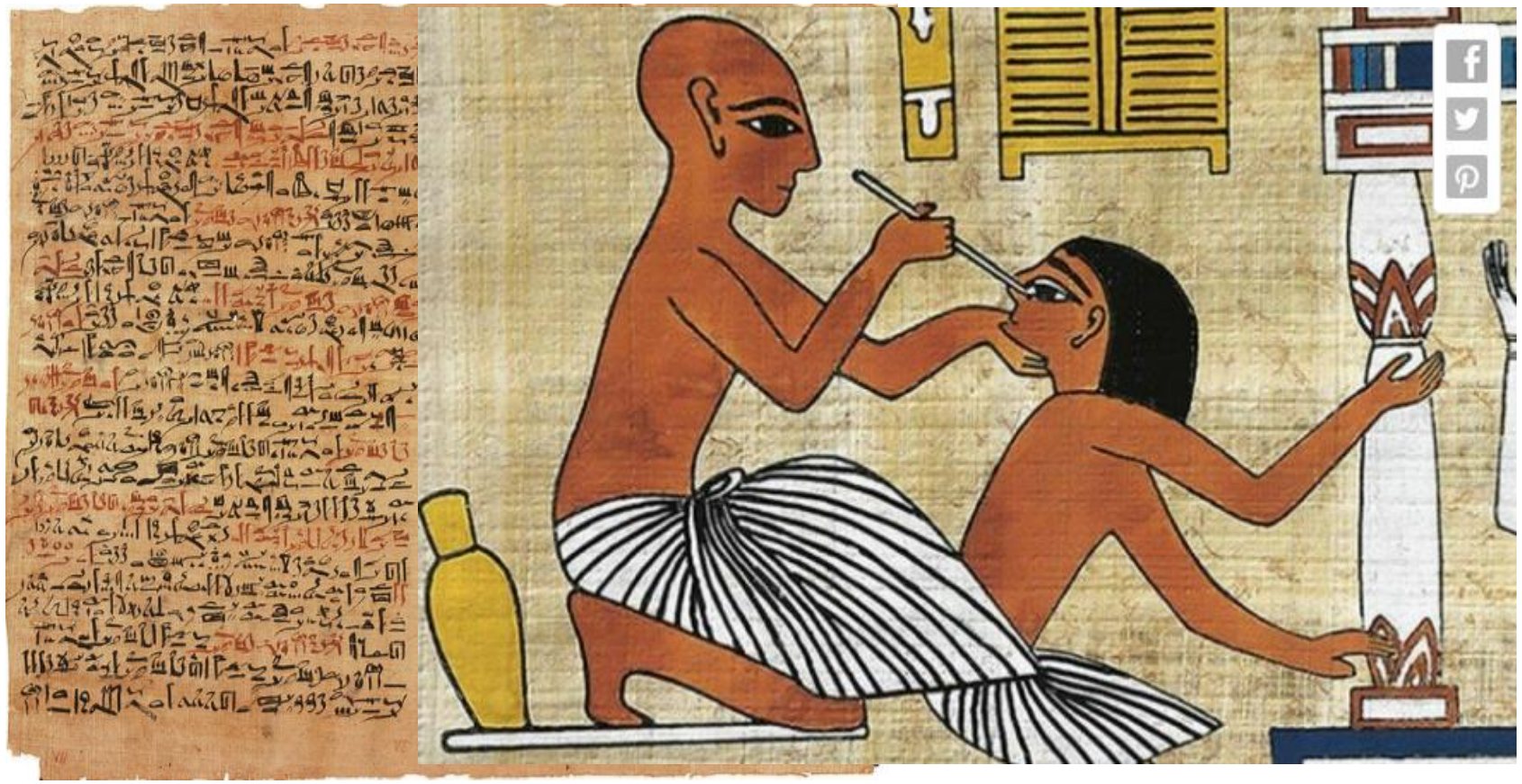
62 percent readmission rate

(Sutton & Friedman, 2013; Sepsis Alliance, 2014)


31.5 million people are treated each year
5.3 million end up dying
Most expensive condition treated in US hospitals
Pour bien le traiter, il faut l'étudier
Sepsis
Pour bien l'étudier il faut le définir
62 %
readmission rate
% of all ICU costs
One person dying every 2 minutes

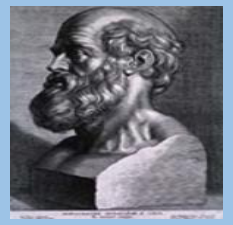
History of sepsis

First descriptions of sepsis are found in Egyptian papyrus as early as **1600 BC**



Le papyrus Edwin Smith

They used **honey** and **human brains** to cure eye infections

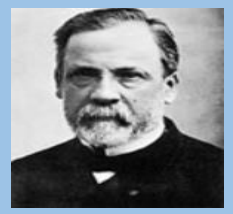
Hippocrate	Galien	Avicenne
		
460-470 av. JC	130-200	979-1037 BC
Sepsis (σῆψις) = « putréfaction »	« *Pus bonum et laudabile* »	**Coincidence** of **blood putrefaction** and **fever**

Greek word		
Sipsis	Make rotten	Faire pourrir
Pepsis	Good digestion	Bonne digestion

Semmelweiss

1818-1865

Pasteur



Robert koch

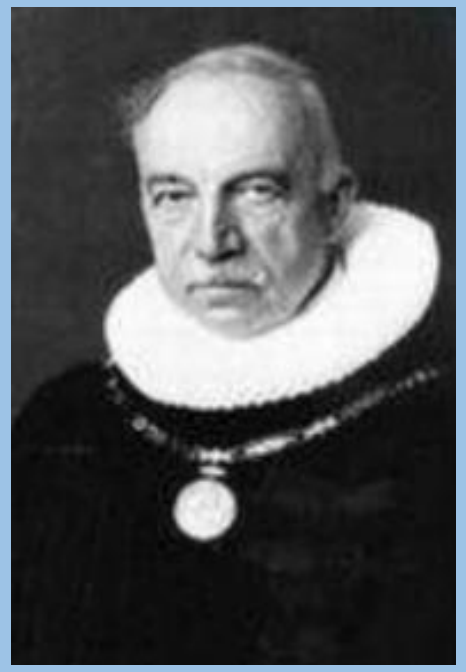
1870

Hungary

Théorie des germes

Les processus d'infection et de suppuration étaient causés par des micro-organisme

Le terme de sepsis devenant synonyme d'infection invasive.



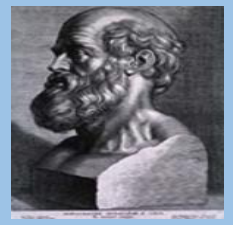
HUGO Schottmuller

1867-1936 Germany

Modern definition of sepsis (1914)

Le sepsis survenait si des **germes pathogènes** envahissaient d'une façon constante ou périodiquement la **circulation sanguine** à partir d'un **foyer infectieux** et provoquaient des **symptômes** subjectifs et objectifs

Le traitement ne doit pas être dirigé contre les **bactéries** dans le sang, mais contre les **toxines bactériennes libérées**



Des [illegible]ermes [illegible]nent pour décrire le patient [illegible]epsis

Rising incidence, new etiologies

Changing demographics

= the **most common cause of death** in the noncoronary intensive care unit

↗ use of **ATB**, **immunosuppressive** agents, and invasive technology in the treatment

Bactériémique

Septicémique

Définition opérationnelle et universelle

American College Of Chest Physicians

Society of Critical Care Medicine

1992

SEPSIS-1

accp/sccm consensus conference

Definitions for Sepsis and Organ Failure and Guidelines for the Use of Innovative Therapies in

Table 1—*Definitions*

Infection = microbial phenomenon characterized by an inflammatory response to the presence of microorganisms or the invasion of normally sterile host tissue by those organisms.

Bacteremia = the presence of viable bacteria in the blood.

Systemic inflammatory response syndrome (SIRS) = the systemic inflammatory response to a variety of severe clinical insults. The response is manifested by two or more of the following conditions: (1) temperature >38°C or <36°C; (2) heart rate >90 beats per minute; (3) respiratory rate >20 breaths per minute or $PaCO_2$ <32 m… …12,000/cu mm, <4,000…

Sepsis = t… …sted by two or more o… …f infection: (1) temper… …>90 beats per minute… …nute or $PaCO_2$ <32 m… …2,000/cu m…, <4,000/cu mm, or >10% immature (band) forms.

Température < 36°C ou ≥ 38,5°C

FC > 90 battements/minute

FR > 20/mn ou PaCO2 < 32 mmHg

GB > 12000/mm3 ou < 4000/mm3 ou cellules immatures > 10%

Severe sepsis = sepsis associated with organ dysfunction, hypoperfusion, or hypotension. Hypoperfusion and perfusion abnormalities may include, but are not limited to lactic acidosis, oliguria, or an acute alteration in mental status.

Septic shock = sepsis-induced with hypotension despite adequate fluid resuscitation along with the presence of perfusion abnormalities that may include, but are not limited to, lactic acidosis, oliguria, or an acute alteration in mental status. Patients who are receiving inotropic or vasopressor agents may not be hypotensive at the time that perfusion abnormalities are measured.

Sepsis-induced hypotension = a systolic blood pressure <90 mm Hg or a reduction of ≥40 mm Hg from baseline in the absence of other causes for hypotension.

Multiple organ dysfunction syndrome (MODS) = presence of altered organ function in an acutely ill patient such that homeostasis cannot be maintained without intervention.

Definitions for Sepsis and Organ Failure *(Bone et al)* IE, 1992

In 2001, a second consensus conference validated most of the previous concepts

but drew attention to the fact that systemic inflammatory response is not specific of sepsis and could be seen in many diseases.

accp/sccm consensus conference

Definitions for Sepsis and Organ Failure and Guidelines for the Use of Innovative Therapies in Sepsis

CHEST / 101 / 6 / JUNE, 1992

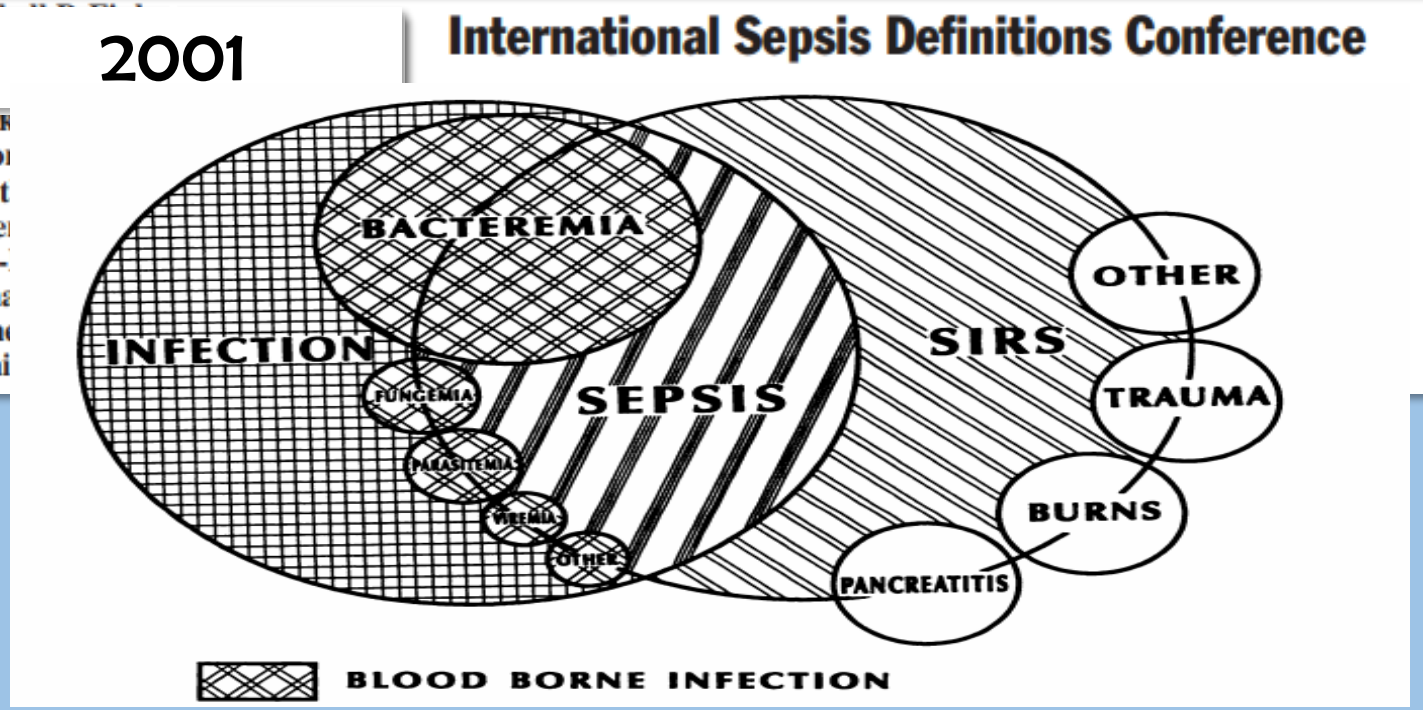
THE ACCP/SCCM CONSENSUS CONFERENCE COMMITTEE:

Roger C. Bone, M.D., F.C.C.P., Chairman
Robert A. Balk, M.D., F.C.C.P.
Frank B. Cerra, M.D.
R. Phillip Dellinger, M.D., F.C.C.P.
Alan M. Fein, M.D., F.C.C.P.
William A. Knaus, M.D.
Roland M. H. Schein, M.D.
William J. Sibbald, M.D., F.C.C.P.

1992

SEPSIS-1

2001



Peu sensible

SIRS

SIRS criteria are **missing** in **1** in **8** patients

34 % des patients en sepsis sévère et **24 %** en choc septique REC aux urgences ne présentent pas les critères de SIRS

study

Table 1. Baseline Characteristics and Hospital Outcomes of Patients with Severe Sepsis, According to Status with Respect to Criteria for the Systemic Inflammatory Response Syndrome (SIRS).*

Characteristic	All Patients	Patients with SIRS-Positive Sepsis	Patients with SIRS-Negative Sepsis	P Value
	no. of patients with data	*no. of patients with data*	*no. of patients with data*	
Hospital outcome — no. (%)	109,663	96,385	13,278	
Death	25,713 (23.4)	23,577 (24.5)	2136 (16.1)	<0.001

D. Jamie Cooper, M.D., Ph.D., and Rinaldo Bellomo, M.D., Ph.D.

Long Ngo, PhD
Daniel Talmor, MD, MPH

Pittsburgh, PA (Angus); The Division of General Internal Medicine; Beth Israel Deaconess Medical Center, and Harvard Medical School, Boston, MA (Ngo); and Anesthesia, Critical Care and Pain Medicine, Beth Israel Deacones

Volume 48, NO. 5 : November 2006

This lack of positivity was **associated** with **highest** hospital **morbidity** and **mortality**

Peu sensible

Peu spécifique

Dépend Recueil

SIRS

Sepsis

Sepsis severe

Sepsis et sepsis sévère étaient utilisés de façon interchangeable par les cliniciens

43 %

Intensive Care Med (2012) 38:811–819
DOI 10.1007/s00134-012-2549-5

ORIGINAL

Peter
David
Marc
Olaf

ons in data capture and definition
S criteria

Vol 381 March 2, 2013

Sepsis definitions: time for change

Jean-Louis Vincent, Steven M Opal, John C Marshall, Kevin J Tracey

N ENGL J MED 369;9 NEJM.ORG AUGUST 29, 2013

REVIEW ARTICLE

CRITICAL CARE MEDICINE

Simon R. Finfer, M.D., and Jean-Louis Vincent, M.D., Ph.D., *Editors*

Severe Sepsis and Septic Shock

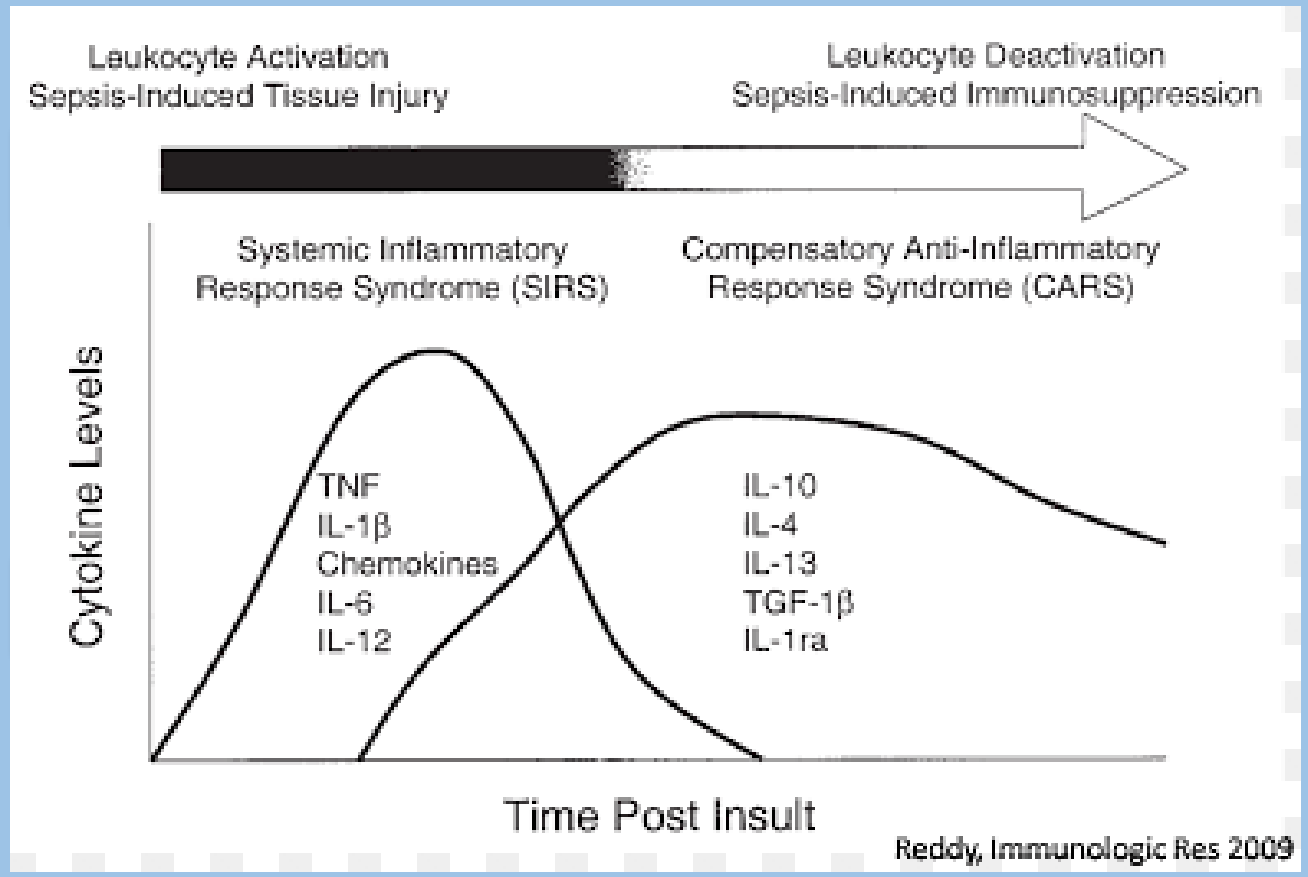
Derek C. Angus, M.D., M.P.H., and Tom van der Poll, M.D., Ph.D.

1992

SEPSIS-1

2001

SEPSIS-2



NEW

Méthodologie

Un groupe international de 19 experts

Critic alists

Données issues de l'analyse rétrospective

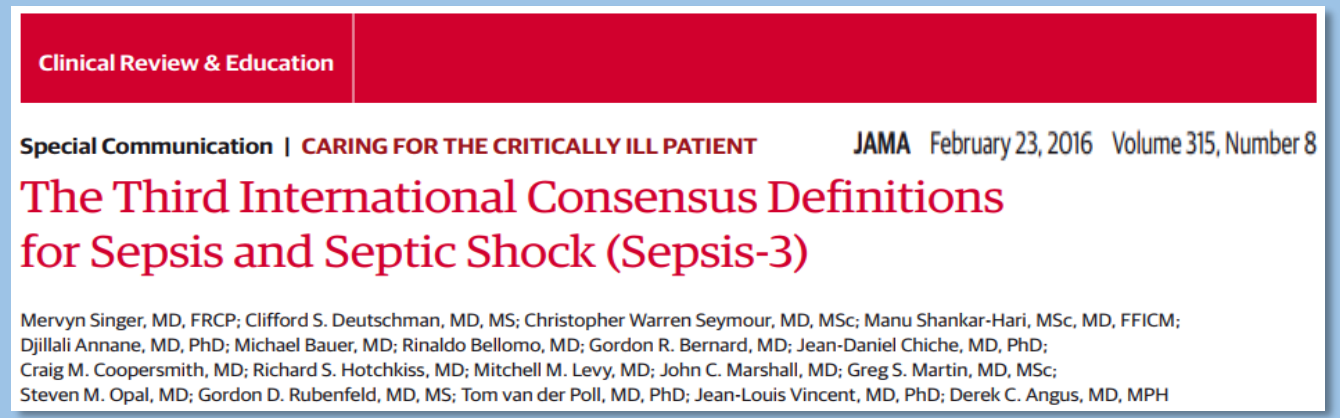
Plusieurs cohortes de patients américains et allemands

Special Communicati

Table 2. Summary of Data Sets

Characteristics	UPMC[a]	KPNC	VA	ALERTS	KCEMS
Years of cohort	2010-2012	2009-2013	2008-2010	2011-2012	2009-2010
No. of hospitals	12	20	130	1	14
Total No. of encounters	1 309 025	1 847 165	1 640 543	38 098	50 727
Data source and study design	Retrospective study of EHRs	Retrospective study of EHRs	Retrospective study of EHRs	Prospective cohort study	Retrospective study of administrative records
Setting					

définitions du sepsis et choc septique dites SEPSIS-3



Clinical Review & Education

Special Communication | CARING FOR THE CRITICALLY ILL PATIENT JAMA February 23, 2016 Volume 315, Number 8

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

Mervyn Singer, MD, FRCP; Clifford S. Deutschman, MD, MS; Christopher Warren Seymour, MD, MSc; Manu Shankar-Hari, MSc, MD, FFICM; Djillali Annane, MD, PhD; Michael Bauer, MD; Rinaldo Bellomo, MD; Gordon R. Bernard, MD; Jean-Daniel Chiche, MD, PhD; Craig M. Coopersmith, MD; Richard S. Hotchkiss, MD; Mitchell M. Levy, MD; John C. Marshall, MD; Greg S. Martin, MD, MSc; Steven M. Opal, MD; Gordon D. Rubenfeld, MD, MS; Tom van der Poll, MD, PhD; Jean-Louis Vincent, MD, PhD; Derek C. Angus, MD, MPH

Sepsis = Dysfonction d'organe secondaire à une réponse inappropriée de l'hôte envers une infection

SEPSIS - 3

SEPSIS 1 et 2

Sepsis = ~~SIRS~~ + **Infection**

On oublie le SIRS

Table 1. Sequential [Sepsis-Related] Organ Failure Assessment Score[a]

	Score				
System	0	1	2	3	4
Respiration					
Pao_2/Fio_2, mm Hg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, $\times 10^3/\mu L$	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg/dL (μmol/L)	<1.2 (20)	1.2-1.9 (20-32)	2.0-5.9 (33-101)	6.0-11.9 (102-204)	>12.0 (204)
Cardiovascular	MAP ≥70 mm Hg	MAP <70 mm Hg	Dopamine <5 or dobutamine (any dose)[b]	Dopamine 5.1-15 or epinephrine ≤0.1 or norepinephrine ≤0.1[b]	Dopamine >15 or epinephrine >0.1 or norepinephrine >0.1[b]
Central nervous system					
Glasgow Coma Scale score[c]	15	13-14	10-12	6-9	<6
Renal					
Creatinine, mg/dL (μmol/L)	<1.2 (110)	1.2-1.9 (110-170)	2.0-3.4 (171-299)	3.5-4.9 (300-440)	>5.0 (440)
Urine output, mL/d				<500	<200

Abbreviations: Fio_2, fraction of inspired oxygen; MAP, mean arterial pressure; Pao_2, partial pressure of oxygen.

[a] Adapted from Vincent et al.[27]

[b] Catecholamine doses are given as μg/kg/min for at least 1 hour.

[c] Glasgow Coma Scale scores range from 3-15; higher score indicates better neurological function.

La complexité du score SOFA

Prélèvements biologiques

Limitent son a

Une version simplifiée du SOFA

e réanimation

Altér

mmHg

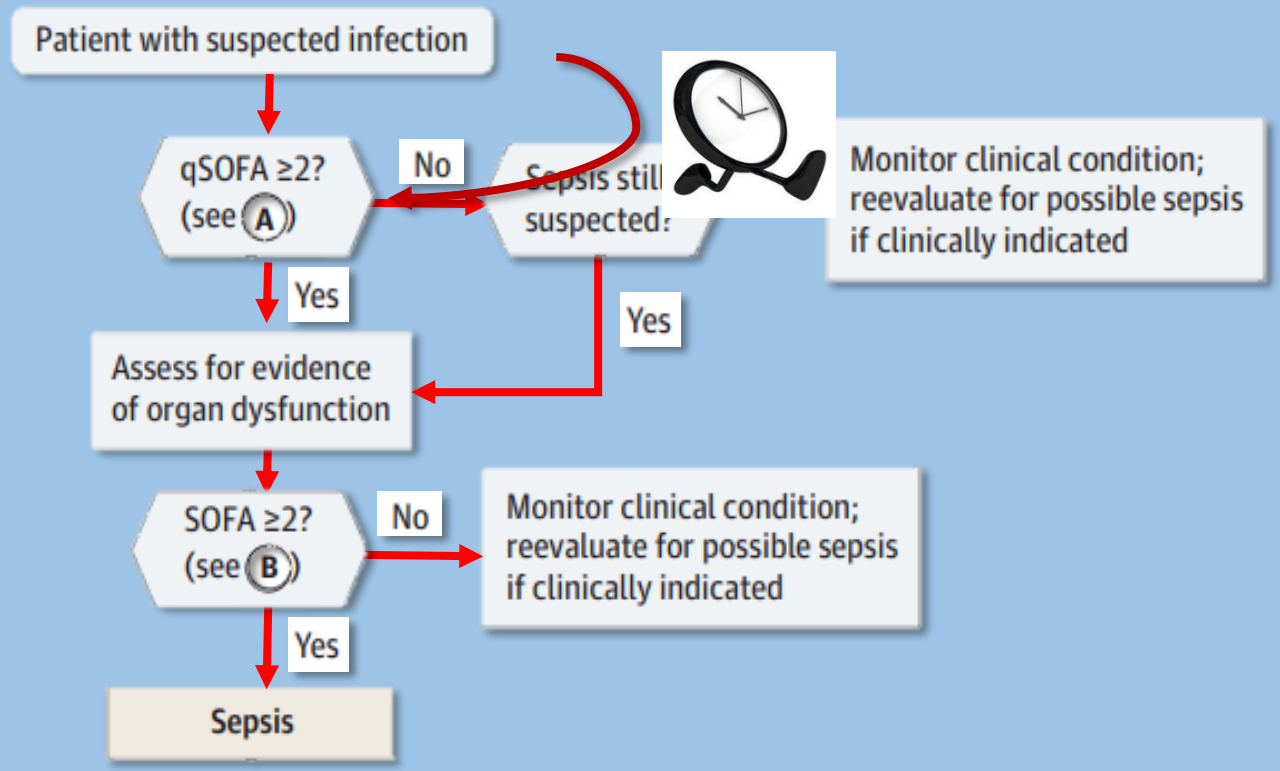
Outcomes of the Surviving Sepsis Campaign in intensive care units in the USA and Europe: a prospective cohort study

Vol 12 December 2012

Mitchell M Levy, Antonio Artigas, Gary S Phillips, Andrew Rhodes, Richard Beale, Tiffany Osborn, Jean-Louis Vincent, Sean Townsend, Stanley Lemeshow, R Phillip Dellinger

	USA	Europe	p value*
Count	18766 (74·0%)	6609 (26·0%)	
Hospital mortality	5313 (28·3%)	2719 (41·1%)	<0·0001
Origin			<0·0001
Emergency department	12218 (65·1%)	2159 (32·7%)	
Ward	4763 (25·4%)	3405 (51·5%)	
ICU	1785 (9·5%)	1045 (15·8%)	

Figure. Operationalization of Clinical Criteria Identifying Patients With Sepsis and Septic Shock



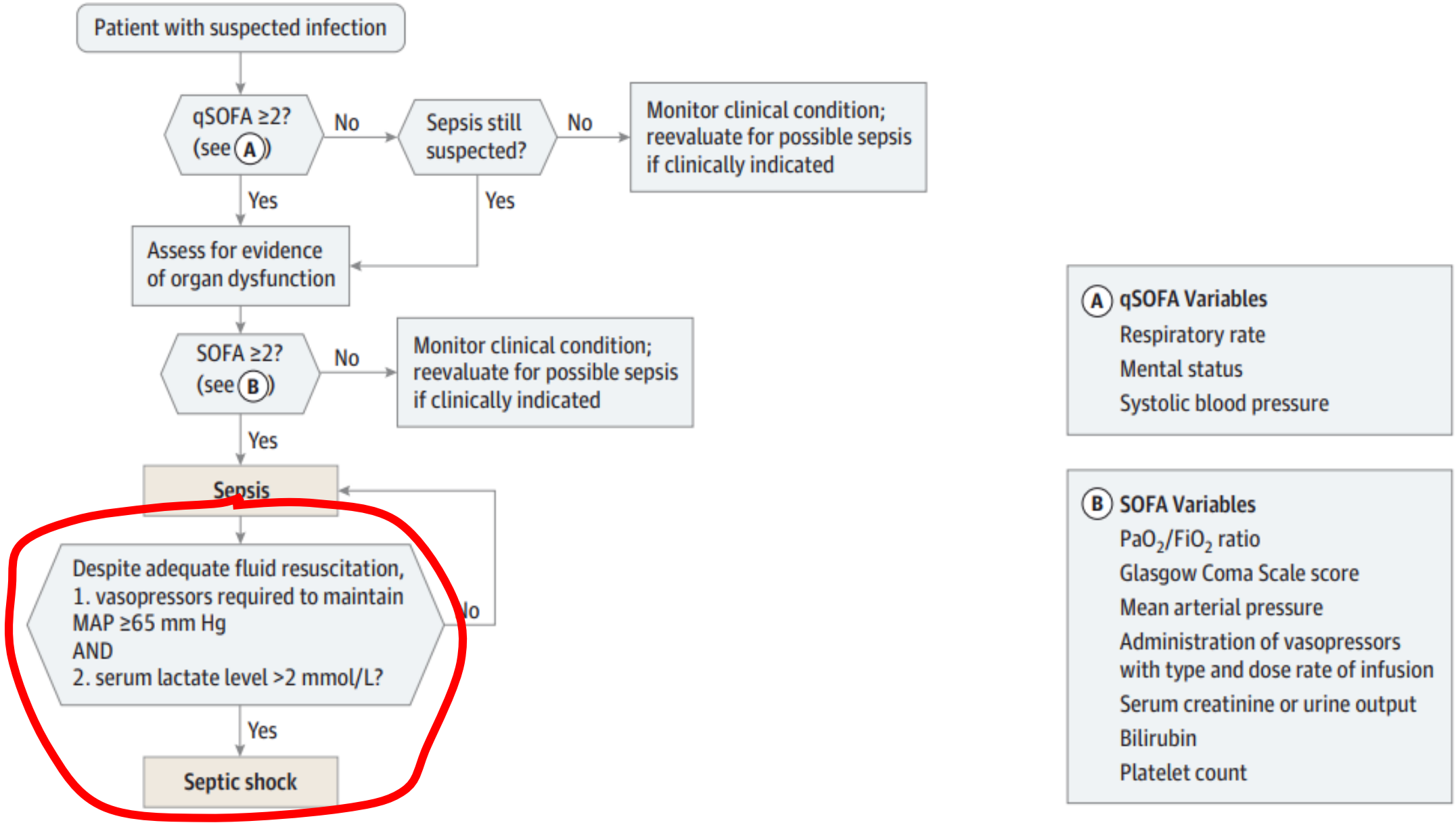
qSOFA

Cette stratification du risque a pour but de mettre l'accent sur la précocité de la prise en charge

N'est pas un critère diagnostique de sepsis

Identification rapide patients les + graves/susceptibles de s'aggraver

Figure. Operationalization of Clinical Criteria Identifying Patients With Sepsis and Septic Shock



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Validation des critères SEPSIS-3

Étude de c

30 ser

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

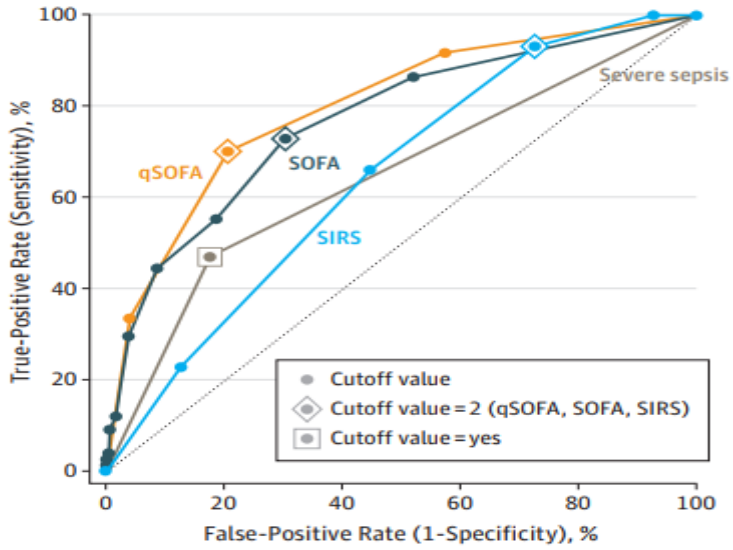
Prognostic Accuracy of Sepsis-3 Criteria for In-Hospital Mortality Among Patients With Suspected Infection Presenting to the Emergency Department

Yona
Yann
Jenn
Fabri

Table 3. Diagnostic Performances for the Prediction of In-Hospital Death

For Prediction of Death	qSOFA	SOFA	SIRS	Severe Sepsis
Sensitivity, % (95% CI)	70 (59-80)	73 (61-83)	93 (85-98)	47 (36-59)
Specificity, % (95% CI)	79 (76-82)	70 (67-73)	27 (24-31)	82 (80-85)

Figure 2. Receiver Operating Characteristic Curves for In-Hospital Mortality



qSOFA indicates quick Sequential Organ Failure Assessment; SIRS, systemic inflammatory response syndrome; and SOFA, Sequential [Sepsis-related] Organ Failure Assessment. The area under the receiver operating characteristic curves for qSOFA is 0.80 (95% CI, 0.74-0.85); SOFA, 0.77 (95% CI, 0.71-0.82); SIRS, 0.65 (95% CI, 0.59-0.70); and severe sepsis, 0.65 (95% CI, 0.59-0.70).

Chara					P Value
qSOF					
No		18 (14-23)	11 (8-13)	20 (14-27)	<.001
Yes		97 (95-98)	98 (95-99)	94 (92-96)	
SOFA					
No					<.001
Yes					
SIRS					
No					<.001
Yes					
Sever					
No			39 (53)	664 (82)	<.001
Yes			35 (47)	141 (18)	

2

2

%

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT JAMA January 17, 2017 Volume 317, Number 3

Prognostic Accuracy of the SOFA Score, SIRS Criteria, and qSOFA Score for In-Hospital Mortality Among Adults With Suspected Infection Admitted to the Intensive Care Unit

Eamon P. Raith, MBBS, MACCP; Andrew A. Udy, MBChB, PhD, FCICM; Michael Bailey, PhD; Steven McGloughlin, BMed FRACP, FCICM, MPHTM; Christopher MacIsaac, MBBS, PhD, FRACP, FCICM; Rinaldo Bellomo, MD, FRACP, FCICM, FAHMS; David V. Pilcher, MBBS, FRACP, FCICM; for the Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcomes and Resource Evaluation (CORE)

Étude rétrospective

190 000 patients

182 services de réanimation

Étude australienne et néozélandaise

2000 - 2015

Les performances **pronostiques** de l'item diagnostique **score SOFA ≥2**

2critères ou plus de SIRS

qSOFA ≥2

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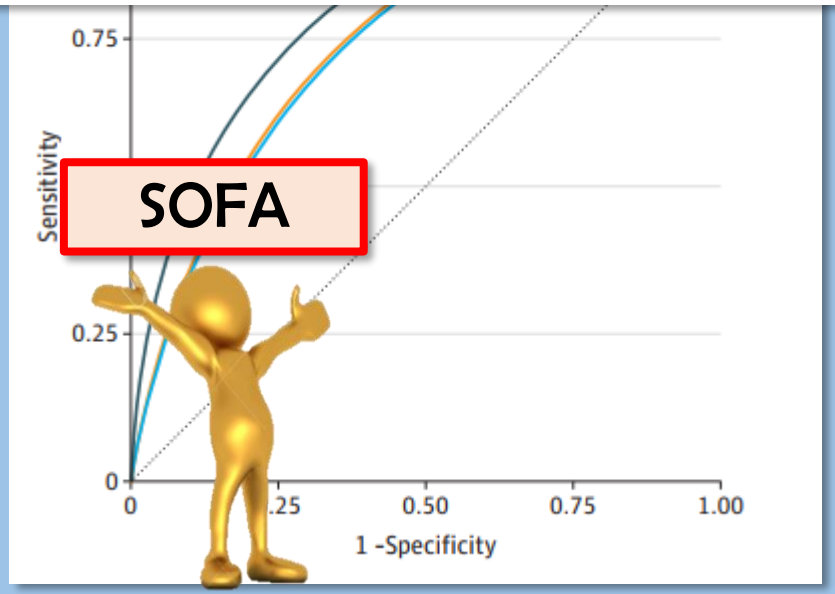

SOFA

SC 9%CI 0,811-0,818)

0,765)

0,759)

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

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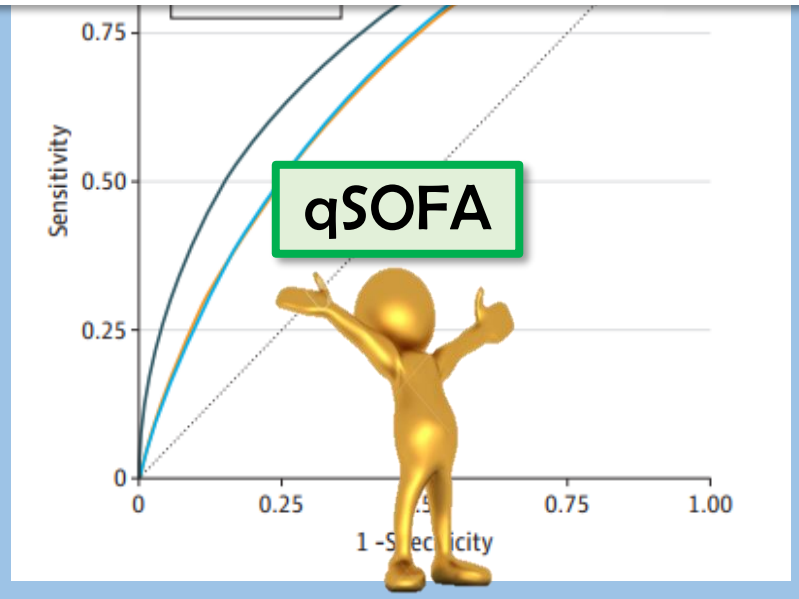
JAMA January 17, 2017 Volume 317, Number 3



qSOFA

SOFA 0,761 3-0,764)

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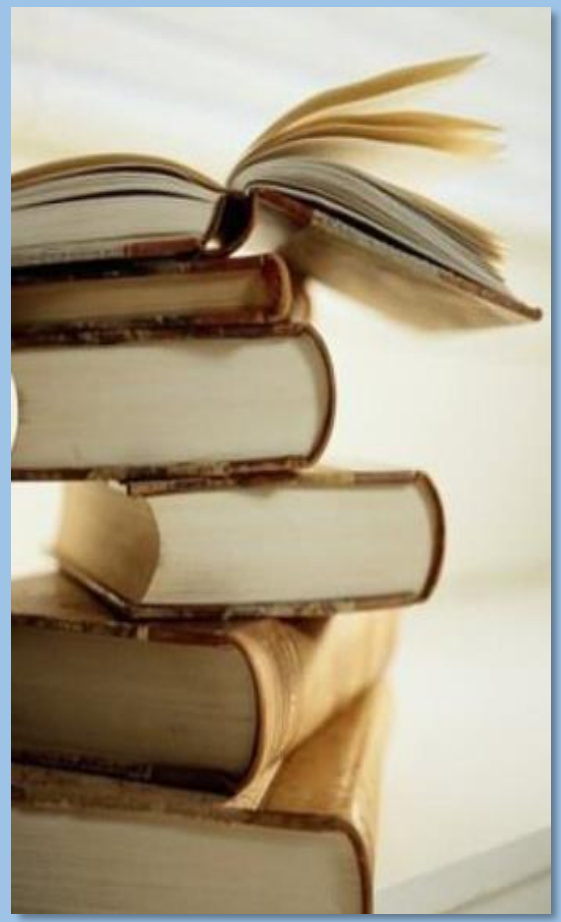
The good



- La définition du sepsis
  - Physiopathologie (SOFA)
  - EDC septique
  - Pas de SIRS ni de sepsis sévère
- qSOFA
- qSOFA et SOFA
- Meilleure comparabilité des études

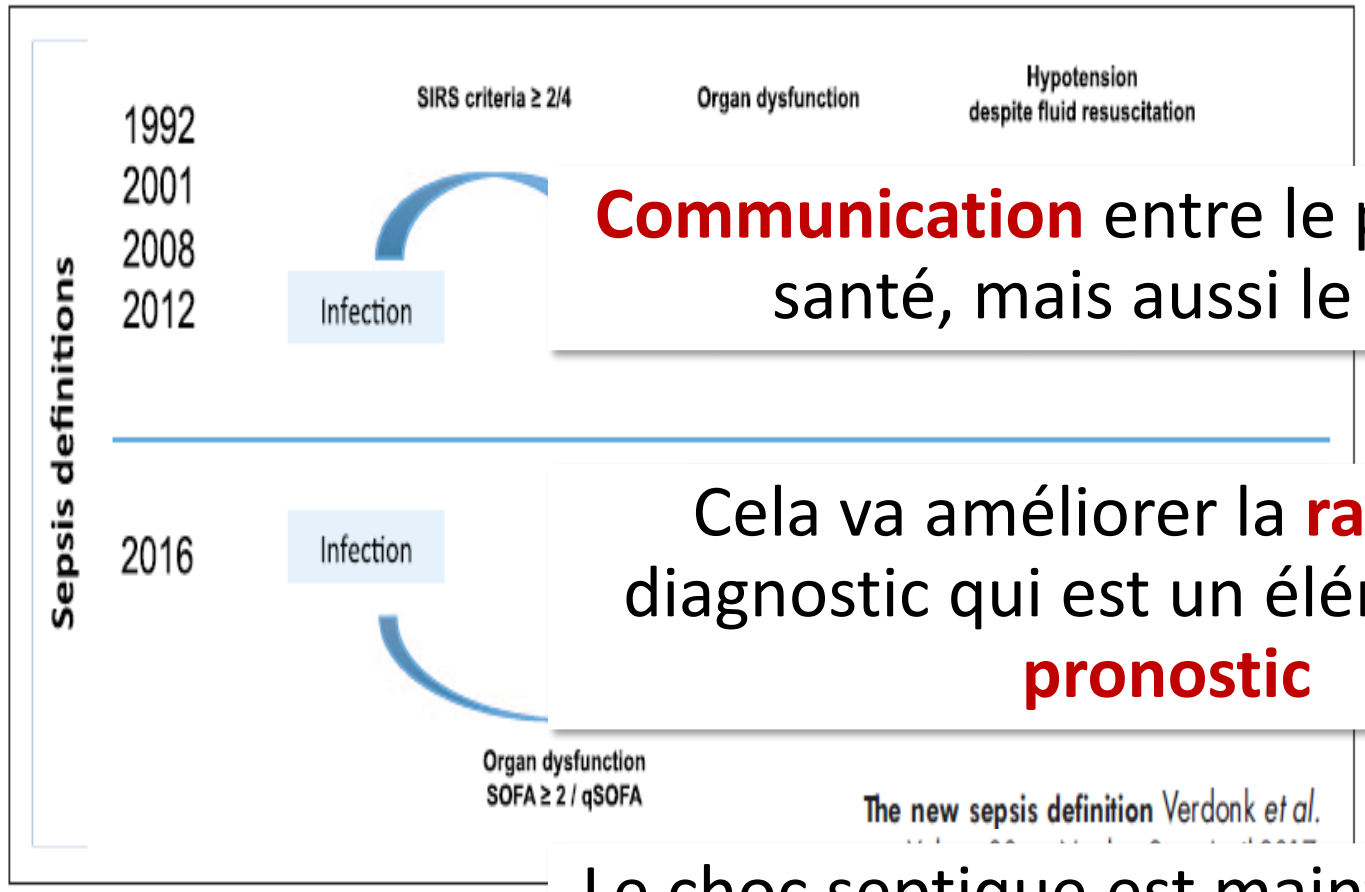


FIGURE 1. Diagram comparing the different defi
(1992, 2001 and 2016) [5,7,8], and during the S

Communication entre le personnel de santé, mais aussi le public.

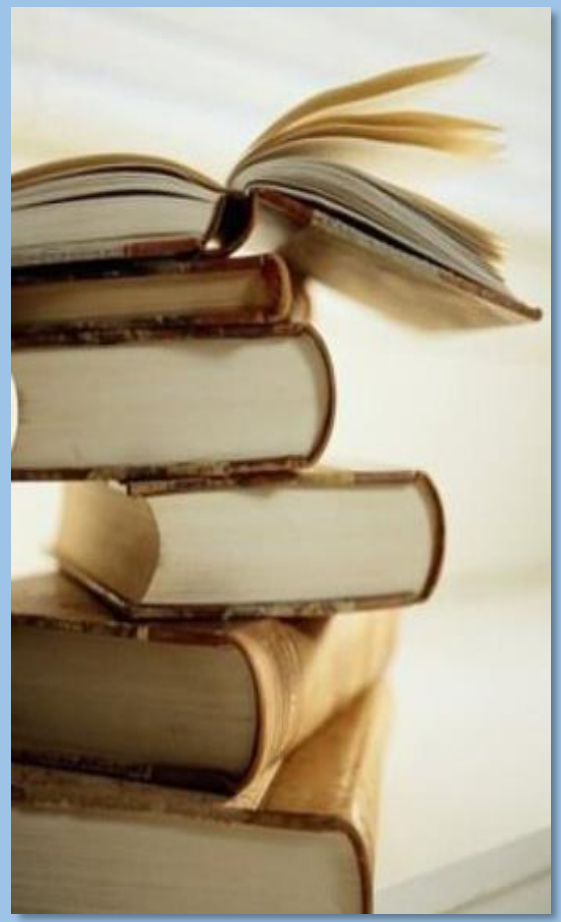
Cela va améliorer la **rapidité** du diagnostic qui est un élément clé de **pronostic**

Le choc septique est maintenant défini comme un sous-ensemble de sepsis

(hyperleucocytose, fièvre)

La définition des **différentes étapes de la sévérité** est simplifiée

Les critères SIRS



- La définition du sepsis
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  - EDC septique
  - Pas de SIRS ni de sepsis sévère
- qSOFA
- qSOFA et SOFA
- Meilleure comparabilité des études

Déterminé à partir d'analyses de grandes bases de données

Trois éléments cliniques

Simple et f … enir

qSOFA

SOFA

Méc … non-me …

Any 2 of 3 clinical variables

=

The full SOFA score **outside the ICU**

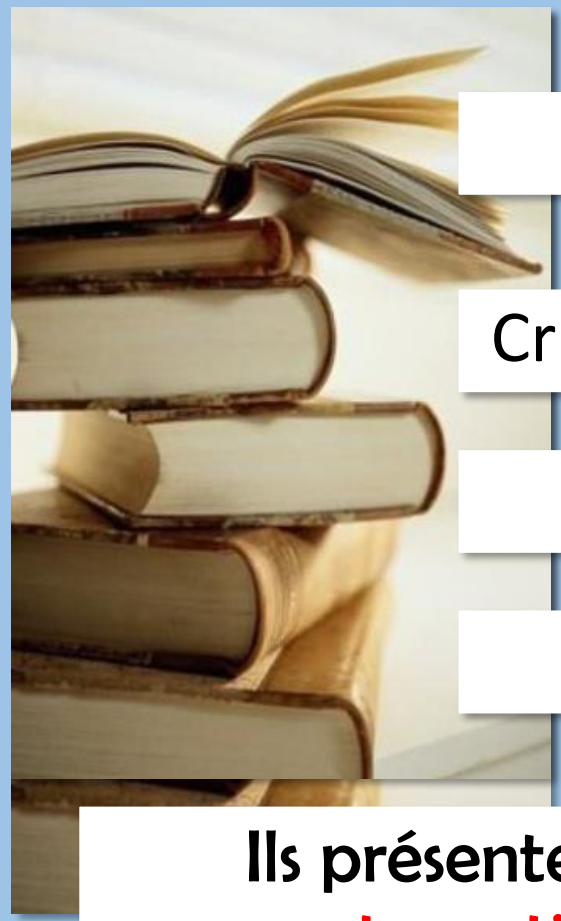
… la **dete** … sepsis

(… …lu patient)

Predictive validity

(AUROC = 0.81; 95% CI, 0.80-0.82)

Seymour CW, Liu VX, Iwashyna TJ, et al (2016) Assessment of clinical criteria for sepsis: for the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA 315:762–74



La définition du sepsis

Etudes SEPSIS

Physiopathologie (SOFA)

Critères de recrutement plus simples

Pas de SIRS ni de sepsis sévère

Etudes reproductibles

qSOFA

Meilleure comparibilité

qSOFA et SOFA

Ils présentent deux avantages: leurs mesures peut être automatisés et il peut être réalisé rétrospectivement

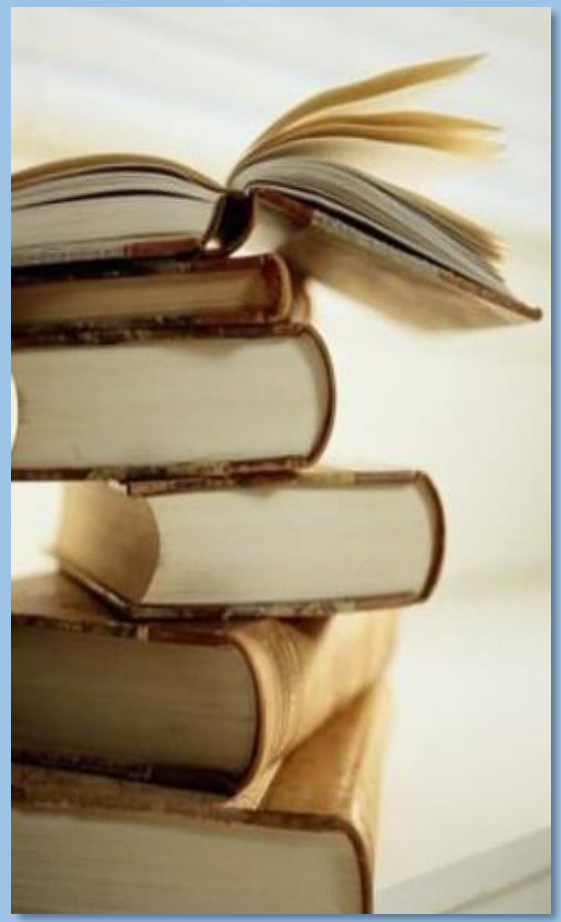
Clinical Review & Education

Special Communication | CARING FOR THE CRITICALLY ILL PATIENT JAMA February 23, 2016 Volume 315, Number 8

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

Mervyn Singer, MD, FRCP; Clifford S. Deutschman, MD, MS; Christopher Warren Seymour, MD, MSc; Manu Shankar-Hari, MSc, MD, FFICM; Djillali Annane, MD, PhD; Michael Bauer, MD; Rinaldo Bellomo, MD; Gordon R. Bernard, MD; Jean-Daniel Chiche, MD, PhD; Craig M. Coopersmith, MD; Richard S. Hotchkiss, MD; Mitchell M. Levy, MD; John C. Marshall, MD; Greg S. Martin, MD, MSc; Steven M. Opal, MD; Gordon D. Rubenfeld, MD, MS; Tom van der Poll, MD, PhD; Jean-Louis Vincent, MD, PhD; Derek C. Angus, MD, MPH

The bad



La définition du sepsis

- Physiopathologie (SOFA)
- EDC septique
- Pas de SIRS ni de sepsis sévère

qSOFA

qSOFA et SOFA

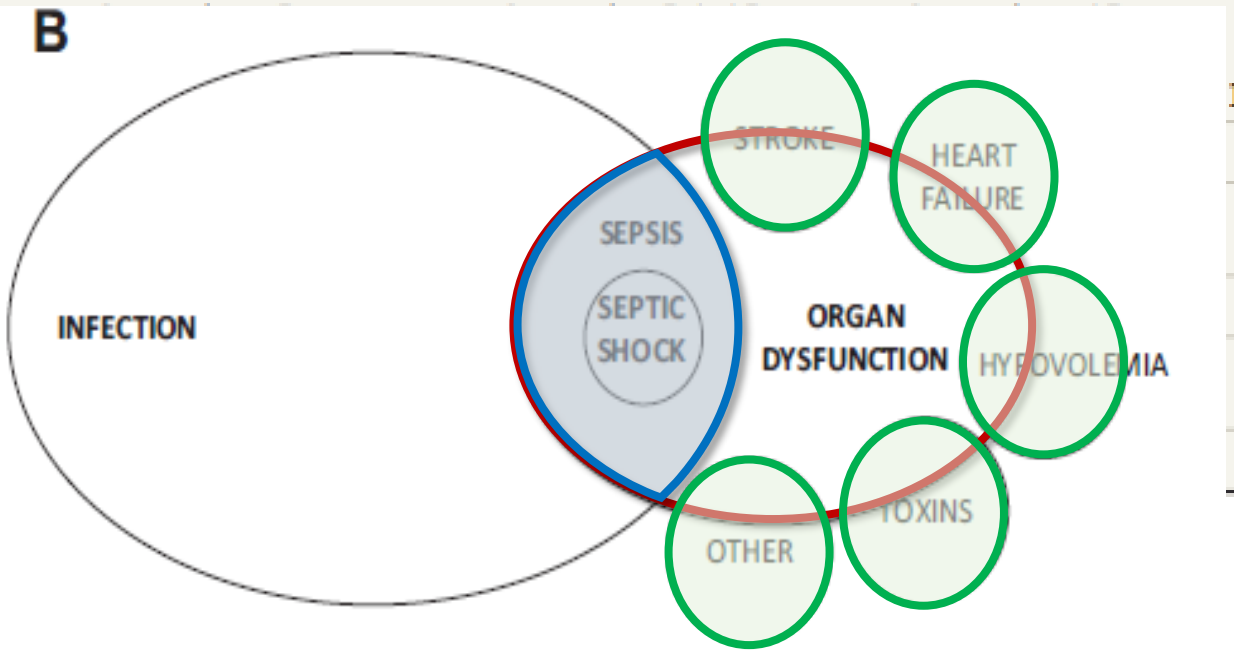
Meilleure comparabilité des études

Table 1. Sequential [Sepsis-Related] Organ Failure Assessment Score[a]

	Score				
System	0	1	2	3	4
Respiration					
Pao_2/Fio_2, mm Hg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, $\times 10^3/\mu L$	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg/dL (μmol/L)	<1.2 (20)	1.2-1.9 (20-32)	2.0-5.9 (33-101)	6.0-11.9 (102-204)	>12.0 (204)
Cardiovascular	MAP ≥70 mm Hg	MAP <7(			1[b]
Central nervous system					
Glasgow Coma Scale score[c]	15	13-14			
Renal					
Creatinine, mg/dL (μmol/L)	<1.2 (110)	1.2-1.9			
Urine output, mL/d					

Abbreviations: Fio_2, fraction of inspired oxygen; MAP, mean arte
Pao_2, partial pressure of oxygen.

[a] Adapted from Vincent et al.[27]



Détecter un dysfonctionnement organique

Sepsis = **Dysfonction d'organe secondaire à une réponse inappropriée de l'hôte envers une infection**

Avec l'espoir qu'elle a été causée par une infection

Ce patient est-il infecté ou non?

Les nouvelles définitions n'offrent aucune indication sur l'identification de l'i

When the infection is not certain and organ dysfunction is present

Des progrès importants ont été réalisés ces dix dernières années dans l'utilisation de biomarqueurs (Dg et ATBpie)

It is difficult to exclude a sepsis diagnosis

Vijayan et al. Journal of Intensive Care (2017) 5:51
DOI 10.1186/s40560-017-0246-8

REVIEW

Procalcitonin: a p marker for sepsis

Ashitha L. Vijayan, Vanimaya, Shilpa Ra

Abstract

Background: Sepsis is a global health microbial infection, which leads to orga Early and differential diagnosis of sepsis proper antibiotic treatments through th

Main body of abstract: Current target factor-α, interleukins, etc.) are non-speci family could be a critical tool for the dia procalcitonin alone may not be effective biomarkers during an infection and it infection. Beside this, the procalcitonin of secondary inflammations, diagnosis The present article summarizes the rele determining the therapeutic approache

Conclusion: Further studies are neede differentiating between microbial and for sepsis.

Keywords: Procalcitonin, Sepsis, Antib

Journa

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The importance of pr

Funda

[1] Inonu University Faculty of M
[2] Malatya State Hos

Received 03 N
Available online 29.1

Abstract

Despite the advances and a wide range of studies conducted, sep diagnosis, rapid and effective treatment are extremely importan Procalcitonin is an important test as "point-of-care testing (PO released from the parenchymal cells of the liver, kidneys and m bacterial infection, the serum procalcitonin level may increase interleukin-6 (IL-6) trigger due to tissue injury, inflammation an in patients suspicious of sepsis in the early period. A total of 6 Medical Faculty Turgut Özal Medical Center Investigation H diagnostic criteria of systemic inflammatory response syndrome were investigated on the first day after having been included in 108.39 and 83.47 mg/l on the 1st, 3rd and 7th days, respectively. was 316.054 ng/ml. The minimum/maximum levels were 0.091 No statistically significant difference was observed betweem t difference was observed between its levels between the 1st and th significant ($p<0.005$). C-reactive protein levels revelaed a signifi ($p<0.010$). The Wilcoxon Signed test was used to investigate patients. Although conflicting results have been obtained in diffe of sepsis, we believe that PCT is an appropriate and important in

Keywords: Procalcitonin, early diagnosis, sepsis

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Asian Pacific Journal of Tropical Biomedicine

journal homepage: www.elsevier.com/locate/apjtb

Mini review http://dx.doi.org/10.1016/j.apjtb.2016.04.005

New sepsis biomarkers

Dolores Limongi[1], Cartesio D'Agostini[2], Marco Ciotti[3*]

[1]*Telematic University San Raffaele Rome, Via di Val Cannuta, 00167, Rome, Italy*

[2]*Clinical Microbiology and Virology, Polyclinic Tor Vergata Foundation, Viale Oxford 81, 00133, Rome, Italy*

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ARTICLE INFO

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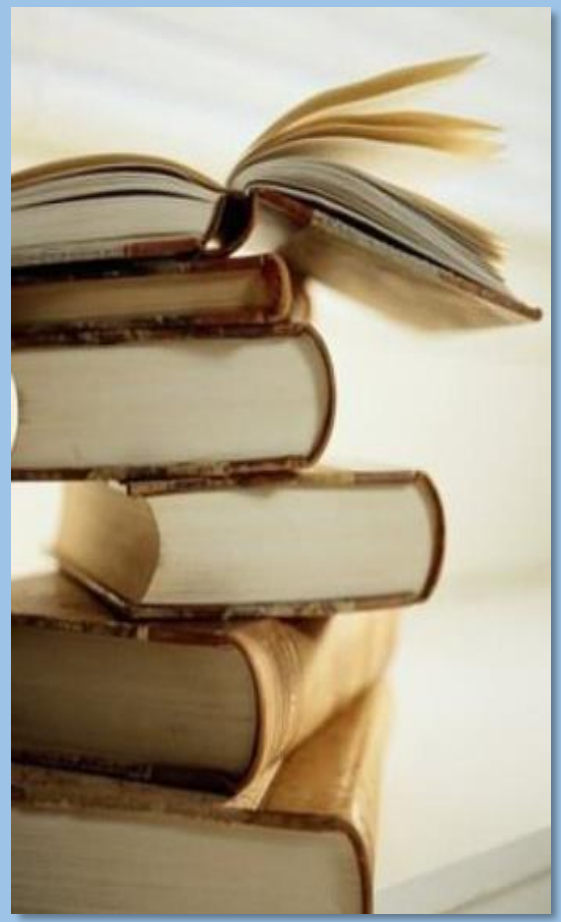
Keywords:
Biomarker
Sepsis
Plasma chitotriosidase

ABSTRACT

Sepsis remains a leading cause of death in the intensive care units and in all age groups worldwide. Early recognition and diagnosis are key to achieving improved outcomes. Therefore, novel biomarkers that might better inform clinicians treating such patients are surely needed. The main attributes of successful biomarkers would be high sensitivity, specificity, possibility of bedside monitoring and financial accessibility. A panel of sepsis biomarkers along with currently used laboratory tests will facilitate earlier diagnosis, timely treatment and improved outcome may be more effective than single biomarkers. In this review, we summarize the most recent advances on sepsis biomarkers evaluated in clinical and experimental studies.



La définition du sepsis

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qSOFA

qSOFA et SOFA

Meilleure comparabilité des études

Choc septique = forme grave et continuum du sepsis

Infection → ~~SIRS~~ → **Sepsis** → ~~Sepsis sévère~~ → **Choc septique**

Lactate Level Versus Lactate Clearance for Predicting Mortality in Patients With Septic Shock

TABLE 2. Prognostic Value of Measuring the Serum Lactate Level and Clearance After 6 Hours of Sep

6hr From Shock	Receiver Operaing	Sensitivity	Specificity	Predictive	Predictive	Positive Likelihood Ratio	Negative Likelihood Ratio
Lactate (mmol/L)							
Lactate over 2						1.26	0.40
Lactate over 3						1.60	0.60
Lactate over 4	0.64 (0.60–0.68)	55.9	72.3	40.2	83.1	1.39	0.42
Clearance (%)							
Clearance under						1.78	0.72
Clearance under						1.63	0.68
Clearance under						1.50	0.60

for prognosis of septic shock patients who were treated with protocol-driven resuscitation bundle therapy.

Volémie adéquate?

Évaluation HD invasive?
Non invasive?

Perte de temps % transfert en USI (pronostic)

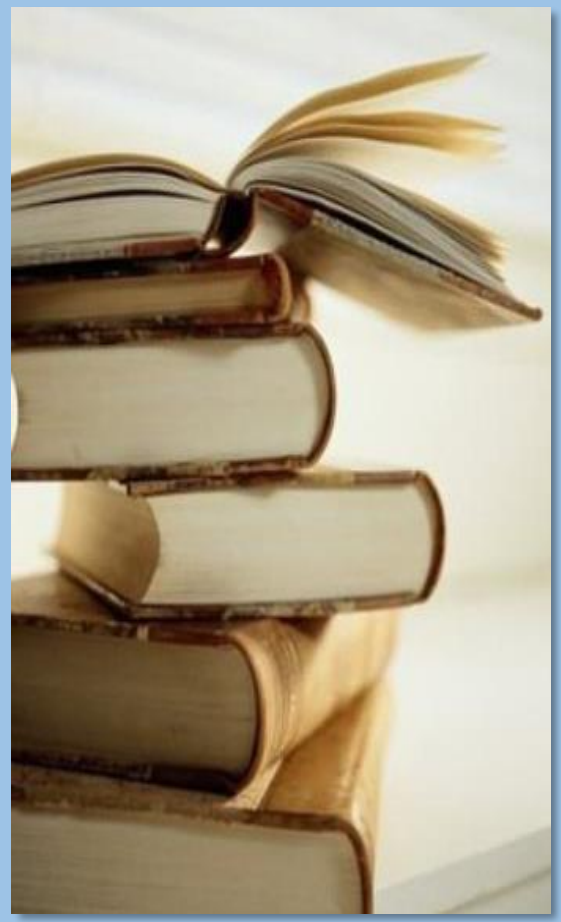
Vasopresseurs

PAM ≥ 65 mmHg

Lactate >2 mmol/L

(18 mg/dL)

Malgré la correction d'une hypovolémie



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[Original Research **Critical Care**]

CHEST

Systemic Inflammatory Response Syndrome, Quick Sequential Organ Function Assessment, and Organ Dysfunction

Insights From a Prospective Da

Julian M. Williams, MBBS; Jaimi H. Greenslade, PhD
Anthony F. T. Brown, MBChB; and Jeffrey Lipman,

[Original Research **Critical Care**

Systemic Inflamn Quick Sequential Assessment, and

Insights From a Prospe

Julian M. Williams, MBBS; Jaimi H. Gr
Anthony F. T. Brown, MBChB; and Jeff

RESULTS: We enrolled 8,871 patients, wit

CONCLUSIONS: SIRS was associated with organ dysfunction and mortality, and abandoning the concept appears premature. A qSOFA score ≥ 2 showed high specificity, but poor sensitivity may limit utility as a bedside screening method. Although mortality for organ dysfunction was comparable between Sepsis-2 and Sepsis-3, more prognostic and clinical information is conveyed using Sepsis-2 regarding number and type of organ dysfunctions. The SOFA score may require recalibration. CHEST 2017; 151(3):586-596

The SOFA score may require recalibration. CHEST 2017; 151(3):586-596

KEY WORDS: emergency medicine; infection; organ dysfunction; qSOFA; SIRS

Editorial

Table 1 Sensitivity and specificity for mortality of diagnostic criteria for sepsis/severe sepsis in non-ICU settings

Criteria	Source	Sensitivity (%)	Specificity (%)
SIRS ≥2	Sepsis-3	64.0	65.0
	U of C	93.8	12.3
qSOFA ≥2	Sepsis-3	55.0	84.0
	U of C	68.7	63.5
		86.6	47.5
		71.4	65.0
		92.0	84.0

ère

Intensive Care Med (2004) 30:536–555
DOI 10.1007/s00134-004-2210-z

SPECIAL ARTICLE

R. Phillip Dellinger
Jean M. Carlet
Henry Masur
Herwig Gerlach
Thierry Calandra
Jonathan Cohen

Surviving Sepsis Campaign guidelines for management of severe sepsis and septic shock

Intensive Care Med (2008) 34:17–60
DOI 10.1007/s00134-007-0934-2

SPECIAL ARTICLE

R. Phillip Dellinger
Mitchell M. Levy
Jean M. Carlet
Julian Bion
Margaret M. Parker
Roman Jaeschke
Konrad Reinhart

Surviving Sepsis Campaign: International guidelines for management of severe sepsis and septic shock: 2008

Figure 1. Mean Annual Mortality in Patients With Severe Sepsis

JAMA April 2, 2014 Volume 311, Number 13

Intensive Care Med (2015) 41:1620–1628
DOI 10.1007/s00134-015-3906-y

ORIGINAL

Research

Original Investi

Mortali

Criticall

Andrew Rhodes
Gary Phillips
Richard Beale
Maurizio Cecconi
Jean Daniel Chiche
Daniel De Backer
Jigeeshu Divatia

Kirsi-Maija Kaukonen, MD,
Rinaldo Bellomo, MD, PhD

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olume 311, Number 13

gn bundles

Among

012

Table 2 Surviving Sepsis Campaign bundle compliance and associated hospital mortality for patients enrolled into the IMPreSS study

Detail	
3-h bundle compliance (all patients, n = 1794)	
Measurement of lactate	1002 (55.9)
Obtain blood c… antibiotics	
Administer bro… antibiotics	
Administer 30	
Hospital morta	
Hospital morta compliance	
6-h bundle compliance (all patients, n = 1794)	
Repeat the lactate measurement	1077 (60.0)
Application of vasopressors for hypotension	1479 (82.4)
Measurement c… saturation	
Hospital morta	
Hospital morta compliance	
hypotension (MAP <65 mmHg) and/or hyperlactataemia (>4 mmol/L) after volume administration (n = 824)	
Repeat the lactate meas…	
Application of vasopres…	
Measurement of central… saturation	
Measurement of central… saturation	
Full bundle	90 (10.9)
Hospital mortality for 6-h bundle compliance	25/90 (27.8)
Hospital mortality for 6-h bundle non-compliance	261/734 (35.6)

All numbers are presented as n (%) unless otherwise stated
* Represents a p value of ≤0.0001 by the Fishers exact test for the mortality of bundle compliance versus non-compliance

Hospital mortality for 3-h bundle compliance
Hospital mortality for 3-h bundle non-compliance
Hospital mortality for 6-h bundle compliance
Hospital mortality for 6-h bundle non-compliance

67/340 (19.7)
443/1454 (30.5)*
143/637 (22.4)
367/1157 (31.7)*

* Represents a p value of ≤0.0001 by the Fishers exact test for the mortality of bundle compliance versus non-compliance

Intensive Care Med (2017) 43:304–377
DOI 10.1007/s00134-017-4683-6

CONFERENCE REPORTS AND EXPERT PANEL

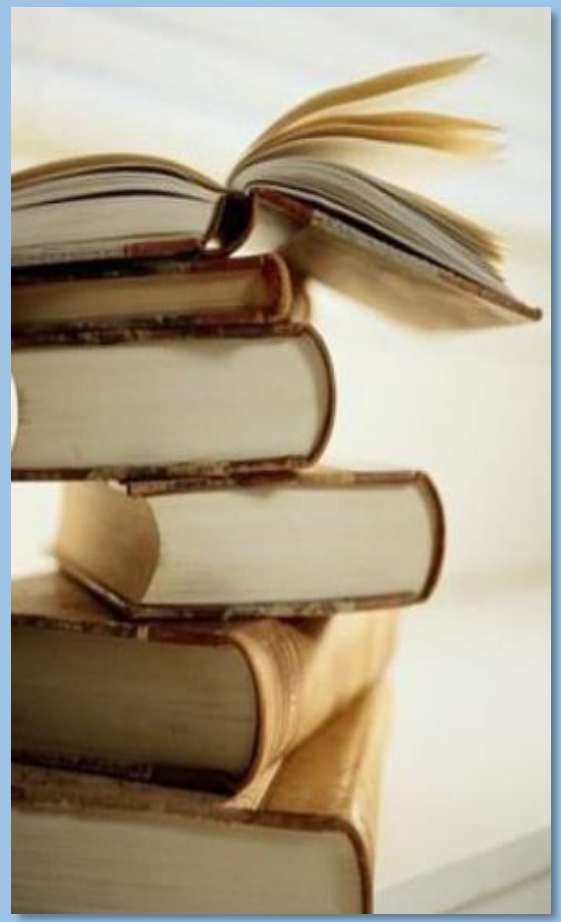
Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016

Andrew Rhodes[1*], Laura E. Evans[2], Waleed Alhazzani[3], Mitchell M. Levy[4], Massimo Antonelli[5], Ric…

GUIDELINES

…gn: International Guidelines for Management of Severe Sepsis and Septic Shock, 2012

Rangel-Fau… …berg, et al., 1998



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Meilleure comparabilité des études

qSOFA

1 GCS < 15

1 FR ≥22/min

1 PAS ≤ 100 mmHg

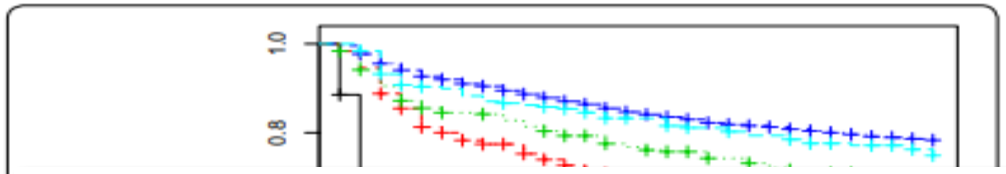
Table 3 Multivariate analysis of factors associated with sepsis-associated encephalopathy

SMART-COP: A Tool for Predicting the Need for Intensive Respiratory or Vasopressor Support in Community-Acquired Pneumonia

Clinical Infectious Diseases 2008; 47:375–84

Patrick G. P. Charles,[1,3] Rory Wolfe,[4] Michael Whitby,[7] Michael J. Fine,[14,15] Andrew J. Fuller,[9] Robert Stirling,[10] Alistair A. Wright,[11] Julio A. Ramirez,[16] Keryn J. Christiansen,[12] Grant W. Waterer,[13] Robert J. Pierce,[2] John G. Armstrong,[8] Tony M. Korman,[5] Peter Holmes,[6] D. Scott Obrosky,[15] Paula Peyrani,[16] Barbara Johnson,[7] Michelle Hooy,[10] the Australian Community-Acquired Pneumonia Study Collaboration,* and M. Lindsay Grayson[1,3,4]

Departments of [1]Infectious Diseases and [2]Respiratory and Sleep Medicine, Austin Health, Heidelberg, [3]Department of Medicine, University of Melbourne, Parkville, [4]Department of Epidemiology and Preventive Medicine, Monash University, and Departments of [5]Infectious Diseases and [6]Respiratory Medicine, Monash Medical Centre, Clayton, Departments of [7]Infectious Diseases and [8]Respiratory Medicine, Princess Alexandra Hospital, Woolloongabba, Departments of [9]Infectious Diseases and [10]Respiratory Medicine, The Alfred Hospital, Prahran, [11]West Gippsland Hospital, Warragul, and [12]Department of Microbiology and Infectious Diseases, PathWest Laboratory Medicine, and [13]Department of Respiratory Medicine, Royal Perth Hospital, Perth, Australia; [14]Division of General Internal Medicine, University of Pittsburgh, and [15]Center for Healthcare Equity Research and Promotion, VA Pittsburgh Healthcare System, Pittsburgh, Pennsylvania; and [16]Division of Infectious Diseases, University of Louisville, Louisville, Kentucky



severity of encephalopathy at ICU admission

The SMARTCOP study reported that in young adults, the RR threshold that was associated with an increased risk of critical care was **25/min**, while it was **30/min** in patients above **50 years** of age

qSOFA peut remplacer le SIRS?

qSOFA

SDMV

median of 5 hours

Specific (96.1%) but insensitive (29.7%)

Mortalité (30j)

ICU transfer or death

SIRS

less specific (61.1%) but more sen

17 hours

	Sensitivity [% (95% CI)]	Specificity [% (95% CI)]
qSOFA ≥ 2	27	
SIRS ≥ 2	65.3 (53.1–75.9)	49.1 (46.0–52.3)

Williams JM, Greenslade JH, McKenzie JV, et al. Systemic inflammatory response syndrome
insights fr
151(3):58

Churpek MM, Snyder A, Han X, et al. qSOFA, SIRS, and early warning scores for detecting clinical deterioration in infected patients outside the ICU. Am J Respir Crit Care Med. 2017;45(10): 1677-1682.

Eur J Clin Microbiol Infect Dis

CrossMark

Prognostic accuracy of SIRS criteria, qSOFA score and GYM score for 30-day mortality in older non-severely dependent

Received: 6 June 2017 / Accepted: 12 July 2017

© Springer-Verlag GmbH Germany 2017

In a
cohort of emergency department
patients with **suspected infection**

Prédiction tardive de la détérioration clinique

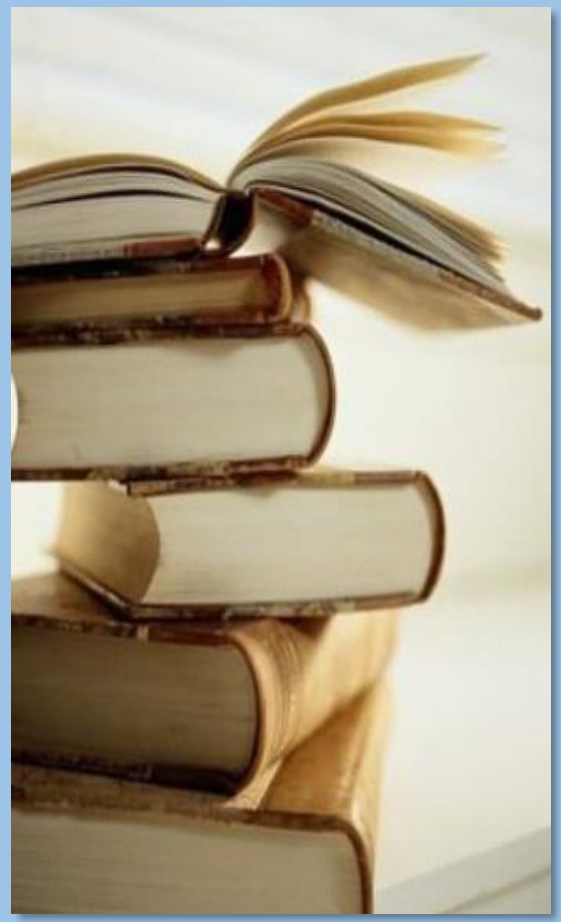
Conclusion: In this observational cohort study, qSOFA failed to identify two thirds of the patients admitted to an ED with severe sepsis. Further, qSOFA failed to be a risk stratification tool as the sensitivity to predict 7-day and 30-day mortality was low. The sensitivity was poorer than the other warning scores already in use at the study site, RETTS-triage and the SIRS criteria.

symptoms or clinical signs suggesting an infection ($n = 1535$) were prospectively included in the study from January 1

Table 5 Sensitivity, Specificity, and Positive (PPV) and Negative Predictive Values (NPV) for 30-day mortality by different stratification tools in the Emergency Department ($n = 68$ cases of deaths within 30 days among 1535 patients)

Stratification tool	Ability to identify those who died *n* (% of 68 cases)	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
Severe sepsis	19 (27.9%)	0.29 (0.18-0.41)	0.94 (0.92-0.95)	0.18 (0.12-0.24)	0.96 (0.95-0.97)
SIRS ≥ 2	42 (61.8%)	0.64 (0.51-0.75)	0.55 (0.53-0.58)	0.06 (0.05-0.07)	0.97 (0.96-0.98)
SIRS ≥ 2 (without leucocytes)	32 (45.6%)	0.48 (0.36-0.61)	0.70 (0.68-0.72)	0.07 (0.05-0.08)	0.97 (0.96-0.97)
qSOFA ≥2	8 (11.9%)	0.13 (0.05-0.25)	0.96 (0.95-0.97)	0.14 (0.07-0.23)	0.96 (0.96-0.96)
Red triage	14 (20.2%)	0.21 (0.12-0.32)	0.94 (0.92-0.95)	0.13 (0.08-0.19)	0.96 (0.96-0.96)
Orange triage	31 (45.6%)	0.46 (0.22-0.58)	0.61 (0.58-0.63)	0.05 (0.04-0.07)	0.96 (0.95-0.97)
≥ Orange triage	45 (66.1%)	0.66 (0.54-0.77)	0.54 (0.52-0.57)	0.06 (0.05-0.07)	0.97 (0.96-0.97)

(Sepsis-relate(syndrome (SIRS), Rapid eme



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qSOFA et SOFA

Meilleure comparabilité des études

Retards potentiels dans l'identification précoce et le traitement

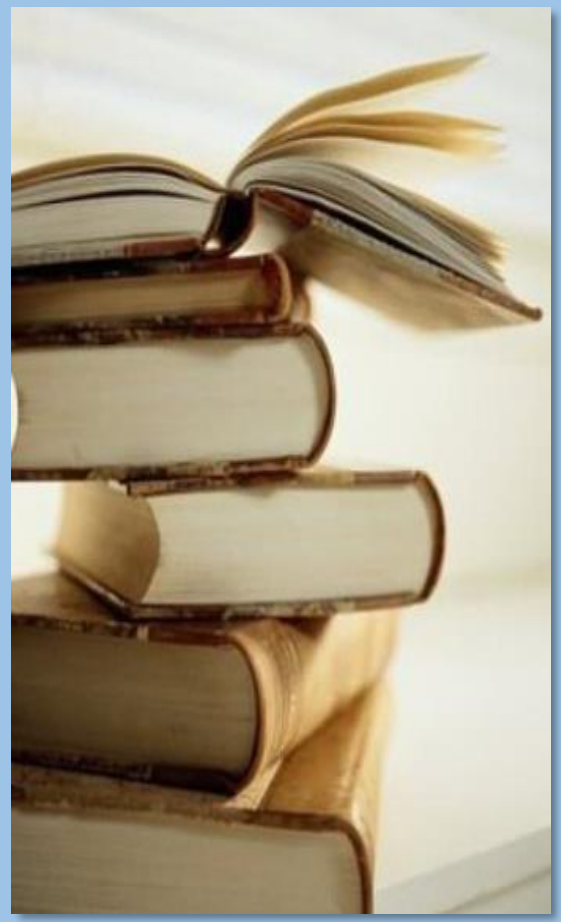
Simpson SQ. New sepsis criteria: a change we should not make. Chest 2016; 149(5):1117–8.

Cortes-Puch I, Hartog CS. Opening the debate on the new sepsis definition change is not necessarily progress: revision of the sepsis definition should be based on new scientific insights. Am J Respir Crit Care Med 2016;194(1):16–8.

Le calcul du score SOFA doit inclure des mesures biologiques.

Coûts associés + temps (Pc)

Ni qSOFA ni le SOFA ne permettent d’identifier l'infection



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Meilleure comparabilité des études

Comparibilité avec les anciennes études

Travaux

1992 | SEPSIS 1-2 | 2002 | 2016 | SEPSIS 3

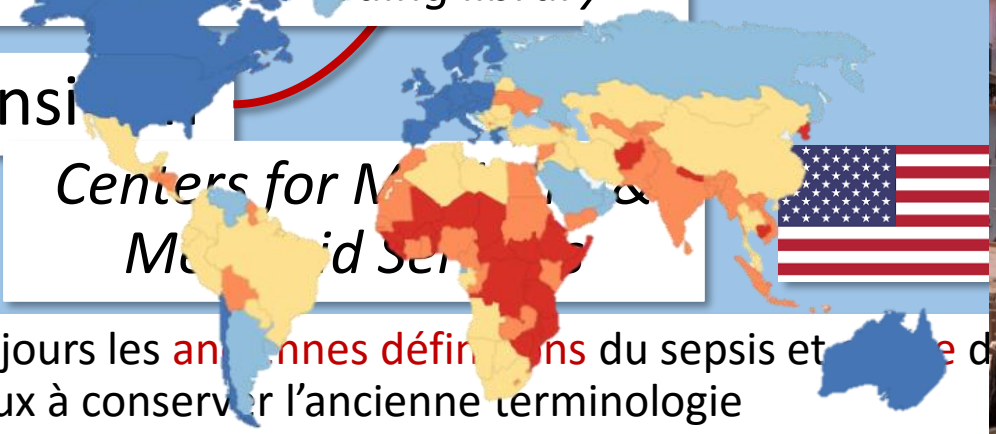
1ère définitions consensuelles

Ajoutés bibliothèque de codage

The International Classification of Dis[illegible]ding library

ansi[illegible]

Centers for M[illegible] & Me[illegible]id Se[illegible]



ujours les an[illegible]nnes défin[illegible]ns du sepsis et [illegible]e d[illegible]
aux à conserv[illegible]r l'ancienne terminologie

Clinical Review & Education

Special Communication | CARING FOR THE CRITICALLY ILL PATIENT JAMA February 23, 2016 Volume 315, Number 8

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

Mervyn Singer, MD, FRCP; Clifford S. Deutschman, MD, MS; Christopher Warren Seymour, MD, MSc; Manu Shankar-Hari, MSc, MD, FFICM; Djillali Annane, MD, PhD; Michael Bauer, MD; Rinaldo Bellomo, MD; Gordon R. Bernard, MD; Jean-Daniel Chiche, MD, PhD; Craig M. Coopersmith, MD; Richard S. Hotchkiss, MD; Mitchell M. Levy, MD; John C. Marshall, MD; Greg S. Martin, MD, MSc; Steven M. Opal, MD; Gordon D. Rubenfeld, MD, MS; Tom van der Poll, MD, PhD; Jean-Louis Vincent, MD, PhD; Derek C. Angus, MD, MPH

Townsend SR, Rivers E et al. Definitions for sepsis and septic shock. JAMA 2016;316(4):457–8.

Table 3 Availability of equipment to implement the surviving sepsis campaign guidelines

Table 5 Possibility to implement the surviving sepsis campaign guidelines

		African countries	High-income countries	*P*-value
Respondents	*n*	263	44	
Possibility to implement the SSC guidelines in entirety	*n* (%)	(1.5)	36 (81.8)	<0.001*
Percentage of implementable recommendations/suggestions	(%)			
Possibility to implement all Grade 1 recommendations	*n* (%)	15 (5.7)		<0.001*
Percentage of implementable Grade 1 recommendations	(%)	80.8 (63.5 to 88.5)		<0.001*
Possibility to implement all Grade 1A and 1B recommendations	*n* (%)	30 (11.4)		<0.001*
Percentage of implementable Grade 1A and 1B recommendations	(%)	87.5 (70.8 to 95.8)		<0.001*
Possibility to implement all Grade 1C and 1D recommendations	*n* (%)	26 (9.9)		<0.001*
Percentage of implementable Grade 1C and 1D recommendations	(%)	71.4 (57.1 to 89.3)		<0.001*
Possibility to implement all Grade 2 recommendations	*n* (%)	4 (1.5)		<0.001*
Percentage of implementable Grade 2 recommendations	(%)	57.1 (38.1 to 81)		<0.001*
Possibility to implement all sepsis resuscitation bundles	*n* (%)	43 (16.3)		<0.001*
Bundle element "Lactate"	*n* (%)	64 (24.3)		<0.001*
Bundle element "Cultures"	*n* (%)	188 (71.5)		<0.001*
Bundle element "Antibiotics"	*n* (%)	204 (77.6)		<0.001*
Bundle element "Hypotension"	*n* (%)	238 (90.5)		0.03*
Bundle element "CVP/ScvO2"	*n* (%)	70 (26.6)		<0.001*
Possibility to implement all sepsis management bundles	*n* (%)	12 (4.6)		<0.001*
Bundle element "Steroids"	*n* (%)	252 (95.8)		0.17
Bundle element "rhAPC"	*n* (%)	15 (5.7)		<0.001*
Bundle element "Glucose"	*n* (%)	221 (84)		0.004*
Bundle element "Plateau Pressure"	*n* (%)	182 (69.2)		<0.001*

absolute values and percentages of completed responses.

Table 1. Sequential [Sepsis-Related] Organ Failure Assessment Score[a]

System	
Respiration	
Pao_2/Fio_2, mm Hg (kPa)	
Coagulation	
Platelets, $\times 10^3/\mu L$	
Liver	
Bilirubin, mg/dL (μmol/L)	
Cardiovascular	
Central nervous system	
Glasgow Coma Scale score[c]	
Renal	
Creatinine, mg/dL (μmol/L)	
Urine output, mL/d	

30)

Impact sur le traitement

Nouvelles recommandations basées sur ces nouvelles définitions

new definition

EDITORIAL

New Definitior
Continuing Evc

Edward Abraham, MD

Surviving Sepsis Campaign

Surviving Sepsis Campaign Responds to Sepsis-3

March 1, 2016

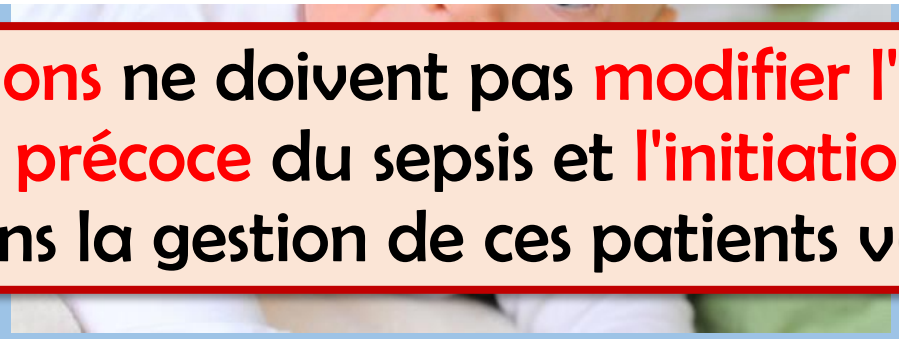
ıe opinions of the authors and *JAMA*
of the American Medical Association

Done

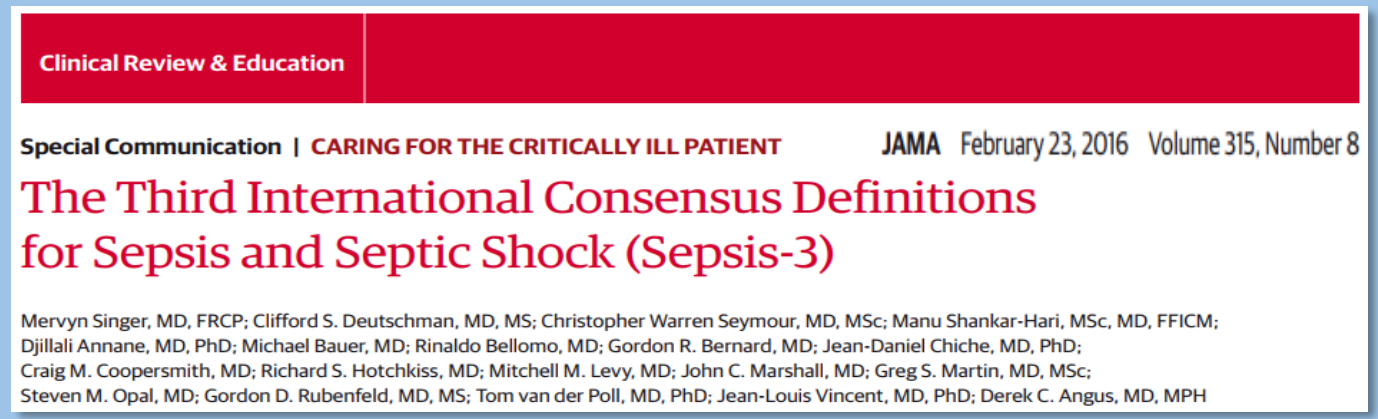
ıry 23, 2016 Volume 315, Number 8

Conclusion

Once hospitals have adequately prepared for change, sepsis team leaders should reinforce the message that the new definitions do not change the primary focus of early sepsis identification and initiation of timely treatment in the management of this vulnerable patient population.



Les nouvelles définitions ne doivent pas modifier l'objectif principal qui est l'identification précoce du sepsis et l'initiation d'un traitement rapide dans la gestion de ces patients vulnérables



Définition plus proche de la physiopathologie du sepsis

Critères simples et facile à retenir

Le risque de **minimiser la gravité du sepsis**

Le risque d'anéantir les efforts déployés depuis plusieurs décennies dans le cadre de la ***Surviving Sepsis Campaign***

MERCI DE VOTRE ATTENTION

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