

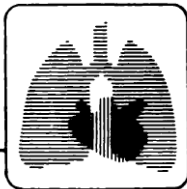


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Les nouvelles définitions du sepsis/choc septique: utiles en onco-hématologie?

AP Meert

Introduction



accp/sccm consensus conference

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

THE ACCP/SCCM CONSENSUS CONFERENCE COMMITTEE:

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(*Chest* 1992; 101:1644-55)

- ◆ **SIRS** (syndrome de réponse inflammatoire systémique) : si deux ou plus des conditions suivantes sont remplies (1992)
 - ◆ température $< 36^{\circ}\text{C}$ ou $> 38^{\circ}\text{C}$
 - ◆ fréquence cardiaque $> 90/\text{min}$
 - ◆ fréquence respiratoire $> 20/\text{min}$ ou $\text{PaCO}_2 < 32 \text{ mm Hg}$
 - ◆ leucocytose $> 12.000/\text{mm}^3$, $< 4.000/\text{mm}^3$ ou présence de formes immatures circulantes ($> 10\%$ des cellules)
- ◆ **Sepsis** : si le SIRS est dû à une infection
- ◆ **Sepsis sévère** : si le sepsis est associé à une dysfonction organique, de l'hypoperfusion (acidose lactique, oligurie, troubles de conscience,...) ou de l'hypotension artérielle (TAs $< 90 \text{ mmHg}$ ou chute de $> 40 \text{ mmHg}$ de la valeur de base sans autre raison connue)
- ◆ **Choc septique** : sepsis avec hypotension, malgré un remplissage adéquat, avec des signes d'hypoperfusion

Intensive Care Med (2003) 29:530–538
DOI 10.1007/s00134-003-1662-x

EXPERT PANEL

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2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference

SIRS

- Body temperature higher than 38°C or lower than 36°C
- Heart rate higher than 90/min
- Hyperventilation evidenced by respiratory rate higher than 20/min or PaCO₂ lower than 32 mmHg
- White blood cell count higher than 12,000 cells/ μl or lower than 4,000/ μl

Sepsis

- ◆ the clinical syndrome defined by the presence of both infection and a systemic inflammatory response
- ◆ infection is a pathological process caused by invasion of normally sterile tissue or fluid or body cavity by pathogenic or potentially pathogenic micro-organisms.

Table 1 Diagnostic criteria for sepsis

Infection^a

Documented or suspected *and* some of the following^b:

General parameters

Fever (core temperature $>38.3^{\circ}\text{C}$)

Hypothermia (core temperature $<36^{\circ}\text{C}$)

Heart rate >90 bpm or >2 SD above the normal value for age

Tachypnea: >30 bpm

Altered mental status

Significant edema or positive fluid balance (>20 ml/kg over 24 h)

Hyperglycemia (plasma glucose >110 mg/dl or 7.7 mM/l) in the absence of diabetes

Inflammatory parameters

Leukocytosis (white blood cell count $>12,000/\mu\text{l}$)

Leukopenia (white blood cell count $<4,000/\mu\text{l}$)

Normal white blood cell count with $>10\%$ immature forms

Plasma C reactive protein >2 SD above the normal value

Plasma procalcitonin >2 SD above the normal value

Hemodynamic parameters

Arterial hypotension^b (systolic blood pressure <90 mmHg, mean arterial pressure <70 , or a systolic blood pressure decrease >40 mmHg in adults or <2 SD below normal for age)

Mixed venous oxygen saturation $>70\%$ ^b

Cardiac index >3.5 $\text{l min}^{-1} \text{m}^{-2}$ ^{c,d}

Organ dysfunction parameters

Arterial hypoxemia ($\text{PaO}_2/\text{FIO}_2 <300$)

Acute oliguria (urine output <0.5 $\text{ml kg}^{-1} \text{h}^{-1}$ or 45 mM/l for at least 2 h)

Creatinine increase ≥ 0.5 mg/dl

Coagulation abnormalities (international normalized ratio >1.5 or activated partial thromboplastin time >60 s)

Ileus (absent bowel sounds)

Thrombocytopenia (platelet count $<100,000/\mu\text{l}$)

Hyperbilirubinemia (plasma total bilirubin >4 mg/dl or 70 mmol/l)

Tissue perfusion parameters

Hyperlactatemia (>3 mmol/l)

Decreased capillary refill or mottling

^a Defined as a pathological process induced by a micro-organism

^b Values above 70% are normal in children (normally 75–80%) and should therefore not be used as a sign of sepsis in newborns or children

^c Values of 3.5–5.5 are normal in children and should therefore not be used as a sign of sepsis in newborns or children

^d Diagnostic criteria for sepsis in the pediatric population is signs and symptoms of inflammation plus infection with hyper- or hypothermia (rectal temperature $>38.5^{\circ}\text{C}$ or $<35^{\circ}\text{C}$), tachycardia (may be absent in hypothermic patients) and at least one of the following indications of altered organ function: altered mental status, hypoxemia, elevated serum lactate level, and bounding pulses

Severe sepsis (sepsis with organ dysfunction)

The definition of severe sepsis remains unchanged and refers to sepsis complicated by organ dysfunction. Severe sepsis is now considered to be the most common cause of death in noncoronary critical care units. Approximately 150,000 persons die annually in Europe and more than 200,000 in the United States [18].

Organ dysfunction can be defined using the definitions developed by Marshall et al. [19] or by the Sequential Organ Failure Assessment score [20]. Organ dysfunction in severe sepsis in the pediatric population can be defined using definitions developed by Wilkinson et al. [21], Proulx et al. [22], and Doughty et al. [23] or the definitions used for the Pediatric Multiple Organ Dysfunction and Pediatric Logistic Organ Dysfunction scores [24].

Septic shock

Septic shock in adults refers to a state of acute circulatory failure characterized by persistent arterial hypotension unexplained by other causes. Hypotension is defined by a systolic arterial pressure below 90 mmHg (in children, less than 2 SD below normal for age); mean arterial pressure lower than 60, or a reduction in systolic blood pressure of more than 40 mmHg from baseline, despite adequate volume resuscitation, in the absence of other cause

Table 2 The PIRO system for staging sepsis

Domain	Present	Future	Rationale
Predisposition	Premorbid illness with reduced probability of short tem survival. Cultural or religious beliefs, age, gender	Genetic polymorphisms in components of inflammatory response (e.g., Toll-like receptor, tumor necrosis factor, interleukin 1, CD14); enhanced understanding of specific interactions between pathogens and host diseases	At the present, premorbid factors impact on the potential attributable morbidity and mortality of an acute insult; deleterious consequences of insult depend heavily on genetic predisposition (future)
Insult (infection)	Culture and sensitivity of infecting pathogens; detection of disease amenable to source control	Assay of microbial products (lipopolysaccharide, mannan, bacterial DNA); gene transcript profiles	Specific therapies directed against inciting insult require demonstration and characterization of that insult
Response	SIRS, other signs of sepsis, shock, C-reactive protein	Nonspecific markers of activated inflammation (e.g., procalcitonin or interleukin 6) or impaired host responsiveness (e.g., HLA-DR); specific detection of target of therapy (e.g., protein C, tumor necrosis factor, platelet-activating factor)	Both mortality risk and potential to respond to therapy vary with nonspecific measures of disease severity (e.g., shock); specific mediator-targeted therapy is predicated on presence and activity of mediator
Organ dysfunction	Organ dysfunction as number of failing organs or composite score (e.g., multiple-organ dysfunction syndrome, logistic organ dysfunction system, Sequential Organ Failure Assessment, Pediatric Multiple Organ Dysfunction, Pediatric Logistic Organ Dysfunction)	Dynamic measures of cellular response to insult – apoptosis, cytopathic hypoxia, cell stress	Response to preemptive therapy (e.g., targeting micro-organism or early mediator) not possible if damage already present; therapies targeting the injurious cellular process require that it be present

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

JAMA. 2016;315(8):801-810.

PROCESS A task force (n = 19) with expertise in sepsis pathobiology, clinical trials, and epidemiology was convened by the Society of Critical Care Medicine and the European Society of Intensive Care Medicine. Definitions and clinical criteria were generated through meetings, Delphi processes, analysis of electronic health record databases, and voting, followed by circulation to international professional societies, requesting peer review and endorsement (by 31 societies listed in the Acknowledgment).

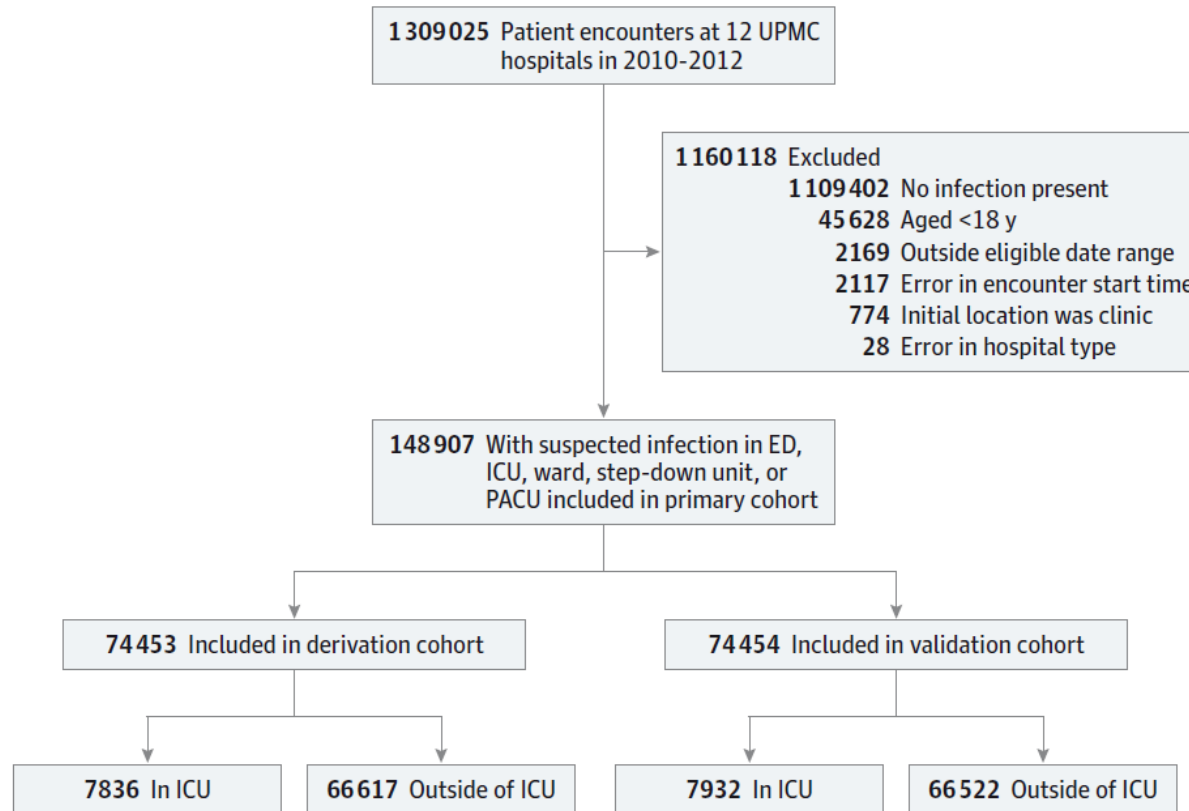
Assessment of Clinical Criteria for Sepsis For the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)

Christopher W. Seymour, MD, MSc; Vincent X. Liu, MD, MSc; Theodore J. Iwashyna, MD, PhD; Frank M. Brunkhorst, MD; Thomas D. Rea, MD, MPH; André Scherag, PhD; Gordon Rubenfeld, MD, MSc; Jeremy M. Kahn, MD, MSc; Manu Shankar-Hari, MD, MSc; Mervyn Singer, MD, FRCP; Clifford S. Deutschman, MD, MS; Gabriel J. Escobar, MD; Derek C. Angus, MD, MPH

DESIGN, SETTINGS, AND POPULATION Among 1.3 million electronic health record encounters from January 1, 2010, to December 31, 2012, at 12 hospitals in southwestern Pennsylvania, we identified those with suspected infection in whom to compare criteria. Confirmatory analyses were performed in 4 data sets of 706 399 out-of-hospital and hospital encounters at 165 US and non-US hospitals ranging from January 1, 2008, until December 31, 2013.

EXPOSURES Sequential [Sepsis-related] Organ Failure Assessment (SOFA) score, systemic inflammatory response syndrome (SIRS) criteria, Logistic Organ Dysfunction System (LODS) score, and a new model derived using multivariable logistic regression in a split sample, the quick Sequential [Sepsis-related] Organ Failure Assessment (qSOFA) score (range, 0-3 points, with 1 point each for systolic hypotension [≤ 100 mm Hg], tachypnea [≥ 22 /min], or altered mentation).

Figure 1. Accrual of Encounters for Primary Cohort



ED indicates emergency department; ICU, intensive care unit; PACU, postanesthesia care unit.

Table 1. Variables for Candidate Sepsis Criteria Among Encounters With Suspected Infection

Systemic Inflammatory Response Syndrome (SIRS) Criteria (Range, 0-4 Criteria)	Sequential [Sepsis-related] Organ Failure Assessment (SOFA) (Range, 0-24 Points)	Logistic Organ Dysfunction System (LODS) (Range, 0-22 Points) ^a	Quick Sequential [Sepsis-related] Organ Failure Assessment (qSOFA) (Range, 0-3 Points)
Respiratory rate, breaths per minute	PaO ₂ /FiO ₂ ratio	PaO ₂ /FiO ₂ ratio	Respiratory rate, breaths per minute
White blood cell count, 10 ⁹ /L	Glasgow Coma Scale score	Glasgow Coma Scale score	Glasgow Coma Scale score
Bands, %	Mean arterial pressure, mm Hg	Systolic blood pressure, mm Hg	Systolic blood pressure, mm Hg
Heart rate, beats per minute	Administration of vasopressors with type/dose/rate of infusion	Heart rate, beats per minute	
Temperature, °C	Serum creatinine, mg/dL, or urine output, mL/d	Serum creatinine, mg/dL	
Arterial carbon dioxide tension, mm Hg	Bilirubin, mg/dL	Bilirubin, mg/dL	
	Platelet count, 10 ⁹ /L	Platelet count, 10 ⁹ /L	
		White blood cell count, 10 ⁹ /L	
		Urine output, L/d	
		Serum urea, mmol/L	
		Prothrombin time, % of standard	

Figure 3. Area Under the Receiver Operating Characteristic Curve and 95% Confidence Intervals for In-Hospital Mortality of Candidate Criteria (SIRS, SOFA, LODS, and qSOFA) Among Suspected Infection Encounters in the UPMC Validation Cohort (N = 74 454)

A ICU encounters (n=7932)

	SIRS	SOFA	LODS	qSOFA
SIRS	0.64 (0.62-0.66)	0.43 (0.41-0.46)	0.41 (0.38-0.43)	0.46 (0.43-0.48)
SOFA	<.001	0.74 (0.73-0.76)	0.87 (0.87-0.88)	0.65 (0.63-0.66)
LODS	<.001	0.20	0.75 (0.73-0.76)	0.76 (0.75-0.77)
qSOFA	.01	<.001	<.001	0.66 (0.64-0.68)

B Non-ICU encounters (n=66 522)

	SIRS	SOFA	LODS	qSOFA
SIRS	0.76 (0.75-0.77)	0.52 (0.51-0.53)	0.43 (0.42-0.44)	0.61 (0.61-0.62)
SOFA	<.001	0.79 (0.78-0.80)	0.80 (0.80-0.81)	0.59 (0.58-0.60)
LODS	<.001	<.001	0.81 (0.80-0.82)	0.68 (0.68-0.69)
qSOFA	<.001	<.001	.72	0.81 (0.80-0.82)

ICU indicates intensive care unit; LODS, Logistic Organ Dysfunction System; qSOFA, quick Sequential [Sepsis-related] Organ Function Assessment; SIRS, systemic inflammatory response syndrome; SOFA, Sequential [Sepsis-related] Organ Function Assessment. The area under the receiver operating characteristic curve (AUROC) data in the blue-shaded diagonal cells derive from models that include baseline variables plus candidate criteria. For comparison,

the AUROC of the baseline model alone is 0.58 (95% CI, 0.57-0.60) in the ICU and 0.69 (95% CI, 0.68-0.70) outside of the ICU. Below the AUROC data cells are *P* values for comparisons between criteria, while above the AUROC data cells are Cronbach α data (with bootstrap 95% confidence intervals), a measure of agreement.

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

System	Score				
	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, ×10 ³ /μL	≥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: Fio₂, fraction of inspired oxygen; MAP, mean arterial pressure; Pao₂, 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.

- Sepsis is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection.
- Organ dysfunction can be identified as an acute change in total SOFA score ≥ 2 points consequent to the infection.
 - The baseline SOFA score can be assumed to be zero in patients not known to have preexisting organ dysfunction.
 - A SOFA score ≥ 2 reflects an overall mortality risk of approximately 10% in a general hospital population with suspected infection. Even patients presenting with modest dysfunction can deteriorate further, emphasizing the seriousness of this condition and the need for prompt and appropriate intervention, if not already being instituted.
- In lay terms, sepsis is a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs.

- Septic shock is a subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality.
- Patients with septic shock can be identified with a clinical construct of sepsis with persisting hypotension requiring vasopressors to maintain MAP ≥ 65 mm Hg and having a serum lactate level >2 mmol/L (18 mg/dL) despite adequate volume resuscitation. With these criteria, hospital mortality is in excess of 40%.

Box 4. qSOFA (Quick SOFA) Criteria

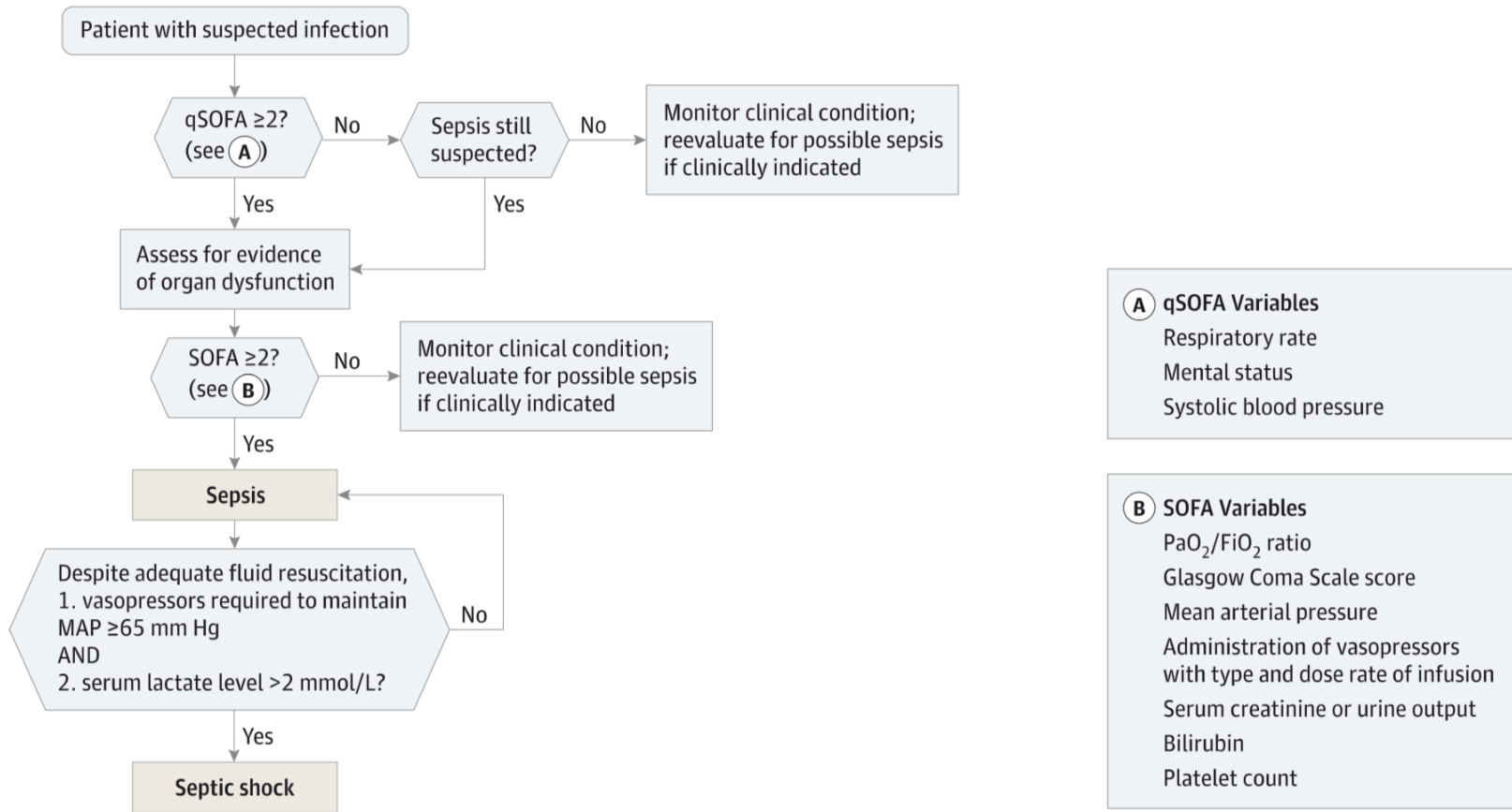
Respiratory rate ≥ 22 /min

Altered mentation

Systolic blood pressure ≤ 100 mm Hg

- Patients with suspected infection who are likely to have a prolonged ICU stay or to die in the hospital can be promptly identified at the bedside with qSOFA, ie, alteration in mental status, systolic blood pressure ≤ 100 mm Hg, or respiratory rate ≥ 22 /min.

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



The baseline Sequential [Sepsis-related] Organ Failure Assessment (SOFA) score should be assumed to be zero unless the patient is known to have preexisting (acute or chronic) organ dysfunction before the onset of infection. qSOFA indicates quick SOFA; MAP, mean arterial pressure.

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

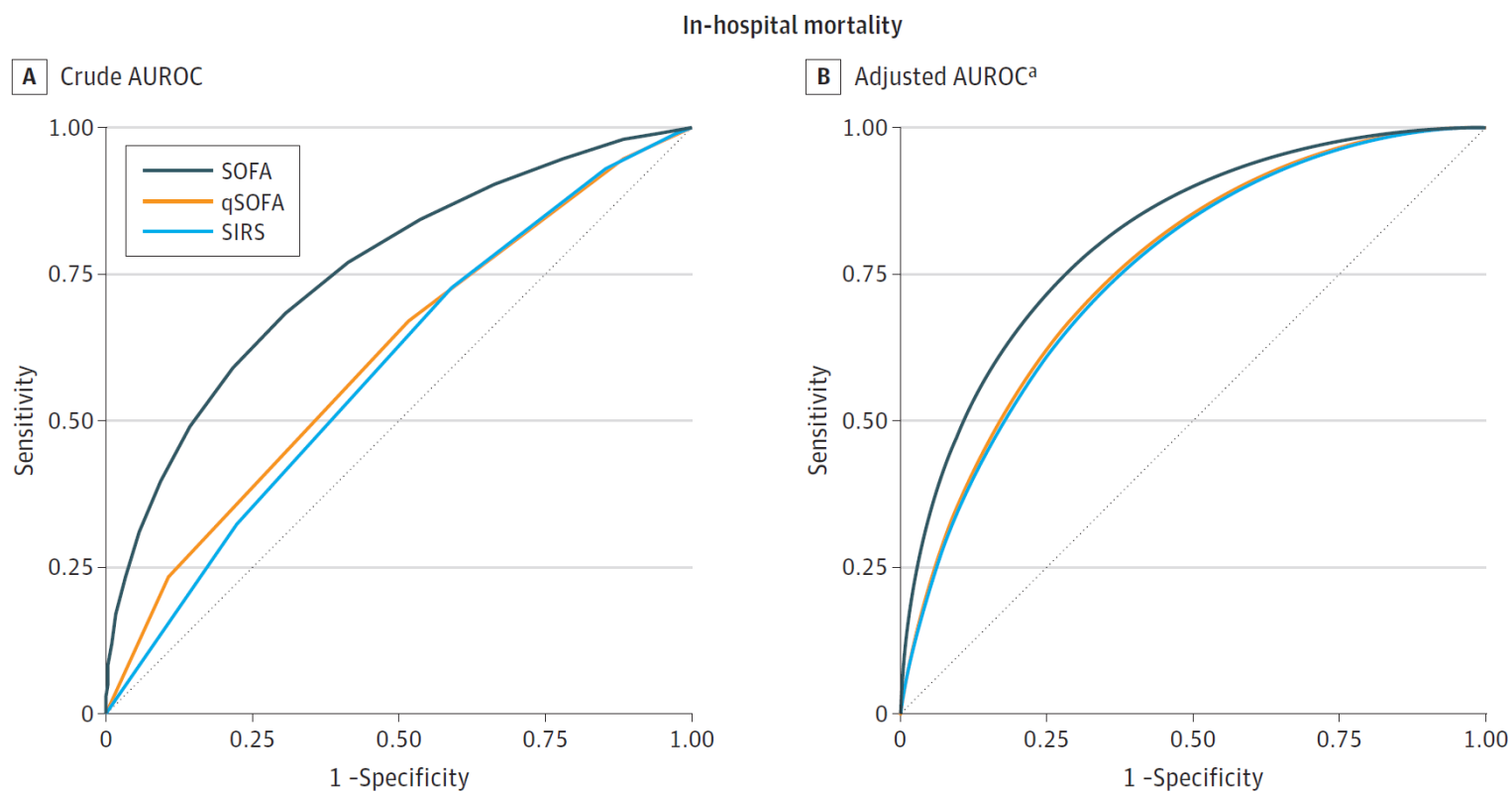
Eamon P. Raith, MBBS, MACCP; Andrew A. Udy, MBChB, PhD, FCICM; Michael Bailey, PhD; Steven McGloughlin, BMed FRACP, FCICM, MPHTM; Christopher MacIsaac, MBBS, PhD, FRACP, FCICM; Rinaldo Bellomo, MD, FRACP, FCICM, FAHMS; David V. Pilcher, MBBS, FRACP, FCICM; for the Australian and New Zealand Intensive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

Table 1. Demographic, Physiological, Illness Severity, Diagnostic and Outcome Data Among Critically Ill Patients Admitted With Infection in the ANZICS Adult Patient Database (2000-2015)

	All (N = 184 875)	Survivors (n = 150 297) ^a	Nonsurvivors (n = 34 578) ^a
Demographics			
Age, mean (SD), y	62.9 (17.4)	61.4 (17.7)	69.2 (14.6)
Male, No. (%)	102335 (55.4)	82 528 (54.9)	19807 (57.3)
Type of hospital, No. (%)			
Tertiary	80 571 (43.6)	63 515 (42.3)	17 056 (49.3)
Metropolitan	48 269 (26.1)	39 463 (26.3)	8806 (25.5)
Rural or regional	34 817 (18.8)	29 389 (19.6)	5428 (15.7)
Private	21 218 (11.5)	17 930 (11.9)	3288 (9.5)
ICU admission source, No. (%)			
Emergency department	69 209 (37.4)	57 409 (38.2)	11 800 (34.1)
Ward	48 411 (26.2)	34 925 (23.2)	13 486 (39.0)
Operating theatre	44 016 (23.8)	39 615 (26.4)	4401 (12.7)
Other ICU or hospital	23 008 (12.4)	18 183 (12.1)	4825 (14)
Unknown	231 (0.2)	165 (0.1)	66 (0.2)
Severity of Illness and Other Scores on Admission to ICU			
qSOFA score ≥ 2 (n = 183 078), No. (%)	99 611 (54.4)	76 853 (51.6)	22 758 (66.8)
SIRS criteria ≥ 2 (n = 182 974), No. (%)	158 710 (86.7)	127 062 (85.3)	31 648 (93.0)
SOFA score ≥ 2 (n = 183 331), No. (%)	165 103 (90.1)	131 738 (88.3)	33 365 (97.7)
APACHE III score, mean (SD) ^b	62.9 (29.8)	56.3 (24.9)	91.8 (32.2)
APACHE III risk of death, mean, median (IQR), % ^c	24.1, 14.7 (5.1-35.6)	19.6, 11.0 (4.0-25.5)	49.5, 48.2 (24.9-73.9)
ANZROD, mean, median (IQR), % ^d	18.7, 9.9 (3.6-25.7)	13.2, 7.3 (2.9-17.2)	42.6, 38.9 (19.8-63.6)
Outcomes			
Hospital mortality (primary outcome), No. (%)	34 578 (18.7)	0	34 578 (100)
Hospital mortality or ICU stay ≥ 3 d (secondary outcome), No. (%)	102 976 (55.7)	68 398 (45.5)	34 578 (100)
ICU mortality, No. (%)	22 950 (12.4)	0	22 950 (66.4)
ICU LOS, median (IQR), d	2.8 (1.3-5.9)	2.7 (1.3-5.6)	3.1 (1.1-7.6)
Hospital LOS, median (IQR), d	11.5 (6.1-22.4)	12.0 (6.5-23.0)	9.2 (3.2-20.2)

JAMA. 2017;317(3):290-300.

Figure 3. Area Under the Receiver Operating Characteristic Curves (AUROCs) for Discriminatory Capacity for In-Hospital Mortality or Composite Outcomes of In-Hospital Mortality or ICU Length of Stay ≥ 3 Days for SIRS Criteria, qSOFA Score, and SOFA Score (Increase in Score) on ICU Admission



En onco-hématologie

- ◆ Le sepsis et le choc septique sont une cause importante d'admission aux SI
- ◆ Mortalité plus importante que la population générale

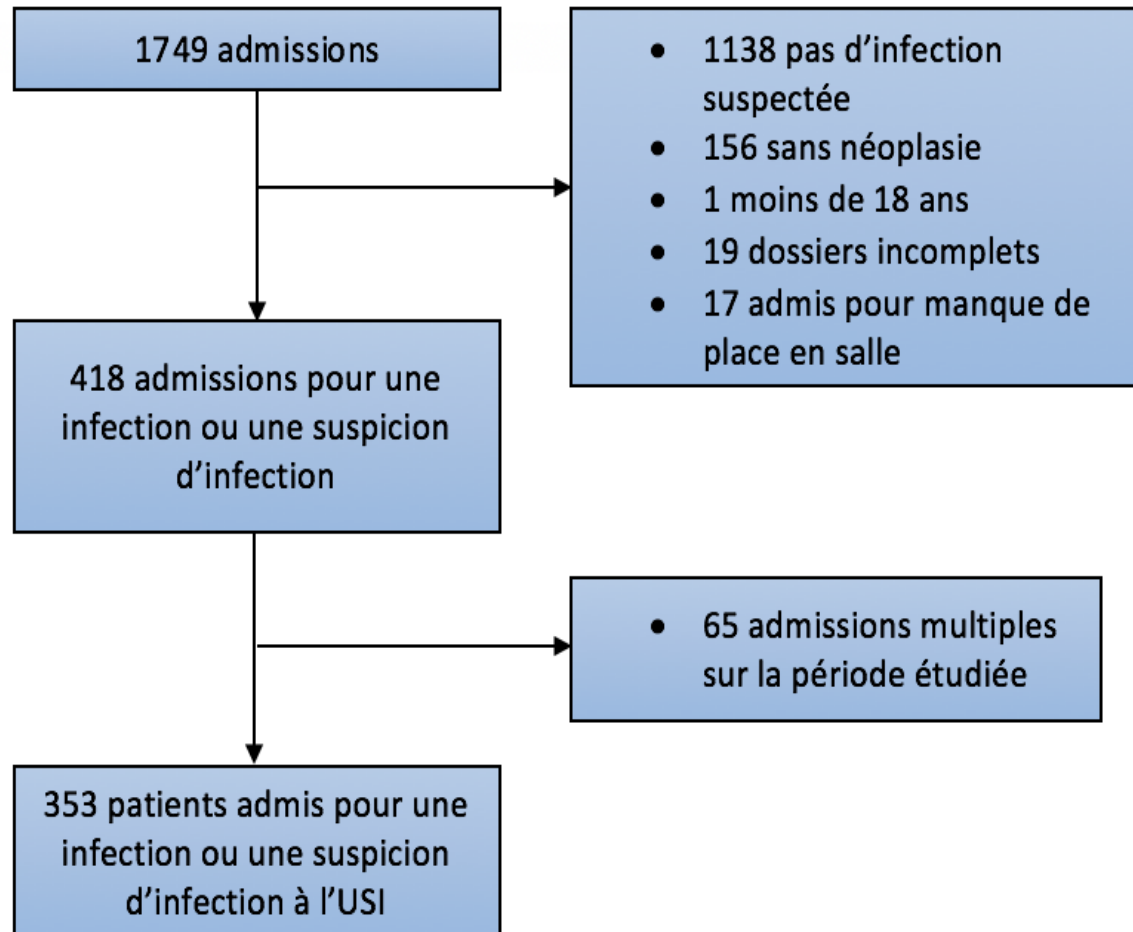
Objectif

- ◆ Evaluer ces nouvelles définitions et ces scores (SOFA, SIRS et qSOFA) chez le patient oncologique admis pour une suspicion d'infection aux soins intensifs.

Patients et méthodes

- ◆ Patients admis aux soins intensifs de 2013 à 2016
- ◆ Plus de 18 ans
- ◆ Ayant une néoplasie
- ◆ Suspicion d'infection ou infection établie
- ◆ Seulement la première admission

Échantillon



Caractéristiques des patients

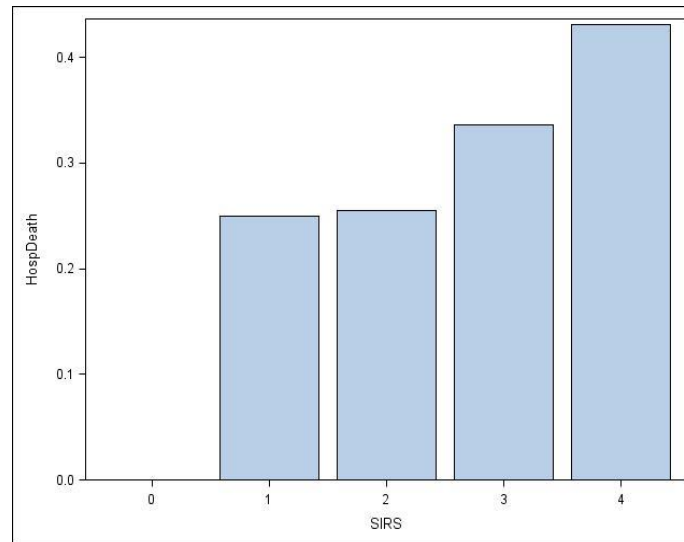
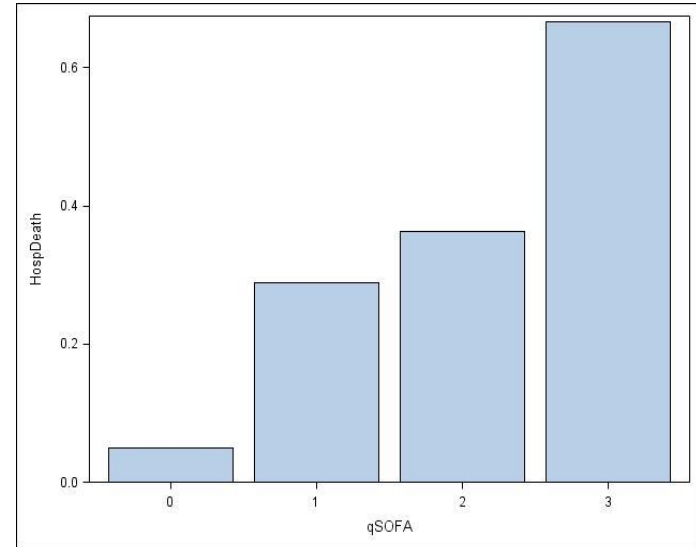
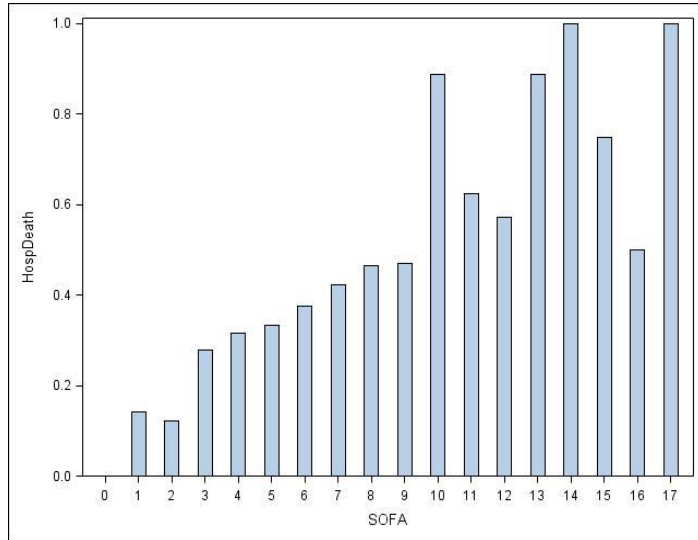
Catégories	Total	Vivant à la sortie	Mort à l'hôpital	P
Patients	353	224 (63%)	129 (37%)	
Âge	60 (+/- 14std)	59 (+/- 15 std)	62 (+/- 12std)	0,17
Sexe	353			
Hommes	213 (60%)	136 (64%)	77 (36%)	0,85
Femmes	140 (40%)	88 (63%)	52 (37%)	
Type de cancer	353			
Solide	241 (68%)	152 (63%)	89 (37%)	0,83
Hématologique	112 (32%)	72 (64%)	40 (36%)	
Cancers solides	241			
Sans métastases	62 (26%)	49 (79%)	13 (21%)	0,002
Avec métastases	177 (73%)	101 (57%)	76 (43%)	
Infos manquantes	2 (1%)	2 (100%)		
Cancers hématologiques	112			
Allogreffés	30 (27%)	15 (50%)	15 (50%)	0,06
Non allogreffés	82 (73%)	57 (70%)	25 (30%)	
Statut du cancer	353			
Induction	87 (25%)	51 (59%)	36 (41%)	Global : 0,07 Rémission complète vs les autres : 0,01
Rémission complète	52 (15%)	41 (79%)	11 (21%)	
Rémission partielle	16 (5%)	12 (75%)	4 (25%)	
Stable	34 (10%)	23 (68%)	11 (32%)	
Progressive	164 (46%)	97 (59%)	67 (41%)	
Stade fonctionnel	353			
Diagnostique	14 (4%)	7 (50%)	7 (50%)	Global : 0,02 Curative vs les autres : 0,002
Curative	132 (37%)	97 (73%)	35 (27%)	
Contrôle	173 (49%)	102 (59%)	71 (41%)	
Pivot	22 (6%)	13 (59%)	9 (41%)	
Palliative	12 (3%)	5 (42%)	7 (58%)	
Chimiothérapie dans le mois	353			
Oui	175 (50%)	109 (62%)	66 (38%)	0,65
Non	178 (50%)	115 (65%)	63 (35%)	
Neutropénie	353			
Oui	90 (25%)	56 (62%)	34 (38%)	0,76
Non	239 (68%)	153 (64%)	86 (34%)	
Infos manquantes	24 (7%)	15	9	
Admis via	353			
Consultations	1 (<1%)	1 (100%)		Global : 0,01 Domicile vs autres : 0,01 Hôpital vs autres : 0,006
Domicile	44 (12%)	35 (80%)	9 (20%)	
Hôpital	219 (62%)	127 (58%)	92 (42%)	
Urgence	88 (25%)	61 (69%)	27 (31%)	
Info manquante	1 (<1%)		1	

Scores

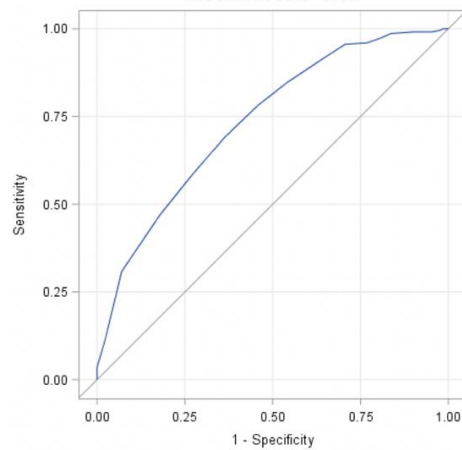
Catégories	Total	Vivant à la sortie	Mort à l'hôpital	P
Organes défaillants	353			
0	7 (2%)	7 (100%)		<0,001
1	63 (18%)	53 (84%)	10 (16%)	
2	91 (26%)	68 (75%)	23 (25%)	
3	84 (24%)	51 (61%)	33 (39%)	
4	66 (19%)	31 (47%)	35 (53%)	
5	35 (10%)	12 (34%)	23 (66%)	
6	7 (2%)	2 (29%)	5 (71%)	
Scores SOFA	353			
SOFA ≥ 2	324 (92%)	198 (61%)	126 (39%)	0,002
SOFA < 2	29 (8%)	26 (90%)	3 (10%)	
qSOFA	353			
qSOFA ≥ 2	222 (63%)	126 (57%)	96 (43%)	<0,001
qSOFA < 2	131 (37%)	98 (75%)	33 (25%)	
SIRS score	353			
SIRS ≥ 2	348 (99%)	220 (63%)	128 (37%)	0,66
SIRS <2	5 (1%)	4 (80%)	1 (20%)	
Score de Charlson	353	6,5 (+/- 3 std)	7,2 (+/- 3 std)	0,03



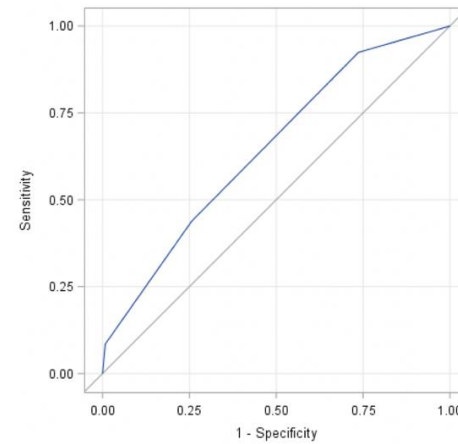
Mortalité en fonction des scores



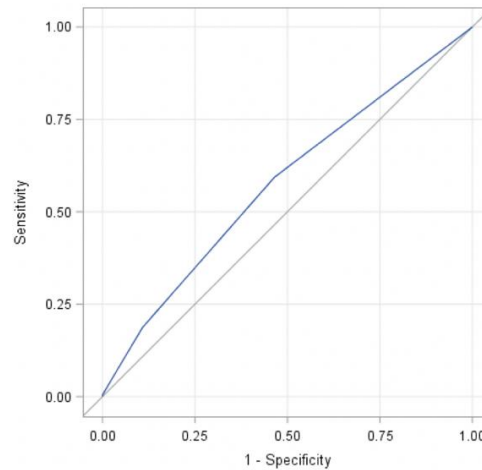
Courbes ROC



AUROC SOFA



AUROC qSOFA



AUROC SIRS

SOFA vs qSOFA: $p = 0.006$ / SOFA vs SIRS: $p < 0.001$ / qSOFA vs SIRS: $p = 0.04$

Analyse multivariée des facteurs influençant la mortalité hospitalière

	Odds ratio (IC 95%)	p
SOFA (par augmentation d'une unité)	1,28 (1,18 – 1,39)	<0,001
qSOFA (par augmentation d'une unité)	1,48 (1,04 – 2,11)	0,03
Rémission complète	0,39 (0,22 – 0,67)	<0,001

Anciennes et nouvelles définitions du sepsis et du choc septique

	Ancienne définition		Nouvelle définition	
	Vivants à la sortie de l'hôpital	Morts à l'hôpital	Vivants à la sortie de l'hôpital	Morts à l'hôpital
Sepsis	9		267	
	8 (89%)	1 (11%)	180 (67%)	87 (33%)
Sepsis sévère	271		/	
	185 (68%)	86 (32%)		
Choc septique	68		57	
	27 (40%)	41 (60%)	18 (32%)	39 (68%)

Accuracy of SOFA, qSOFA, and SIRS scores for mortality in cancer patients admitted to an intensive care unit with suspected infection☆



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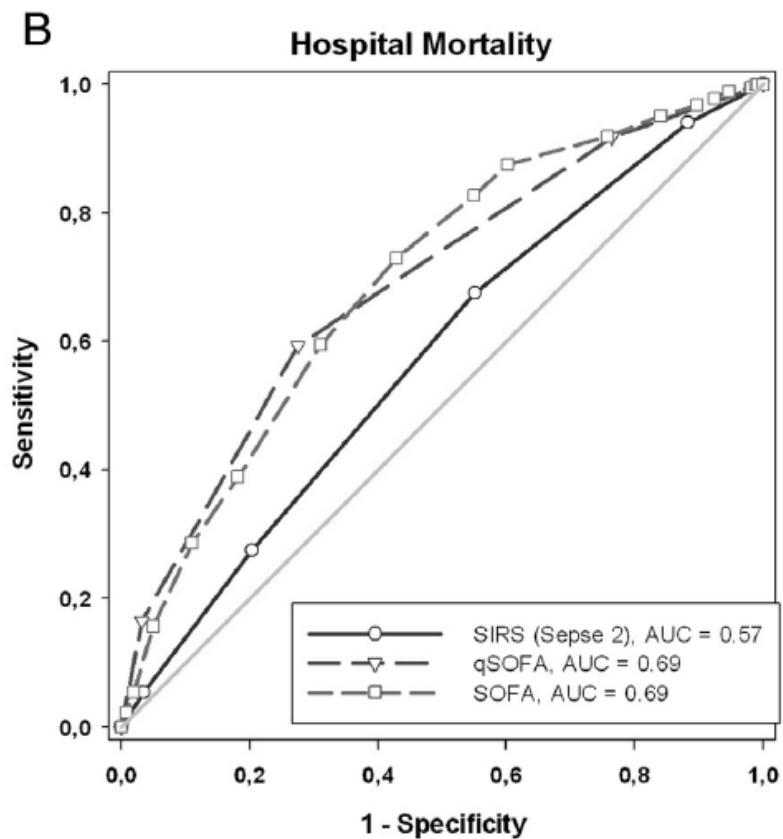
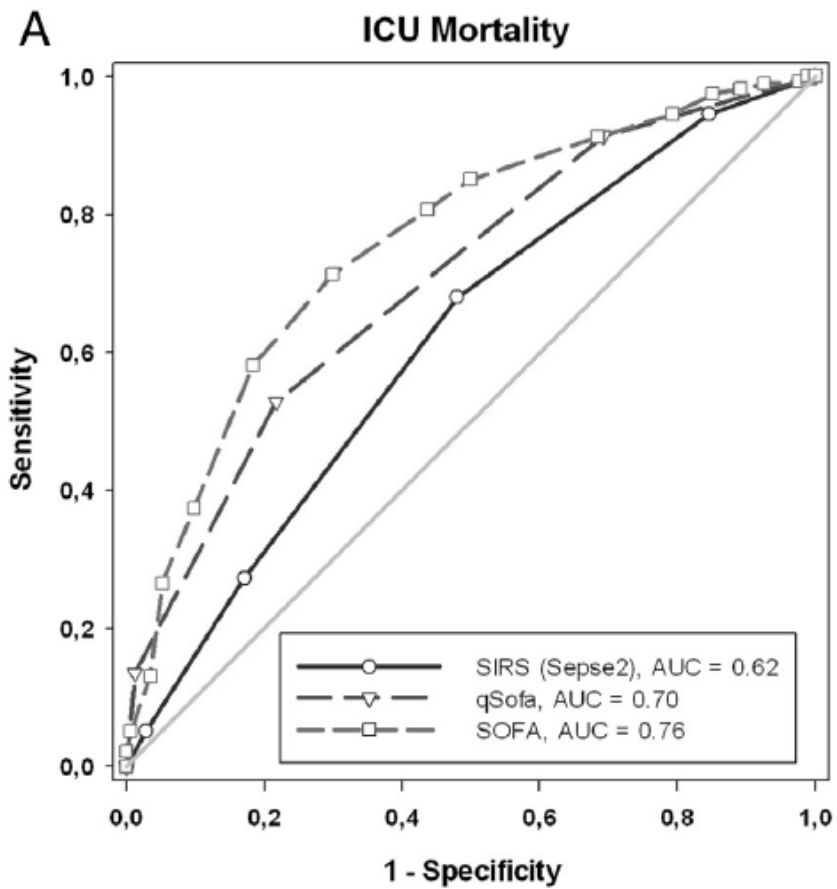
^c Pulmonary Division, Heart Institute (Incor), Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, Av. Dr. Enéas de Carvalho Aguiar, 44 Pinheiros, São Paulo, SP 05403-900, Brazil

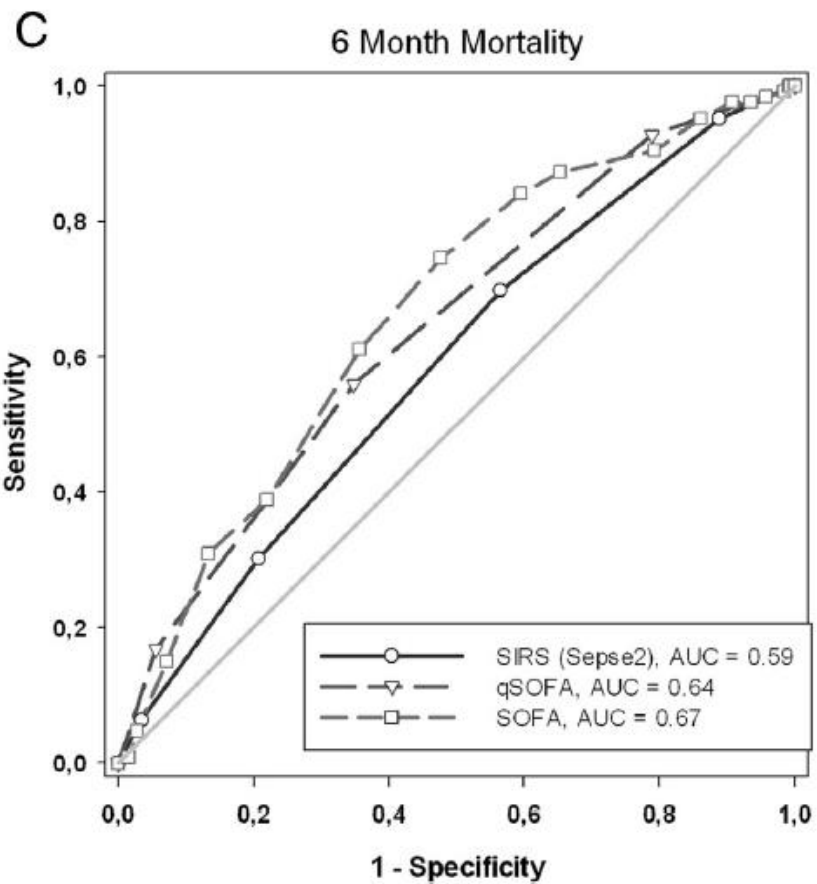
Table 1
Patients' characteristics and outcomes.

Variables	Whole group (N = 450)	Survivors (N = 185)	Nonsurvivors (N = 265)	P-value
Age (years)	59.6 ± 14.4	58.6 ± 13.8	60.4 ± 14.8	0.20
Male (%)	248 (55.1%)	102 (55.1%)	146 (55.1%)	0.99
SAPS 3	87 ± 17	81 ± 14	90 ± 18	<0.01
SOFA	6.53 ± 3.26	5.26 ± 2.80	7.41 ± 3.27	<0.01
Type of cancer				
Hematological malignancies	84 (18.7%)	43 (23.2%)	41 (15.5%)	0.80
Locoregional solid tumor	112 (24.9%)	47 (25.4%)	65 (24.5%)	0.09
Metastatic solid tumor	254 (56.4%)	77 (41.6%)	177 (66.8%)	<0.01
Solid tumor source				0.705
Gastrointestinal	132 (29.3%)	57 (30.8%)	75 (28.3%)	
Genitourinary	40 (8.9%)	16 (8.6%)	24 (9.1%)	
Head and neck	36 (8.0%)	14 (7.6%)	22 (8.3%)	
Cynecological	29 (6.4%)	12 (6.5%)	17 (6.4%)	
Lung	27 (6.0%)	9 (2.0%)	18 (6.8%)	
ECOG				
0-1	154 (34.2%)	82 (44.3%)	72 (27.2%)	0.40
2-4	296 (65.8%)	103 (55.7%)	193 (72.8%)	<0.01
Infection site				0.315
Abdominal	125 (27.8%)	48 (29.1%)	77 (29.0%)	
Respiratory	105 (23.3%)	32 (17.3%)	73 (27.5%)	
Urinary	54 (12.0%)	26 (14.0%)	28 (10.6%)	
Unknown ^a	83 (18.4%)	41 (22.2%)	42 (15.8%)	
Lactate at admission (mmol/L)	1.8 (1.2-2.7)	1.8 (1.0-2.1)	1.8 (1.5-3.5)	<0.01
Mechanical ventilation	79 (17.6%)	11 (5.9%)	68 (25.7%)	<0.01
Renal replacement therapy	32 (7.1%)	13 (7.0%)	19 (7.2%)	0.30
Vasopressors	343 (76.2%)	134 (72.4%)	209 (78.9%)	<0.01
Number of SIRS criteria				
≤1 criteria	105 (23.3%)	51 (27.6%)	54 (20.4%)	0.09
2 criteria	166 (36.9%)	74 (40.0%)	92 (34.7%)	0.16
3 criteria	137 (30.4%)	49 (26.5%)	88 (33.2%)	0.01
4 criteria	42 (9.3%)	11 (5.9%)	31 (11.7%)	<0.01
Temperature <36 °C or >38 °C	171 (38.0%)	52 (28.1%)	119 (44.9%)	<0.01
Increased respiratory rate or decreased or PaCO ₂	181 (40.2%)	69 (37.3%)	112 (42.3%)	0.50
White-cell < 4000 or > 12,000/mm ³	322 (71.6%)	130 (70.3%)	192 (72.5%)	0.60
Heart rate > 100 bpm	317 (70.4%)	129 (69.7%)	188 (70.9%)	0.80
Sepsis-2 definition				
Sepsis	2 (0.4%)	1 (0.5%)	1 (0.4%)	1.00
Severe sepsis	27 (6.0%)	12 (6.5%)	15 (5.7%)	0.60
Septic shock	316 (70.2%)	122 (65.9%)	194 (73.2%)	<0.01
Sepsis-3 definition				
Infection without organ dysfunction	15 (3.3%)	10 (5.4%)	5 (1.9%)	0.20
Sepsis	287 (63.8%)	128 (69.2%)	159 (60.0%)	0.11
Septic shock	148 (32.9%)	47 (25.4%)	101 (38.1%)	<0.01
ICU length of stay (days)	5.7 ± 8.6	6.1 ± 9.2	5.2 ± 7.6	<0.001
End-of-life decisions (ICU)	99 (22%)			

Table 2
Performance of SIRS, qSOFA and SOFA criteria for prediction of ICU and hospital mortality.

	ICU mortality			Hospital mortality		
	Sensitivity (95% CI)	Specificity (95% CI)	AUC (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)	AUC (95% CI)
SIRS	68.0 (62.1–73.5)	52 (44.3–59.6)	0.62 (0.56–0.67)	67.6 (60.3–74.2)	44.9 (38.8–51.1)	0.58 (0.52–0.63)
qSOFA	78.3 (71.3–84.3)	52.8 (46.6–58.9)	0.71 (0.65–0.76)	72.5 (66.5–77.9)	59.3 (51.8–66.5)	0.69 (0.64–0.74)
SOFA	96.4 (92.7–98.7)	13.1 (9.3–17.7)	0.76 (0.71–0.81)	95.1 (91.7–97.4)	15.7 (10.8–21.7)	0.69 (0.65–0.74)





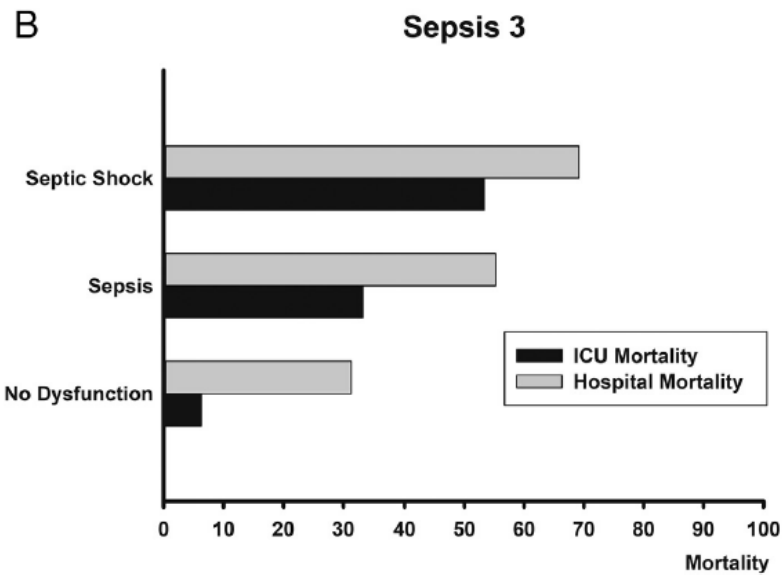
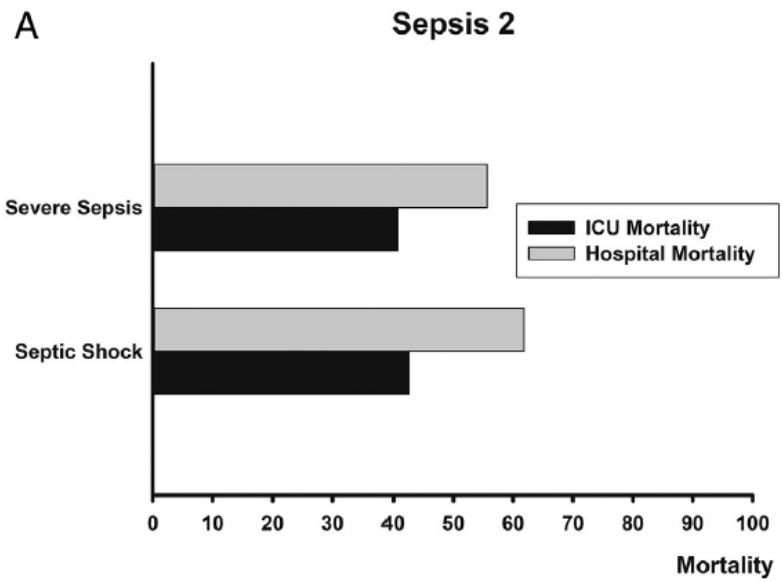


Fig. 2. Mortality across Sepsis-2 (a) and Sepsis-3 (b) definitions.

Courbes ROC

AUROC : SOFA > qSOFA > SIRS

	AUROC SOFA	AUROC qSOFA	AUROC SIRS
Seymour	0,74	0,66	0,64
Raith	0,753	0,607	0,589
Costa	0,69	0,69	0,58
Notre étude	0,74	0,65	0,58

Conclusion

- 1/ Nouvelles définitions applicables aux patients oncologiques
- 2/ Même fiabilité que dans la population générale
- 3/ Augmentation des scores SOFA et qSOFA est associée à un risque accru de mortalité hospitalière
- 4/ SOFA > qSOFA > SIRS pour prédire la mortalité hospitalière

En pratique...

- ◆ SIRS?
- ◆ qSOFA?
- ◆ SOFA?

Box 4. qSOFA (Quick SOFA) Criteria

Respiratory rate ≥ 22 /min

Altered mentation

Systolic blood pressure ≤ 100 mm Hg

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

System	Score				
	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, ×10 ³ /μL	≥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: Fio₂, fraction of inspired oxygen; MAP, mean arterial pressure; Pao₂, 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.

Respiratoire: tachypnée, hypoxémie
Cardiovasculaire: hypotension
Neurologique: status mental altéré

Rénal: oligurie, augmentation créatinine
Hématologique: plaquettes basses, CIVD
Foie: augmentation bilirubine

