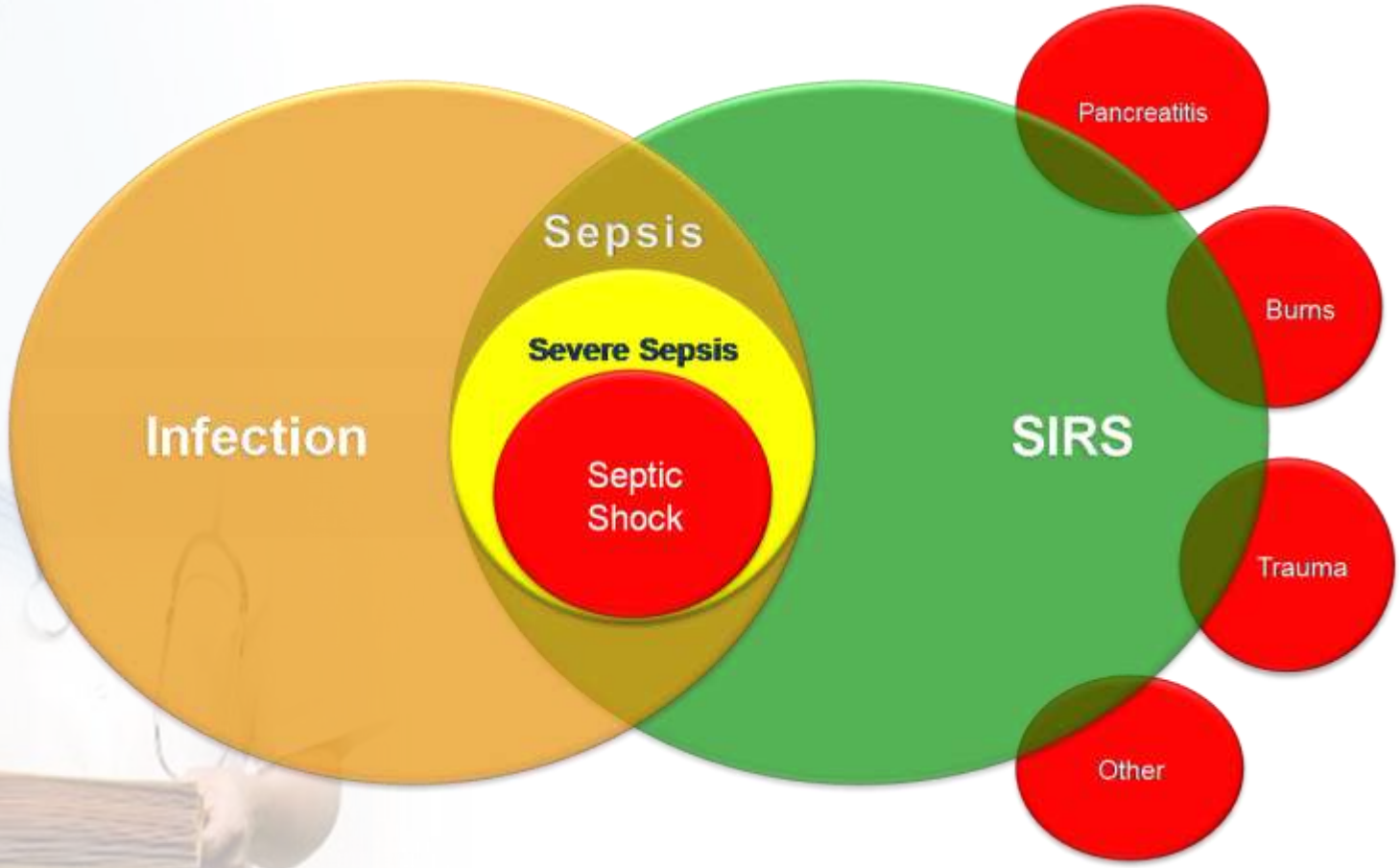
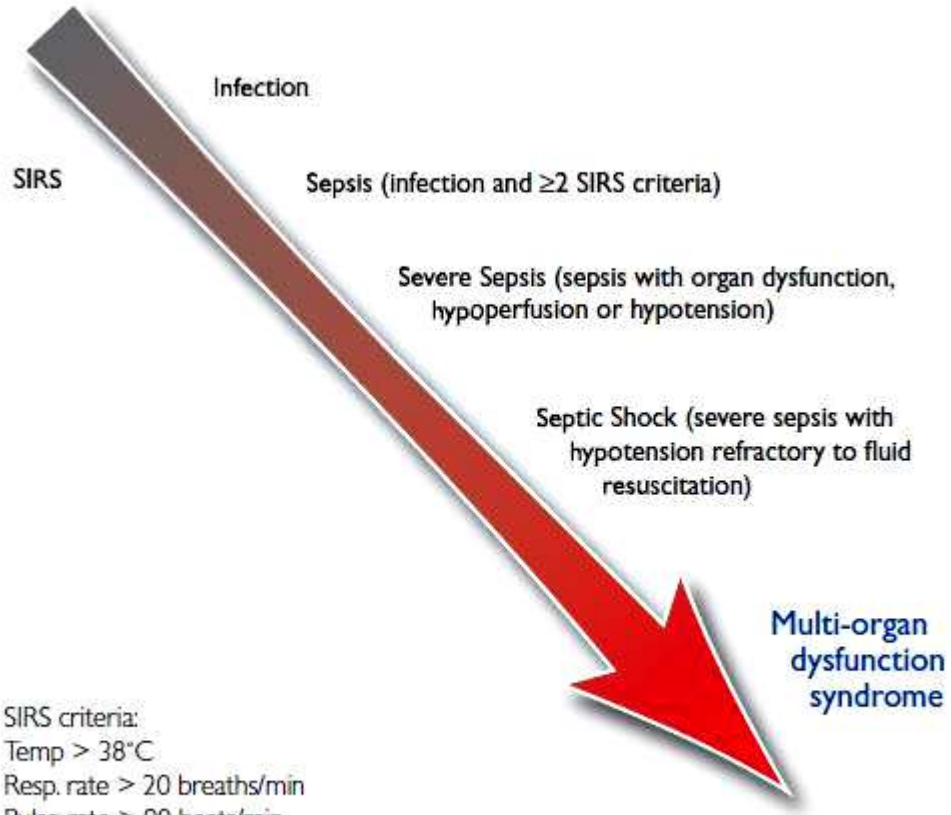
« Survivre aux recommandations de la SSC »!

Pr Souheil Elatrous

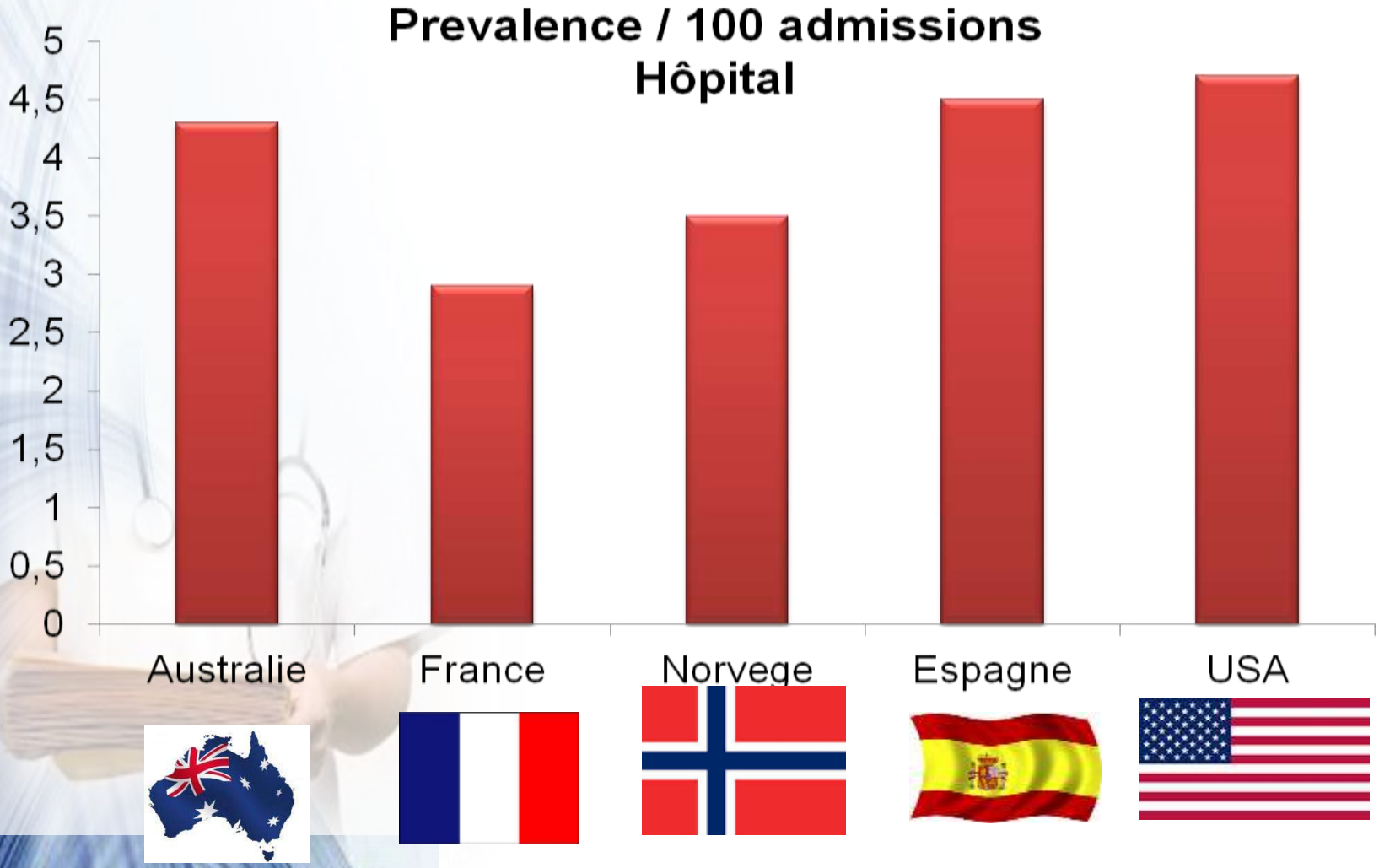

Infection
Sepsis
Severe Sepsis
Septic Shock
SIRS
Pancreatitis
Burns
Trauma
Other



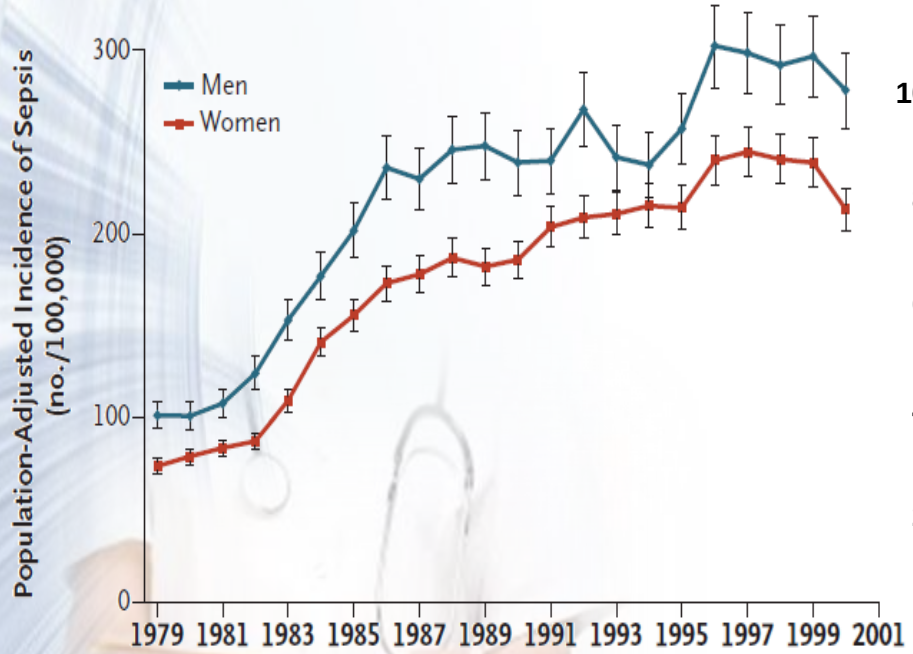
SIRS criteria:
Temp > 38°C
Resp. rate > 20 breaths/min
Pulse rate > 90 beats/min
WBC <4 or >12 x10^9 cells/litre

SIRS = Systemic Inflammatory Response Syndrome

Epidémiologie

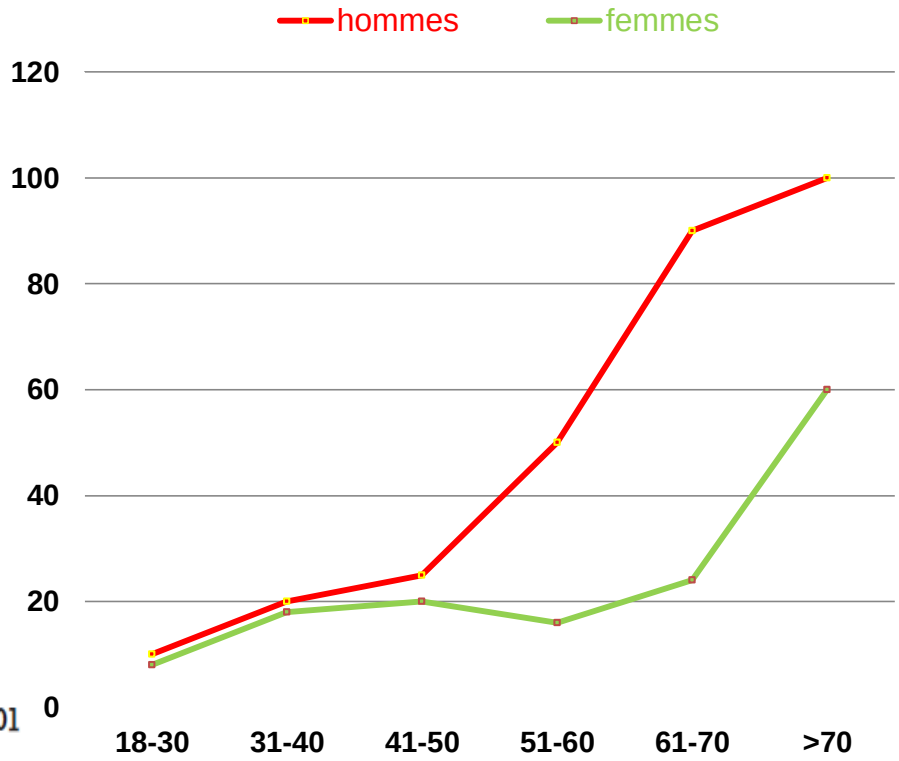


Epidémiologie



USA

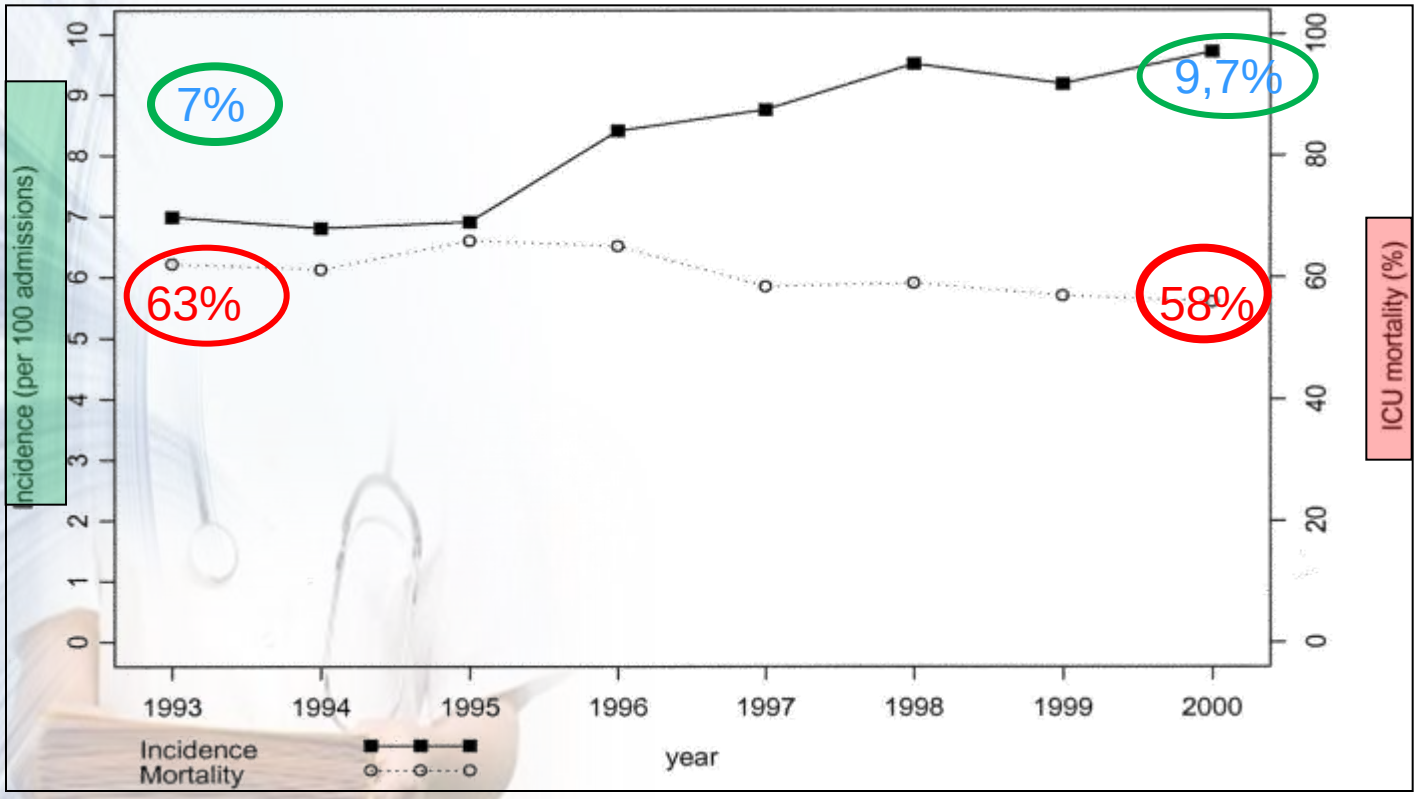
Martin NEJM 2003



Spain

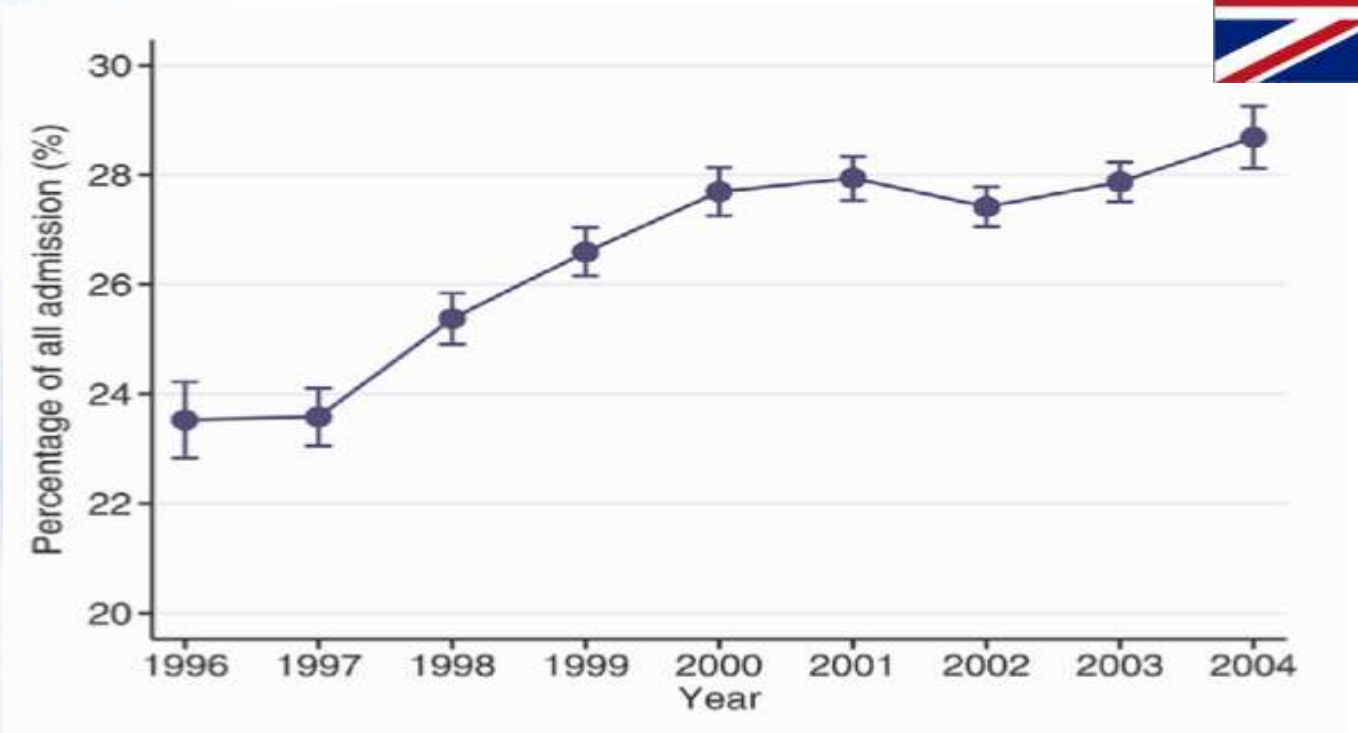
(455 cases)

Réanimation



Annane AJRCCM 2003

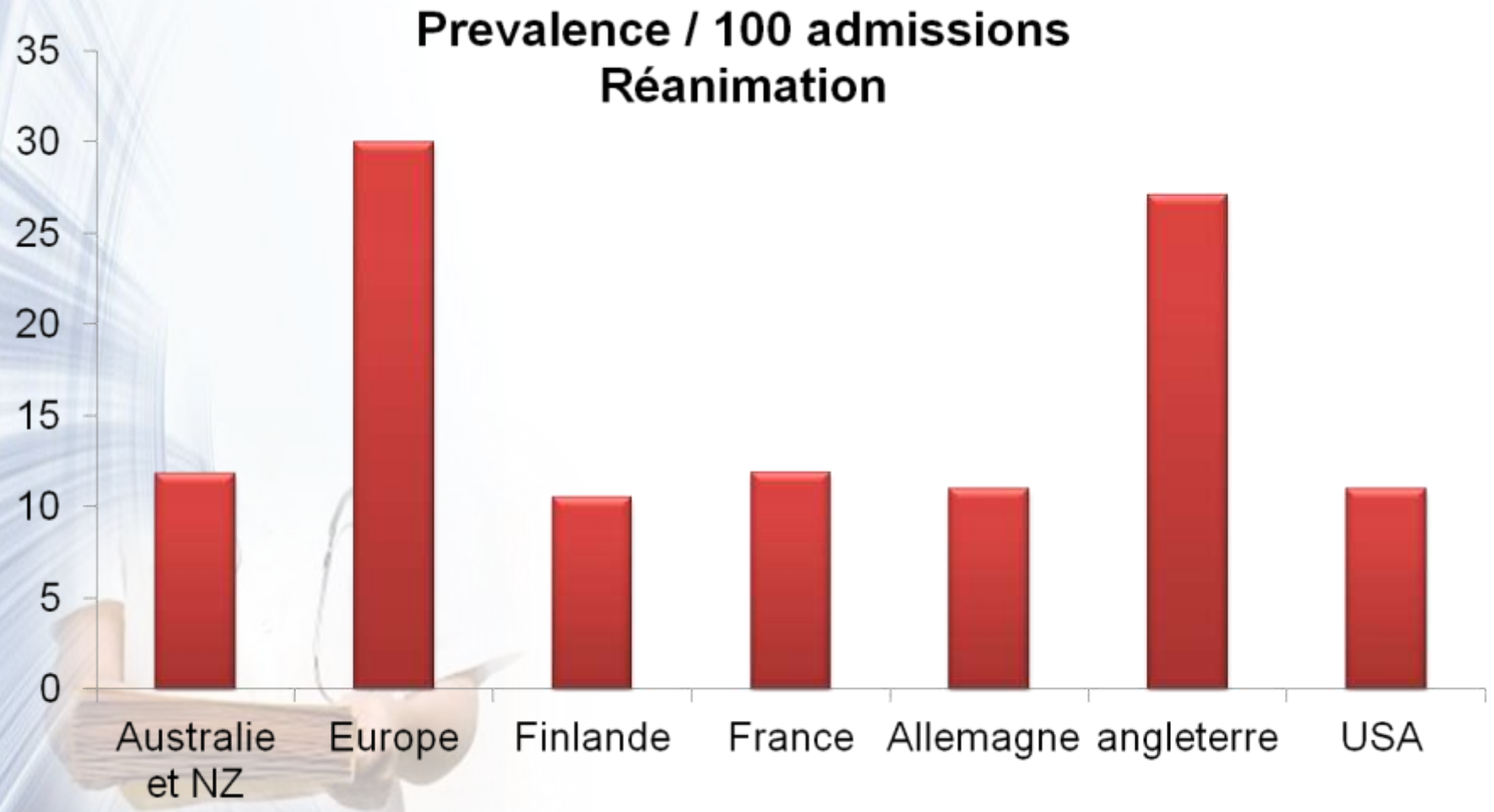
Réanimation



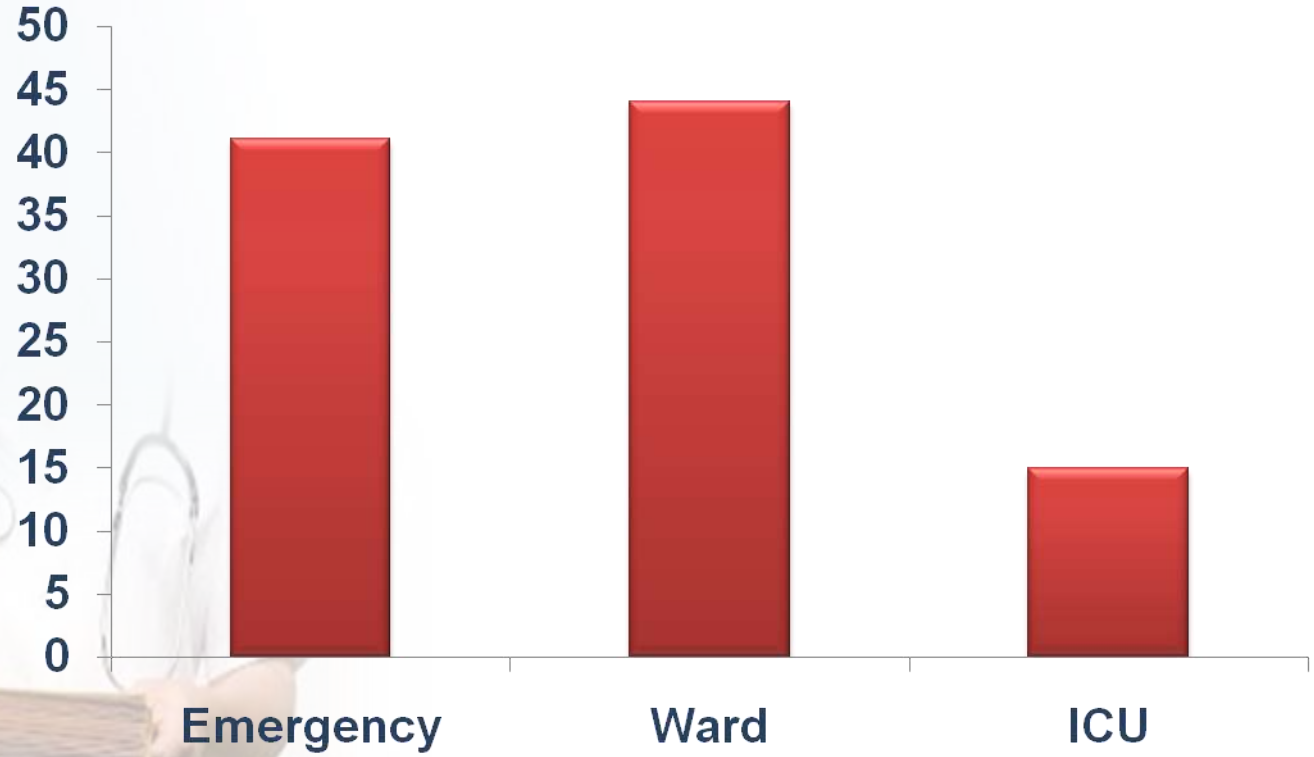
United Kingdom

Harisson D Crit Care 2006

Epidémiologie

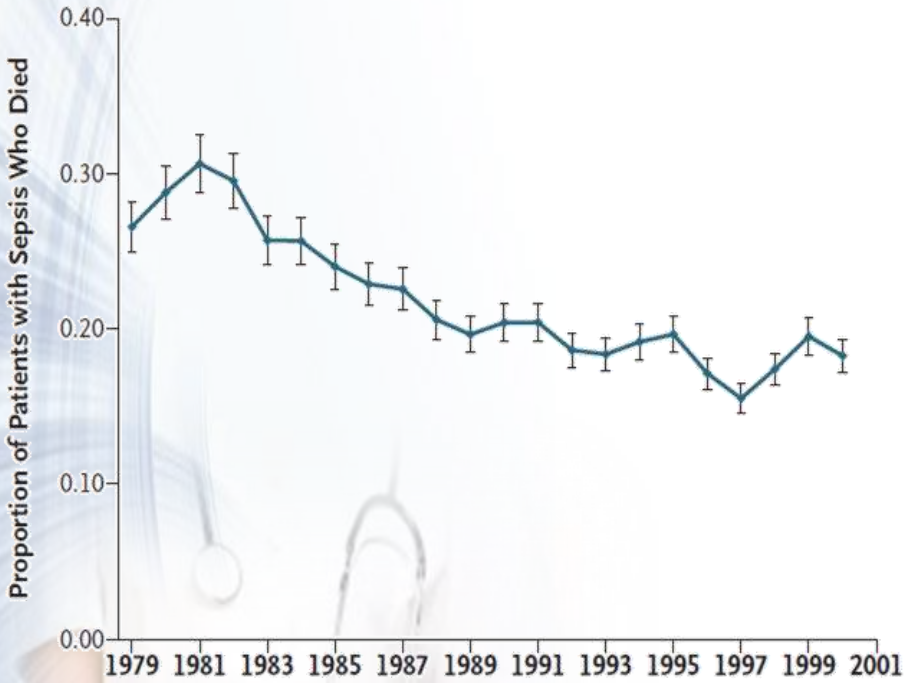


Localisation du malade au moment du diagnostic du sepsis



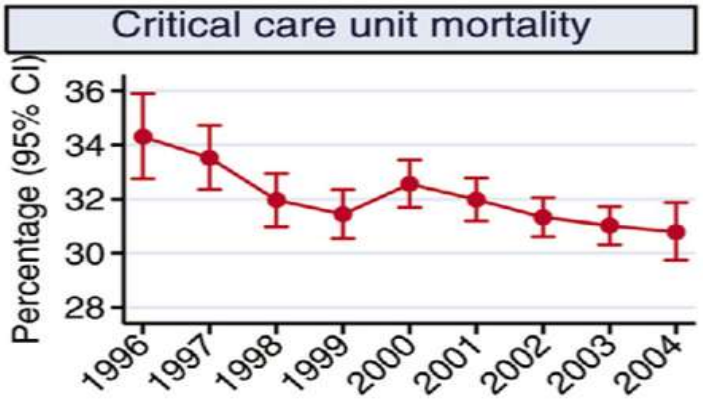
Ferrer AJRCCM 2009

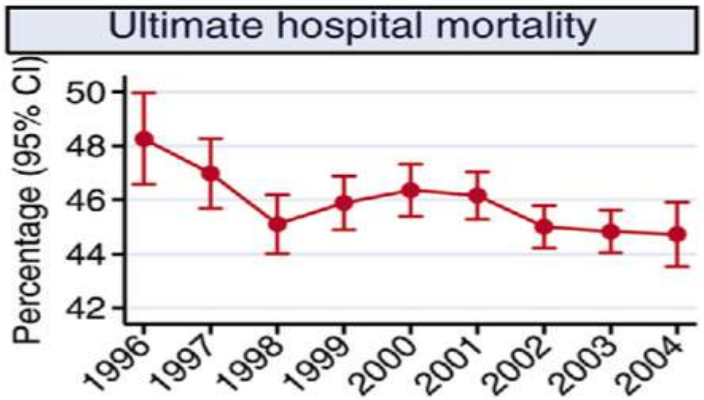
Mortalité



USA

Martin NEJM 2003

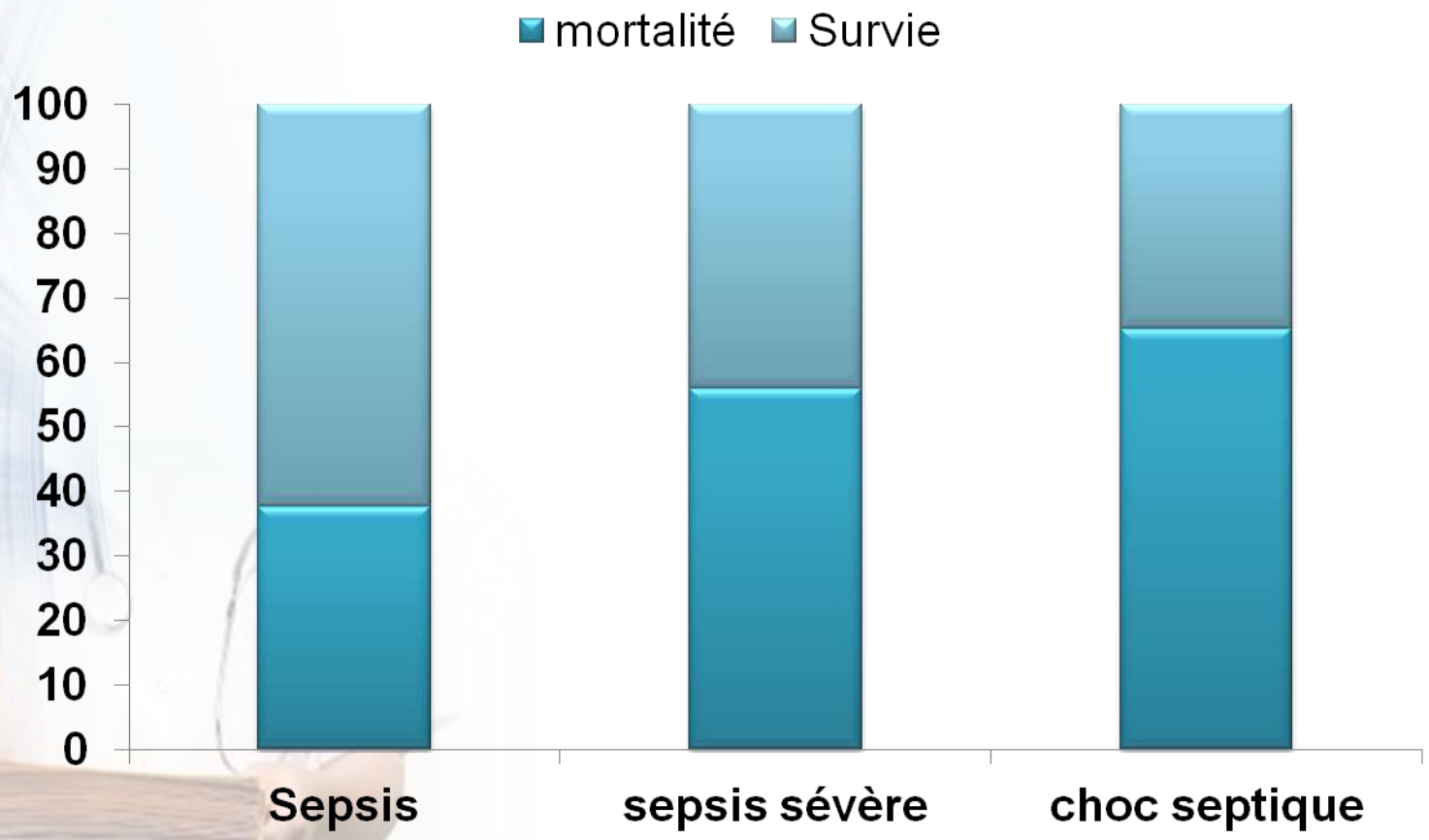


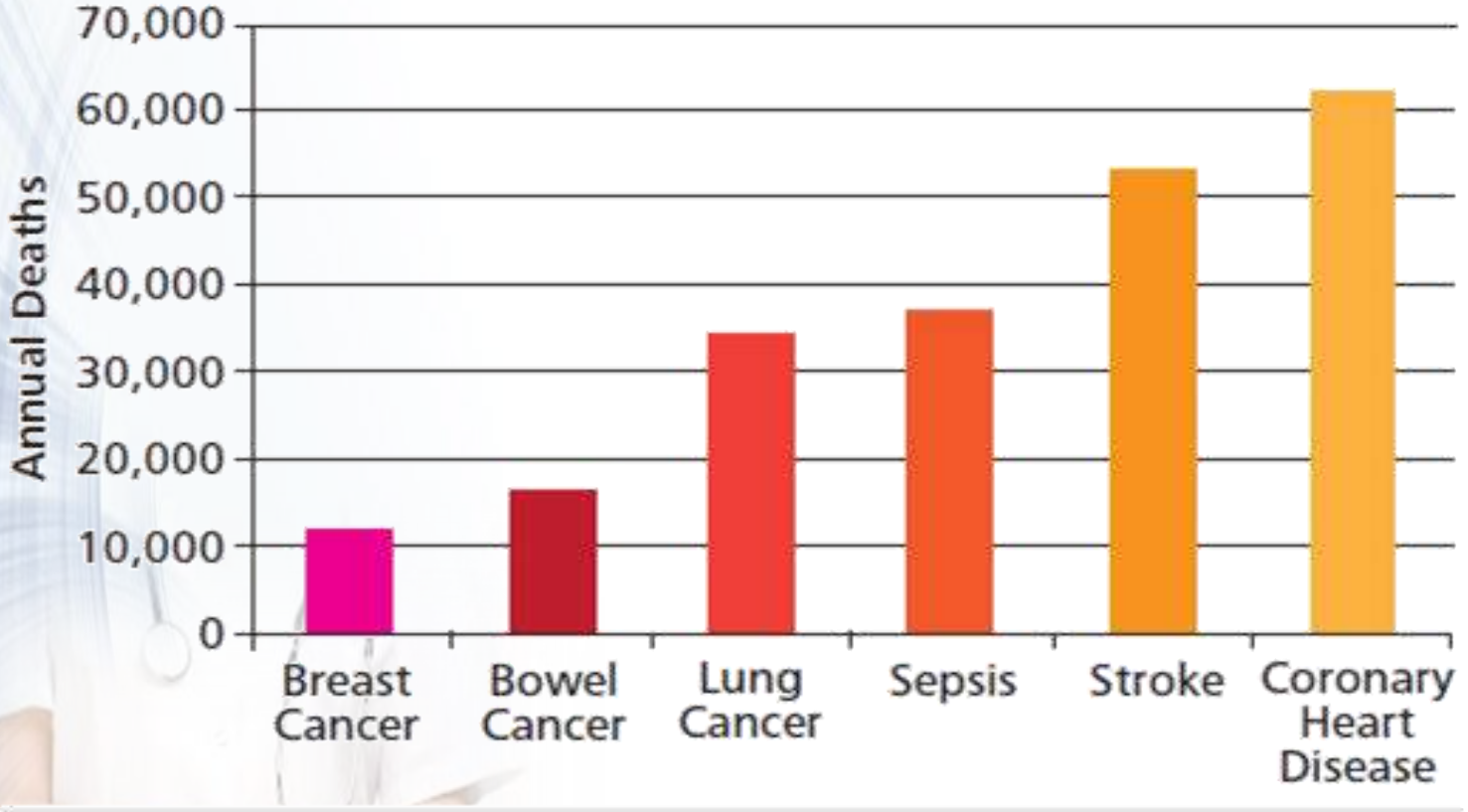


United Kingdom

Harisson D Crit Care 2006

Mortalité


mortalité
Survie
100
90
80
70
60
50
40
30
20
10
0
Sepsis
sepsis sévère
choc septique


Annual Deaths
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Breast Cancer
Bowel Cancer
Lung Cancer
Sepsis
Stroke
Coronary Heart Disease

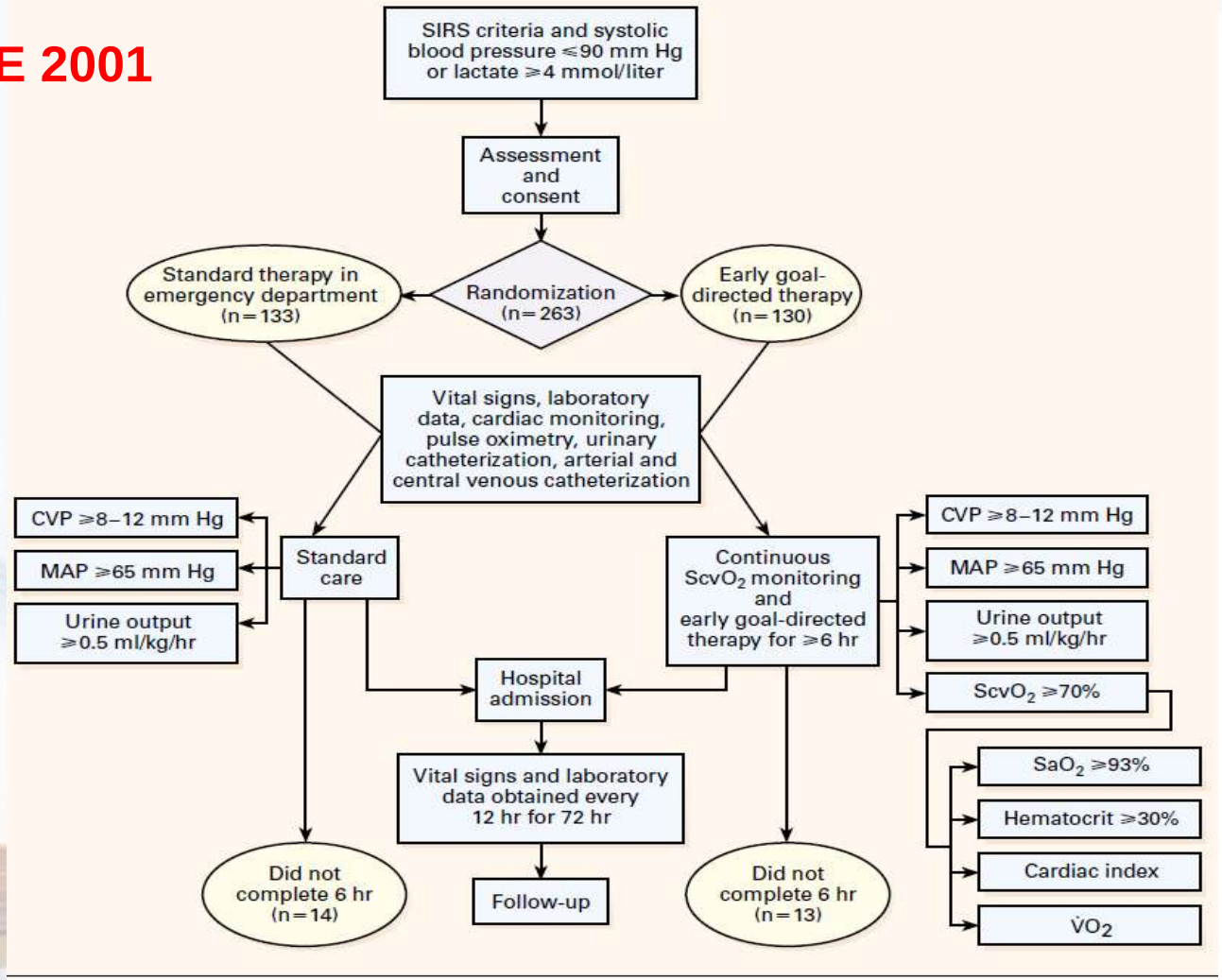
OBJECTIF :

RÉDUIRE LA MORTALITÉ

EARLY GOAL-DIRECTED THERAPY IN THE TREATMENT OF SEVERE SEPSIS AND SEPTIC SHOCK

EMANUEL RIVERS, M.D., M.P.H., BRYANT NGUYEN, M.D., SUZANNE HAVSTAD, M.A., JULIE RESSLER, B.S., ALEXANDRIA MUZZIN, B.S., BERNHARD KNOBLICH, M.D., EDWARD PETERSON, PH.D., AND MICHAEL TOMLANOVICH, M.D., FOR THE EARLY GOAL-DIRECTED THERAPY COLLABORATIVE GROUP*

Rivers E 2001



igure 1. Overview of Patient Enrollment and Hemodynamic Support.

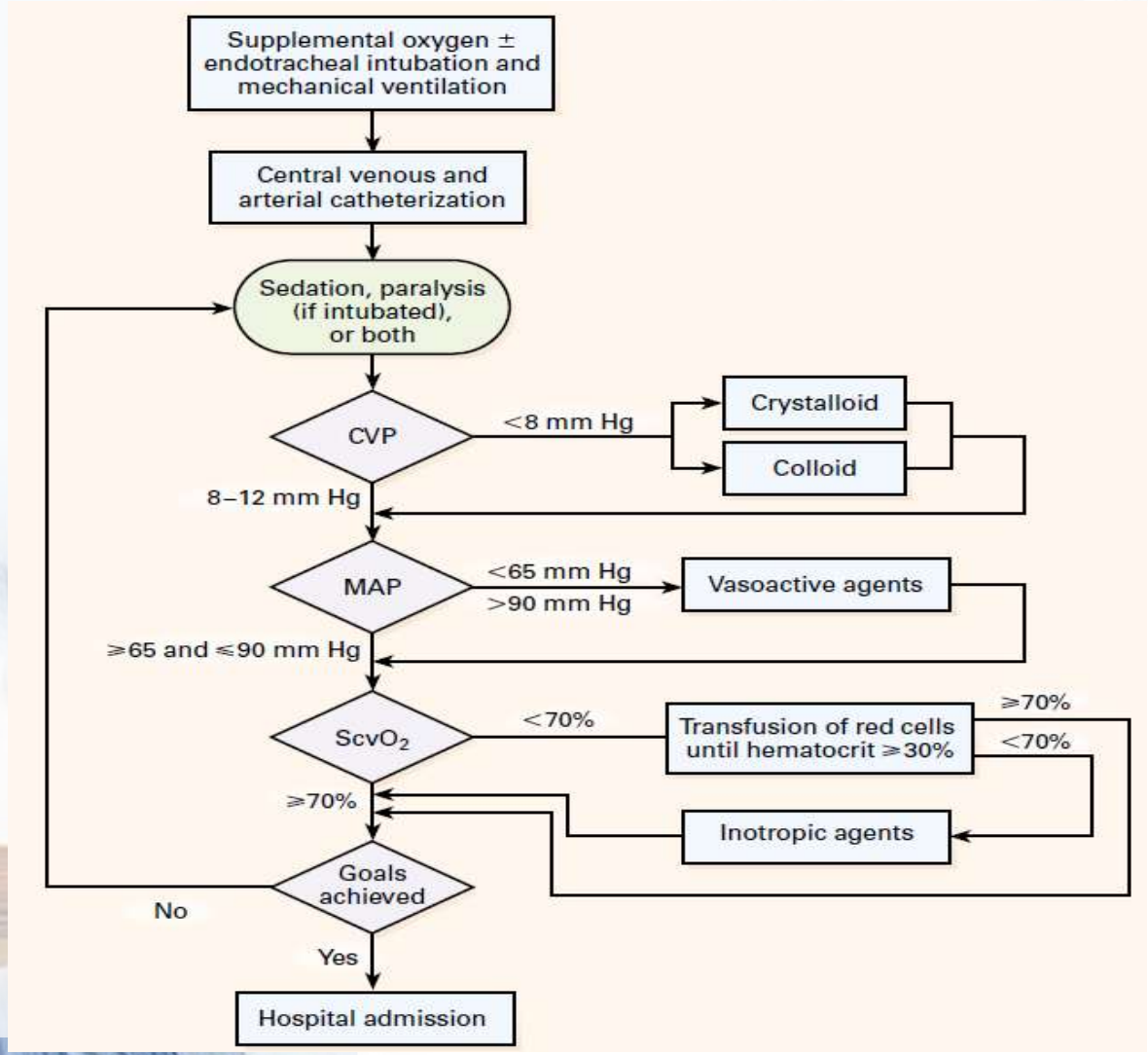

Supplemental oxygen ± endotracheal intubation and mechanical ventilation
Central venous and arterial catheterization
Sedation, paralysis (if intubated), or both
CVP
<8 mm Hg
Crystalloid
Colloid
8–12 mm Hg
MAP
<65 mm Hg
>90 mm Hg
Vasoactive agents
⩾65 and ⩽90 mm Hg
ScvO2
<70%
Transfusion of red cells until hematocrit ⩾30%
⩾70%
<70%
⩾70%
Inotropic agents
Goals achieved
No
Yes
Hospital admission

TABLE 4. TREATMENTS ADMINISTERED.*

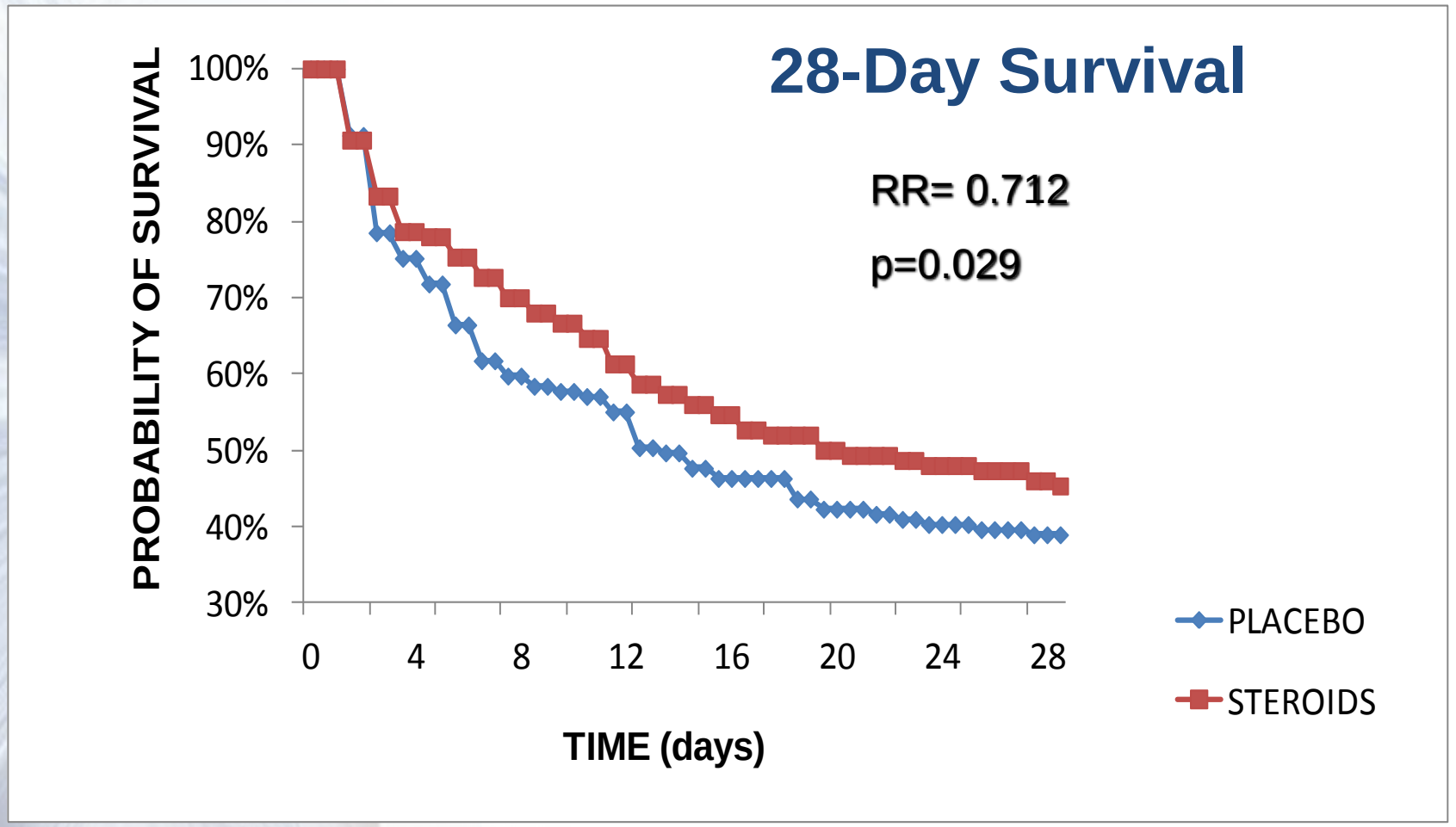
TREATMENT	HOURS AFTER THE START OF THERAPY		
	0–6	7–72	0–72
Total fluids (ml)			
Standard therapy	3499±2438	10,602±6,216	13,358±7,729
EGDT	4981±2984	8,625±5,162	13,443±6,390
P value	<0.001	0.01	0.73
Red-cell transfusion (%)			
Standard therapy	18.5	32.8	44.5
EGDT	64.1	11.1	68.4
P value	<0.001	<0.001	<0.001
Any vasopressor (%)†			
Standard therapy	30.3	42.9	51.3
EGDT	27.4	29.1	36.8
P value	0.62	0.03	0.02
Inotropic agent (dobutamine) (%)			
Standard therapy	0.8	8.4	9.2
EGDT	13.7	14.5	15.4
P value	<0.001	0.14	0.15
Mechanical ventilation (%)			
Standard therapy	53.8	16.8	70.6
EGDT	53.0	2.6	55.6
P value	0.90	<0.001	0.02
Pulmonary-artery catheterization (%)‡			
Standard therapy	3.4	28.6	31.9
EGDT	0	18.0	18.0
P value	0.12	0.04	0.01

TABLE 3. KAPLAN–MEIER ESTIMATES OF MORTALITY AND CAUSES OF IN-HOSPITAL DEATH.*

VARIABLE	STANDARD THERAPY (N=133)	EARLY GOAL-DIRECTED THERAPY (N=130)	RELATIVE RISK (95% CI)	P VALUE
	no. (%)			
In-hospital mortality†				
All patients	59 (46.5)	38 (30.5)	0.58 (0.38–0.87)	0.009
Patients with severe sepsis	19 (30.0)	9 (14.9)	0.46 (0.21–1.03)	0.06
Patients with septic shock	40 (56.8)	29 (42.3)	0.60 (0.36–0.98)	0.04
Patients with sepsis syndrome	44 (45.4)	35 (35.1)	0.66 (0.42–1.04)	0.07
28-Day mortality†	61 (49.2)	40 (33.3)	0.58 (0.39–0.87)	0.01
60-Day mortality†	70 (56.9)	50 (44.3)	0.67 (0.46–0.96)	0.03
Causes of in-hospital death‡				
Sudden cardiovascular collapse	25/119 (21.0)	12/117 (10.3)	—	0.02
Multiorgan failure	26/119 (21.8)	19/117 (16.2)	—	0.27

RR = 42%
RRA= 15.9 %
NNT= 6.2

Les corticoïdes



Annane et al (2002) JAMA 288; 862-871

Meta-analysis - 28-day mortality

Study or sub-category	Treatment n/N	Control n/N	RR (fixed) 95% CI	Weight %	RR (fixed) 95% CI
08 long course of low dose corticosteroids					
Bollaert 1998	7/22	12/19		9.84	0.50 [0.25, 1.02]
Briegel 1999	3/20	4/20		3.05	0.75 [0.19, 2.93]
Chawla 1999	6/23	10/21		7.98	0.55 [0.24, 1.25]
Annane 2002	82/151	91/149		69.96	0.89 [0.73, 1.08]
Yildiz 2002	8/20	12/20		9.16	0.67 [0.35, 1.27]
Subtotal (95% CI)	236	229		100.00	0.80 [0.67, 0.95]
Total events: 106 (Treatment), 129 (Control)					
Test for heterogeneity: Chi² = 3.94, df = 4 (P = 0.41), I² = 0%					
Test for overall effect: Z = 2.49 (P = 0.01)					
09 Short course of high dose corticosteroids					
Klasterski 1971	22/46	18/39		11.47	1.04 [0.66, 1.63]
Schumer 1976	9/86	33/86		19.43	0.27 [0.14, 0.53]
Lucas 1984	5/23	5/25		2.82	1.09 [0.36, 3.27]
Sprung 1984	33/43	11/16		9.44	1.12 [0.77, 1.61]
Bone 1987	65/191	48/190		28.34	1.35 [0.98, 1.84]
VASSCSG 1987	23/112	24/111		14.20	0.95 [0.57, 1.58]
Luce 1988	22/38	20/37		11.94	1.07 [0.72, 1.60]
Slusher 1996	6/36	4/36		2.36	1.50 [0.46, 4.87]
Subtotal (95% CI)	575	540		100.00	0.99 [0.83, 1.17]
Total events: 185 (Treatment), 163 (Control)					
Test for heterogeneity: Chi² = 18.92, df = 7 (P = 0.008), I² = 63.0%					
Test for overall effect: Z = 0.14 (P = 0.89)					

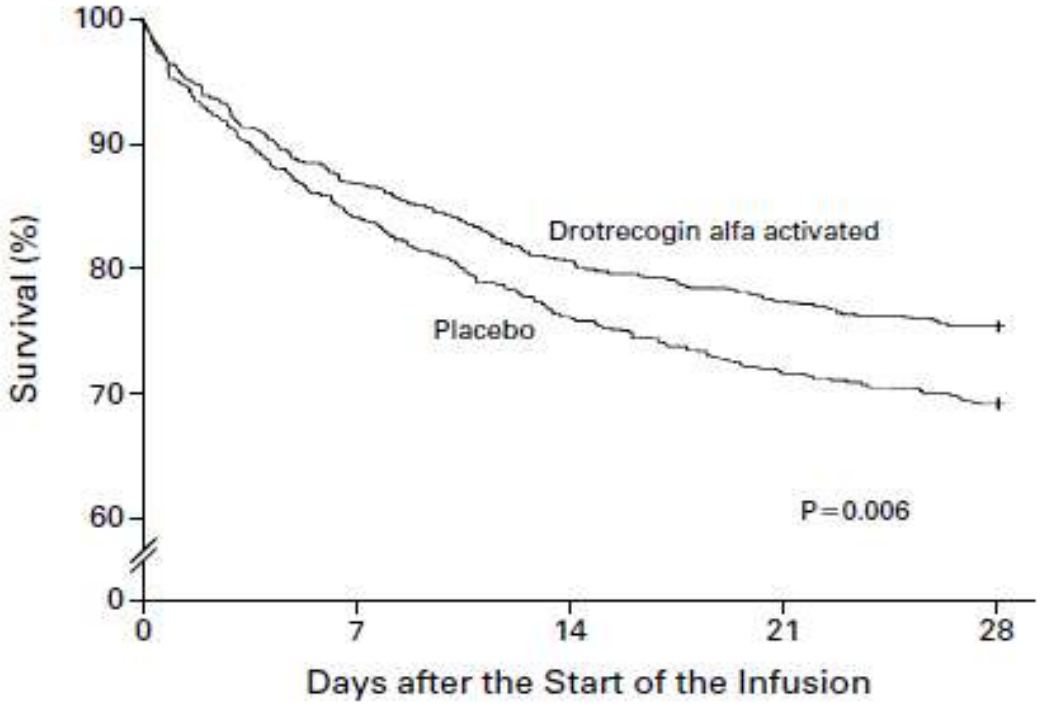
Cochrane Library

EFFICACY AND SAFETY OF RECOMBINANT HUMAN ACTIVATED PROTEIN C FOR SEVERE SEPSIS

GORDON R. BERNARD, M.D., JEAN-LOUIS VINCENT, M.D., PH.D., PIERRE-FRANCOIS LATERRE, M.D., STEVEN P. LAROSA, M.D., JEAN-FRANCOIS DHAINAUT, M.D., PH.D., ANGEL LOPEZ-RODRIGUEZ, M.D., JAY S. STEINGRUB, M.D., GARY E. GARBER, M.D., JEFFREY D. HELTERBRAND, PH.D., E. WESLEY ELY, M.D., M.P.H., AND CHARLES J. FISHER, JR., M.D., FOR THE RECOMBINANT HUMAN ACTIVATED PROTEIN C WORLDWIDE EVALUATION IN SEVERE SEPSIS (PROWESS) STUDY GROUP*

2001

Patients à haut risque
APACHE II >25
MOF
Sepsis → ARDS



NO. AT RISK					
Drotrecogin alfa activated	850	737	684	657	640
Placebo	840	705	639	602	581

The New England Journal of Medicine

VOLUME 345 NOVEMBER 8, 2001 NUMBER 19

INTENSIVE INSULIN THERAPY IN CRITICALLY ILL PATIENTS

GREET VAN DEN BERGHE, M.D., PH.D., PIETER WOUTERS, M.SC., FRANK WEEKERS, M.D., CHARLES VERWAEST, M.D., FRANS BRUYNINCKX, M.D., MIET SCHETZ, M.D., PH.D., DIRK VLASSELAERS, M.D., PATRICK FERDINANDE, M.D., PH.D., PETER LAUWERS, M.D., AND ROGER BOUILLON, M.D., PH.D.

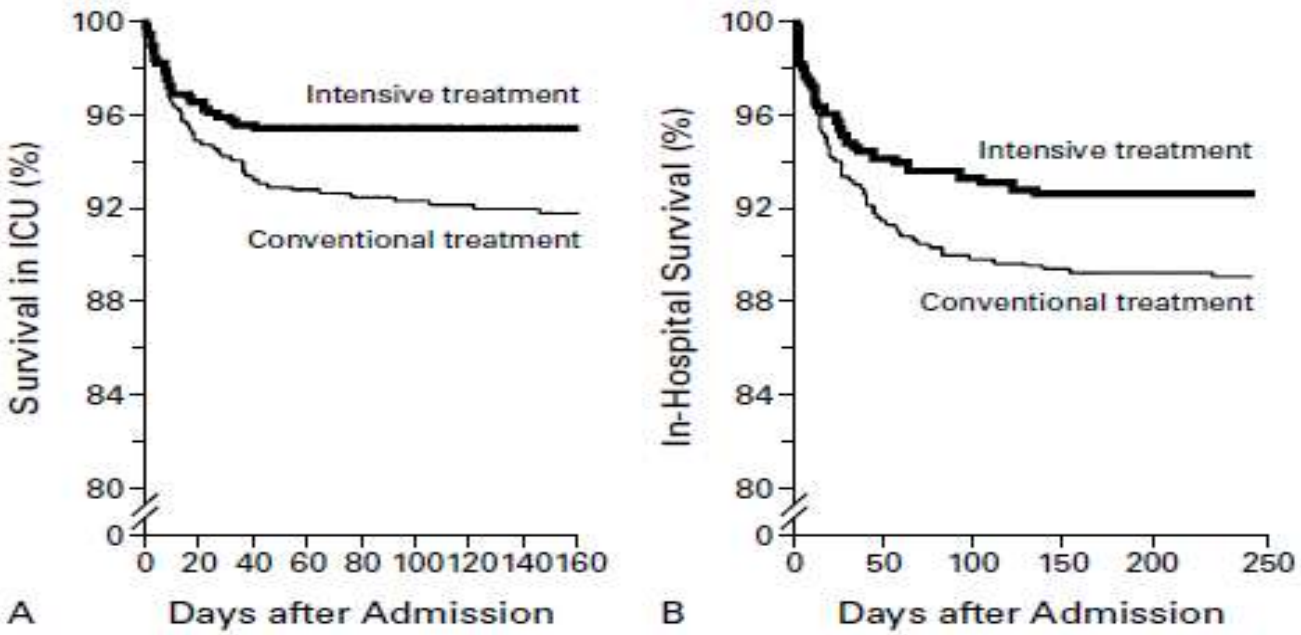
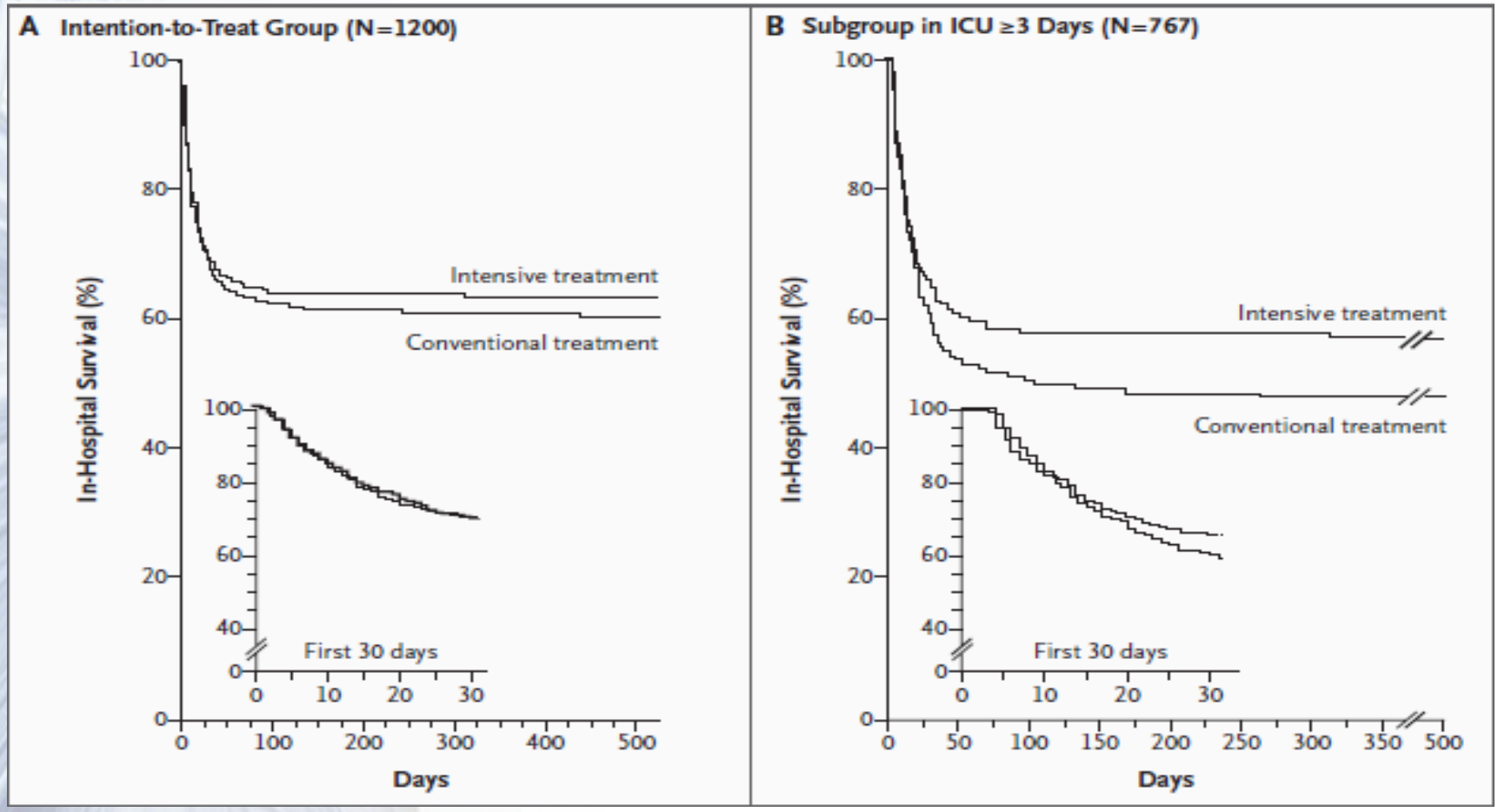


Figure 1. Kaplan–Meier Curves Showing Cumulative Survival of Patients Who Received Intensive Insulin Treatment or Conventional Treatment in the Intensive Care Unit (ICU).

ESTABLISHED IN 1812 FEBRUARY 2, 2006 VOL. 354 NO. 5

Intensive Insulin Therapy in the Medical ICU

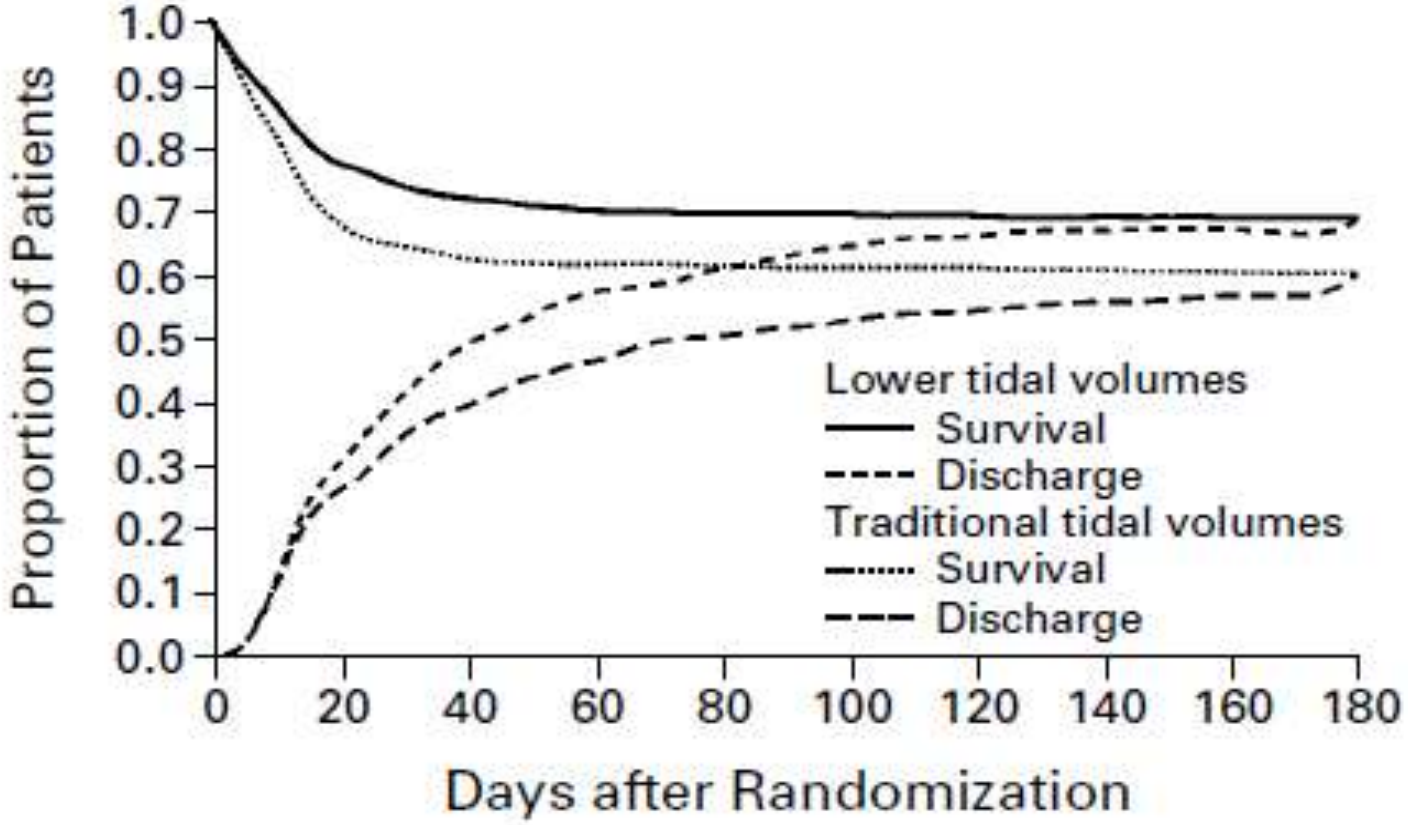
Greet Van den Berghe, M.D., Ph.D., Alexander Wilmer, M.D., Ph.D., Greet Hermans, M.D., Wouter Meersseman, M.D., Pieter J. Wouters, M.Sc., Ilse Milants, R.N., Eric Van Wijngaerden, M.D., Ph.D., Herman Bobbaers, M.D., Ph.D., and Roger Bouillon, M.D., Ph.D.



VOLUME 342 MAY 4, 2000 NUMBER 18

VENTILATION WITH LOWER TIDAL VOLUMES AS COMPARED WITH TRADITIONAL TIDAL VOLUMES FOR ACUTE LUNG INJURY AND THE ACUTE RESPIRATORY DISTRESS SYNDROME

THE ACUTE RESPIRATORY DISTRESS SYNDROME NETWORK*



SURVIVING SEPSIS CAMPAIGN

A global program to:
Reduce mortality rates in severe sepsis

Surviving Sepsis Campaign

- Lancé à l'automne **2002** (**déclaration de Barcelone**)
- Plusieurs sociétés savantes dont
  - **American Association of Critical Care Nurses**
  - **American College of Chest Physicians**
  - **American College of Emergency Physicians**
  - **American Thoracic Society**
  - **Australian and New Zealand Intensive Care Society**
  - **European Society of Clinical Microbiology and Infectious Diseases**
  - **European Society of Intensive Care Medicine**
  - **European Respiratory Society**
  - **International Sepsis Forum**
  - **Society of Critical Care Medicine**
  - **Surgical Infection Society**
- **Objectif:** réduire la mortalité sepsis de **25%** dans les 5 prochaines années

Surviving Sepsis Campaign

- Elle propose également **2 bouquets d'objectifs** à remplir systématiquement pour tous les malades:
  - **« Ressuscitation bundle »**
  - **« Management bundle »**

Bundles of care

- « **Bundles** » : regroupe **les meilleures pratiques** par rapport une maladie qui, individuellement améliorent les soins, mais lorsqu'ils sont appliqués ensemble → **une amélioration nettement supérieure.**
  - Généralement de ***trois à cinq***
  - Choix fondées sur des preuves (**niveau de preuves 1**)

- « **Bundles** » il faut éviter l'application fragmentaire des traitements → approche « **tout ou rien**».

Objectifs pour les 6 premières heures

SURVIVING SEPSIS CAMPAIGN BUNDLES

TO BE COMPLETED WITHIN 3 HOURS:

1) Measure lactate level
2) Obtain blood cultures prior to administration of antibiotics
3) Administer broad spectrum antibiotics
4) Administer 30 mL/kg crystalloid for hypotension or lactate ≥4mmol/L

TO BE COMPLETED WITHIN 6 HOURS:

5) Apply vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a mean arterial pressure (MAP) ≥ 65 mm Hg
6) In the event of persistent arterial hypotension despite volume resuscitation (septic shock) or initial lactate ≥4 mmol/L (36 mg/dL):
   - Measure central venous pressure (CVP)*
   - Measure central venous oxygen saturation ($Scvo_2$)*
7) Remeasure lactate if initial lactate was elevated*

*Targets for quantitative resuscitation included in the guidelines are CVP of ≥8 mm Hg, $Scvo_2$ of ≥70%, and normalization of lactate.

Objectifs pour les premières 24 heures

1- Faibles doses de corticoïdes

2- Contrôle de la glycémie

3- Prescription de Xigris® en fonction des recommandations

4- Utiliser une stratégie de ventilation protectrice

Surviving Sepsis Campaign

2004

1ère publication

2008

1ère revision

2012

2ème revision


SSC
Recommendations
Adhésion
Effets :
Baisse de la mortalité

ADHÉSION

Table 1. Survey responses

Question	Positive Responses[a] n	%
1. Standard ED use of goal-directed therapy		
Yes	2	7
No	28	93
2. If goal-directed therapy is used in the ED, is continuous $ScVo_2$ measured?		
Yes	2	100
No	0	0
3. Barriers to implementing goal-directed therapy in the ED		
Too much patient time in ED	6	21
Too many ED resources required	12	43
Too much emergency physician time required	8	29
Specialty monitoring equipment required	21	75
Central venous cannulation required	10	36
4. Sepsis cases managed per year[b]		
0	0	0
1–5	2	7
6–10	5	16
11–15	11	37
>15	12	40
5. Availability of ABG analyzer in ED for use 24 hrs/day, 7 days/wk		
Yes	23	82
No	7	18

Jones AE, Crit Care Med 2005;33:1888–90.

Effectiveness of Treatments for Severe Sepsis

A Prospective, Multicenter, Observational Study

Ricard Ferrer[1], Antonio Artigas[1], David Suarez[2], Eduardo Palencia[3], Mitchell M. Levy[4], Angel Arenzana[5], Xose Luis Pérez[6], and Josep-Maria Sirvent[7], for the Edusepsis Study Group*

77 Réa

TABLE 2. THERAPEUTIC GOALS FOR SEVERE SEPSIS IN SURVIVORS AND NONSURVIVORS

Variable	All patients (*n* = 2,796)	Nonsurvivors (*n* = 1,164)	Survivors (*n* = 1,632)	*P* Value
CVP ≥8 mm Hg for persistent hypotension despite fluid resuscitation and/or lactate >36 mg/dl (n = 1,878), n (%)	1,496 (79.7)	676 (78.7)	820 (80.5)	0.341
Scv_{O_2} ≥70% for persistent hypotension despite fluid resuscitation and/or lactate >36 mg/dl (n = 1,878), n (%)	654 (34.8)	272 (31.7)	382 (37.5)	0.008
Blood glucose: lower limit of normal but <150 mg/dl (n = 2,796), n (%)	1,347 (48.2)	495 (42.5)	852 (52.2)	<0.001
IPP <30 cm H_2O for mechanically ventilated patients (n = 1,642), n (%)	1,391 (84.7)	697 (82.0)	694 (87.6)	0.002

TABLE 3. TREATMENTS FOR SEVERE SEPSIS IN SURVIVORS AND NONSURVIVORS

Variable	All patients (*n* = 2,796)	Nonsurvivors (*n* = 1,164)	Survivors (*n* = 1,632)	*P* Value
Broad-spectrum antibiotics (n = 2,776), n (%):				0.001
0–1 h	510 (18.4)	175 (15.1)	335 (20.7)	
1–3 h	572 (20.6)	228 (19.7)	344 (21.2)	
3–6 h	290 (10.4)	123 (10.6)	167 (10.3)	
Previous antibiotic	989 (35.6)	441 (38.1)	548 (33.8)	
No antibiotic in the first 6 h	415 (14.9)	189 (16.3)	226 (14.0)	
Fluid challenge in the event of hypotension and/or lactate >36 mg/dl (n = 2,316), n (%)	2,109 (91.1)	918 (91.3)	1,191 (90.9)	0.778
Low-dose steroids for persistent hypotension despite fluid resuscitation and/or lactate >36 mg/dl (n = 1,878), n (%)	995 (53.0)	480 (55.9)	515 (50.5)	0.021
Drotrecogin alfa (activated) in multiorgan failure (n = 2,545), n (%)	165 (6.5)	66 (6.0)	99 (6.9)	0.365

Am J Respir Crit Care Med Vol 180. pp 861–866, 2009

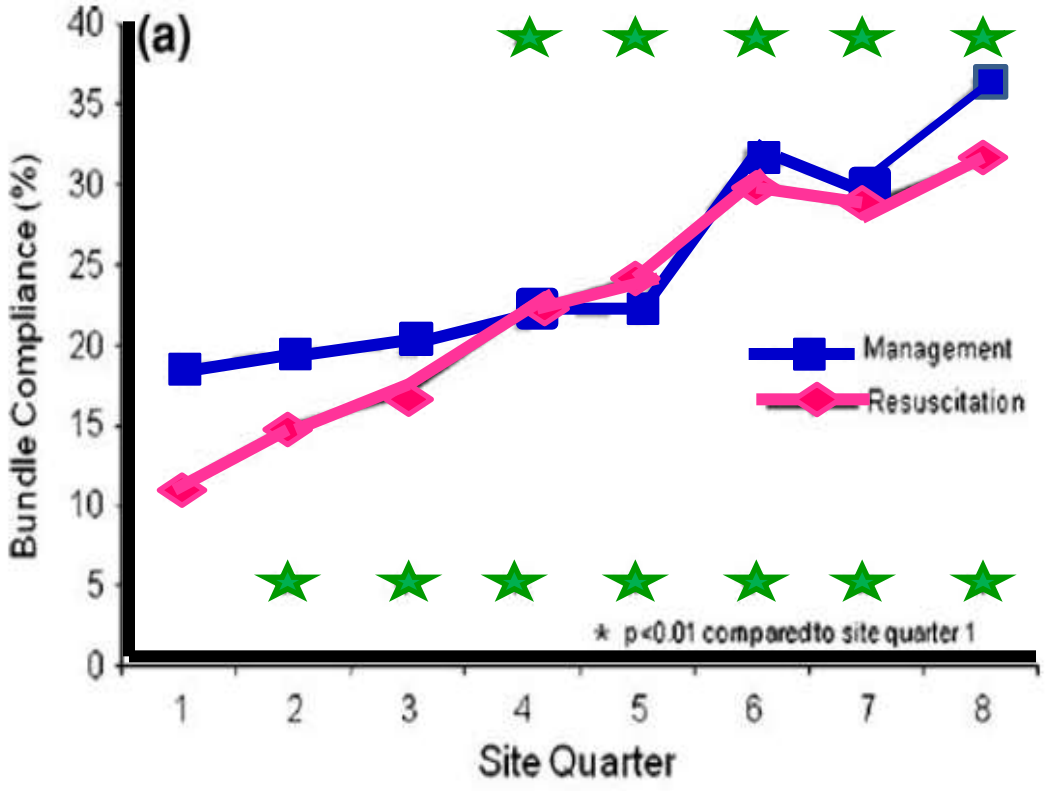
Intensive Care Med (2010) 36:222–231
DOI 10.1007/s00134-009-1738-3

ORIGINAL

Mitchell M. Levy
R. Phillip Dellinger
Sean R. Townsend
Walter T. Linde-Zwirble
John C. Marshall
Julian Bion

The Surviving Sepsis Campaign: results of an international guideline-based performance improvement program targeting severe sepsis

252 sites 165 hospitals
15022 patients



(3 months) /2 ans

Impact of the Surviving Sepsis Campaign protocols on hospital length of stay and mortality in septic shock patients: Results of a three-year follow-up quasi-experimental study*

Álvaro Castellanos-Ortega, MD, PhD; Borja Suberviola, MD; Luis A. García-Astudillo, MD; María S. Holanda, MD; Fernando Ortiz, MD; Javier Llorca, MD, PhD; Miguel Delgado-Rodríguez, MD, MPH, PhD

3 réa , médico-chir, 2005

Gr historique : June-may

Gr intervention: August -september

Table 2. Comparison between the historical and the intervention groups

	Historical Group, n = 96 (20%)	Intervention Group, n = 384 (80%)	*p*
Compliance with 6-hr resuscitation bundle, n (%)			
Serum lactate measured	15 (15.6)	288 (75.0)	<.001
Blood cultures before antibiotics	36 (37.5)	210 (56.7)	.003
Early broad-spectrum antibiotics	47 (49.0)	220 (57.3)	.168
Intravenous fluids delivered	57 (59.4)	322 (83.9)	.037
Mean arterial pressure ≥65 mm Hg achieved	71 (74.0)	257 (66.9)	.187
Central venous pressure ≥8 mm Hg achieved	68 (70.8)	288 (75.0)	.435
Central venous oxygen saturation ≥70% achieved	53 (55.2)	215 (56.0)	.909
N of interventions of the bundle accomplished			<.001

Crit Care Med 2010 Vol. 38, No. 4

Impact of the Surviving Sepsis Campaign protocols on hospital length of stay and mortality in septic shock patients: Results of a three-year follow-up quasi-experimental study*

Álvaro Castellanos-Ortega, MD, PhD; Borja Suberviola, MD; Luis A. García-Astudillo, MD; María S. Holanda, MD; Fernando Ortiz, MD; Javier Llorca, MD, PhD; Miguel Delgado-Rodríguez, MD, MPH, PhD

Table 2. Comparison between the historical and the intervention groups

	Historical Group, n = 96 (20%)	Intervention Group, n = 384 (80%)	*p*
Compliance with 24-hr management bundle, n (%)			
Low-dose steroids administered	11 (11.5)	92 (23.9)	.008
Glycemia ≤150 mg/dL	44 (51.2)	218 (56.8)	.412
Activated protein C administered In eligible patients	3 (4.0)	12 (4.0)	.949
Plateau pressure <30 cm H_2O	55 (79.7)	209 (82.3)	.597
Number of interventions of the bundle accomplished			<.001

Crit Care Med 2010 Vol. 38, No. 4

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Table 3. Degree of compliance with the sepsis bundles and risk of in-hospital mortality

	Total Patients n = 480	Deaths (%)	Crude Odds Ratio (95% Confidence Interval)	Adjusted[a] Odds Ratio (95% Confidence Interval)
6-hr resuscitation bundle (N interventions accomplished)				
0	7	6 (85.7)	1 (reference)	1 (reference)
1	16	6 (37.5)		
2	35	16 (45.7)		
3	67	33 (49.3)		
4	104	55 (52.9)		
5	106	40 (40.6)	0.66 (0.41–1.09)	0.55 (0.30–1.00)
6	101	25 (24.8)	0.32 (0.18–0.55)	0.26 (0.14–0.48)
7	44	15 (34.1)	0.50 (0.24–1.03)	0.45 (0.19–1.05)
p for trend			<.001	<.001
24-hr management bundle (N interventions accomplished)				
0	24	17 (70.8)	1 (reference)	1 (reference)
1	188	90 (47.9)		
2	215	72 (33.5)	0.49 (0.33–0.74)	0.76 (0.46–1.24)
3	48	18 (37.5)	0.59 (0.30–1.15)	0.51 (0.24–1.06)
4	5	2 (40.0)		
p for trend			<.001	.048

Impact of the Surviving Sepsis Campaign protocols on hospital length of stay and mortality in septic shock patients: Results of a three-year follow-up quasi-experimental study*

Álvaro Castellanos-Ortega, MD, PhD; Borja Suberviola, MD; Luis A. García-Astudillo, MD; María S. Holanda, MD; Fernando Ortiz, MD; Javier Llorca, MD, PhD; Miguel Delgado-Rodríguez, MD, MPH, PhD

Table 4. Characteristics and compliance with the bundles according to location before intensive care unit admission

	Emergency Department, n = 145 (30.2%)	Medical Ward, n = 108 (22.5%)	Surgery Department, n = 149 (31%)	Another Hospital, n = 78 (16.3%)	*p*
Patient characteristics					
Age, yr	60.8 ± 16.6	61.8 ± 15.4	68.9 ± 13.3	63.9 ± 15.1	.328
Male, n (%)	96 (66.6)	67 (62.0)	97 (65.1)	50 (64.1)	.919
Sequential Organ Failure Assessment score	9.6 ± 3.2	10.3 ± 3.5	8.9 ± 2.8	9.9 ± 3.4	.034
Acute Physiology and Chronic Health Evaluation II score	23.1 ± 7.3	24.7 ± 7.0	22.6 ± 7.3	24.1 ± 8.0	.136
Mechanical ventilation, n (%)	86 (59.3)	79 (73.1)	113 (75.8)	59 (75.6)	.007
Time from severe sepsis presentation to intensive care unit admission, hr	4.6 ± 7.2	12.3 ± 14.9	13.9 ± 18.9	7.9 ± 9.0	<.001
Number of interventions of the 6-hr resuscitation bundle accomplished	5.0 ± 1.5	4.1 ± 1.6	4.2 ± 1.7	4.3 ± 1.4	<.001
Number of interventions of the 24-hr management bundle accomplished	1.7 ± 0.8	1.4 ± 0.7	1.6 ± 0.8	1.5 ± 0.9	<.001
Compliance with 6-hr resuscitation bundle, n (%)	24 (16.6)	7 (6.4)	9 (6.0)	4 (5.1)	.003
Compliance with ≥6 interventions of the 6-hr resuscitation bundle, n (%)	64 (44.1)	24 (22.2)	40 (26.8)	17 (21.8)	<.001
Compliance with ≥3 interventions of the 24-hr management bundle, n (%)	14 (9.7)	9 (8.3)	17 (11.4)	13 (16.7)	.305
Hospital mortality, n (%)	47 (32.4)	58 (53.7)	60 (40.3)	34 (43.6)	.008
Standardized mortality ratio	0.66 ± 0.07	0.99 ± 0.08	0.77 ± 0.07	0.82 ± 0.08	.030

EARLY GOAL-DIRECTED THERAPY (EGDT) FOR SEVERE SEPSIS/SEPTIC SHOCK: WHICH COMPONENTS OF TREATMENT ARE MORE DIFFICULT TO IMPLEMENT IN A COMMUNITY-BASED EMERGENCY DEPARTMENT?

Rory O'Neill, DO, Javier Morales, DO, and Michael Jule, DO

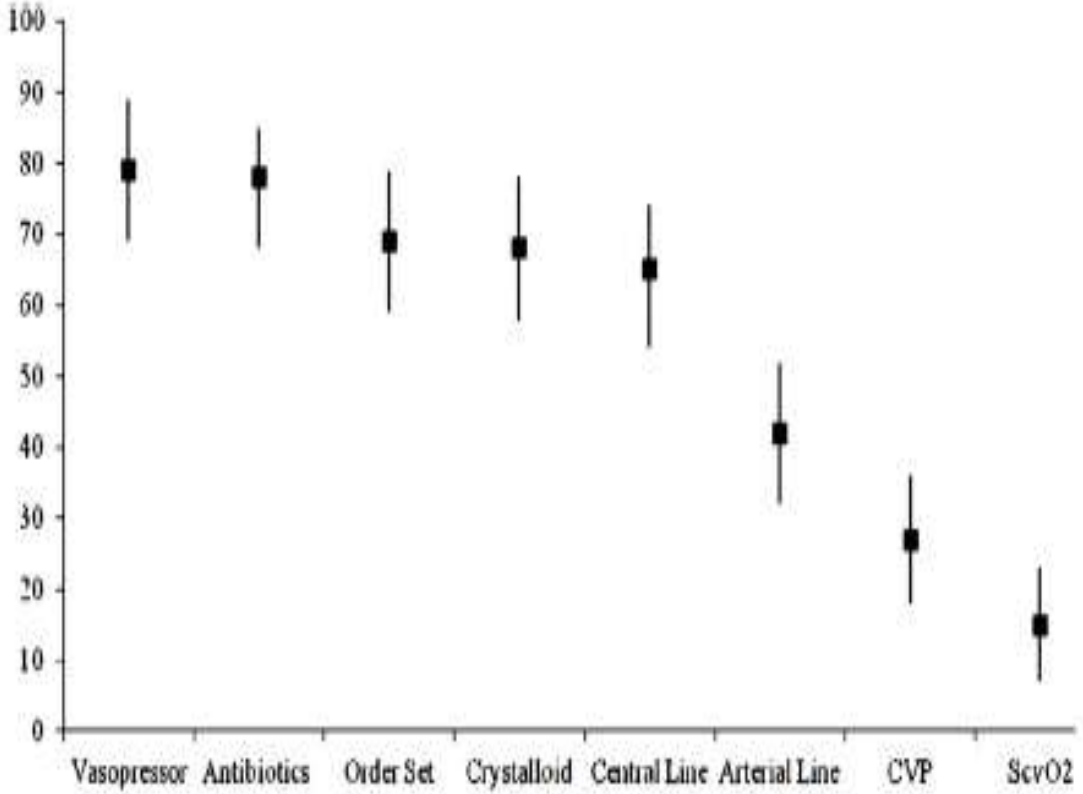


Figure 2. Compliance with components of EGDT. CVP = central venous pressure; $ScvO_2$ = central venous oxygen saturation.

The Journal of Emergency Medicine, Vol. 42, No. 5, pp. 503–510, 2012

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

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

SSC database , 200 sites
2005-2010; 25375 patients
107 sites USA et 79 hospital sites Europe

	USA (N=18766)	Europe (N=6609)	p value
Compliance with all applicable elements of sepsis resuscitation bundle	21·6%	18·4%	<0·0001
Serum lactate obtained within 6 h of presentation	70·1%	71·9%	0·005
Blood cultures obtained before broad-spectrum antibiotic administration	83·7%	64·7%	<0·0001
Broad-spectrum antibiotic given within 3 h of admission to emergency department or 1 h of non-emergency department admission	70·8%	63·9%	<0·0001
For hypotension or lactate concentration >4 mmol/L, 20 mg/kg crystalloid fluid bolus delivered followed by vasopressors if needed to maintain MAP ≥65 mm Hg	70·0%	72·6%	0·0001
For septic shock or lactate >4 mmol/L, CVP ≥8 mm Hg achieved within 6 h of presentation	25·7%	45·2%	<0·0001
For septic shock or lactate >4 mmol/L, $ScvO_2$ 70% (or SvO_2 65%) achieved within 6 h of presentation	17·1%	25·8%	<0·0001
Compliance with all applicable elements of sepsis management bundle	19·8%	28·2%	<0·0001
Low dose steroids given in accordance with standardised ICU policy within 24 h of presentation	59·6%	71·0%	<0·0001
Drotrecogin alfa given in accordance with standardised ICU policy within 24 h of presentation	39·8%	64·2%	<0·0001
Glucose control maintained >lower limit of normal with median <150 mg/dL (8·3 mmol/L) 6–24 h after presentation	53·5%	56·8%	<0·0001
Median inspiratory plateau pressure <30 cm H_2O over first 24 h after presentation	84·7%	85·1%	0·516

MAP=mean arterial pressure. CVP=central venous pressure. $ScvO_2$=central venous oxygen saturation. SvO_2=mixed venous oxygen saturation. ICU=intensive care unit.

Table 2: **Compliance with sepsis care measures**

Lancet Infect Dis 2012; 12: 919–24

IMPACT OF SEPSIS BUNDLE STRATEGY ON OUTCOMES OF PATIENTS SUFFERING FROM SEVERE SEPSIS AND SEPTIC SHOCK IN CHINA

Zhen Wang, MD,* Yingxia Xiong, MD,* Christa Schorr, RN, BSN,† and R. P. Dellinger, MD†

2008-2009
Urgences
195 patients

Table 2. Compliance with Sepsis Bundles in the Two Groups

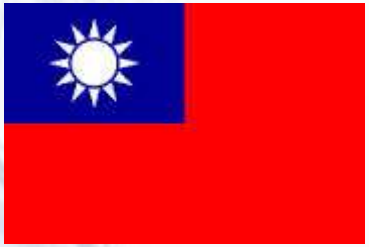
Treatments of Studied Groups	Group 1 n = 78	Group 2 n = 117	p Value*
Lactate	1.3% (1/78)	98.3% (115/117)	<0.05
Blood culture	19.2% (15/78)	65% (76/117)	<0.05
Antibiotics	25.6% (20/78)	69.2% (81/117)	<0.05
Fluids	27% (21/78)	82.9% (97/117)	<0.05
CVP ≥ 8 mm Hg	7.7% (6/78)	27.3% (32/117)	<0.05
$ScvO_2$ (≥70%)/ SvO_2 (≥65%) > 70%	1.3% (1/78)	12.8% (15/117)	<0.05
Sepsis resuscitation bundle	1% (1/78)	9% (8/117)	<0.05
Steroids	1.3% (1/78)	17.9% (21/117)	<0.05
Glucose control	28.2% (22/78)	46.2% (54/117)	<0.05
Median IPP < 30 cm H_2O	15.4% (12/78)	20.5% (24/117)	<0.05
Sepsis management bundle	1.3% (1/78)	8.5% (10/117)	<0.05

Table 3. Questionnaire Results of Reasons Given for Not Achieving the Targeted Goals

Variables	Unsure	Forgot	Didn't Think it Was Needed	Didn't Know How to Do It	Despite Attempt, Patient Condition Prevented Achieving Target	Patient or Other Doctors Refused to Do It
Lactate	16%	27%	57%			
Blood culture	12%	13%	15%			60%
Antibiotics	26%	29%	45%			
Fluids	41%		59%			
CVP ≥ 8 mm Hg	3%	22%	16%	3%	7%	49%
$ScvO_2$ > 70%	12%	5%	16%	5%	13%	49%
Steroids	31%	11%	42%	16%		
Glucose < 150 mg/dL	18%	41%	27%		14%	
IPP < 30 cm H_2O	72%			28%		
Average	25.6%	16.4%	30.8%	5.6%	3.8%	17.6%

Compliance and barriers to implementing the sepsis resuscitation bundle for patients developing septic shock in the general medical wards

Yao-Wen Kuo [a], Hou-Tai Chang [b], Pei-Chen Wu [c], Yen-Fu Chen [c], Ching-Kai Lin [c], Yueh-Feng Wen [c], Jih-Shuin Jerng [c,*]



Taiwan
General medical wards
40 patients

Table 2 Compliance with the sepsis resuscitation bundle and performance of central venous catheterization.

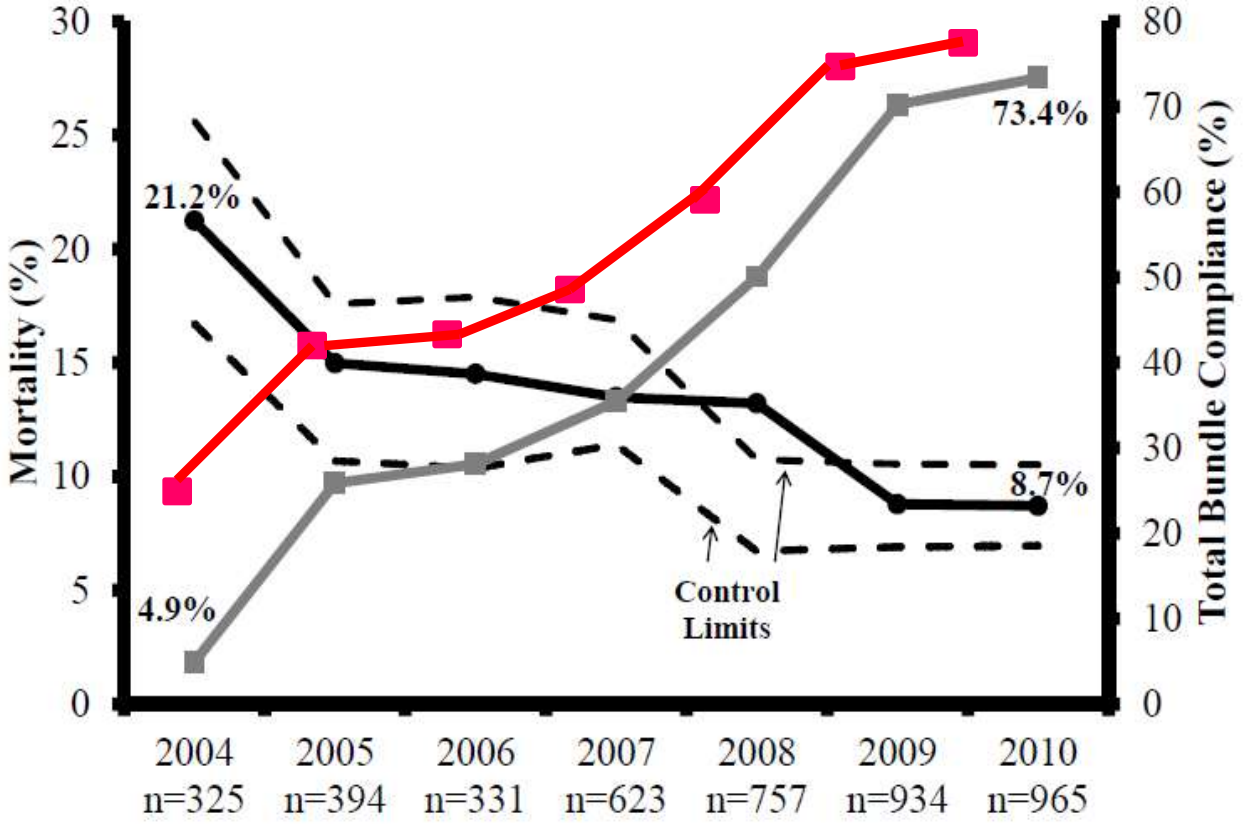
Intervention	Within 6 h		6–24 h	
	N (%)	Time required (min), mean ± SD	N (%)	Time required, (min), mean ± SD
Sepsis resuscitation bundle				
Measure lactate	24 (60.0)	179 ± 134	9 (22.5)	771 ± 366
Blood culture before antibiotics	25 (62.5)	138 ± 106	4 (10.0)	775 ± 348
Broad-spectrum antibiotics	31 (77.5)	150 ± 106	4 (10.0)	533 ± 124
Fluids and vasopressors to keep MAP ≥65 mm Hg	32 (80.0)	114 ± 92	4 (10.0)	603 ± 413
Central venous pressure ≥8 mm Hg	8 (20.0)	317 ± 61	2 (5.0)	690 ± 311
Central venous oxygen saturation ≥ 70%	1 (2.5)	360	0 (0)	
Replacement of a new central venous catheter	28 (70.0)	143 ± 104	1 (2.5)	640
Internal jugular vein or subclavian vein	11 (27.5)	177 ± 84	1 (2.5)	640
Femoral vein	17 (42.5)	121 ± 113	0(0)	

MAP, mean arterial pressure.

Journal of the Formosan Medical Association (2012) 111, 77–82

Multicenter Implementation of a Severe Sepsis and Septic Shock Treatment Bundle

2 villes
18 Réa
11Hopitaux
4329 patients
2004-2010

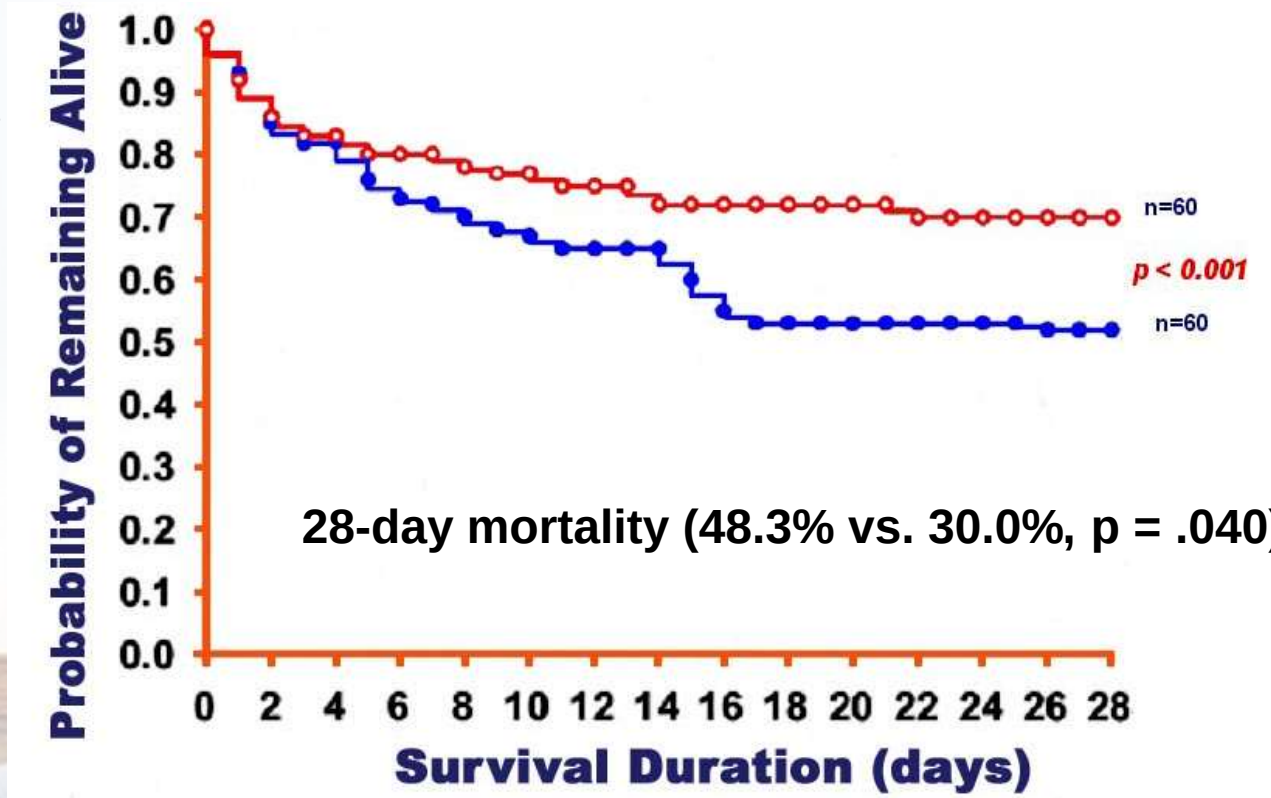


Russell RM. AJRCCM 2013 in press

IMPACT SUR LA MORTALITÉ

Probability of survival of patients with septic shock managed before or after (open circles) the implementation of standardized hospital order set

Urgences
120 patients



28-day mortality (48.3% vs. 30.0%, p = .040)

Micek S. Crit Care Med 2006; 34: 2707.

Impact of the Surviving Sepsis Campaign protocols on hospital length of stay and mortality in septic shock patients: Results of a three-year follow-up quasi-experimental study*

Álvaro Castellanos-Ortega, MD, PhD; Borja Suberviola, MD; Luis A. García-Astudillo, MD; María S. Holanda, MD; Fernando Ortiz, MD; Javier Llorca, MD, PhD; Miguel Delgado-Rodríguez, MD, MPH, PhD

Table 2. Comparison between the historical and the intervention groups

	Historical Group, n = 96 (20%)	Intervention Group, n = 384 (80%)	*p*
Outcome measurements			
Hospital mortality, n (%)	55 (57.3)	144 (37.5)	.001
Standardized mortality ratio	1.05 ± 0.18	0.75 ± 0.13	.139
ICU mortality, n (%)	51 (53.1)	117 (30.5)	<.001
Hospital LOS for all patients, days	26.5 ± 23.9	30.6 ± 33.2	.435
ICU LOS for all patients, days	9.9 ± 9.3	9.1 ± 10.4	.235
Hospital LOS for survivors, days	41.0 ± 26.3	36.2 ± 34.8	.043
ICU LOS for survivors, days	11.0 ± 9.5	8.4 ± 9.8	.004

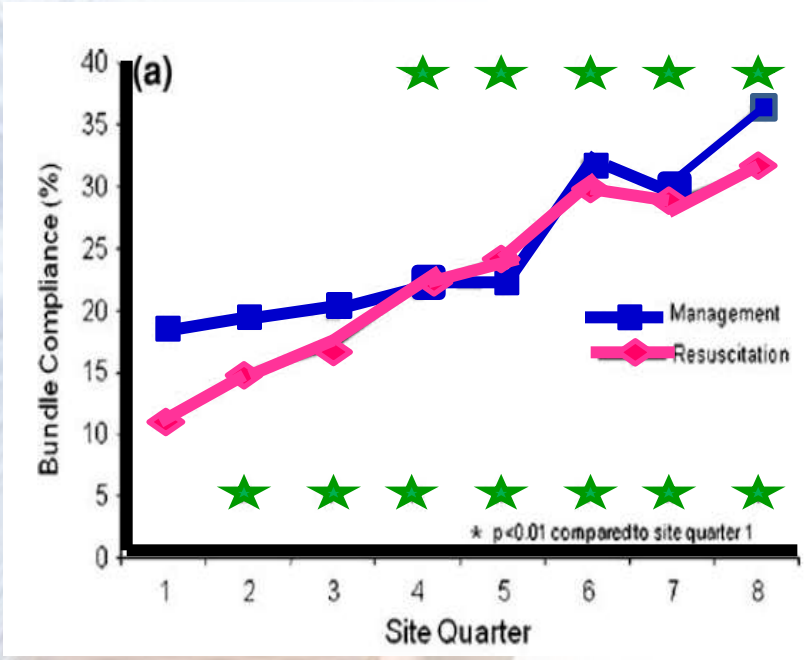
Crit Care Med 2010 Vol. 38, No. 4

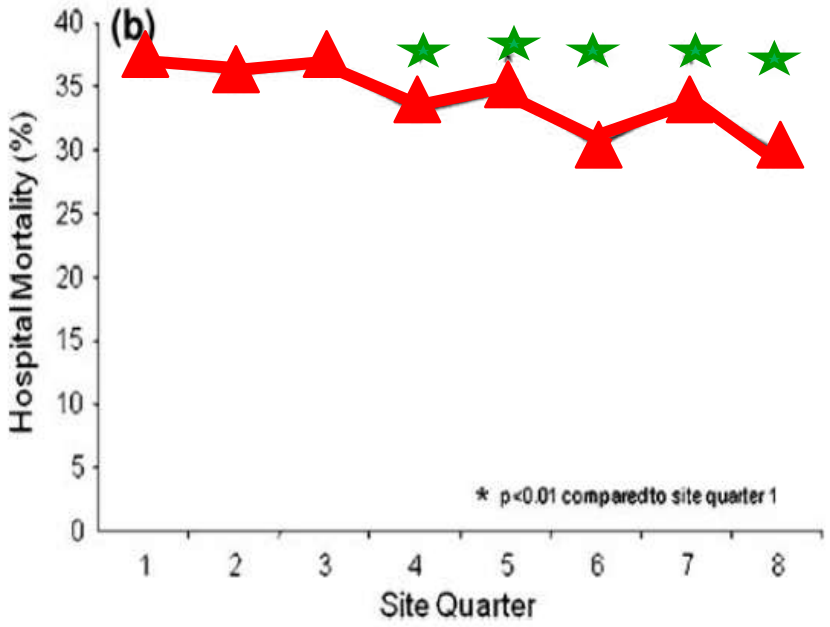
Intensive Care Med (2010) 36:222–231
DOI 10.1007/s00134-009-1738-3

ORIGINAL

Mitchell M. Levy
R. Phillip Dellinger
Sean R. Townsend
Walter T. Linde-Zwirble
John C. Marshall
Julian Bion

The Surviving Sepsis Campaign: results of an international guideline-based performance improvement program targeting severe sepsis



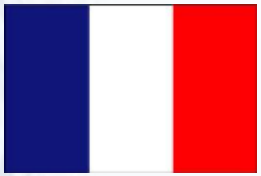


(3 months) /2 ans

Reduction of the severe sepsis or septic shock associated mortality by reinforcement of the recommendations bundle: A multicenter study

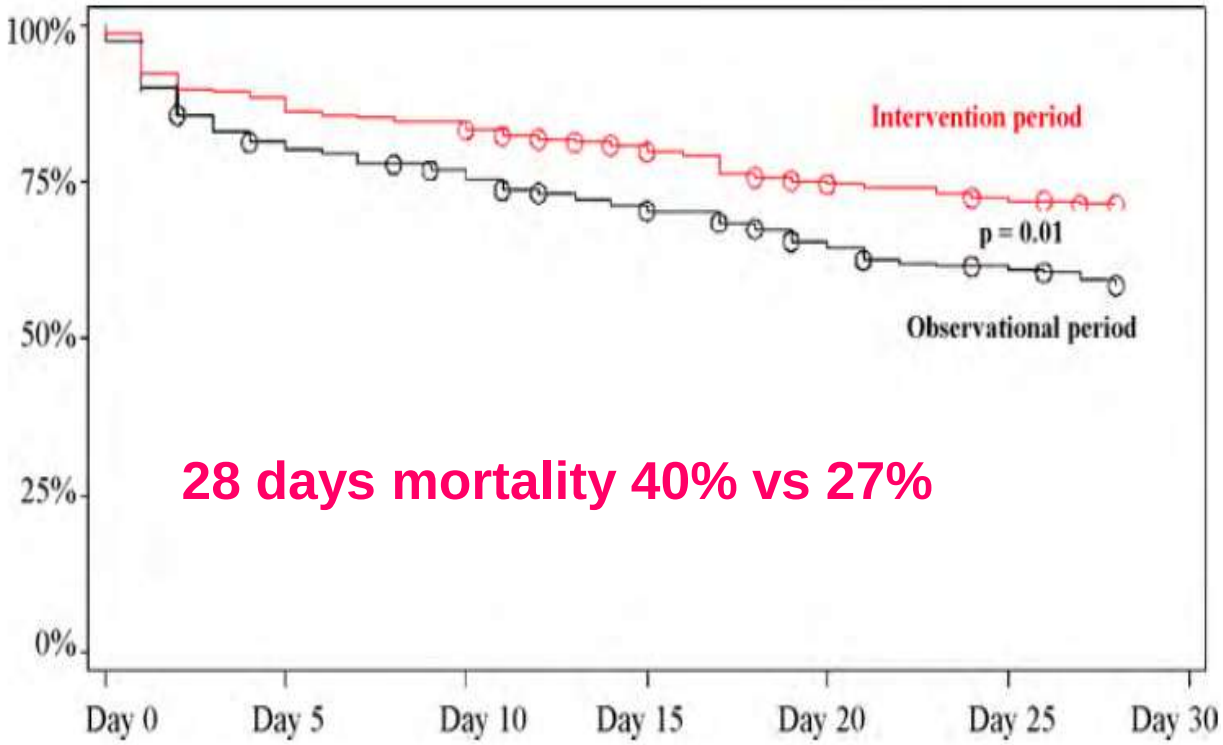
Réduction de la mortalité par rappel de dix recommandations dans la prise en charge du sepsis sévère et/ou au choc septique : étude multicentrique

J.-Y. Lefrant [a,*,b], L. Muller [a,b], A. Raillard [c], B. Jung [d,e], L. Beaudroit [a,b], L. Favier [f], B. Masson [g], G. Dingemans [a], F. Thévenot [h], D. Selcer [i], O. Jonquet [e], X. Capdevila [j], P. Fabbro-Peray [c], S. Jaber [d], Sepsi d'Oc study Group in the AzuRéa Group [1]



2006
6 mois observation
6 mois intervention
(10 recommandations)

6902 patients
15 réanimations



28 days mortality 40% vs 27%

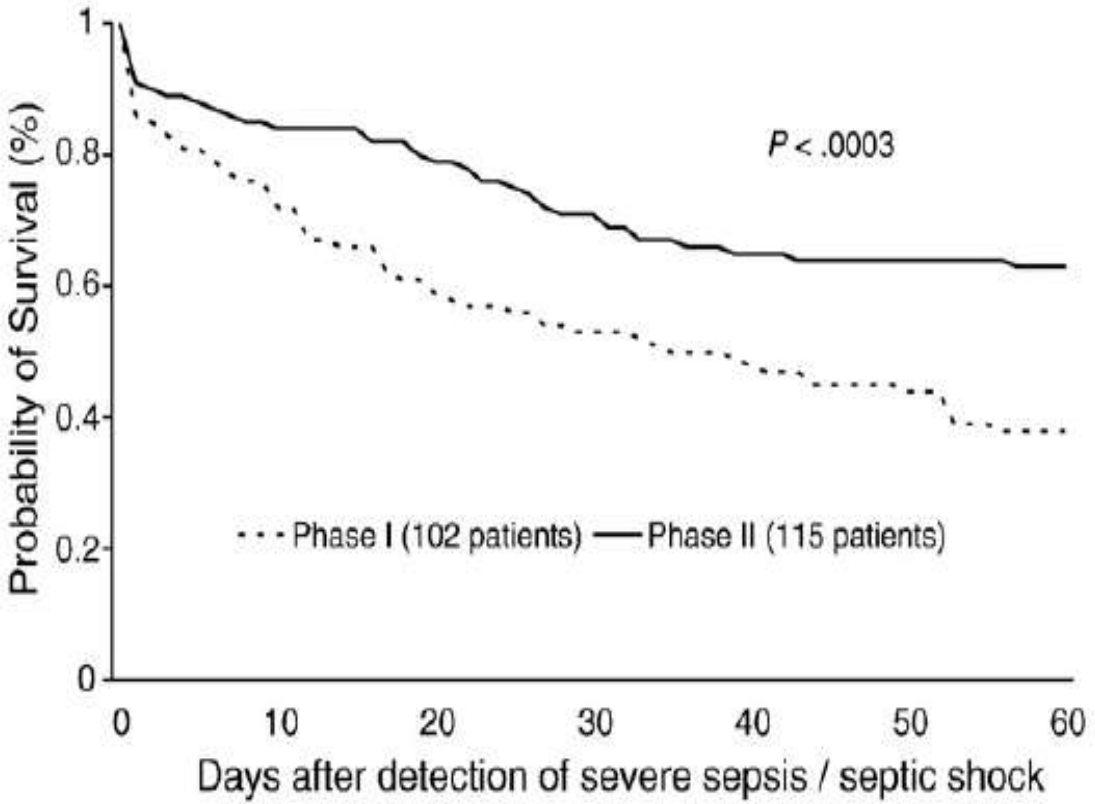
Fig. 1. Survival at Day 28.

Annales Françaises d'Anesthésie et de Réanimation 29 (2010) 621–628

Reduced mortality after the implementation of a protocol for the early detection of severe sepsis

Glauco A. Westphal MD, PhD[a,b], Álvaro Koenig MD[b,*], Milton Caldeira Filho MD[a], Janaína Feijó MD[a], Louise Trindade de Oliveira[a], Fernanda Nunes[a], Kênia Fujiwara MD[b], Sheila Fonseca Martins[a], Anderson R. Roman Gonçalves MD, PhD[a]

217 patients
General hospital
Ph I 2005-2006
Ph II: 2006-2007
Phase I: SSC
Phase II : sujet à risque



Journal of Critical Care (2011) **26**, 76–81

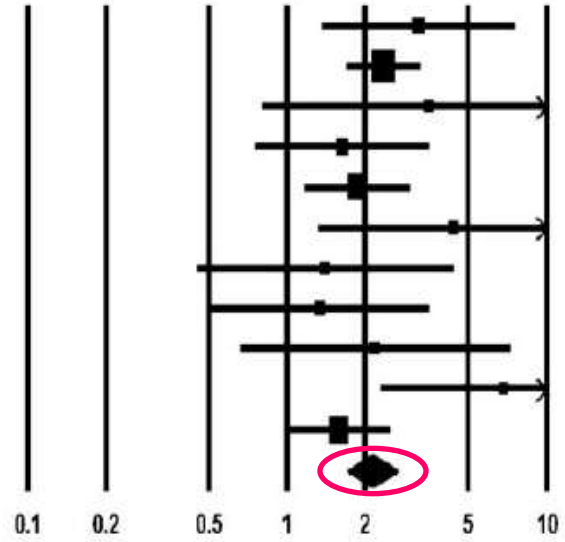
The severe sepsis bundles as processes of care: A meta-analysis

Diane J. Chamberlain RN, BN, BSc, MNSc, MPH, PhD[a,*],
Eileen M. Willis[b], Andrew B. Bersten[c]

Resuscitation 6 Hour Bundle and Survival

Study name	Subgroup within study	Odds ratio	Lower limit	Upper limit	Z-Value	p-Value	Survive / Total Compliant	Not Compliant
Gao et al 2005	6 hour	3.200	1.362	7.519	2.668	0.008	40 / 52	25 / 49
Douglas 2006	6 hour	2.350	1.697	3.255	5.140	0.000	443 / 509	377 / 509
Trzeciak et al 2006	6 hour	3.500	0.808	15.163	1.675	0.094	18 / 22	9 / 16
Jones et al 2007	6 hour	1.629	0.759	3.500	1.251	0.211	63 / 77	58 / 79
Nguyen et al 2007	6 hour	1.850	1.157	2.956	2.571	0.010	125 / 168	99 / 162
Ellender et al 2008	6 hour	4.375	1.320	14.504	2.414	0.016	25 / 30	16 / 30
Baldwin et al 2008	6 hour	1.398	0.448	4.363	0.576	0.565	25 / 32	23 / 32
De Miguel et al 2008	6 hour	1.333	0.507	3.505	0.583	0.560	41 / 50	41 / 53
Zambon et al 2008	6 hour	2.176	0.659	7.188	1.276	0.202	37 / 44	17 / 24
Girardis et al 2009	6 hour	6.845	2.300	20.373	3.457	0.001	23 / 30	12 / 37
Castellanos-Ortega et al 2010	6 hour	1.586	1.013	2.483	2.015	0.044	105 / 145	149 / 239
		2.124	1.701	2.651	6.649	0.000		

Odds ratio and 95% C



Australian Critical Care (2011) **24**, 229–243

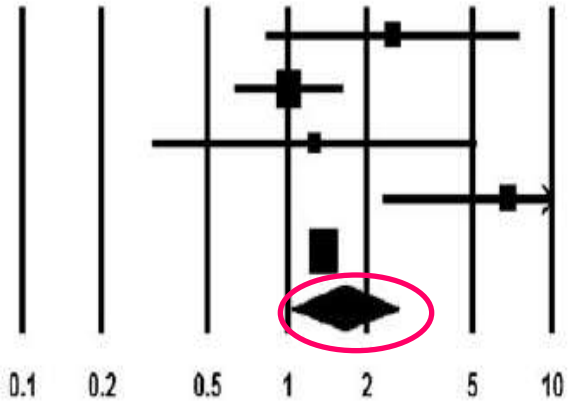
The severe sepsis bundles as processes of care: A meta-analysis

Diane J. Chamberlain RN, BN, BSc, MNSc, MPH, PhD[a,*],
Eileen M. Willis[b], Andrew B. Bersten[c]

Management 24 Hour Bundle and Survival

Study name	Subgroup within study	Odds ratio	Lower limit	Upper limit	Z-Value	p-Value	Survived / Total: Compliant	Survived / Total: Not Compliant
Gao et al 2005	24 hour	2.500	0.830	7.532	1.628	0.103	15 / 21	24 / 48
Douglas 2006	24 hour	1.020	0.636	1.636	0.082	0.935	87 / 117	290 / 392
Zambon et al 2008	24 hour	1.270	0.310	5.194	0.332	0.740	16 / 23	9 / 14
Girardis et al 2009	24 hour	6.845	2.300	20.373	3.457	0.001	23 / 30	12 / 37
Levy et al 2010	24 hour	1.370	1.266	1.483	7.809	0.000	2681 / 3830	7050 / 11190
		1.646	1.036	2.614	2.109	0.035		

Odds ratio and 95% CI



Australian Critical Care (2011) **24**, 229–243

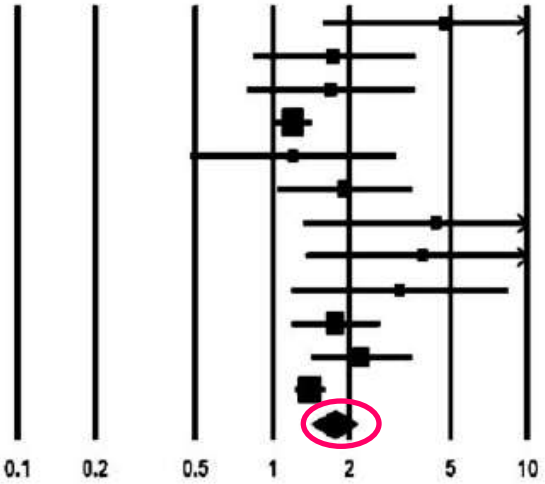
The severe sepsis bundles as processes of care: A meta-analysis

Diane J. Chamberlain RN, BN, BSc, MNSc, MPH, PhD[a,*],
Eileen M. Willis[b], Andrew B. Bersten[c]

Both Sepsis Bundles*and Survival

Study name	Subgroup within study	Odds ratio	Lower limit	Upper limit	Z-Value	p-Value	Survived / Total Compliant	Not Compliant
Kortgen et al 2006	Both	4.750	1.584	14.245	2.781	0.005	22 / 30	11 / 30
Micek et al 2006	Both	1.737	0.834	3.617	1.476	0.140	39 / 60	31 / 60
Shapiro et al 2006	Both	1.685	0.791	3.587	1.353	0.176	93 / 116	36 / 51
Ferrer et al 2008	Both	1.200	1.012	1.424	2.093	0.036	885 / 1465	478 / 854
Orford et al 2008	Both	1.199	0.473	3.039	0.383	0.702	53 / 66	34 / 44
ElSohl et al 2008	Both	1.919	1.049	3.507	2.117	0.034	53 / 87	39 / 87
Ellander et al 2008	Both	4.375	1.320	14.504	2.414	0.016	25 / 30	16 / 30
Douglas et al 2008	Both	3.869	1.362	10.994	2.539	0.011	44 / 48	344 / 465
Guo et al 2009	Both	3.150	1.184	8.379	2.299	0.022	35 / 43	25 / 43
Thiel et al 2009	Both	1.764	1.185	2.624	2.799	0.005	122 / 200	94 / 200
Castellanos-Ortega et al 2010	Both	2.236	1.420	3.521	3.473	0.001	240 / 384	41 / 96
Levy et al 2010	Both	1.400	1.225	1.600	4.939	0.000	2487/3455	7286/11567
		1.744	1.421	2.141	5.319	0.000		

Odds ratio and 95% CI



Meta Analysis Random Effects Model * Both Resuscitation 6 Hour Bundle & Management 24 Hour Bundle Combined

Figure 4 Both sepsis bundles and survival.

Australian Critical Care (2011) **24**, 229–243

Original Article

The Implementation of Sepsis Bundles on the Outcome of Patients With Severe Sepsis or Septic Shock in Intensive Care Units☆

Shu-Lien Chou [1], Khee-Siang Chan [1,2], Kuo-Chen Cheng [3,4,5], Willy Chou [1], Hui-Mei Hung [2], Chin-Ming Chen [1,2,*]

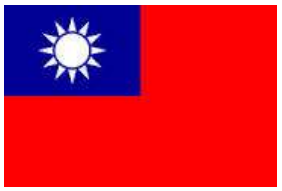


Table 3
The outcomes among different patients.

Items	All (n = 164)	Preintervention	Education	Operational	Postintervention	p
		Jan–Apr 2010 (n = 55)	Jul–Oct 2010 (n = 30)	Nov–Dec 2010 (n = 26)	Jan-Apr 2011 (n = 53)	
ICU days	11.0 (6.0–16.0)	12.0 (7.0–16.0)	8.0 (6.0–11.0)	10.0 (6.0–16.0)	10.0 (6.0–15.0)	0.177
Hospital days	19.0 (13.0–34.0)	23.0 (13.0–35.0)	15.0 (13.0–32.0)	19.0 (11.0–34.0)	17.0 (11.0–36.0)	0.590
ICU mortality	41 (25.0%)	19 (34.5%)	3 (10.0%)	6 (23.1%)	13 (24.5%)	0.099
Hospital mortality	46 (28.0%)	24 (43.6%)	3 (10.0%)	6 (23.1%)	13 (24.5%)	0.012
Total hospital cost (×1000 USD)	8.5 (5.3–12.5)	9.1 (6.1–12.8)	6.3 (4.4–11.3)	8.3 (2.1–10.0)	8.5 (4.1–10.8)	0.645

Data are presented as median (interquartile ranges) or n (%).
ICU = intensive care unit; USD = US dollars.

Original Article

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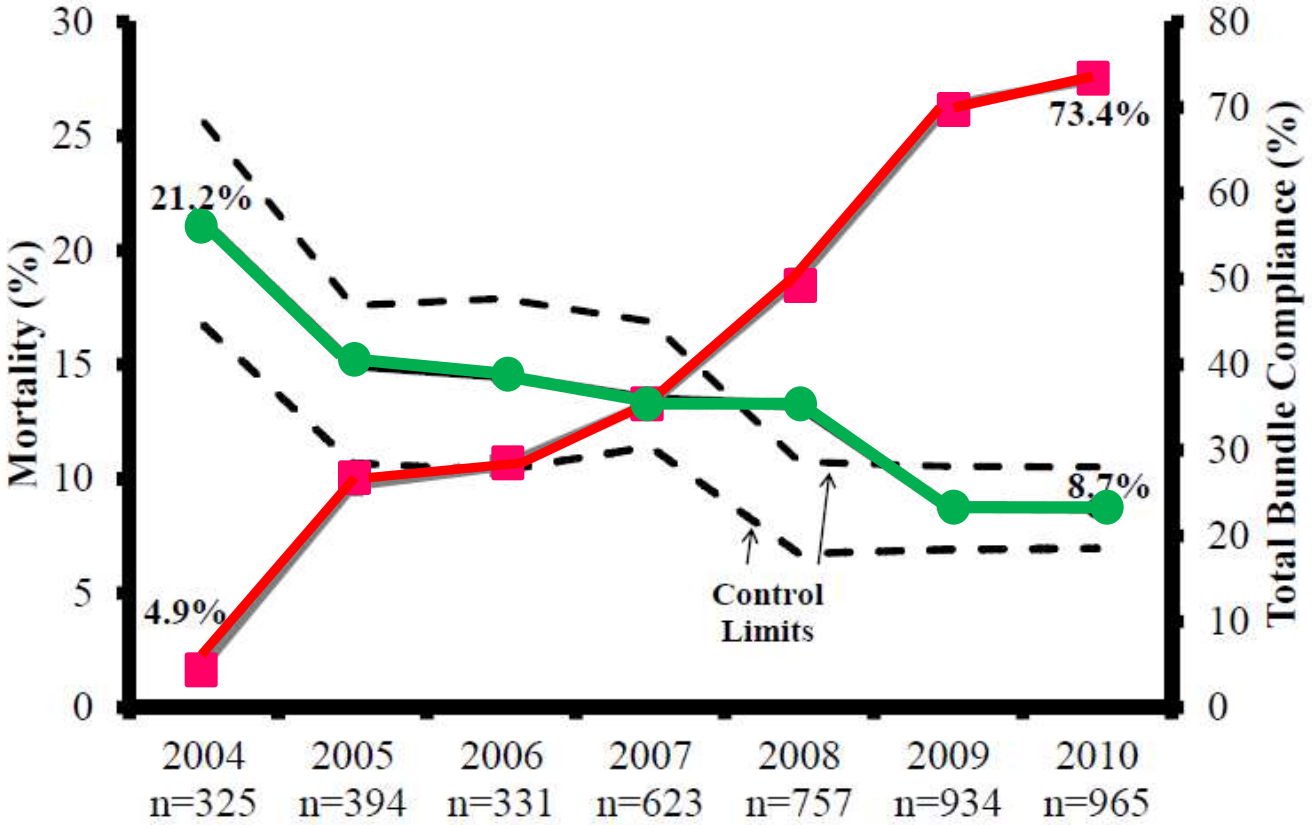
Table 4
The completion of sepsis bundles among different groups.

Items	All (n = 164)	Preintervention	Education	Operational	Postintervention	p
		Jan–Apr 2010 (n = 55)	Jul–Oct 2010 (n = 30)	Nov–Dec 2010 (n = 26)	Jan–Apr 2011 (n = 53)	
Within 6 h						
Broad antibiotics	155 (94.5%)	46 (83.6%)	30 (100%)	26 (100%)	53 (100%)	<0.001
Lactate survey	161 (98.2%)	52 (94.5%)	30 (100%)	26 (100%)	53 (100%)	0.109
$ScvO_2$ survey	137 (83.5%)	30 (54.5%)	30 (100%)	26 (100%)	53 (100%)	<0.001
Blood culture before antibiotics	163 (99.4%)	54 (98.2%)	30 (100%)	26 (100%)	53 (100%)	0.574
Fluid resuscitation ≥ 20 mL/kg	162 (98.2%)	53 (96.4%)	30 (100%)	26 (100%)	53 (100%)	0.260
Use vasopressor on refractory hypotension	164 (100.0%)	55 (100%)	30 (100%)	26 (100%)	53 (100%)	1.000
Within 24 h						
Check cortisol before steroid use	150 (91.5%)	49 (89.1%)	29 (96.7%)	24 (92.3%)	49 (92.5%)	0.614
Low dose steroid on vasopressor use	164 (100.0%)	55 (100%)	30 (100%)	26 (100%)	53 (100%)	1.000
Blood sugar ≤ 150 (≥ 80) mg/dL	106 (64.6%)	23 (41.8%)	14 (46.7%)	25 (96.2%)	46 (86.8%)	<0.001
Peak inspiratory pressure ≤ 35 (and plateau pressure ≤ 30) cmH_2O on ventilator	164 (100.0%)	55 (100%)	30 (100%)	26 (100%)	53 (100%)	1.000
All completion	86 (52.4%)	11 (20.0%)	13 (43.3%)	22 (84.6%)	42 (79.2%)	<0.001

Multicenter Implementation of a Severe Sepsis and Septic Shock Treatment Bundle



Russell RM. AJRCCM 2013

Clinical Study

Impact of 6-Hour Sepsis Resuscitation Bundle Compliance on Hospital Mortality in a Saudi Hospital

Javed I. Memon,[1] Rifat S. Rehmani,[2] Abdulsalam M. Alaithan,[1] Ayman El Gammal,[3] Talib M. Lone,[1] Khaled Ghorab,[1] and Abdulsaboor Abdulbasir[1]

Critical Care Research and Practice
Volume 2012, Article ID 273268, 7 pages

Table 3: Association between the increasing number of resuscitation bundle elements compliance and the survival in both groups.

Compliance with number of elements of resuscitation bundle	Survival *n* (%)	95% CI
1 ($n = 1$)	0 (0)	0-0
2 ($n = 4$)	1 (25.0)	34.1–71.0
3 ($n = 27$)	15 (55.5)	37.3–72.4
4 ($n = 66$)	45 (67.4)	56.2–78.2
5 ($n = 90$)	72 (80.0)	70.5–87.0
6 ($n = 58$)	45 (78.0)	65.2–86.5
7 ($n = 52$)	44 (84.6)	72.2–92.3

n: number of patients, CI: confidence interval.

Table 4: Outcome measures.

Outcome variables	Results		*P* value
	Historical group	Post-intervention group	
Primary outcome			
30-day hospital mortality	31/99 (31.3%)	42/199 (21.1%)	0.05
Secondary outcomes			
ICU mortality	27 (27.3%)	39 (19.6%)	0.11
Hospital stay, days	21.1 ± 19.6	21.8 ± 19.4	0.89
ICU stay, days	8.2 ± 7.9	7.6 ± 8.3	0.53

Mortalities are described as *n* (%); Stays are described as mean ± SD, ICU: intensive care unit.

Reducing mortality in severe sepsis with the implementation of a core 6-hour bundle: results from the Portuguese community-acquired sepsis study (SACiUCI study)

Teresa Cardoso*[1], António Henriques Carneiro[1], Orquídea Ribeiro[2], Armando Teixeira-Pinto[2] and Altamiro Costa-Pereira[2]

Critical Care 2010, **14**:R83

Table 4: Odds ratio for 28-days mortality for each action of the bundle completed in patients with septic shock

	Odds ratio SIMPLE (95% CI)	*P* value	Odds ratio ADJUSTED (95% CI)	*P* value
Individual actions of the bundle				
1) Serum lactate measured in the first 6-hours	0.68 (0.46; 1.02)	0.064	0.64 (0.40; 1.03)	0.064
2) Fluids administered to achieve a MAP >65 mmHg	0.82 (0.52; 1.28)	0.383	1.01 (0.60; 1.70)	0.984
3) Specimens collected for microbiology before antibiotic started	**0.61 (0.37; 0.98)**	**0.041**	**0.57 (0.33; 0.97)**	**0.037**
4) Blood cultures done	0.52 (0.32; 0.84)	0.008	**0.50 (0.29; 0.88)**	**0.016**
5) Antibiotic therapy administered in the first hour after diagnosis	0.83 (0.56; 1.23)	0.356	0.77 (0.49; 1.21)	0.258
6) Vasopressores administered to achieve a MAP >65 mmHg	0.54 (0.30; 0.97)	0.038	**0.52 (0.28; 0.99)**	**0.048**
7) Was CVP measured?	**0.62 (0.41; 0.94)**	**0.023**	0.74 (0.47; 1.18)	0.207
8) SvcO2 measured?	0.85 (0.50; 1.46)	0.853	0.76 (0.40; 1.44)	0.396
9) Inotropes administered	0.98 (0.56; 1.70)	0.931	0.94 (0.49; 1.80)	0.848
Bundle				
Bundle completed with actions 1) through 6) versus partial or non completed	**0.51 (0.29; 0.90)**	**0.021**	**0.49 (0.25; 0.95)**	**0.036**
Bundle completed with the 9 actions versus partial or non completed	0.51 (0.21; 1.26)	0.146	0.41 (0.14; 1.19)	0.101

IMPACT OF SEPSIS BUNDLE STRATEGY ON OUTCOMES OF PATIENTS SUFFERING FROM SEVERE SEPSIS AND SEPTIC SHOCK IN CHINA

Zhen Wang, MD,* Yingxia Xiong, MD,* Christa Schorr, RN, BSN,† and R. P. Dellinger, MD†

Table 1. Patient Characteristics and Outcomes for the Two Groups

Characteristics of Studied Groups	Group 1 n = 78	Group 2 n = 117	*p* Value
Age (years)	65.9 ± 16.7	69.9 ± 17.5	NS
Gender (M/F)	43/35	66/51	NS
APACHE II score	19.7 ± 7.8	19.5 ± 6.7	NS
Patients admitted to ICU	19.2% (15/78)	23.9% (28/117)	NS
In-hospital mortality	44.8% (35/78)	31.6% (37/117)	<0.05*

The Journal of Emergency Medicine, Vol. 44, No. 4, pp. 735–741, 2013

Early interventions in severe sepsis and septic shock: a review of the evidence one decade later

E. P. RIVERS [1], M. KATRANJI [2], K. A. JAEHNE [1], S. BROWN [1]
G. ABOU DAGHER [1], C. CANNON [3], V. COBA [1]

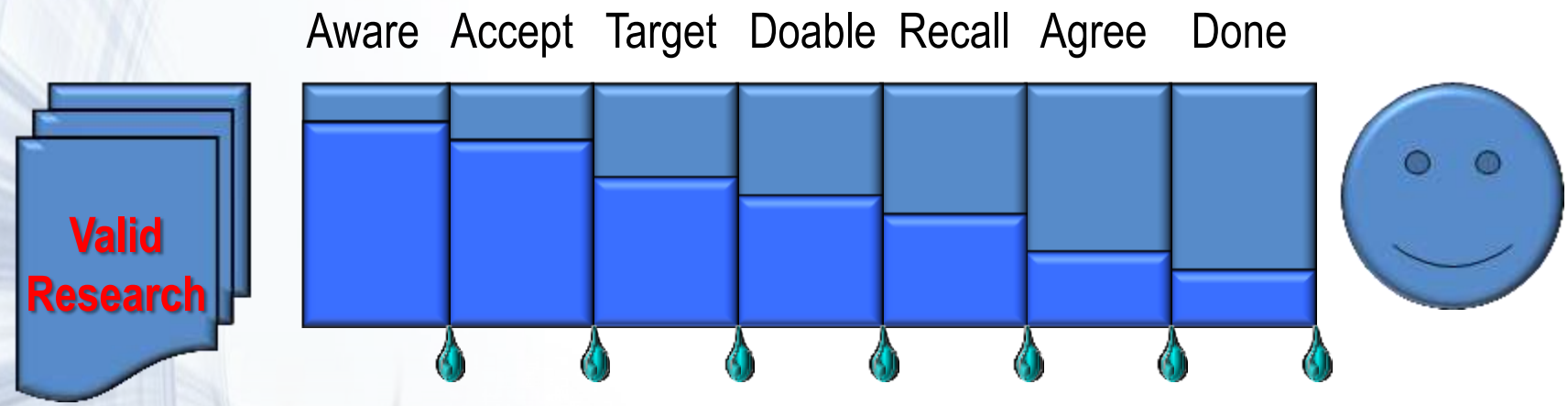
TABLE I.—*Comparison of sepsis intervention studies using the resuscitation bundle compared to the original EGDT study.*[8, 41, 49, 68, 80-128]

	Summary of implementation study		Rivers *et al.*	
	Before or control	After	Control	EGDT
Number of patients	9527	9884	133	130
APACHE II score	24.2	24.2	20.4	21.4
Sex, % Males	58.15	57.3	50.4	50.8
Age (years)	63.8	62.9	64.4	67.1
Mortality before (SD)**	46.8 (26)%	29.1 (12)%	46.5%	30.5%
Relative risk reduction	0.37		0.34	
Absolute risk reduction	18.3%		16.0%	
NNT	5.45		6.25	

*Includes before and after and concurrent implementation studies. **The average mortality of each study. NNT=number needed to treat.

Minerva Anestesiol 2012;78:712-24,

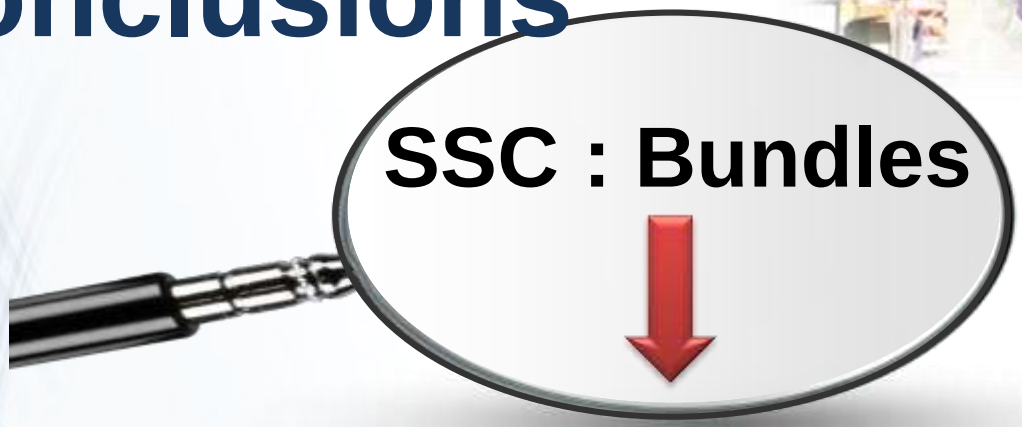
Conclusions



If 80% achieved at each stage then

0.8 x 0.8 x 0.8 x 0.8 x 0.8 x 0.8 x 0.8 = 0.21

Conclusions



SSC : Bundles

Formation

Adhésion des différents intervenants de la chaine de soins

Baisse de la Mortalité

A clinician, armed with the sepsis bundles, attacks the three heads of severe sepsis: hypotension, hypoperfusion and organ dysfunction.
***Crit Care Med* 2004; 320(Suppl):S595-S597**

SEPSIS KILLS®

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« Survivre avec les recommandations de la SSC »!

Pr Souheil Elatrous