Projecte Edusepsis

34 Reunió de la SOCMIC

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EDUSEPSIS

EDUSEPSIS es una organización independiente de profesionales que atienden al paciente crítico, tanto adulto como pediátrico, cuyo objetivo es reducir la mortalidad de la sepsis grave y el shock séptico mediante la evaluación de la eficacia y eficiencia de los tratamientos y la transferencia del conocimiento científico.

edusepsis.org

Acciones

- Intervenciones de Transferencia del Conocimiento en Sepsis.
  - Adultos
  - Pediatría
- Evaluaciones de la efectividad de los tratamientos de la sepsis.
  - Nacional
  - Internacional: SSC
- Evaluaciones de costes y Coste-Efectividad.

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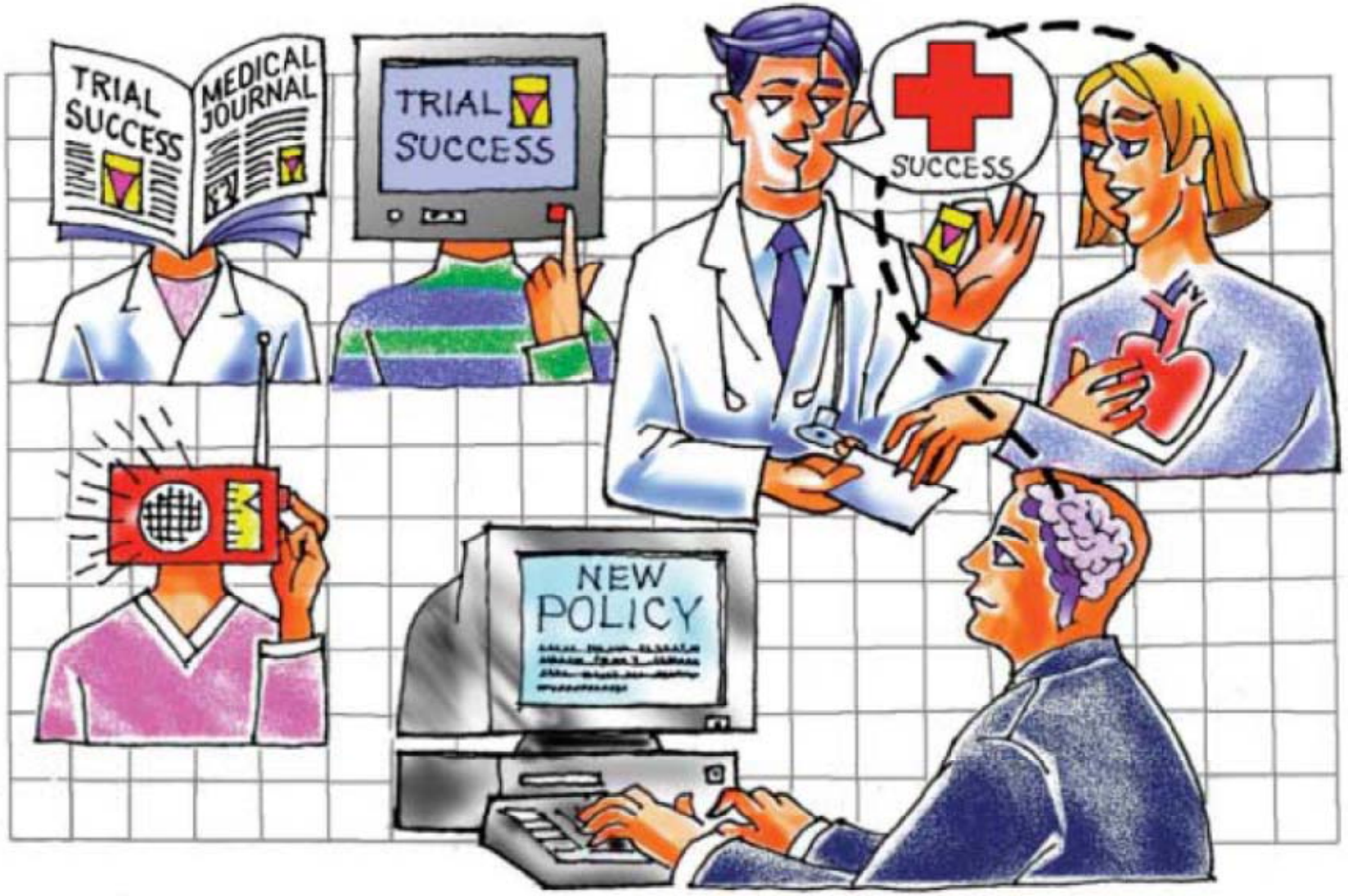
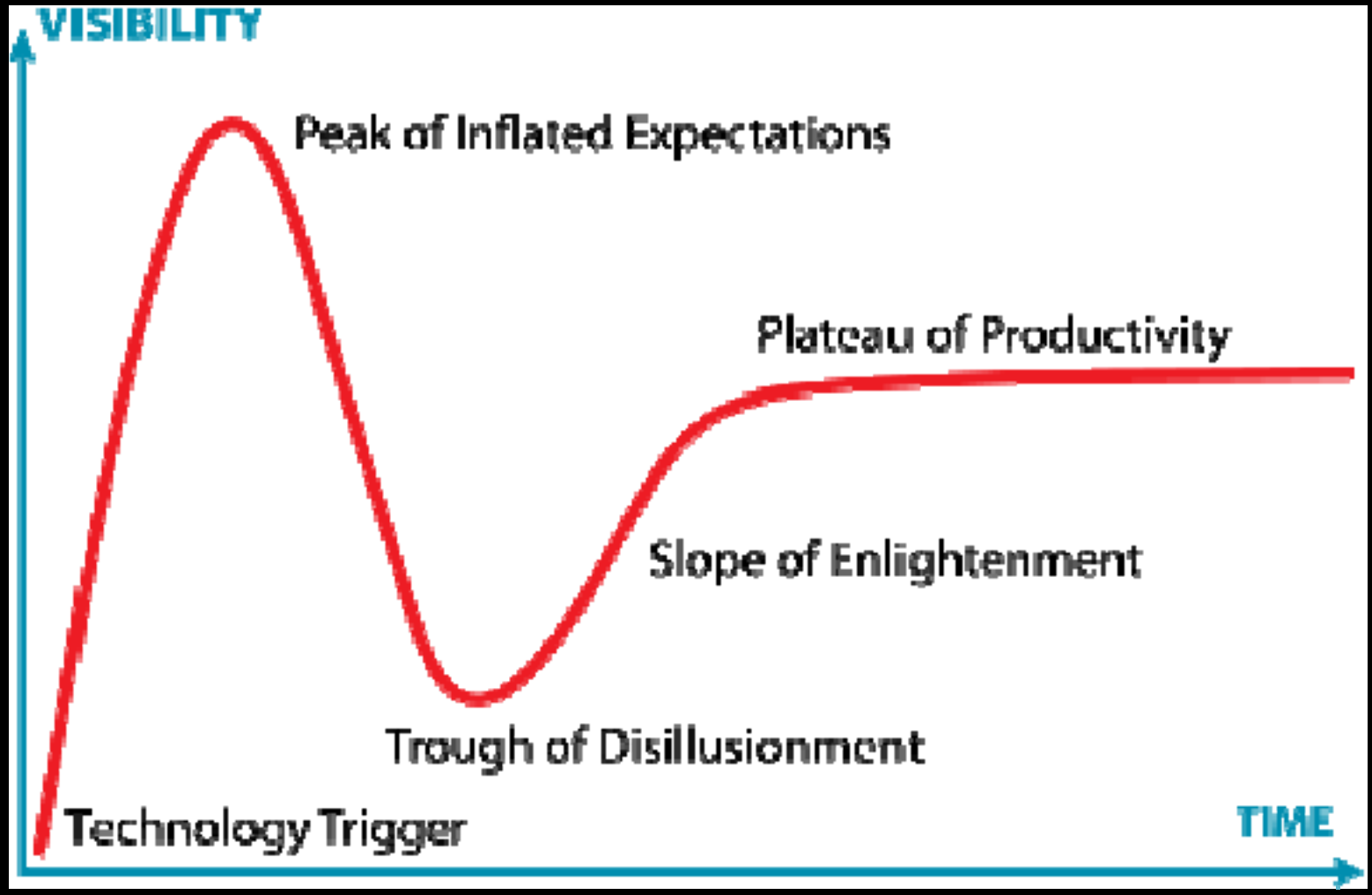
Transferencia del Conocimiento



Knowledge Transfer: Hype cycle



Knowledge Transfer in Critical Care

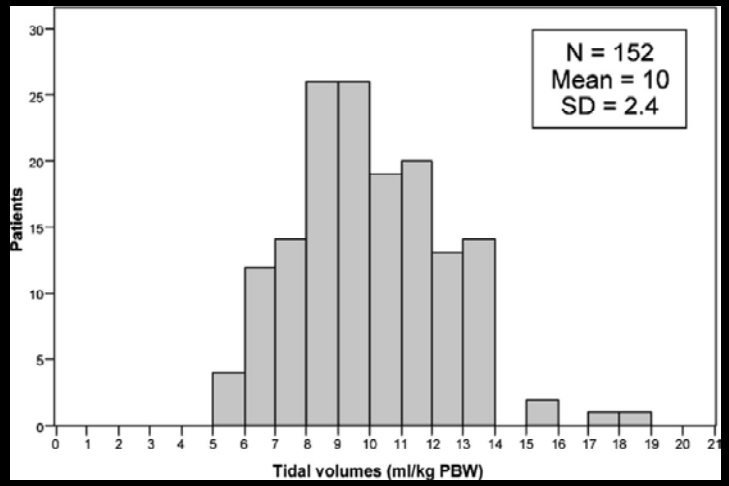
Practice	Potentially Eligible Patients, %	Patients Without Contraindication, %	Patients Receiving Practice, % of Eligible Patients Without Contraindication (95% CI)
Thromboembolism prophylaxis	100	86	95.3 (88.5–98.7)
Antibiotic prophylaxis	51	51	94.1 (83.7–98.8)
Stress ulcer prophylaxis	68	68	89.7 (79.9–95.7)
Enteral nutrition	100	58	72.4 (59.1–83.3)
Insulin infusion	17	17	58.8 (32.9–81.5)
Low tidal volume ventilation	13	13	53.8 (25.1–80.8)
Perioperative β-blockers	22	15	40.0 (16.3–67.7)
Steroids for septic shock	10	10	20 (2.5–55.6)
Specialty mattress	17	17	17.6 (3.8–43.4)
Interruption of sedation	68	48	8.3 (2.3–20.0)

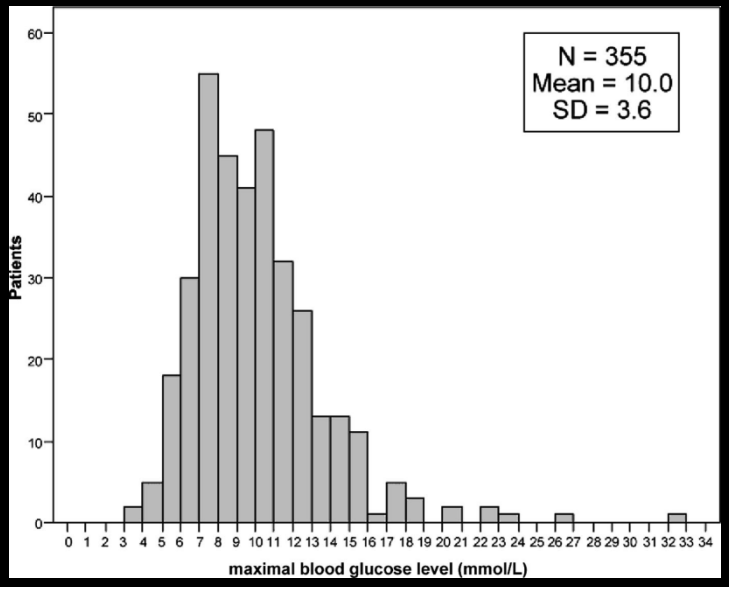
Fowler et al. CCM 2007;35:1696-1702

Practice and perception—A nationwide survey of therapy habits in sepsis*

Crit Care Med 2008; 36:2719–2725

Frank M. Brunkhorst, MD; Christoph Engel, MD; Max Ragaller, MD; Tobias Welte, MD; Rolf Rossaint, MD; Herwig Gerlach, MD; Konstantin Mayer, MD; Stefan John, MD; Frank Stuber, MD; Norbert Weiler, MD; Michael Oppert, MD; Onnen Moerer, MD; Holger Bogatsch, MD; Konrad Reinhart, MD; Markus Loeffler, MD; Christiane Hartog, MD; for the German Sepsis Competence Network (SepNet)

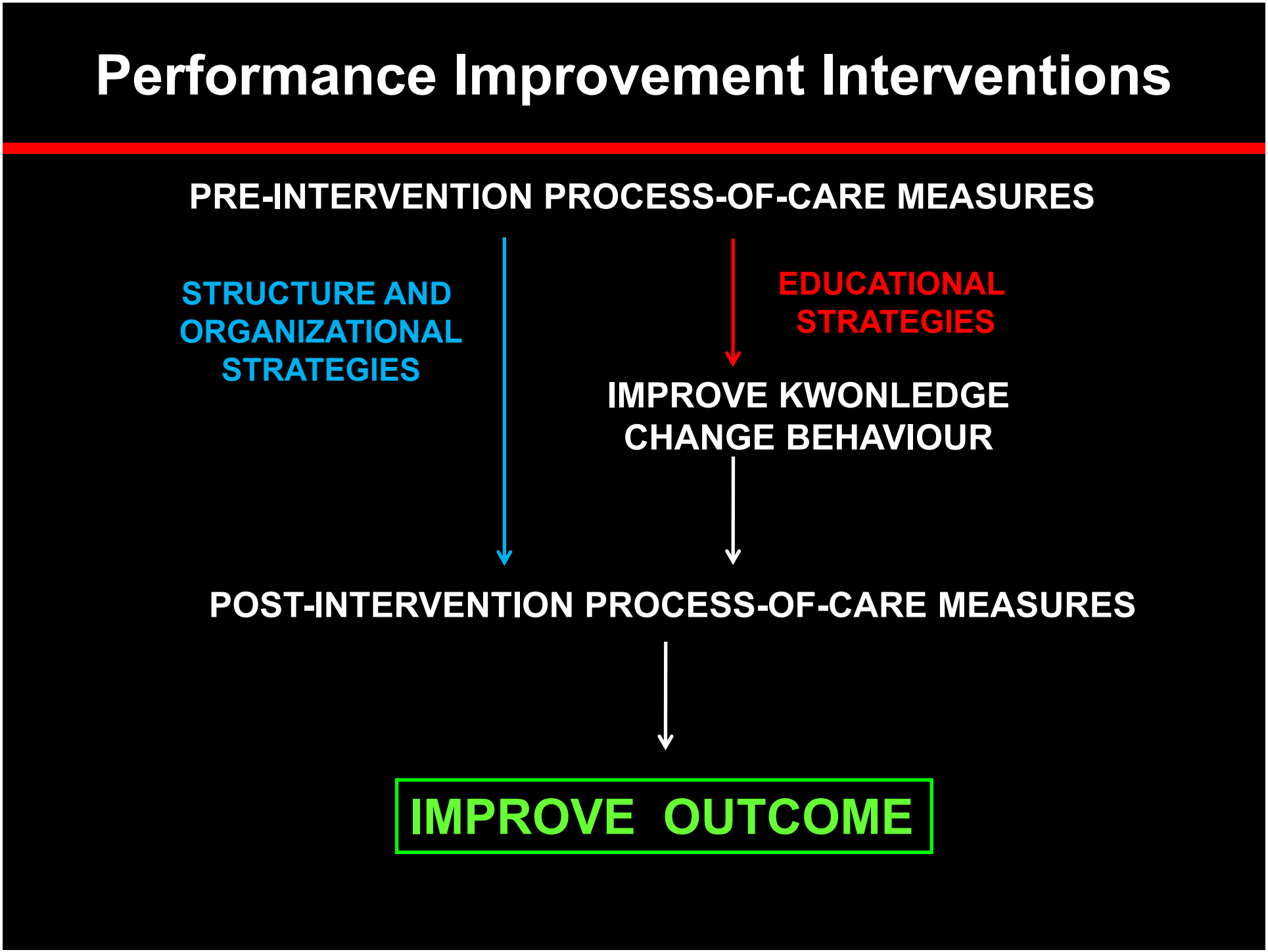




Perception

	All (N = 214)	S1 (n = 30)	S2 (n = 67)	S3 (n = 31)	S4 (n = 53)	S5 (n = 33)
Low-tidal volume ventilation						
Yes (%)	79.9	63.3	76.2	80.7	83.1	97.0
Not answered (%)	2.8	3.3	1.5	0.0	7.5	0.0
Glycemic control						
Yes (%)	65.9	63.3	59.7	71.0	66.1	75.8
Not answered (%)	0.5	0.0	0.0	0.0	1.9	0.0
Low-dose hydrocortisone						
Yes (%)	67.7	63.3	58.2	64.6	71.7	87.9
Not answered (%)	0.5	0.0	0.0	0.0	1.9	0.0
Activated protein C						
Yes (%)	1.4	0.0	0.0	6.5	1.9	0.0
Not answered (%)	1.4	0.0	1.5	0.0	1.9	3.0
Low-dose dopamine						
No (%)	79.0	46.7	73.2	80.6	92.5	97.0
Not answered (%)	0.5	0.0	0.0	0.0	1.9	0.0
Antithrombin						
No (%)	42.5	36.7	39.3	61.3	28.3	57.6
Not answered (%)	0.9	0.0	1.5	0.0	1.9	0.0

Performance Improvement Interventions



Surviving Sepsis Campaign

INSTITUTE FOR HEALTHCARE IMPROVEMENT

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

R. Phillip Dellinger, MD; Mitchell M. Levy, MD; Jean M. Carlet, MD; Julian Bion, MD; Margaret M. Parker, MD; Roman Jaeschke, MD; Konrad Reinhart, MD; Derek C. Angus, MD, MPH; Christian Brun-Buisson, MD; Richard Beale, MD; Thierry Calandra, MD, PhD; Jean-Francois Dhainaut, MD; Herwig Gerlach, MD; Maurene Harvey, RN; John J. Marini, MD; John Marshall, MD; Marco Ranieri, MD; Graham Ramsay, MD; Jonathan Sevransky, MD; B. Taylor Thompson, MD; Sean Townsend, MD; Jeffrey S. Vender, MD; Janice L. Zimmerman, MD; Jean-Louis Vincent, MD, PhD; for the International Surviving Sepsis Campaign Guidelines Committee

SEPSIS RESUSCITATION BUNDLE

6H

1. Measure serum lactate.
2. Obtain blood cultures prior to antibiotic administration.
3. Administer broad-spectrum antibiotics within 3 hours from time of presentation for ED admissions and 1 hour for non-ED ICU admissions.
4. In the event of hypotension and/or lactate > 4 mmol/L (36 mg/dL):
   a. Deliver an initial minimum of 20 ml/kg of crystalloid (or colloid equivalent).
   b. Apply vasopressors for hypotension not responding to initial fluid resuscitation to maintain mean arterial pressure (MAP) ≥ 65 mm Hg.
5. In the event of persistent hypotension despite fluid resuscitation (septic shock) and/or lactate > 4 mmol/L (36 mg/dL):
   a. Achieve central venous pressure (CVP) of ≥ 8 mm Hg.
   b. Achieve central venous oxygen saturation ($ScvO_2$) of ≥ 70%.*

SEPSIS MANAGEMENT BUNDLE

24H

1. Administer low-dose steroids* for septic shock in accordance with a standardized ICU policy.
2. Administer drotrecogin alfa (activated) in accordance with a standardized ICU policy.
3. Maintain glucose control ≥ lower limit of normal, but < 150 mg/dl (8.3 mmol/L).
4. Maintain inspiratory plateau pressures < 30 cm H_2O for mechanically ventilated patients.

Intensive Care Med 2008;34:17-60

Multifaceted Interventions

Intervention	Effect
Interventions incorporating educational outreach	Modest
Educational material + Educational meetings	Small-Modest
Educational material + Audit and Feedback	Modest
Educational material + Audit and Feedback + Educational meetings	Small-Modest
Educational material + Educational meetings + organizational interventions	Small-Modest
Reminders + Patient-directed interventions	Moderate-Large

Remainders have a summative effect with other interventions

Improvement in Process of Care and Outcome After a Multicenter Severe Sepsis Educational Program in Spain

JAMA 2008;299(19):2294-2303

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Manuel Quintana, MD
María Victoria de la Torre-Prados, MD, PhD
for the Edusepsis Study Group

Study Timeline

PERCEPTION

a before-and-after intervention study

BASELINE DATA COLLECTION	EDUCATIONAL PROGRAMME	POST-EDUCATION DATA COLLECTION	LONG-TERM FOLLOW-UP
OCT-DEC	JAN-FEB	MAR-JUN	MAR-JUN
2005	2006		2007

Multifaceted Intervention

PI

Interview → Hospital Manager

Clinical training → Physicians, Nurses

ICU

ED

Medical Ward

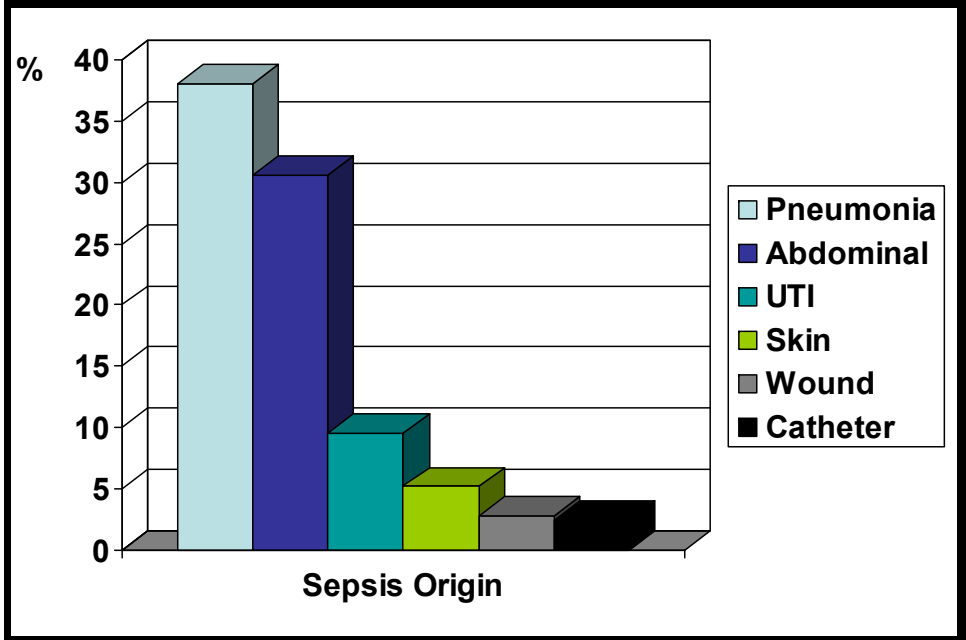
Surgical Ward

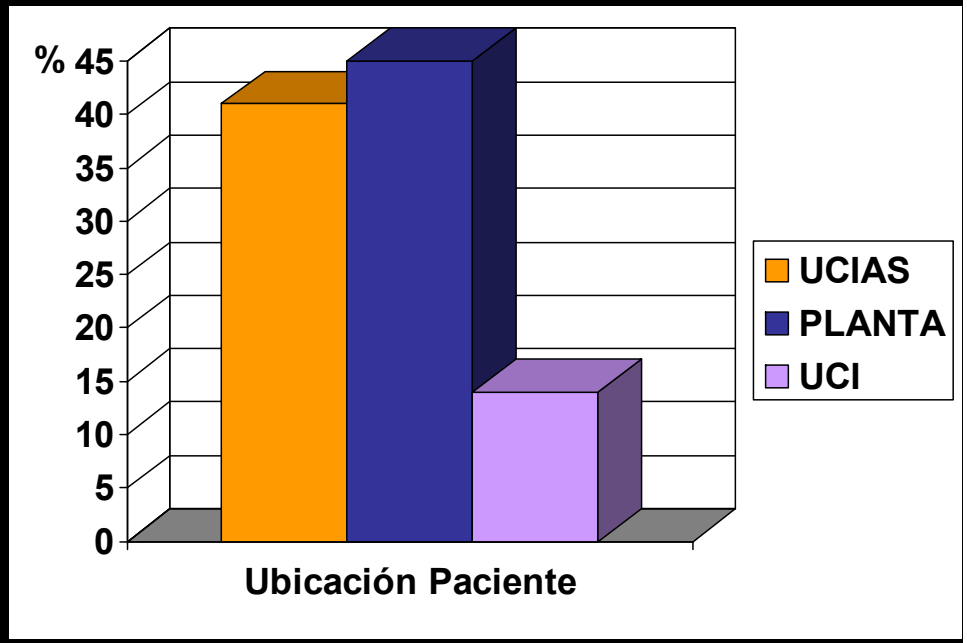
Graphic material: distribution and display

Patient Characteristics

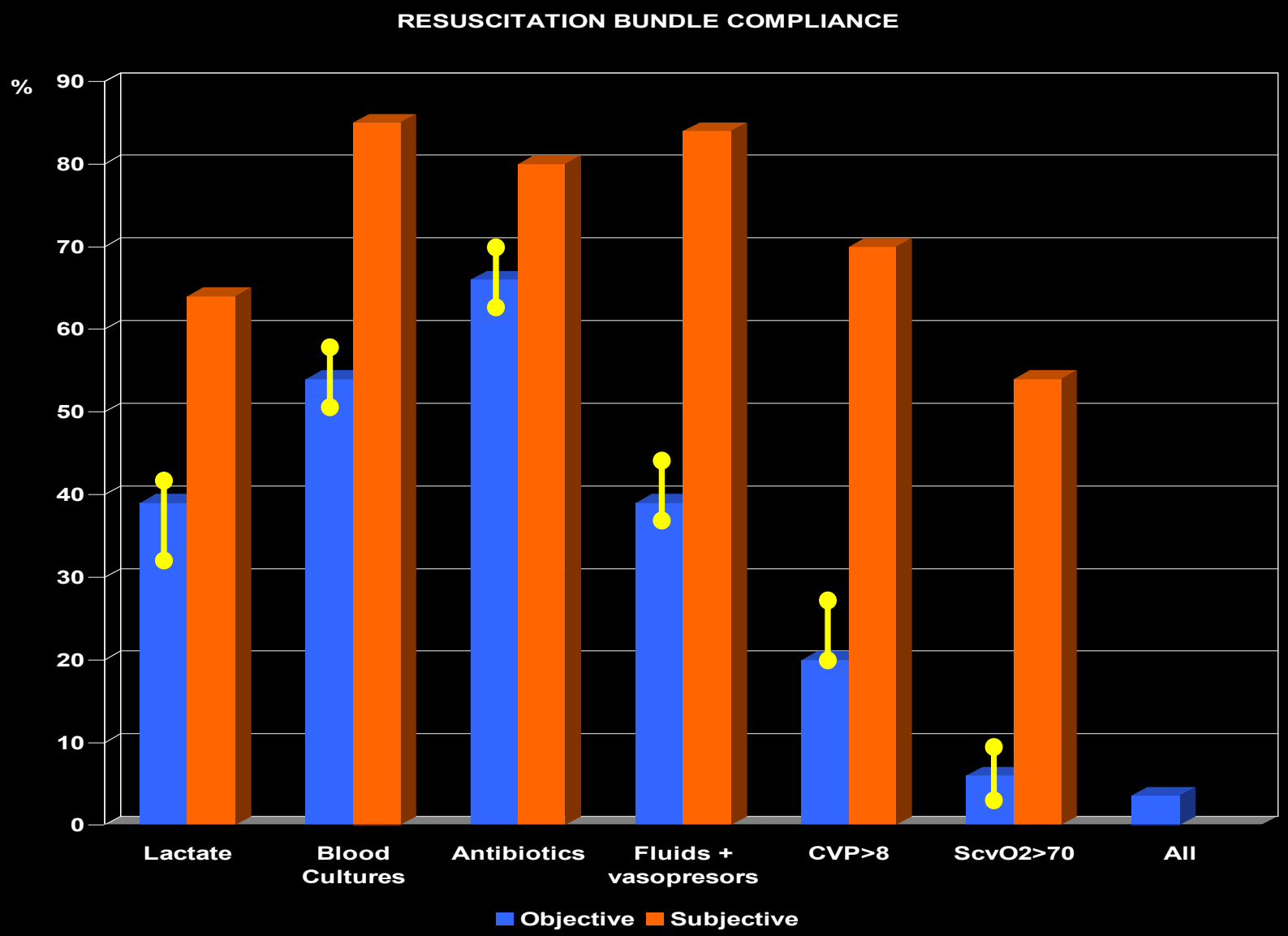
- Age 62.2 ± 16.3 years
- APACHE II score 21.1 ± 7.7
- 60.8% male
- Septic shock 79.6%
- Hospital mortality: 41.2%.

n= 2.796

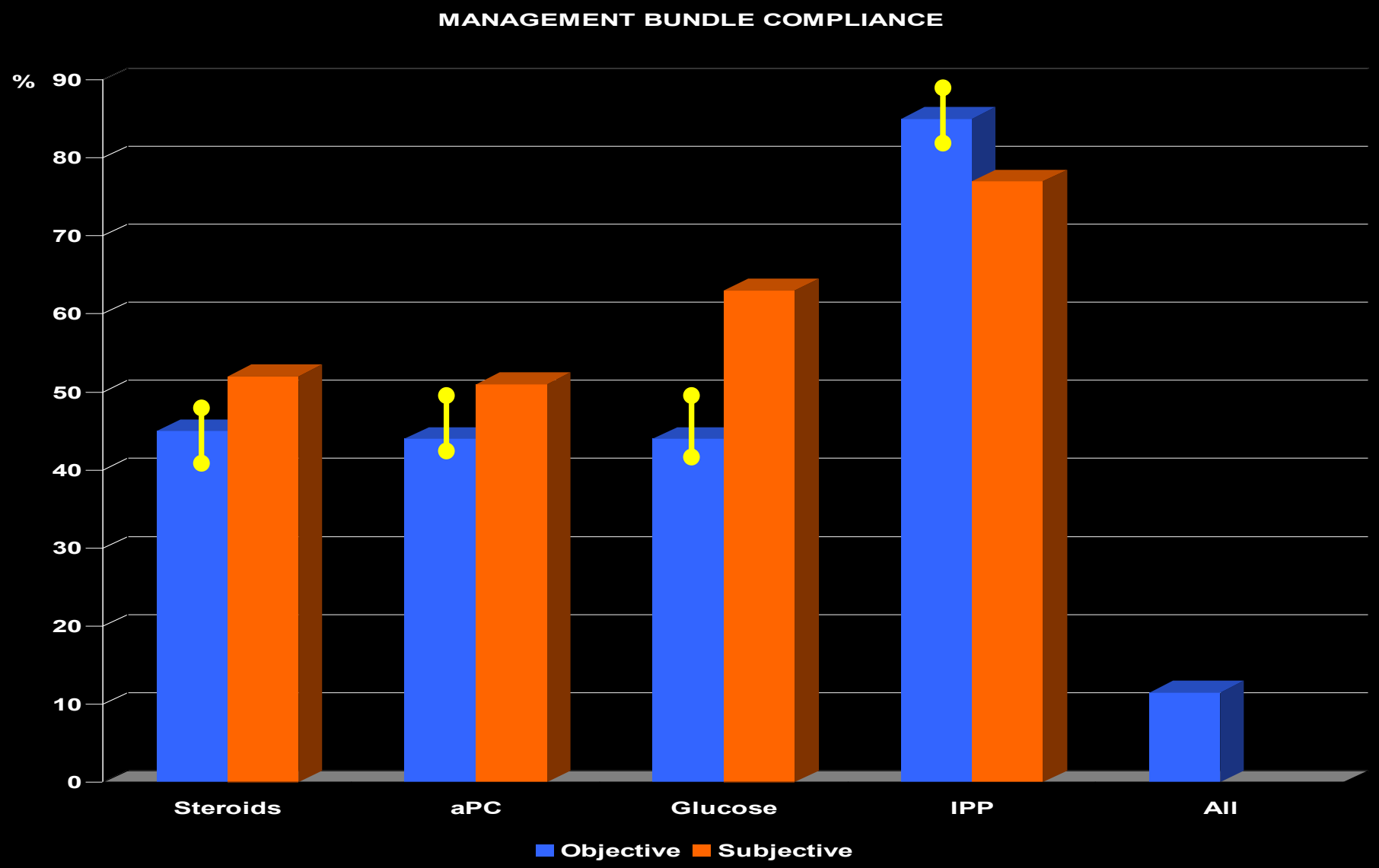




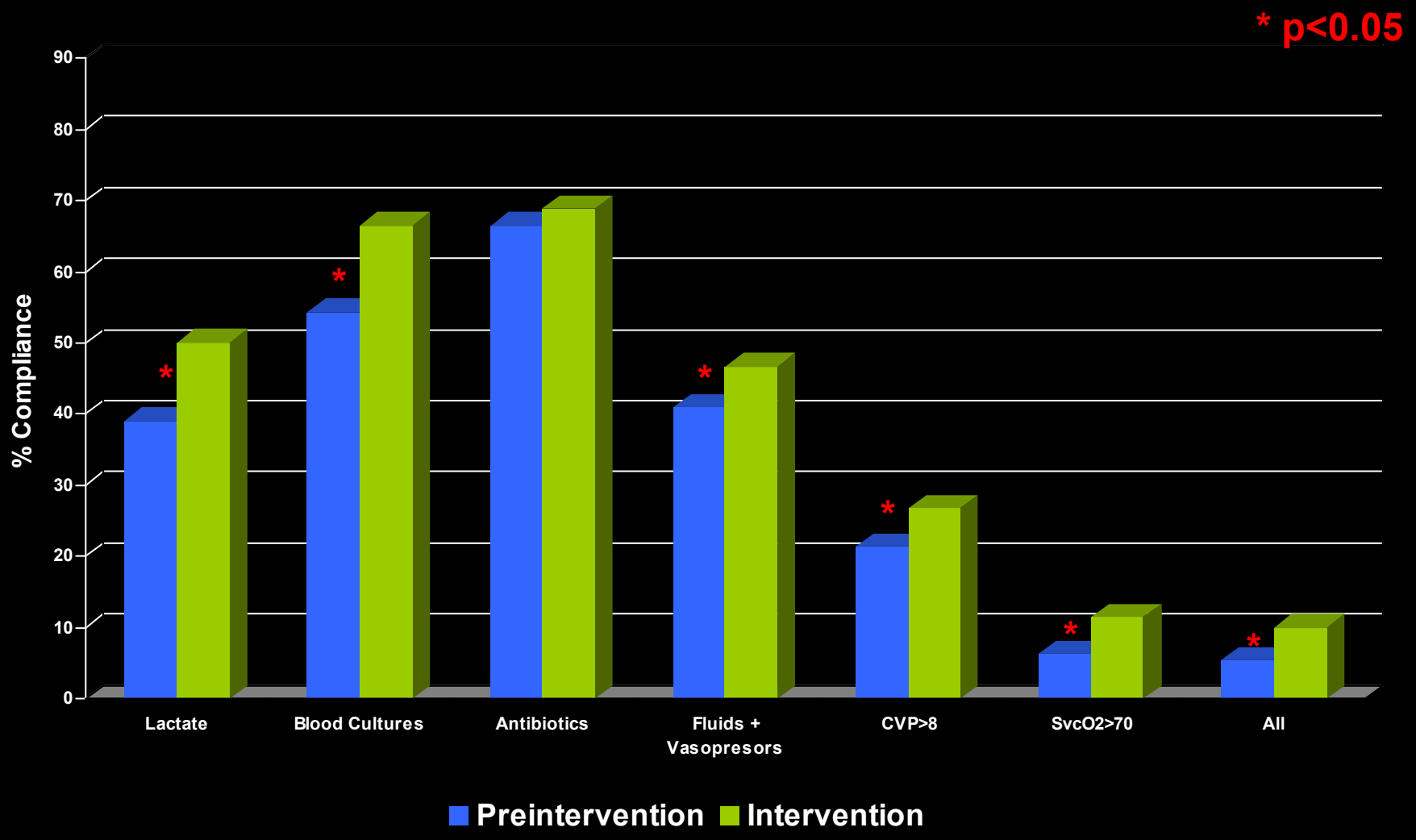
Sepsis bundles: Audit vs Subjective Perception



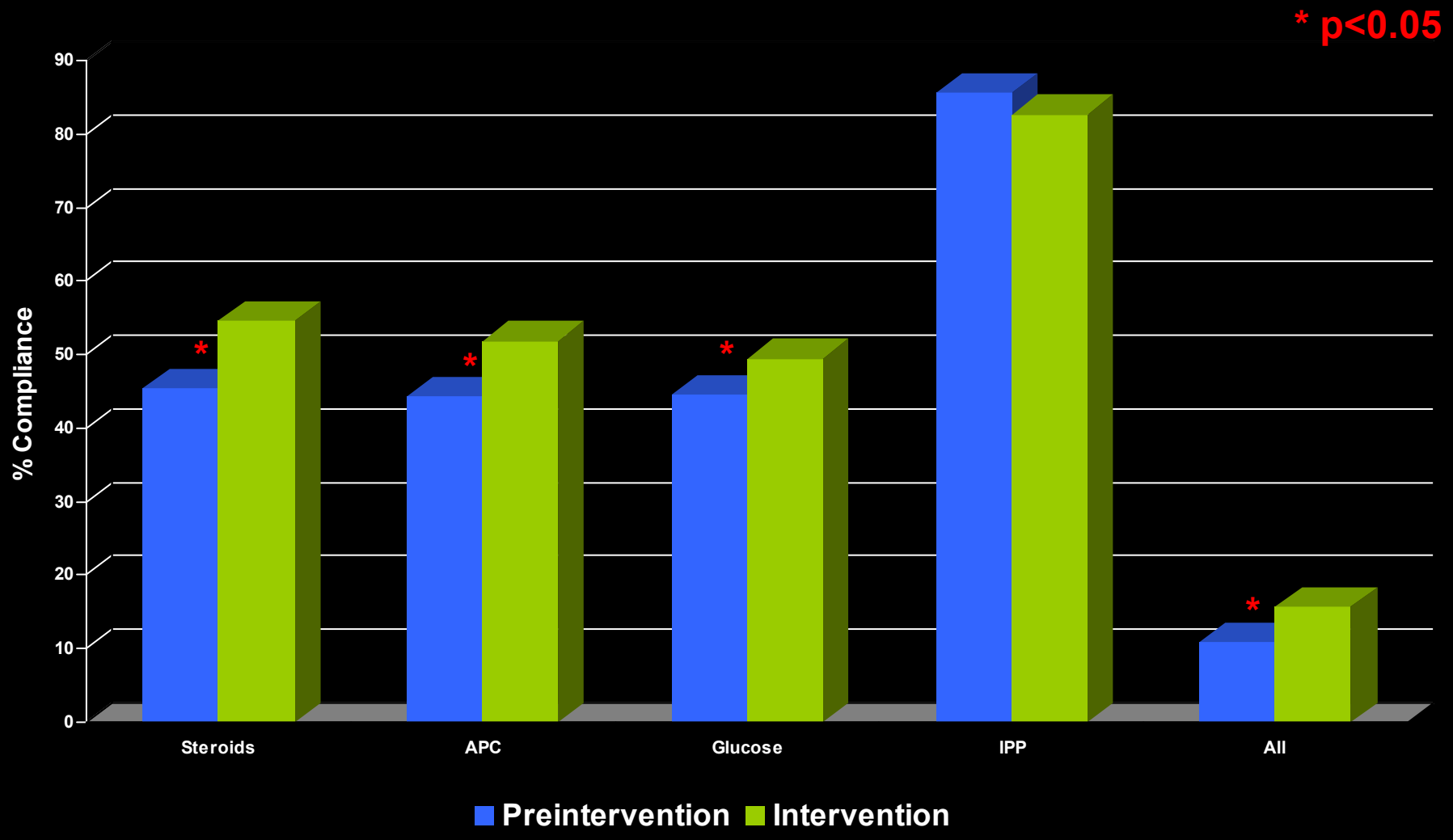
Sepsis bundles: Audit vs Subjective Perception



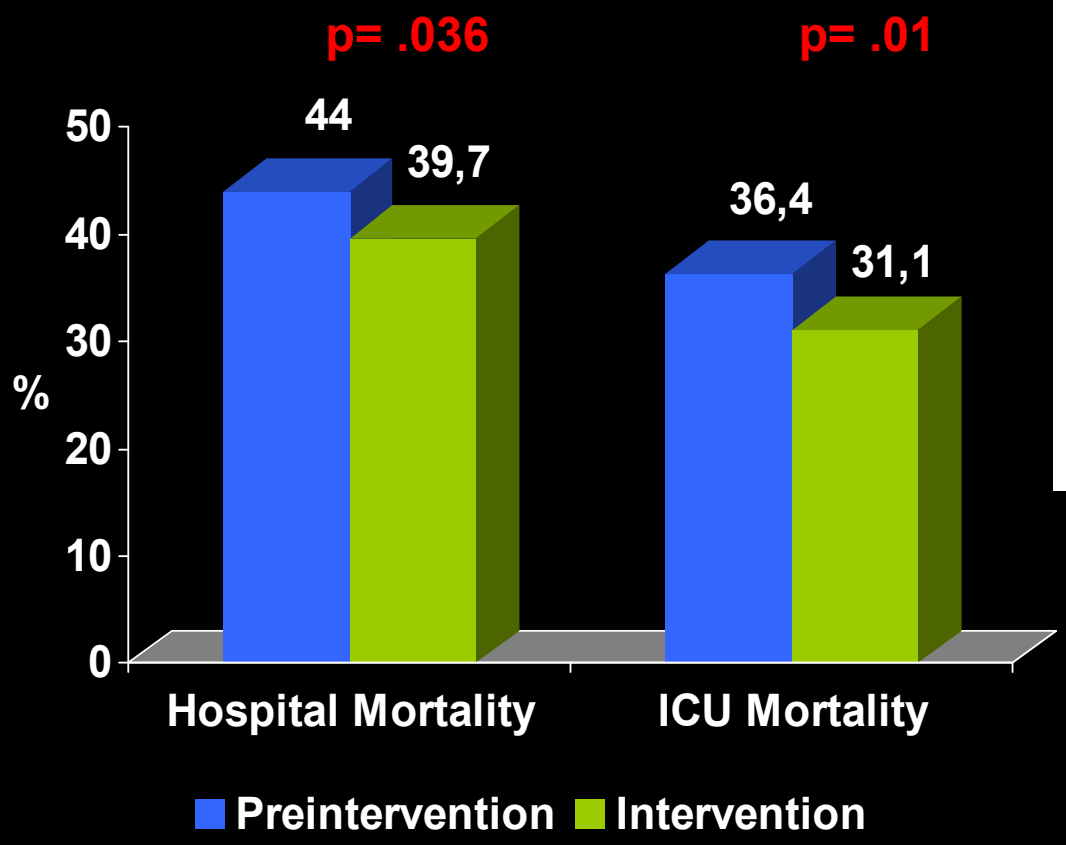
Resuscitation Bundle (6H)



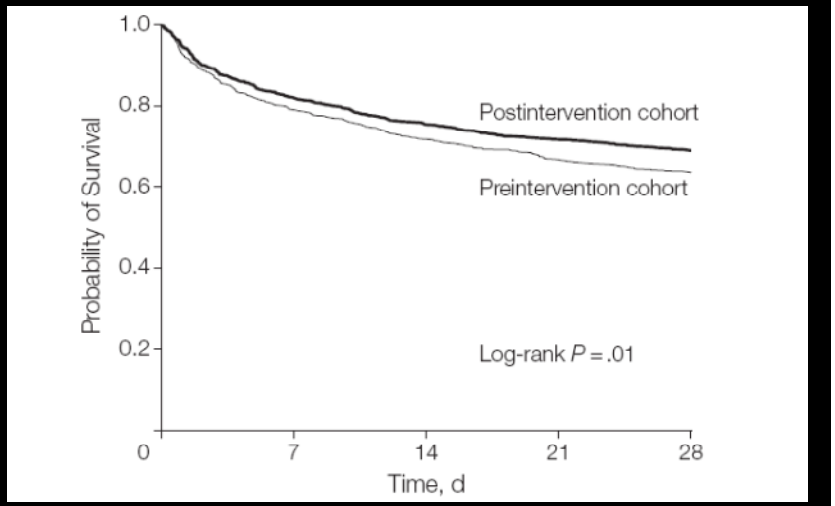
Management Bundle (24h)



Educational Program and Mortality

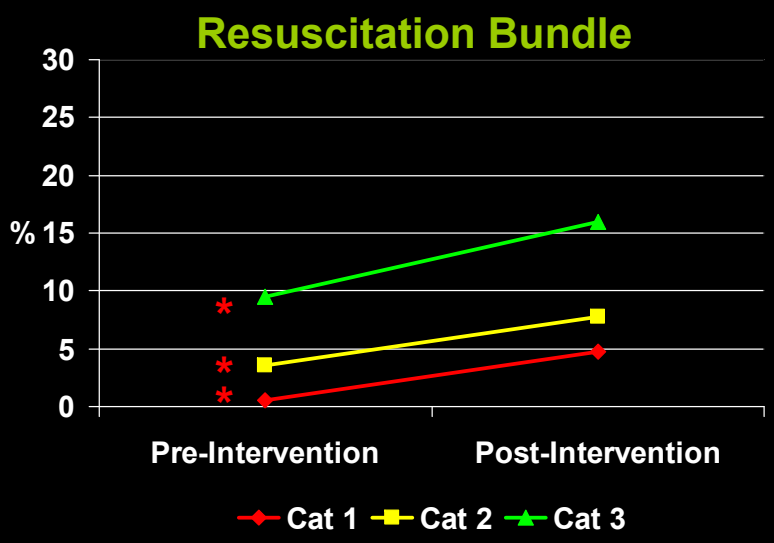


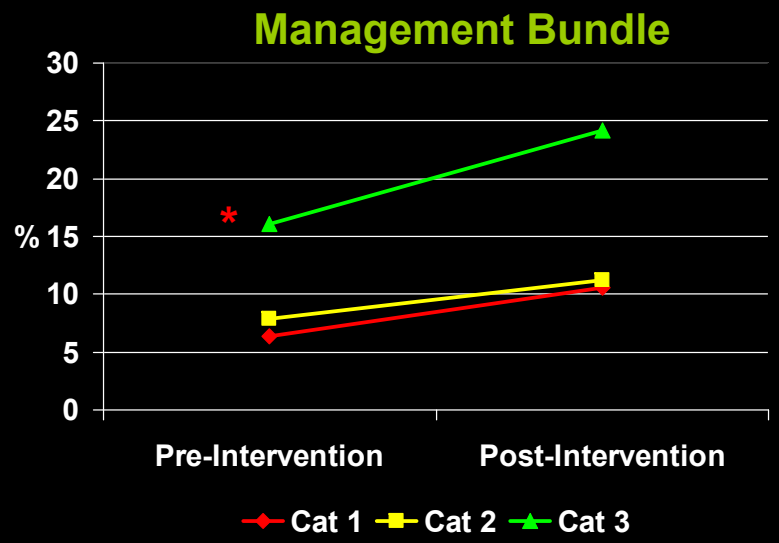
28d Mortality: Kaplan-Meier curve

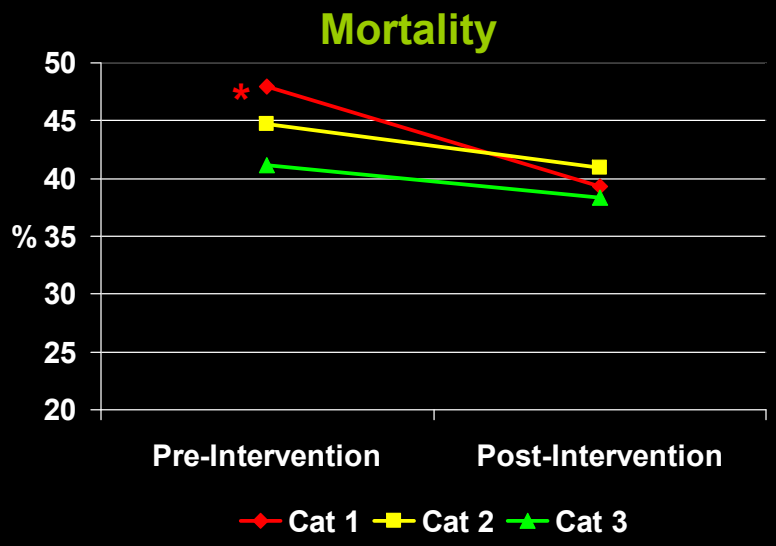


Absolute reduction: 4.3%
Relative reduction 10%
SSC objective was 25%!

Impact of Baseline Compliance



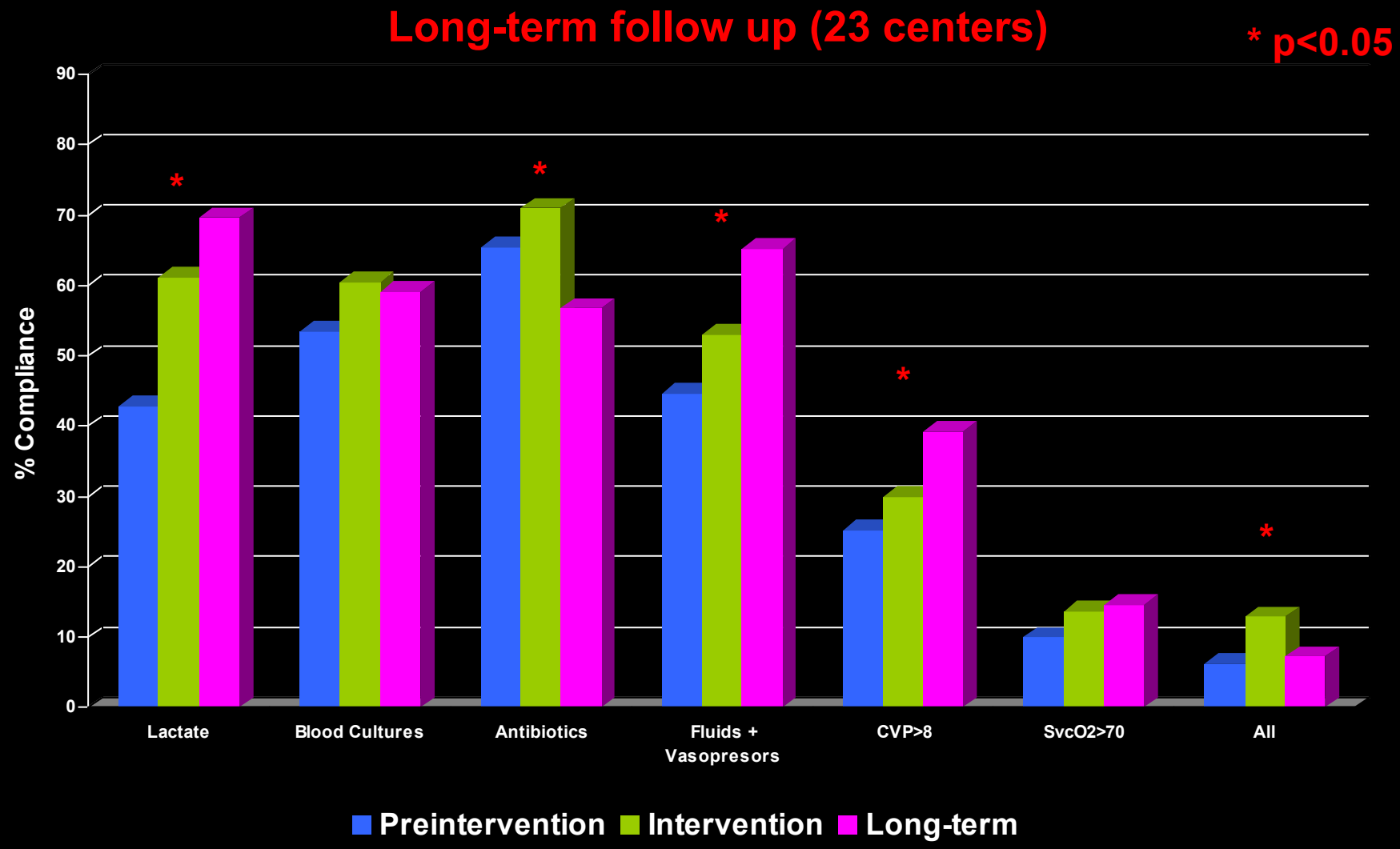




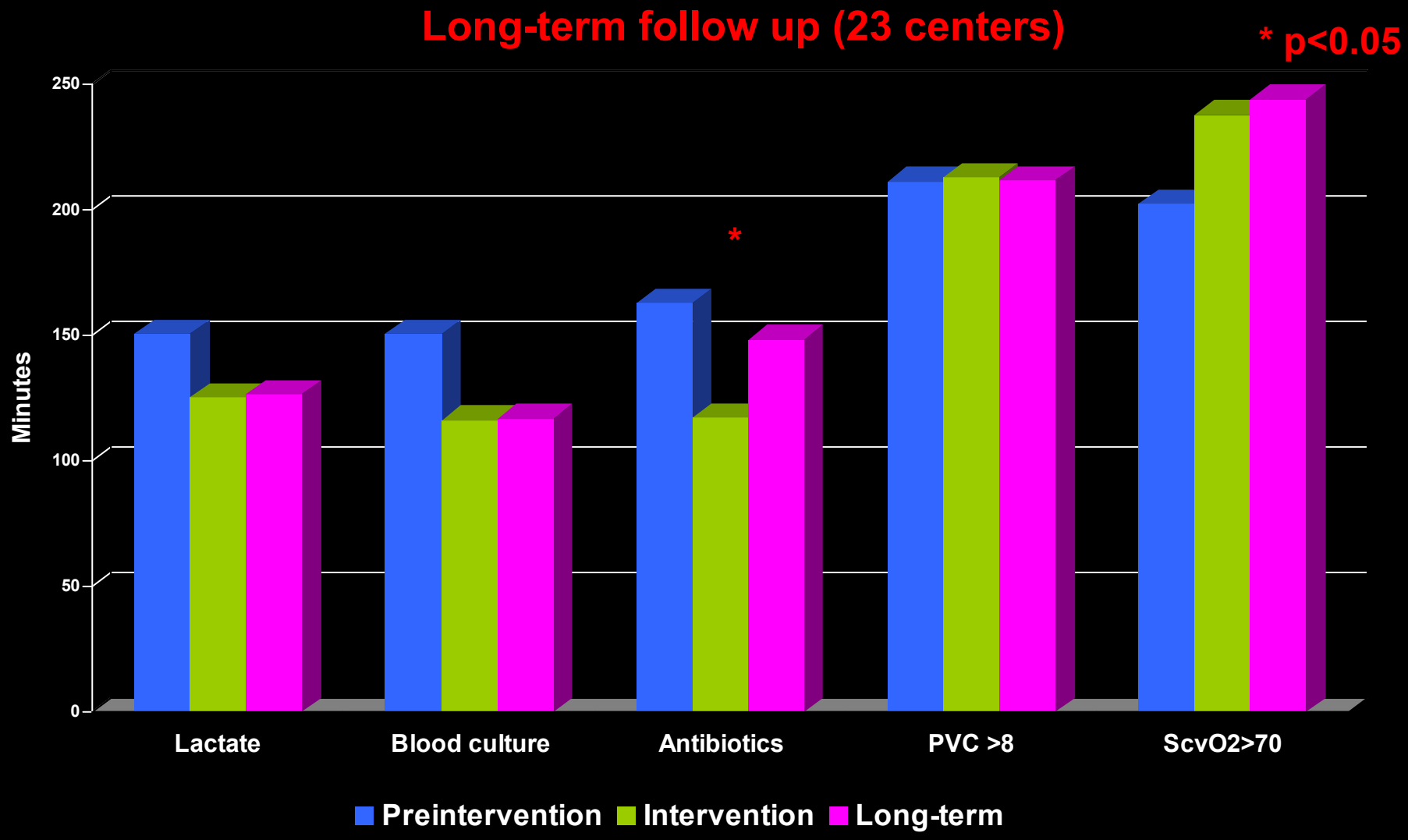
*** p<0.05**

Cat 1: < 4 tasks (n= 20)
Cat 2: 4-5 tasks (n= 19)
Cat 3: > 5 tasks (n= 20)

Resuscitation Bundle (6H)

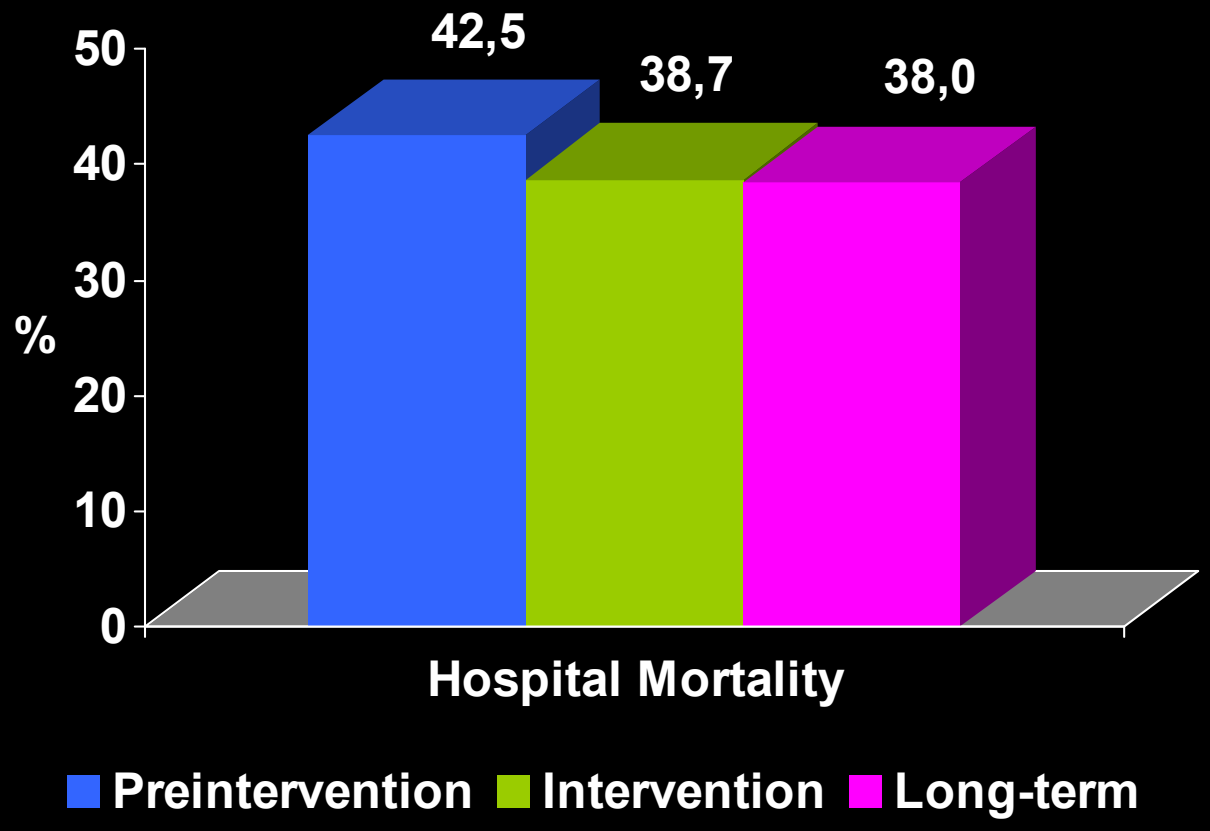


Time to Treatment



Educational Program and Mortality

Long-term follow up (23 centers)



Continuous Performance Improvement

PRE-INTERVENTION GUIDELINE IMPLEMENTATION

EDUCATIONAL STRATEGIES

IMPROVE KWONLEDGE

POST-INTERVENTION GUIDELINE IMPLEMENTATION

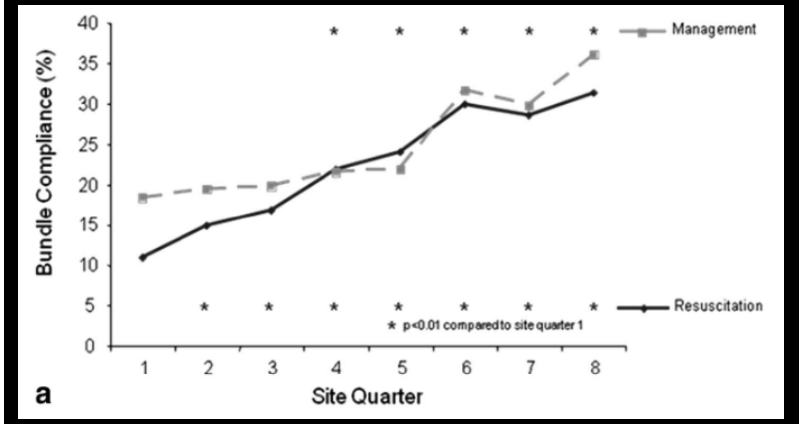
IMPROVE OUTCOME

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

Mitchell M. Levy, MD; R. Phillip Dellinger, MD; Sean R. Townsend, MD; Walter T. Linde-Zwirble; John C. Marshall, MD; Julian Bion, MD; Christa Schorr, RN, MSN; Antonio Artigas, MD; Graham Ramsay, MD; Richard Beale, MD; Margaret M. Parker, MD; Herwig Gerlach, MD, PhD; Konrad Reinhart, MD; Eliezer Silva, MD; Maurene Harvey, RN, MPH; Susan Regan, PhD; Derek C. Angus, MD, MPH; on behalf of the Surviving Sepsis Campaign

n= 15.022

	Initial Quarter Achieved, %	Final Quarter Achieved, %[a]	*p* Value Compared With Initial
Initial care bundle (first 6 hrs of presentation)			
Measure lactate	61.0	78.7	≤.0001
Blood cultures before antibiotics	64.5	78.3	≤.0001
Broad-spectrum antibiotics	60.4	67.9	.0002
Fluids and vasopressors	59.8	77.0	≤.0001
CVP >8 mm Hg	26.3	38.0	≤.0001
$Scvo_2$ >70%	13.3	24.3	≤.0001
All resuscitative measures	10.9	21.5	≤.0001
Management bundle (first 24 hrs after presentation)			
Steroid policy	58.5	73.9	≤.0001
Administration of drotrecogin alfa policy	47.4	53.5	.003
Glucose control	51.4	56.8	.0009
Plateau pressure control	80.8	83.8	.24
All management measures	18.4	25.5	≤.0001



Crit Care Med 2010; 38(2):367-374

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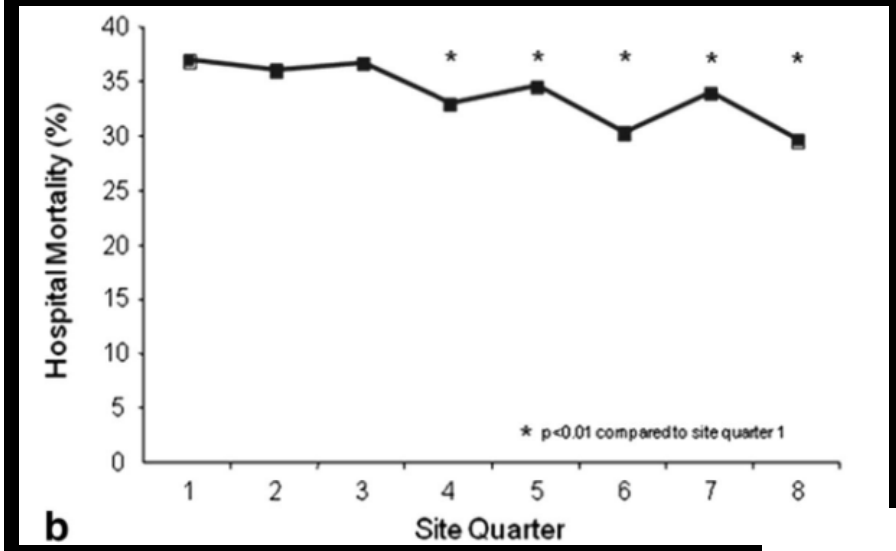


Variable	OR	95% CI	p
Admission source			
Ward compared to ED	1.87	1.73, 2.02	≤.0001
ICU compared to ED	2.25	2.02, 2.51	
Pneumonia as source of sepsis compared to other infections	1.37	1.27, 1.48	≤.0001
Organ dysfunction at presentation			
Cardiovascular	1.39	1.26, 1.55	≤.0001
Respiratory	1.23	1.14, 1.34	≤.0001
Hematologic	1.61	1.48, 1.75	≤.0001
Hepatic	1.28	1.14, 1.75	≤.0001
Renal	1.40	1.30, 1.51	≤.0001
Site duration in Campaign			
Per quarter	0.97	0.96, 0.99	.0006

Crit Care Med 2010; 38(2):367-374

ABISS Edusepsis Study

Antibiotic Intervention in Severe Sepsis

edusepsis.org

Objectives

- Efficacy:
  - Reduce time to empiric antibiotic in severe sepsis.
  - Increase appropriateness of antibiotic treatment
  - Reduce hospital mortality.
- Safety:
  - Increase antibiotic deescalation.

By a multifaceted quality-improvement intervention in patients with severe sepsis/septic shock admitted to the Spanish ICUs.

Multifaceted Intervention

- Audit and Feed-back.
- Educational meetings: PP presentation.
- Interactive Sepsis simulation on-line.
- Posters and pocket material about initial TTM.
- Support for antibiotic prescription.
- Remainders by mail and SMS to all staff assisting to educational meetings.

Remainders: SMSs

The effect of mobile phone text-message reminders on Kenyan health workers' adherence to malaria treatment guidelines: a cluster randomised trial

Lancet 2011; 378: 795–803

Dejan Zurovac, Raymond K Sudoi, Willis S Akhwale, Moses Ndiritu, Davidson H Hamer, Alexander K Rowe, Robert W Snow

	Baseline		Follow-up one		Follow-up two		Effect size (difference of differences)			
	Control	Intervention	Control	Intervention	Control	Intervention	Immediately after end of intervention		6 months after end of intervention	
							% change (95% CI)	p value	% change (95% CI)	p value
Composite performance										
Correctly managed	422/47 (11·1%)	439/90 (20·5%)	358/59 (16·5%)	391/194 (49·6%)	332/58 (17·5%)	327/168 (51·4%)	23·7% (7·6 to 40·0)	0·0040	24·5% (8·1 to 41·0)	0·0034

Audit and Feed-Back

Apreciado investigador del estudio ABISS EDUSEPSIS,

Durante la fase preintervención del estudio hemos evaluado el tratamiento que reciben los pacientes con sepsis grave/shock séptico en tu centro y en más de 100 UCIs españolas.

Los resultados preliminares muestran:

	Tu Centro	**España**
Nº de pacientes incluidos		
Nº de pacientes sin tratamiento antibiótico previo		
Tiempo Sepsis Grave -Tratamiento antibiótico		
% Tratamiento antibiótico apropiado		
% Desescalamiento a las 72h		
Mortalidad		

Estos datos justifican plenamente una intervención dirigida a reducir el tiempo Sepsis Grave -Tratamiento antibiótico que incluye un programa educativo junto con material gráfico dirigido a médicos y enfermeras de los ámbitos que atienden pacientes sépticos.

Te ruego que hayas llegar esta información a tu Jefe de Servicio, Dirección Médica y Dirección de Enfermería. Asimismo, te pongas todo tu empeño en la implementación de la intervención del estudio ABISS-Edusepsis.

Un cordial saludo,

Ricard Ferrer

Coordinador del estudio ABISS-Edusepsis

Educational Meetings

120 hospitals were invited to participate and received the educational material:

-Poster “La Sepsis Mata”: 360
-Poster “Pilares del tratamiento de la Sepsis”: 360
-Poster “Juego interactivo”: 360
-Triptics “Pilares del tratamiento de la Sepsis”: 6000

Educational intervention:
-80 hospitals complete the educational intervention
-4567 doctors and nurses attend to the meetings and provide a email address and/or mobile phone for remainders.

ABISS EDUSEPSIS

Educational Material

PILARES DEL TRATAMIENTO DE LA SEPSIS

ANTIBIÓTICOS PRECOCES

- Tome 2 hemocultivos simultáneos en diferente localización lo antes posible.
- Adicionalmente tome las muestras pertinentes según la sospecha diagnóstica.
- PRESCRIBA ANTIBIÓTICOS INMEDIATAMENTE. Su administración precoz es fundamental y debe considerarse una EMERGENCIA!
- Utilice los protocolos de antibióticos de su centro.
- Reevalúe diariamente el tratamiento antibiótico para optimizar la eficacia, prevenir las resistencias, evitar toxicidad y minimizar costes.

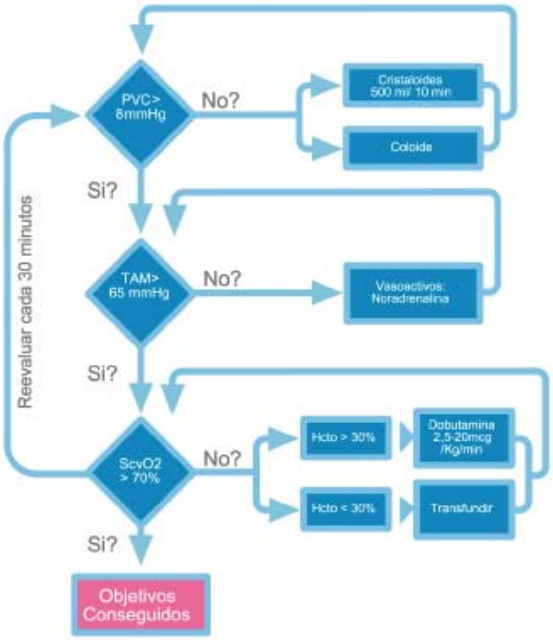
También están disponibles las siguientes pautas:

www.es.dgai-abx.de Usuario y Contraseña para cada centro.

Libro Rojo del GTEI-SEMICYUC: http://goo.gl/LEfai Socios SEMICYUC.

REANIMACIÓN HEMODINÁMICA

- Determine rápidamente lactato en sangre. Nos indicará el grado de hipoperfusión del enfermo.
- En caso de hipotensión o lactato elevado:
  - ADMINISTRE RÁPIDAMENTE FLUÍDOS! 20ml/Kg de suero salino en 1 hora.
  - Evalúe la respuesta de forma inmediata. Si persiste hipotensión o lactato elevado siga resucitando en función del algoritmo:



CONTROL DEL FOCO DE INFECCIÓN

- Se debe realizar la erradicación del foco causal ya sea drenaje de abscesos, desbridamiento de tejidos necróticos y retirada de dispositivos infectados.
- Las medidas de control del foco deben iniciarse inmediatamente tras la resucitación inicial.
- El proceso de sepsis no mejorará de no ser controlado y adecuadamente tratado el foco de origen.
- Deben realizarse TODAS las exploraciones complementarias pertinentes (Rx, TC, Eco, etc).

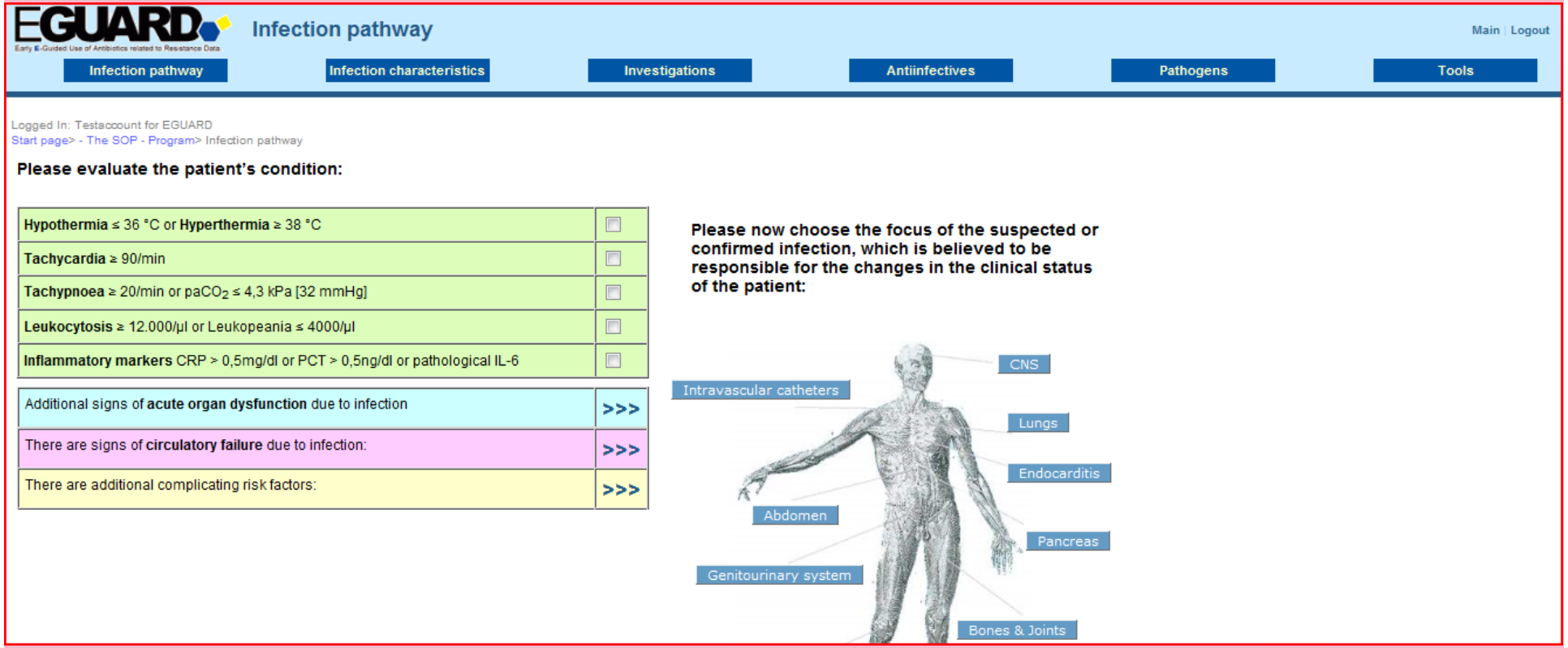
Ejemplos:

- Neumonía: Evalúe posible EMPIEMA.
- Si hay un absceso drénelo.
- Pielonefritis: Evalúe obstrucción y considere drenaje percutaneo.
- Colangitis: Evalúe obstrucción y considere drenaje
- Infección de piel y partes blandes: Considere desbridamiento.

Consulte con su equipo quirúrgico o de radiología intervencionista de referencia.

Prescription Support

- Local Guidelines of empiric antibiotic treatment
- Spanish Society of Intensive Care Guidelines of empiric antibiotic treatment



ABISS EDUSEPSIS

Gamification

Remainder. SMSs

- En sepsis la administración del antibiótico adecuado es una emergencia.Consulta tu guia local de tto antibiotico empirico.TU VELOCIDAD ES VIDA.
- Los pilares del tratamiento de la sepsis son:antibióticoterapia, control del foco y resucitación hemodinámica.¡COMPLETALOS RAPIDAMENTE!
- Tardamos 3 horas en administrar antibiótico empírico en sepsis con mortalidad 33%. Administrado en 1h la mortalidad sería inferior!.
- Antes del tto antibiótico, recuerda tomar hemocultivos + cultivos adicionales según foco de sepsis, después podrás ajustar tu tto empírico!.

Results

- 72 hospitals in Spain.
- 2576 patients: PRE 1,325, POST: 1,251
- Age 64.1 ± 15.1 years, 54.1% male.
- CHARLSON 2.7 ± 2.2
- Septic Shock 67.6%, 32.4% severe sepsis.
- Bacteriemia: 33%
- APACHE-II 22 ± 8.
- SOFA 9 ± 3
- PCT 25 ± 35

Results: Blood Cultures

Microorganism	n
Escherichia coli	299
Staphylococcus aureus MS and MR	78
Streptococcus neumoniae	75
Staphylococcus CN	60
Klebsiella spp	53
Pseudomonas aeuroginosa	42
Enterococcus spp	35
Streptococcus pyogenes	28
Enterobacter spp	25
Streptococcus other	22
Candida spp	21
Multiple microorganisms	19
Proteus mirabilis	16
Bacterioides fragillis	14
Acinetobacter baumanii	11
Clostridium	6
Neisseria meningitidis	5
Salmonella	5
Listeria monocytogenes	4
Serratia marcescens	4

Results: Source Control

28,3% de los pacientes precisan una técnica de control del foco

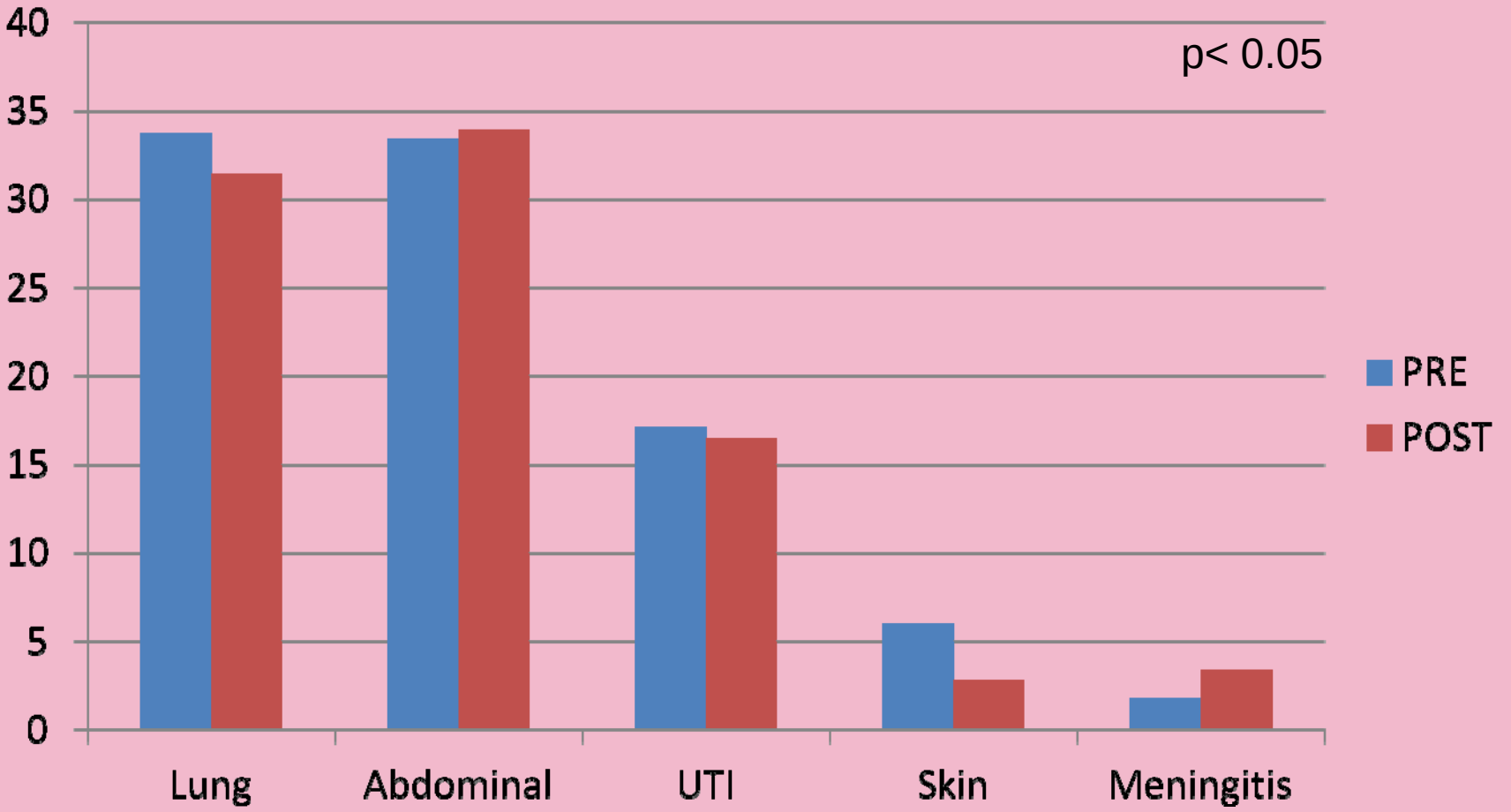
Técnica	n
Colectomía parcial/total	201
Colecistectomía	96
Resección intestino delgado	70
Desbridamiento piel-partes blandas	77
Drenaje abdominal percutáneo	48
Nefrostomía	41
Cateterismo ureteral	37
Drenaje vía biliar	33
Drenaje torácico	24
Desbridamiento de absceso	19
Cirugía gástrica	19

Técnica	n
Apendicectomía	17
Pancreatectomía parcial	13
Sutura úlcera	17
Cirugía hepática	9
Nefrectomía	7
Esofaguectomía	4
Desbridamiento cuello/mediastino	6
Histerectomía	3
Cirugía craneal	2
Cirugía de pulmón y bronquio	1
Cirugía valvular cardiaca	1

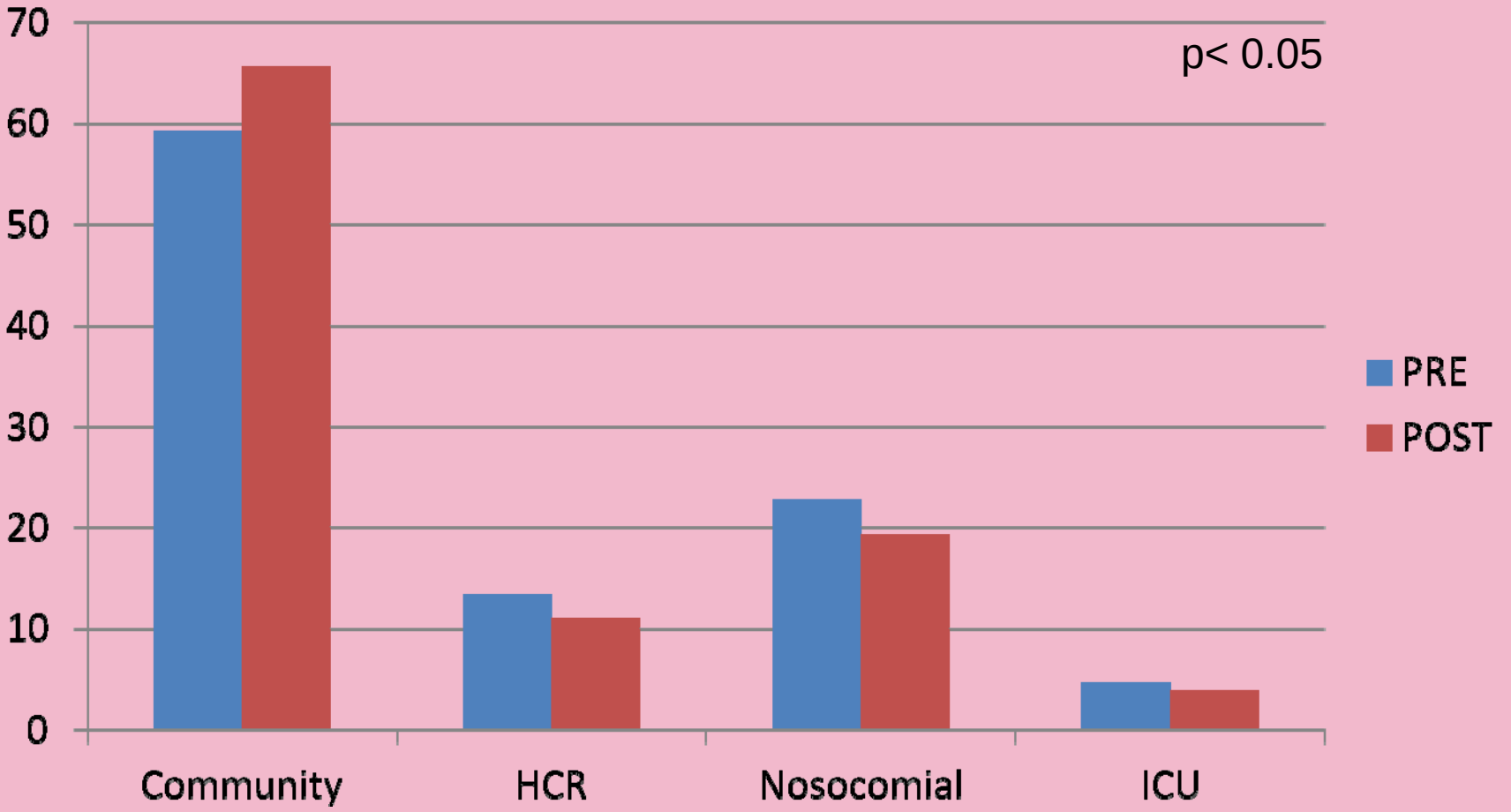
Results

	PRE	POST	P value
Age	64.3±15.3	63.9±15.0	0.480
Charlson	2.7±2.3	2.7±2.3	0.308
Leukocytes	14.4±11.5	15.9±11.0	0.290
CRP	27.1±24.8	25.0±24.5	0.055
PCT	25.1±35.2	25.6±34.5	0.804
Lactate (mmol/L)	3.5±3.1	3.6±2.8	0.247
APACHE II	22.6±8.1	21.4±8.0	<0.001
Number OF	3.0±1.4	3.0±1.4	0.897
SOFA	8.7±3.5	8.5±3.4	0.073

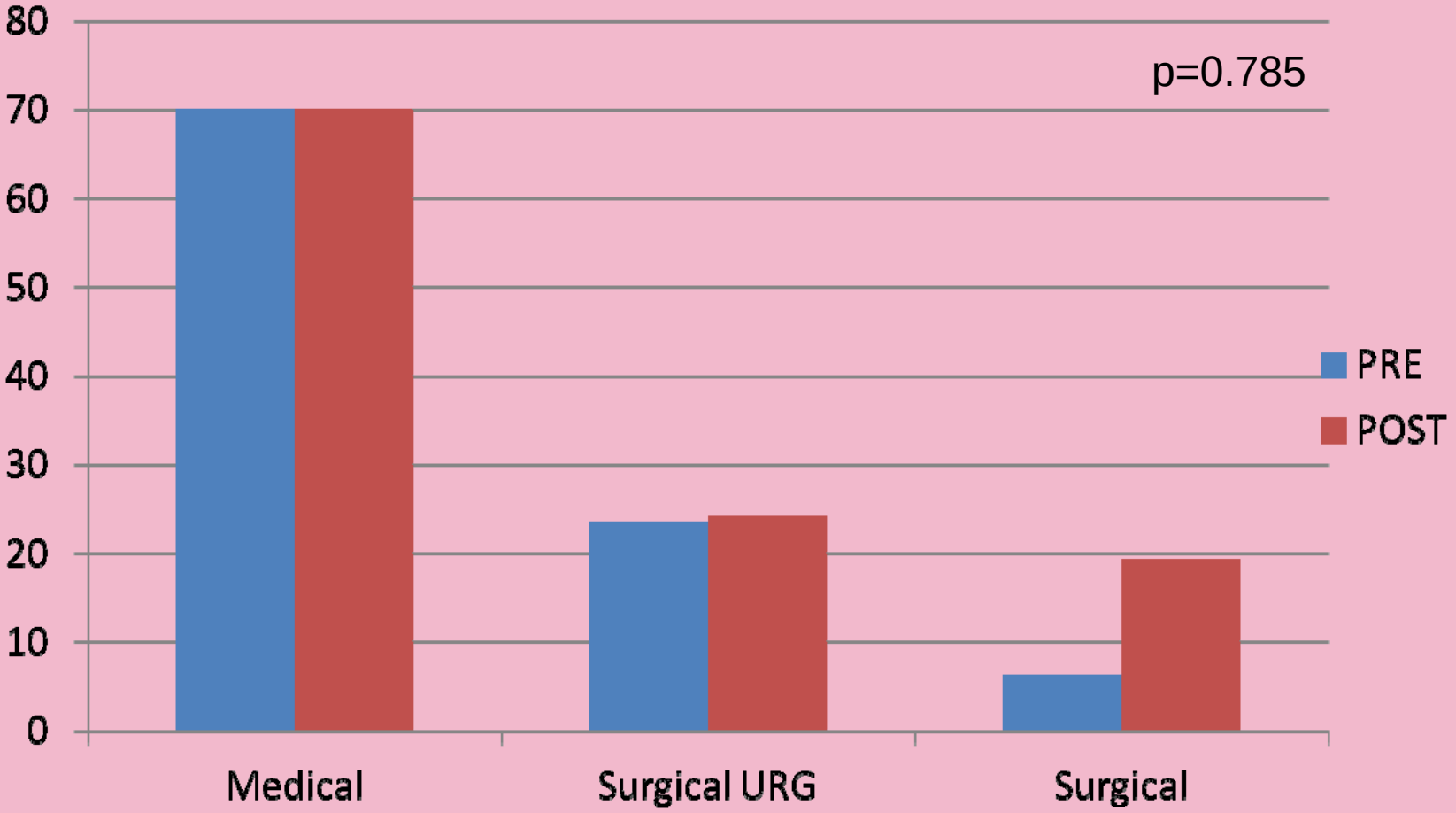
Results: Source Infection



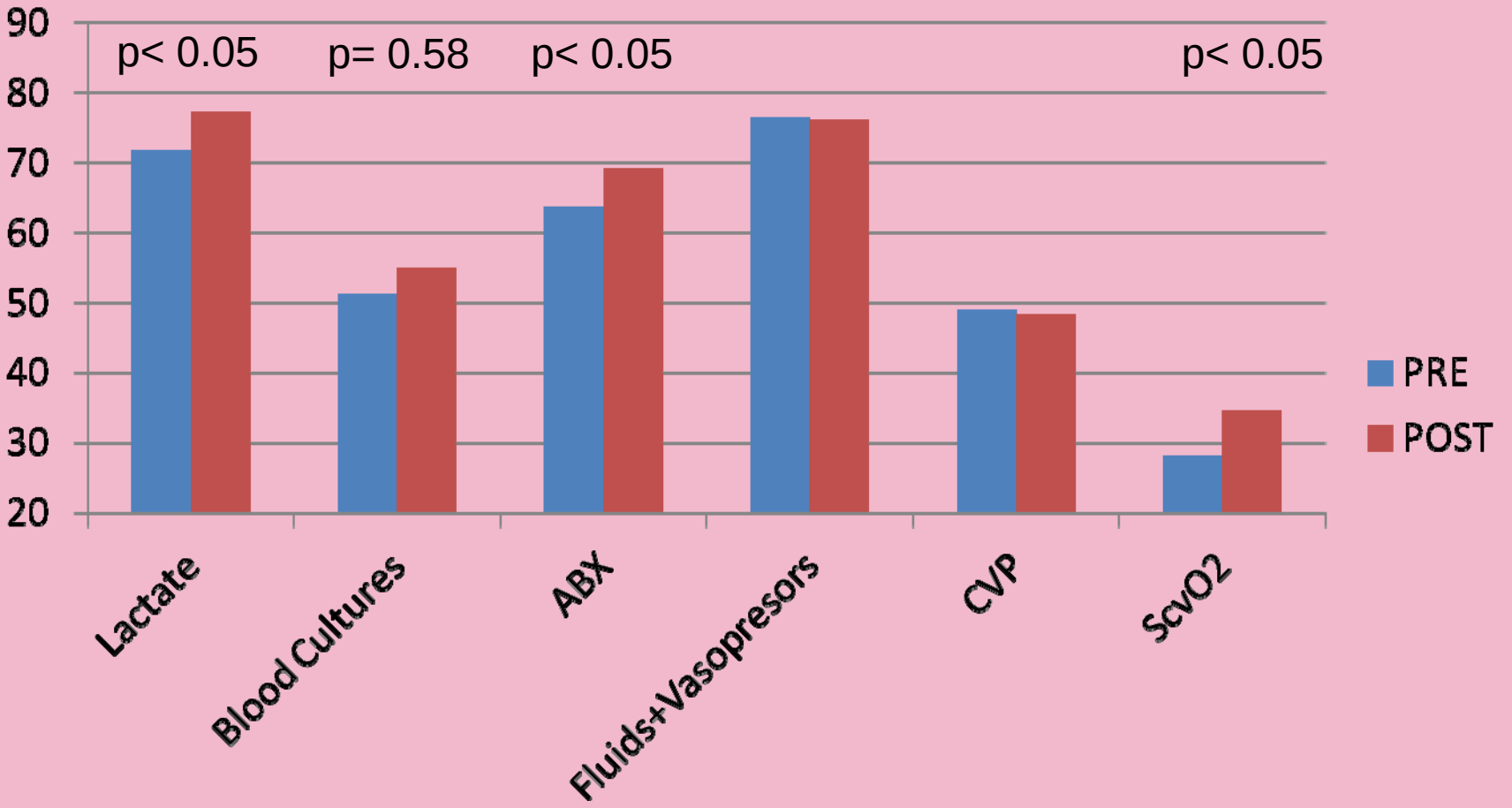
Results: Acquisition



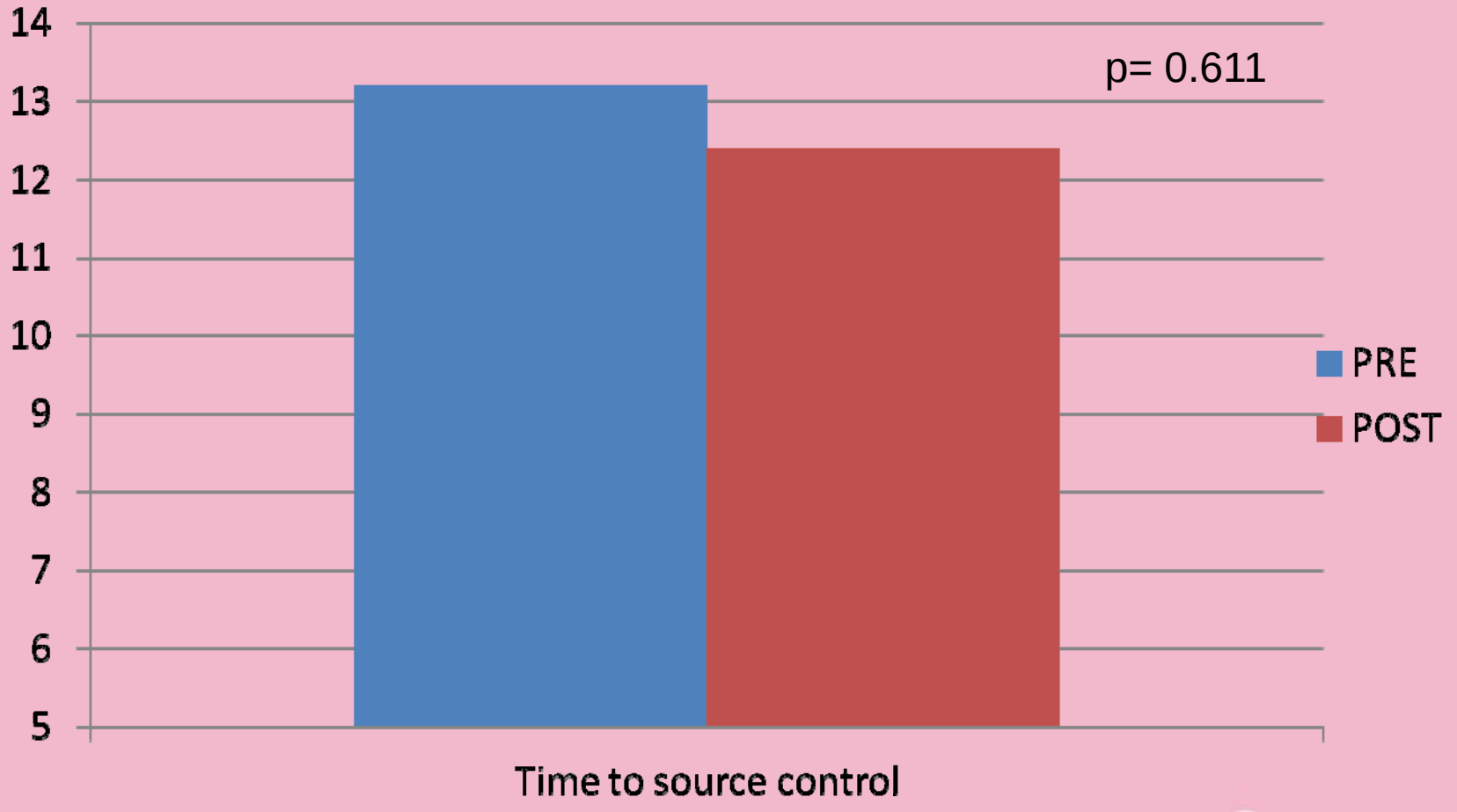
Results: Type Pathology



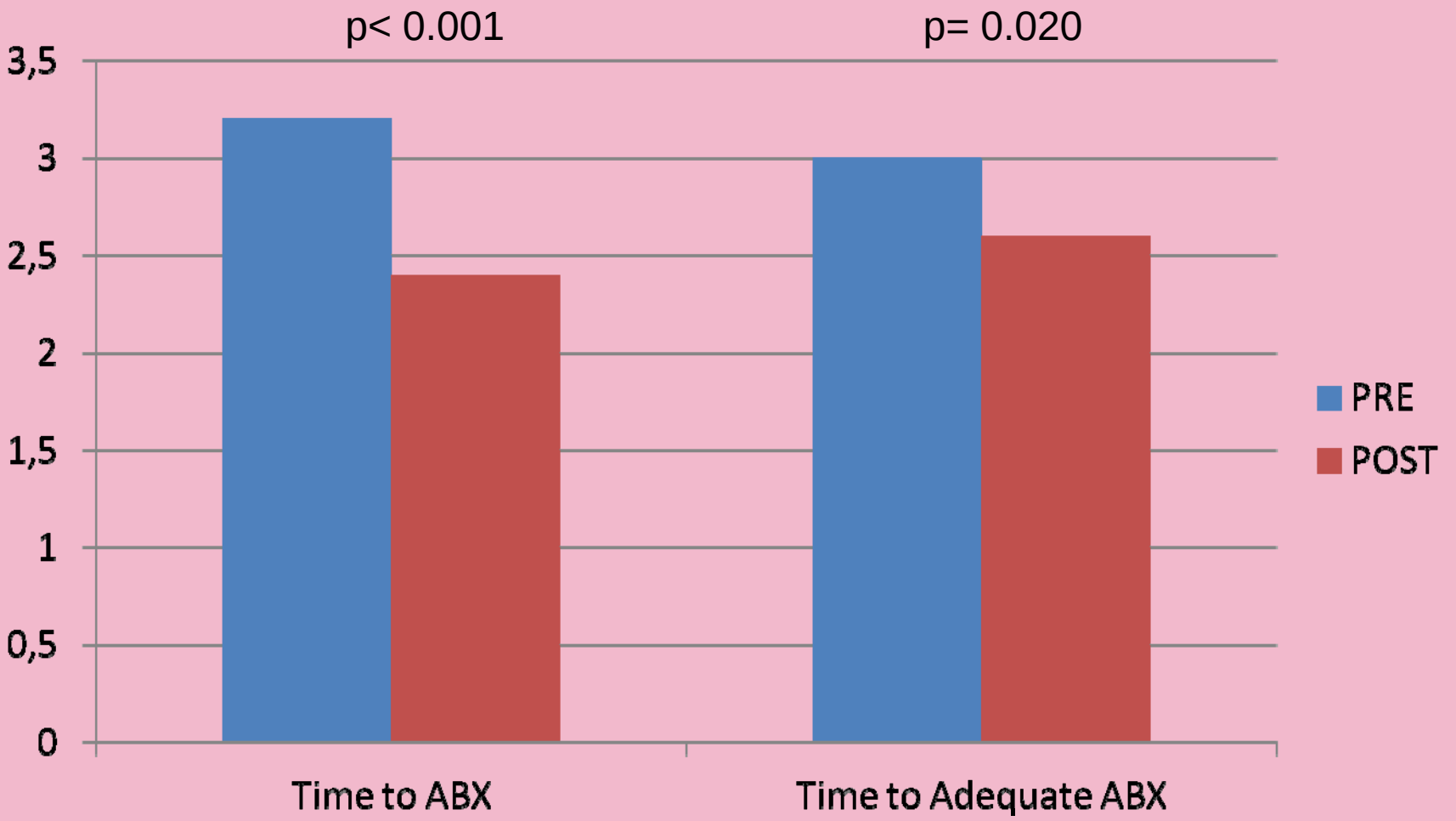
Results: Quality indicators



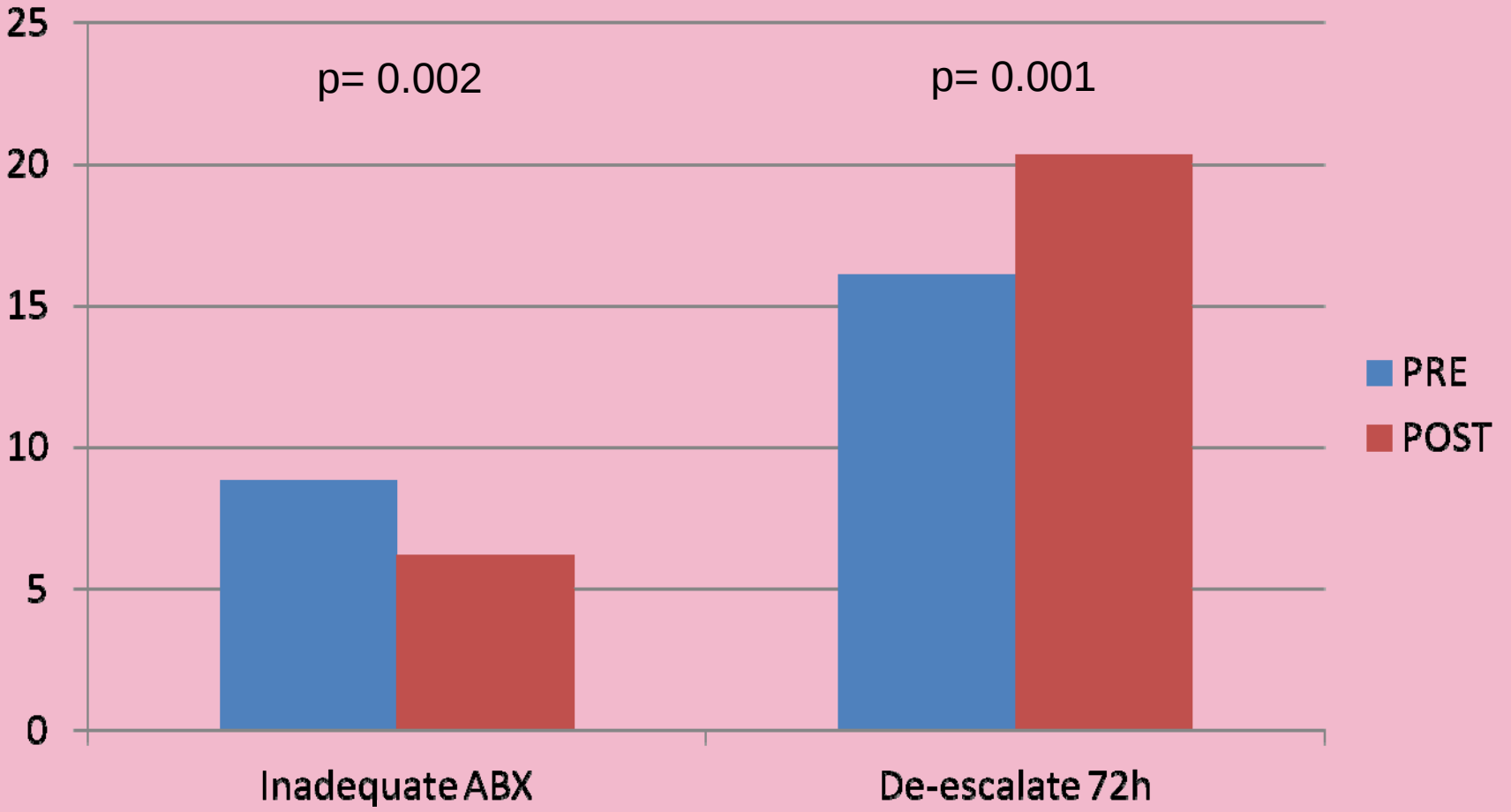
Results: Source control



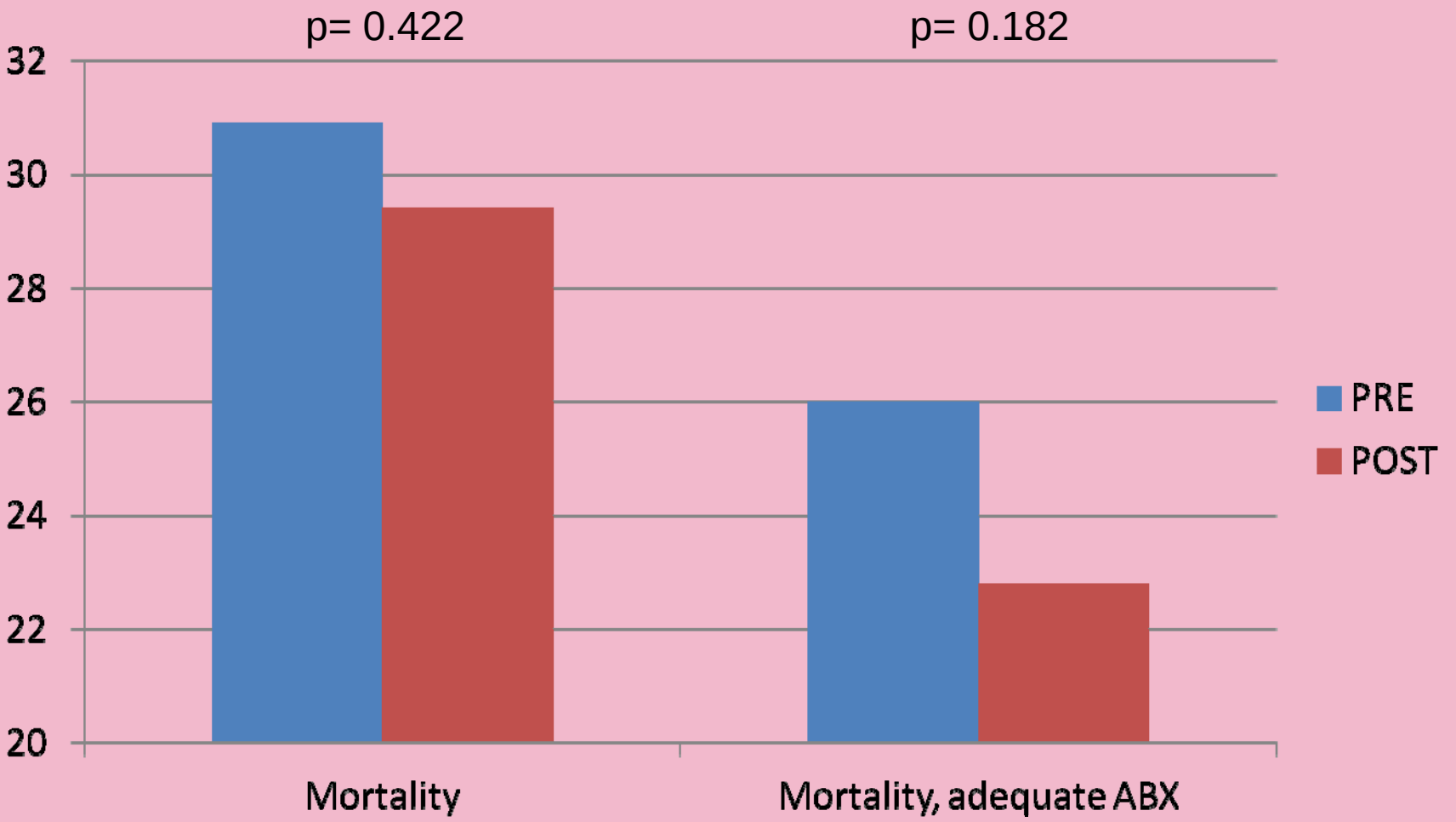
Results: Antibiotics



Results



Results



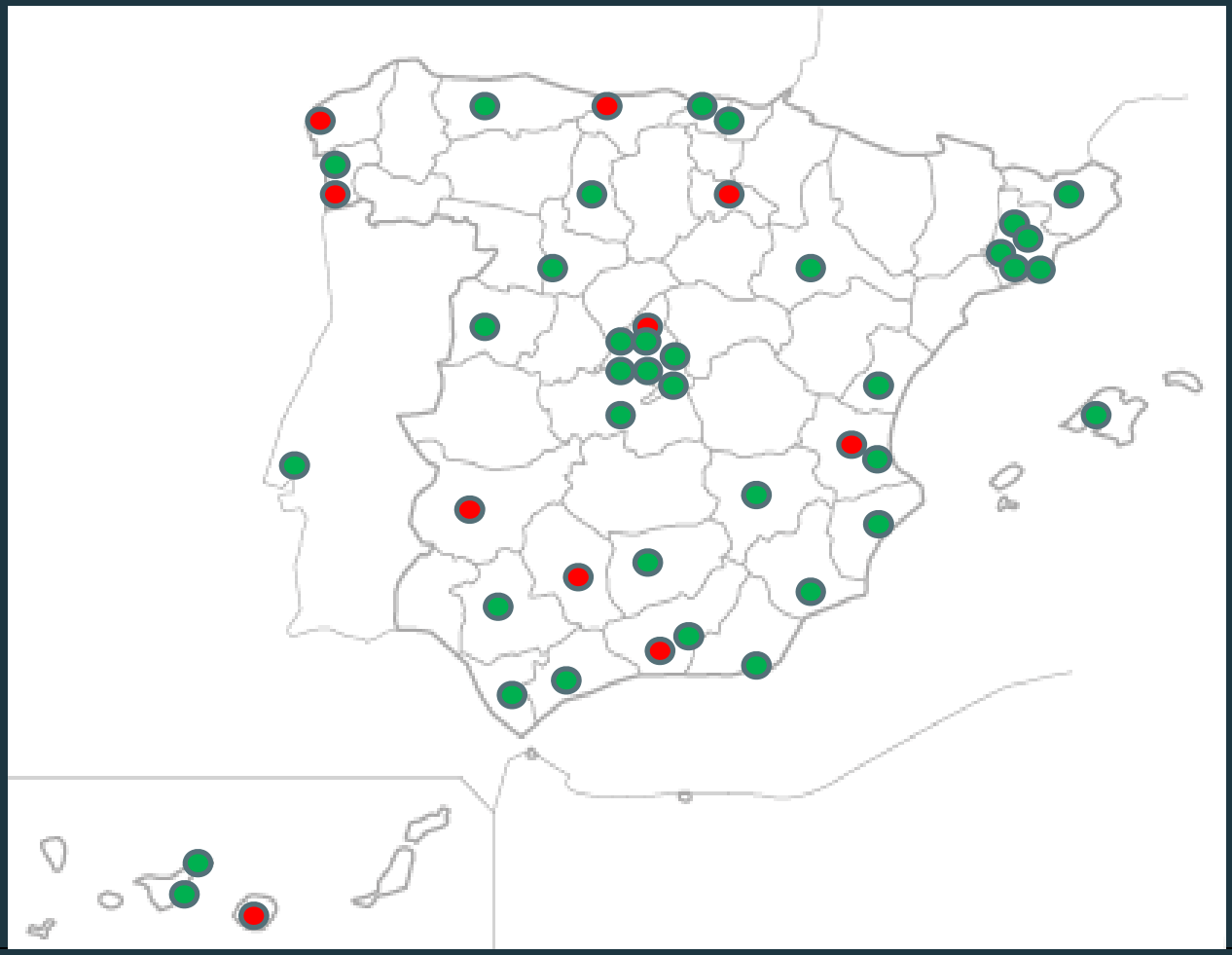
ABISS Edusepsis Pediatric

ABISS pediatric net

SECIP
SOCIEDAD ESPAÑOLA DE CUIDADOS INTENSIVOS PEDIÁTRICOS

EDUSEPSIS
PEDIATRIC

PICUs ABISS: 33



ABISS pediatric

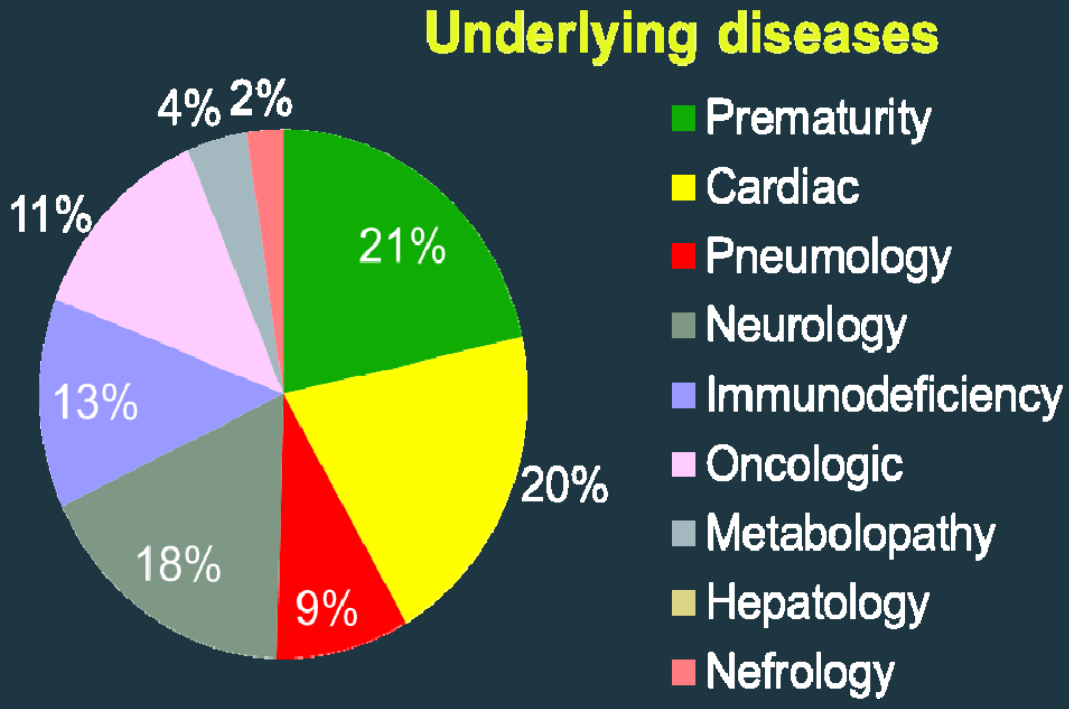
ABISS PICUs characteristics:

- Total: **380** PICU beds
- Total admissions/month: 1460
- 100% of PICU with residents
- 94% public
- 83.3% medical and surgical, 25% pediatrics-neonatal
- Protocols for sepsis management 100%
- Use of biomarkers: PCR 100%, PCT 64%
- Hemofiltration: 50%; ECMO: 20%

EDUSEPSIS

Preintervention results

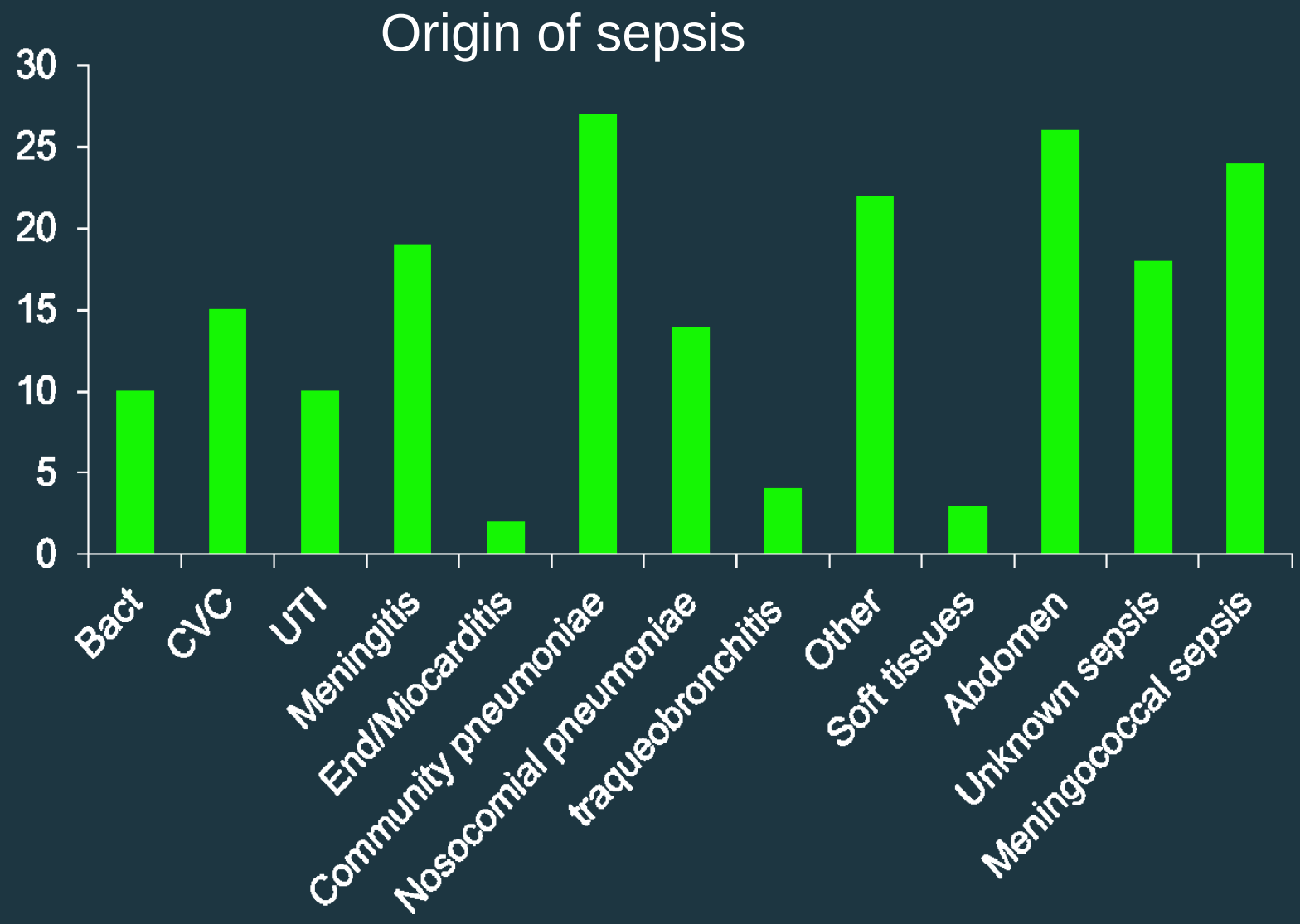
- **198 cases**
- 118 ♂ (59.6%)
- Median age (years) 2.9 ±4.6 (7 days-17.8 ys)
- Underlying diseases: 88 (44,4%)
- SOFA 6,74±3.71
- PRISM3 10.71± 7.21
- Biomarkers:
  - PCT 36.97±52.25 ng/ml
  - CRP 19.60±21.66 mg/dl



Preintervention results

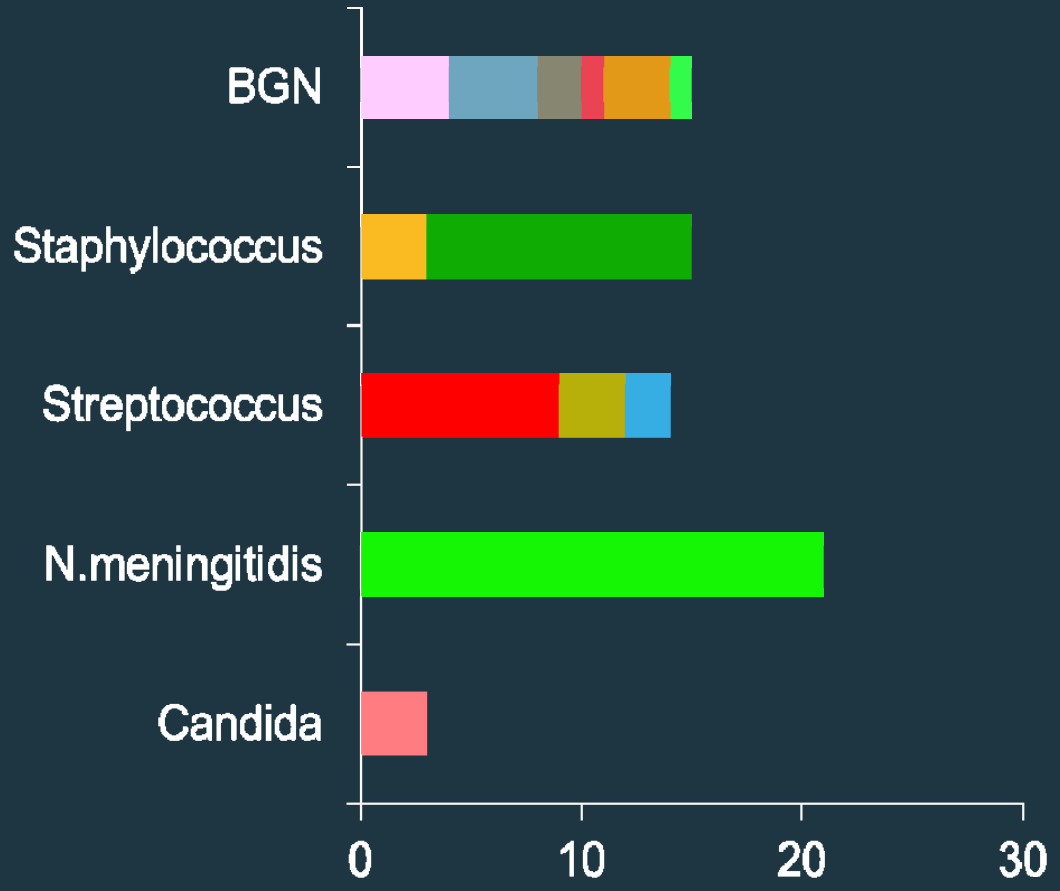
- Global Mortality **15.6%**
  - Mortality Septic shock **26.2%**
- Days of mechanical ventilation: 13.6±42.6
- Days of inotropic support: 5.77± 8.43
- PICU length of stay (days): 12.02±35.03
- Hospital length of stay (days): 26±45.09

Preintervention results



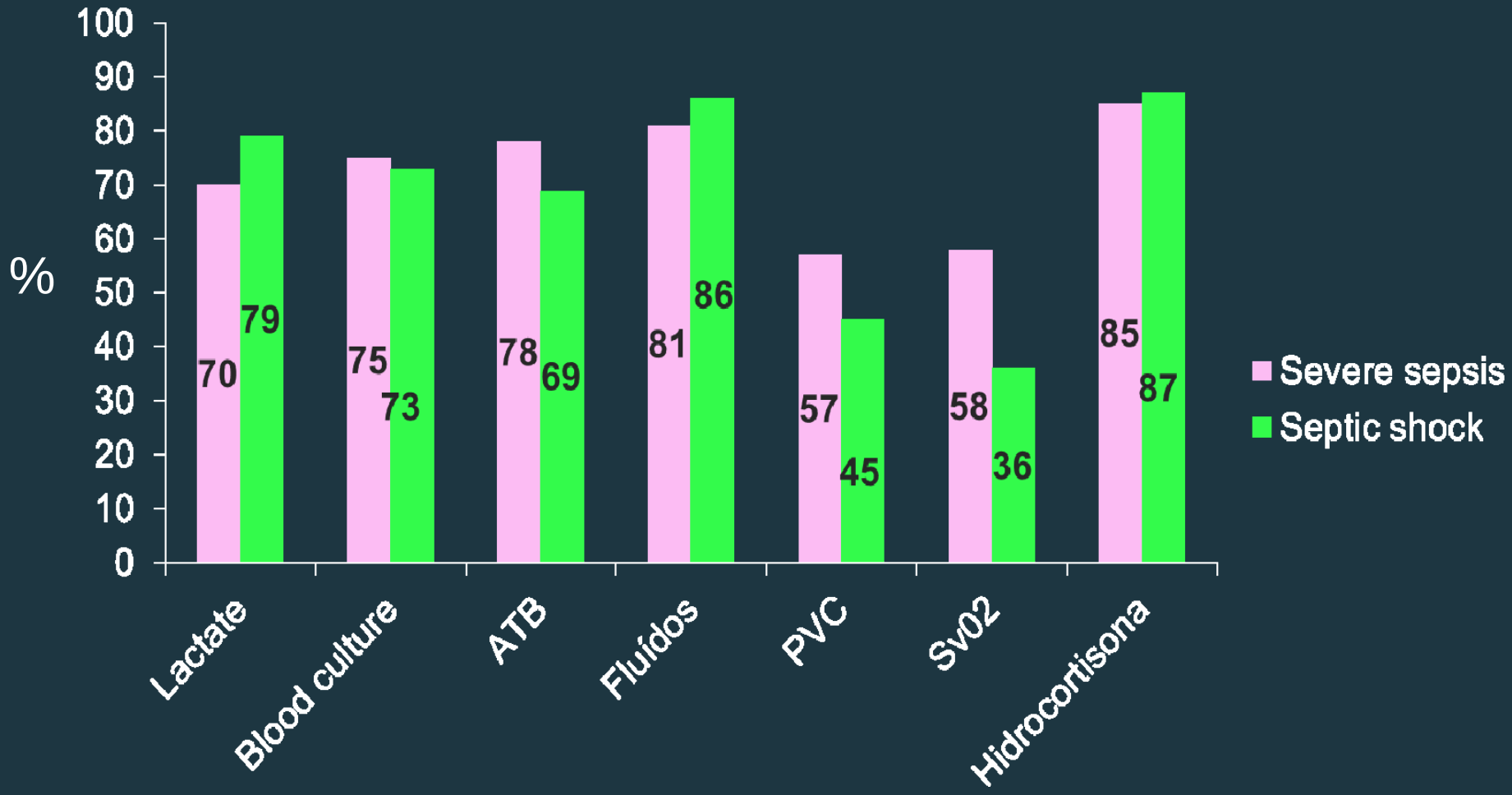
Preintervention results

- Blood cultures:
  - 96.7% blood cultures
  - Bacteriemia: 40.4%



Preintervention results

- % of Bundles compliance in severe sepsis and septic shock:

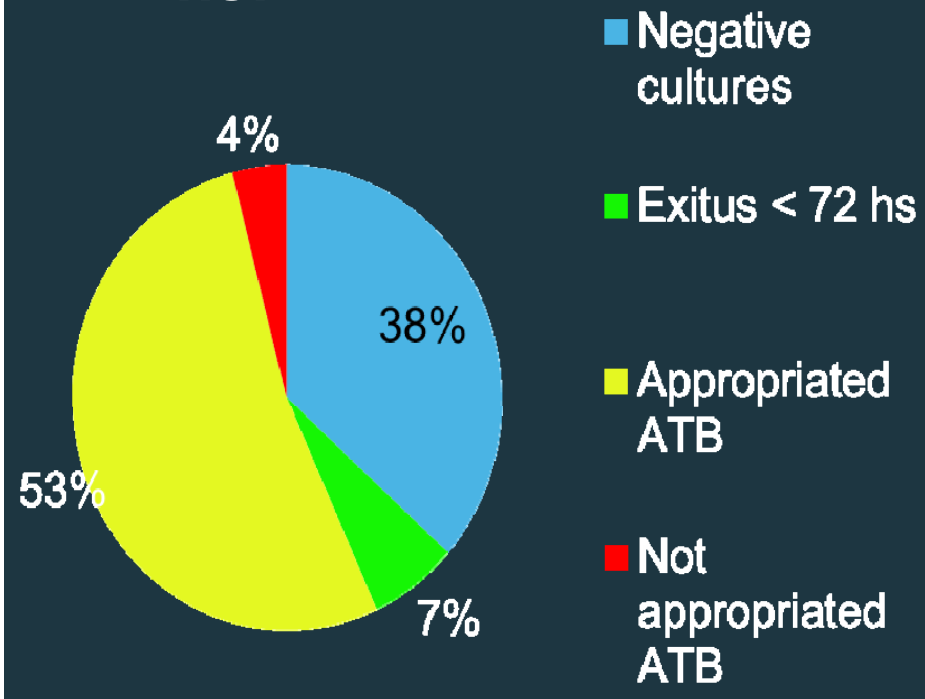


Preintervention results

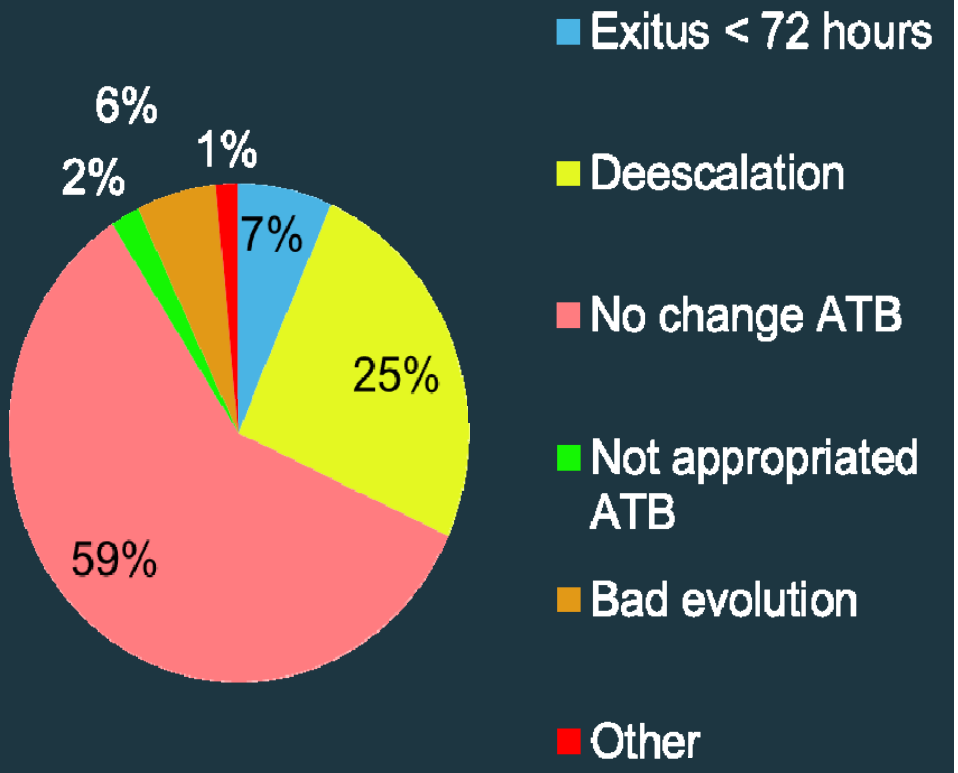
- Time to ATB from the diagnose of sepsis in patients whithout previous antibiotic tretament: mean **113.8±170.04 minutes**, median 60 minutes
  - In patients with septic shock 126.56±202.2 median 60
  - In patients with severe sepsis 101.53± 131.62, median 60

Preintervention results

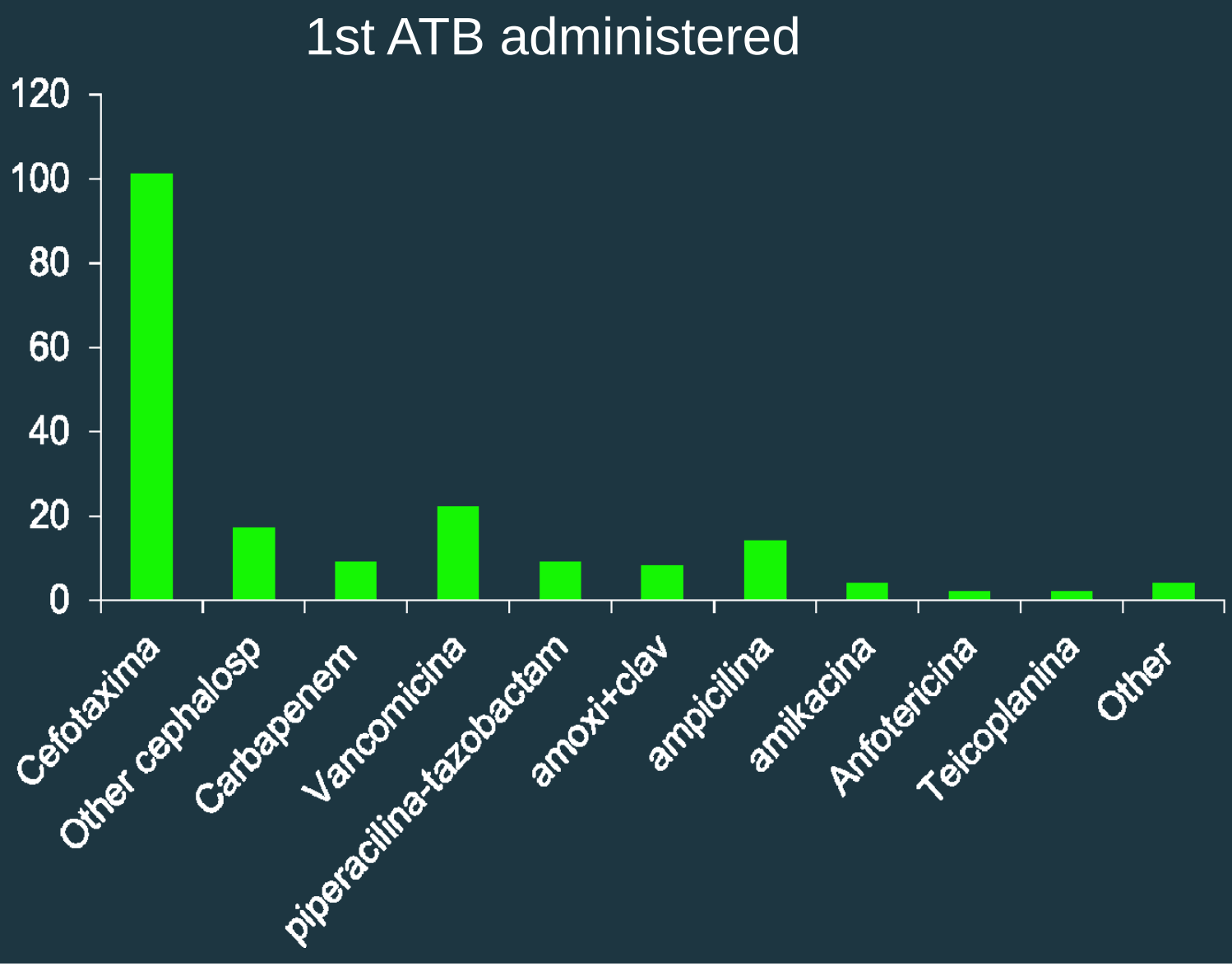
- **Antibiotics previous to the onset of sepsis: 46 (23,2%)**
- **Evaluation of treatment: hs:**



Change of ATB at 72



Preintervention results



Evaluación Efectividad de los Tratamientos

Eficacia

Efectividad

edusepsis.org

Assessment of the Effects of Treatments for Severe Sepsis on Mortality

Randomized Control Trials

Observational Studies

Randomized Control Trials in CCM

Pros:

- RCT is the standard for generating evidence.
- Bias are minimized.
- Confounders are limited.
- Data about efficacy and safety.

Cons:

- Lack of biomarkers: Heterogeneous groups of patients.
- Stringent eligibility criteria.
- Difficult to homogenize treatments.
- Complex outcomes.
- Ethical constraints.

Knowledge Generation

- Consistency:
  - Biological plausibility.
  - Confirmatory studies of single RCT.
  - Multicentric confirmation of unicentric studies.
- Effectiveness studies in “real world scenario”.
  - Patients excluded from RCT.
  - Effect of combining several treatment.
  - Feasibility of complex therapeutic interventions/algorithms.
- Efficiency: Cost-effectiveness studies.
- Pharmacovigilance/Post-commercialization studies: Safety

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

Objective: To analyze the impact on hospital mortality of severe sepsis treatments included in the SSC guidelines in a prospective multicenter observational study (n= 2,796 adult patients with severe sepsis in 77 Spanish ICUs).

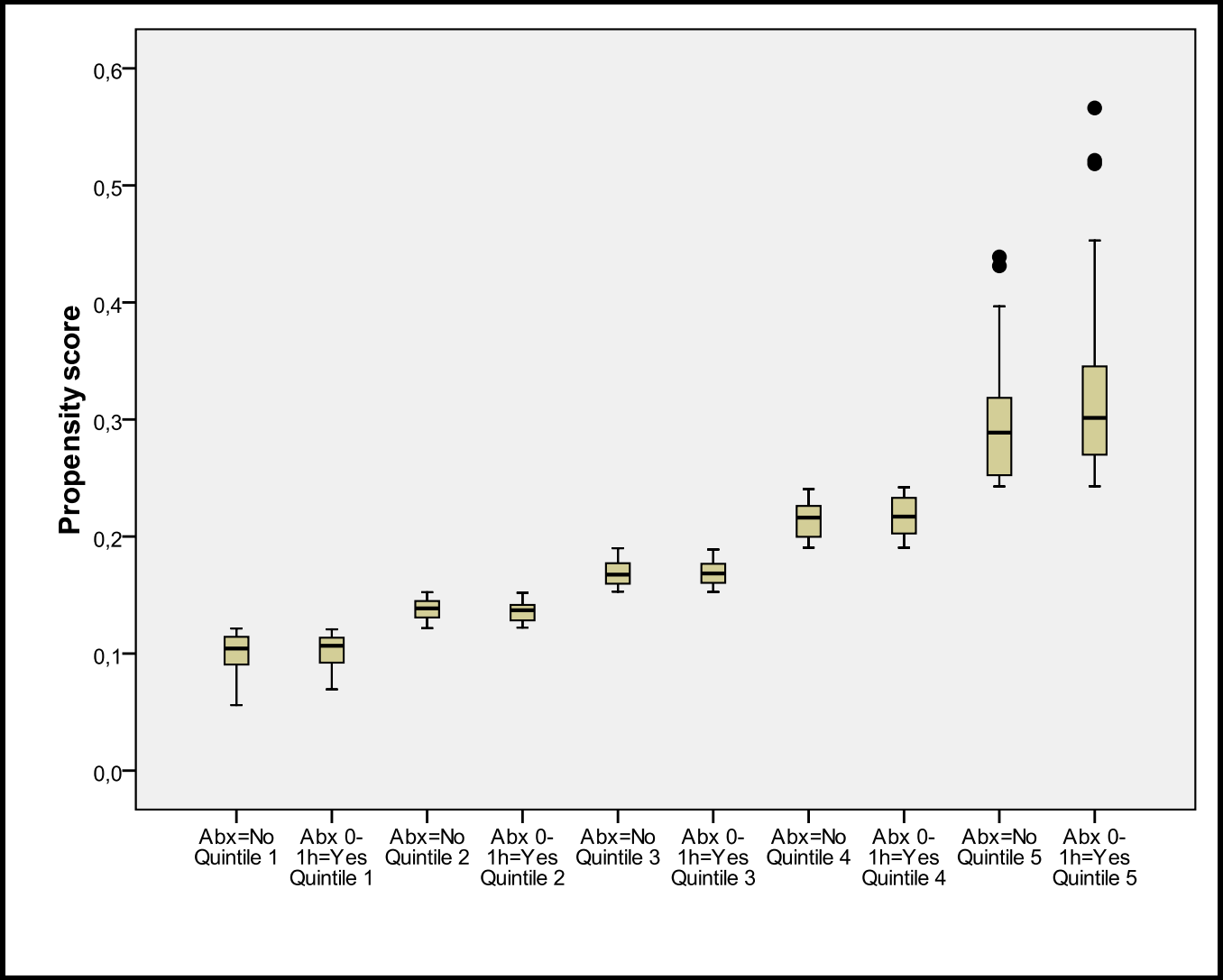
Method: The effectiveness of each sepsis treatment was estimated by using PS.

AJRCCM 2009;180:861–866.

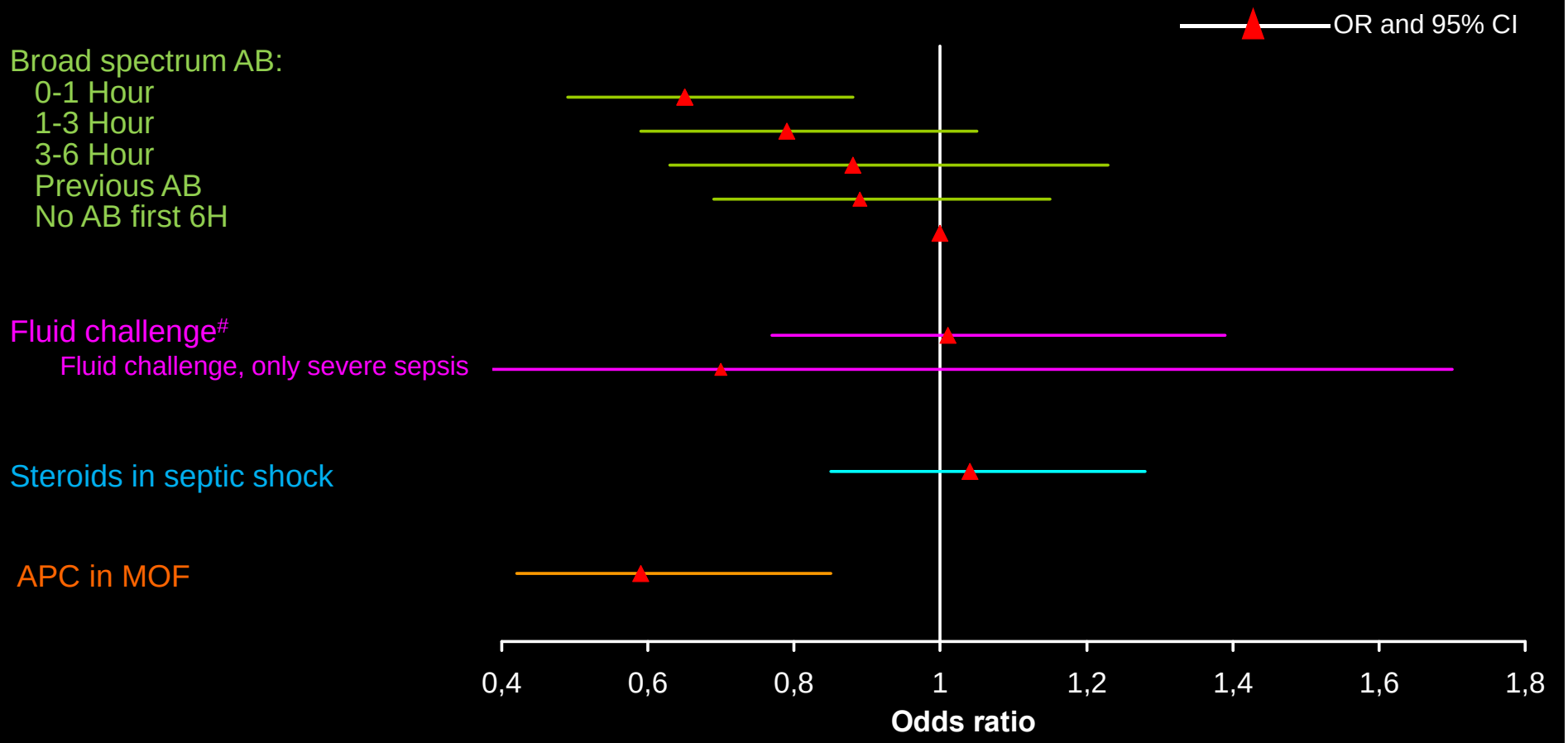
TREATMENTS and MORTALITY

- Adjust for possible confounders:
  - Clinical risks factors for mortality
  - Other treatments and therapeutic goals
  - Propensity Score

Propensity Score. Antibiotics.

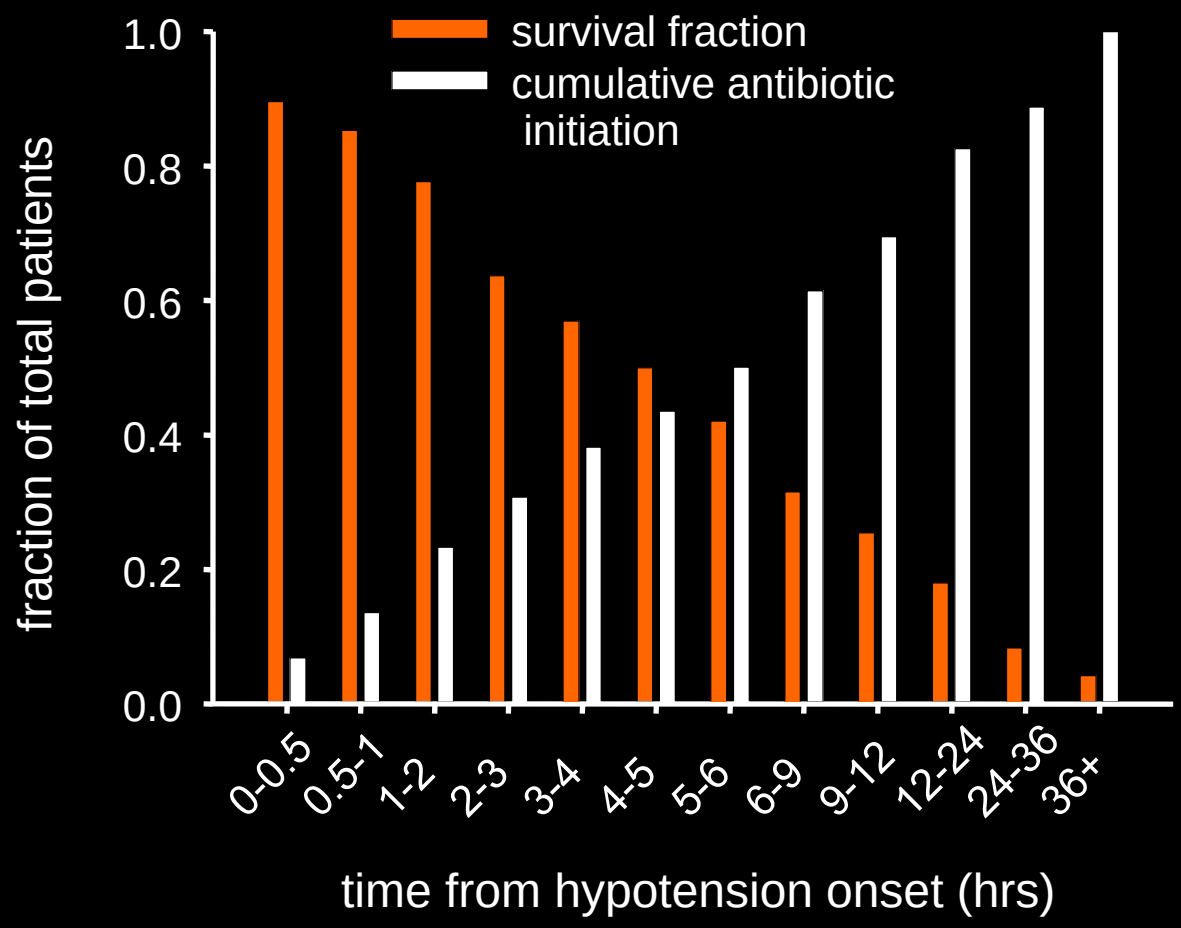


Effectiveness of APC in MOF
Final Model: All risk factors + Other TTMs + PS



Ferrer R et al. AJRCCM 2009;180:861–866

Early antibiotic treatment



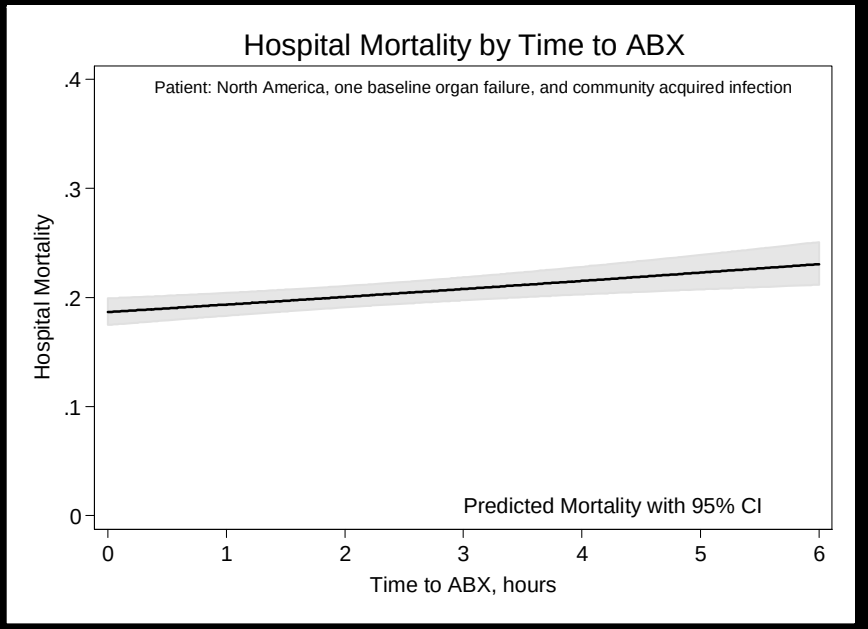
- Retrospective
- Only septic shock
- Only adequate treatment

Kumar A et al. Crit Care Med 2006;34:1589-96

Time to Treatment. Antibiotics

25.089 patients with severe sepsis or septic shock

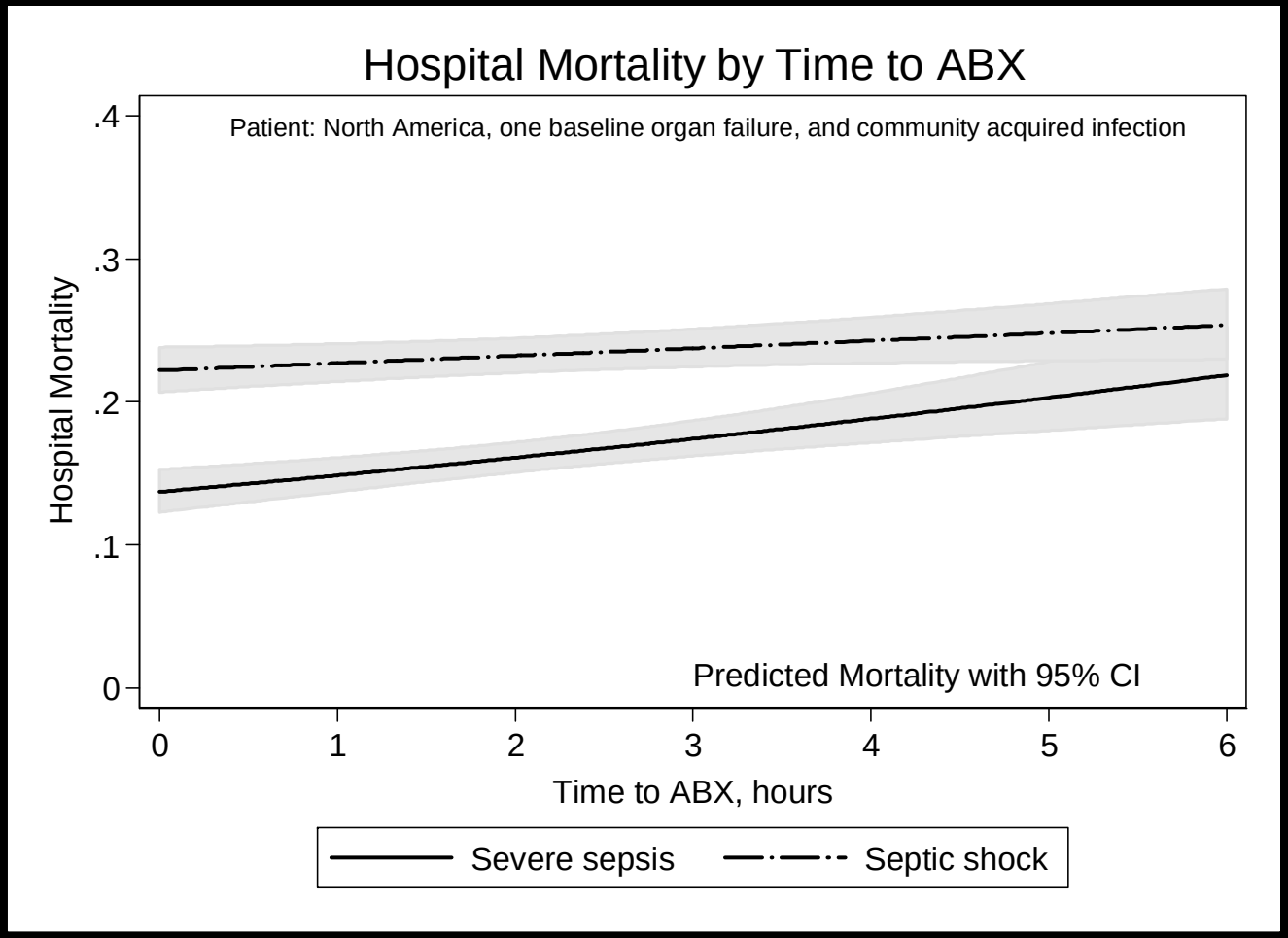
Time to ABX, hrs	OR	95% CI		*p*-value
0 (ref)	1.00	---	---	---
1	1.05	1.02	1.07	< 0.001
2	1.09	1.04	1.15	< 0.001
3	1.14	1.06	1.23	< 0.001
4	1.19	1.08	1.32	< 0.001
5	1.25	1.11	1.41	< 0.001
6	1.31	1.13	1.51	< 0.001



Ferrer et al. ESICM 2011, Abstract 139; Annals Internal Medicine Submitted

Time to Treatment. Antibiotics

25.089 patients with severe sepsis or septic shock



Ferrer et al. ESICM 2011, Abstract 139; Annals Internal Medicine Submitted

CRITICAL CARE

Díaz-Martín *et al. Critical Care* 2012, **16**:R223
http://ccforum.com/content/16/6/R223

Antibiotic prescription patterns in the empiric therapy of severe sepsis: combination of antimicrobials with different mechanisms of action reduces mortality

Antibiotics	Global *n* = 1,372	Community-acquired *n* = 1,022 (74.5%)	Nosocomial *n* = 350 (25.5%)	*P*
β-lactams	902 (65.7%)	708 (69.3%)	194 (55.4%)	<0.001
Carbapenems	345 (25.1%)	218 (21.3%)	127 (36.3%)	<0.001
Quinolones	282 (20.6%)	241 (23.6%)	41 (11.7%)	<0.001
Aminoglycosides	183 (13.3%)	114 (11.2%)	69 (19.7%)	<0.001
Macrolides	60 (4.4%)	54 (5.3%)	6 (1.7%)	0.004
Anti-gram-positive	161 (11.7%)	96 (9.4%)	65 (18.6%)	<0.001
Antifungals	38 (2.8%)	20 (2.0%)	18 (5.1%)	0.004
Others	151 (11.0%)	111 (10.9%)	40 (11.4%)	0.767

Antibiotics	Non-DCCT group *n* = 984 (71.7%)	DCCT group *n* = 388 (28.3%)	*P*
β-Lactams	582 (59.1%)	320 (82.5%)	<0.001
Carbapenems	269 (27.3%)	76 (19.6%)	0.003
Quinolones	96 (9.8%)	186 (47.9%)	<0.001
Aminoglycosides	25 (2.5%)	158 (40.7%)	<0.001
Macrolides	7 (0.7%)	53 (13.7%)	<0.001
Anti-gram-positive	120 (12.2%)	41 (10.6%)	0.456
Antifungals	21 (2.1%)	17 (4.4%)	0.028
Others	121 (12.3%)	30 (7.7%)	0.016

CRITICAL CARE

Díaz-Martín *et al. Critical Care* 2012, **16**:R223
http://ccforum.com/content/16/6/R223

Antibiotic prescription patterns in the empiric therapy of severe sepsis: combination of antimicrobials with different mechanisms of action reduces mortality

Ana Díaz-Martín[1,2,3*], María Luisa Martínez-González[4], Ricard Ferrer[5,6], Carlos Ortiz-Leyba[1,2,3], Enrique Piacentini[5], Maria Jesus Lopez-Pueyo[7], Ignacio Martín-Loeches[4,6], Mitchell M Levy[8], Antoni Artigas[4,6], José Garnacho-Montero[1,2,3] and for the Edusepsis Study Group

Factors	OR	CI (95%)	*P*
Age (years)	1.023	(1.014-1.032)	<0.001
Sex (male)	1.350	(1.041-1.750)	0.024
APACHE II	1.099	(1.099-1.141)	<0.001
Community-acquired	1.487	(1.119-1.974)	0.006
DCCT	0.699	(0.522-0.936)	0.016
Focus of infection			
Pneumonia	0.784	(0.358-1.718)	0.543
Abdominal	0.595	(0.269-1.317)	0.200
Urologic	0.241	(0.102-0.569)	0.001
Meningitis	0.357	(0.122-1.046)	0.060
Skin and soft-tissue	0.424	(0.157-1.141)	0.089
Catheter	0.441	(0.135-1.445)	0.177
Others	0.772	(0.330-1.806)	0.551
More than one focus	1		

EUROPEAN RESPIRATORY *journal*
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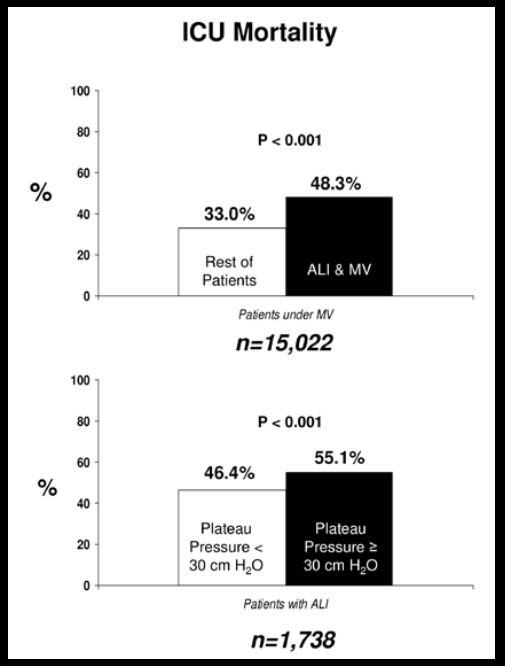
Effectiveness of inspiratory pressure-limited approach to mechanical ventilation in septic patients

Ignacio Martin-Loeches*⇓, Candelaria de Haro*, R. Phillip Dellinger#, Ricard Ferrer¶, Gary S. Phillips+, Mitchell M. Levy§ and Antonio Artigas*



Cox proportional hazard regression of PP < 30 cm H2O in patients with ALI

Plateau pressure < 30 cm H_2O	Observations	Mortality HR	95% CI	*p*-value
Unadjusted	1,737	0.88	0.75 – 1.03	0.111
Adjusted[1]	1,737	0.84	0.72 – 0.99	0.038

Cox proportional hazard regression of PP < 30 cm H2O in patients without ALI

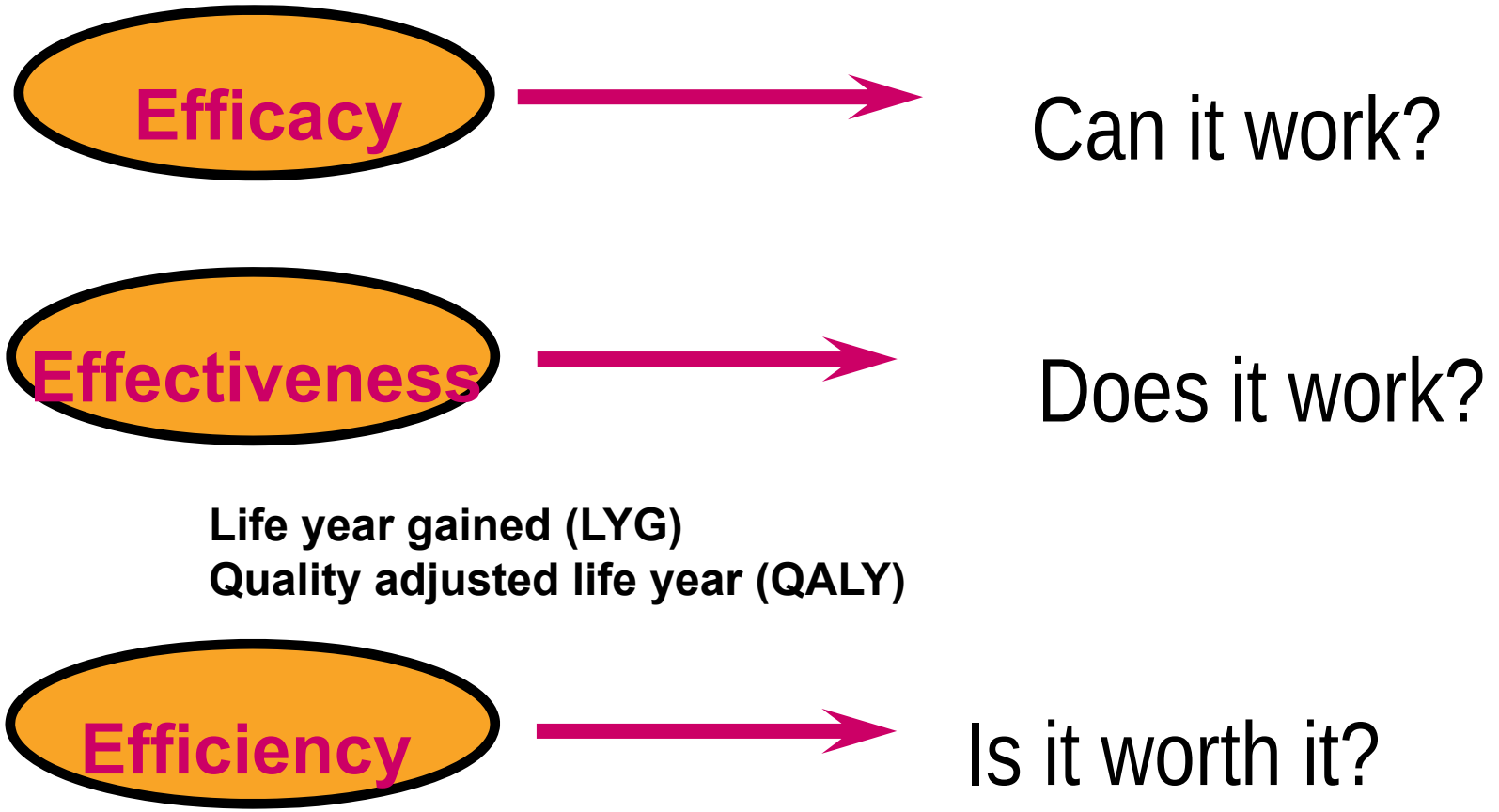
Plateau pressure < 30 cm H_2O	Observations	Mortality HR	95% CI	*p*-value
Unadjusted	6,139	0.78	0.71 – 0.86	< 0.001
Adjusted[1]	6,139	0.77	0.70 – 0.85	< 0.001

Factores de Riesgo de Muerte en Pacientes > 80 años

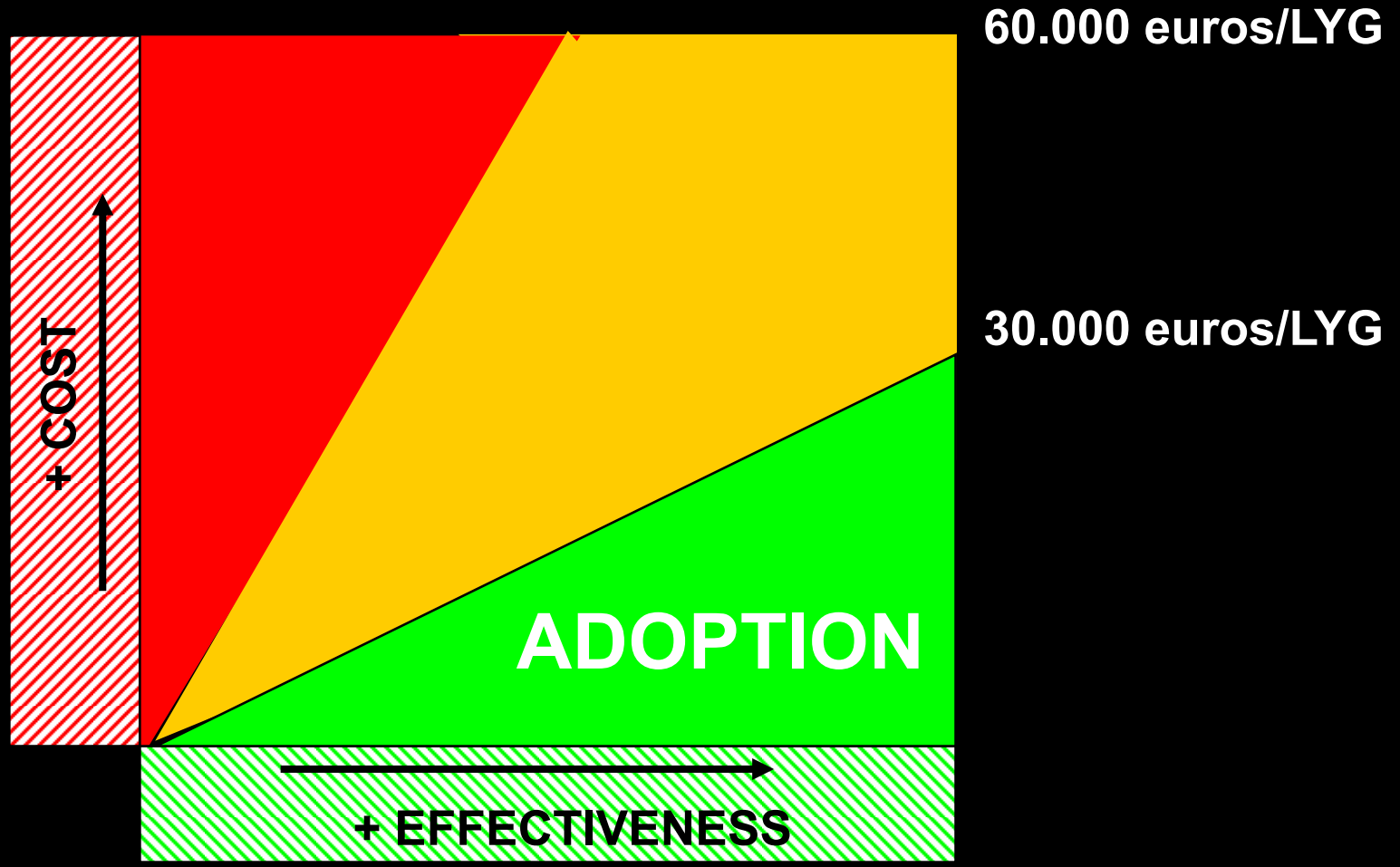
Hospital Mortality 48%
Multivariate Analysis

	Very elderly N = 161 (54.2%) OR (95% CI)	*p*
Age (years)[a]	1.1 (0.9-1.2)	0.061
Sex(male)	1.1 (0.6-1.8)	0.710
APACHE II modified score[b]	1.1 (1.1-1.2)	0.000
ICU LOS	1.031 (1.0-1.0)	0.009
Patient location at sepsis diagnosis[c]		
-Ward	1.5 (0.8-2.7)	0.130
-ICU	0.6 (0.2-2.1)	0.507
Source of infection[d]		
-Peritonitis	0.9 (0.4-1.9)	0.856
-UTI	0.3 (0.1-1.0)	0.059
-SSTI	0.4 (0.1-2.1)	0.307
-Catheter-related bacteremia	0.9 (0.1-5.1)	0.243
-Other	1.1 (0.4-2.7)	0.864
Baseline acute organ dysfunction		
-Cardiovascular	0.6 (0.3-1.4)	0.316
-Pulmonary	1.1 (0.5-2.3)	0.621
-Renal	0.8 (0.4-1.7)	0.648
-Hepatic	0.7 (0.3-1.6)	0.466
-Trombopenia	0.9 (0.4-2.1)	0.955
-Coagulopathy	1.5 (0.8-2.6)	0.171
Resuscitation bundles	0.2 (0.1-0.9)	0.042
Treatment bundles	0.8 (0.3-1.8)	0.562

Coste y Coste-Efectividad

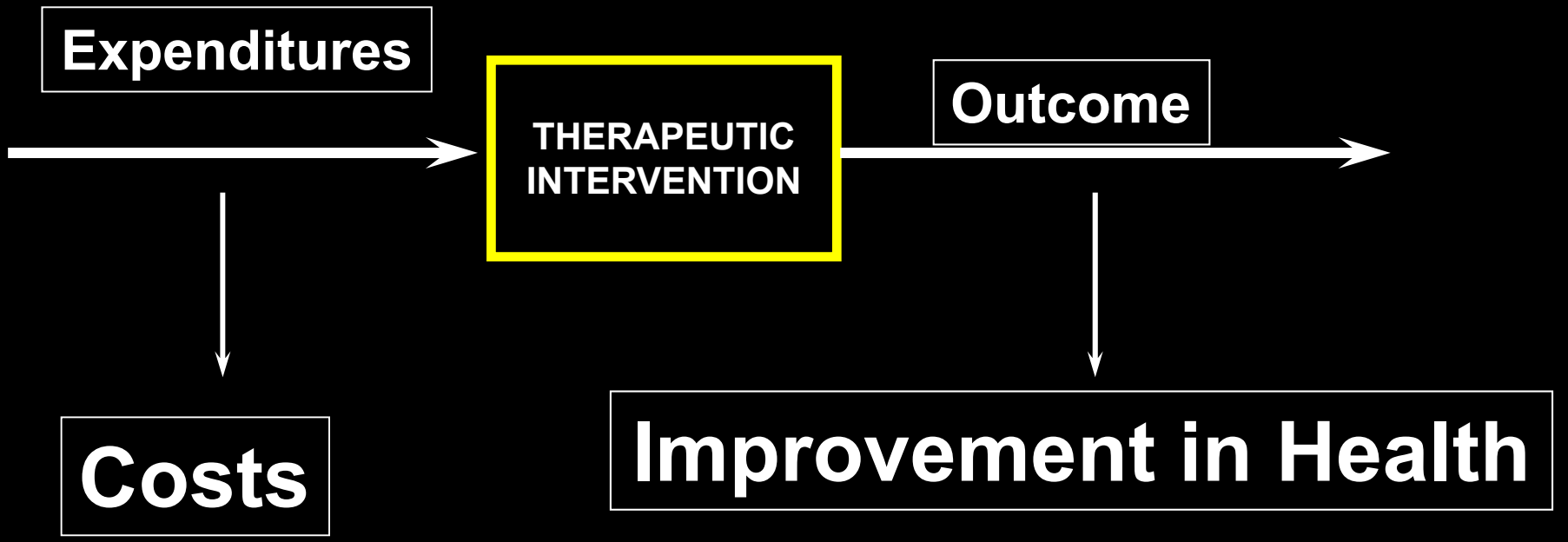


Cost-Effectiveness



Cost-Effectiveness Analysis

- Ratio of the cost of the intervention to a relevant measure of its effect.



Incremental Cost-Effectiveness Ratio (ICER)
Incremental Cost-Utility Ratio (ICUR)

Intensive Care Med (2011) 37:444–452
DOI 10.1007/s00134-010-2102-3

ORIGINAL

David Suarez
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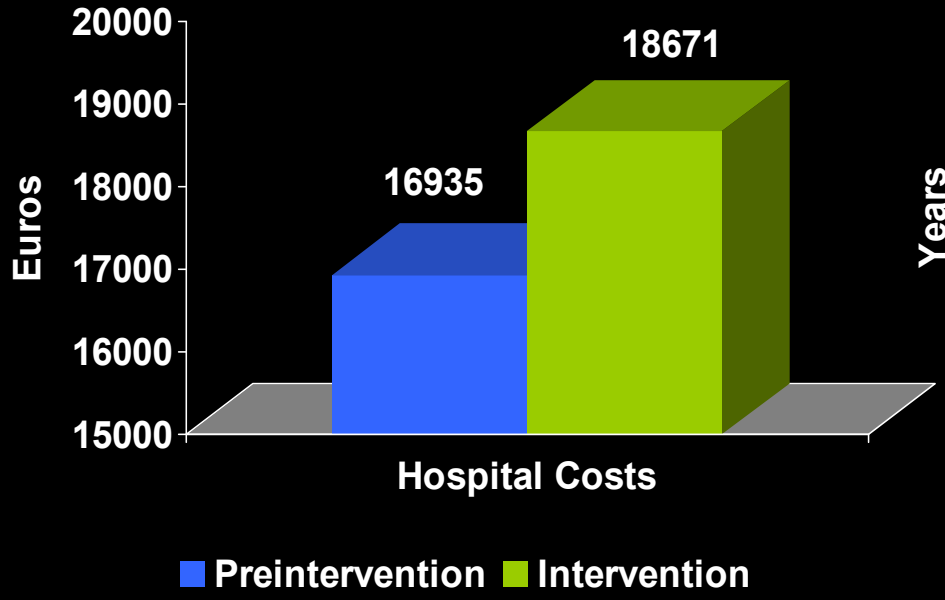
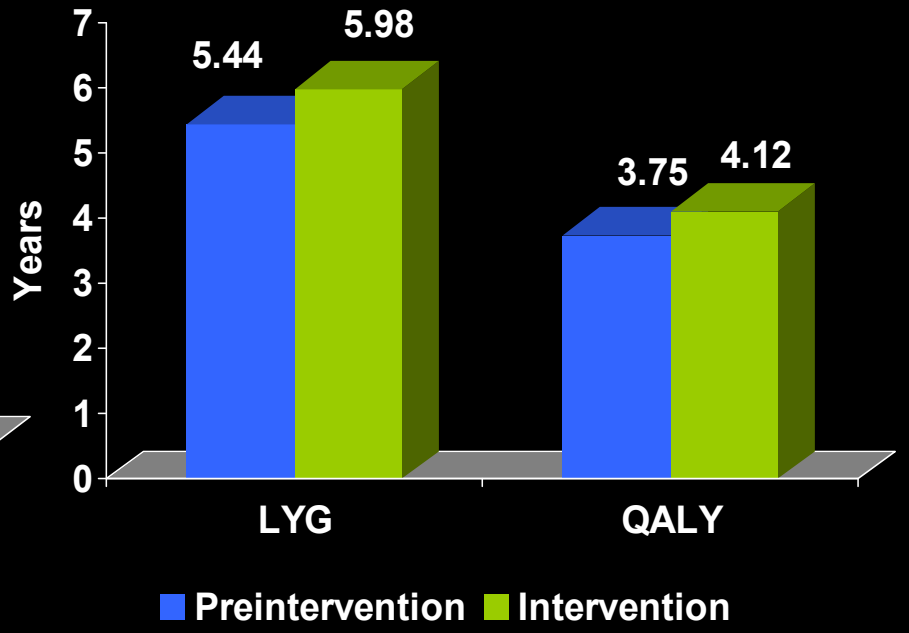
Mitchell M. Levy
Juan Carlos Ruiz
For the Edusepsis Study Group

Cost-effectiveness of the Surviving Sepsis Campaign protocol for severe sepsis: a prospective nation-wide study in Spain

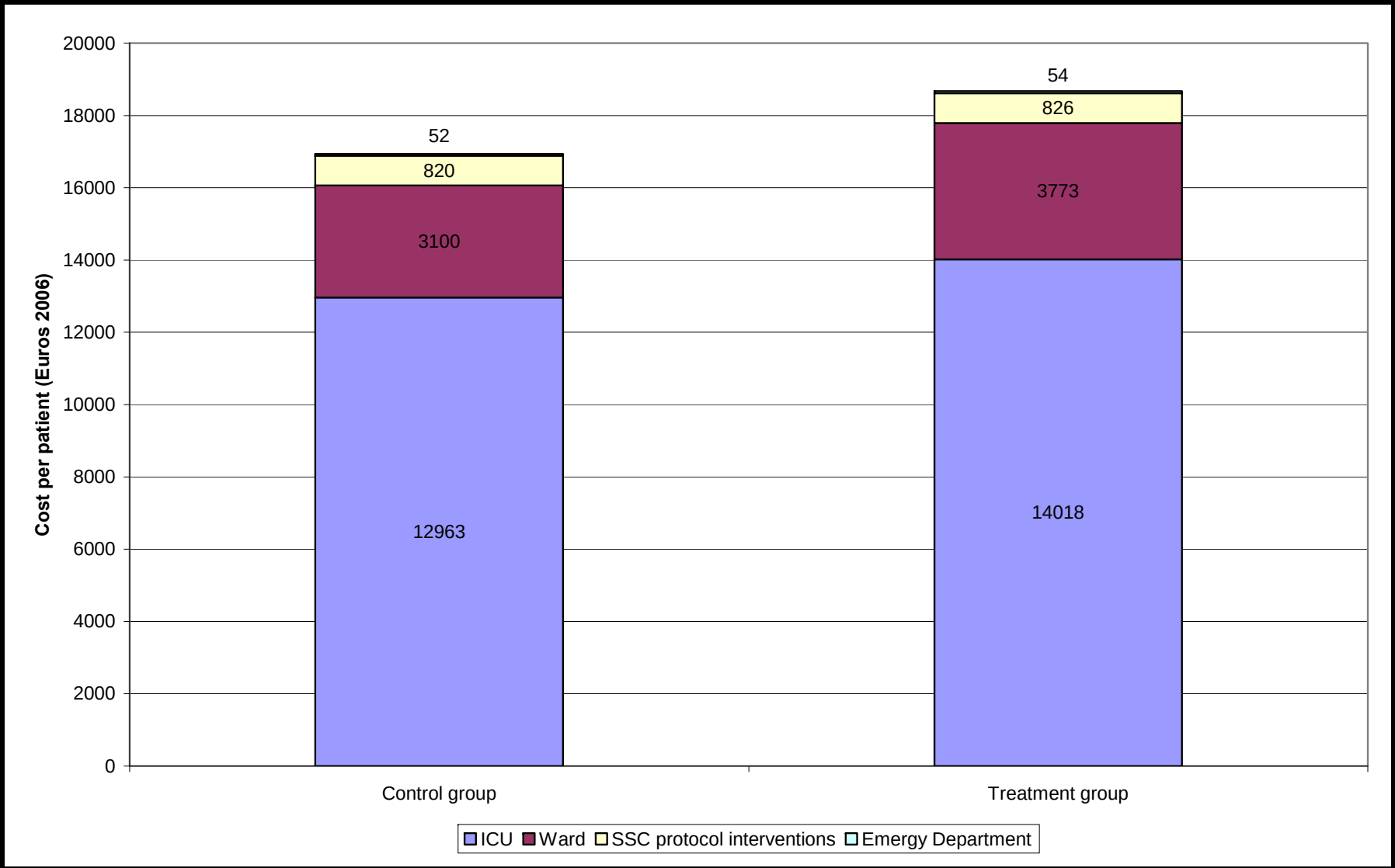




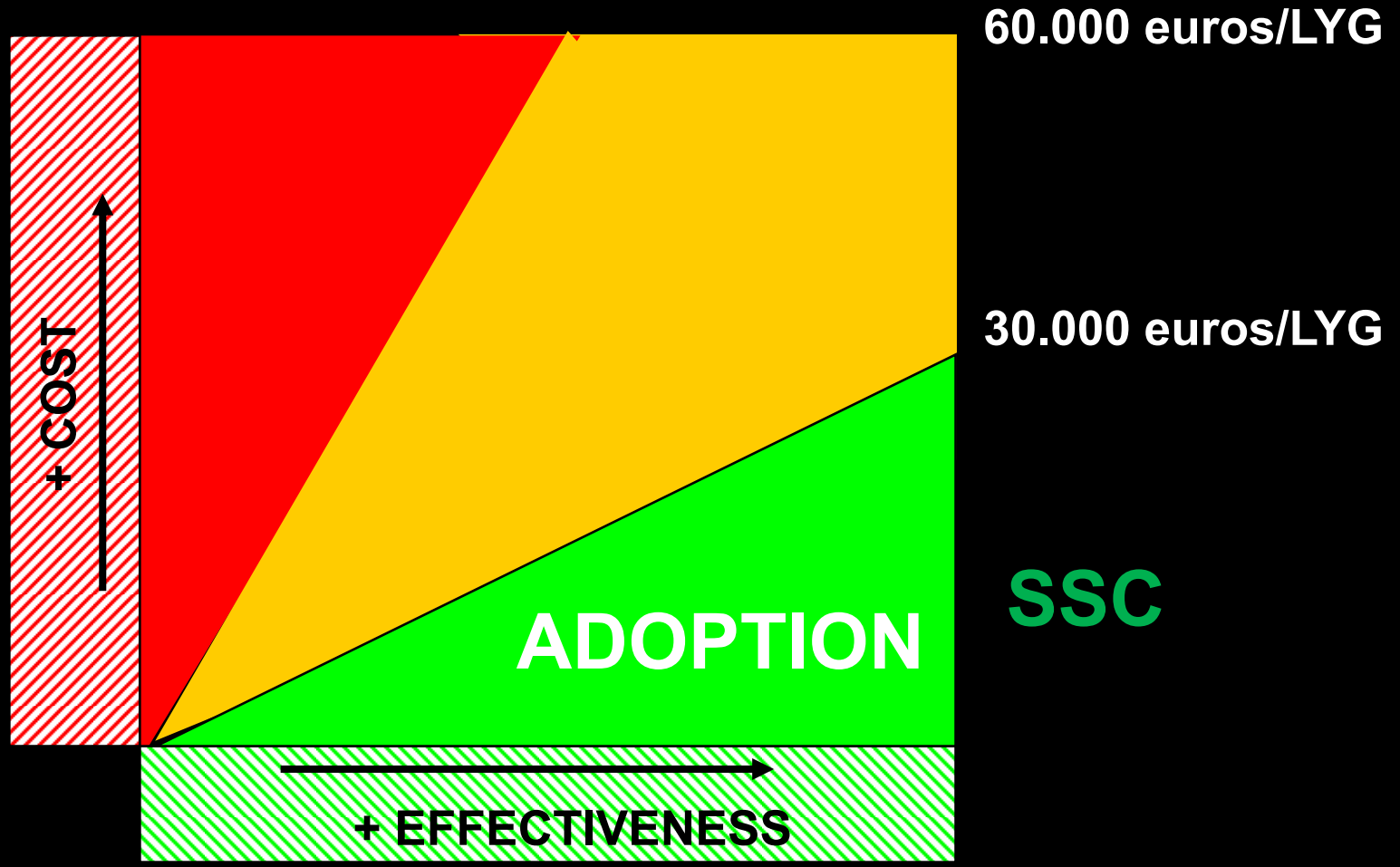
Adjusted ICER 4,435 euros per LYG

Adjusted ICUR 6,428 euros per QALY

Distribution of mean costs per patient



Cost-Effectiveness



Premis

1. **Premi a la millor comunicació** presentada a la SOCMIC 2008, Badalona.
2. **Mejores Ideas Diario Médico** 2008 Política profesional por el Estudio Edusepsis.
3. **Accèsit a la millor comunicació mèdica presentada** SOCMIC 2009.
4. **Premi mutual médica Dr. Josep Font** millor article científic 2008.
5. **Award for the best abstract on sepsis** (International Sepsis Forum): Poster Award Winner 2009. 23rd Annual Congress ESICM.
6. **Millor Comunicació Publicada** SOCMIC 2010. AJRCCM.
7. **Millor comunicació mèdica presentada** SOCMIC 2010.
8. **Premis Científics Capio – Hospital General de Catalunya, Edició 20. Categoria Assistencial.**
9. **Mejor Comunicación XLVII CONGRESO NACIONAL DE LA SEMICYUC**

Conclusions

1. Els clínics identifiquen la sepsis com un problema i col·laboren en programes de transferència del coneixement i millora de la qualitat.
2. Lideratge
3. Metodologia.
4. Difusió de resultats. Subestudis. Publicacions i Abstracts.
5. Estructura centralitzada: Website, CRDe, monitorització, anàlisis.
6. Finançament:
    1. Beca FIS-Evaluación Tecnologías Sanitarias. Cost-Efectivitat.
    2. FIS PI10-01497. ABISS.
    3. Suport Logistic: Lilly, Astra-Zeneca.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