



**EVIDENCE AND COLLABORATION  
IN ACTION:  
PRACTICAL STRATEGIES IN THE  
EARLY DIAGNOSIS AND  
TREATMENT OF SEVERE SEPSIS**

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# Disclosures

- Personal:
  - Financial:
    - None
- SSC
  - Financial:
    - None
    - No industry support since 2006

# *Surviving Sepsis*

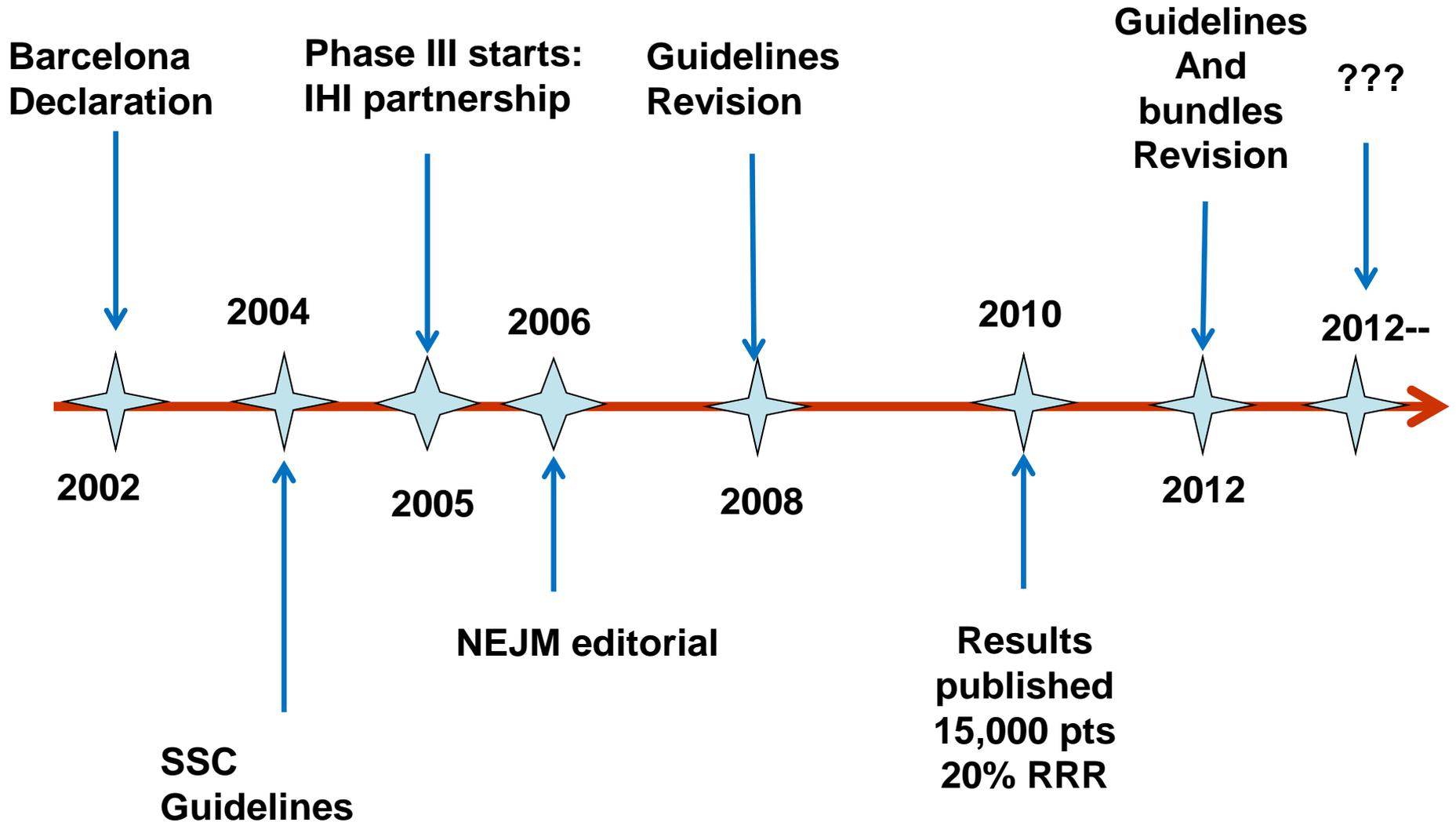


*Phase 1 Barcelona declaration*

*Phase 2 Evidence based guidelines*

*Phase 3 Implementation and  
education*

# Surviving Sepsis Campaign: Timeline



# *Campaign Targets*



- *Mortality goal*
  - *25% reduction in 5 years*
    - *35% to 26%:*
      - *72,000 lives saved in US*
      - *500,000 worldwide*



# *Surviving Sepsis*

*Phase 1 Barcelona declaration*

*Phase 2 Evidence based guidelines*

*Phase 3 Implementation and  
Education*

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

**Dellinger RP, Levy MM, Carlet JM, Bion J, Parker MM, Jaeschke R, Reinhart K, Angus DC, Brun-Buisson C, Beale R, Calandra T, Dhainaut JF, Gerlach H, Harvey M, Marini JJ, Marshall J, Ranieri M, Ramsay G, Sevransky J, Thompson BT, Townsend S, Vender JS, Zimmerman JL, Vincent JL.**

***Crit Care Med* 2008; 36:296-327  
*Intensive Care Med* 2008;30:536-555**

# ent Surviving Sepsis Campaign Guidelines Sponsors

- **American Association of Critical-Care Nurses**
- **American College of Chest Physicians**
- **American College of Emergency Physicians**
- **Australian and New Zealand Intensive Care Society**
- **Asia Pacific Association of Critical Care Medicine**
- **American Thoracic Society**
- **Brazilian Society of Critical Care(AIMB)**
- **Canadian Critical Care Society**
- **Chinese Society of Critical Care Medicine**
- **Chinese Society of Critical Care Medicine of Chinese Medical Association**
- **European Respiratory Society**
- **European Society of Clinical Microbiology and Infectious Diseases**
- **European Society of Intensive Care Medicine**
- **European Society of Pediatric and Neonatal Intensive Care**
- **German Sepsis Society**
- **Infectious Diseases Society of America**
- **Indian Society of Critical Care Medicine**
- **Japanese Association for Acute Medicine**
- **Japanese Society of Intensive Care Medicine**
- **Latin American Sepsis Institute**
- **Pan Arab Critical Care Medicine Society**
- **Pediatric Acute Lung Injury and Sepsis Investigators**
- **Society Academic Emergency Medicine**
- **Society of Critical Care Medicine**
- **Society of Hospital Medicine**
- **Surgical Infection Society**
- **World Federation of Critical Care Nurses**
- **World Federation of Societies of Intensive and Critical Care Medicine**



# Surviving Sepsis

*Phase 1 Barcelona declaration*

*Phase 2 Evidence-based guidelines*

*Phase 3 **Implementation and education***

# SSC Phase III: Methodology



- Partner with Institute for Healthcare Improvement (IHI)
  - Develop sepsis “change bundles”
    - **Facilitate adoption of guidelines**
      - VAP, CLABSI
    - **15 member panel**
      - Gap analysis

# Surviving Sepsis Campaign: Phase III



- A global, multi-center, 4-year trial (2006-2010)
  - **Multiple hospital networks**
- Non-interrupted time series
- **Primary outcome**
  - The impact of a model for changing bedside management of sepsis
- **Secondary outcome**
  - Mortality

# SSC Methodology: Multifaceted Intervention



- **National/regional/network “launch meetings”**
  - Identify local champions
  - Introduce sepsis bundles
  - Educational tools
    - **SSC manual**
    - **SSC slides**
  - Staff support for coordinating sites
  - Regular conference calls
- **Website**
  - **SSC and IHI website**
  - **Sepsis list-serve**
- **Interactive database**
  - **Automated uploading to SSC server**
  - **Technical support**
  - **Local audit and feedback capabilities**



**Data**

# Bundled care for septic shock: An analysis of clinical trials\*

## Survival

Author Yr

Trzeciak 06

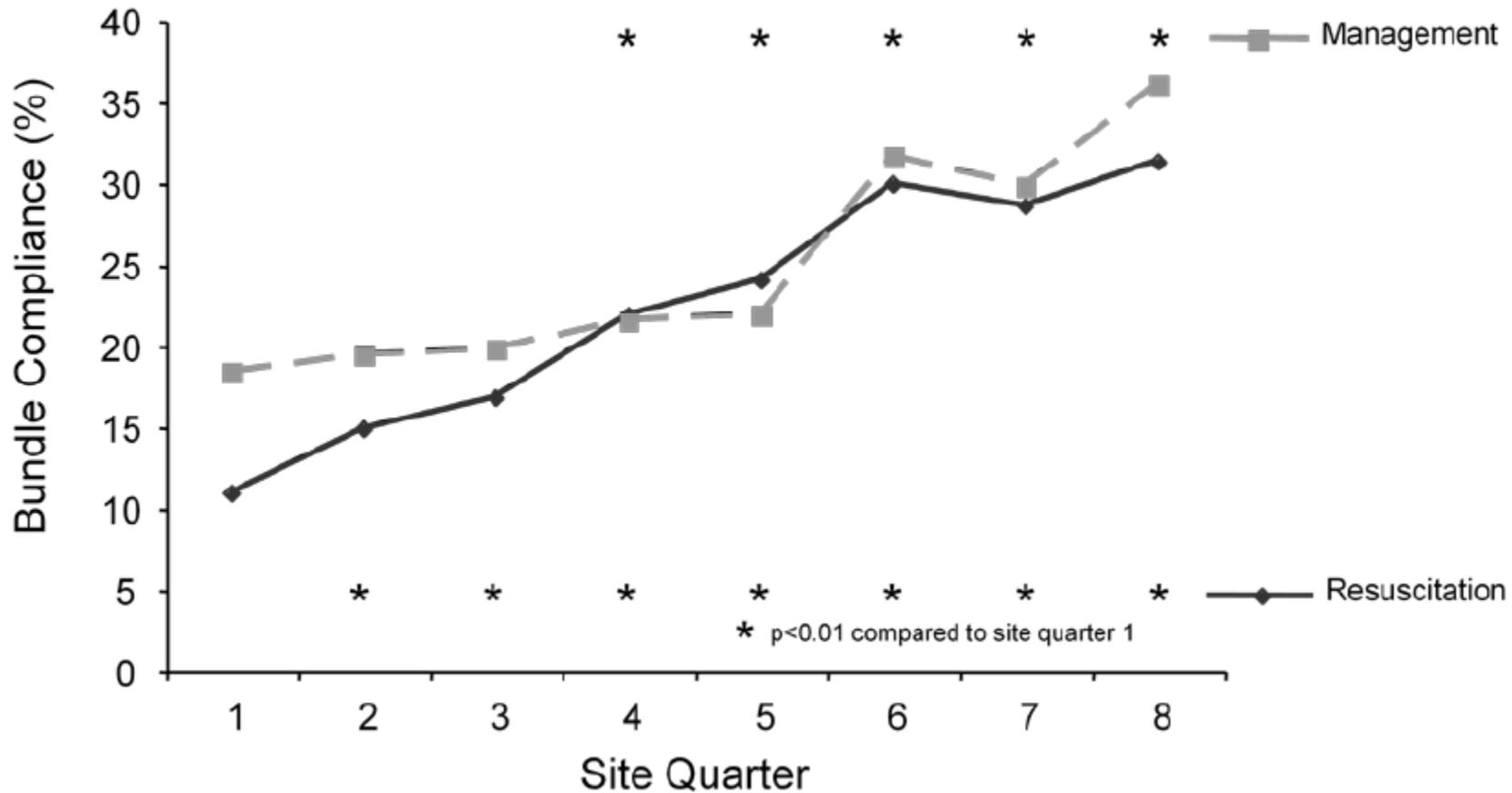
Heterogeneity  
 $I^2 = 0\%$ ,  $p = 0.87$

Sepsis care bundles were associated with consistent and significant increases in survival across eight studies.

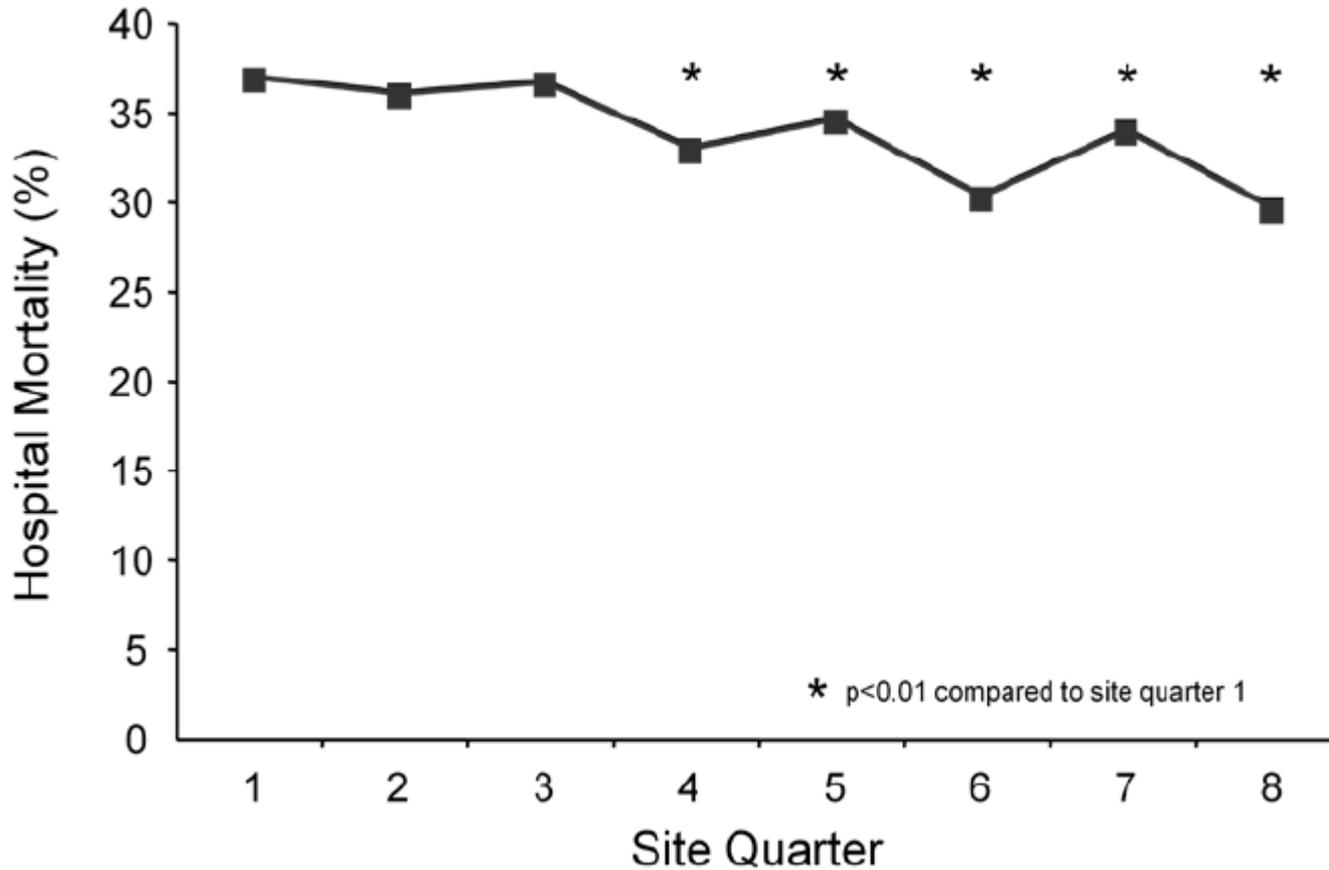
Jones 07



# Change in Compliance Over Time



# Change in Mortality Over Time



# The Surviving Sepsis Campaign: A Global Effort at Knowledge Translation

- What is it:
  - A model for knowledge translation
  - International guidelines for sepsis
  - An attempt to standardize care
    - Provide guidance for bedside ICU clinicians
    - Variations are expected and necessary
      - Regional, cultural
      - Individual patient
  - Provide user-friendly tools for audit and feedback
    - To be used locally to drive improvement

# The Surviving Sepsis Campaign: A Global Effort at Knowledge Translation

## Strengths

- Significant cultural impact
  - 30,000 patients currently
- Significant compliance change
  - Model successful in knowledge translation
  - Cross-cultural success
- Significant mortality reduction
- Insights emerging of impact of individual elements
- Guidelines

## Weaknesses

- Initial industry funding
- Evidence base for performance metrics
  - How much is enough?
- All prospective, observational trials
- Which elements are important?

# So, Where are We?

- The Surviving Sepsis Campaign has successfully employed a collaborative model of knowledge translation, using bundled performance metrics, to integrate “best practice” models into bedside clinical practice
- Increased compliance with performance metrics is associated with improved survival
- Bundles = performance metrics = protocols = checklists = guidelines

# Conclusions

- **Surviving Sepsis Campaign achieved targeted goal of 25-39% mortality reduction**
  - Performance metrics can change clinical practice
- **Practical Strategies for diagnosis and treatment of severe sepsis:**
  - Protocolized care/check lists/bundles can improve patient care
- **Increased compliance with performance metrics is associated with improved survival**

# Acknowledgements



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- Nancy Brunner
- Ricard Ferrar
- So many others.....



**What's Next?**

# What's Next?

- Marked increased attention to sepsis
  - Governments
  - National funding agencies
  - Hospital networks

# The Surviving Sepsis Campaign: Ongoing Performance Initiatives

- A multitude of ongoing Sepsis Performance Improvement initiatives derived from SSC
  - New York City initiative (STOP SEPSIS)
  - Partnership between IHI and large hospital system in New York
  - Moore Foundation initiative (West coast USA)
  - Many others...

# The Surviving Sepsis Campaign: Government involvement

- Sepsis metrics (from SSC) now under consideration by National Quality Forum (US)
- New York State department of health programs
- CMS
  - Multiple sepsis projects
- CMMI funding

# Revised SSC Bundles

- Based on 2012 SSC guideline Revision
  - Utilizing analysis of 28,000 pt SSC database
- New software to be developed
- No industry funding utilized in revising guidelines or bundles

# Revised SSC Bundles

- Management bundle dropped
  - IPP: High compliance at outset of study
    - No significant change in compliance
  - Glucose
    - Clouded by controversy
  - Steroids
    - OR > 1.0 in SSC analysis
  - rhAPC
    - PROWESS-SHOCK negative
    - Removed from market

# Revised SSC Bundles

- Two resuscitation bundles
  - Analysis of large database confirm importance of early identification and resuscitation
  - Initial resuscitation bundle
    - To be initiated immediately upon identifying patients with severe sepsis and septic shock
  - Septic Shock bundle
    - To be initiated immediately and completed within 6 hours for patients with septic shock
- Bundles consistent with previous Resuscitation bundle
  - No new metrics

# SSC/NQF Sepsis Resuscitation Bundle

- **WITHIN THREE HOURS OF SEVERE SEPSIS:**
  - 1) Measure lactate level
  - 2) Obtain blood cultures prior to antibiotics
  - 3) Administer broad spectrum antibiotics
  - 4) Administer 30ml/kg crystalloid for hypotension or lactate  $\geq 4$ mmol/L

# SSC/NQF Septic Shock Bundle

- WITHIN 6 HOURS OF INITIAL SYMPTOMS FOR SEPTIC SHOCK:
  - 5) Apply vasopressors (for hypotension that does not respond to initial fluid resuscitation to maintain a mean arterial pressure  $\geq 65$  mmHg)
  - 6) In the event of persistent arterial hypotension despite volume resuscitation (septic shock) or initial lactate  $\geq 4$  mmol/L (36 mg/dl):
    - Measure central venous pressure (CVP)
    - Measure central venous oxygen saturation (ScvO<sub>2</sub>)
  - 7) Re-measure lactate if initial lactate elevated



# Discussion