LE INFEZIONI ASSOCIATE ALLE CURE SANITARIE

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FERRARA, 20 GIUGNO 2013

Terzo Meeting

La collaborazione Intensivista - Infettivologo nella gestione delle infezioni gravi e complesse

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La collaborazione Intensivista -Infettivologo nella gestione delle infezioni gravi e complesse

Percorso assistenziale

- **Riconoscimento (precoce)**
- **Prevenzione**
- **Trattamento**

Riconoscimento che qualche cosa non va…

- alterazione del sensorio
- dispnea, tachipnea, alterazione della meccanica-dinamica ventilatoria
- SpO_2
- alterazione della PA
- tachicardia, aritmia
- contrazione della diuresi
- ↓↑ T°
- alterazione degli esami ematochimici
- ecc.

Quanto non va ?
Valutazione della gravità

- giudizio personale
- scale di gravità

Segni precoci di allarme

Modified Early Warning Score

	3	2	1	0	1	2	3
PA sist	<70	71-80	81-100	101-199		>200	
FC		<40	41-50	51-100	101-110	111-129	>130
FR		<9		9-14	15-20	21-29	>=30
T °C		<35		35-38.4		>=38.5	
AVPU				Alert	reagisce	reagisce	Non reagisce
					Voce	Pain	Unresponsive

Cut-off >4

Subbe CP et al Q J Med 2001; 94: 521-526

Frequenza respiratoria

L'aumento è un evento primario: la alcalosi respiratoria deve sempre far pensare ad un processo infiammatorio

Cause

•IL -1, IL – 6

•afferenze vagali dalla periferia del polmone → attività del frenico

•Fibre di tipo III e IV non mielinizzate dai muscoli respiratori che rispondono a:

- metaboliti acido arachidonico
- osmolarità aumentata
- aumento del K^+
- Lattato

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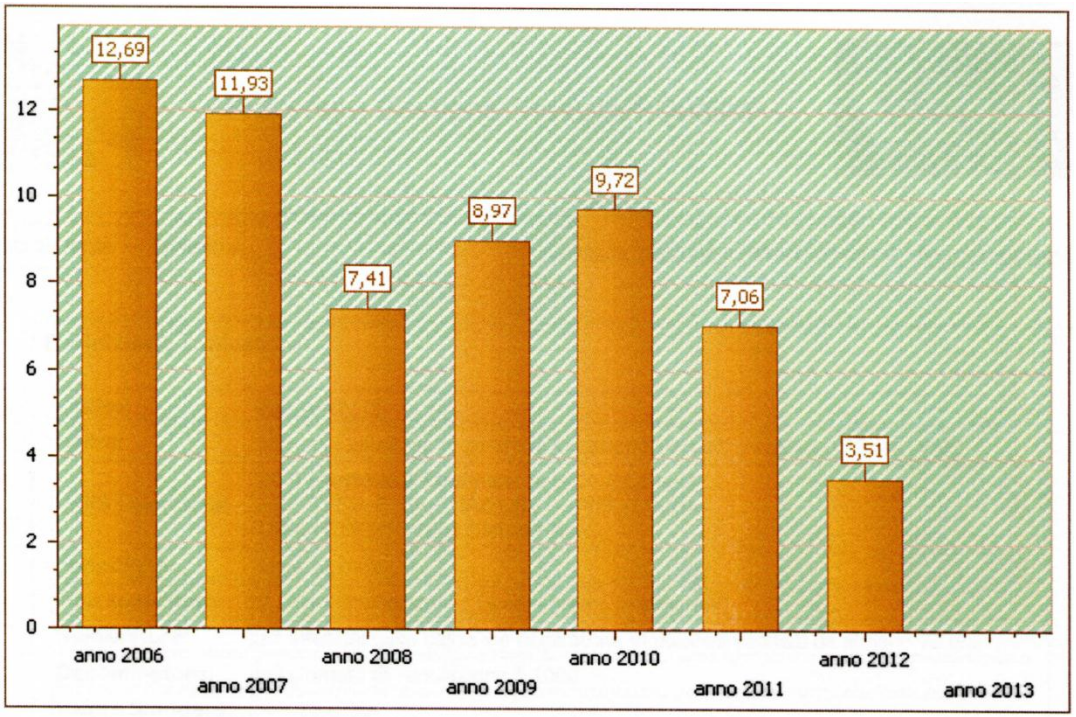
Prevenzione

- **Infezioni nosocomiali**

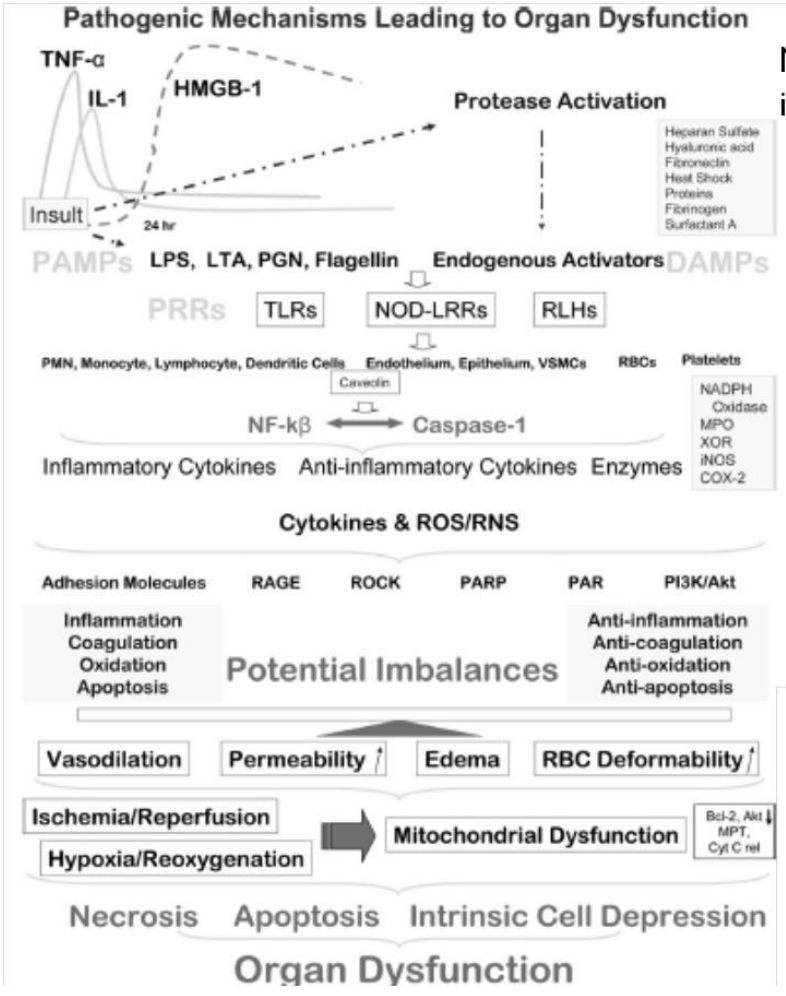
F. Infection prevention
1a. Selective oral decontamination and selective digestive decontamination should be introduced and investigated as a method to reduce the incidence of ventilator-associated pneumonia; This infection control measure can then be instituted in health care settings and regions where this methodology is found to be effective (grade 2B)
1b. Oral chlorhexidine gluconate be used as a form of oropharyngeal decontamination to reduce the risk of ventilator-associated pneumonia in ICU patients with severe sepsis (grade 2B)

Cut of: < 14%



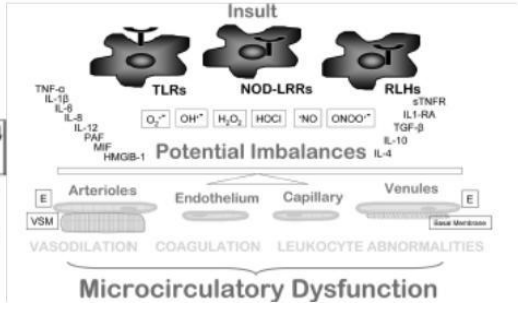
La collaborazione Intensivista -Infettivologo nella gestione delle infezioni gravi e complesse

Prevenzione: Disfunzione → insufficienza d'organo



Molecular biology of inflammation and sepsis

(Crit Care Med 2009;37:291–304)



Quanti liquidi devo dare ai miei pazienti?

Sappiamo che c'è una correlazione inversa tra la mortalità e la quantità di liquidi somministrata: più alta è la quantità, maggiore è la mortalità.

Brandstrup, Annals of Surgery 2003

Ma è proprio tutto così semplice?

Quando devo dare liquidi ai miei pazienti?

Presto, molto presto!

E. Rivers, NEJM 2001

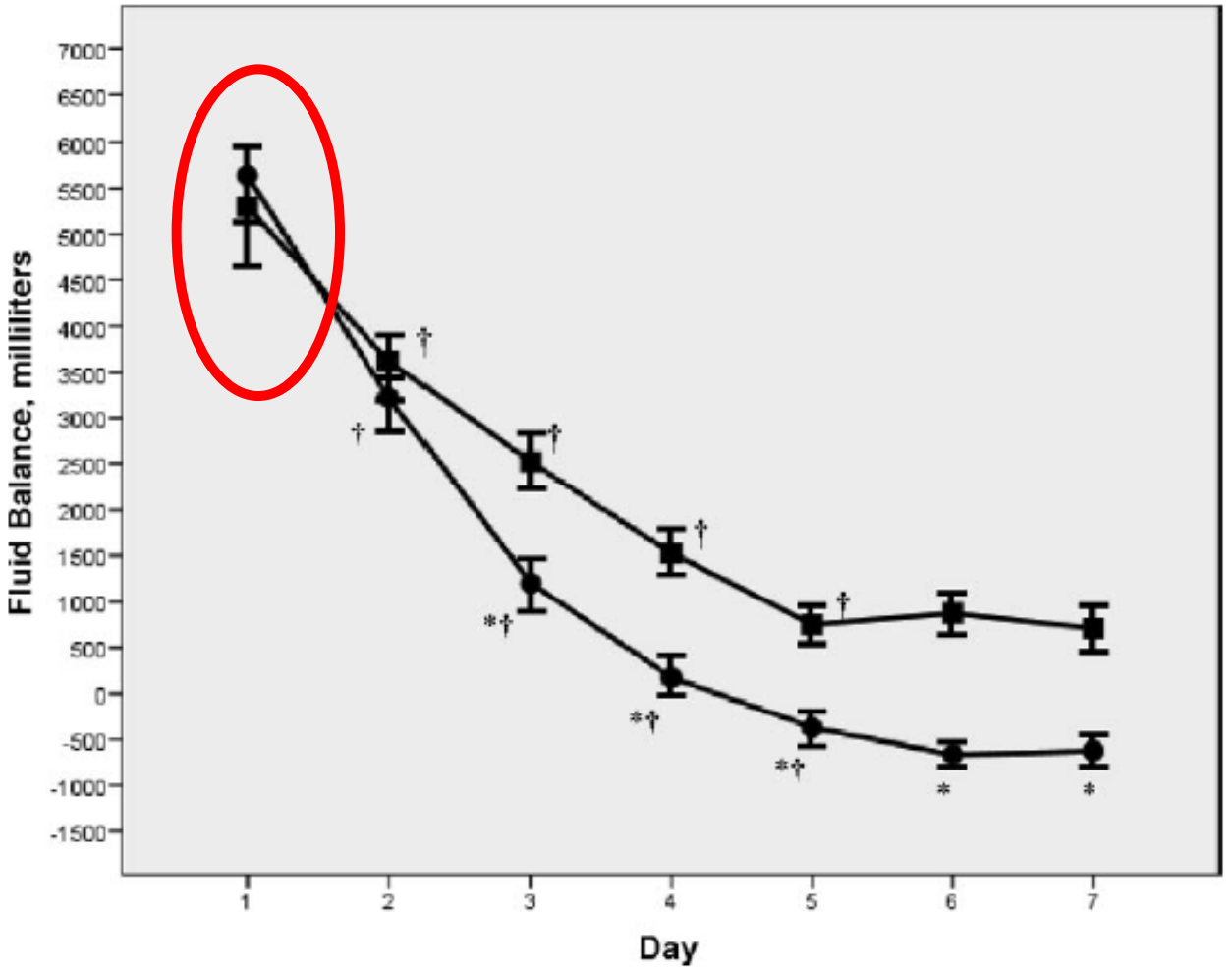


FIGURE 1. Mean (± SE) daily fluid balance (in milliliters) for days 1 through 7 following the onset of septic shock. Nonsurvivors are depicted by squares, and survivors by circles. * = $p < 0.05$ pairwise compared between survivors and nonsurvivors (ANOVA for repeated measures); † = $p < 0.05$ compared with the previous time point (ANOVA for repeated measures).

Murphy et al: Chest 2009; 136:102-109

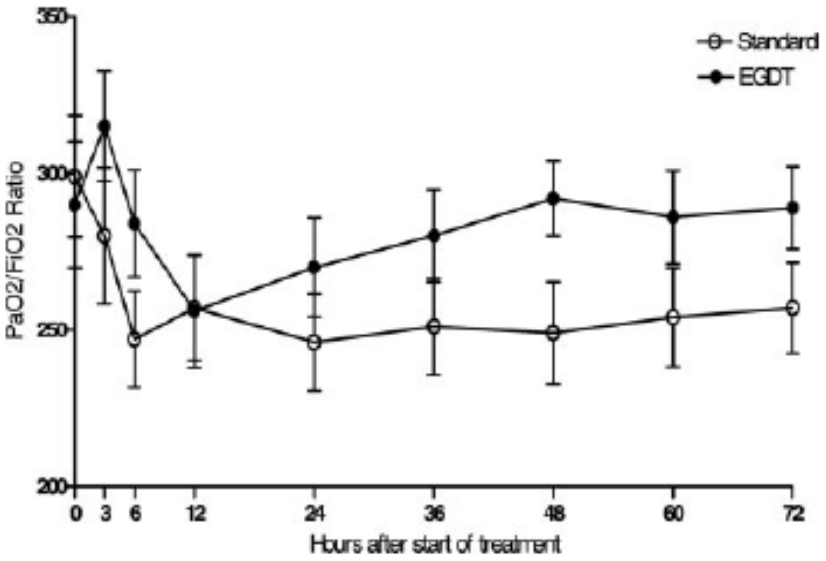


FIGURE 4. Comparing the PaO_2/fraction of inspired oxygen (FIO_2) ratios between the EGDT and standard-care groups. Despite more volume resuscitation in the EGDT group during initial 6 h, there was no net difference in PaO_2/FIO_2 ratio ($p = 0.34$).

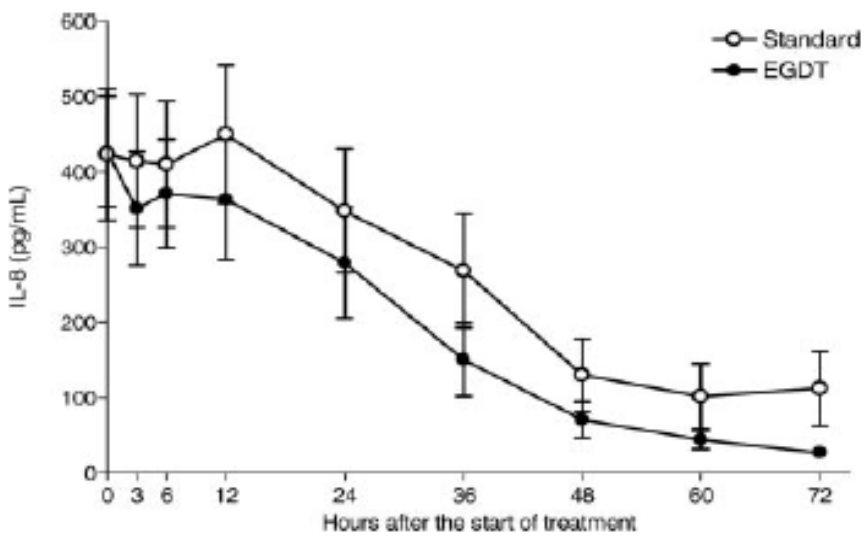


FIGURE 5. The effect of EGDT on inflammation. EGDT effects on inflammation (IL-8) associated with ALI. EGDT patients had a corresponding lower level of IL-8 and a decreased rate of mechanical ventilation in the subsequent 7 to 72 h time period ($p = 0.045$).

(CHEST 2006; 130:1579–1595)

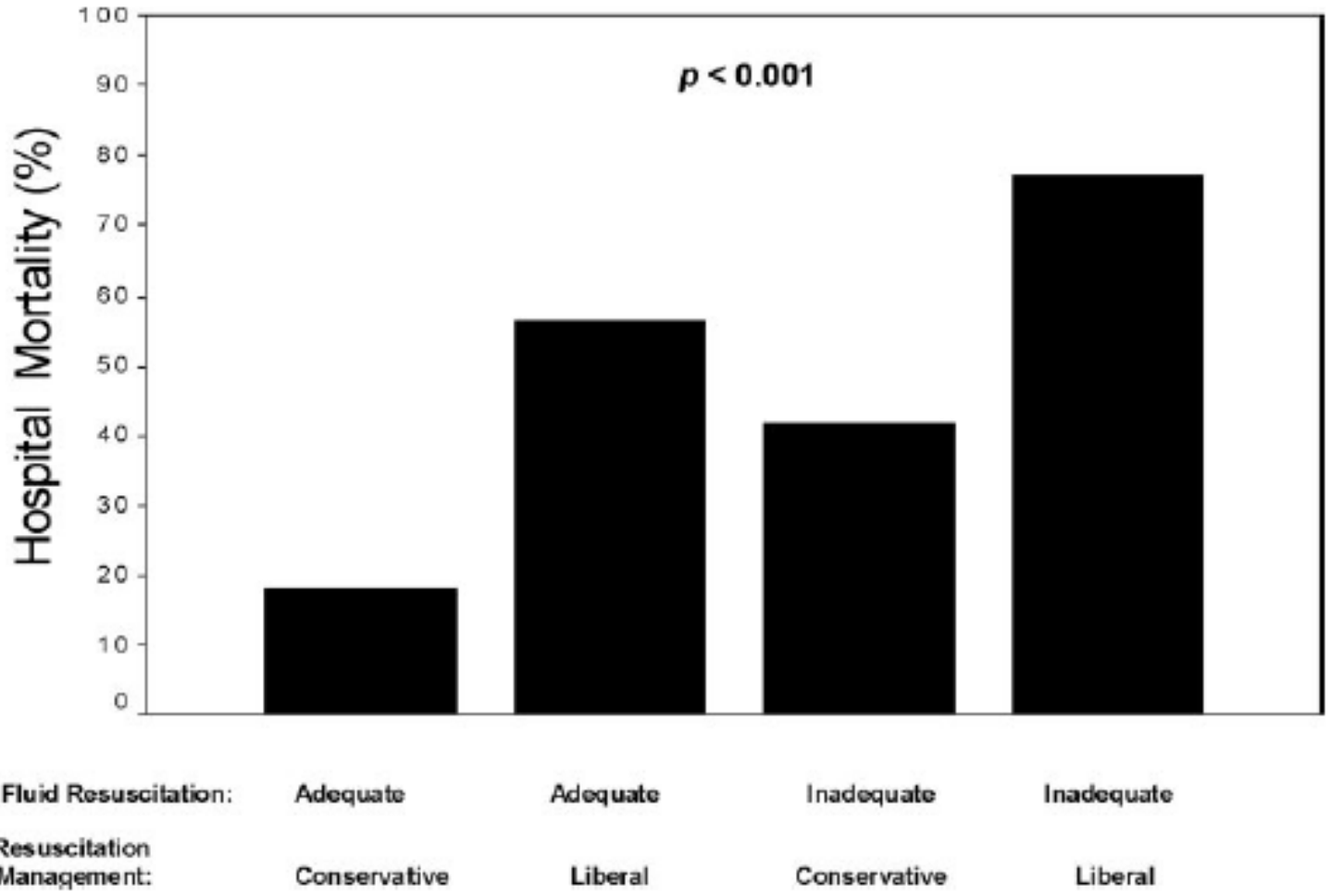


FIGURE 3. Hospital mortality according to whether or not patients achieved AIFR, CLFM, both, or neither.

Murphy et al. Chest 2009; 136:102-109

QUINDI…

- Abbiamo la responsabilità di evitare la ipoperfusione d'organo, → livelli plasmatici elevati di citochine proinfiammatorie che mantengono il paziente ipovolemico.

- Dovremmo dare la giusta quantità al momento giusto.

- Di conseguenza la corretta strategia fluidica dovrebbe essere quella di somministrare abbastanza liquidi quando il paziente ne ha realmente bisogno, con lo scopo di evitare bilanci idrici ripetutamente positivi a causa di una sottostimata ipoperfusione tessutale.

Intensive Care Med (2013) 39:165–228
DOI 10.1007/s00134-012-2769-8

GUIDELINES

Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock, 2012

R. P. Dellinger
Mitchell M. Levy
Andrew Rhodes
Djillali Annane
Herwig Gerlach
Steven M. Opal
Jonathan E. Sevransky
Charles L. Sprung
Ivor S. Douglas
Roman Jaeschke
Tiffany M. Osborn
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Derek C. Angus
Clifford S. Deutschman
Flavia R. Machado
Gordon D. Rubenfeld
Steven Webb
Richard J. Beale
Jean-Louis Vincent
Rui Moreno
The Surviving Sepsis Campaign Guidelines Committee
including The Pediatric Subgroup*

A. Initial resuscitation

1. Protocolized, quantitative resuscitation of patients with sepsis-induced tissue hypoperfusion (defined in this document as hypotension persisting after initial fluid challenge or blood lactate concentration ≥4 mmol/L). Goals during the first 6 h of resuscitation:
   (a) Central venous pressure 8–12 mmHg
   (b) Mean arterial pressure (MAP) ≥ 65 mmHg
   (c) Urine output ≥ 0.5 mL kg $^{-1}$ h
   (d) Central venous (superior vena cava) or mixed venous oxygen saturation 70 or 65 %, respectively (grade 1C)
2. In patients with elevated lactate levels targeting resuscitation to normalize lactate as rapidly as possible (grade 2C)

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SURVIVING SEPSIS CAMPAIGN CARE 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 ≥ 4 mmol/L

Paz. di 70 Kg, 2.1 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.

Ruolo dell'Intensivista nelle Emergenze Infettivologiche

L'intensivista deve essere addestrato a:

- ✓ prevenire le infezioni nosocomiali;
- ✓ riconoscere e trattare cause e conseguenze di ogni tipo di infezione;
- ✓ percepire ed interpretare segni aspecifici (→SIRS): riconoscere uno stato di sepsi e contrastarne l'evoluzione verso forme più gravi;
- ✓ trattare la sepsi grave, la MOF, e lo shock settico;
- ✓ promuovere la cultura di prevenzione, riconoscimento e trattamento, dall'infezione allo shock.
- ✓ ***collaborare con infettivologo e batteriologo;***

Ruolo dell'Intensivista nelle Emergenze Infettivologiche

L'intensivista deve essere addestrato a:

- ✓ ***collaborare con infettivologo e batteriologo;***

D. Antimicrobial therapy

1. Administration of effective intravenous antimicrobials within the first hour of recognition of septic shock (grade 1B) and severe sepsis without septic shock (grade 1C) as the goal of therapy

2a. Initial empiric anti-infective therapy of one or more drugs that have activity against all likely pathogens (bacterial and/or fungal or viral) and that penetrate in adequate concentrations into tissues presumed to be the source of sepsis (grade 1B)

2b. Antimicrobial regimen should be reassessed daily for potential deescalation (grade 1B)

3. Use of low procalcitonin levels or similar biomarkers to assist the clinician in the discontinuation of empiric antibiotics in patients who initially appeared septic, but have no subsequent evidence of infection (grade 2C)

4a. Combination empirical therapy for neutropenic patients with severe sepsis (grade 2B) and for patients with difficult to treat, multidrug-resistant bacterial pathogens such as *Acinetobacter* and *Pseudomonas spp.* (grade 2B). For patients with severe infections associated with respiratory failure and septic shock, combination therapy with an extended spectrum beta-lactam and either an aminoglycoside or a fluoroquinolone is for *P. aeruginosa* bacteremia (grade 2B). A combination of beta-lactam and macrolide for patients with septic shock from bacteremic *Streptococcus pneumoniae* infections (grade 2B)

4b. Empiric combination therapy should not be administered for more than 3–5 days. De-escalation to the most appropriate single therapy should be performed as soon as the susceptibility profile is known (grade 2B)

5. Duration of therapy typically 7–10 days; longer courses may be appropriate in patients who have a slow clinical response, undrainable foci of infection, bacteremia with *S. aureus;* some fungal and viral infections or immunologic deficiencies, including neutropenia (grade 2C)

6. Antiviral therapy initiated as early as possible in patients with severe sepsis or septic shock of viral origin (grade 2C)

7. Antimicrobial agents should not be used in patients with severe inflammatory states determined to be of noninfectious cause (UG)

Severity	Location	Intervention
pH > 7,35	Ward	Drugs+Oxygen
pH 7,35 -7,30	Ward	NPPV
pH <7,30; Alertness	ICU	NPPV or INPV
pH < 7.25 and/or Neurologic Status Fatigue or ET indication MOF	ICU	ET intubation


To fail to plan is to plan to fail

The six most frequent causes of infections in septic patients

pneumonia, bloodstream infections (including infective endocarditis), intravascular catheter-related sepsis, intra-abdominal infections, urosepsis, and surgical wound infections.

Crit Care Med 2005; 33:1538-48