

Napule è...

PEDIATRIA PREVENTIVA E SOCIALE



LUCI OMBRE ABBAGLI

Prevenzione

Nutrizione

Allergologia

Dermatologia

Gastroenterologia

22 - 25 APRILE 2016
Hotel Royal Continental, Napoli

Bambino Gesù
OSPEDALE PEDIATRICO

La gestione della bronchiolite Il nuovo documento intersocietario

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- infants less than 12 months
- first attack
- brief prodrome

- wheezing
- dyspnea
- respiratory distress
- poor feeding
- tachypnea
- rx hyperaeration of the lung
- fine crepitation

- ✓ RSV bronchiolitis is the primary cause of hospitalisation in the first year of life for children in most parts of the world.
- ✓ In USA the virus is estimated to cause 3000 to 4000 deaths annually (Ogra PL, Paediatr Respir Rev 2004).



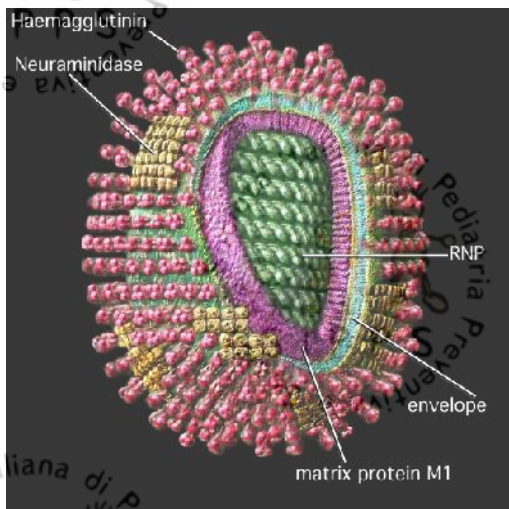
Physiological reasons for the increased susceptibility of infants for respiratory compromise in comparison to adults

Cause	Physiological or anatomical basis
Metabolism ↑ Risk of apnoea ↑ Airway resistance ↑ Upper airway resistance ↑	O ₂ consumption ↑ Immaturity of control of breathing Nose breathing Large tongue Airway size ↓ Collapsibility ↑ Pharyngeal muscle tone ↓ Compliance of upper airway structures ↑
Lower airway resistance ↑	Airway size ↓ Collapsibility ↑ Airway wall compliance ↑ Elastic recoil ↓
Lung volume ↓ Efficiency of respiratory muscles ↓	Numbers of alveoli ↓ Lack of collateral ventilation Efficiency of diaphragm ↓ Rib cage compliance ↑ Horizontal insertion at the rib cage Efficiency of intercostal muscles ↓ Horizontal ribs
Endurance of respiratory muscles ↓	Respiratory rate ↑ Fatigue-resistant type I muscle fibres ↓

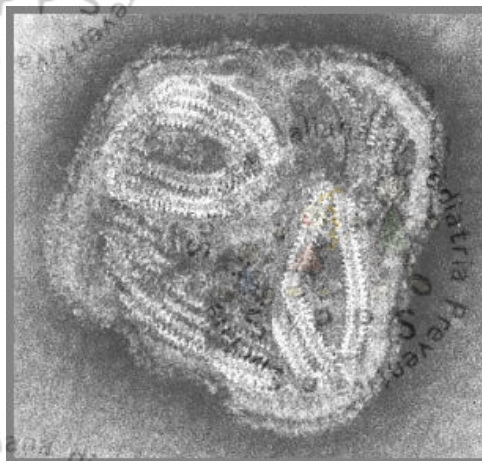
Hammer J, Eber E (eds): Paediatric Pulmonary Function Testing. Prog Respir Res. Basel, Karger, 2005, vol 33, pp 2-7

Le cause

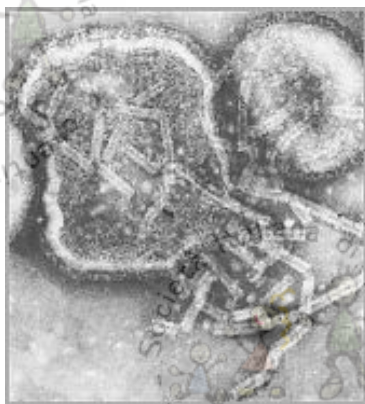
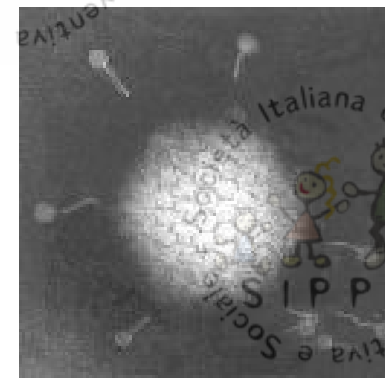
influenza



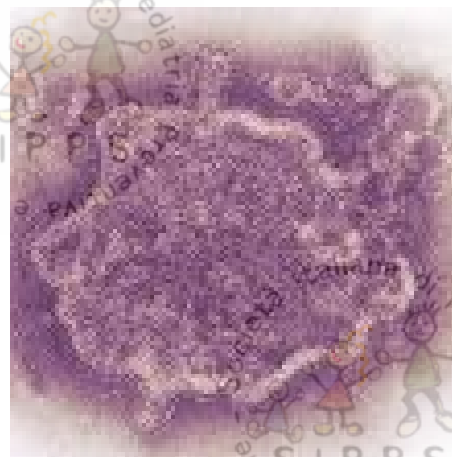
VRS



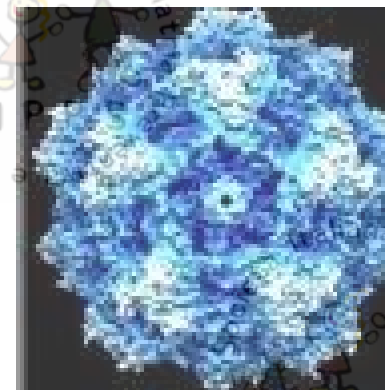
Adenovirus



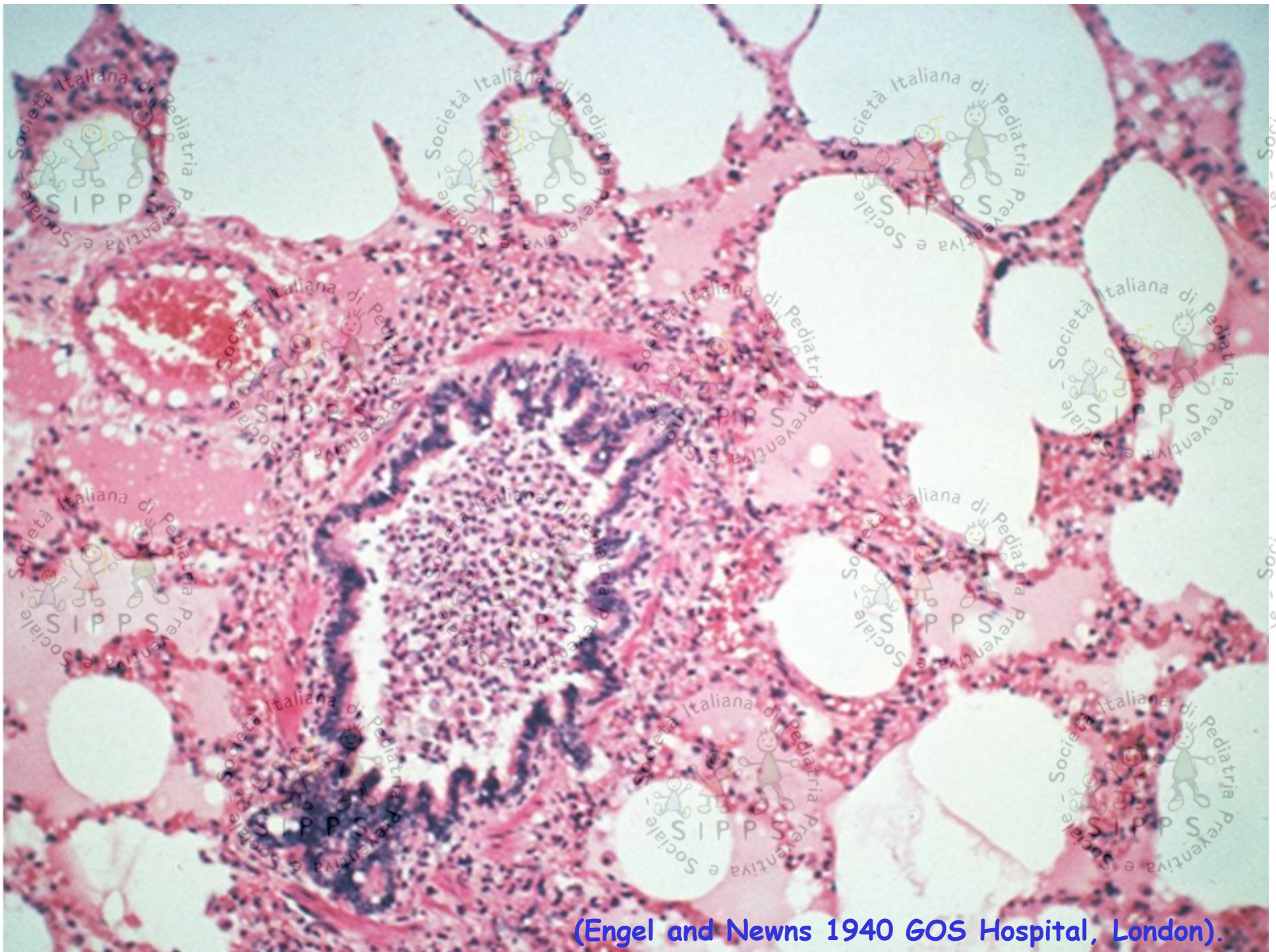
Parainfluenza



human metapneumovirus



human bocavirus



(Engel and Newns 1940 GOS Hospital, London).

Acute Viral Bronchiolitis: To Treat or Not to Treat That Is the Question

Calogero C, Sly PD. *Pediatr*. 2007 Sep;151(3):235-7

NCC-WCH

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Version 1.0

Bronchiolitis: diagnosis and management of bronchiolitis in children

Bronchiolitis in children

Clinical Guideline NG 9

Methods, evidence and recommendations

Monday 1st June, 2015

Final draft
Commissioned by the National Institute for
Health and Care Excellence

Baraldi et al. *Italian Journal of Pediatrics* 2014, **40**:65
<http://www.ijponline.net/content/40/1/65>

ITALIAN JOURNAL
OF PEDIATRICS

REVIEW

Open Access

Inter-society consensus document on treatment and prevention of bronchiolitis in newborns and infants

Eugenio Baraldi^{1,2*}, Marcello Lanari³, Paolo Manzoni³, Giovanni A Rossi¹, Silvia Vandini³, Alessandro Rimini⁴, Costantino Romagnoli³, Pierluigi Colonna⁴, Andrea Biondi⁵, Paolo Biban⁶, Giampietro Chiamenti⁷, Roberto Bernardini⁸, Marina Picca⁹, Marco Cappa¹⁰, Giuseppe Magazzù¹¹, Carlo Catassi¹², Antonio Francesco Urbino¹³, Luigi Memo¹⁴, Gianpaolo Donzelli¹⁵, Carlo Minetti¹⁶, Francesco Paravati¹⁷, Giuseppe Di Mauro¹⁸, Filippo Festini¹⁹, Susanna Esposito²⁰, Giovanni Corsello²¹ and on behalf of their respective Scientific Pediatric Societies

Mi chiamano per Kevin,
maschio, caucasico, 2
mesi

La famiglia agitata b
nato a termine, buon
accrescimento, non
problemi conosciuti

Da 2 giorni raffreddore.

Da oggi t febbrile (38° C
max),

Respira male,
rientramenti
intercostali e al giugulo.

Alitamento pinne nasale

FR da sveglia 60/min,

SaO₂:92% non cianosi.

Torace rantoli
crepitanti e sibili

Latte materno e mangia
con difficoltà

Scenario



Domande

Lo ricovero?

Criteri per l'Ospedalizzazione

☑ Most infants with acute bronchiolitis will have mild disease and can be managed at home with primary care support. Parents/care givers should be given information on how to recognise any deterioration in their infant's condition and asked to bring them back for reassessment should this occur.

☑ Any of the following indications should prompt hospital referral/acute paediatric assessment in an infant with acute bronchiolitis or suspected acute bronchiolitis:

- poor feeding (< 50% of usual fluid intake in preceding 24 hours)
- lethargy
- history of apnoea
- respiratory rate > 70/min
- presence of nasal flaring and/or grunting
- severe chest wall recession
- cyanosis
- oxygen saturation \leq 94%
- uncertainty regarding diagnosis.

Clinicians assessing the need to refer (or review in primary care) should also take account of whether the illness is at an early (and perhaps worsening) stage, or at a later (improving) stage.

Kevin, maschio, caucasico, 2m.
La famiglia e' agitata, b nato a termine, buon accrescimento finora, non problemi conosciuti sottostanti.

Da 2 giorni raffreddore. Da oggi t febbrile (38° C max),

Respira male, rientramenti intercostali e al giugolo
Alitamento pinne nasale FRda
sveglio 60/min, SaO2:92 %
non cianosi.

Torace rantoli crepitanti e sibili

prende latte materno e mangia con difficoltà

Domande

Lo ricovero?

SI

Ossigeno?

Lo metto in flebo?

Ossigenoterapia e monitoraggio



- ✓ Se saturazione di O₂ (SaO₂) \geq 92% in aria no monitoraggio (D)
- ✓ O₂ per mantenere SaO₂ almeno 92 %
- ✓ Se ossigenoterapia, monitoraggio SaO₂
- ✓ Ossigeno, umidificato e riscaldato NHFO₂T ?
- ✓ Monitoraggio nei bambini più piccoli (apnee centrali)



Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis

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OXYGEN

Key Action Statement 6a

Clinicians may choose not to administer supplemental oxygen if the oxyhemoglobin saturation exceeds **90%** in infants and children with a diagnosis of bronchiolitis (Evidence Quality: D; Recommendation Strength: Weak Recommendation [based on low-level evidence and reasoning from first principles]).

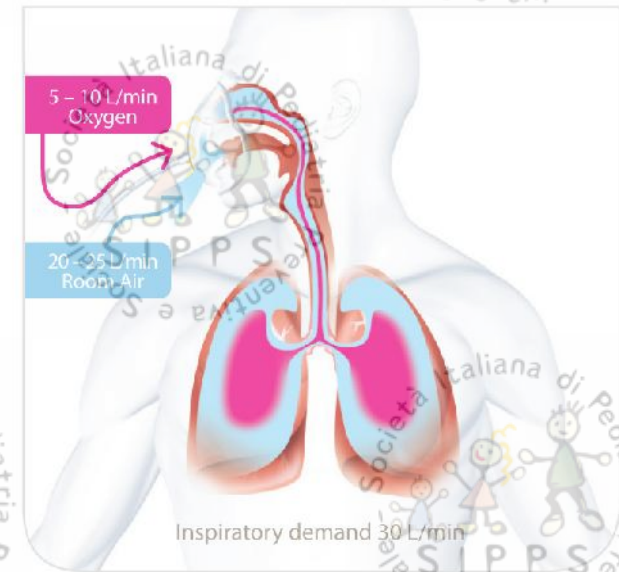
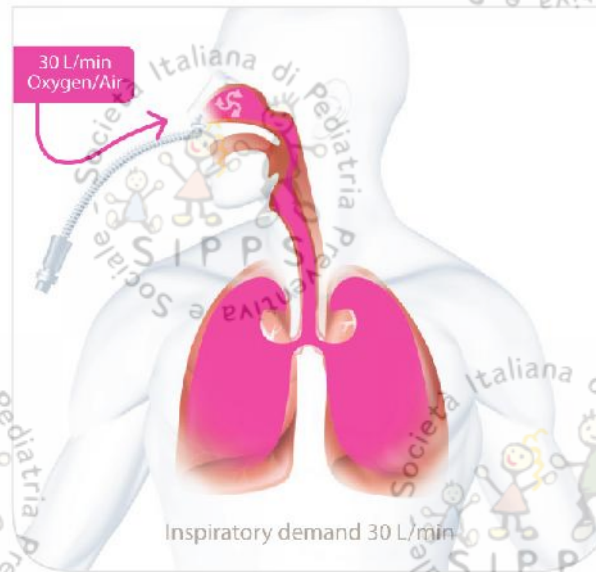
Key Action Statement 6b

Clinicians may choose not to use continuous pulse oximetry for infants and children with a diagnosis of bronchiolitis (Evidence Quality: C; Recommendation Strength: Weak Recommendation [based on lower-level evidence]).



Nasal High Flow (NHF™)

1. Deliver up to 100% oxygen accurately
2. Flushing of anatomical dead space
3. Positive airway pressure throughout the respiratory cycle
4. Optimized mucociliary clearance



Noninvasive continuous positive airway pressure in acute respiratory failure: helmet versus facial mask. Chidini G, Calderini E, Cesana BM, Gandini C, Prandi E, Pelosi P. Pediatrics. 2010 Aug;126(2):e330-6. Epub 2010 Jul 26



Nutrizione - Idratazione

- ✓ dieta abituale: latte materno o formula, pasti solidi appropriati per l'età
- ✓ Sospendere alimentazione se:
 - polipnea $> 80/\text{min}$
 - vomito persistente
 - ipossia ($< 90\%$) durante il pasto
 - aumento lavoro respiratorio

- ✓ fluidoterapia e.v. o sondino n.g. se disidratazione
- ✓ No accesso venoso e fluidoterapia di routine
- ✓ peso giornaliero



Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis

NUTRITION AND HYDRATION

Key Action Statement 9

Clinicians should administer nasogastric or intravenous fluids for infants with a diagnosis of bronchiolitis who cannot maintain hydration orally (Evidence Quality: X; Recommendation Strength: Strong Recommendation).

Domande

Lo ricovero? **Si**

Ossigeno? **No, ma controllo frequente**

Lo metto in flebo? **Si o sondino n.g.**

Lo tratto con Salbutamolo? **Adrenalina?**

Summary on Bronchodilators



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11-15

- It is recommended that serial albuterol aerosol therapies **not** be **routinely** used
- It is recommended that a single administration trial inhalation using albuterol may be considered as an option, particularly when there is a family history for allergy, asthma, or atopy.
- It is recommended that inhalation therapy **not** be repeated nor continued if there is no improvement in clinical appearance between 15 to 30 minutes after a trial inhalation therapy

- should not be used routinely in the management of bronchiolitis
- should be continued only if there is a documented positive clinical response
- not evidence that the use of bronchodilators is beneficial in shortening duration of illness or length of hospital stay
- in selected infants, there is an improvement in the clinical condition after bronchodilator administration.

- Inhaled β -2-agonist bronchodilators and anticholinergics (nebulised ipratropium) are not recommended for treatment of acute bronchiolitis in infants.
- The use of bronchodilators had no effects on rate of hospitalisation or time to hospital discharge.

Summary on Epinephrine



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- It is recommended that a single administration trial inhalation using epinephrine may be considered as an option, particularly when there is a family history for allergy, asthma, or atopy
- It is recommended that inhalation therapy **not** be repeated nor continued if there is no improvement in clinical appearance between 15 to 30 minutes after a trial inhalation therapy

- "some potential for being efficacious"

- did not impact the overall course of the illness as measured by hospital length of stay

- There is insufficient evidence to support the use of epinephrine for the treatment of bronchiolitis among *inpatients*.

- **There is some evidence to suggest that epinephrine may be favorable to salbutamol among outpatients.**

- **Nebulised epinephrine is not recommended**

- did not affect overall clinical status, oxygen requirement, time to hospital discharge or rate of hospital readmission within one month, for infant hospitalised with acute bronchiolitis.



Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis

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ALBUTEROL

Key Action Statement 2

Clinicians should not administer albuterol (or salbutamol) to infants and children with a diagnosis of bronchiolitis (Evidence Quality: B; Recommendation Strength: Strong Recommendation).

EPINEPHRINE

Key Action Statement 3

Clinicians should not administer epinephrine to infants and children with a diagnosis of bronchiolitis (Evidence Quality: B; Recommendation Strength: Strong Recommendation).

Domande

Lo ricovero? **Si**

Ossigeno? **No, ma controllo frequente**

Lo metto in flebo? **Si**

Lo tratto con Salbutamolo? **Si**

Provo il Salbutamolo e aspetto una mezz'ora per vedere se funziona? **Meglio**

Lo tratto con Adrenalina? **Solo se devo trasferirlo aspettando il rianimatore / 118**

Lo tratto con steroide?

Summary on Corticosteroids



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➤ It is recommended that **steroid therapy not be given** (as inhalations, intravenously, orally, or intramuscularly)

➤ **not be used routinely**

➤ No benefits were found in either LOS or clinical score in infants and young children treated with systemic glucocorticoids as compared with placebo.

➤ Inhaled and oral **corticosteroids are not recommended**

➤ did not reduce LOS in previously well infants less than 12 months of age with acute bronchiolitis.



Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis

CORTICOSTEROIDS

Key Action Statement 5

Clinicians should not administer systemic corticosteroids to infants with a diagnosis of bronchiolitis in any setting (Evidence Quality: A; Recommendation Strength: Strong Recommendation).

Domande

Lo ricovero? **Si**

Ossigeno? **No, ma controllo frequente**

Lo metto in flebo? **Si**

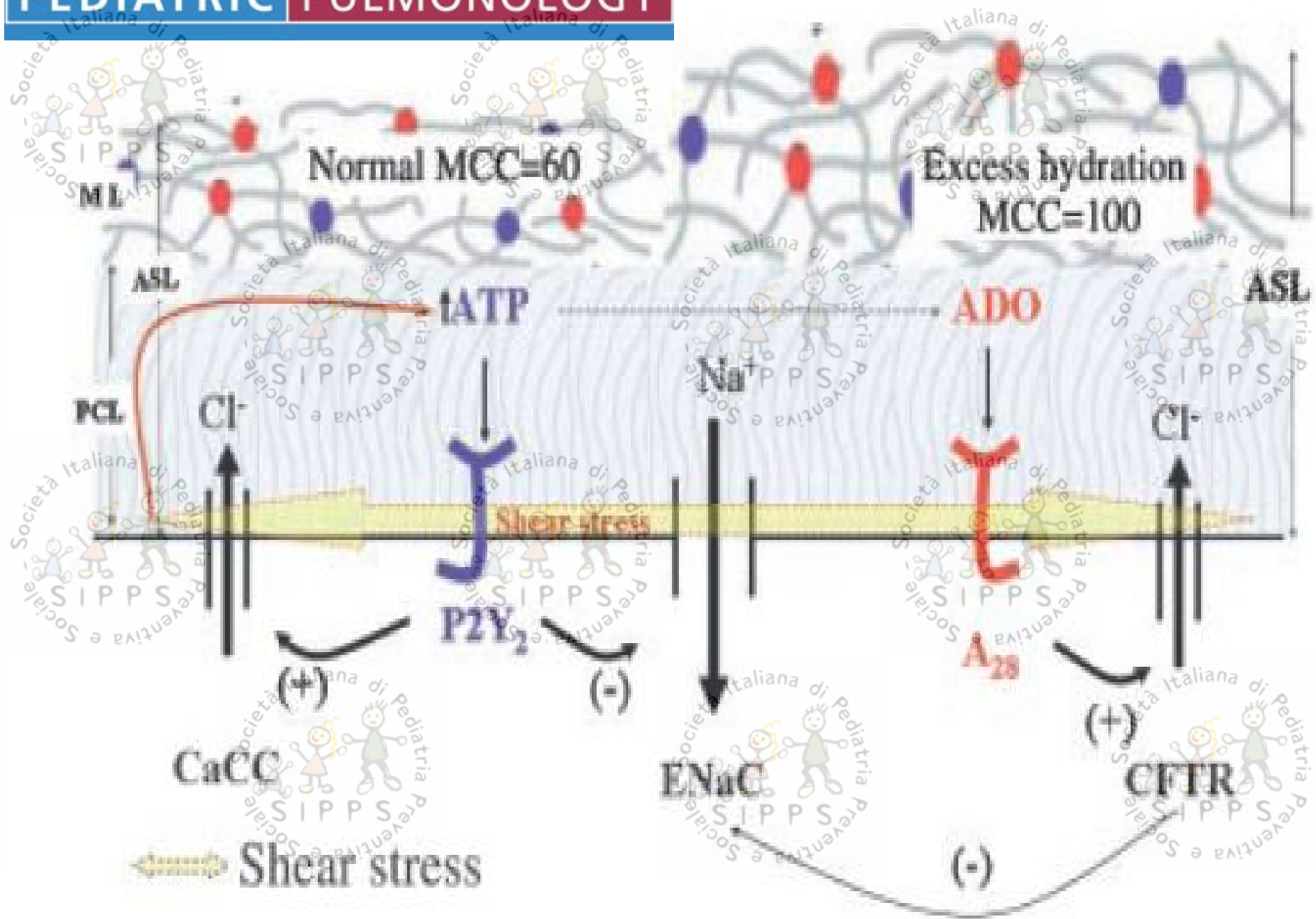
Lo tratto con Salbutamolo? **NO - NO (USA)**

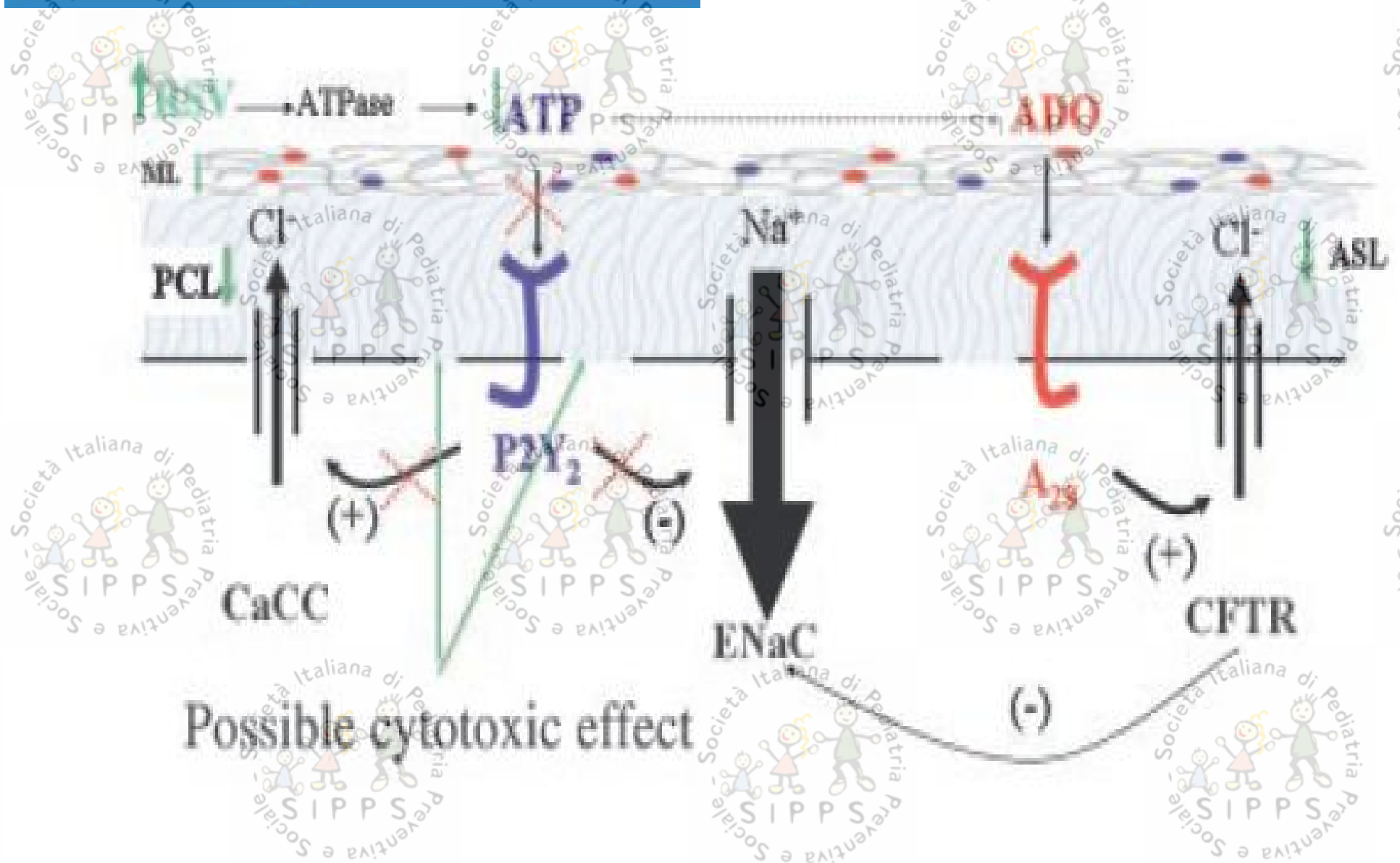
Provo il Salbutamolo e aspetto una mezz'ora per vedere se funziona? **SI NO (USA)**

Lo tratto con Adrenalina? **Solo se devo trasferirlo aspettando il rianimatore**

Lo tratto con steroide? **No, in generale**

E la soluzione salina ipertonica per inalazione?







Nebulized hypertonic saline solution for acute bronchiolitis in infants (Review)

Zhang L, Mendoza-Sassi RA, Wainwright C, Klassen TP

Implications for practice

Nebulized 3% saline produces a 1.2 day reduction in the mean length of hospital stay, compared to nebulized normal saline, among infants hospitalized with non severe viral bronchiolitis.

This therapy also significantly reduces clinical severity score, among outpatients and inpatients with mild to moderate viral bronchiolitis.

Given the clinically relevant benefit and good safety profile, nebulized 3% saline used in conjunction with bronchodilators should be considered an effective and safe treatment for infants with viral bronchiolitis.



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November 1, 2014, Volume 134, Issue 5

HYPERTONIC SALINE

Key Action Statement 4a

Nebulized hypertonic saline should **not** be administered to infants with a diagnosis of bronchiolitis in the emergency department (Evidence Quality: B; Recommendation Strength: Moderate Recommendation).



NO

Key Action Statement 4b

Clinicians may administer nebulized hypertonic saline to infants and children hospitalized for bronchiolitis (Evidence Quality: B; Recommendation Strength: Weak Recommendation [based on randomized controlled trials with inconsistent findings]).



SI

Inter-society consensus document on treatment and prevention of bronchiolitis in newborns and infants

Lugaresi Grazia^{1,2}, Vercillo Liana³, Padoa-Schioppa Cinzia⁴, Rossi A. Rosa⁵, Sforza Valeria⁶, Alessandrini Emma⁷, Colaninno Antonella⁸, Piniello Giuseppina⁹, Andreoli Riccardo¹⁰, Spada Bianca¹¹, Garavito Stefania¹², Roberto Bernardini Maria Rosa¹³, Russo Giuseppe¹⁴, Grossi Massimo¹⁵, Carli Carlo¹⁶, Antonini Edoardo¹⁷, Pignatelli Valeria¹⁸, Galassone Elisabetta¹⁹, Carraro Alessia²⁰, Tommasini Barbara²¹, Giuseppe Di Mauro²², Rippi Paola²³, Ausonia Elisabetta²⁴, Giordano Giuseppina²⁵ and on behalf of the respective scientific societies

Treatment of bronchiolitis

Supportive therapy

Oxygen therapy

If O₂Sat < 90-92%

Nebulized 3% hypertonic saline

Safe and effective

Recommended

Respiratory physical therapy during acute phase of disease

Not effective

Environment humidification

Insufficient evidence

Pharmacological therapy

Nebulized Beta 2-agonists

Not effective (the possibility of a therapeutic trial of salbutamol is contemplated)

Nebulized adrenaline

Decreases hospitalizations in patients presenting to ER

Nebulized and systemic steroids

Not effective

Nebulized adrenaline + systemic steroids

Further studies are necessary

Antibiotics

Only in selected cases (bacterial co-infection/pre-existing diseases)

Ribavirin

Only in selected cases (severe forms/pre-existing diseases)

Nebulized DNase

Not effective

Montelukast

Apparently not effective

From: Association Between Hypertonic Saline and Hospital Length of Stay in Acute Viral Bronchiolitis: A Reanalysis of 2 Meta-analyses

JAMA Pediatr. Published online April 18, 2016. doi:10.1001/jamapediatrics.2016.0079

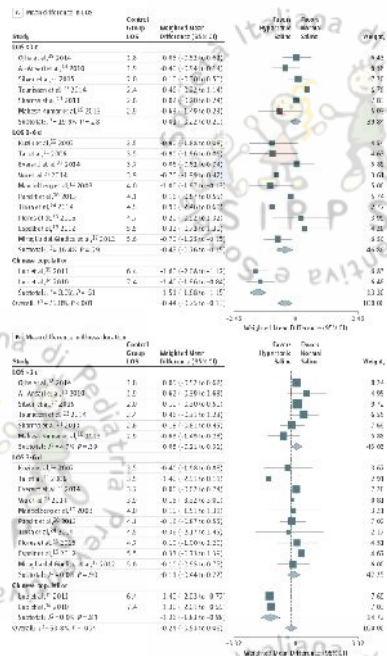


Figure Legend:

Mean Differences in Length of Stay (LOS) and Illness Duration Between Hypertonic Saline (HS) and Normal Saline (NS) Treatment Groups Subgroup analysis postulating a threshold response for LOS of 3 days or more. A, Admission to discharge. No correction for imbalance in day of illness at presentation. B, First symptoms to discharge. Corrected for imbalance in day of illness at presentation. WMD indicates weighted mean difference. Weights are from random effects analysis.

The appearance of a meaningful summary treatment effect on LOS in the cohort of studies on HS in acute viral bronchiolitis is a result of inappropriately combining studies with meaningful differences in outcome definitions and previously unnoticed systematic bias in treatment group allocation.

Hypertonic saline cannot be expected to shorten LOS in bronchiolitis in typical US hospital settings.

Do not use any of the following to treat bronchiolitis in children:

- antibiotics
- hypertonic saline
- adrenaline (nebulised)
- salbutamol
- montelukast
- ipratropium bromide
- systemic or inhaled corticosteroids
- a combination of systemic corticosteroids and nebulised adrenaline

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Bronchiolitis in children

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Methods, evidence and recommendations

Monday 1st June, 2015

Final draft

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First draft

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Think about a diagnosis of viral-induced wheeze or early-onset asthma rather than bronchiolitis in older infants and young children if they have:

- persistent wheeze without crackles or
- recurrent episodic wheeze or
- a personal or family history of atopy.

Take into account that these conditions are unusual in children under 1 year of age

Personalized
Predictive
Participatory
Preemptive



P4 Medicine will be informed by each person's unique clinical, genetic, genomic & environmental information.



Domande

Lo ricovero? **Si**

Ossigeno? **No, ma controllo frequente**

Lo metto in flebo? **Si**

Lo tratto con Salbutamolo? **?**

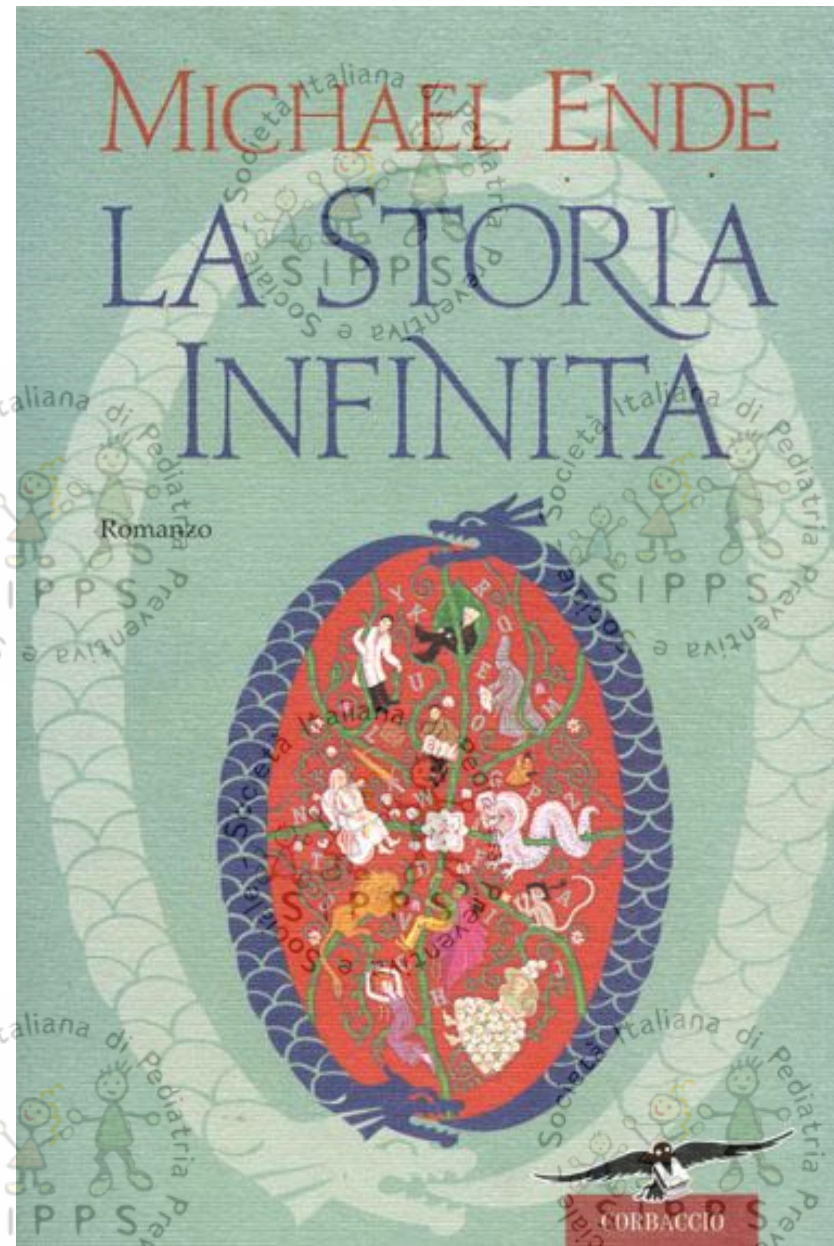
Provo il Salbutamolo e aspetto una mezz'ora per vedere se funziona? **Meglio**

Lo tratto con Adrenalina? **Solo se devo trasferirlo aspettando il rianimatore**

Lo tratto con steroide? **No, in generale,**

E la soluzione salina ipertonica per inalazione? **L'unica vera novità..**
Ma.....

Soluzione salina ipertonica 3% e Bronchiolite



Save the Date

XX Congresso Nazionale SIMRI



Roma 13 - 15 Ottobre 2016

R. Cutrera, 2016 renato.cutrera@opbg.net