Preventing Respiratory Tract Infections:

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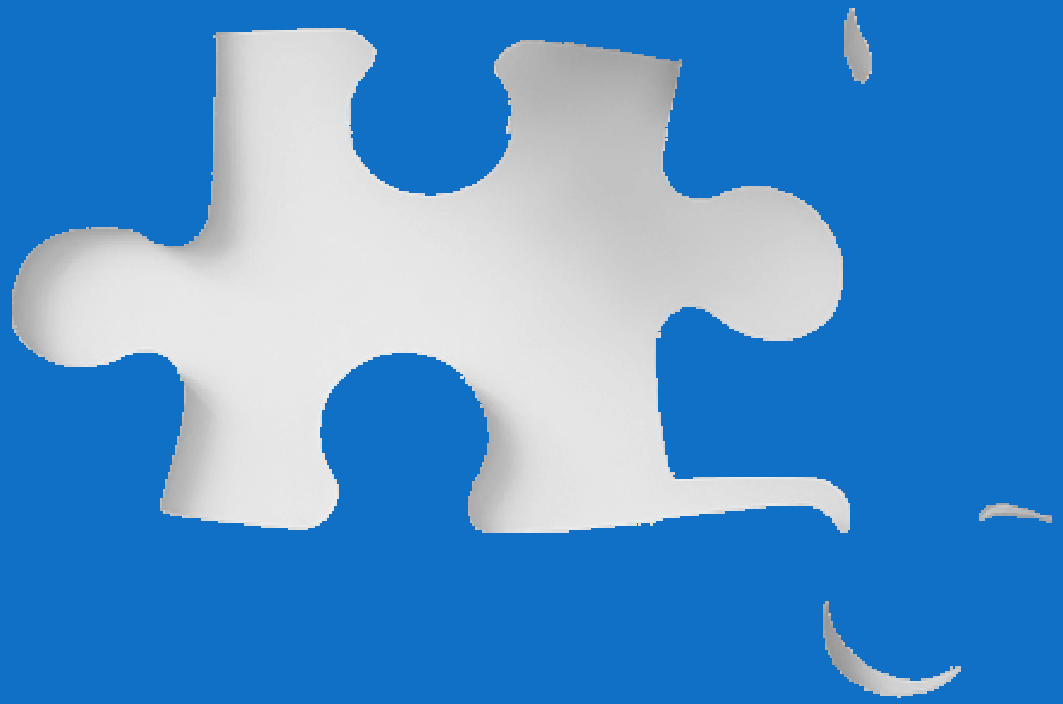
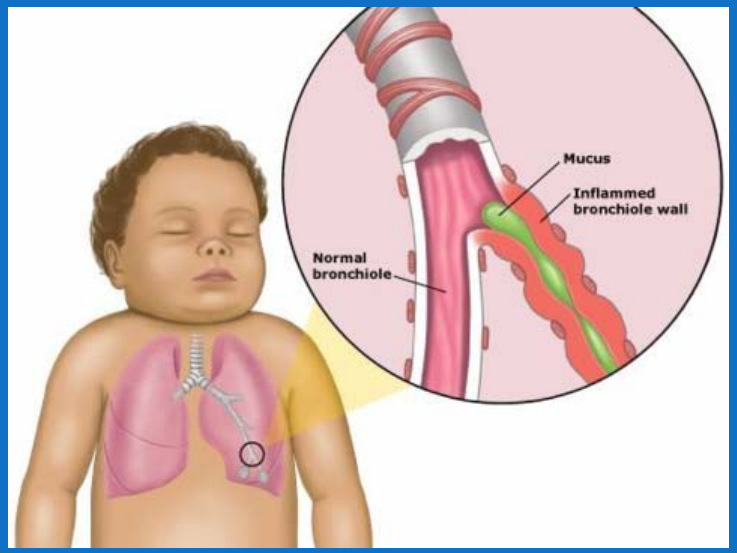


Two major issues

- Respiratory syncytial virus (RSV)
- Ventilator acquired pneumonia

RSV



- Seasonal virus
- Worldwide epidemics peaking in winter or rainy season

Cause of death in 66,000-199,000 less 5 yrs in 2005, most of these in developing countries

79% of hospitalized children with RSV experience complications

Severe RSV infection associated with increase prevalence of allergic asthma, small airway dysfuncton

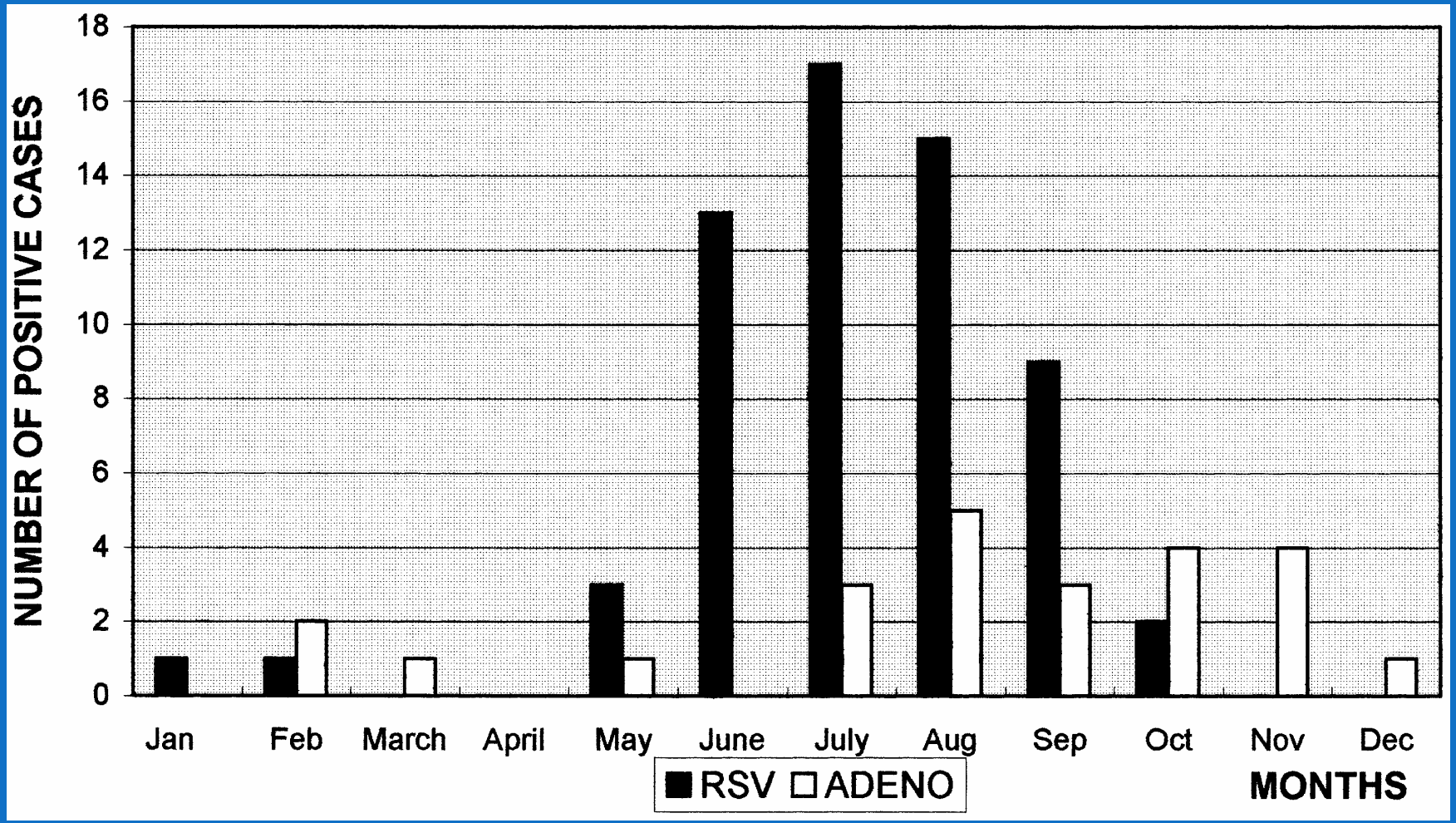
RSV RISK FACTORS (BRAZIL)

TABLE 1
Demographic, social, nutritional and morbid characteristics of 650 children hospitalized for acute respiratory disease in Pelotas, RS, from July 1997 and August 1998

Variables	Cases	
	N	%
Sex		
Male	373	57.4
Female	277	42.6
Age		
0 to 6 months	438	67.4
7 to 12 months	212	32.6
Family income		
Up to 1 MW	245	38.5
1.1 to 3 MW	239	37.5
3.1 to 6 MW	114	17.9
More than 6 MW	39	6.1
Birth weight		
Less than 2,500g	98	15.1
More than 2,500g	552	84.9
Lactation		
Less than 6 months	420	64.6
Still nurses or more than 6 months	230	35.4
Smoking mother		
Yes	291	44.7
No	359	55.3
Respiratory antecedents		
Pneumonia	59	9.1
Screeching with short of breath	185	69.8

MW – minimum wage

Macedo et al, 2003
Jornal de Pneumologia



Monthly distribution of RSV and adenovirus for 168 children under 2 years of age with ALRI hospitalized in a pediatric hospital of Buenos Aires, Argentina during 2 consecutive years.

Videla et al 1998 Clin and Diagnostic Virology

What works in preventing RSV

- A well-coordinated program to administer RSV prophylaxsis (Palivizumab) is key to prevention of RSV in premature infants.

So what else can we do?

- Hand washing- the single most effective infection prevention strategy for all types of infections.
- How do we make it happen?
  - Having a policy is not enough
  - Studies show that baseline compliance can be as low as 23% (van den Hoogen et al 2010 J Nurs Qual)

Hand Hygiene

- Need multiple strategies including education program and audits
  - In a study of health care professionals who received an education program compliance improved from 65-88% and infection rate per 1000 days decreased from 17-13% (Helder et al 2010 Int J Nurs Stud)

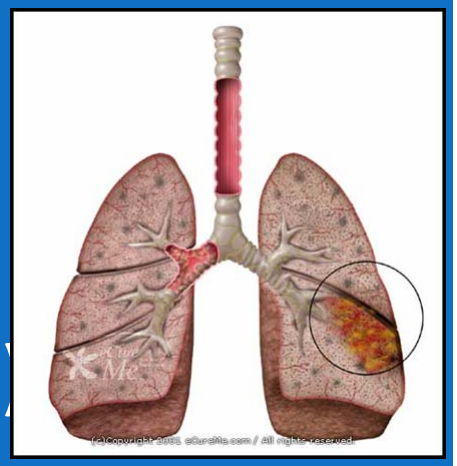
Limiting exposure

- How do we promote family centered care while reducing NICU pts exposure to RSV
  - Targeted health screening of visitors with specific questions about respiratory illness
  - Limiting sibling visits during RSV season
  - Teaching parents to limit their child's exposure to crowds after discharge
- Is there evidence? No systematic reviews or RCTs addressing these measures were found

Cohort segregation

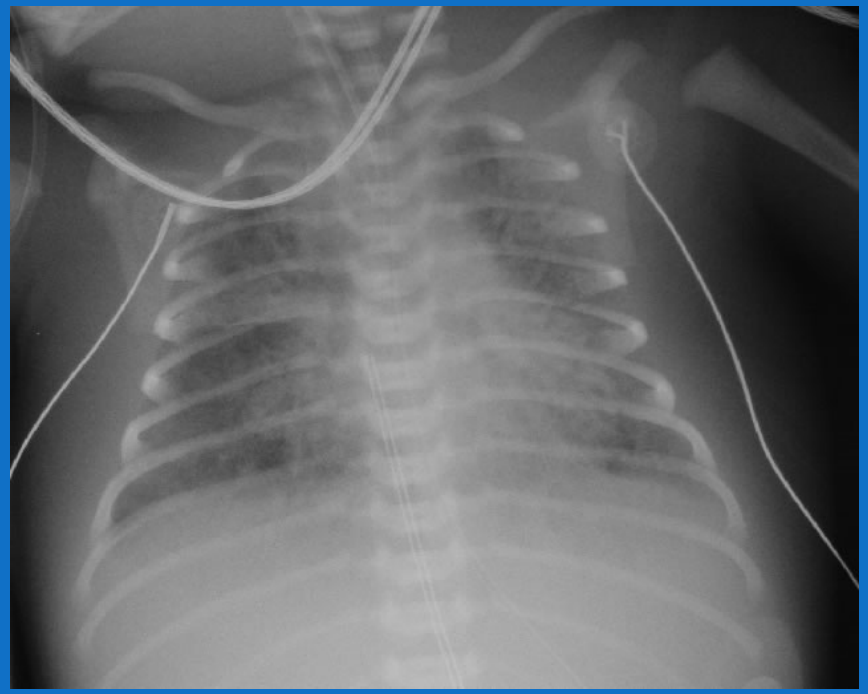
- When combined with hand hygiene, gown and gloves there is non RCT evidence to support a reduction in transmission
- In a Canadian review of cases of nosocomial RSV inconsistent practices for barrier precautions (gowns, gloves and mask) were noted. None of the barrier methods were associated with a decrease in nosocomial infections. All centres used single room cohorting for infected patients. (Langley et al 1997. Peds 100: 943-946)

What about other respiratory infections?



- Ventilator-acquired pneumonia (VAP) increasingly recognized as a serious complication in all ICU pts
- Many insurers in the United States have declared that they will not pay the costs associated with hospital-acquired infections including both VAP and central line infections

VAP in the newborn



- VAP account for 7-32% of nosocomial infections in neonates
- Incidence ranges from 2.4-5.8 episodes per 1000 ventilator days

VAP risk factors

- Mechanical ventilation
- Low birth weight
- Opioid sedation
- Previous bloodstream infection
- Frequent suctioning
- Crowded conditions

- Garland 2010 Clin Perinatol

Step1: Track the incidence

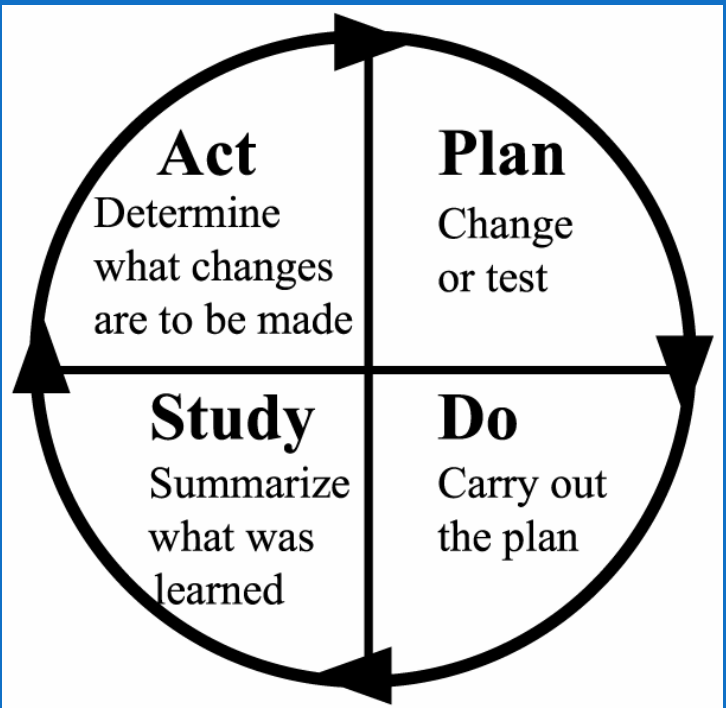
- It is critical that all staff know how many infections occur in their unit
- A surveillance program should be put in place to track the number and types of infections. These numbers can be compared to other units for benchmarking

Next step: Look at best practices

- Determine what practices units with the lowest rates of VAP are using

Choose new practices,

Implement and evaluate



Source: Langley *et al*. (1996)

What can we do

- Limited research directed toward specific interventions other than hand hygiene
- Many ICUs have developed ‘bundles’ or groups of practices that, together, have been shown to reduce VAPs

VAP Bundles

- CDC (2004) and American Thoracic Society (2005) have published guidelines
- Bundles components
  - Closed suction systems
    - Result in less physiologic disruption, loss of PEEP

Easier to use than open systems

Studies examining bacterial colonization show no difference in open vs closed systems (

VAP components

- Elevate the head of the bed- effective in adults, unknown in neonates
- Drain moisture from vent circuits frequently
- Minimize sedation and opioid use (with careful pain assessment)

VAP components

- Avoid gastric distension
- Use non-invasive ventilation strategies where possible
- Avoid medications that decrease gastric pH

Summary

- Lower respiratory tract infections are clearly associated with increased length of stay, increased hospital costs and long-term morbidity in LBW infants
- Tracking the incidence and examining practices to reduce RSV and VAPs will pay off in both the short and long-term

Summary

- A multidisciplinary team approach will bring the greatest success!