SOCIEDAD ARGENTINA DE PEDIATRÍA
38° CONGRESO ARGENTINO DE PEDIATRÍA

¿Como reducir la morbimortalidad en Bronquiolitis?

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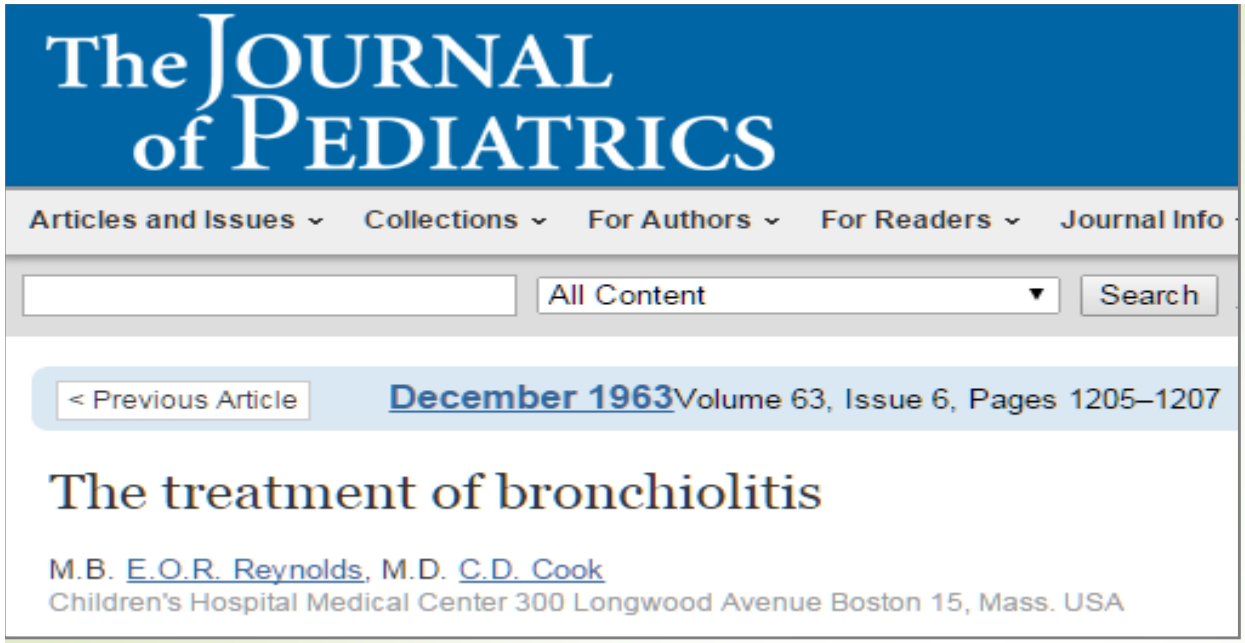
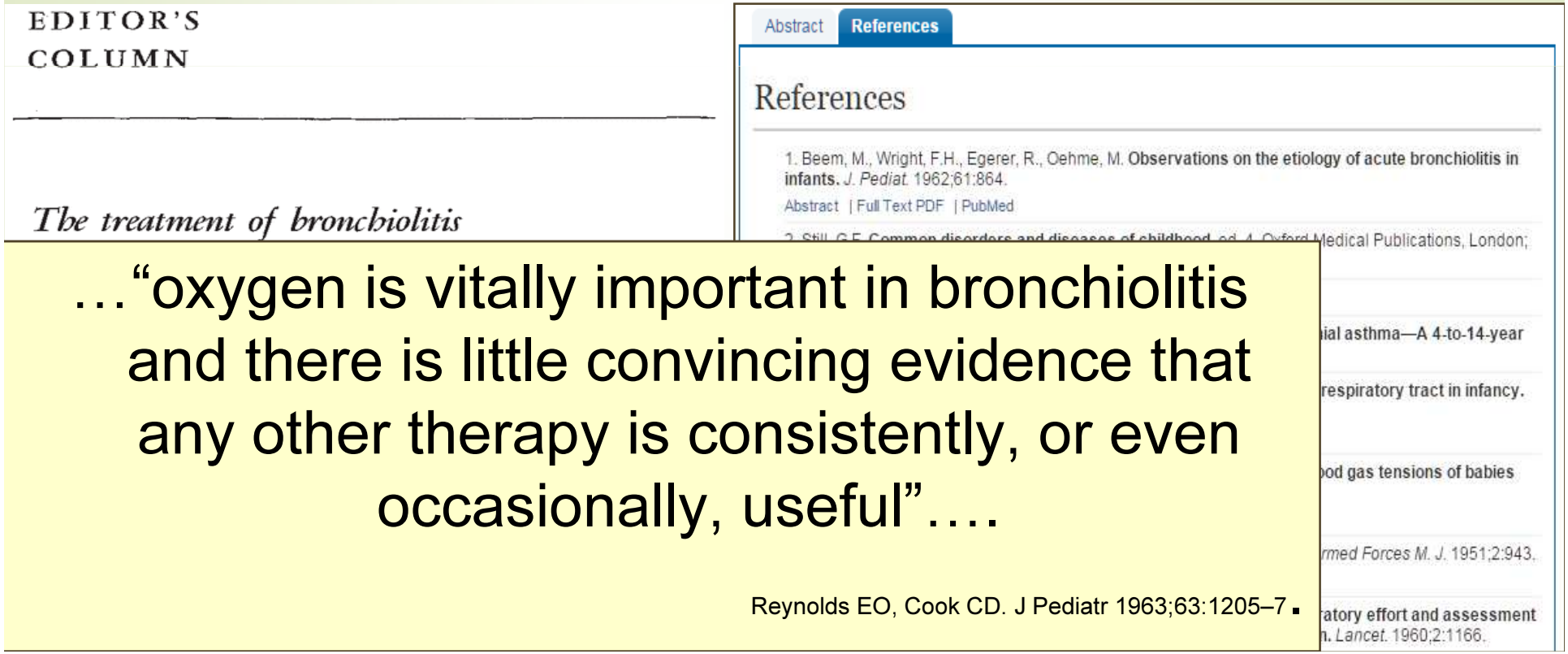


1963…



…"oxygen is vitally important in bronchiolitis and there is little convincing evidence that any other therapy is consistently, or even occasionally, useful"….

Reynolds EO, Cook CD. J Pediatr 1963;63:1205–7.

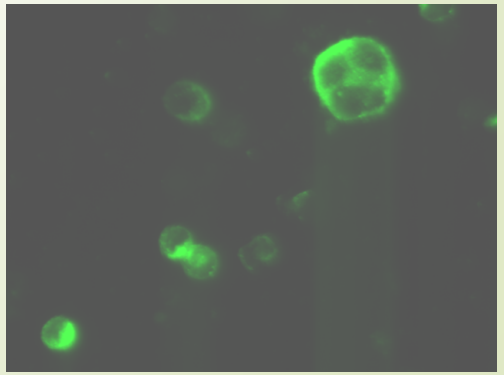
1963-2017…

1. Tratamiento SINTOMÁTICO o de sostén
   - Retiro de fármacos y estudios: "***minimal handling***"
   - Optimizar la **Administración de oxígeno**.

2. Tratamiento y prevención ESPECÍFICA para VRS. …..próximamente….nuevos antivirales/monoclonales/vacunas).

Bronquiolitis. Puntos de interés para el pediatra (1)

- Concepto de "*definición operativa*"
- Entidad clínica: **BRONQUIOLITIS TÍPICA**



2014

Øymar et al. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine 2014, 22:23
http://www.sjtrem.com/content/22/1/23

trauma, resuscitation & emergency medicine

REVIEW

Open Access

….las sibilancias (SBO) en el > 12 meses tendrían otros mecanismos fisiopatogénicos (respuesta al tratamiento)….

BRONQUIOLITIS TÍPICA:<12 MESES !!

Clinical definition

There is no unifor[m] definit[ion] bron[chiolitis], and [no] definite age limitation. In 2[006] a subcom[mit]tee of the American Academy of Pediat[rics] (AAP) toget[h]er with the European Respiratory Society (ERS) underlined that bronchiolitis is a clinical diagnosis, recognized as "a constellation of clinical symptoms and signs including a viral upper respiratory prodrome followed by increased respiratory effort and wheezing in children less than 2 years of age" [3]. In Europe, wheezing is regarded as a less important finding [2,6,7]. During recent years, several studies from Europe and the USA have included children only up to 12 months of age [2,8,9]. Children hospitalized for wheezing between 12 and 24 months of age may have a higher risk for having asthma, and with different pathophysiology

Bronquiolitis en menores de 2 años

Definición de caso: todo niño menor de 2 años, con primer (o segundo) episodio de sibilancias, asociado a evidencia clínica de infección viral con síntomas de obstrucción bronquial periférica, taquipnea, tiraje, o espiración prolongada, con o sin fiebre.

Sinónimos diagnósticos: BQL, BQ, lactante sibilante, Síndrome Bronquiolítico, Bronquiolitis, bronquitis espasmódica, Síndrome bronquiolar, broncoobstrucción, broncoespasmo (siempre en el grupo de edad de menores de 2 años).

Caso con confirmación etiológica: caso sospechoso con detección de antígenos virales, genoma viral o aislamiento a partir de muestras respiratorias.

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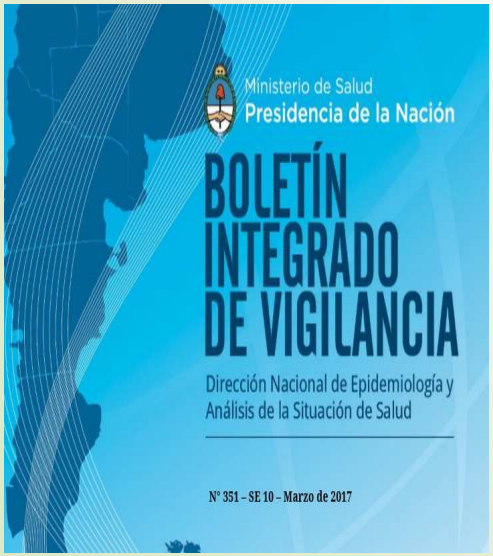
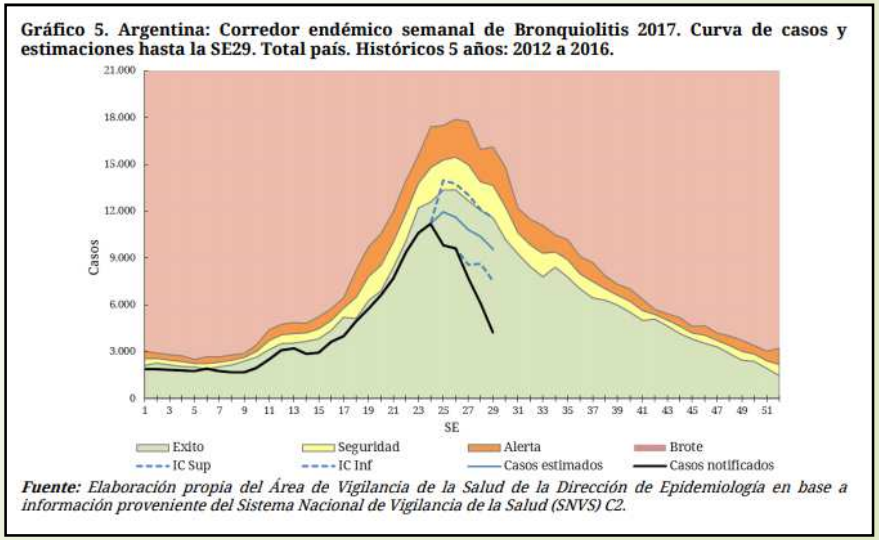
[4] Las definiciones de caso están contenidas en el Manual de normas y procedimientos de Vigilancia Epidemiológica y Control de Enfermedades de Notificación Obligatoria

Definición de caso: SBO/sindrome bronquiolar





Sociedad Argentina de Pediatría
Subcomisiones, Comités y Grupos de Trabajo

Por un niño sano en un mundo mejor

Recomendaciones para el manejo de las infecciones respiratorias agudas bajas en menores de 2 años

Recommendations for the management of acute lower respiratory infections in children under 2 years of age

Comité Nacional de Neumonología, Comité Nacional de Infectología y Comité de Medicina Interna.

- DEFINICIÓN OPERATIVA: 1°ó 2° episodio de sibilancias asociado a manifestaciones de infección viral en menor de 2 años:

  → **guía de manejo clínico (algoritmo)**

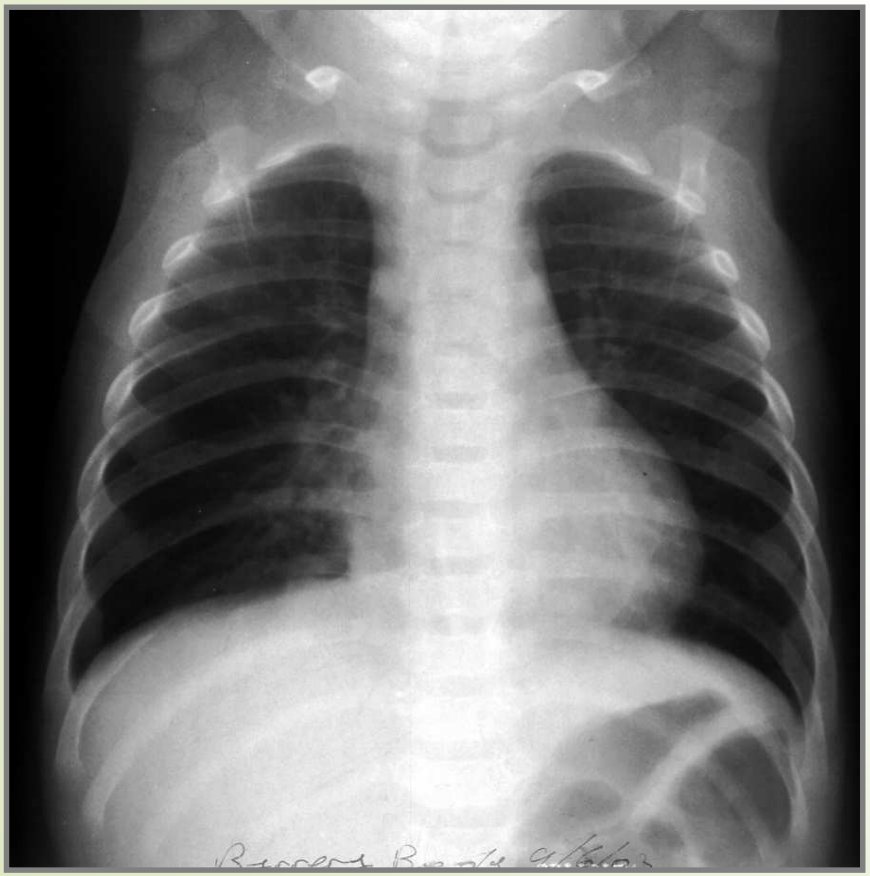
- 1° episodio en menor de 12 meses:

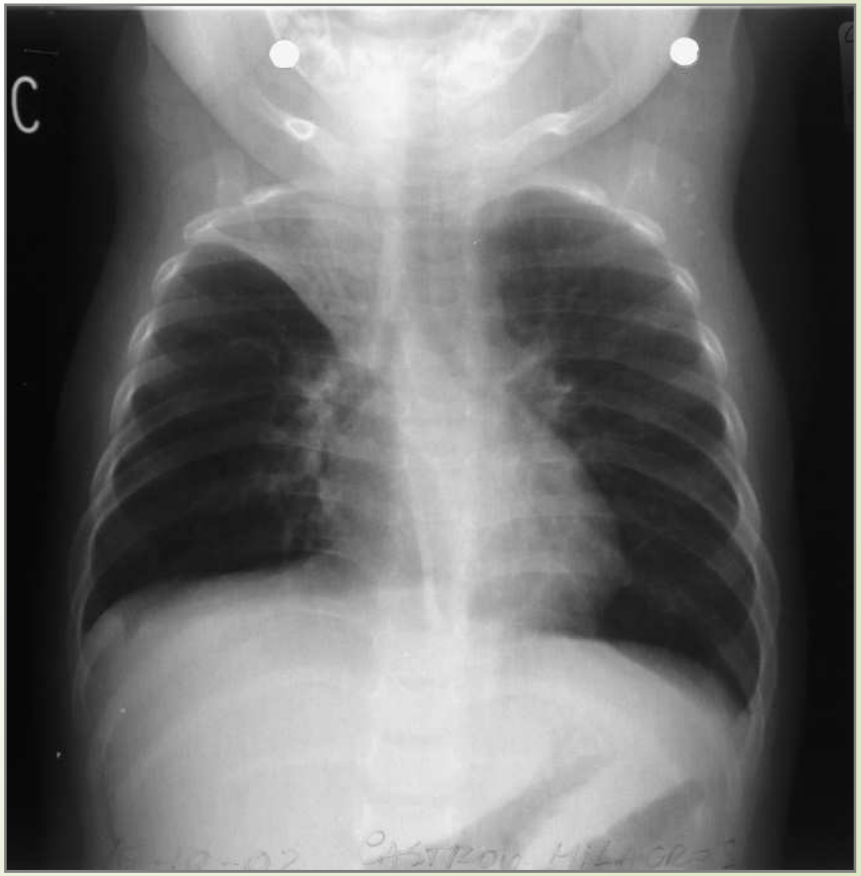
  → **BRONQUIOLITIS TÍPICA**

Comité Nacional de Neumonología, Comité Nacional de Infectología y Comité de Medicina Interna. Recomendaciones para el manejo de las infecciones respiratorias agudas bajas en menores de 2 años. Arch Argent Pediatr Supl. 2015

Bronquiolitis típica por VRS…

Clínica con patrón "obstructivo" y
Radiología normal o pulmones "negros"
(con o sin atelectasias)





Reynolds EO, Cook CD. The Treatment of Bronchiolitis. J Pediatr 1963;63:1205–7.

…"existen controversias en el manejo de la bronquiolitis"…

1. Un grupo con edema y detritus celulares…la mayoría!!!!!
2. Otro grupo con hiperreactividad bronquial (predisposición al asma)

…"hasta el presente es imposible ser dogmático en el tratamiento de la bronquiolitis (SUBGRUPOS)

Manejo de broquiolitis. Conferencia Fabio Midulla. ERS. Milán. Septiembre 2017.

Tratamiento de sostén

- Hidratación (líquidos endovenosos o SNG)
- Aspiración nasal (superficial y no frecuente)
- Oxígenotarapia (OAF)

Tratamiento médico

- Probar respuesta a B_2 adrenérgicos (lactantes mayores, historia de atopía, cuadro clínico)

Comparación entre guías Nacionales de Manejo de Bronquiolitis.

Referencia	SUPLEMENTO DE OXIGENO	ASPIRACIÓN	SALBUTAMOL/ B2-AGONISTA	ADRENALINA	CORTICOIDES
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CPS (CANADA), 2014	< 90%	SI, SUPERFICIAL	NO	S/RESPUESTA	NO
ITALIA, 2014	< 90-92%	SI, SUPERFICIAL	S/RESPUESTA	NO	NO
FRANCIA, 2013	< 92%	SI, SUPERFICIAL	S/RESPUESTA	NO	NO
ESPAÑA, 2010	< 92%	SI, SUPERFICIAL	S/RESPUESTA	NO	NO
AUSTRALIA, 2008	¿?	----------	S/RESPUESTA	NO	NO
SIGN (ESCOCIA), 2006	< 92%	SI	NO	NO	NO
Consenso SAP (ARGENTINA), 2015	< 92%	SI, SUPERFICIAL	S/RESPUESTA	NO	NO

Bronquiolitis. Puntos de interés para el pediatra (2)

- El pico de síntomas respiratorios ocurre entre los 3-5 días

- Rechazo a la alimentación (<50% del volumen diario) es el primer signo en aparecer y el primero en recuperarse (antes que la $SatO_2$).
  - **Es PREDICTOR DE HIPOXEMIA Y DE GRAVEDAD!!!**

Corrard *et al. BMC Pediatrics* 2013, **13**:6
http://www.biomedcentral.com/1471-2431/13/6

BMC Pediatrics

RESEARCH ARTICLE **Open Access**

Food intake during the previous 24 h as a percentage of usual intake: a marker of hypoxia in infants with bronchiolitis: an observational, prospective, multicenter study

François Corrard[1*], France de La Rocque[1], Elvira Martin[1], Claudie Wollner[1*], Annie Elbez[1], Marc Koskas[1,2], Alain Wollner[1], Michel Boucherat[1] and Robert Cohen[1,2,3]

Factores de riesgo hospitalización < 6meses-alimentación bierones:

- Menor de 2 meses
- 24 hs (Ingesta Alimentaria < 50%)
- Tiraje intercostal

factors (history of prematurity, chronic heart or lung disorders), breast-fed infants, and infants having previously been treated for bronchial disorders were excluded.
The 24h FI, subcostal, intercostal, supracostal retractions, nasal flaring, respiratory rate, pauses, cyanosis, rectal temperature and respiratory syncytial virus test results were noted. The highest stable value of transcutaneous oxygen saturation (SpO2) was recorded. Hypoxia was noted if SpO2 was below 95% and verified.

Results: 24h FI ≥ 50% was associated with a 96% likelihood of SpO2 ≥ 95% [95% CI, 91–99]. In univariate analysis, 24h FI < 50% had the highest odds ratio (13.8) for SpO2 < 95%, compared to other 24h FI values and other clinical signs, as well as providing one of the best compromises between specificity (90%) and sensitivity (60%) for identifying infants with hypoxia. In multivariate analysis with adjustment for age, SpO2 < 95% was related to the presence of intercostal retractions (OR = 9.1 [95% CI, 2.4-33.8%]) and 24h FI < 50% (OR = 10.9 [95% CI, 3.0-39.1%]). Hospitalization (17 infants) was strongly related to younger age, 24h FI and intercostal retractions.

Conclusion: In practice, the measure of 24 h FI may be useful in identifying hypoxia and deserves further study.

Keywords: Bronchiolitis, Hypoxia, Feeding, Infant, Out-patient, Intercostal retraction, Subcostal retraction, Supracostal retractions, Respiratory syncytial virus

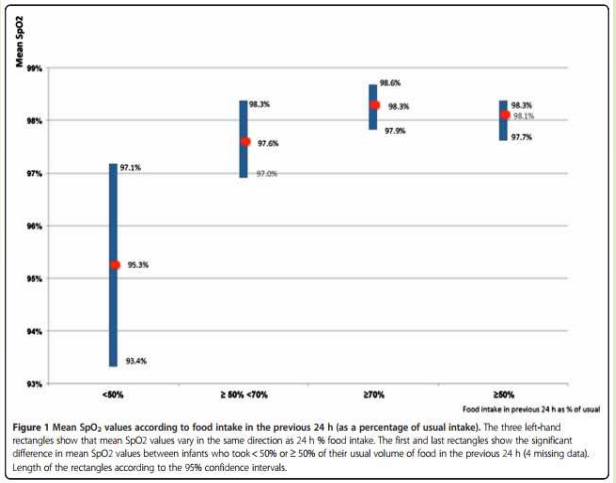

Figure 1 Mean SpO_2 values according to food intake in the previous 24 h (as a percentage of usual intake). The three left-hand rectangles show that mean SpO2 values vary in the same direction as 24 h % food intake. The first and last rectangles show the significant difference in mean SpO2 values between infants who took < 50% or ≥ 50% of their usual volume of food in the previous 24 h (4 missing data). Length of the rectangles according to the 95% confidence intervals.

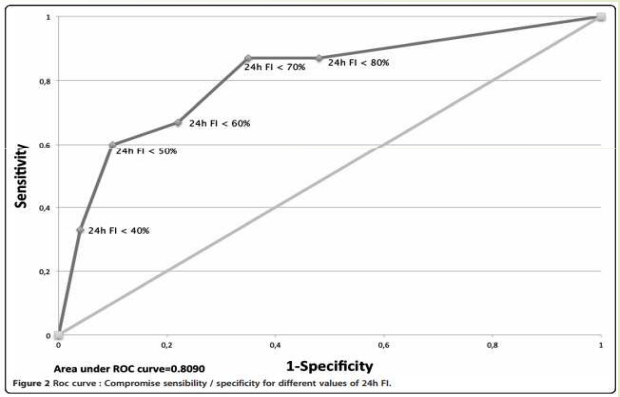

Figure 2 Roc curve : Compromise sensibility / specificity for different values of 24h FI.

Table 2 Factors associated with hospitalization for bronchiolitis

	Hospitalized (n = 17)		Non hospitalized (n = 154)		
	n	%	n	%	p
Age < 2 months	13	76%	7	5%	< 0.001
24h FI < 50%	9	53%	15/150 (*)	10%	< 0.001
Intercostal retraction	9	53%	33/151 (*)	22%	< 0.005
1 or more of these 3 factors	14	82%	49/147 (*)	33%	< 0.001
SpO2 < 95%	11	65%	4	3%	< 0.001

* missing data.

Corrard et al. BMC Pediatrics 2013, 13:6
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24 hs Ingesta alimentaria <50% tiene sensibilidad 60% y especificidad 90% para Sat O2 <95%. Tiene más alta OR que otros signos clinicos (13.8)

Conclusion

We studied the semiological value of a clinical sign for assessing the severity of bronchiolitis in previously healthy, mainly bottle-fed, full-term infants presenting to a pediatrician's office.

Food intake during the previous 24 hours, as a percentage of usual intake, was predictive of oxygenation status (hypoxia or normoxia), and is easy for parents to memorize and measure. Apart from in very young infants (less than 6 weeks old), this parameter could serve as an initial screening tool and to monitor bronchiolitic child in the home.

If an infant has ingested at least half the usual amount of food during the previous 24 hours, hypoxia is unlikely; in contrast, if food intake falls below half the usual amount, medical attention is required.

Table 1 Sensitivity, specificity, PPV, NPV, LR$^+$, LR$^-$ and odds ratios of clinical signs of hypoxia (SpO2 < 95%) in infants with bronchiolitis

	Sensitivity % [95% IC]	Specificity % [95% IC]	PPV % [95% IC]	NPV % [95% IC]	LR$^+$ n [95% IC]	LR$^-$ n [95% IC]	Odds ratio n [95% IC]
Suprasternal retraction	50 [21–79]	87 [81–92]	24 [9–45]	96 [91–98]	4 [2-8]	0,6 [0.3 - 1]	6.9 [2.0 - 23.7]
Intercostal retraction	73 [45–92]	80 [73–86]	26 [14–42]	97 [92–99]	3.6 [2-6]	0.3 [0.1 - 78]	10.8 [3.2 - 36.3]
Subcostal retraction	47 [21–73]	72 [64–79]	14 [6–27]	93 [87–97]	1.7 [0.9 - 3]	0.7 [0,5 – 1.2]	2.3 [0.8 - 6.6]
Polypnea (≥ 50/min)	87 [60–98]	62 [53–70]	19 [10–30]	98 [93–100]	2.3 [1.7 - 3]	0.2 [0.06 – 0.8]	10.5 [2.3 - 48.2]
24h FI < 70%	87 [60–98]	65 [56–72]	19 [11–31]	98 [93–100]	2.4 [1.8 – 3.2]	0.2 [0.06 – 0.8]	11.8 [2.6 - 54.2]
24h FI < 60%	67 [38–88]	78 [70–84]	23 [11 \- 38]	96 [91–99]	3 [1.9 – 4.7]	0.4 [0.2 – 0.8]	6.9 [2.2 - 21.7]
24h FI < 50%	**60** [32–84]	**90** [84–94]	**38** [19–59]	**96** [91–99]	**6.1** [3-11]	**0.4** [0.2 – 0.8]	**13.8** [4.3 - 44.1]
24h FI < 40%	33 [12–62]	96 [92–99]	46 [17–77]	94 [89–97]	8.5 [2.9 - 24]	0.7 [0.5 – 0.99]	12.2 [3.2 - 47.2]

24h FI food intake in previous 24h as a % of usual intake; *PPV* positive predictive value ; *NPV* negative predictive value ; *LR$^+$* positive likelihood ratio ; *LR$^-$* negative likelihood ratio; *[95% CI]* 95% confidence interval.

Criterios de hospitalización en Broquiolitis. Conferencia Fabio Midulla. ERS. Milán, septiembre 2017.

- Sat O2 <92% respirando aire ambiental
- Sat O2 entre 92%-94% de acuerdo a:
  - Valoración clínica (trabajo respiratorio)
  - **Fase de la enfermedad (días de inicio de síntomas)**
  - Condición social
- **Ingesta inadecuada (50% del volumen habitual)**
- Dificultad respiratoria grave (tiraje)
- Apnea (documentada o referida)
- Factores de riesgo de gravedad en bronquiolitis

Criterios de alta Hospitalaria Conferencia Fabio Midulla. ERS. Milán. Sep.2017.

- Clíicamente estable
- Adecuada ingestión de líquidos por vía oral.
- Sat O2 >94% mantenido durante 4 horas (incluidas horas de sueño)

Por un niño sano en un mundo mejor

Recomendaciones para el manejo de las infecciones respiratorias agudas bajas en menores de 2 años

Recommendations for the management of acute lower respiratory infections in children under 2 years of age

Comité Nacional de Neumonología, Comité Nacional de Infectología y Comité de Medicina Interna.

Mensaje hacia la comunidad

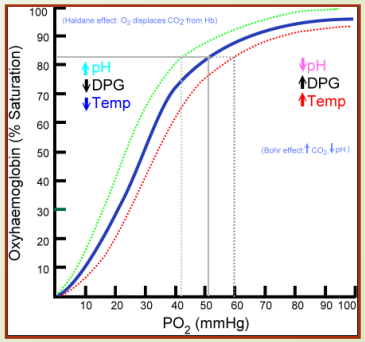
Tabla 14- Contenidos del mensaje a la comunidad para prevenir morbimortalidad por IRAB

Signos de alarma	Taquipnea*, tos, tiraje, fiebre, quejido, dificultad para alimentarse, somnolencia excesiva
Conductas	Bajar fiebre, ofrecer líquidos (no suspender lactancia), no dar medicamentos por propia cuenta, consultar inmediatamente
Acciones preventivas	Consulta precoz, control de la contaminación domiciliaria, control periódico de salud, lactancia materna, inmunizaciones, control del embarazo

*FR >60 en menor de 2 meses,>50 entre 2 y 11 meses y >40 en mayores de 12 meses

Bronquiolitis. Puntos de interés para el pediatra (3)

- Nivel de Saturometría: **hipoxemia permisiva?**
- Diagnóstico de gravedad de la dificultad respiratoria
  - **SatO_2 Vs. Escalas clínicas?**



American Academy of Pediatrics
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2014

Guidance for the Clinician in Rendering Pediatric Care

CLINICAL PRACTICE GUIDELINE

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

abstract

FREE

This guideline is a revision of the clinical practice guideline, "Diagnosis and Management of Bronchiolitis," published by the American Academy of Pediatrics in 2006. The guideline applies to children from 1 through 23 months of age. Other exclusions are noted. Each key action state-

Shawn L. Ralston, MD, FAAP, Allan S. Lieberthal, MD, FAAP, H. Cody Meissner, MD, FAAP, Brian K. Alverson, MD, FAAP, Jill E. Baley, MD, FAAP, Anne M. Gadomski, MD, MPH, FAAP, David W. Johnson, MD, FAAP, Michael J. Light, MD, FAAP, Nizar F. Maraqa, MD, FAAP, Eneida A. Mendonca, MD, PhD, FAAP, FACMI, Kieran J. Phelan, MD, MSc, Joseph J. Zorc, MD, MSCE, FAAP, Danette Stanko-Lopp, MA, MPH, Mark A. Brown, MD, Jan Nathanson, MD, FAAP, Elizabeth

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www.pediatrics.org/cgi/doi/10.1542/peds.2014-2742

. PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

"hipoxemia permisiva" con $SatO_2$ entre 90 -94% !!!!!

Administrar oxígeno
Con Sat O_2 <90%

TABLE 1 Guideline Recommendations

1. Nasal suction via bulb or neosucker is recommended to clear the upper airway.
2. Deep suction (beyond the nasopharynx) is not recommended and requires a special order.
3. Oxygen is recommended for hypoxia, defined as a persistent oxygen saturation (SpO2) <90%.
4. SpO2 spot checks are recommended to monitor for hypoxia.
5. Continuous SpO2 monitoring is suggested for monitoring patients on oxygen.
6. Continuous cardiopulmonary monitoring (CAM) is recommended for patients at high risk of apnea. It is recommended that CAM be discontinued if there are no apneas for 24 h.
7. Bronchodilators should not be used routinely in the management of bronchiolitis. A single trial of inhaled epinephrine or albuterol for respiratory distress may be considered, but only if h/o asthma, atopy, or allergy. It is recommended to discontinue inhalation therapy if there is no clinical response.
8. Steroids, antibiotics, nasal decongestants, and chest physiotherapy are not recommended.

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Comparación entre guías Nacionales de Manejo de Bronquiolitis.

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- Dificultad respiratoria grave (tiraje)
- Apnea (documentada o referida)
- Factores de riesgo de gravedad en bronquiolitis

Effect of Oximetry on Hospitalization in Bronchiolitis

A Randomized Clinical Trial

Suzanne Schuh, MD, FRCPC[1,2]; Stephen Freedman, MD, FRCPC[3]; Allan Coates, MD[2]; et al

≫ Author Affiliations | Article Information

JAMA. 2014;312(7):712-718. doi:10.1001/jama.2014.8637

213 lactantes < 12 meses con bronquiolitis leve/moderada fueron ramdomizados a ser manejados con oxímetros alterados (3 puntos más alto) Vs lecturas verdaderas. Los pacientes con lecturas articicialmente elevadas recibieron menos terapia en la emergencia y se hospitalizaron menos que aquellos con lecturas verdaderas.

values displayed.

Design, Setting, and Participants Randomized, double-blind, parallel-group trial conducted from 2008 to 2013 in a tertiary-care pediatric emergency department in Toronto, Ontario, Canada. Participants were 213 otherwise healthy infants aged 4

Triage saturation <94%, No. (%)	11 (10)	17 (16)
Experimental oxygen saturation, %		
Mean (SD)[a,b]	96.0 (2.8)	97.6 (2.4)
Median (IQR) [total range]	96 (95-98) [86-100]	98 (96-100) [90-100]
Initial respiratory rate per min, mean (SD)	53.0 (11.6)	50.0 (15.0)
Initial heart rate per min, mean (SD)	152 (18)	151 (22)
Initial RDAI, mean (SD)[c]	8.0 (2.9)	8.3 (2.9)
Participating emergency department physicians, No.	13	12

Abbreviations: IQR, interquartile range; RDAI, Respiratory Disease Assessment Instrument.
[a] Saturation values provided to emergency department physician.
[b] One hundred percent had displayed oximetry values of 100%.

Conclusiones: la oximetría no debería ser utilizada como único factor de evaluación en el manejo de lactantes con bronquiolitis.

with altered saturation values displayed that have been increased 3 percentage points above true values.

Conclusions

Among infants presenting to a pediatric emergency department with mild to moderate bronchiolitis, those with an artificially elevated pulse oximetry reading were less likely to be hospitalized within 72 hours or receive active hospital care for more than 6 hours than those with unaltered oximetry readings. This suggests that oxygen saturation should not be the only factor in the decision to admit or discharge and may need to be reevaluated.

Outcome	True (n = 108)	Altered (n = 105)	Difference, % (95% CI)	P Value
Primary				
Hospitalized within 72 h, No. (%)	44 (41)	26 (25)	16 (0.04 to 0.28)	.005
Secondary				
Length of emergency department stay, h				
Mean (SD)	5.2 (5.6)	5.0 (2.4)	0.2 (-0.13 to 0.12)	.82
Median (IQR)	4.0 (3.0-5.6)	4.1 (2.9-5.5)		.76
Supplemental oxygen in emergency department, No. (%)	4 (3.7)	4 (3.8)	-0.1 (-0.05 to 0.05)	.97
Agree/strongly agree with discharge home, No. (%)				
At initial assessment	29 (27)	28 (27)	0 (-0.16 to 0.15)	.94
At 60 min	46 (43)	58 (55)	8 (-0.25 to 0.02)	.08
At 120 min	39/71 (55)	29/64 (45)	10 (-0.26 to 0.07)	.26
Unscheduled visits within 72 h, No. (%)	23 (21)	15 (14)	7 (-0.3 to 0.17)	.18
Exploratory, No. (%)				
Delayed hospitalizations within 72 h	8 (7)	7 (7)	0 (-0.06 to 0.08)	.99
Treatment in hospital >6 h	37 (34)	20 (19)	15 (0.04 to 0.27)	.01
Hospitalization at index visit	26 (24)	16 (15)	9 (-0.01 to 0.2)	.10

Prev document - Next Document

- DOI: 10.1016/j.aller.2017.01.012

Original Article

A comparison of two clinical scores for bronchiolitis. A multicentre and prospective study conducted in hospitalised infants

C. Rivas-Juesas [a], J.M. Rius Peris [b], A.L. García [a], A.A. Madramany [c], M.G. Peris [d], L.V. Álvarez [e], J. Primo [a]

2017

- Ninguna de las escalas fue cosiderada óptima para determinar severidad clínica en bronquiollitis.
- Los puntos de corte ajustados mejoraron la habilidad para clasificarlos pero son necesarios nuevos estudios para validadarlos con los nuevos puntajes

Method

We designed a study to compare two scales of bronchiolitis (ESBA and Wood Downes Ferres) and determine which of them better predicts the severity. A multicentre prospective study with patients <12 months with acute bronchiolitis was conducted. Each patient was assessed with the two scales when admission was decided. We created a new variable "severe condition" to determine whether one scale afforded better discrimination of severity. A diagnostic test analysis of sensitivity and specificity was made, with a comparison of the AUC. Based on the optimum cut-off points of the ROC curves for classifying bronchiolitis as severe we calculated new Se, Sp, LR+ and LR− for each scale in our sample.

Results

201 patients were included, 66.7% males and median age 2.3 months (IQR = 1.3–4.4). Thirteen patients suffered bronchiolitis considered to be severe, according to the variable severe condition. ESBA showed a Se = 3.6%, Sp = 98.1%, and WDF showed Se = 46.2% and Sp = 91.5%.

The difference between the two AUC for each scale was 0.02 (95%CI: 0.01–0.15), $p = 0.72$. With new cut-off points we could increase Se and Sp for ESBA: Se = 84.6%, Sp = 78.7%, and WDF showed Se = 92.3% and Sp = 54.8%; with higher LR.

Conclusions

None of the scales studied was considered optimum for assessing our patients. With new cut-off points, the scales increased the ability to classify severe infants. New validation studies are needed to prove these new cut-off points.

Validación de una herramienta de predicción clínica simple para la evaluación de la gravedad en niños con síndrome bronquial obstructivo

Validation of a clinical prediction tool to evaluate severity in children with wheezing

Dra. Alejandra Coarasa[a], Dra. Hilda Giugno[b], Dr. Adrián C
Dr. Fernando Torres[a], Dra. Verónica Giubergia[b], Dra. Mar
Dr. Pablo Durán[a], Dra. Hebe González Pena[b] y Dr. Fernan

Conclusión. La escala argentina fue suficientemente sensible para predecir hipoxemia (SaO_2 ≤91) en un puntaje ≥5, pero no mostró especificidad que permita una correcta discriminación por encima de este punto. Esta escala sólo permite identificar niños que no se beneficiarían con el uso de O_2.

TABLA 1. *Escala de dificultad respiratoria, I*

Puntaje	Frecuencia cardíaca	Frecuencia respiratoria		Sibilancias	Retracción costal
		< 6 m	> 6 m		
0	Menos de 120	< 40	< 30	Ausentes	No retracción costal
1	120-140	40-55	30-45	Fin de la espiración	Leve intercostal
2	140-160	55-70	45-60	Inspiración y espiración	Tiraje generalizado
3	Más de 160	> 70	> 60	Audible sin estetoscopio	Tiraje y aleteo nasal

TABLA 2. *Escala de dificultad respiratoria, Ministerio de Salud de Chile (EDRCH)*

Puntaje	Frecuencia respiratoria		Sibilancias	Cianosis	Retracción costal
	< 6 m	> 6 m			
0	≤ 40	≤ 30	Ausentes	No	No retracción costal
1	41-55	31-45	Fin de la espiración	Perioral con llanto	Leve intercostal
2	56-70	46-60	Inspiración y espiración	Perioral en reposo	Tiraje generalizado
3	> 70	> 60	Audible sin estetoscopio	Generalizada en reposo	Tiraje y aleteo nasal

Bronquiolitis. Puntos de interés para el pediatra (4)

- Modalidades de administración de Oxígeno (hospitalizado)

Oxigenoterapia de alto flujo (OAF)

Oxigenoterapia de alto flujo (OAF)

- Consiste en aportar un flujo de oxígeno (solo, o mezclado con aire) **superior al flujo pico inspiratorio** del paciente, a través de una cánula nasal.
- El gas se **humidifica** (95-100%) y se **calienta** hasta un valor cercano a la temperatura corporal (34°-37°C).

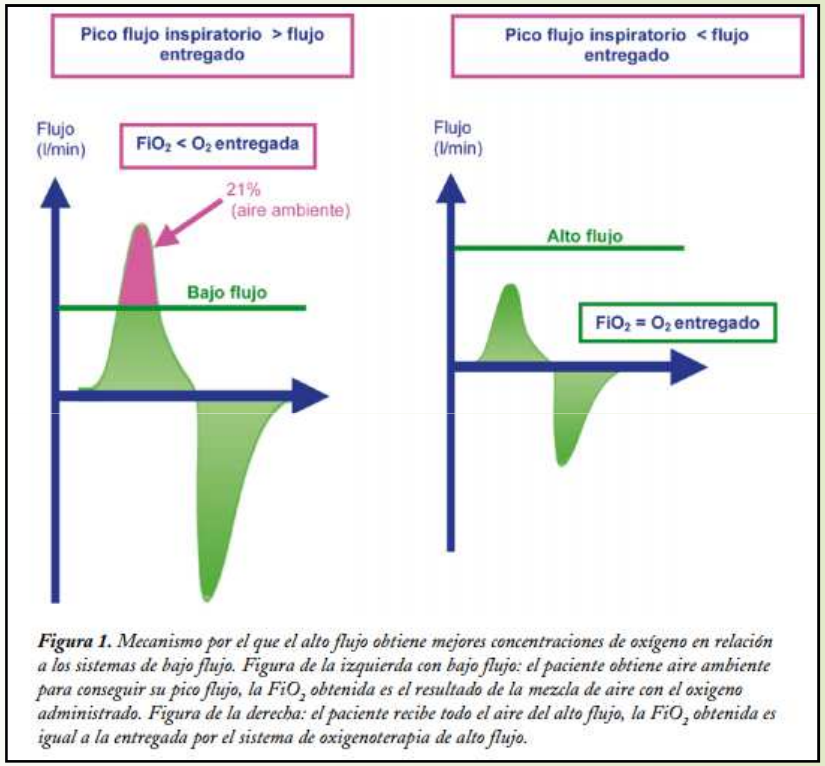

Figura 1. Mecanismo por el que el alto flujo obtiene mejores concentraciones de oxígeno en relación a los sistemas de bajo flujo. Figura de la izquierda con bajo flujo: el paciente obtiene aire ambiente para conseguir su pico flujo, la FiO_2 obtenida es el resultado de la mezcla de aire con el oxigeno administrado. Figura de la derecha: el paciente recibe todo el aire del alto flujo, la FiO_2 obtenida es igual a la entregada por el sistema de oxigenoterapia de alto flujo.

An Pediatr Contin. 2014;12(1):25-9

OAF. Mecaismo de acción

- Lavado del espacio muerto nasofaríngeo, disminuye la resistencia inspiratoria relacionada con el paso de aire.
- Mejores fracciones de gases alveolares, **facilitando la oxigenación**
- El aire calentado y humidificado mejora el **movimiento ciliar.**
- Reduce el **trabajo metabólico** necesario para calentar y humidificar el aire externo
- Aporta cierto grado de **presión de distensión** para el **reclutamiento alveolar.**

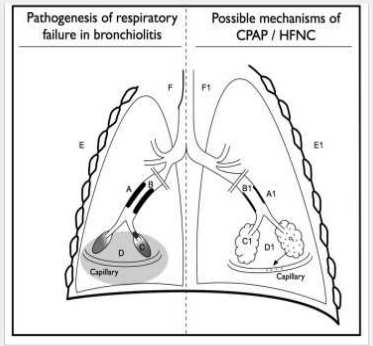

Figure 1

Mechanisms of respiratoryfailure in bronchiolitis andpossible actions of CPAP and HFNC. Intraluminal mucus and debris cause airway obstruction (A) and increased resistance (B). Warmed, humidified oxygen can reduce intraluminal mucus (A1), and positive end-expiratory pressure (PEEP) from CPAP (and possibly HFNC) might help to overcome resistance (B1). Intraluminal obstruction causes atelectasis (C). Increased PEEP prevents atelectasis (C1). Increased interstitial edema limits oxygen transport to blood, contributing to hypoxemic respiratory failure (D). CPAP and HFNC are efficient methods of delivering high oxygen concentrations to the lower airways (D1), which may overcome this. All these mechanisms cause respiratory muscle fatigue (E). Overcoming airway resistance (A1 and B1), reducing atelectasis (C1), and increasing oxygen delivery to the blood (D1) can help to reduce this respiratory muscle fatigue (E1). Although primarily a small airways disease, increased respiratory efforts can cause upper airway collapse in infants (F), and PEEP may help to reduce this (F1). HFNC = high-flow nasal cannula.

Tabla 3. *Flujo de gas según peso*

Peso (kg)	Flujo (lpm)
3-4	5
4-7	6
8-10	7-8
11-14	9-10
15-20	10-15
21-25	15-20
> 30	≥ 25

Antcedentes…OAF

- Bressan S, Balzani M, Krauss B, Pettenazzo A, Zanconato S, Baraldi E. Highflow nasal cannula oxygen for bronchiolitis in a pediatric ward: a pilot study. Eur J Pediatr. **2013;**172(12):1649–56.
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2014

High-flow nasal cannula therapy for infants with bronchiolitis (Review)

Beggs S, Wong ZH, Kaul S, Ogden KJ, Walters JAE

[Intervention Review]

High-flow nasal cannula therapy for infants with bronchiolitis

Sean Beggs[1,2], Zee Hame Wong[3], Sheena Kaul[4], Kathryn J Ogden[3], Julia AE Walters[2]

NO hay evidencia suficiente para determinar la efectividad de la OAF para tratar lactantes con bronquiolitis.

Los estudios incluidos proveen evidencia de que la terapia con OAF es factible y bien tolerada.

Se requieren mas estudios…

Authors' conclusions

There is insufficient evidence to determine the effectiveness of HFNC therapy for treating infants with bronchiolitis. The current evidence in this review is of low quality, from one small study with uncertainty about the estimates of effect and an unclear risk of performance and detection bias. The included study provides some indication that HFNC therapy is feasible and well tolerated. Further research is required to determine the role of HFNC in the management of bronchiolitis in infants. The results of the ongoing studies identified will contribute to the evidence in future updates of this review.

Franklin *et al. BMC Pediatrics* (2015) 15:183
DOI 10.1186/s12887-015-0501-x

BMC Pediatrics

STUDY PROTOCOL Open Access

Early high flow nasal cannula therapy in bronchiolitis, a prospective randomised control trial (protocol): A Paediatric Acute Respiratory Intervention Study (PARIS)

2015

Donna Franklin[1,2,3,21*], Stuart Dalziel[4,5,14], Luregn J. Schlapbach[1,2,3,6], Franz E. Babl[7,8,9,18], Ed Oakley[7,8,9,18], Simon S. Craig[8,10,11,18], Jeremy S. Furyk[12,13,18], Jocelyn Neutze[14,15,18], Kam Sinn[16,17,18], Jennifer A. Whitty[19], Kristen Gibbons[1,3], John Fraser[2,20], Andreas Schibler[1,2,3] and on behalf of PARIS and PREDICT

Background: Bronchiolitis imposes the largest health care burden on non-elective paediatric hospital admissions worldwide, with up to 15 % of cases requiring admission to intensive care. A number of previous studies have failed to show benefit of pharmaceutical treatment in respect to length of stay, reduction in PICU admission rates or intubation frequency. The early use of non-invasive respiratory support devices in less intensive scenarios to facilitate earlier respiratory support may have an impact on outcome by avoiding progression of the disease process. High Flow Nasal Cannula (HFNC) therapy has emerged as a new method to provide humidified air flow to deliver a non-invasive form of positive pressure support with titratable oxygen fraction. There is a lack of high-grade evidence on use of HFNC therapy in bronchiolitis.

Methods/Design: Prospective multi-centre randomised trial comparing standard treatment (standard subnasal oxygen) and High Flow Nasal Cannula therapy in infants with bronchiolitis admitted to 17 hospitals emergency departments and wards in Australia and New Zealand, including 12 non-tertiary regional/metropolitan and 5 tertiary

Discussion: This large multicenter randomised trial will allow the definitive assessment of the efficacy of HFNC therapy as compared to standard subnasal oxygen in the treatment of bronchiolitis.

Trial registration: The trial is registered with the Australian and New Zealand Clinical Trials Registry ACTRN12613000388718 (registered on 10 April 2013).

Trial registration: The trial is registered with the Australian and New Zealand Clinical Trials Registry ACTRN12613000388718 (registered on 10 April 2013).

El informe preliminar presentando en la PAS-SPR Annual Meeting 2017.San Francisco, USA, mayo 2017:

Background: Bronchiolitis represents the most common cause for nonelective hospital admission in infants. Nasal High Flow (NHF) therapy has achieved high uptake of use in infants with bronchiolitis despite limited high-quality evidence. The efficacy and safety of NHF therapy in infants with bronchiolitis outside intensive care remains unknown.

Objective: To demonstrate if the early use of NHF therapy reduces the need to escalate the level of care in infants with bronchiolitis.

Design/Methods: Open-labelled randomized controlled trial using delayed consent, occurring in 17 emergency departments and general pediatric wards of tertiary pediatric and secondary hospitals in Australia and New Zealand, comparing NHF therapy (2L/kg/min) vs. standard oxygen therapy (SOT) via nasal cannula (0-2L/min) in infants <12 months admitted with bronchiolitis and hypoxia (SpO2 <92%/94%, threshold dependent on hospital guideline).

- Primary outcome was treatment failure during hospital admission requiring escalation of respiratory support and/or intensive care admission. Escalation of therapy occurred if ?3 out of 4 criteria were met: persistent tachycardia, tachypnea, hypoxemia, and/or hospital early warning tool activated.
- Secondary outcomes were length of oxygen therapy (LoO2T) and serious adverse events.

Results: 1.476 patients were randomized over 3 years. Baseline characteristics were similar between groups. Mean (SD) age in SOT was 6.1 (3.4) months and in NHF therapy 5.8 (3.5) months. Escalation of care was required in 89/745 (12%) of infants on NHF therapy vs. 167/731 (23%) of infants on SOT (risk difference 10.9%, 95% CI 7.1-14.7, p<0.001) (Table 2). Median LoO2T for NHF therapy was 1.24 (IQR 1.81) days, and SOT was 1.23 (IQR 1.82) (p=0.21). Other than one (0.1%) pneumothorax in each study arm there were no serious adverse events.

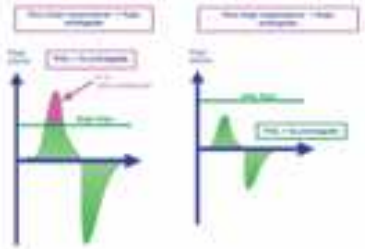
Conclusions: In infants with bronchiolitis with an oxygen requirement NHF therapy had a significantly lower treatment failure rate than SOT with a number to treat is 9. NHF therapy appears safe in a large data set when delivered to infants with bronchiolitis in the emergency department and general paediatric ward.

1018

"OXIGENO DE ALTO FLUJO EN INFECCIONES RESPIRATORIAS AGUDAS BAJAS". EXPERIENCIA PRELIMINAR EN UN DEPARTAMENTO DE EMERGENCIAS.

Autores: Greca L., Quiroga V. Y., García N., Morra L., Miretti M., De Uriarte H. (loregreca@yahoo.com)

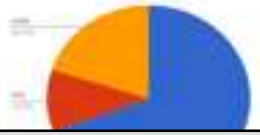
Introducción: Las infecciones respiratorias agudas bajas (IRAB), representan una importante causa de morbimortalidad en menores de dos años. La mayoría son de etiología viral y el oxigeno (O_2) es la única terapia de eficacia comprobada. La Oxigenoterapia de Alto Flujo (OAF) a través de cánula nasal, aporta flujos de oxigeno, provistos de humedad y calor, por encima del pico flujo inspiratorio del paciente, otorgando FIO2 y flujos O_2 altos que mejoran el patrón respiratorio. Existe escasos estudios en la actualidad, sin embargo OAF esta siendo ampliamente implementado a nivel mundial por su fácil aplicación y sus buenos resultados.



Objetivo: Presentar la primera experiencia en la implementación de OAF administrado precozmente en el Departamento de Emergencias, a menores de dos años con IRAB en el Hospital de Niños de la Santísima Trinidad de Córdoba (HNC).

Relato de la propuesta: Se propuso su utilización ante el Ministerio de Salud de la Provincia de Córdoba. Se formuló la "***Guía Clínica para el uso de Oxigenoterapia de Alto Flujo en los Hospitales Públicos de Pediatría en la Provincia de Córdoba***", que protocoliza indicaciones, contraindicaciones, equipamiento, técnicas, monitoreo, manejo y cuidados médicos y de enfermería, fracasos, destete y complicaciones. El proyecto fue aprobado y socializado en las Jornadas sobre IRAB 2017, organizadas por la Dirección de Maternidad e Infancia de la provincia. Se inició la capacitación al equipo de salud de nuestro hospital (abril-mayo): enfermería, médicos de planta y pediatras en formación. Se inicia el 31 de mayo 2017 en la sala anexa a la Emergencia, se contó con 12 dispositivos y se colocó pacientes con IRAB,< 24 meses, con Tal > 9 ó 7-8 mantenido, ciapneas o saturación < 90% con máscara. Se excluyeron aquellos con hipercapnia. Se registró: edad, sexo, procedencia, patrón radiológico, escala de TAL modificada, gasometría y respuesta a OAF.

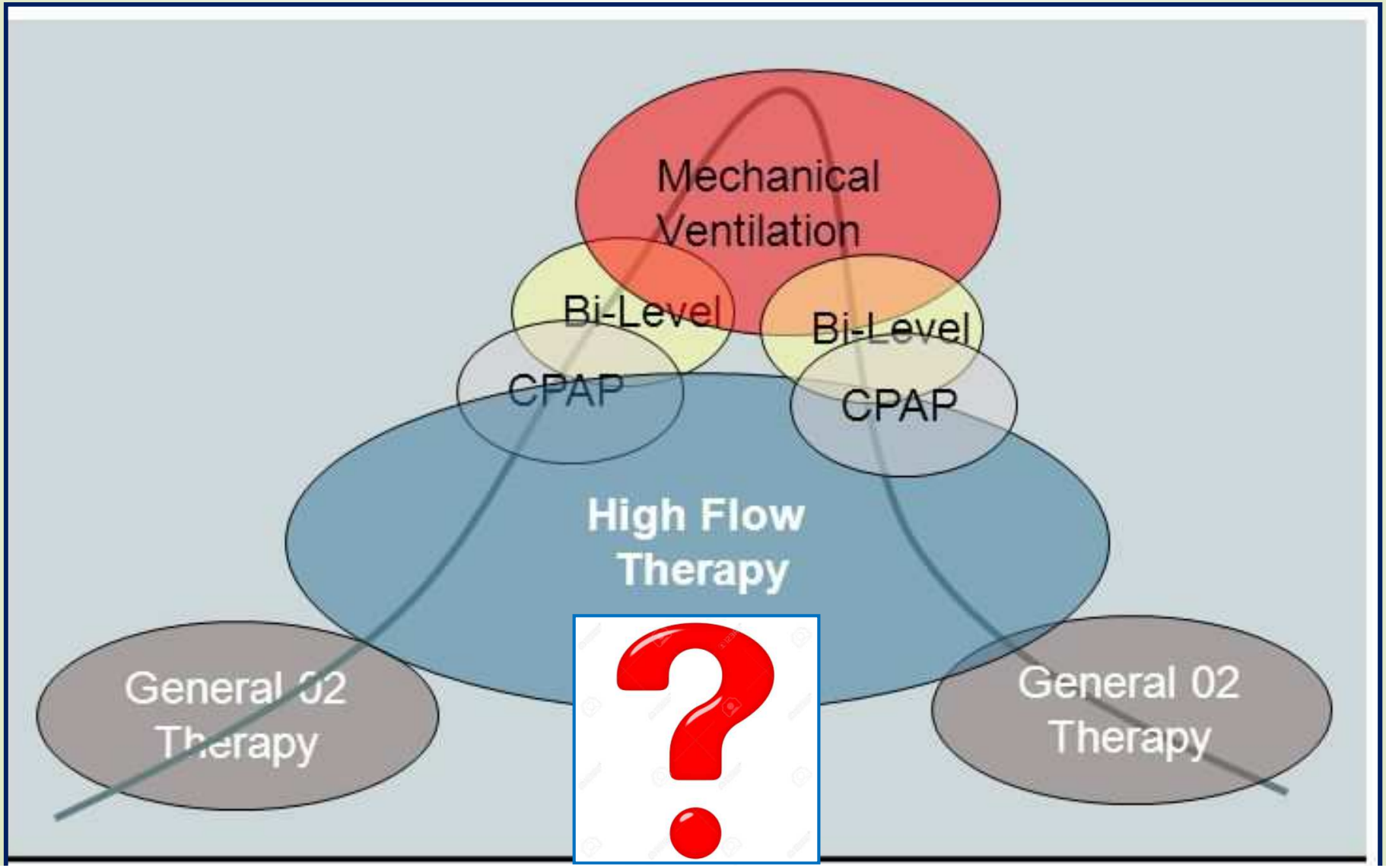
Resultados: Se indicó OAF a 65 pacientes. Media de edad 7.8 meses(1-24) 54% femeninos; patrón clínico/radiológico 49/65 (75.5%) obstructivo (bronquiolitis/obstructivo recurrente), 12/65 (18.5%) mixto y 4/65 (6.5%) restrictivo (neumonía). Media Tal de ingreso 7.7 (7-12).



Hospital de Niños Santísima Trinidad de Córdoba 2017

Conclusiones: La respuesta a OAF de acuerdo al protocolo elegido fue exitosa en casi el 70% de los pacientes, con buena aceptación por la mayoría de los profesionales involucrados. Los resultados finales sobre la eficacia OAF en IRAB y su impacto en la ocupación de unidades críticas/ARM durante el período invernal 2017, así como el costo/beneficio del procedimiento serán analizados oportunamente. Hasta el momento son sólo con resultados parciales.

Escalada de apoyo respiratorio en Bronquiolitis ¿?



September 2017

ORIGINAL ARTICLES

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Variability of Care in Infants with Severe Bronchiolitis: Less-Invasive Respiratory Management Leads to Similar Outcomes

Sandrine Essouri, MD, PhD[1,2], Florent Baudin, MD[3], Laurent Chevret, MD[2], Mélanie Vincent, MD[4], Guillaume Emeriaud, MD, PhD[1], and Philippe Jouvet, MD, PhD[1]

Objective To compare the management of children with severe bronchiolitis requiring intensive care (based on duration of ventilatory support and duration of pediatric intensive care unit [PICU] stay) in 2 countries with differing pediatric transport and PICU organizations.

Study design This was a prospective observational care study in 2 PICUs of tertiary care university hospitals, 1 in France and 1 in Canada. All children with bronchiolitis who required admission to the PICU between November 1, 2013, and March 31, 2014, were included.

Results A total of 194 children were included. Baseline characteristics and illness severity were similar at the 2 sites. There was a significant difference between centers in the use of invasive ventilation (3% in France vs 26% in Canada; $P < .0001$). The number of investigations performed from admission to emergency department presentation and during the PICU stay was significantly higher in Canada for both chest radiographs and blood tests ($P < .001$). The use of antibiotics was significantly higher in Canada both before (60% vs 28%; $P < .001$) and during (72% vs 33%; $P < .0001$) the PICU stay. The duration of ventilatory support, median length of stay, and rate of PICU readmission were similar in the 2 centers.

Conclusion Important differences in the management of children with severe bronchiolitis were observed during both prehospital transport and PICU treatment. Less invasive management resulted in similar outcomes with in fewer complications. *(J Pediatr 2017;188:156-62).*

VNI-OAF

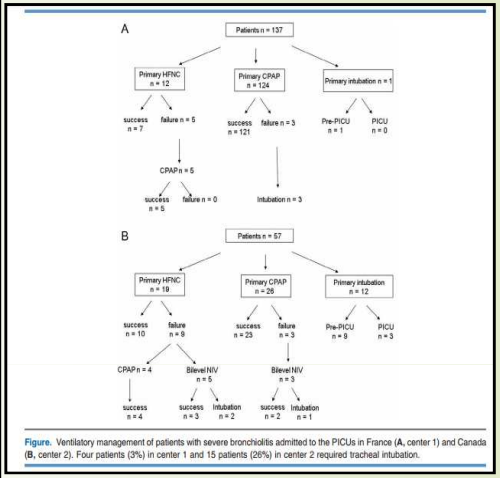
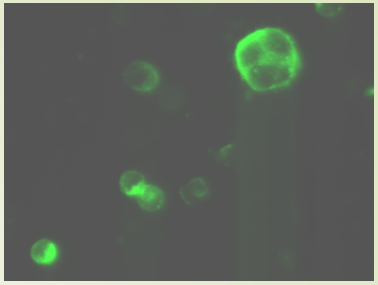


Figure. Ventilatory management of patients with severe bronchiolitis admitted to the PICUs in France (**A**, center 1) and Canada (**B**, center 2). Four patients (3%) in center 1 and 15 patients (26%) in center 2 required tracheal intubation.

Conclusion Important differences in the management of children with severe bronchiolitis were observed during both prehospital transport and PICU treatment. Less invasive management resulted in similar outcomes with in fewer complications. *(J Pediatr 2017;188:156-62).*



2. Nuevas propuestas de tratamiento y prevención específicas para VRS

Próximamente…..

Journal of Infection (2015) xx, 1–8

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2015

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New options in the treatment of respiratory syncytial virus disease

Asuncion M

Division of Pediatr
Hospital and The

Summary R
tality in infa
burden, an ef
understanding of the immune response to RSV and how it relates to clinical disease severity. Current treatment for RSV remains largely supportive and RSV-specific options for prophylaxis and/or treatment are limited to palivizumab and ribavirin. There are a number of promising compounds currently under development, including new monoclonal antibodies and small molecules. These newer antivirals have the potential to impact both the prevention and treatment of RSV disease in the main target populations.

These newer anti-RSV agents have shown enhanced potency, are being explored through alternative routes of administration, have improved pharmacokinetic profiles, and may reduce design and manufacturing costs. These new approaches to anti-RSV therapy are likely to result in new and more effective strategies to target different patient populations. Management strategies will require consideration of both treatment and prophylaxis and not only for high risk groups but also for previously healthy children hospitalized with severe RSV LRTI, outpatient populations with URI or mild LRTI, the elderly, and those with chronic obstructive pulmonary disease.

Nuevas opciones…

Table 1 Antivirals against RSV evaluated in humans.

Antiviral class	Drug candidate	Target/Administration route	Development phase	Target population	Comments
Antibodies					
(A) Polyclonal antibodies					
	RI-001/ADMA biologics	Polyclonal Intravenous (IV)	Phase-II/completed	Immunocompromised	Use to prevent progression from URI to LRTI in immunocompromised[53,54]
(B) Monoclonal antibodies					
	Motavizumab MedImmune	F protein Intramuscular (IM)	Phase-III/not licensed	High-risk infants	Equally effective compared with palivizumab[50]/No effective as treatment[55]
	MEDI-557 MedImmune	F protein Intramuscular (IM)	Phase-I/completed	High-risk infants	Extended half-life[56]
	MEDI-8897 MedImmune	F protein Intramuscular (IM)	Phase-I/ongoing	All infants	Extended half-life/150 fold more potent than palivizumab[57]
	mAb 131-2G	G protein (CXC3 motif) Intraperitoneal (IP)	Preclinical	–	Reduced lung inflammation and viral loads in mice[58]
(C) Nanobodies					
	ALX-0171 Ablynx	F protein Inhaled (INH)	Phase-II/ongoing	Healthy infants and toddlers	Reduced lung inflammation and symptoms in the neonatal lamb model[59]
Fusion inhibitors (small molecules)					
	GS-5806 Gilead	F protein Oral (PO)	Phase-II/ongoing	Adults/HSCT	Reduced viral loads and clinical symptoms in adults experimentally challenged[60]
	BTA-9881 Biota	F protein Oral (PO)	Phase-I/completed	Adults	Has not moved forward[61]
	TMC353121 Janssen	F protein Intravenous (IV)	Preclinical	–	Reduced viral loads and lung inflammation in animal models[62]
	MDT-637 Gilead	F protein Inhaled (INH)	Phase-I/completed	Adults	Tested in adults with asthma[63]
Other mechanisms					
	ALN-RSV01 Alnylan	siRNA inhibitor Intranasal (IN)	Phase-II/completed	Adults/Lung transplant	Antiviral effect and preserves lung function in lung transplant recipients with URI[64,65]
	ALS-008176 Alios Biopharma	Nucleoside analog Oral (PO)	Phase-I/ongoing	Adults/Children	Fast reduction on viral loads and clinical symptoms in adults experimentally challenged[66]
	RSV-604 Novartis	N protein Intravenous (IV)	Phase-I/completed Phase-II	Adults/HSCT	Benzodiazepine. Inhibited viral synthesis and infectivity after mucosal inoculation[67,68]

Expert Review of Respiratory Medicine

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Respiratory syncytial virus: Prospects for new and emerging therapeutics

Patricia A. Jorquera & Ralph A. Tripp

RSV remains an important pathogen in infants and the elderly. There are only two antivirals available which are not sufficient to prevent or treat RSV infection. However, substantial progress has been made with several drugs and monoclonal antibodies that inhibit RSV replication with different mechanisms of action. The majority of antiviral research has been focused on RSV fusion-inhibitors and nucleoprotein inhibitors. Clinical trials have shown promising result and provided further evidence for the development of yet other RSV inhibitors. As clinical studies progress, there is hope that these anti-RSV drugs for risk populations get approved, but clearly second generation of broad-spectrum RSV inhibitors is needed.

rugs and monoclonal antibodies
velopment.

viral drugs and mAb have shown
ble in the coming years. Although
get for inhibitors and mAbs, new
promising results. To overcome
the emergence of RSV escape mutants, combination antiviral therapy may be explored
in the future.

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2015

Novel Antigens for RSV Vaccines

Barney S. Graham[1,*], **Kayvon Modjarrad**[2,3], and **Jason S. McLellan**[4]

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03755, USA

Abstract

Respiratory syncytial virus (RSV) remains a leading global cause of infant mortality and adult morbidity. Infection, which recurs throughout life, elicits only short-lived immunity. The development of a safe and efficacious vaccine has, thus far, been elusive. Recent technological advances, however, have yielded promising RSV vaccine candidates that are based on solving atomic-level structures of surface glycoproteins interacting with neutralizing antibodies. The class I fusion glycoprotein, F, serves as the primary antigenic component of most vaccines, and is the target of the only licensed monoclonal antibody product used to reduce the frequency of severe disease in high-risk neonates. However, success of prior F-based vaccines has been limited by the lack of understanding how the conformational rearrangement between a metastable prefusion F (pre-F) and a stable postfusion F (post-F) affected the epitope content. Neutralizing epitopes reside on both conformations, but those specific to pre-F are far more potent than those previously identified and present on post-F. The solution of the pre-F structure and its subsequent characterization and stabilization illustrates the value of a structure-based approach to vaccine development, and provides hope that a safe and effective RSV vaccine is possible.

¿Como reducir morbimortalidad en Bronquiolitis…2017?

- Identificar población de **riesgo** y diseñar estrategias de abordaje y seguimiento.
- Promoción de **Lactancia materna**
- Mejorar cobertura de **vacunas**
- Conformación y Fortalecimiento de SALAS DE SITUACIÓN/ **vigilancia epidemiológica**
- Bioseguridad en Centros de Salud- Hospitales- comunidad. **Lavado de manos!!!!**
- Cuidado del **aire ambiental** intra-domiciliario
- **Uso racional de fármacos y OXIGENOTERAPIA**

Muchas gracias!