



**Sociedad Argentina de Pediatría**

Dirección de Congresos y Eventos



**SEMANA de CONGRESOS  
y JORNADAS NACIONALES 2019**

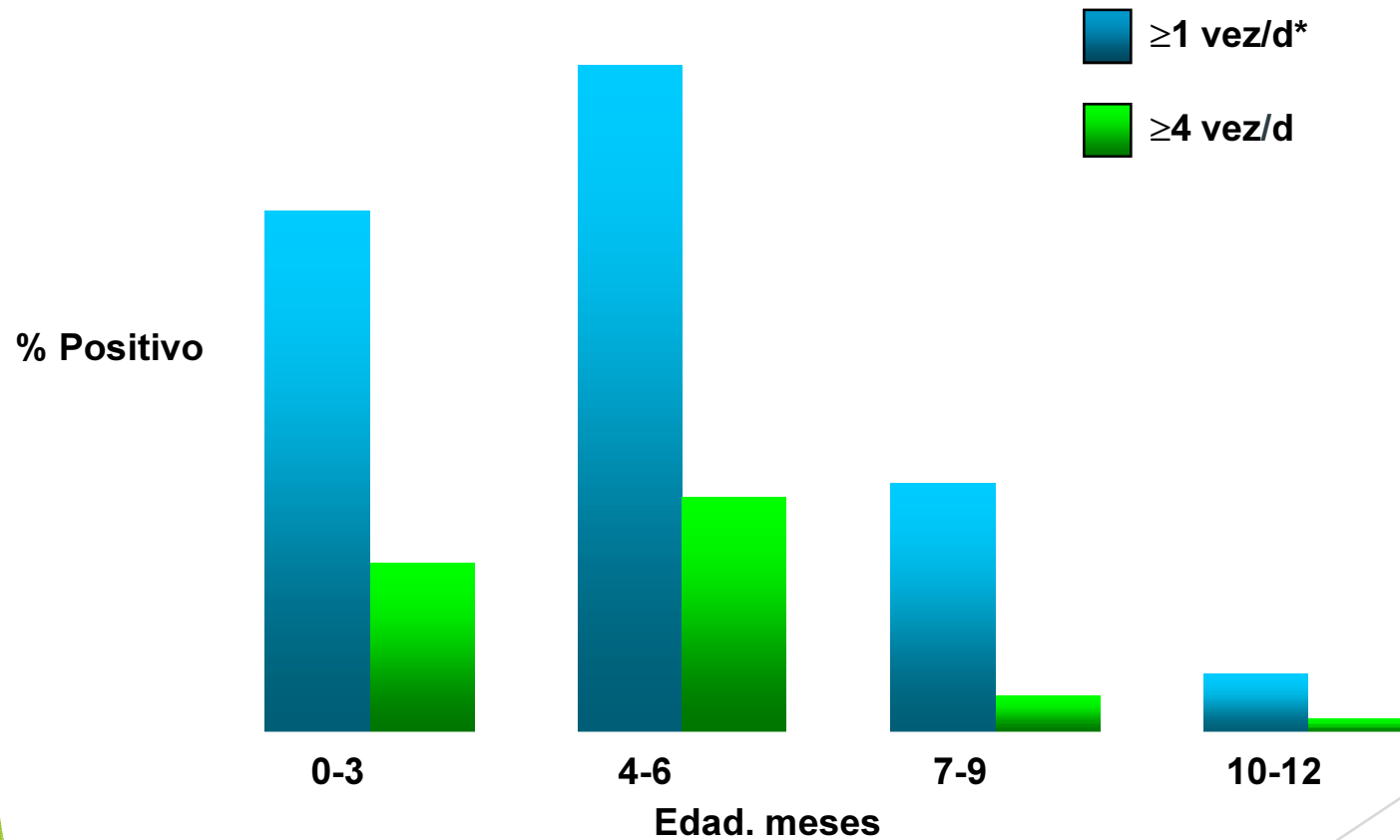
**2° Congreso Argentino de  
Medicina Interna Pediátrica**



# Reflujo gastroesofágico: lo que debemos saber

Francisco R. Follett  
Hospital Universitario Austral

# Prevalencia de regurgitación en la niñez



Nelson et al, *Arch Pediatr Adolesc Med.* 1997;151:569-572.

## Índices de RGE en población normal

Edad	n	IR	Episodios de Reflujo		
			Ep > duración	Nº/24 horas	Nº ep. > 5 min
<b>5-15 días</b>	<b>92</b>	<b>1.20</b>	230	7.73	0.64
<b>24-37 días</b>	<b>28</b>	<b>1.71</b>	404	8.24	0.88
<b>7-8 semanas</b>	<b>44</b>	<b>2.52</b>	369	13.5	1.57
<b>3.5-4.5 meses</b>	<b>52</b>	<b>4.18</b>	706	20	3.24
<b>5.5-6.5 meses</b>	30	3.27	540	20	2.14
<b>7.5-8.5 meses</b>	24	3.93	610	17.9	3.08
<b>14-16 meses</b>	15	2.65	520	19.4	2.21

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# Manifestaciones Extraesofagicas

RGEP

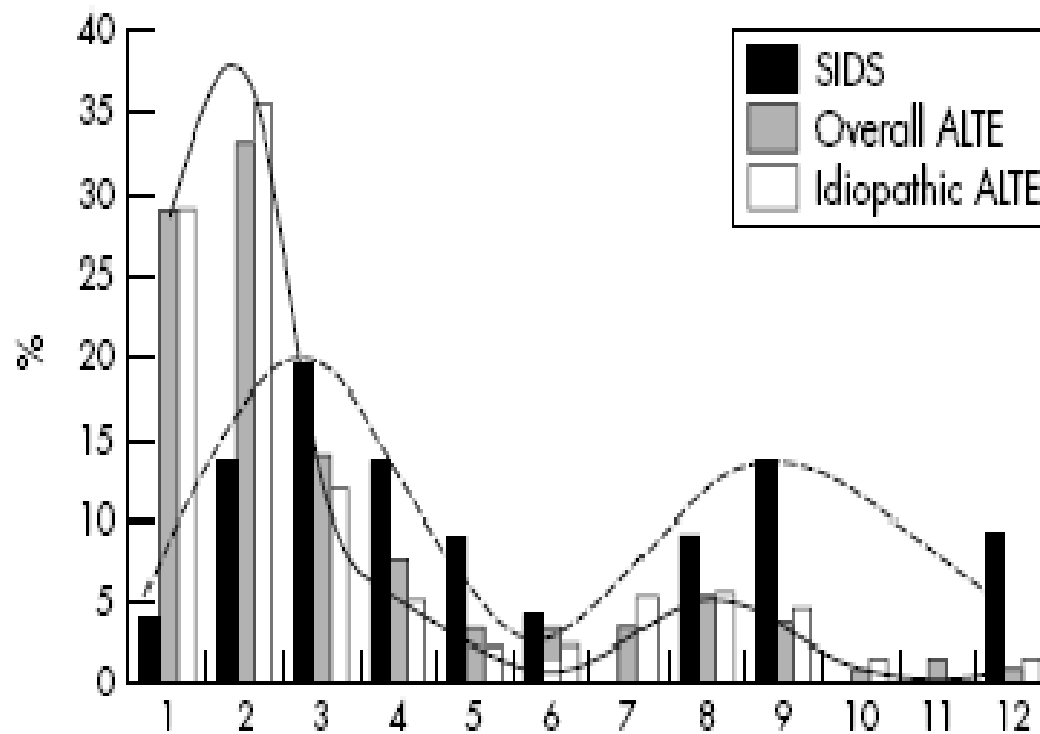


El-Serag H, Gilger M et al. *Gastroenterology* 2001;121:1294-9  
Tasker A et al. *Laryngoscope* 2002;112:1930-4

# RGE: Signos y síntomas, formas de presentación

- Vómitos recurrentes del lactante
- Vómitos recurrentes y escasa ganancia
- Vómitos recurrentes e irritabilidad del lactante
- Vómitos recurrentes en edades mayores
- Epigastralgia en niños mayores y adolescentes
- Esofagitis
- Disfagia o rechazo de alimento
- Apnea o ALTE
- Asma
- Neumonías recurrentes
- Síntomas de vía aérea superior

# Epidemiología de ALTE



U.Kiechl-Kohlendorfer. Arch. Dis. Chil 2004;90:297-300



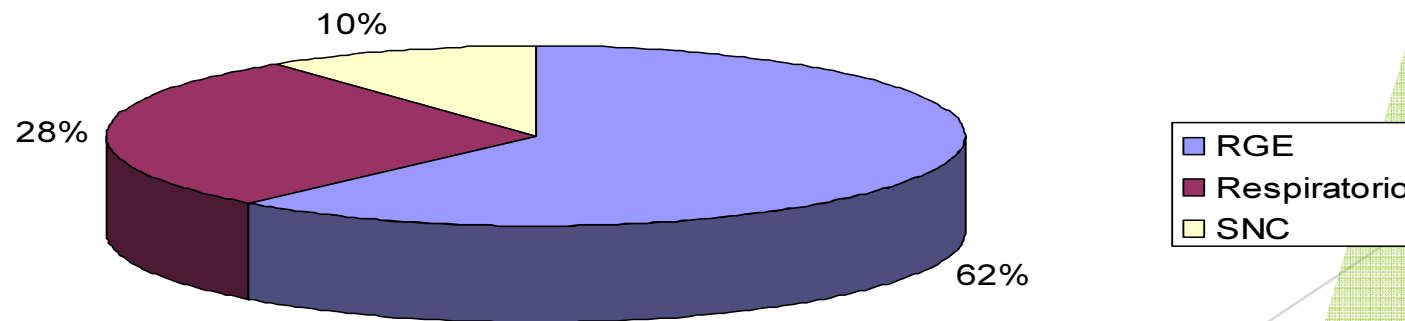
# ALTE: Experiencia de un grupo interdisciplinario

M. Rocca Rivarola, A. Jenik, P. Kenny, G. Agosta, A. Ruiz.  
Hospital Italiano de Buenos Aires. 1997

Nº pacientes: 45

Patología: 39

## Patología en ALTE



# Espid

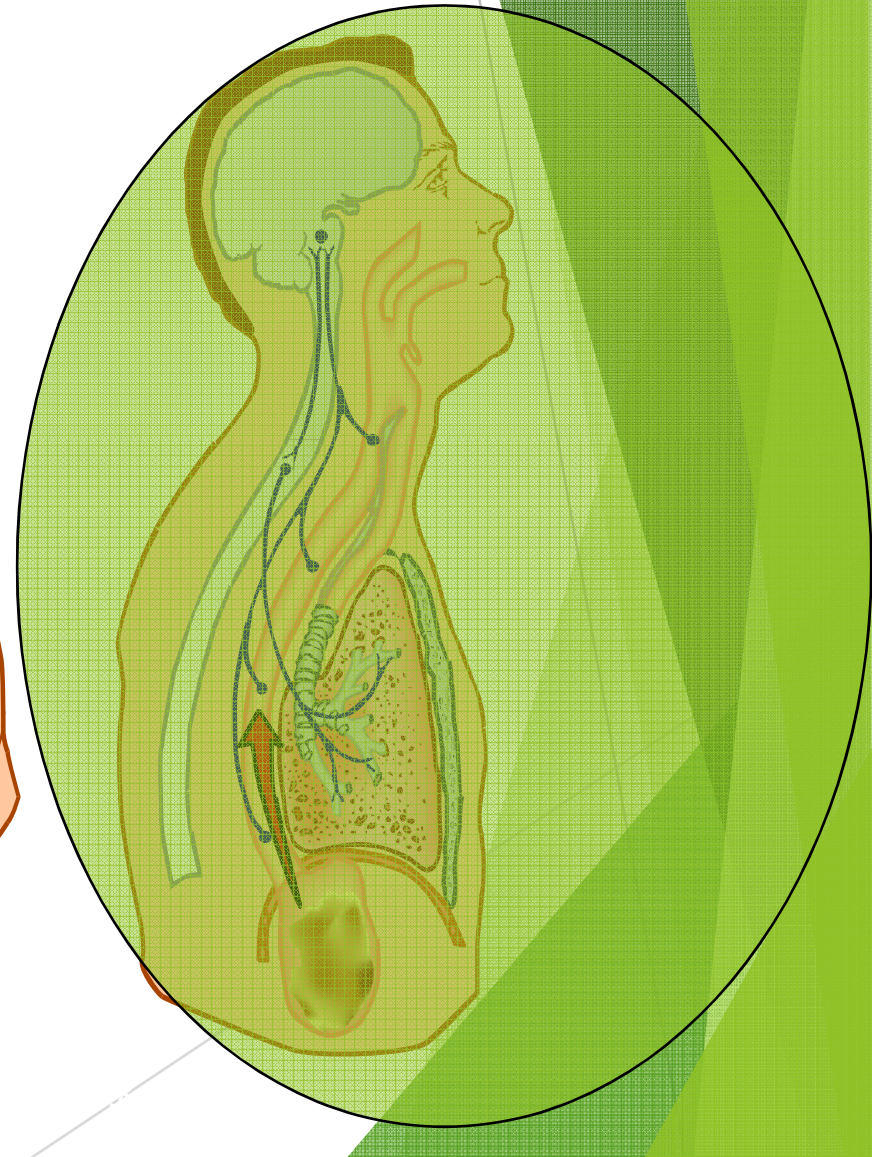
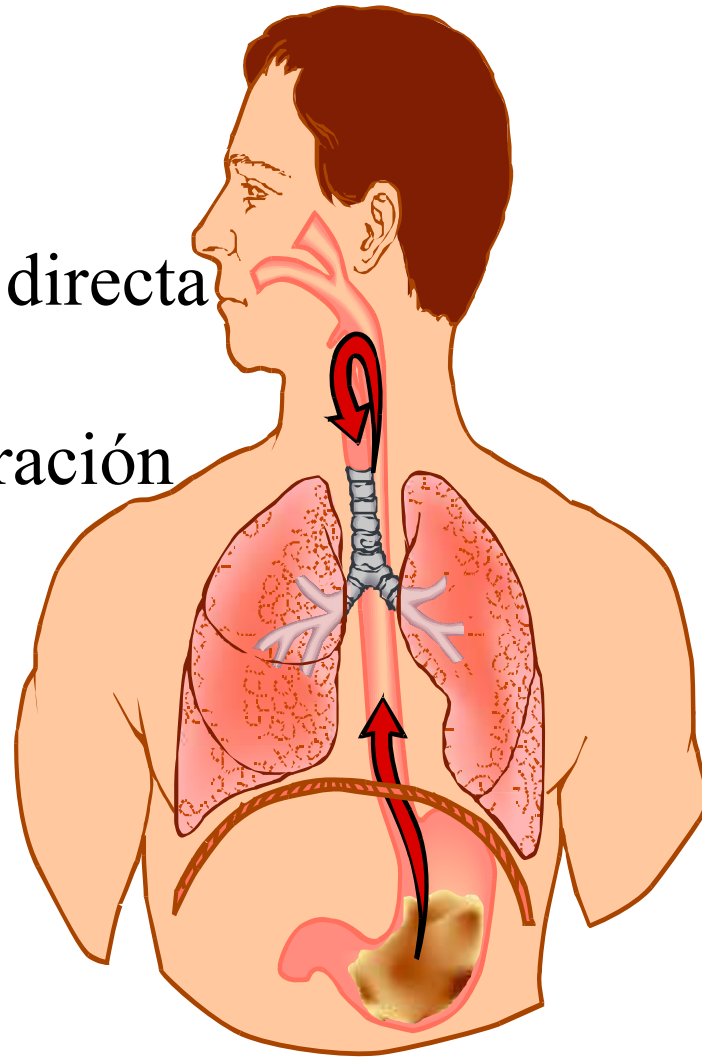
## ALTE secundario

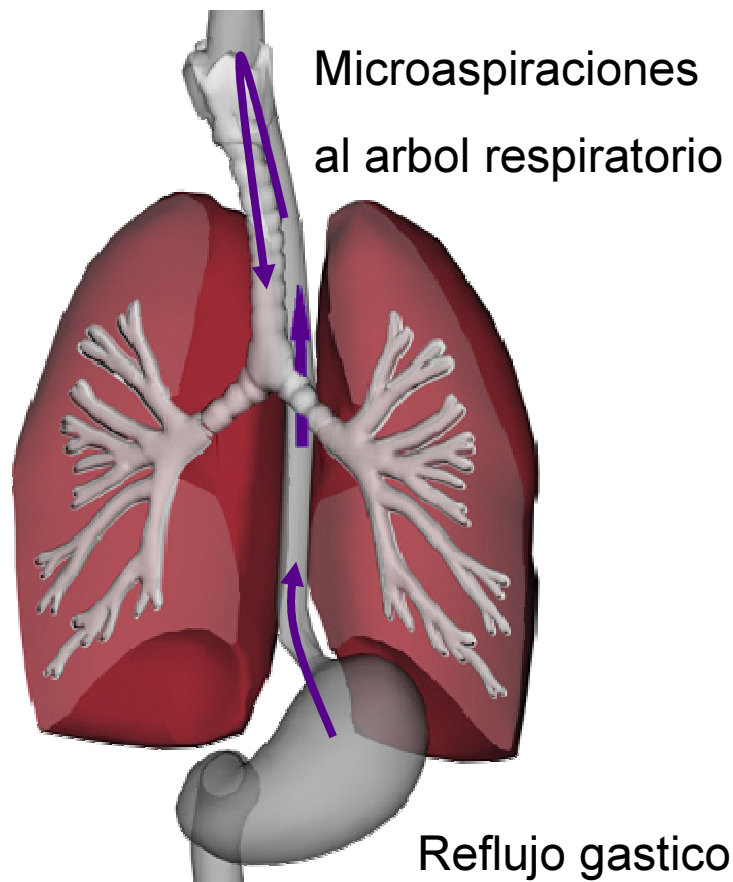
• <b>Causas Gastroenterologicas</b>	<b>47%</b>	<b>Ref. gastroesofagico Infección- malformación</b>
• <b>Causas neurológicas</b>	<b>29%</b>	<b>Vasovagal. Convulsión Infección</b>
• <b>Causas respiratorias</b>	<b>15%</b>	<b>Infección, malformación de vía aérea</b>
• <b>Causas cardiacas</b>	<b>3.5%</b>	<b>Trastornos del ritmo cardíaco (arritmias)</b>
• <b>Causas metabólicas</b>	<b>2.5%</b>	
• <b>Miscelánea</b>	<b>3%</b>	

# Fisiopatología propuesta

Aspiración directa

Micro-aspiración

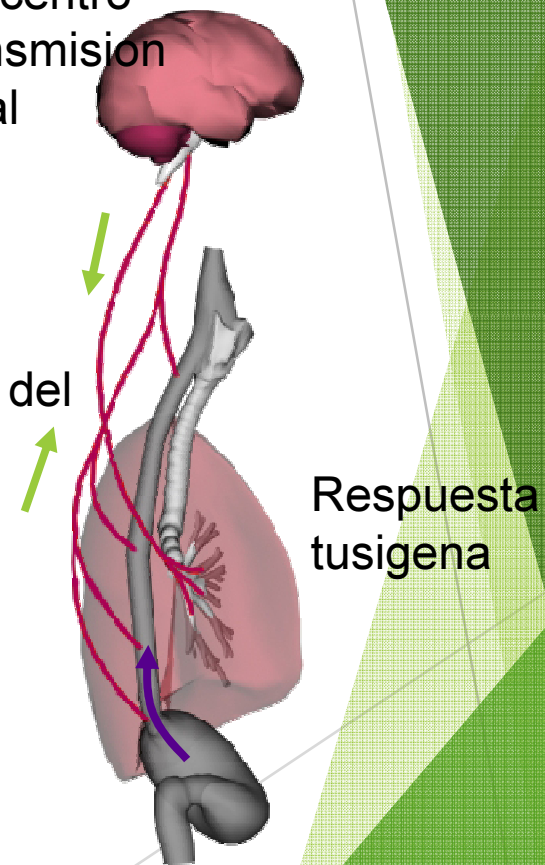




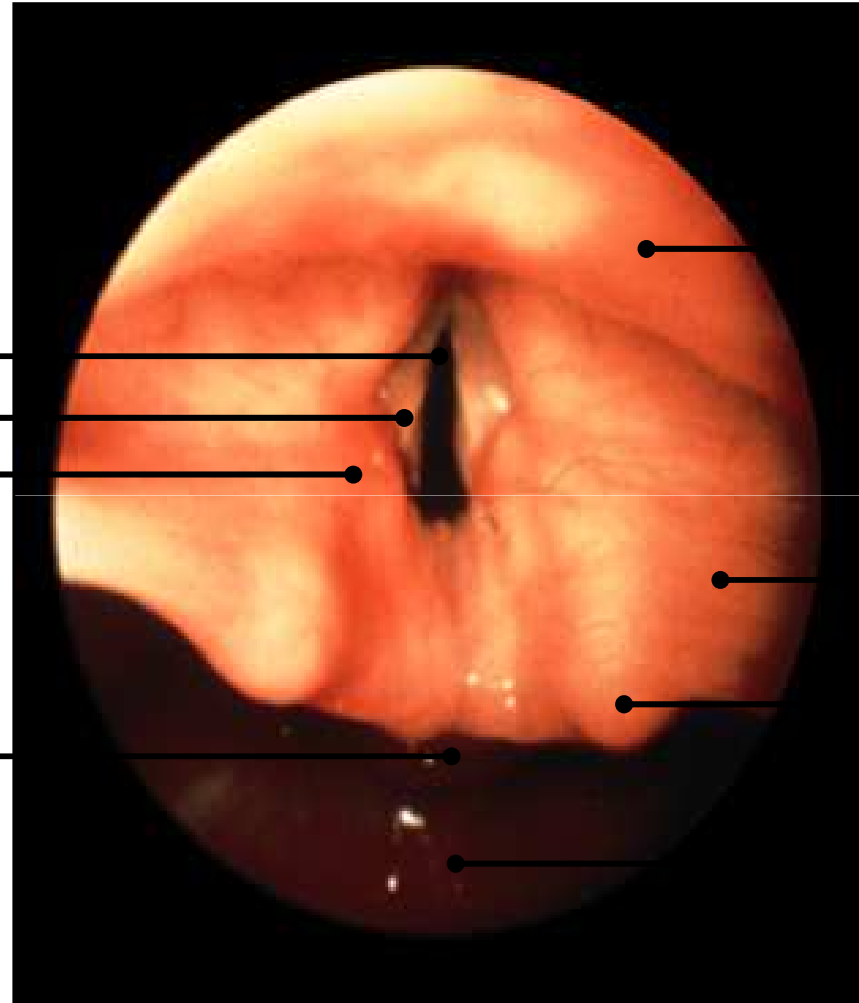
Estimulacion del centro  
de la tos con transmision  
esofago-bronquial

Estimulacion del  
vago

Reflujo gastrico



**Anterior**



**Introitus**  
**Cuerda vocal**  
**Cuerda vocal**

**EES**

**Cara posterior  
de la epiglottis**

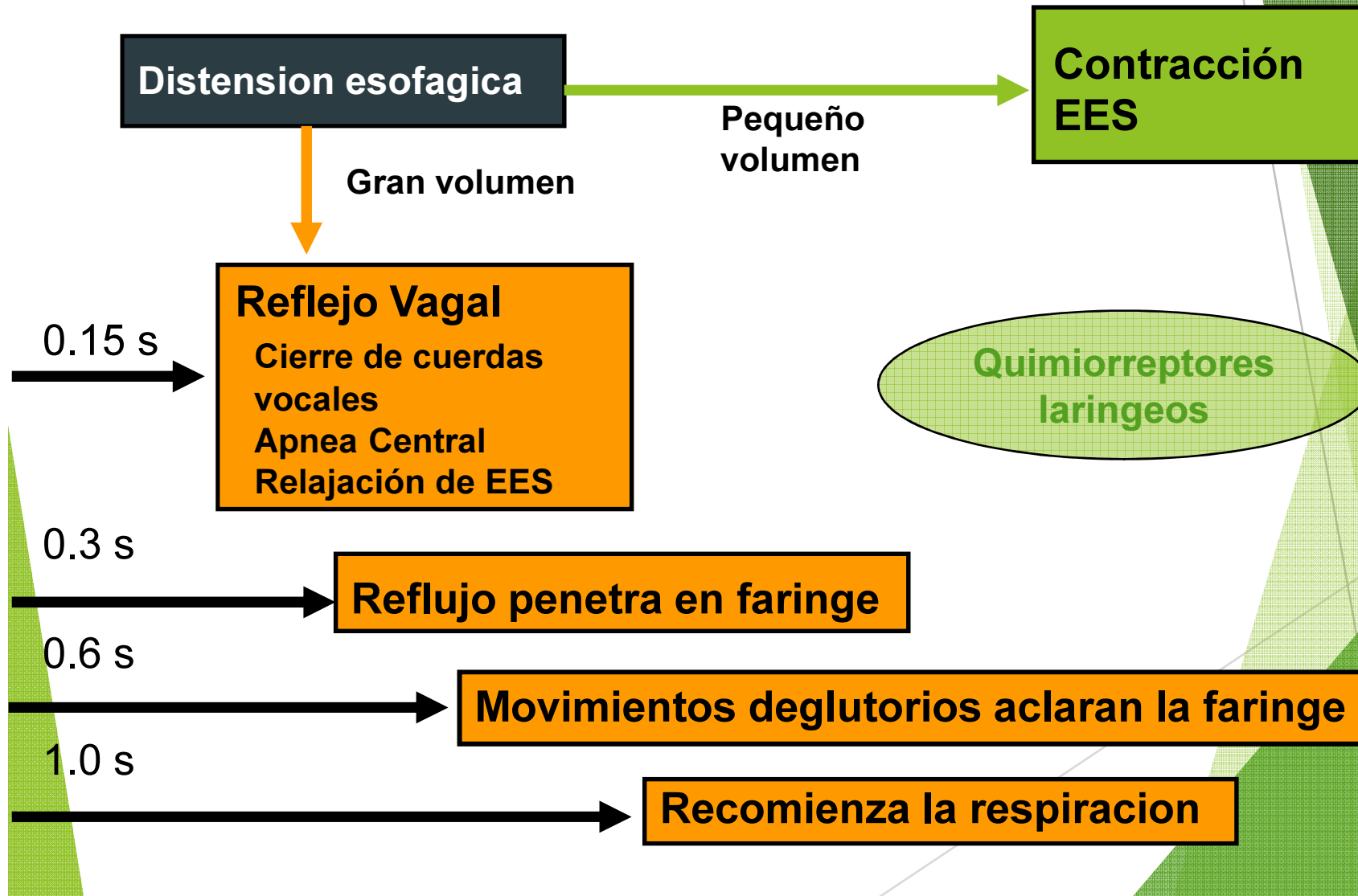
**Repliegue Ari-  
epiglótico**

**Arrtenoides**

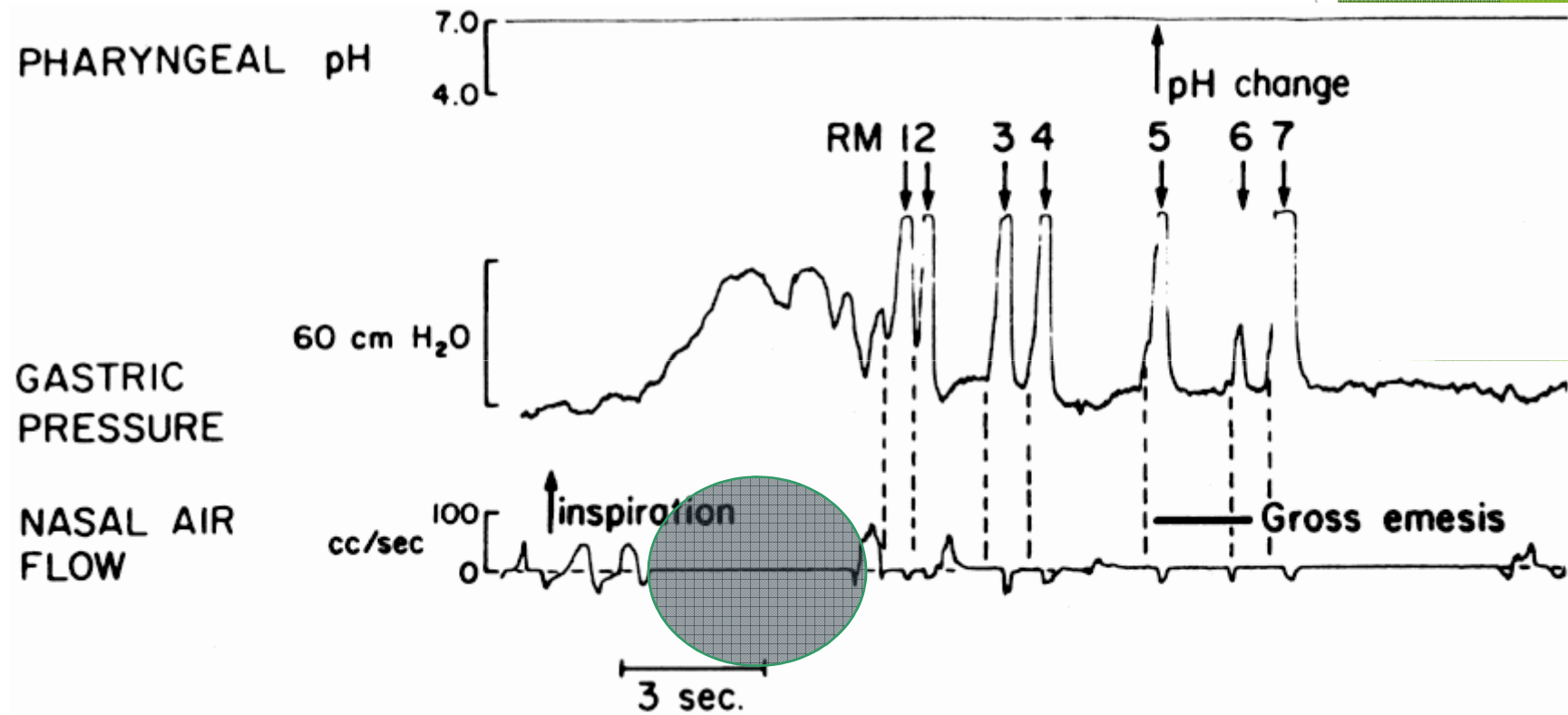
**Pared posterior de  
lafaringel**

**Posterior**

# Protección de la vía aérea



# Apnea y RGE



Apnea previo a regurgitación



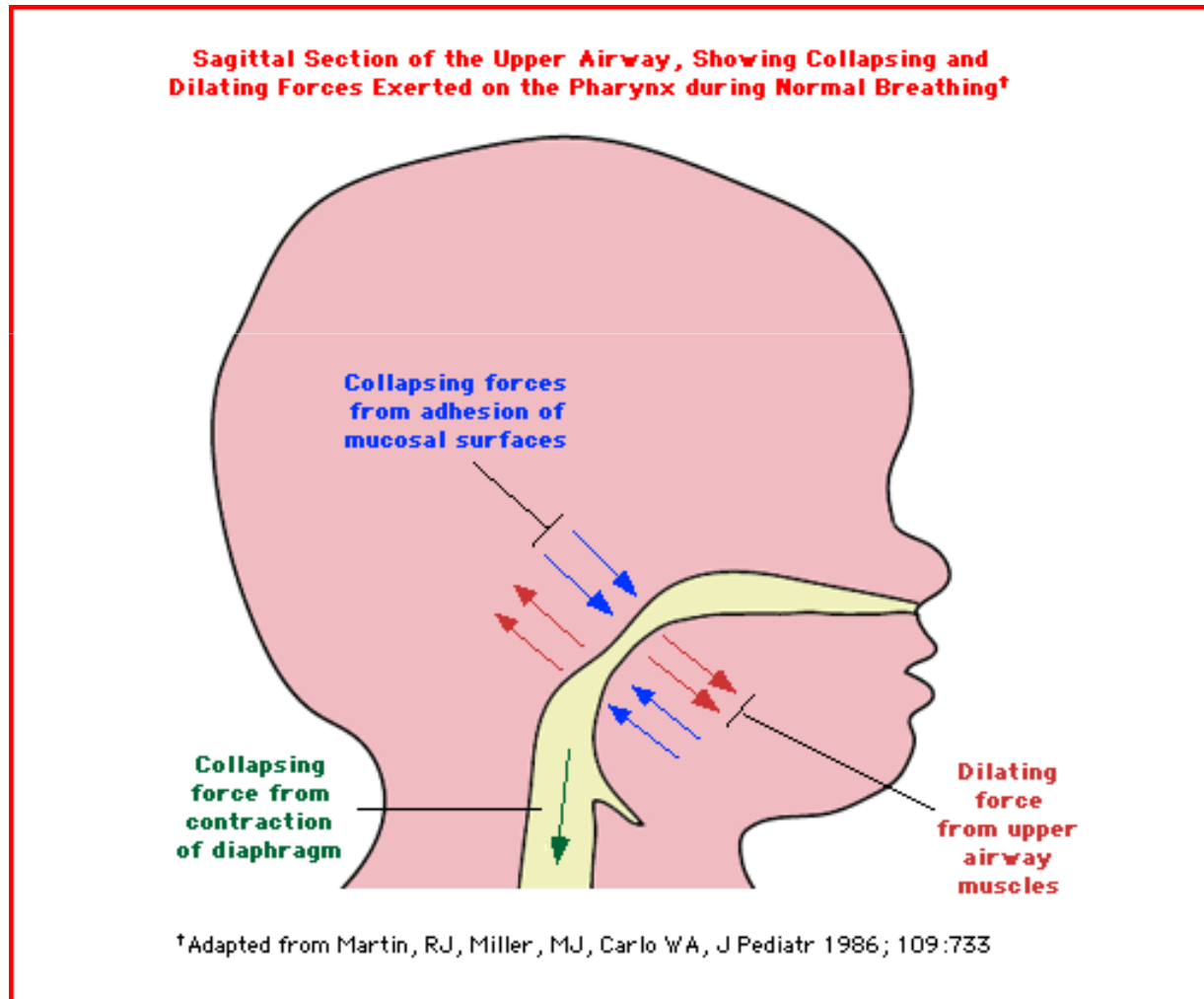
**Normal**



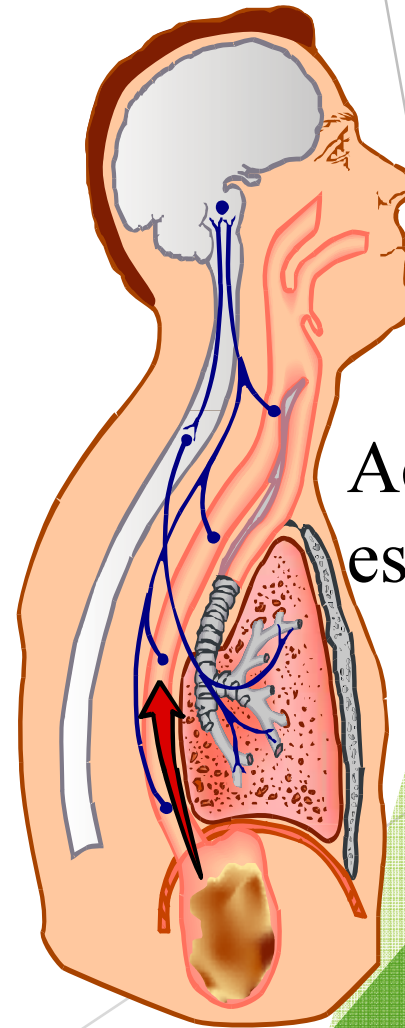
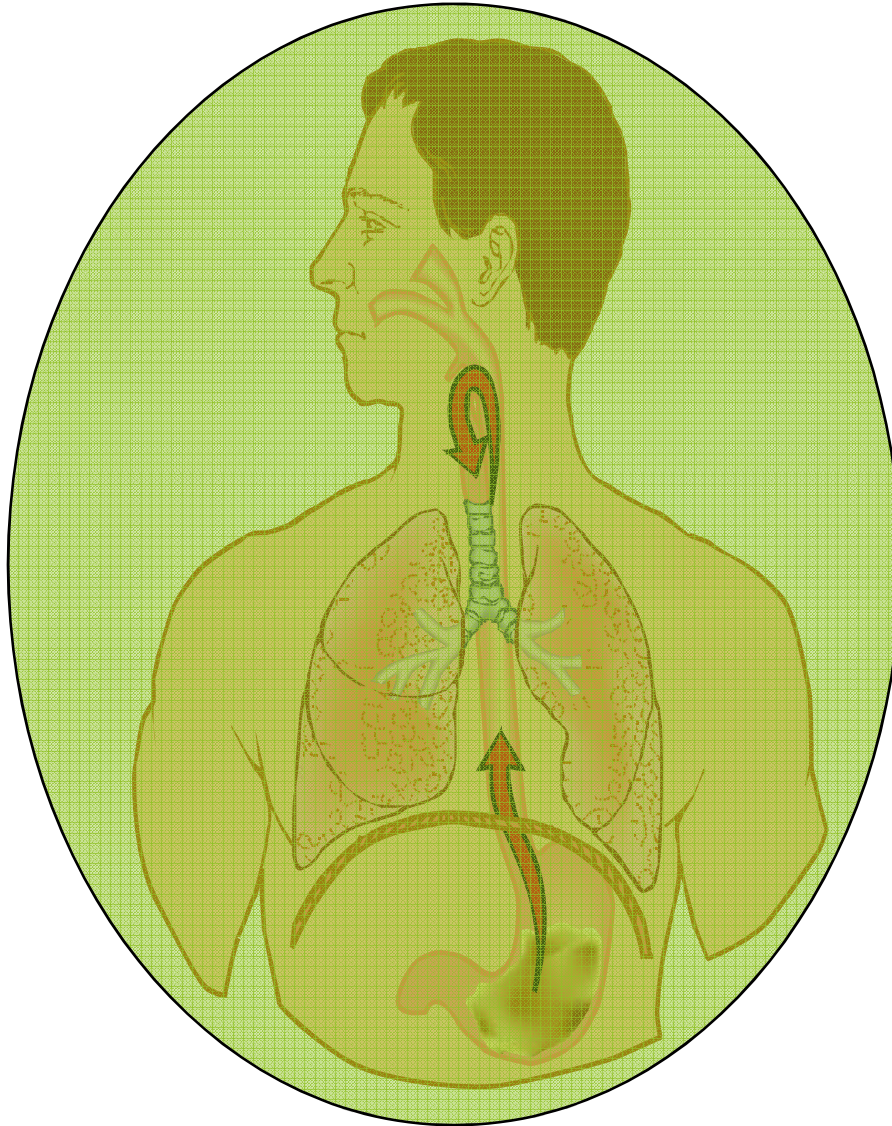
**Laringitis por reflujo**



# Alteración de tensión superficial

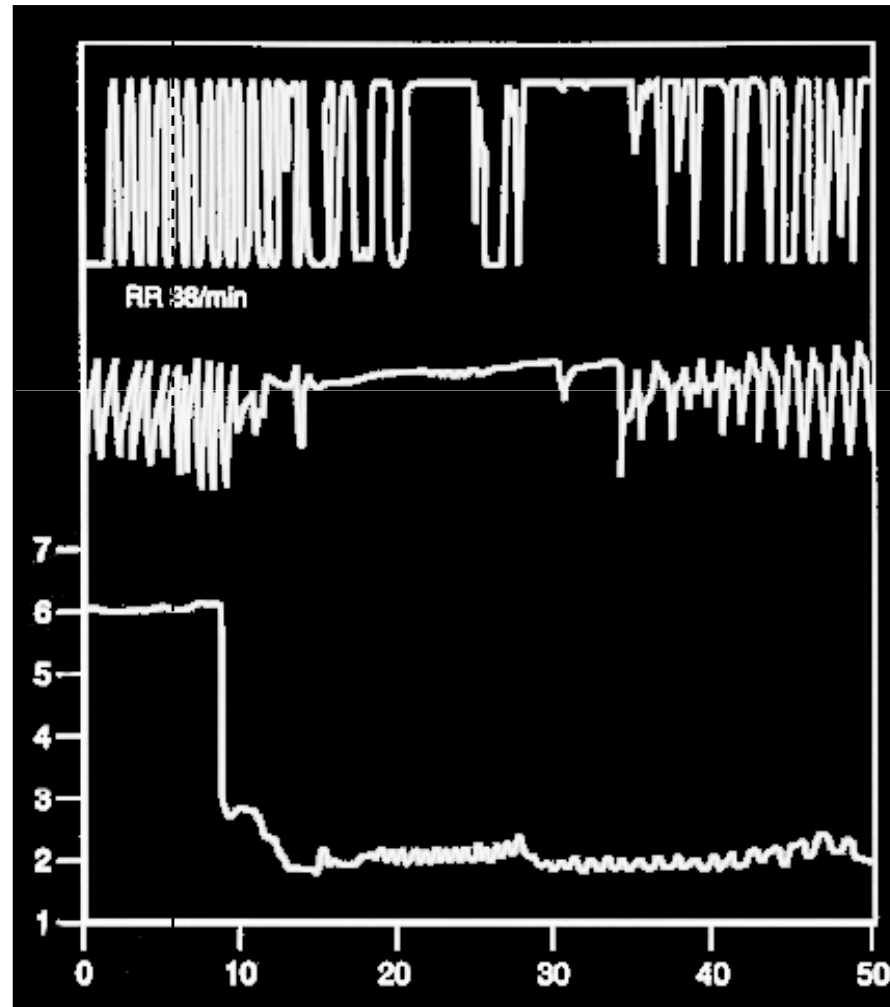


# Fisiopatología propuesta



Acidificación  
esofágica

# Relación RGE y ALTE



Movimiento toracico

Flujo nasal

pH intraesofagico

Herbst et al, *J Pediatr* 1979;95:763

## **Association of Apnea and Nonacid Gastroesophageal Reflux in Infants: Investigations With the Intraluminal Impedance Technique**

Tobias G. Wenzl, MD,<sup>1\*</sup> Simone Schenke, MD,<sup>1</sup> Thomas Peschgens, MD,<sup>1</sup>  
Jiri Silny, MD, PhD,<sup>2</sup> Gerhard Heimann, MD, PhD,<sup>1</sup> and Heino Skopnik, MD, PhD<sup>1</sup>

**Pediatric Pulmonology 31:144–149 (2001)**

## **Testing the Association Between Gastroesophageal Reflux and Apnea in Infants**

\*Hayat Mousa, \*Frederick W. Woodley, \*Melissa Metheney, and †John Hayes

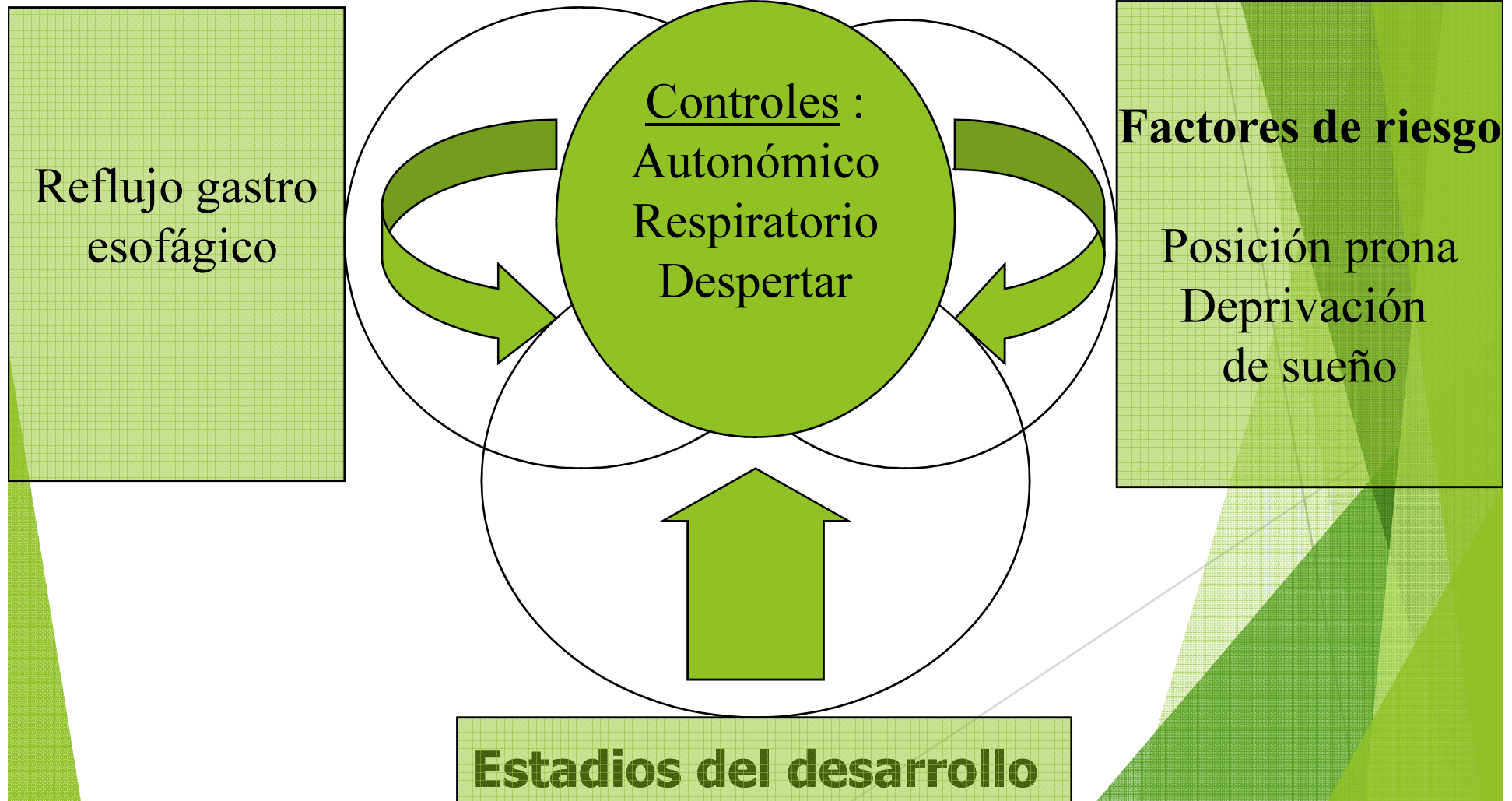
*J Pediatr Gastroenterol Nutr, Vol. 41, No. 2, August 2005*

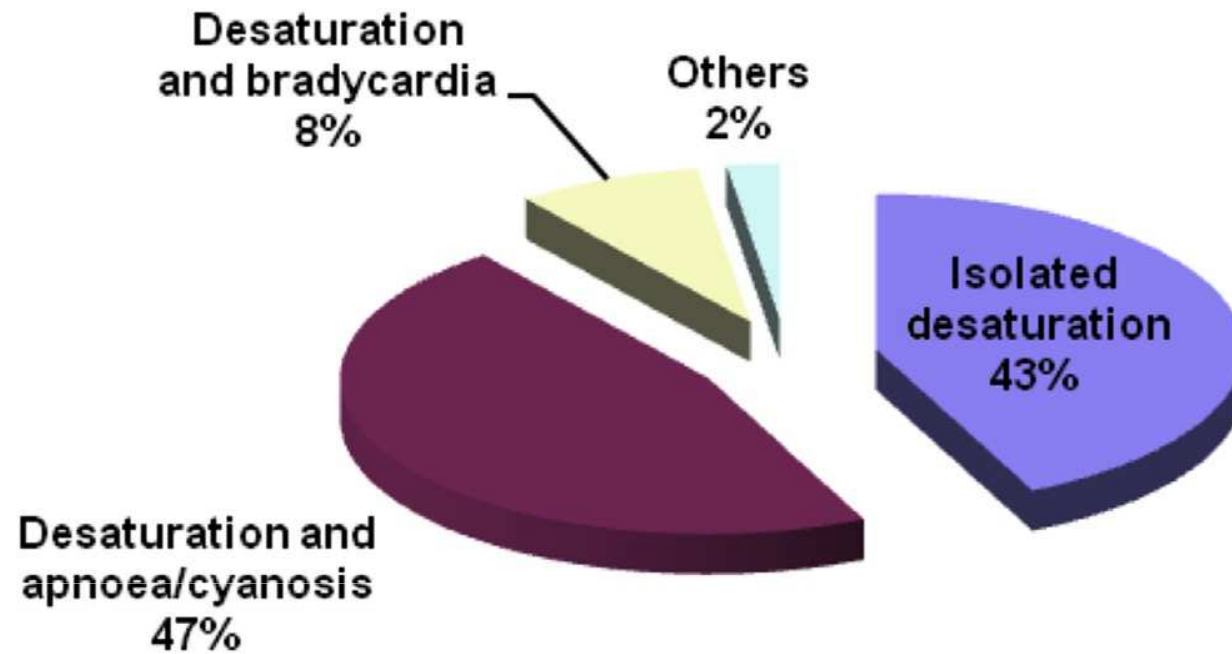
## **Esophageal multichannel intraluminal impedance and pH-testing in the study of apparent life threatening episode incidents in infants**

Javier Blasco-Alonso<sup>1</sup>, Cristina Yun-Castilla<sup>2</sup>, Francisco Girón-Fernández-Crehuet<sup>1</sup>,  
M.<sup>a</sup> José Peláez-Cantero<sup>2</sup>, Juliana Serrano-Nieto<sup>1</sup>, Víctor Manuel Navas-López<sup>1</sup> and Carlos Sierra-Salinas<sup>1</sup>

REV ESP ENFERM DIG 2014; 106 (3): 159-164

# Modelo fisiopatológico





## Acid Gastroesophageal Reflux Disease and Apparent Life-Threatening Events: Simultaneous pH-metry and Cardiorespiratory Monitoring

Francesco Macchini <sup>a</sup>, Anna Morandi <sup>a,\*</sup>, Paola Cognizzoli <sup>b</sup>,  
Giorgio Farris <sup>a</sup>, Valerio Gentilino <sup>a</sup>, Andrea Zanini <sup>a</sup>,  
Ernesto Leva <sup>a</sup>

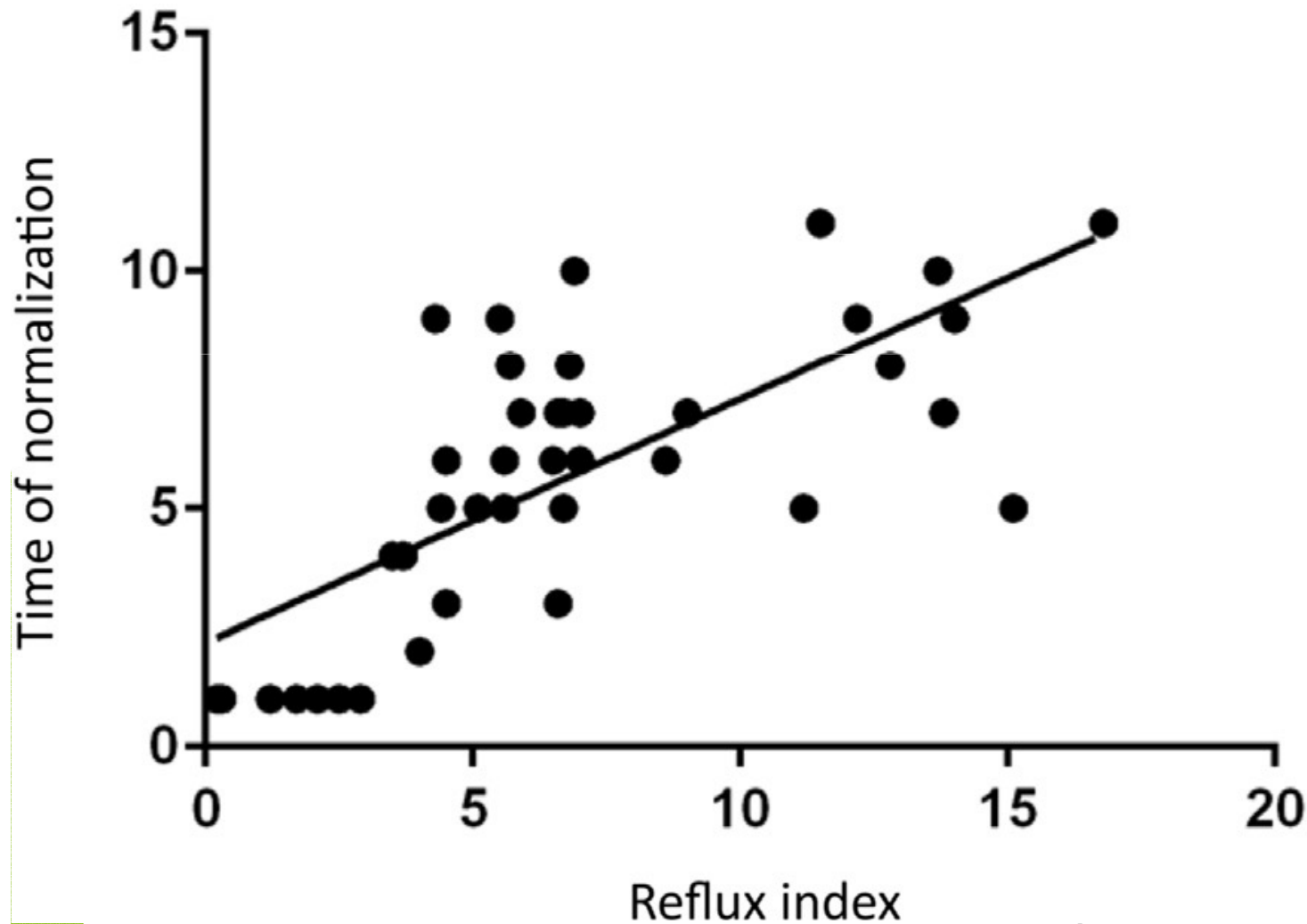
[Pediatr Neonatol.](#) 2017 Feb;58(1):43-47.

**Table 2** Data of the study population.

19	2890	M	37	Des + apn + cyan	39	6.6	B	67	3
20	3130	M	38	Des	26	9.0	C	80	7
21	2780	F	37	Des	42	4.3	B	62	9
22	2550	F	36	Des + apn + cyan	45	5.9	B	43	7
23	1235	F	27	Bradi + des	69	16.8	C	50	11
24	3020	F	39	Bradi + des	24	0.2	A	10	1
25	1790	M	34	Des	78	12.8	C	90	8
26	2230	M	35	Des + apn + cyan	60	6.7	B	60	5
27	3180	F	39	Des + apn + cyan	27	6.9	B	67	10
28	2590	M	36	Des + apn + cyan	39	4.0	B	55	2
29	2775	M	37	Des	22	2.5	A	14	1
30	2960	F	37	Des + apn + cyan	15	6.5	B	73	6
31	3310	F	40	Des + apn + cyan	19	2.9	A	20	1
32.	2480	M	35	Des + apn + cyan	40	4.4	B	62	5
33	2660	F	35	Des	44	1.2	A	25	1
34	3150	F	39	Des	28	12.2	C	73	9
35	2820	M	38	Bradi + des	35	7.0	B	75	7
36	1930	M	33	Des	32	6.8	B	50	8
37	2160	F	34	Des + apn + cyan	47	3.7	B	28	4
38	2450	M	36	Des	41	1.0	A	20	—
39	3860	F	39	Other	23	11.2	C	50	5
40	2220	M	35	Des	40	13.8	C	80	7
41	1980	M	34	Des	39	5.5	B	60	9

apn = apnea; cyan = cyanoses; des = desaturation; RI = reflux index; SI = symptom index.

# Acid Gastroesophageal Reflux Disease and Apparent Life-Threatening Events: Simultaneous pH-metry and Cardiorespiratory Monitoring





CLINICAL PRACTICE GUIDELINE Guidance for the Clinician in Rendering Pediatric Care

American Academy  
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

# Brief Resolved Unexplained Events (Formerly Apparent Life-Threatening Events) and Evaluation of Lower-Risk Infants

Joel S. Tieder, MD, MPH, FAAP, Joshua L. Bonkowsky, MD, PhD, FAAP, Ruth A. Etzel, MD, PhD, FAAP, Wayne H. Franklin, MD, MPH, MMM, FAAP, David A. Gremse, MD, FAAP, Bruce Herman, MD, FAAP, Eliot S. Katz, MD, FAAP, Leonard R. Krilov, MD, FAAP, J. Lawrence Merritt II, MD, FAAP, Chuck Norlin, MD, FAAP, Jack Percelay, MD, MPH, FAAP, Robert E. Sapién, MD, MMM, FAAP, Richard N. Shiffman, MD, MCIS, FAAP, Michael B.H. Smith, MB, FRCPCH, FAAP, for the SUBCOMMITTEE ON APPARENT LIFE THREATENING EVENTS

# BRUE

## Brief Resolved Unexplained Events

### Definición

- ▶ Menor de 1 año
- ▶ Episodio único y resuelto
  - ▶ cianosis o palidez
  - ▶ Respiración ausente irregular o disminuida
  - ▶ Marcado cambio en tono
  - ▶ Alteración del grado de respuesta

### Bajo Riesgo

- ▶ Edad > 60 días
- ▶ Edad gestacional >32 semanas y edad post concepcional >45 semanas
- ▶ Episodio único
- ▶ Duración < 1 min
- ▶ No requiere de RCP
- ▶ Sin datos clínicos positivos
- ▶ Sin hallazgos específicos en EF

**TABLE 1** Summary of Key Action Statements for Lower-Risk BRUEs

When managing an infant who is >60 d and <1 y of age and who, on the basis of a thorough history and physical examination, meets criteria for having experienced a lower-risk BRUE, clinicians:	Evidence Quality; Strength of Recommendation
<b>1. Cardiopulmonary Evaluation</b>	
1A. Need not admit infants to the hospital solely for cardiorespiratory monitoring.	B; Weak
1B. May briefly monitor patients with continuous pulse oximetry and serial observations.	D; Weak
1C. Should not obtain chest radiograph.	B; Moderate
1D. Should not obtain a measurement of venous or arterial blood gas.	B; Moderate
1E. Should not obtain an overnight polysomnograph.	B; Moderate
1F. May obtain a 12-lead electrocardiogram.	C; Weak
1G. Should not obtain an echocardiogram.	C; Moderate
1H. Should not initiate home cardiorespiratory monitoring.	B; Moderate
<b>2. Child Abuse Evaluation</b>	
2A. Need not obtain neuroimaging (CT, MRI, or ultrasonography) to detect child abuse.	C; Weak
2B. Should obtain an assessment of social risk factors to detect child abuse.	C; Moderate
<b>3. Neurologic Evaluation</b>	
3A. Should not obtain neuroimaging (CT, MRI, or ultrasonography) to detect neurologic disorders.	C; Moderate
3B. Should not obtain an EEG to detect neurologic disorders.	C; Moderate
3C. Should not prescribe antiepileptic medications for potential neurologic disorders.	C; Moderate
<b>4. Infectious Disease Evaluation</b>	
4A. Should not obtain a WBC count, blood culture, or cerebrospinal fluid analysis or culture to detect an occult bacterial infection.	B; Strong
4B. Need not obtain a urinalysis (bag or catheter).	C; Weak
4C. Should not obtain chest radiograph to assess for pulmonary infection.	B; Moderate
4D. Need not obtain respiratory viral testing if rapid testing is available.	C; Weak
<b>5. Gastrointestinal Evaluation</b>	
5A. Should not obtain investigations for GER (eg, upper gastrointestinal tract series, pH probe, endoscopy, barium contrast study, nuclear scintigraphy, and ultrasonography).	C; Moderate
5B. Should not prescribe acid suppression therapy.	C; Moderate
6A. Need not obtain measurement of serum lactic acid or serum bicarbonate.	C; Weak
6B. Should not obtain a measurement of serum sodium, potassium, chloride, blood urea nitrogen, creatinine, calcium, or ammonia.	C; Moderate
6C. Should not obtain a measurement of venous or arterial blood gases.	C; Moderate
6D. Need not obtain a measurement of blood glucose.	C; Weak
6E. Should not obtain measurements of urine organic acids, plasma amino acids, or plasma acylcarnitines.	C; Moderate
<b>7. Anemia Evaluation</b>	
7A. Should not obtain laboratory evaluation for anemia.	C; Moderate
<b>8. Patient- and Family-Centered Care</b>	
8A. Should offer resources for CPR training to caregiver.	C; Moderate
8B. Should educate caregivers about BRUEs.	C; Moderate
8C. Should use shared decision making.	C; Moderate

CPR, cardiopulmonary resuscitation; CT, computed tomography; GER, gastroesophageal reflux; WBC, white blood cell.



Evaluación gastroenterológica

no debiera realizarse investigación por RGE  
(seriada, pH métrica, endoscopia centellograma y  
ecografía)

No debiera prescribirse medicación supresora de  
acidez

# Brief resolved unexplained events: Retrospective validation of diagnostic criteria and risk stratification

Marco Colombo MD<sup>1</sup> | Eliot S. Katz MD<sup>2</sup>  | Annalisa Bosco MD<sup>3</sup> |  
 Maria L. Melzi MD<sup>4</sup> | Luana Nosetti MD<sup>3</sup>

*Pediatric Pulmonology. 2019;54:61–65.*

**TABLE 1** Demographic and Diagnostic Data

Hospital days (day/yr) <sup>b</sup>	8.7 (6.9)	20.2 (11)	21.2 (13.5)	0.002
Total cost (Euros) <sup>b</sup>	45 788	92 616	92 298	0.0001
Cost/patient (Euros) <sup>b</sup>	2862	2807	2637	NS
Diagnostic testing (%)				
ECG	100	100	100	
Blood tests	75	88	100	
Chest X-ray	31	21	31	
EEG	81	88	89	
Brain US	37	58	20	
Brain MRI/CT	0	3	3	
Echocardiogram	69	85	66	

LR, lower risk; HR, higher risk; NS, not Significant, ECG, electrocardiogram; EEG, electroencephalogram, US, ultrasound; MRI, magnetic resonance imaging; CT, computed tomography.

<sup>a</sup>Median (interquartile range).

<sup>b</sup>Mean (±standard deviation); P-value comparing LR- BRUE versus HR-BRUE.

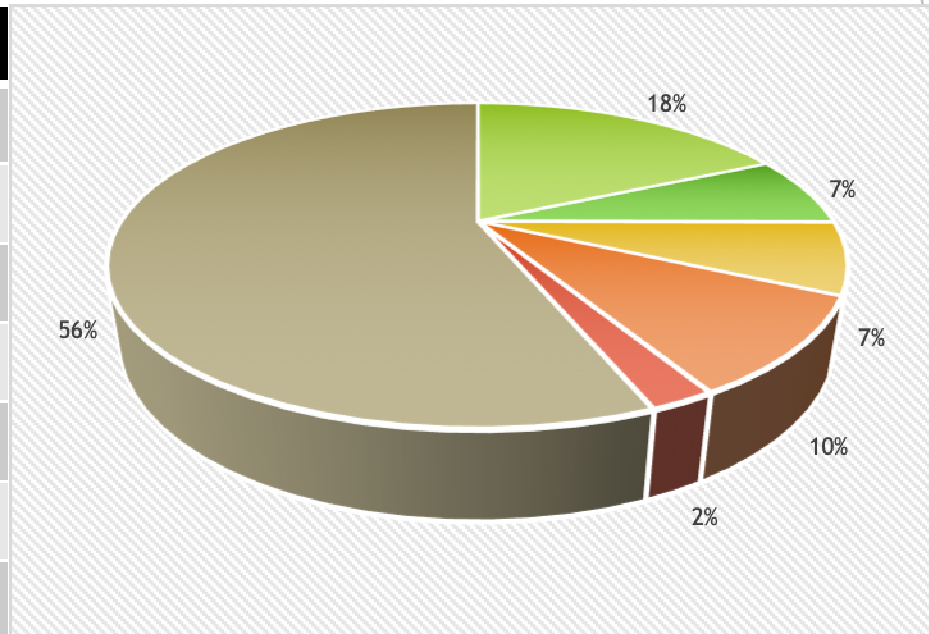
## Brief resolved unexplained events: Retrospective validation of diagnostic criteria and risk stratification

	LR- Brue	HR- Brue	No Brue	Total
RGE	2	8	5	15
Respiratorio			6	6
SNC	1	3	2	6
Cardiológico	1	7		8
Infeccion			2	2
Sin diagnóstico	12	15	20	47
	16	33	35	84

## Brief resolved unexplained events: Retrospective validation of diagnostic criteria and risk stratification

*Pediatric Pulmonology. 2019;54:61–65.*

Diagnostico	n	%
RGE	15	18
Respiratorio	6	7,1
SNC	6	7,1
Cardio	8	9,5
Infeccion	2	2,3
Sin diagnostico	47	56
	84	100



# Es el RGE responsable ?

- ▶ Es difícil determinar la causalidad con los métodos de estudio actuales
- ▶ Parecería que se producen demasiados eventos en una etapa de grandes y rápidos cambios en aspectos madurativos, que quizás determinen un periodo de vulnerabilidad
- ▶ Es necesario continuar buscando elementos que permitan descartar la mera casualidad de estos dos eventos.