

# EVENTOS RESPIRATORIOS EN LA INFANCIA

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cese

disminución

ALTE

irregularidad

BRUE

+

cambios en la coloración

# BRIEF RESOLVED UNEXPLAINED EVENTS (BRUE)

American Academy  
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

- **NO TIENE ETIOLOGÍA CONOCIDA LUEGO DE HISTORIA CLÍNICA Y EXAMEN FÍSICO**
- **LOS LACTANTES CON BRUE SE CLASIFICAN EN AQUELLOS CON BAJO RIESGO.**
- **$\geq 2$  m;  $\geq 32$ w;  $\geq 45$ wPC; NO RCP;  $< 1'$ ; 1º evento.**
- **CON ALTO RIESGO (DE RECURRENCIA O DE PADECER ENFERMEDADES DE BASE)**

### Practice Parameters for the Respiratory Indications for Polysomnography in Children

- **SOSPECHA DE APNEAS/HIPOAPNEAS OBSTRUCTIVAS** (standard)
- **SOSPECHA DE HIPOVENTILACIÓN ALVEOLAR CENTRAL** primaria o secundaria (standard)
- ALTE (guía)
- OSAS considerados casos quirúrgicos (guía)
- Seguimiento de soporte de CPAP (guía)



# APORTES DE LOS ESTUDIOS POLISOMNOGRÁFICOS

- EVALUACIÓN DEL ESTADO ELECTROFISIOLÓGICO EVOLUTIVO
- ANORMALIDADES EEG
- PATRON CARDIO RESPIRATORIO

- APNEA CENTRAL

- APNEA OBSTRUCTIVA

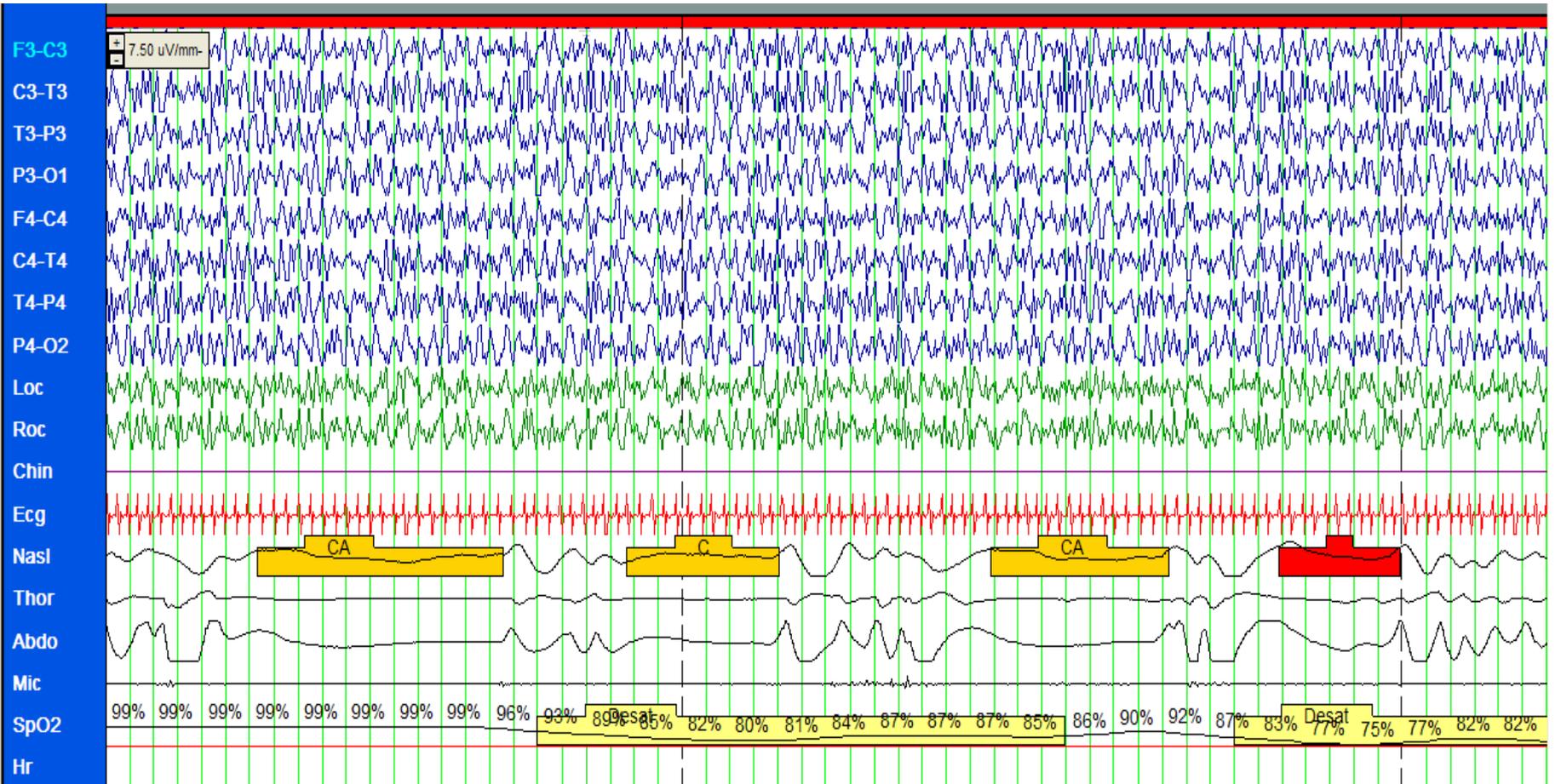
- APNEA MIXTA

- HIPOAPNEAS



# APNEA CENTRAL

- 20" O MÁS
- $\geq 2$  v + arousal/  $\Rightarrow$  3% sat
- $\geq 2$  v + bradicardia (50 lat/m 5'' ó 60 lat/m 15'')
- RESPIRACIÓN PERIÓDICA  $\geq 5\%$  TTS

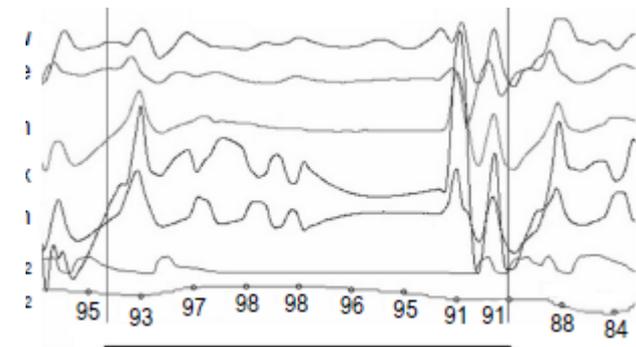
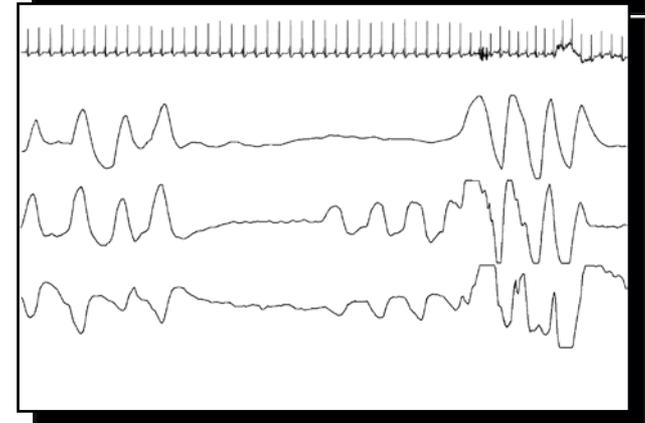
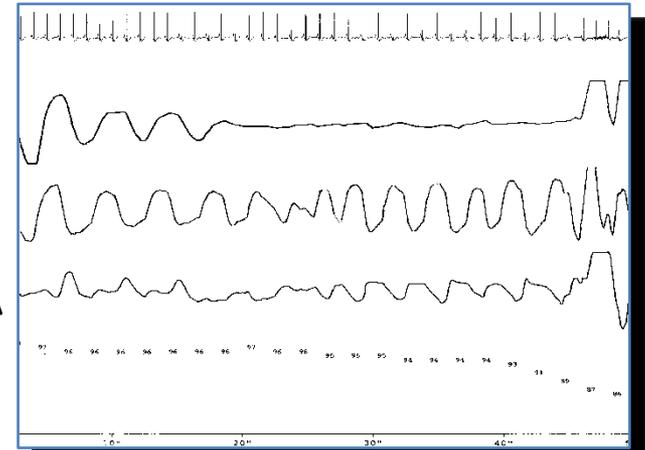


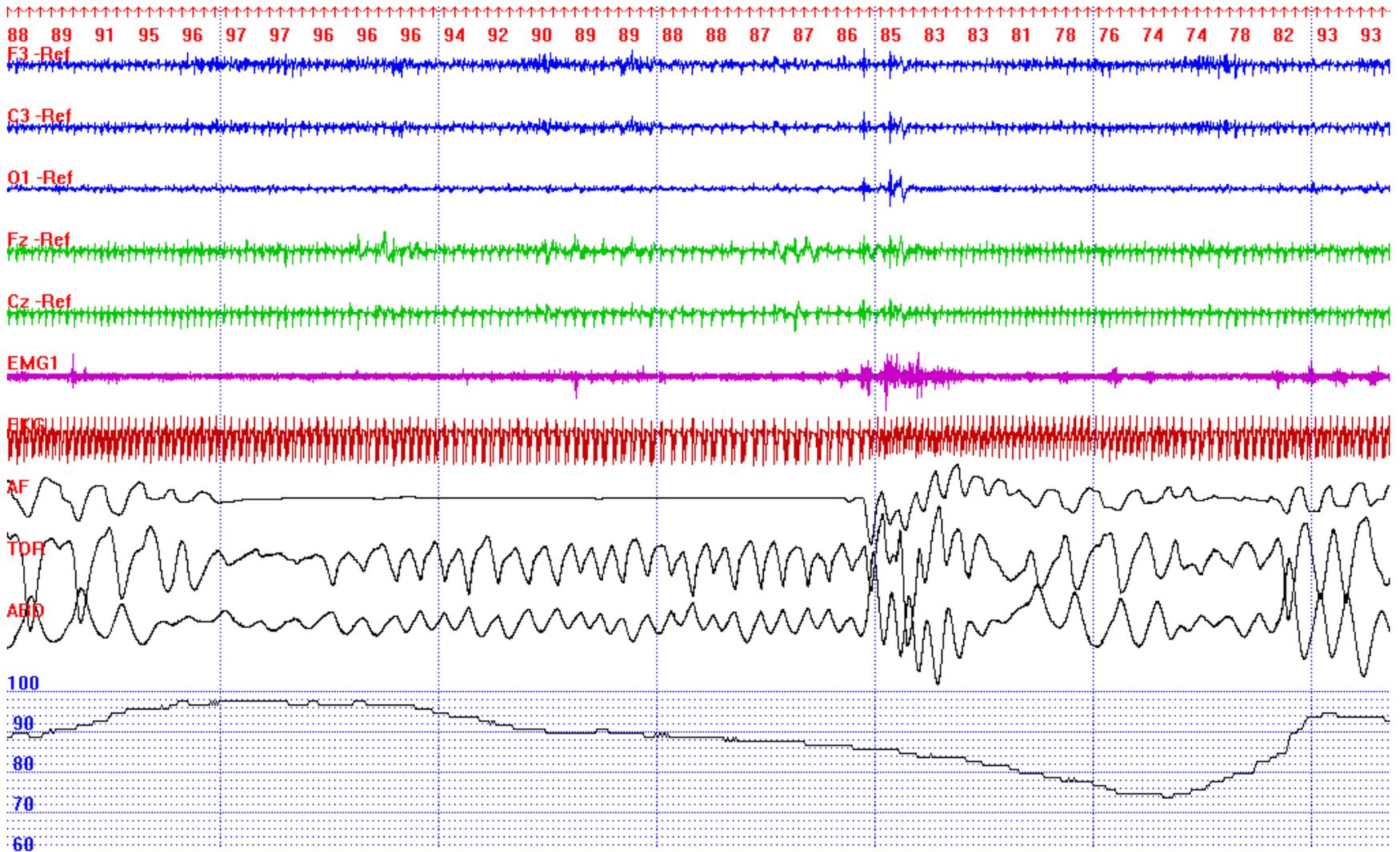
- **APNEA OBSTRUCTIVA**

- $\geq 2$  ventilaciones.

- **APNEA MIXTA**

- $\geq 2$  ventilaciones.

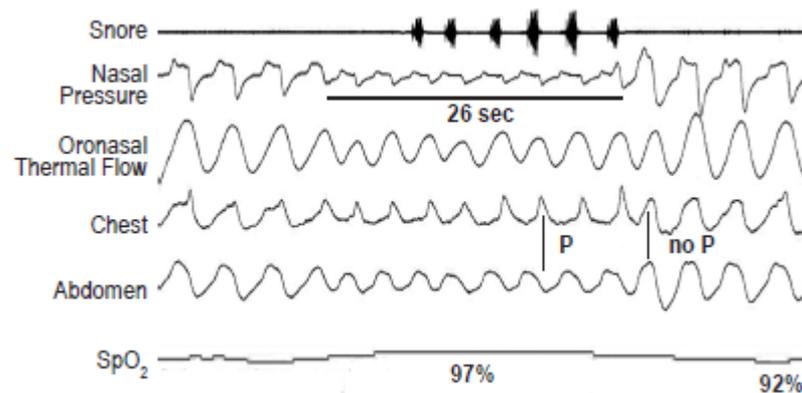




## Apnea Obstructiva

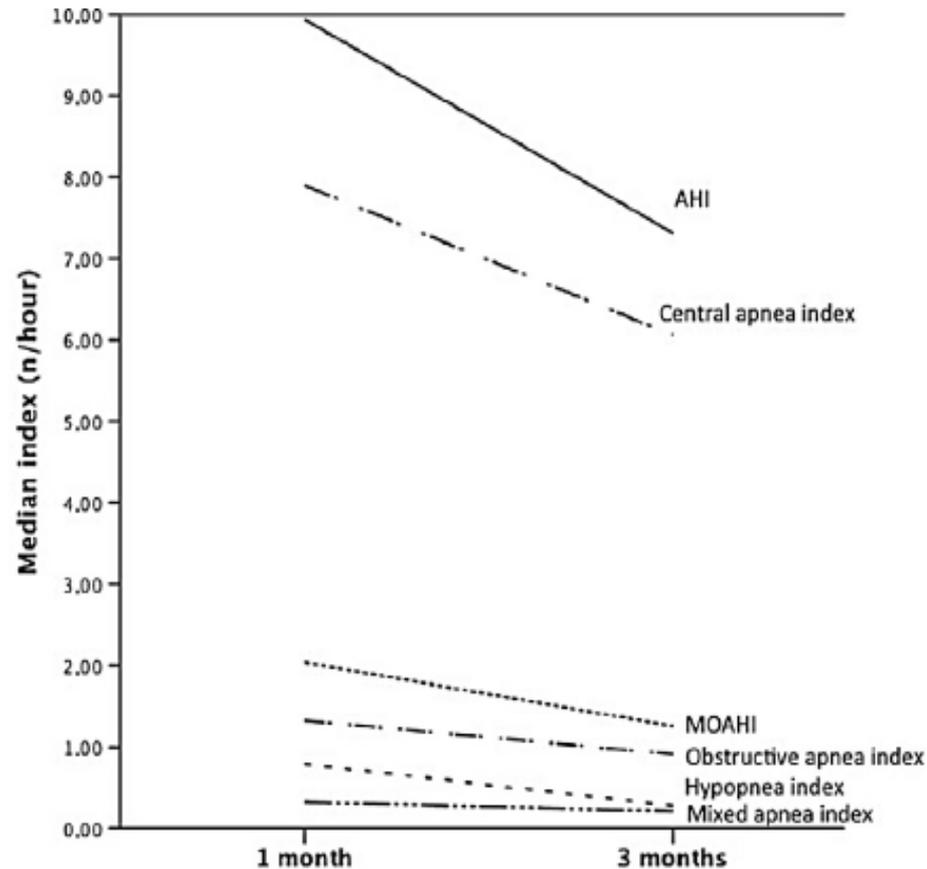
# HIPOAPNEA

- REDUCCION DE UN 30% DE LA VENTILACIÓN
- $\geq 2$  ventilaciones + arousal/  $\geq 3\%$  de sat.
- Pueden ser centrales u obstructivas



# VALORES DE REFERENCIA

*P.E. Brockmann et al./Sleep Medicine 14 (2013) 1323–1327*



**Fig. 1.** Changes of respiratory indices between the ages of 1 and 3 months. *Abbreviations:* AHI, apnea-hypopnea index; MOAHI, mixed obstructive apnea-hypopnea index.

# VALORES DE REFERENCIA

*P.E. Brockmann et al./Sleep Medicine 14 (2013) 1323–1327*

**Table 2**  
Descriptive statistics for cardiorespiratory events and indices during sleep at the age of 1 month.

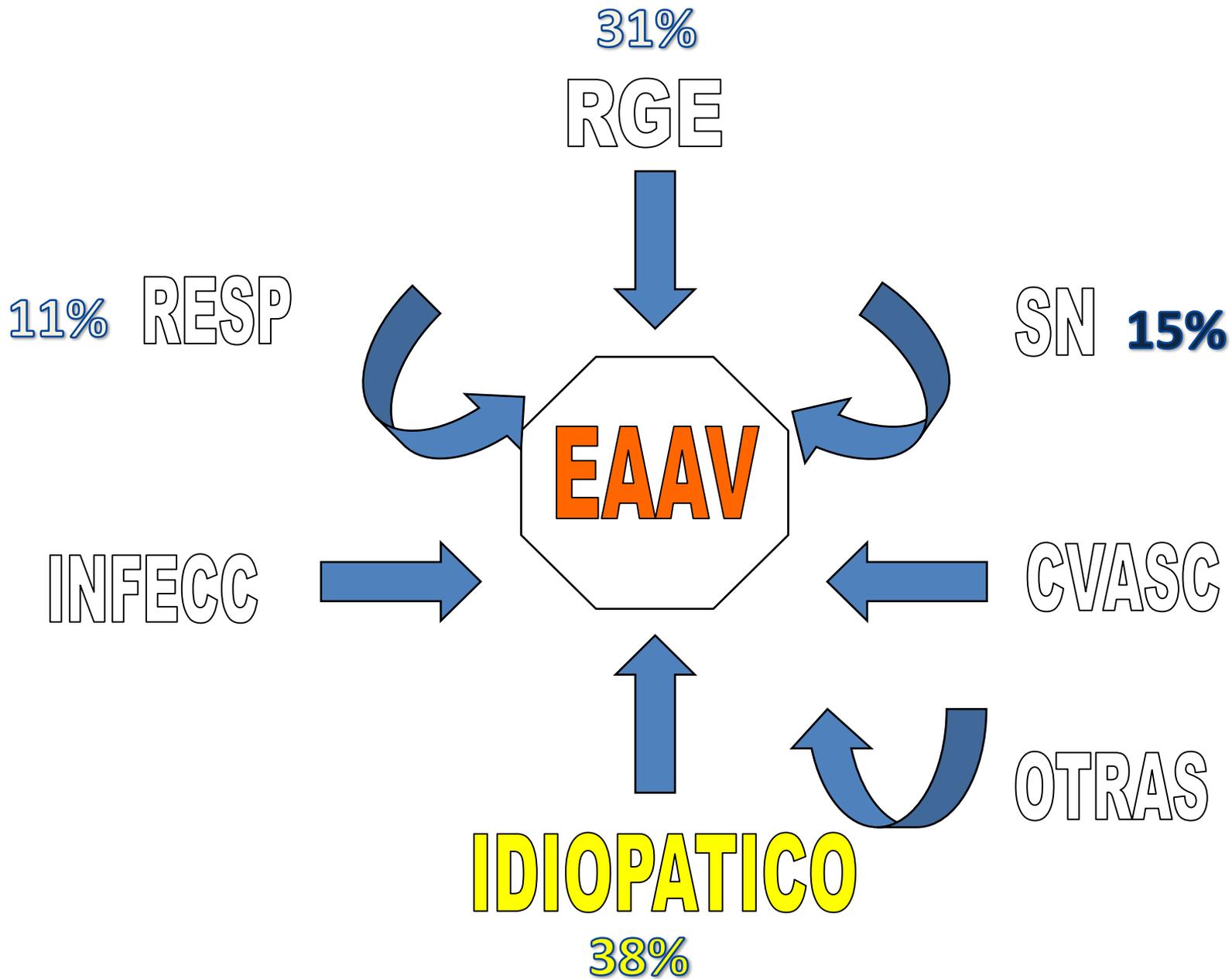
|   | Median | Minimum | 75th Centile | 95th Centile | Maximum |
|---|--------|---------|--------------|--------------|---------|
| <i>Indices (n/h)</i>                                    |        |         |              |              |         |
| Central apnea index                                     | 5.5    | 0.9     | 10.6         | 20.5         | 44.3    |
| Obstructive apnea index                                 | 0.8    | 0.1     | 3.2          | 5.1          | 6.7     |
| Mixed apnea index                                       | 0.3    | 0       | 0.4          | 1.1          | 1.2     |
| Hypopnea index  | 0.2    | 0       | 1.2          | 3.5          | 5.4     |
| Central apnea after sighs index                         | 1.3    | 0       | 1.8          | 3.1          | 3.4     |
| AHI   | 7.8    | 1.9     | 14.2         | 25.5         | 46.4    |
| MOAHI   | 1.5    | 0.2     | 2.6          | 5.8          | 7.0     |
| Index of desaturation events on $\geq 3\%$ points       | 8.2    | 2.2     | 16.2         | 24.9         | 36.8    |
| Index of desaturation events below 90% SpO <sub>2</sub> | 1.6    | 0       | 6.9          | 19.4         | 21.7    |
| Index of desaturation events below 85% SpO <sub>2</sub> | 0.2    | 0       | 0.8          | 5.2          | 6.4     |
| Index of desaturation events below 80% SpO <sub>2</sub> | 0      | 0       | 0.2          | 0.7          | 0.9     |
| <i>Duration of episodes (s)</i>                         |        |         |              |              |         |
| Central apnea   | 5.2    | 3.3     | 6.1          | 7.9          | 20.1    |
| Obstructive apnea                                       | 5.2    | 3.6     | 6.1          | 6.5          | 15.5    |
| Mixed apnea   | 6.9    | 0       | 7.9          | 12.0         | 14.3    |
| Hypopnea  | 6.0    | 0       | 8.9          | 9.9          | 10.2    |
| Central apnea after sighs                               | 8.2    | 5.3     | 9.4          | 11.7         | 13.3    |
| Periodic breathing (% of estimated sleep time)          | 1.1    | 0       | 2.0          | 8.9          | 10.4    |

*Abbreviations:* AHI, apnea-hypopnea index; MOAHI, mixed obstructive apnea-hypopnea index; n/h, number per hour; SpO<sub>2</sub>, oxygen saturation; s, second.

**Table 3**  
Descriptive statistics for cardiorespiratory events and indices during sleep at the age of 3 months.

|   | Median | Minimum | 75th Centile | 95th Centile | Maximum |
|---|--------|---------|--------------|--------------|---------|
| <i>Indices (n/h)</i>                                    |        |         |              |              |         |
| Central apnea index                                     | 4.1    | 1.2     | 7.8          | 24.2         | 27.3    |
| Obstructive apnea index                                 | 0.8    | 0       | 1.5          | 2.2          | 2.3     |
| Mixed apnea index                                       | 0.1    | 0       | 0.3          | 0.7          | 0.8     |
| Hypopnea index  | 0      | 0       | 0.2          | 0.7          | 3.1     |
| Central apnea after sighs index                         | 0.9    | 0       | 1.4          | 4.0          | 4.4     |
| AHI   | 4.9    | 1.7     | 9.7          | 26.4         | 27.4    |
| MOAHI   | 0.9    | 0.2     | 1.9          | 3.4          | 4.4     |
| Index of desaturation events on $\geq 3\%$ points       | 7.5    | 2.2     | 12.5         | 24.0         | 27.3    |
| Index of desaturation events below 90% SpO <sub>2</sub> | 2.6    | 0       | 3.8          | 13.3         | 14.8    |
| Index of desaturation events below 85% SpO <sub>2</sub> | 0.2    | 0       | 1.3          | 3.8          | 5.5     |
| Index of desaturation events below 80% SpO <sub>2</sub> | 0.9    | 0       | 0.3          | 1.0          | 1.6     |
| <i>Duration of episodes (s)</i>                         |        |         |              |              |         |
| Central apnea   | 5.1    | 3.1     | 6.0          | 9.1          | 9.5     |
| Obstructive apnea                                       | 5.1    | 2.9     | 5.7          | 7.8          | 8.5     |
| Mixed apnea   | 6.8    | 0       | 7.8          | 10.9         | 11.3    |
| Hypopnea  | 6.6    | 0       | 8.7          | 9.4          | 9.4     |
| Central apnea after sighs                               | 7.5    | 5.3     | 8.9          | 10.7         | 11.0    |
| Periodic breathing (% of estimated sleep time)          | 1.0    | 0       | 1.9          | 3.9          | 4.6     |

*Abbreviations:* AHI, apnea-hypopnea index; MOAHI, mixed obstructive apnea-hypopnea index; n/h, number per hour; SpO<sub>2</sub>, oxygen saturation; s, second.



# CRISIS-EVENTO RESPIRATORIO

- ¿Causa ?¿Consecuencia ?
- Dificultades diagnósticas

# CRISIS – EVENTO RESPIRATORIO

¿Causa ? ¿Consecuencia ?

Dificultades diagnósticas

- Recurrentes
- Sin patrón claro en cuanto al momento de aparición.
- Asociados a marcada cianosis, rigidez, ojos abiertos.
- Antecedentes personales, familiares.
- Examen neurológico y de desarrollo.
- Alt. EEG-apnea-desaturación-taquicardia

Pediatrics. 1994 Aug; 94(2 Pt 1):148-56. [Hewertson J](#), [Poets CF](#), [Samuels MP](#), [Boyd SG](#), [Neville BG](#), [Southall DP](#).

Journal of Child Neurology, Vol. 23, No. 11, 1305-1307 (2008) Jacob Genizi, MD, Giora Pillar , Israel

Arq Neuropsiquiatr ,2009; 67: 616-619 . Marques dos Anjos A, Lahorgue Nunes M.

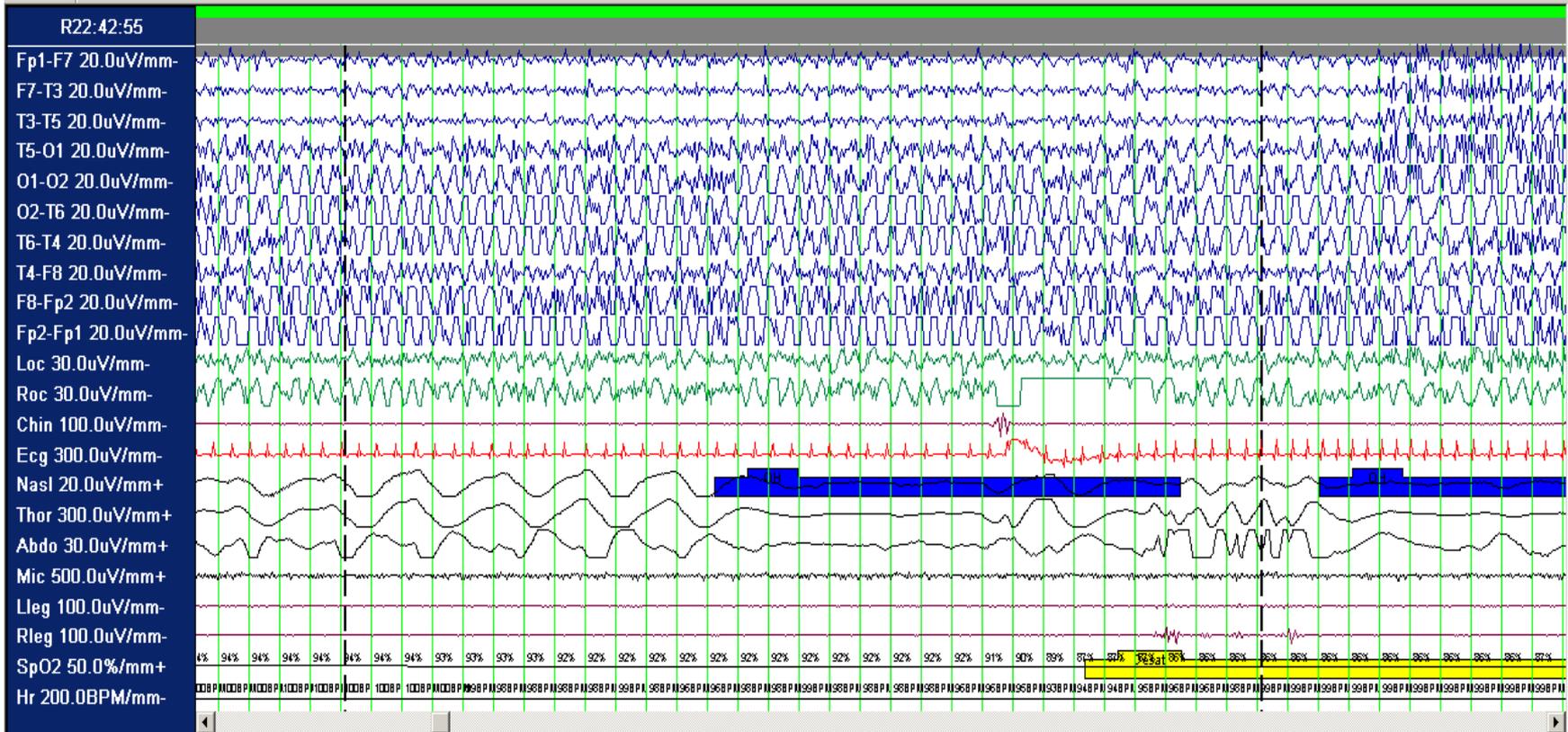


All Mixed B1 B2 Respiratory Detection

R22:43:00 Epoch120:723 StageU Pos:Left SpO2: 86 - 94 PAP:0.0\0.0 1  
PSG LF1 HF15



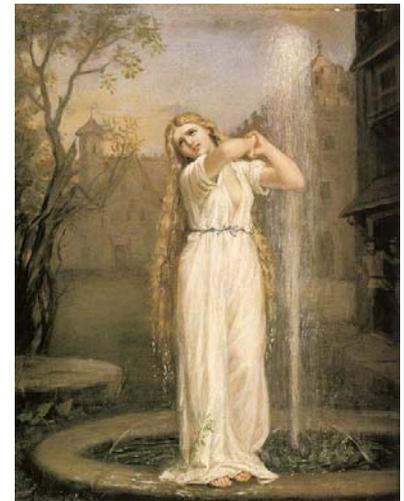
Navigation and control icons for the software interface.



Montage: HALO Time: 22:42:55 Time Scale: 44.8 s/page Time line interval: 1.0 s

# Síndrome de Hipoventilación Alveolar

- Defecto en el control automático de la ventilación por falla de los quimiorreceptores centrales (sensibles al aumento del CO<sub>2</sub>)
- **Primario:** (1 en 200 000 nacidos vivos/ 0.005 por mil) . Debe sospecharse en casos de hipoventilación sostenida durante el sueño **en ausencia** de patología cardiopulmonar o neuromuscular. Cromosoma 4p12 (PHOX 2b)
- **Secundario:** Arnold Chiari, siringobulbia, enf. mitocondriales (Sind. de Leigh), sind de Rett.



[John William Waterhouse](#) (1872)

# SINDROME DE HIPOVENTILACION ALVEOLAR PRIMARIO

- Hipercapnia ( $+ 60$ ) en NO REM
- Hipercapnia en REM
- Hipercapnia en Vigilia
- Falta de respuesta ventilatoria y de despertar al aumento de la  $CO_2$  durante el sueño (fallo de los quimiorreceptores centrales).
- La administración de  $O_2$  empeora la hipertensión pulmonar



NEW RESEARCH

JCSM  
Journal of Clinical  
Sleep Medicine

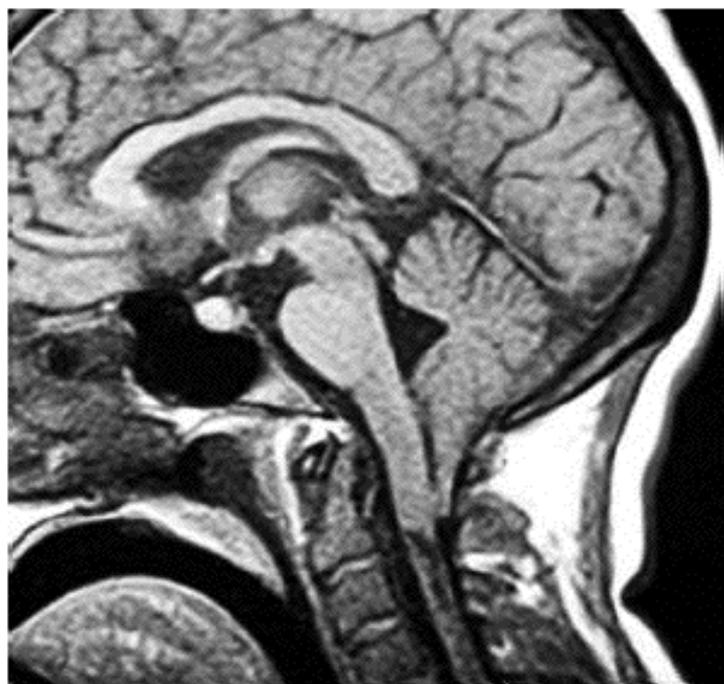
<http://dx.doi.org/10.5664/jcsm.3542>

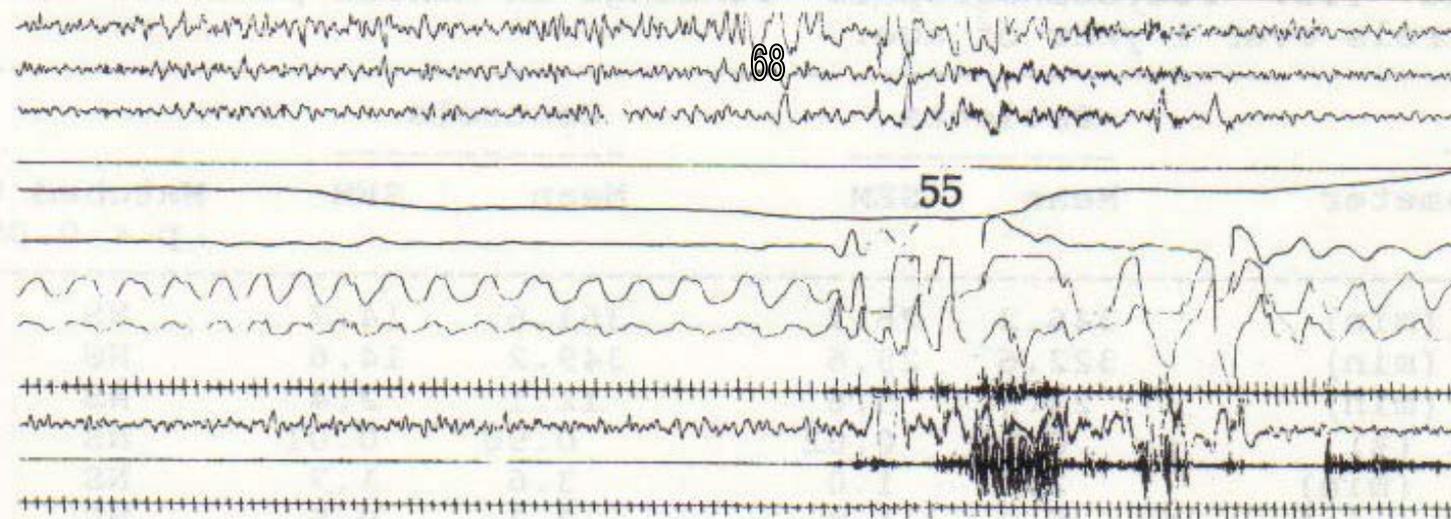
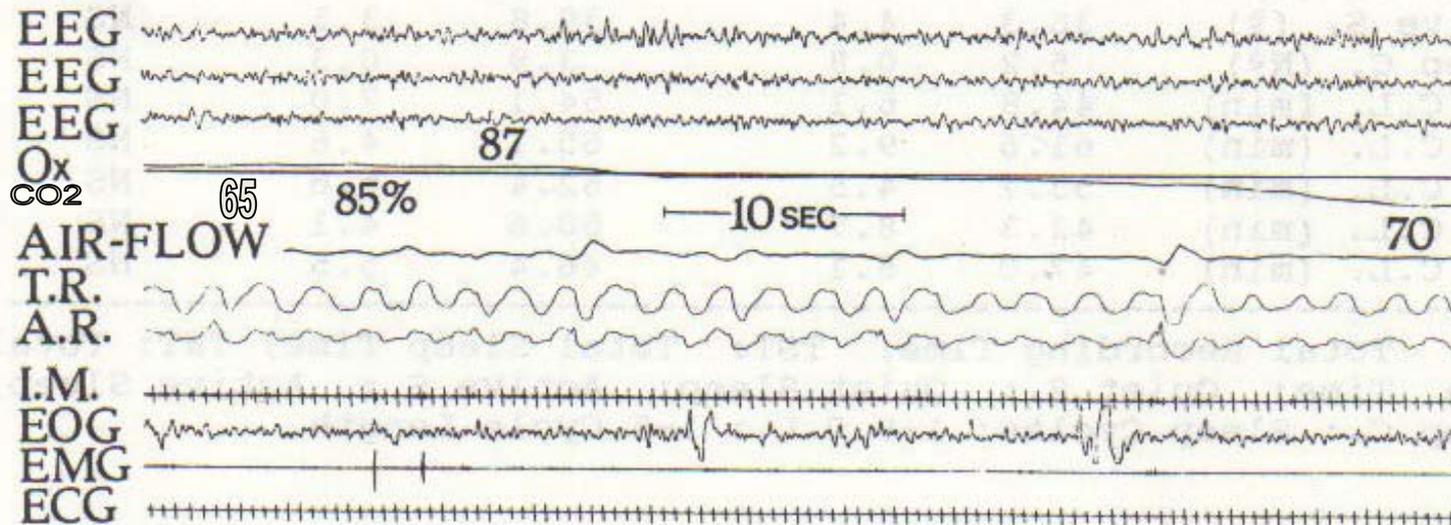
## **A Case of Congenital Central Hypoventilation Syndrome with a Novel Mutation of the *PHOX2B* Gene Presenting as Central Sleep Apnea**

Yuko Amimoto, M.D.<sup>1</sup>; Kenji Okada, Ph.D.<sup>1</sup>; Hiroshi Nakano, Ph.D.<sup>2</sup>; Ayako Sasaki, Ph.D.<sup>3</sup>; Kiyoshi Hayasaka, Ph.D.<sup>3</sup>; Hiroshi Odajima, Ph.D.<sup>1</sup>

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*Journal of Clinical Sleep Medicine, Vol. 10, No. 3, 2014*





**Encabo H; Mazzola ME; Carrara G; Picco P.**  
**New Trends in Pediatric Neurology; 1993. Fejerman and Chamoles eds**

- Las alteraciones respiratorias en los lactantes son manifestaciones clínicas de causas múltiples
- Su base neurológica es relativamente frecuente y en un importante porcentaje de los casos el diagnóstico es retrospectivo
- La polisomnografía NO es mandatoria en los casos de BRUE de bajo riesgo y debe considerarse según el criterio clínico en los **casos severos**.

MUCHAS GRACIAS



# BRIEF RESOLVED UNEXPLAINED EVENTS (BRUE)

- ES UN DIAGNÓSTICO MÉDICO NO LA PERCEPCIÓN DE UN EXPECTADOR
- EVENTO REPENTINO, **BREVE** (MENOR DE 1´) Y **RESUELTO**, QUE LE OCURRE EN UN **LACTANTE**, CARACTERIZADO POR  $\geq 1$ :
  1. CAMBIO DE **COLORACIÓN**: CIANOSIS O PALIDEZ
  2. CAMBIO EN EL **TONO** MUSCULAR
  3. ALTERACION DE LA **CONCIENCIA**
  4. AUSENCIA,  
DISMINUCIÓN  
IRREGULARIDAD **RESPIRATORIA**

