Klgo. José Mauricio Landeros

UPCP Hospital de Niños Roberto del Río

Consideraciones especiales para la ventilación mecánica en pediatría

KINESIOLOGIA INTENSIVA
K.I.
CHILE

V M K CHILE
VENTILACION MECANICA Y KINESIOLOGIA

Preguntas

- ¿Hay algún modo ventilatorio preferente en pediatría?
- ¿Existe algún resultado relevante a favor de algún modo ventilatorio en especial?
- ¿El control del volumen corriente es relevante en el SDRAP?
- ¿Se debe seguir usando VAFO en pediatría?
- ¿Hay un rol para la VMNI inicial en pacientes agudos hipoxémicos?

Concise Clinical Review

The Design of Future Pediatric Mechanical Ventilation Trials for Acute Lung Injury

Robinder G. Khemani[1] and Christopher J. L. Newth[1]

[1]University of Southern California, Keck School of Medicine, Children's Hospital Los Angeles, Los Angeles, California

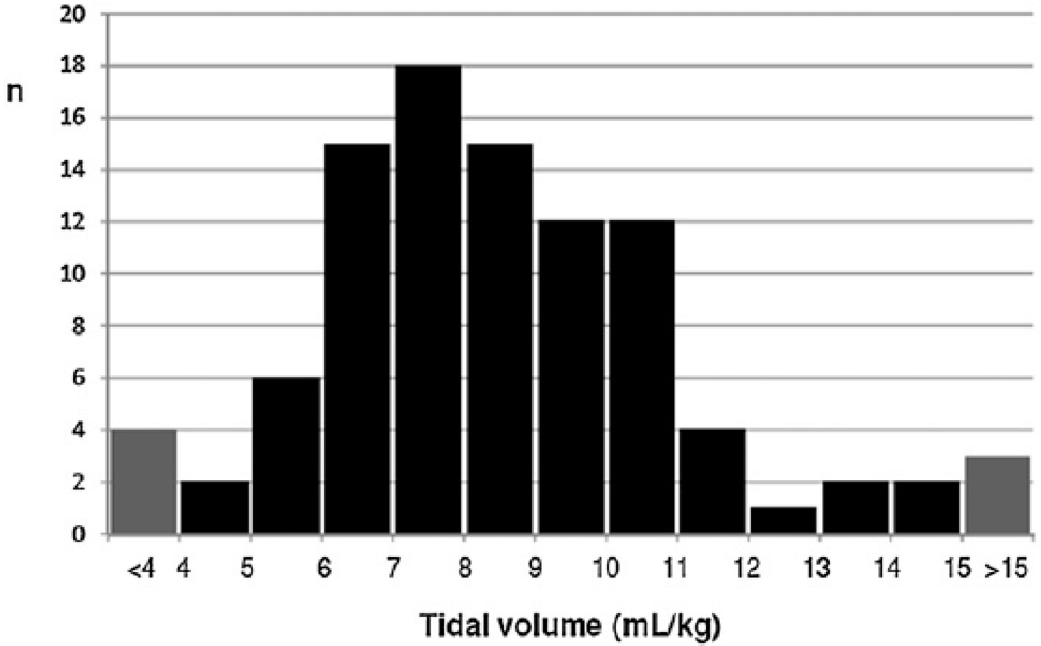


Figure 1. Distribution of VT in ml/kg of actual body weight from 75 patients with acute lung injury/acute respiratory distress syndrome across 59 pediatric intensive care units in Europe and North America. There was significant variability in management, with VT available on less than half of the 165 patients. Pediatric intensivists embraced a "low" VT (median, 7 ml/kg; interquartile range, 6–9) strategy. Reprinted by permission from Referenc

Am J Respir Crit Care Med Vol 182. pp 1465–1474, 2010

- Preferencia por modos de Controlados por Presión y modos duales controlados por volumen pero limitados por presión

Estrategias Protectoras:

PC: PIM < 35 cmH2O/ FR < 35 rpm

VCRP: Vt para Pplat < 30 cmH2O

DPA/SDRA

Am J Respir Crit Care Med Vol 182. pp 1465–1474, 2010

JOURNAL OF LAPAROENDOSCOPIC & ADVANCED SURGICAL TECHNIQUES
Volume 21, Number 7, 2011

DOI: 10.1089/lap.2011.0051

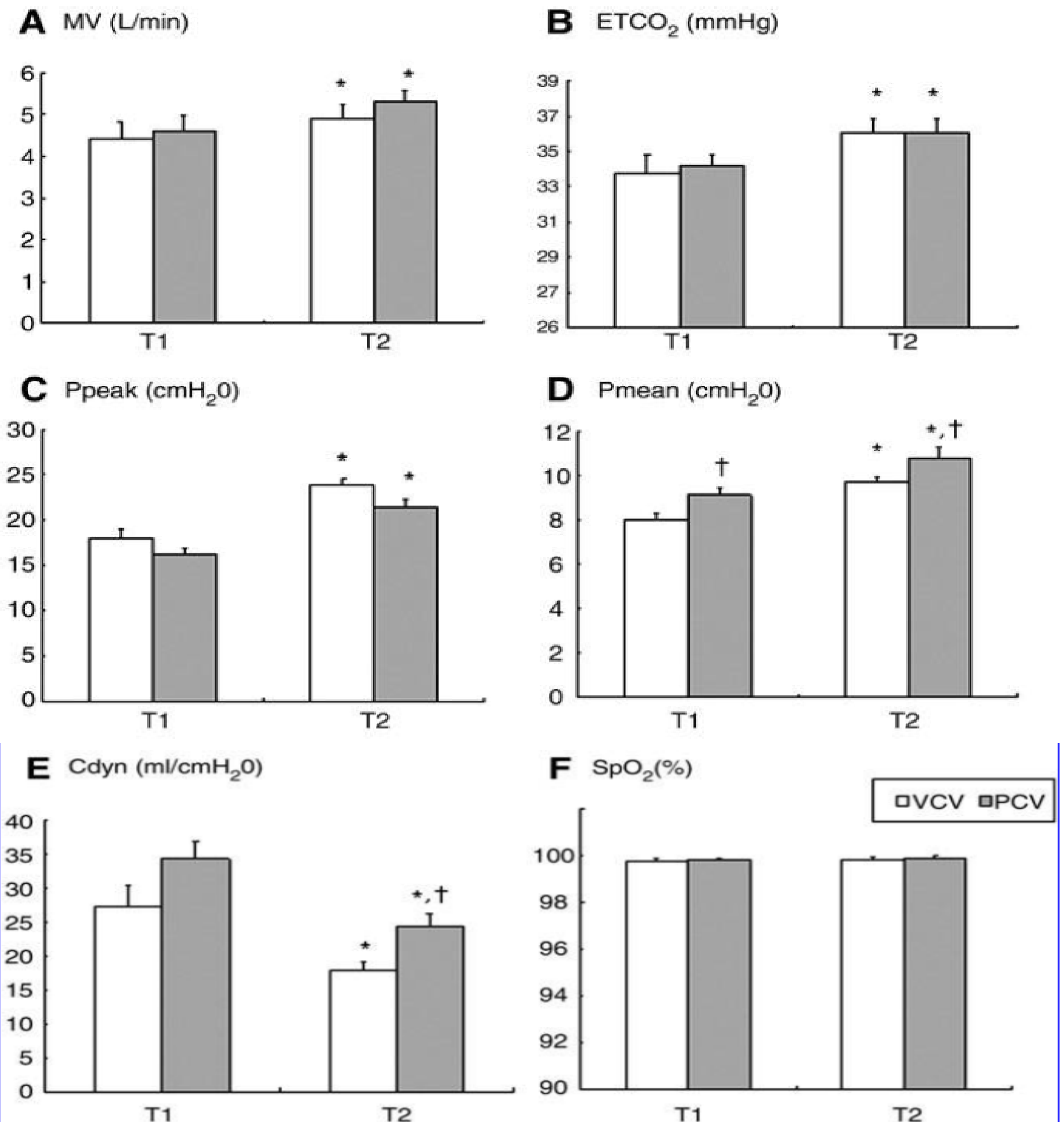
Full Report: Pediatrics

Effect of Pressure- Versus Volume-Controlled Ventilation on the Ventilatory and Hemodynamic Parameters During Laparoscopic Appendectomy in Children: A Prospective, Randomized Study

Ji Young Kim, MD,[1,2] Cheung Soo Shin, MD,[1,2] Kyung Cheon Lee, MD,[3]
Young Jin Chang, MD,[3] and Hyun Jeong Kwak, MD[3]

Table 2. The Changes of Hemodynamic Parameters During Laparoscopic Appendectomy

	VCV (n=*17*)		*PCV* (n=*17*)	
	T1	*T2*	*T1*	*T2*
SBP (mmHg)	102±15	113±14[a]	106±9	108±28
MBP (mmHg)	77±12	88±14[a]	77±8	91±13[a]
DBP (mmHg)	59±16	69±13[a]	56±9	71±13[a]
HR (beats/min)	101±16	100±16	91±13	91±15



Mechanical Ventilation Strategies in Children With Acute Lung Injury: A Survey on Stated Practice Pattern*

Miriam Santschi, MD[1]; Adrienne G. Randolph, MD[2]; Peter C. Rimensberger, MD[3]; Philippe Jouvet, MD[4]; for the Pediatric Acute Lung Injury Mechanical Ventilation (PALIVE) Investigators, the Pediatric Acute Lung Injury and Sepsis Investigators Network (PALISI), and the European Society of Pediatric and Neonatal Intensive Care (ESPNIC)

Objectives: The aim of this survey was to determine North American and European pediatric intensivists' knowledge and stated practice in the management of children with acute respiratory distress syndrome with regard to mechanical ventilation settings; blood gas and So_2 targets; and use of adjunctive treatments at sites where actual practice had just been assessed.

Design and Setting: A survey using three case scenarios to assess mechanical ventilation strategies used in children with acute respiratory distress syndrome was sent out toward the end of data collection to all centers participating in the Pediatric Acute Lung Injury Mechanical Ventilation study (59 PICUs in 12 countries). For each case scenario, intensivists were asked to report the optimal mechanical ventilation parameters; blood gas and So_2 acceptable targets; and threshold for considering high-frequency oscillatory ventilation, and other adjunctive treatments.

Participants: Fifty-four pediatric intensivists, representing 47 centers from 11 countries.

Interventions: None.

Measurements and Main Results: Many pediatric intensivists reported using a tidal volume of 5–8 mL/kg (88–96%) and none reported using a tidal volume above 10 mL/kg. On average, the upper threshold of positive inspiratory pressure at which intensivists would consider another ventilation mode was 35 cm H_2O. Permissive hypercapnia and mild hypoxemia (So_2 as low as 88%) was considered tolerable by many pediatric intensivists. Finally, a large proportion of pediatric intensivists reported they would use adjunctive treatments (nitric oxide, prone position, extracorporeal membrane oxygenation, surfactant, steroids, β-agonists) if the patient's condition worsened.

Conclusions: Although in theory, many pediatric intensivists agreed with adult recommendations to ventilate with lower tidal volumes and pressure limits, the Pediatric Acute Lung Injury Mechanical Ventilation data revealed that over 25% of pediatric patients with acute lung injury/acute respiratory distress syndrome at many of these practice sites were ventilated with tidal volumes above 10 mL/kg and that high positive inspiratory pressure levels (> 35 mm Hg) were often tolerated. (*Pediatr Crit Care Med* 2012; 14:e332–e337)

Key Words: acute lung injury; child; mechanical ventilation; respiratory distress syndrome

*See also p. 732.

[1]Department of Pediatrics, Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, Canada.

[2]Department of Anesthesia, Boston Children's Hospital, Boston, MA.

[3]Division of Pediatric and Neonatal Intensive Care, Department of Pediatrics, University Hospital of Geneva, Geneva, Switzerland.

[4]Department of Pediatrics, Division of Pediatric Critical Care Medicine, Hôpital Sainte-Justine, Montréal, Canada.

The PALIVE study was supported, in part, by the Réseau en santé respiratoire du FRSQ and a grant of the Réseau mère enfant de la Francophonie.

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For information regarding this article, E-mail: Miriam.Santschi@USherbrooke.ca

DOI: 10.1097/PCC.0b013e31828a89a2

Acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) are life-threatening conditions of acute pulmonary inflammation, alveolar edema, and hypoxemia that often lead to respiratory failure. ALI/ARDS are associated with a reported mortality of 8% to 35% in recent studies (1–5). There is evidence that adopting a lung protective ventilation strategy reduces mortality in adult patients (6–10). Guidelines for mechanical ventilation strategies for adult patients with ALI/ARDS include the following: 1) Target a tidal volume of 6 mL/kg (predicted) body weight; 2) Limit plateau pressures to less than or equal to 30 cm H_2O; 3) Allow permissive hypercapnia if needed to achieve these plateau pressures and tidal

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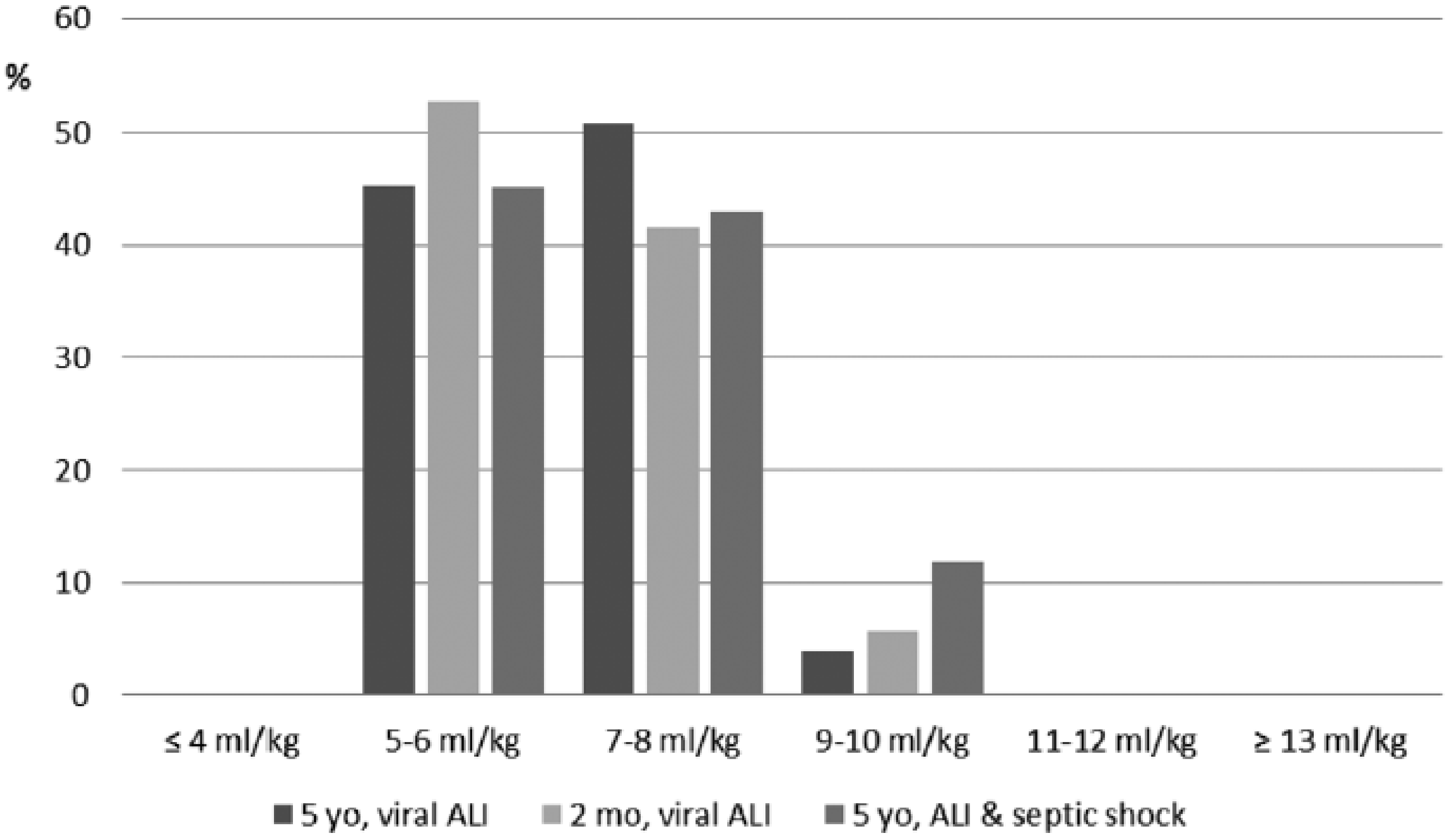
3 casos clínicos
5 años; BNM viral; Infiltrados Bilat; HD adecuada
2 años; BNM viral; Infiltrados Bilat; HD adecuada
5 años; Shock séptico; Infiltrados Bilat; Vasoactivos

Modo ventilatorio:
PC; FiO2 0,75; PEEP 5 cmH2O; PIP 35 cmH2O;
Vtesp 10 ml/Kg; FR 2 años 40 rpm; FR 5 años 25 rpm

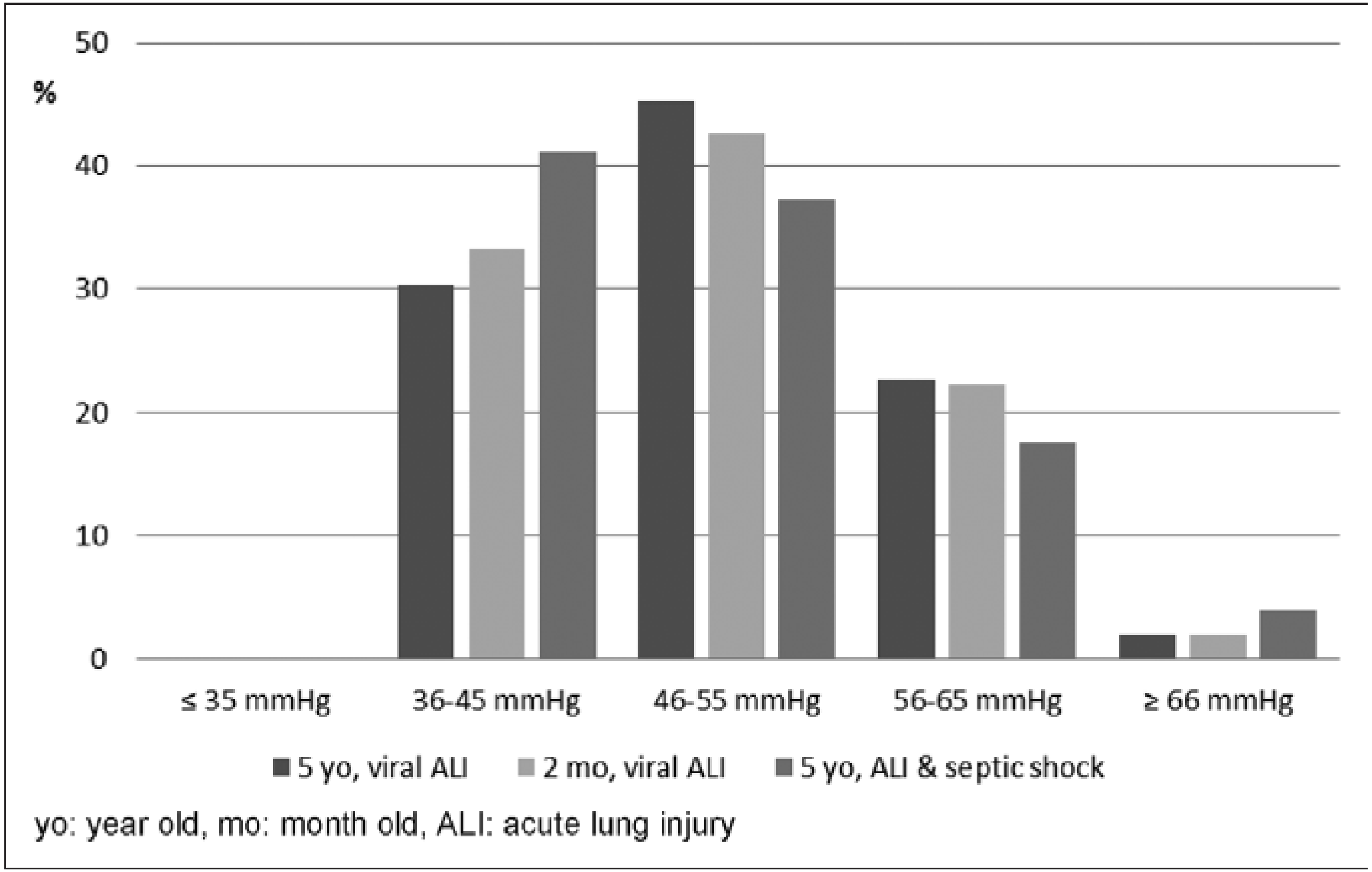
Qué Vt utilizaría
Qué PaCO2 toleraría
Con qué nivel de IOx consideraría VAFO
Qué tratamiento adyuvante consideraría si hay agravamiento

September 2013 • Volume 14 • Number 7

Vt



yo: year old, mo: month old, ALI: acute lung injury,



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PaCO2 tolerada según caso

- 4 % no usaría VAFO
- 44 % lo usaría en base a otros criterios
- 4 % usaría VAFO si IOx 6-9 en cualquiera de los 3 casos
- Si IOx 10-19: 41 % inicia VAFO en Caso 1

  43 % inicia VAFO en Caso 2

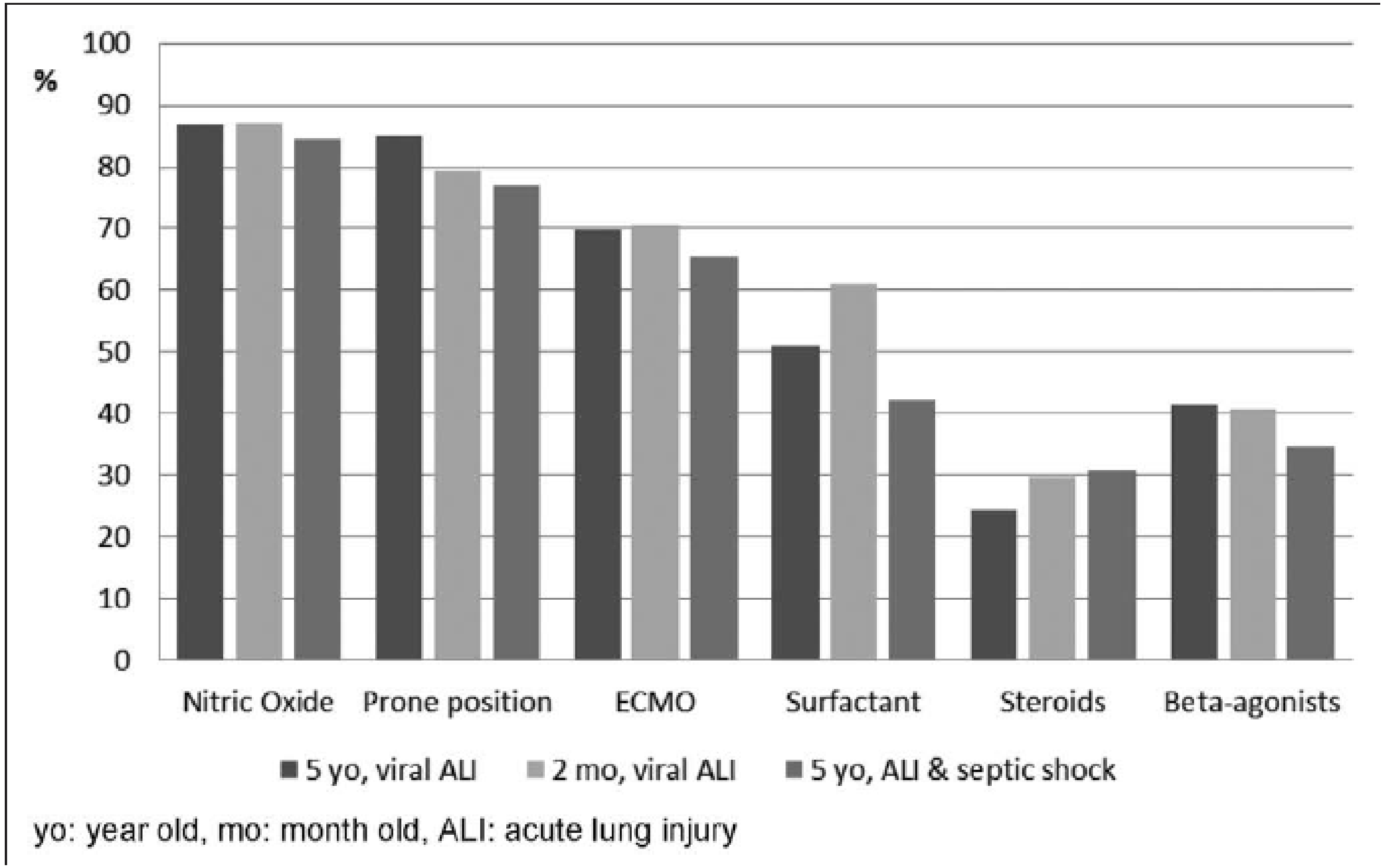
  38 % inica VAFO en Caso 3
- Si IOx 20-29: 48 % inicia VAFO en Caso 1

  50 % inicia VAFO en Caso 2

  54 % inicia VAFO en Caso 3
- Si IOx 30-39: 7% inicia VAFO en Caso 1

  4 % inicia VAFO en Casos 2 y 3

VAFO, criterio de selección según IOx



Terapias asociadas

Volumen corriente

SDRA v/s SDRAP

Intensive Care Med (2009) 35:1428–1437
DOI 10.1007/s00134-009-1527-z

PEDIATRIC ORIGINAL

Robinder G. Khemani
David Conti
Todd A. Alonzo
Robert D. Bart III
Christopher J. L. Newth

Effect of tidal volume in children with acute hypoxemic respiratory failure

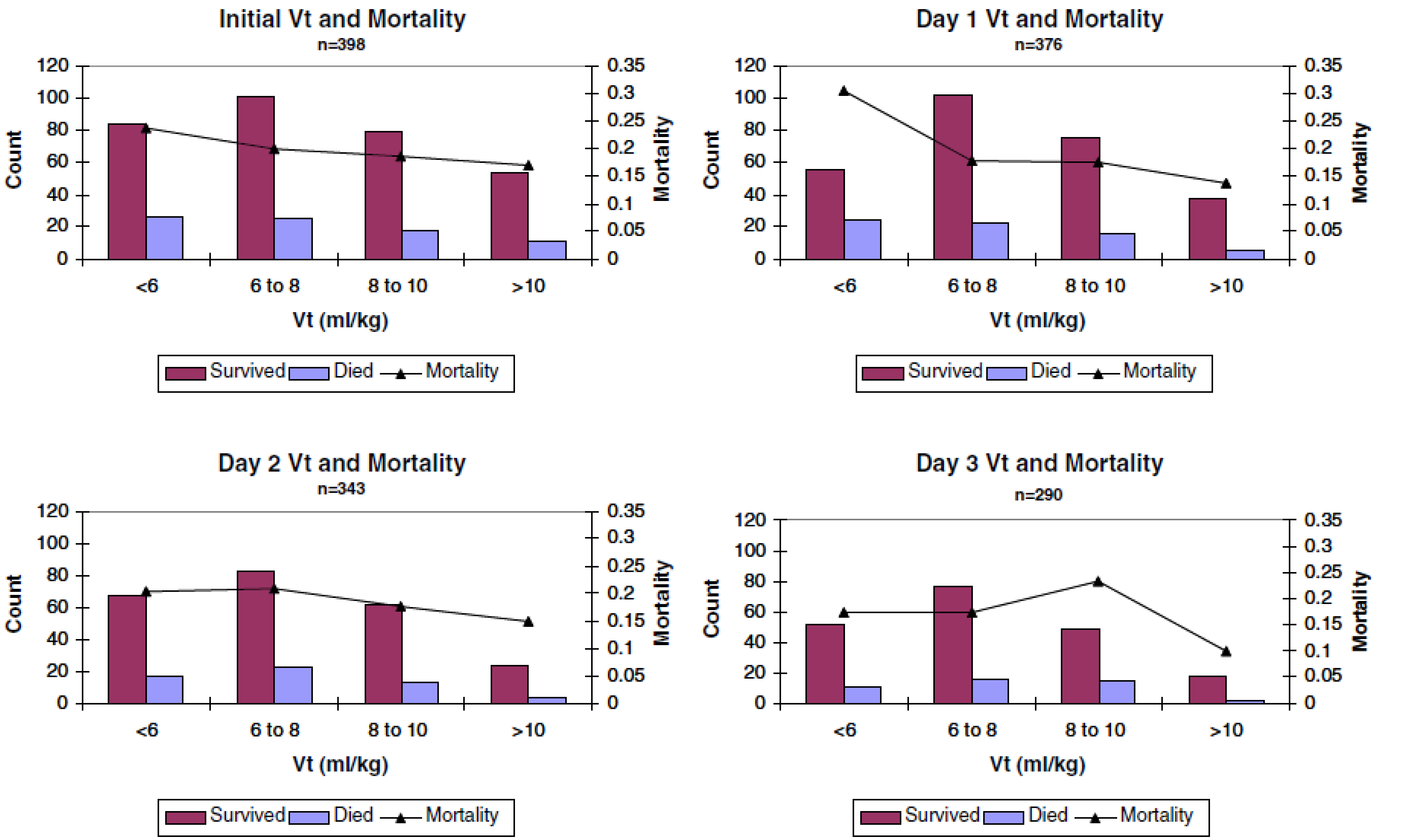
Table 1 Univariate analysis by survival

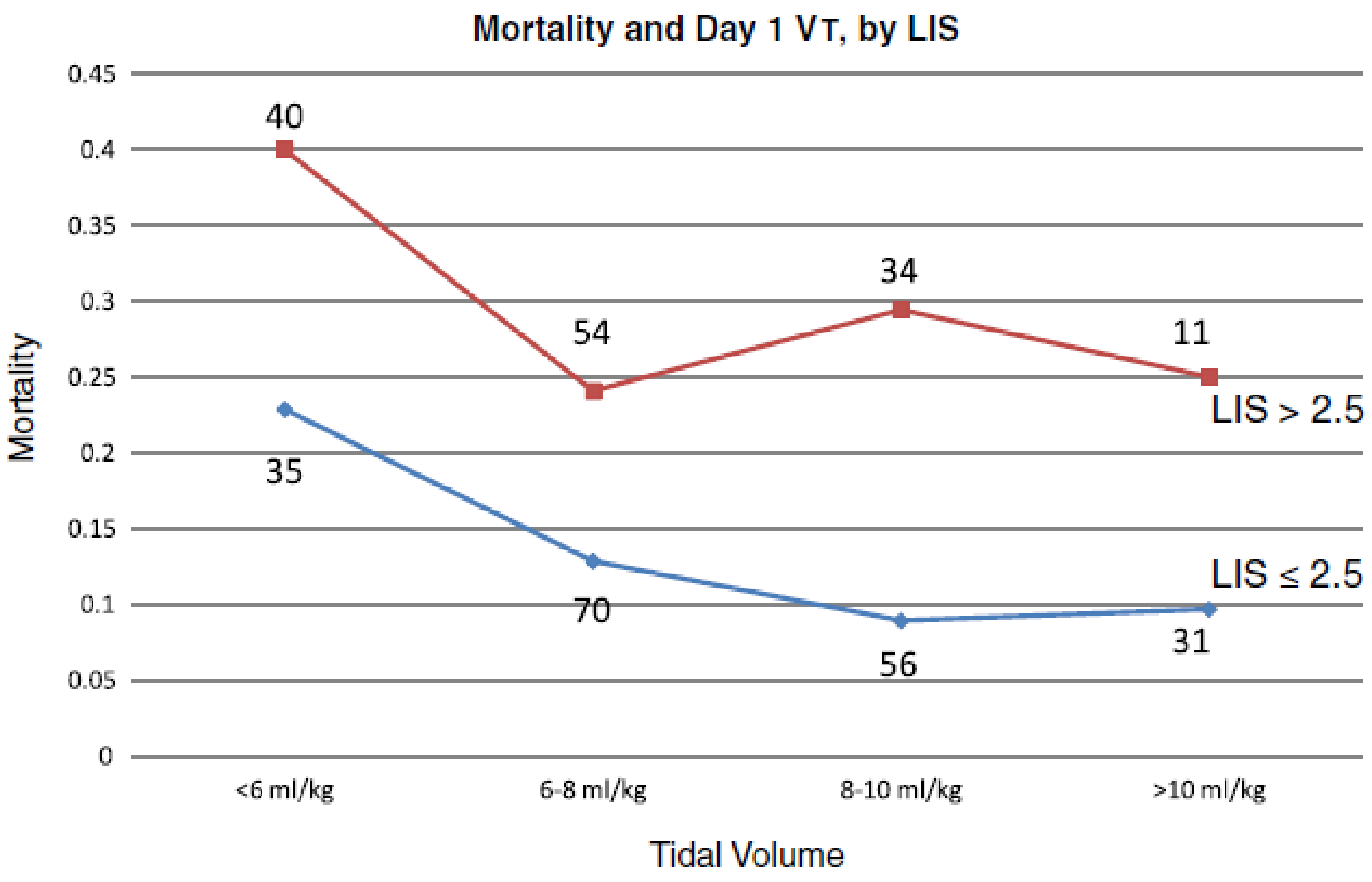
	All $n = 398$	Survived $n = 318$	Died $n = 80$	P value
Weight (kg)	16 (8, 36)	15 (9, 34)	17 (8, 44)	0.73
Age (years)	4.3 (1, 11.5)	3.9 (1, 10.9)	5.9 (0.8, 12.5)	0.73
Race				
Latino	194 (48.7)	157 (49.4)	37 (46.3)	0.71
White	74 (18.6)	56 (17.6)	18 (22.5)	0.40
Black	45 (11.3)	35 (11)	10 (12.5)	0.86
Other	85 (21.4)	70 (22)	15 (18.8)	0.63
Male	227 (57)	180 (56.6)	47 (58.8)	0.83
CXR bilateral infiltrates	192 (48.2)	148 (46.5)	44 (55)	0.22
PRISM Probability of death	0.57 (0.26, 0.86)	0.49 (0.22, 0.79)	0.87 (0.56, 0.97)	<0.001
Admission diagnosis				OR (95% CI)
Parenchymal lung disease[a]	117 (29.4)	92 (28.9)	25 (31.3)	Reference
Other respiratory disease	30 (7.5)	23 (7.2)	7 (8.8)	1.47 (0.57, 3.81)
Shock or sepsis	43 (10.8)	29 (9.1)	14 (17.5)	2.33 (1.08, 5.04)
Trauma	16 (4)	12 (3.8)	4 (5)	1.61 (0.48, 5.41)
Neurologic compromise	50 (12.6)	37 (11.6)	13 (16.3)	1.70 (0.79, 3.65)
Metabolic/renal disease	24 (6)	22 (6.9)	2 (2.5)	0.44 (0.10, 1.99)
Other diagnosis	28 (7)	21 (6.6)	7 (8.8)	1.61 (0.62, 4.20)
Gastrointestinal diagnosis	61 (15.3)	53 (16.7)	8 (10)	0.73 (0.31, 1.73)
Orthopedic diagnosis[b]	29 (7.3)	29 (9.1)	0 (0)	0 (0, 0.27)

Continuous variables expressed as median and interquartile range. Categorical variables expressed as count and percentage

[a] Parenchymal lung disease used as baseline group for computation of odds ratios for diagnostic category for admission
[b] Orthopedic diagnosis was primarily scoliosis

- 90 % ventilados en modos PC


Initial Vt and Mortality
n=398
Day 1 Vt and Mortality
n=376
Day 2 Vt and Mortality
n=343
Day 3 Vt and Mortality
n=290
Count
Mortality
120
100
80
60
40
20
0
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
<6
6 to 8
8 to 10
>10
Vt (ml/kg)
Survived
Died
Mortality



Mortalidad, Vt y Score de Daño Pulmonar

Revisiones sinópticas basadas en la evidencia

- http://pedsccm.org/view-review.php?id=982

PedsCCM.org
THE PEDIATRIC CRITICAL CARE MEDICINE WEBSITE

The Laura P. and Leland K. Whittier
Virtual Pediatric Intensive Care Unit

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Reviews SYSTEMATIC REVIEW

Criteria abstracted from The Users' Guides to the Medical Literature series in JAMA

***Tidal Volume and Mortality in Mechanically Ventilated Children: A Systematic Review and Meta-Analysis of Observational Studies.**

de Jager P, Burgerhof JG, van Heerde M, Albers MJ, Markhorst DG, Kneyber MC Crit Care Med 2014 42; 2461-72

Abstract

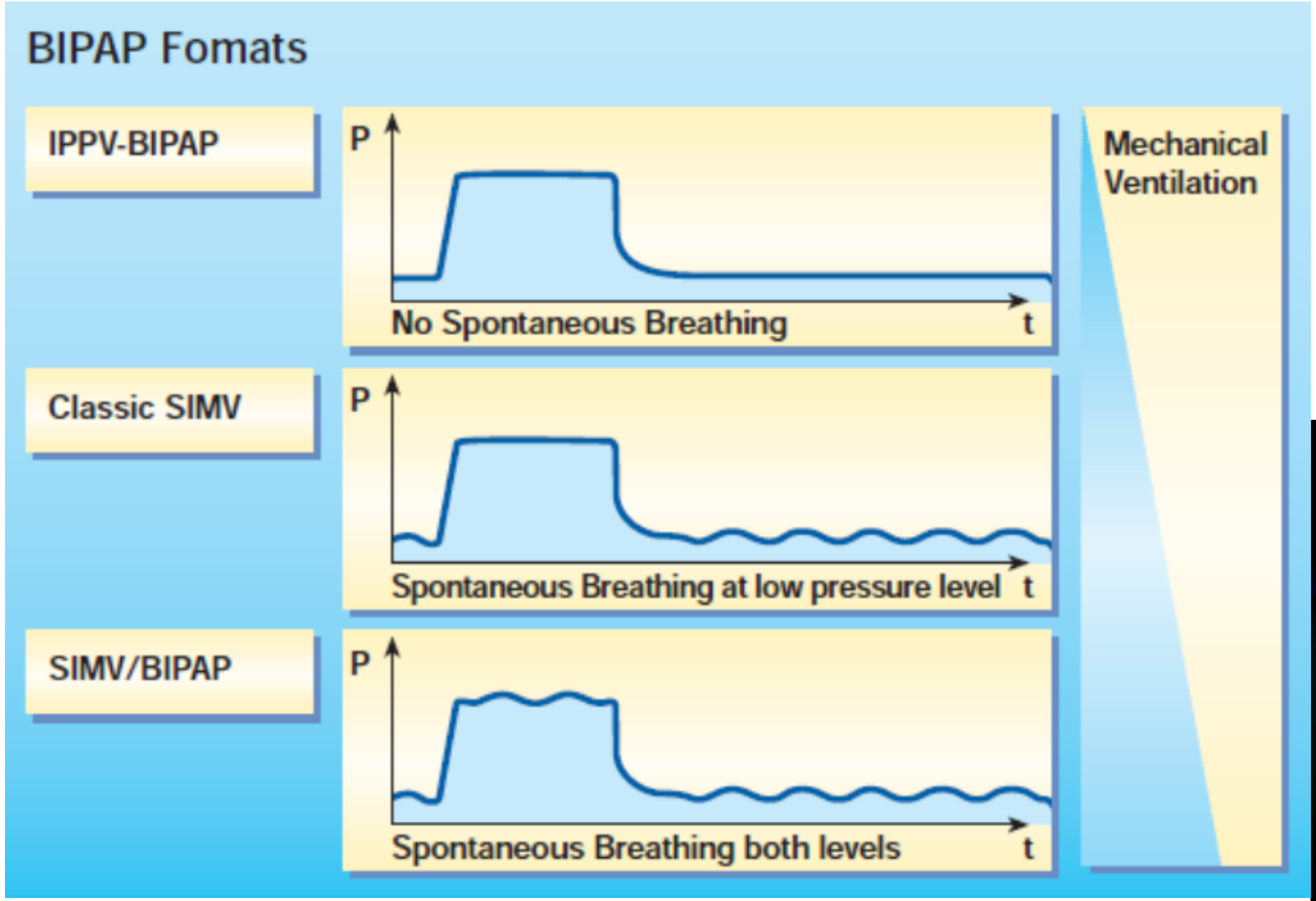
Review by: Gina Kim MD MPH, Children's Hospital Los Angeles, Los Angeles CA

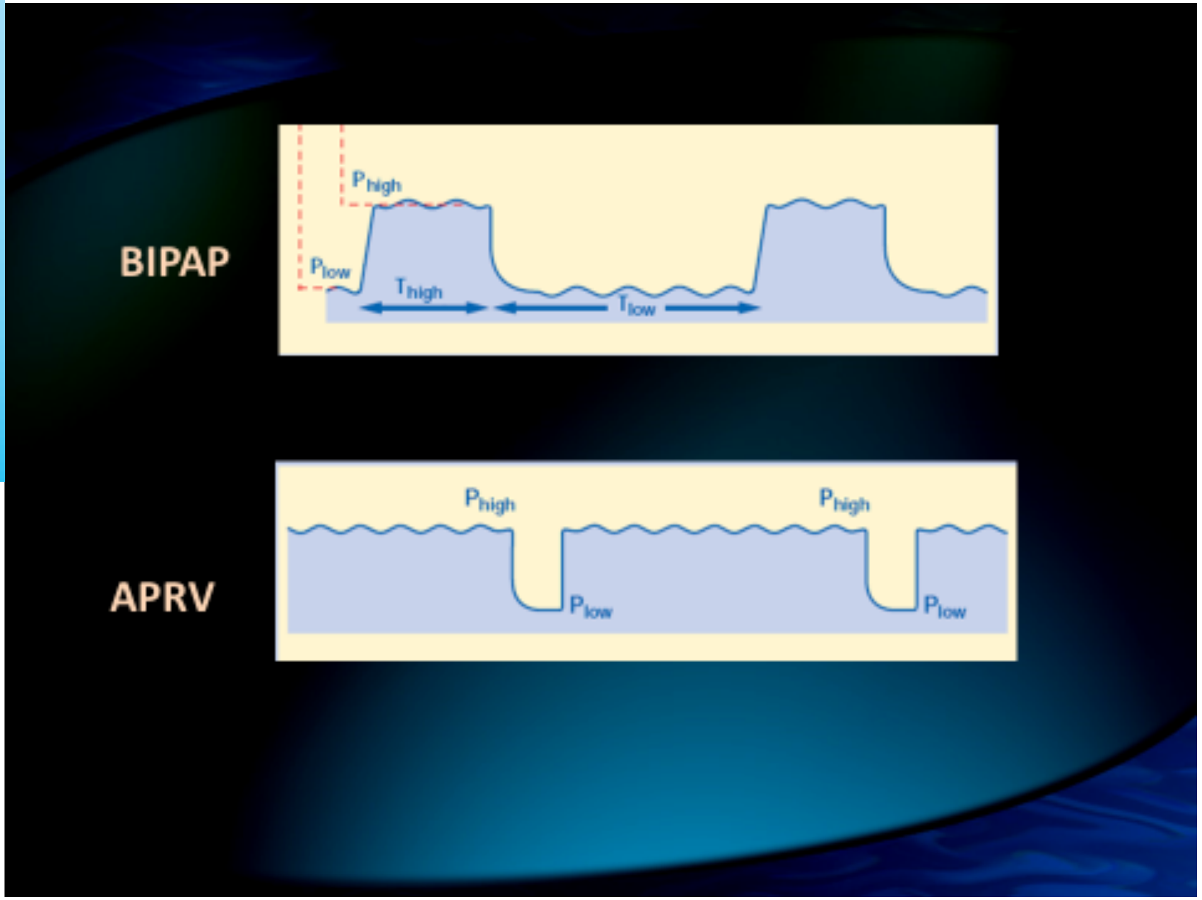
Review Posted: 2016-02-24

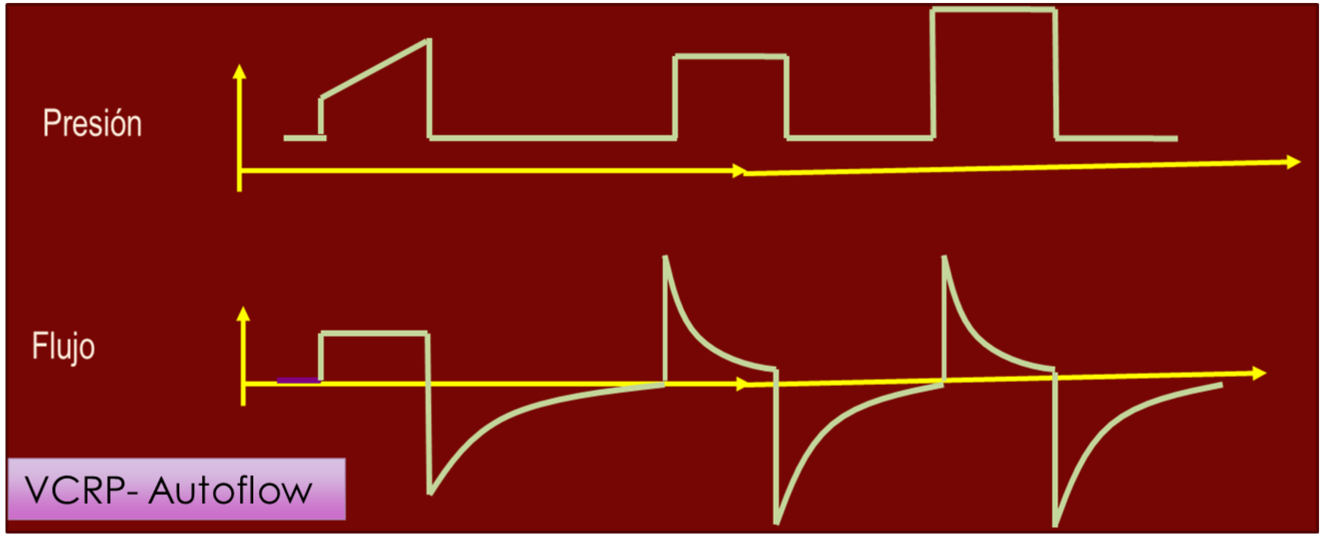
	Albuali et al	Erickson et al	Flori et al	Halbertsma et al	Hu et al	Khemani et al	Khilnani et al	Silva et al
Number of patients	164	117	328	96	461	398	143	49
V_t for analysis	Expiratory	Calculated	Calculated	Unknown	Expiratory	Calculated	Expiratory	Expiratory
Mortality (%)	35; 21*	35	22	14	42	20	23; 37*	35

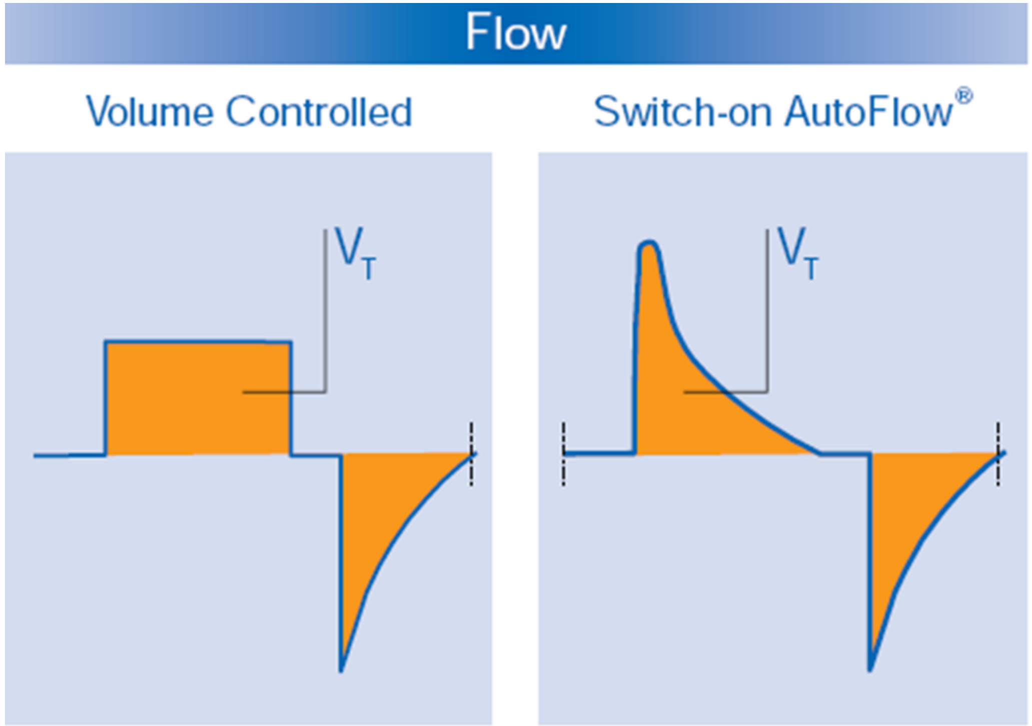
*These studies compared outcomes before and after lung-protective ventilation strategies.

Comparison Groups	Odds Ratio (95% CI)
V_t < 7 mL/kg vs. V_t > 7 mL/kg	1.04 (0.61, 1.76)
V_t < 8 mL/kg vs. V_t > 8 mL/kg	0.88 (0.56, 1.40)
V_t < 10 mL/kg vs. V_t > 10 mL/kg	0.83 (0.50, 1.37)
V_t < 12 mL/kg vs. V_t > 12 mL/kg	0.95 (0.36, 2.48)
V_t < 7 mL/kg vs. V_t > 10 mL/kg	1.13 (0.44, 2.9)
V_t < 7 mL/kg vs. V_t > 12 mL/kg	1.02 (0.23, 4.53)
V_t < 8 mL/kg vs. V_t > 10 mL/kg	0.87 (0.44, 1.73)
V_t < 8 mL/kg vs. V_t > 12 mL/kg	0.90 (0.23, 3.61)

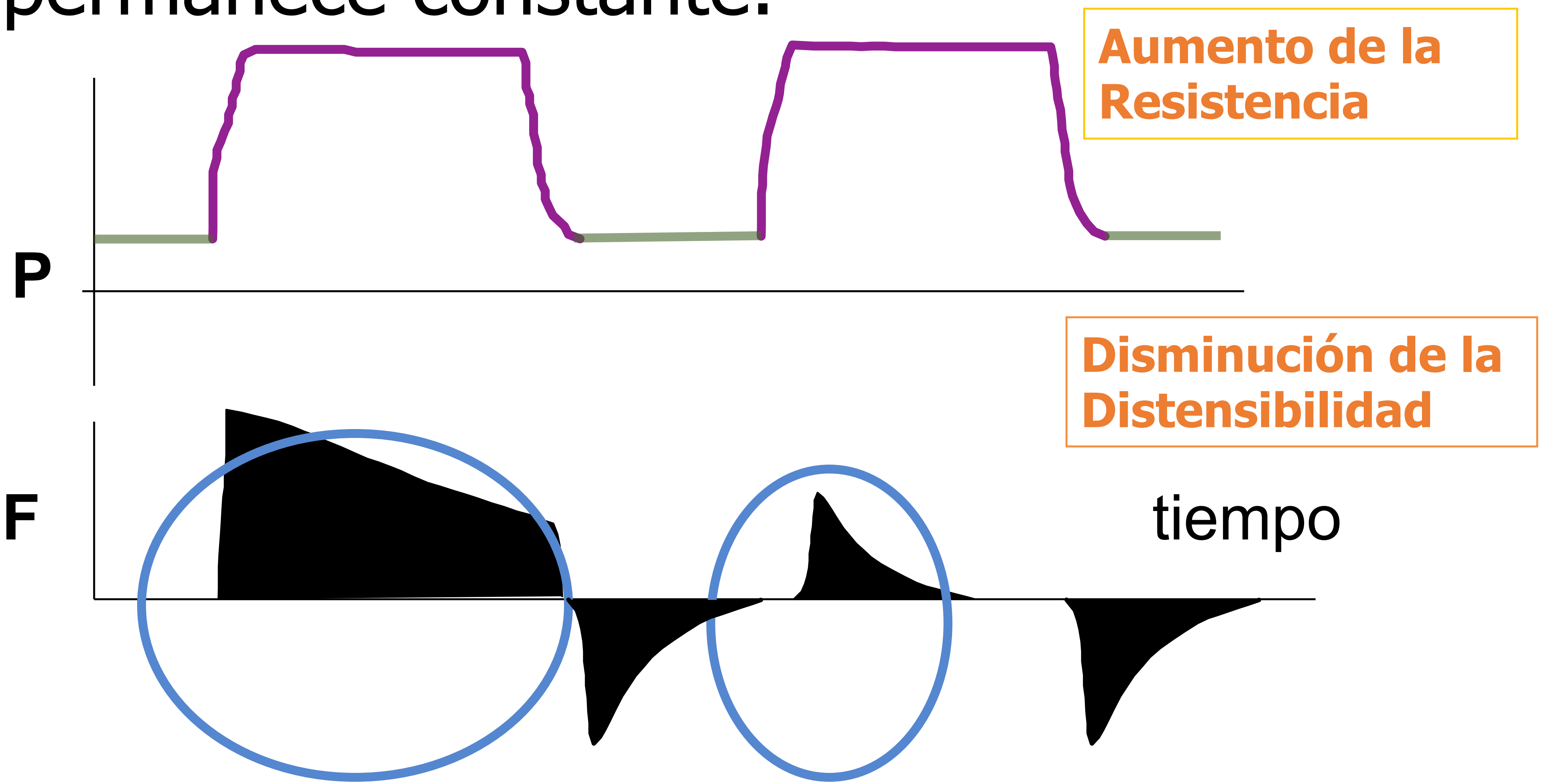

BIPAP Fomats
IPPV-BIPAP
P
No Spontaneous Breathing
t
Classic SIMV
P
Spontaneous Breathing at low pressure level
t
SIMV/BIPAP
P
Spontaneous Breathing both levels
t
Mechanical Ventilation


BIPAP
P high
P low
T high
T low
APRV
P high
P low
P high
P low

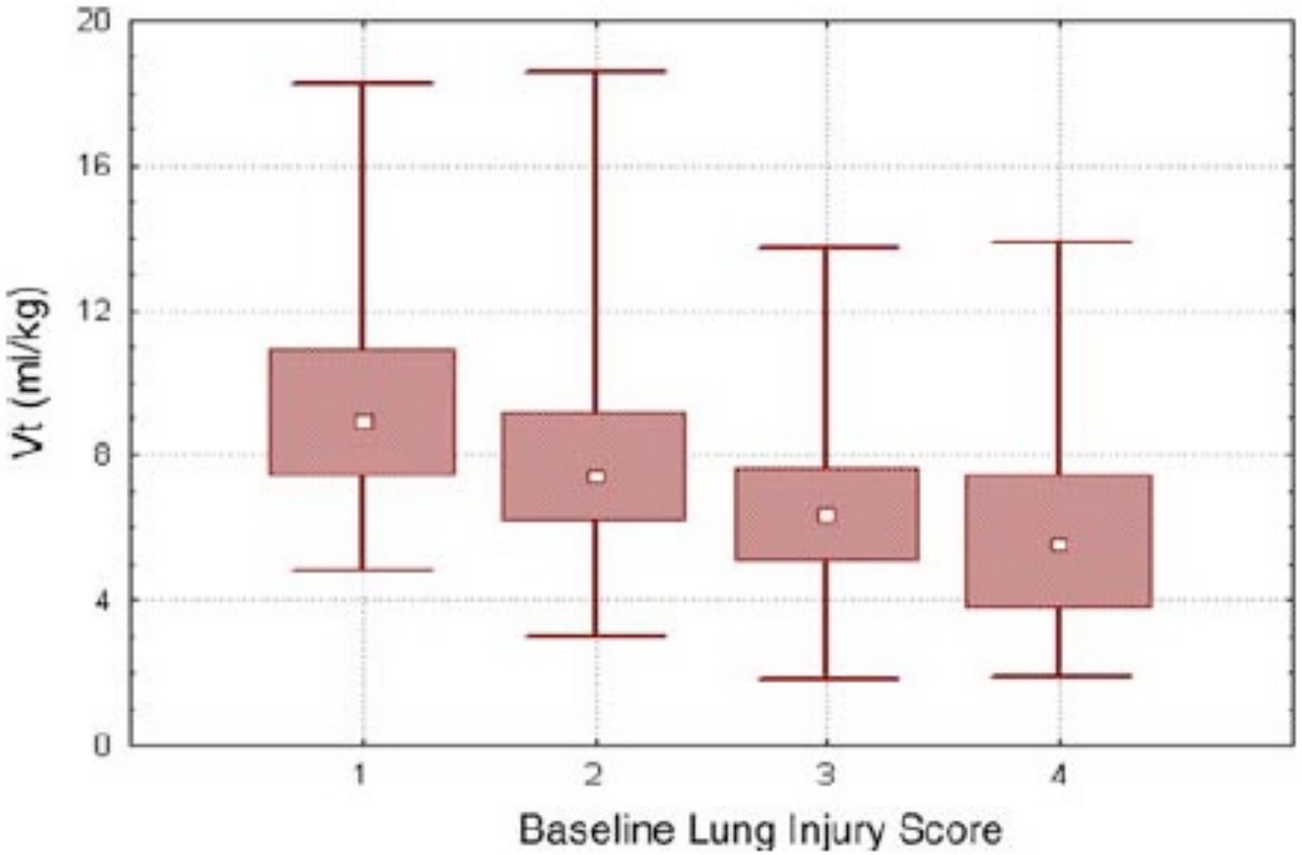

Presión
Flujo
VCRP- Autoflow


Flow
Volume Controlled
Switch-on AutoFlow®
V_T
V_T

En Presión Control, la presión permanece constante.



Intensive Care Med (2009) 35:1428–1437



Modos Controlados o Limitados por Presión

Vt y severidad del daño pulmonar agudo

Ward et al, PCCM Octubre 2016, Vol 17, n° 10

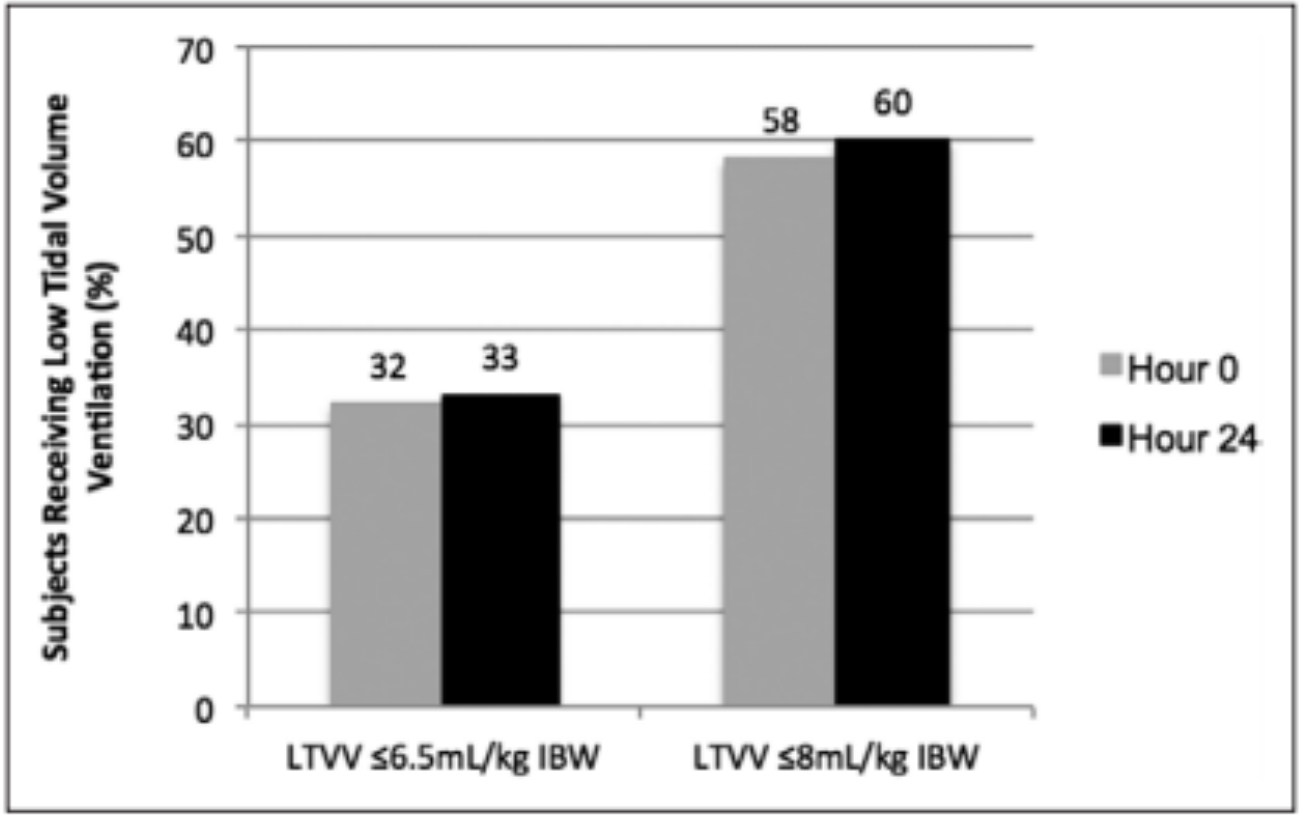


Figure 1. Frequency of patients receiving low- tidal volume ventilation at hours 0 and 24 of pediatric acute respiratory distress syndrome (PARDS). The frequency of patients receiving low-tidal volume ventilation (LTVV) at hours 0 and 24 of PARDS with LTVV defined by tidal volumes less than or equal 6.5 mL/kg of ideal body weight (*left bars*) and by tidal volumes less than 8 mL/kg of ideal body weight (*right bars*).

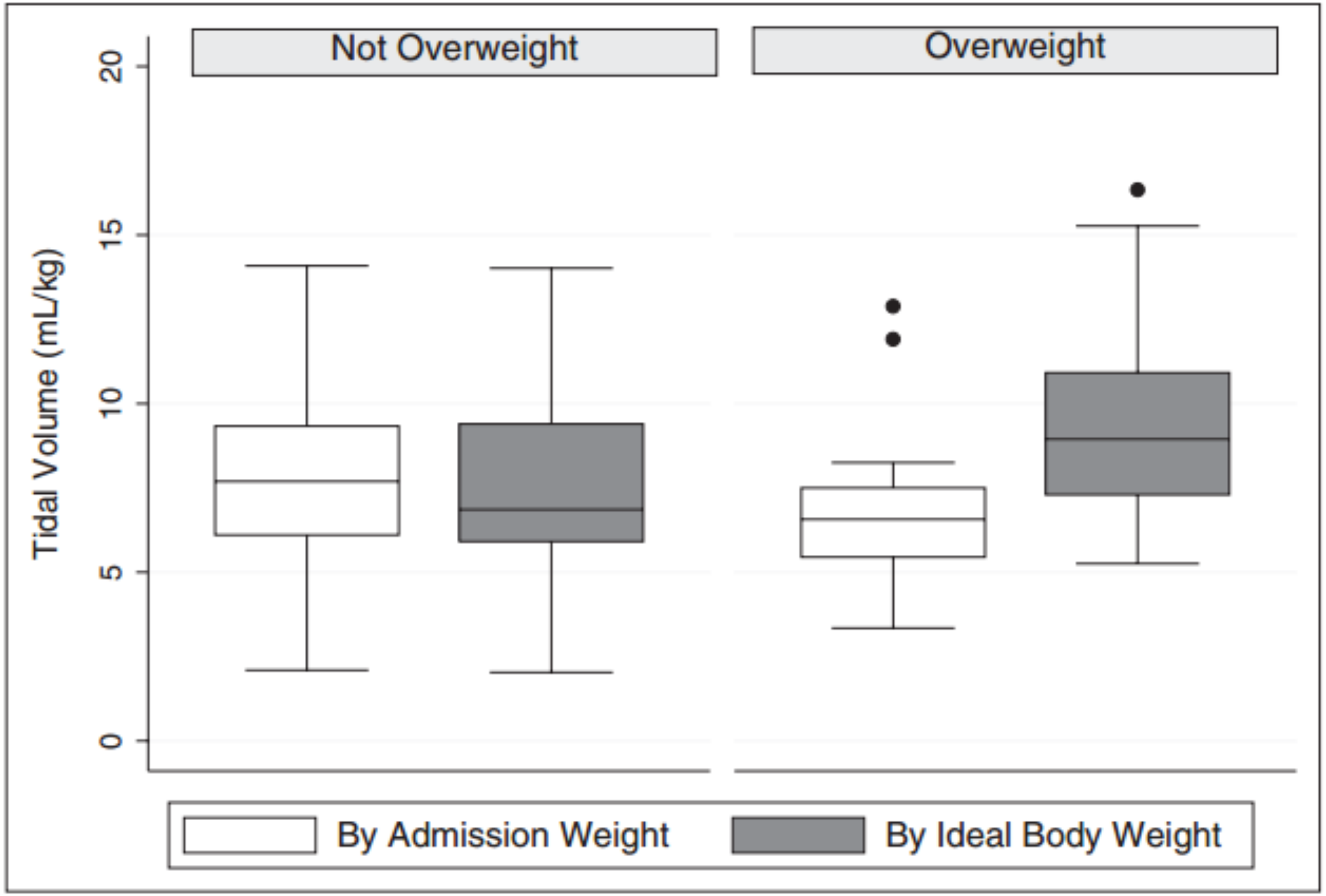
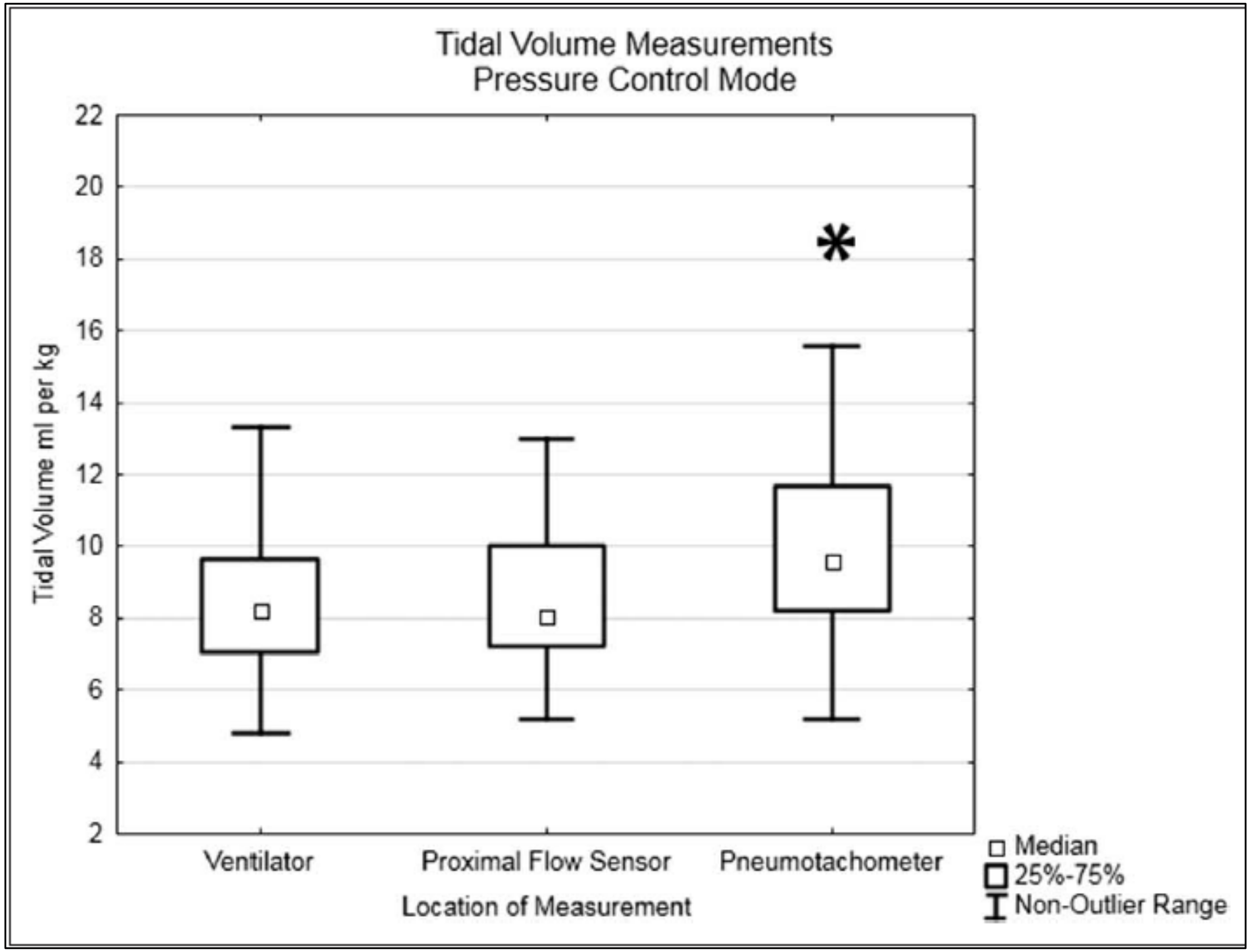
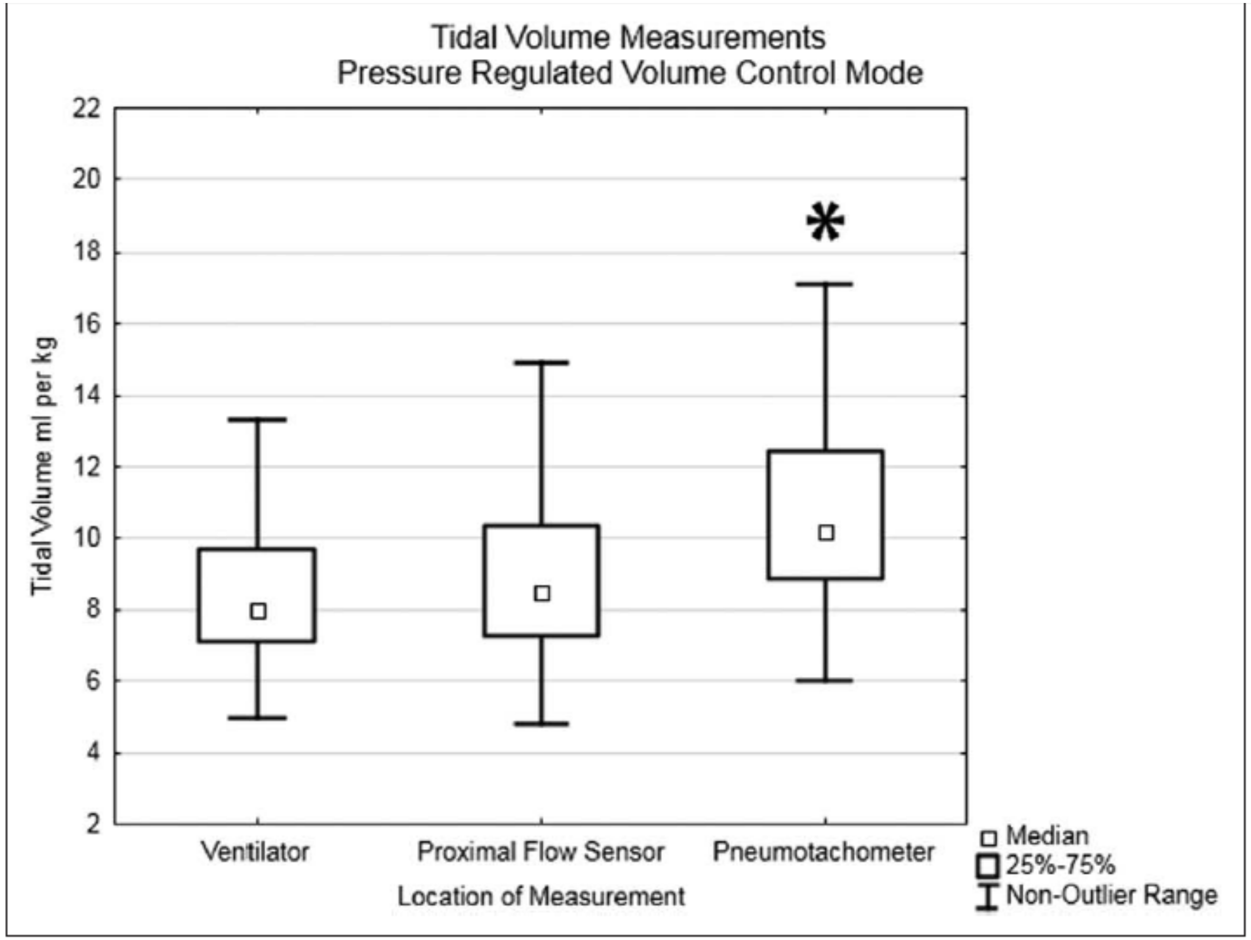


Figure 2. Comparison of tidal volumes when assessed by admission weight and ideal body weight. Boxplot graphs of tidal volumes divided by admission weight (*white*) and by ideal body weight (*grey*); *p* values less than 0.001 for the comparison of the difference between values calculated by admission weight and ideal body weight in the overweight versus nonoverweight individuals.



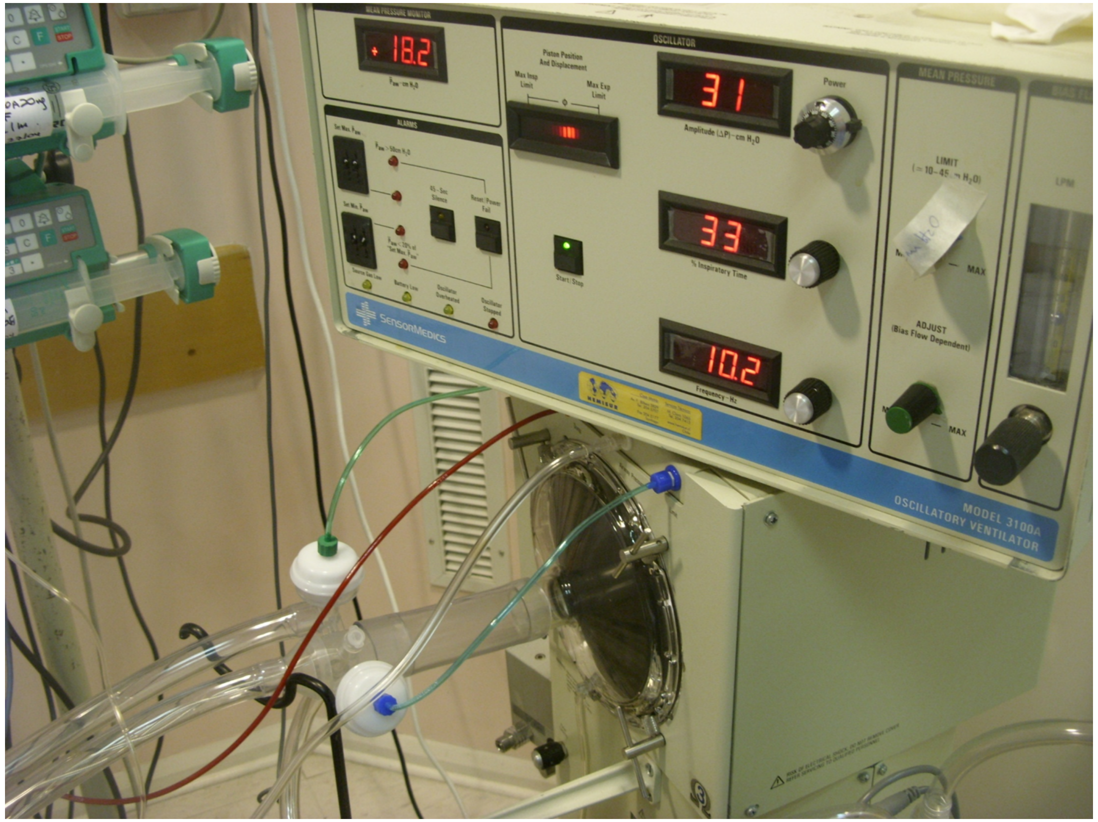
Sensor Proximal y distal subestiman Vt en 1,9 ml/Kg



Sensor Proximal subestima Vt en 2,4 ml/kg
Sensor distal subestima Vt en 2,5 ml/Kg

VAFO

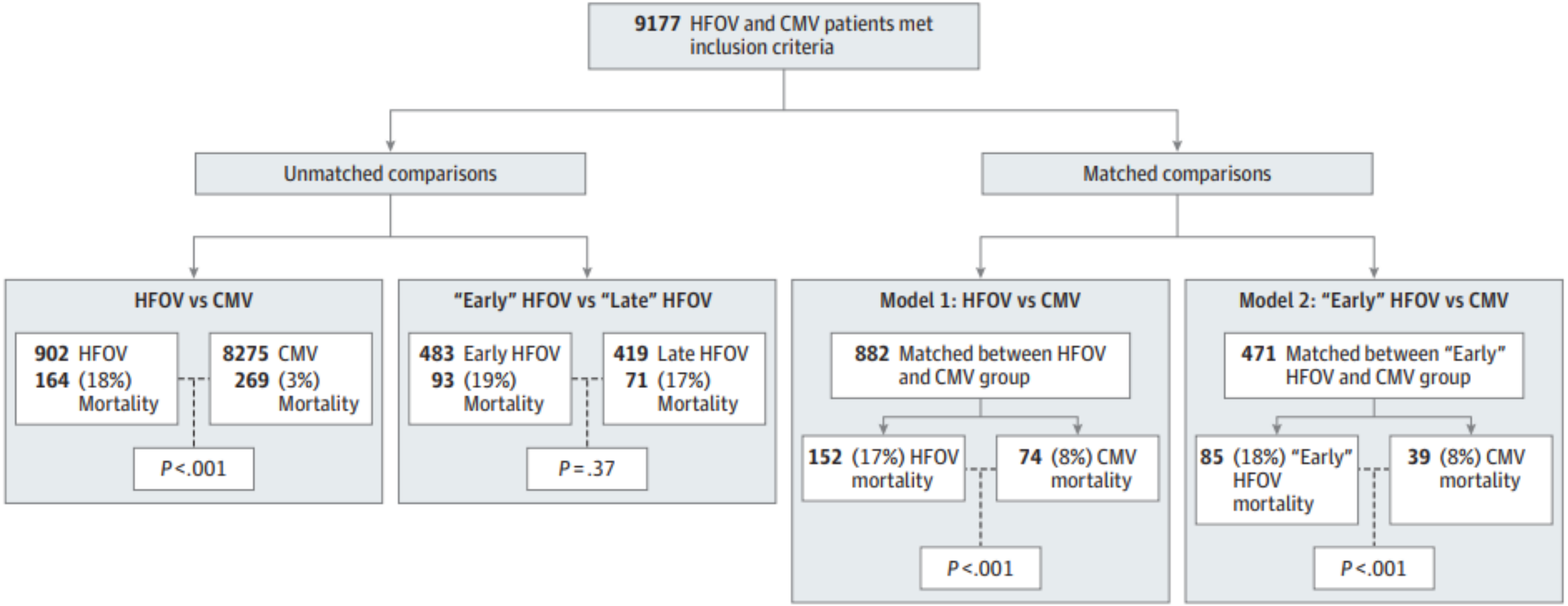
- Cambio de terapia de rescate a una terapia precoz (IOx > 15)



Original Investigation

Comparison of High-Frequency Oscillatory Ventilation and Conventional Mechanical Ventilation in Pediatric Respiratory Failure

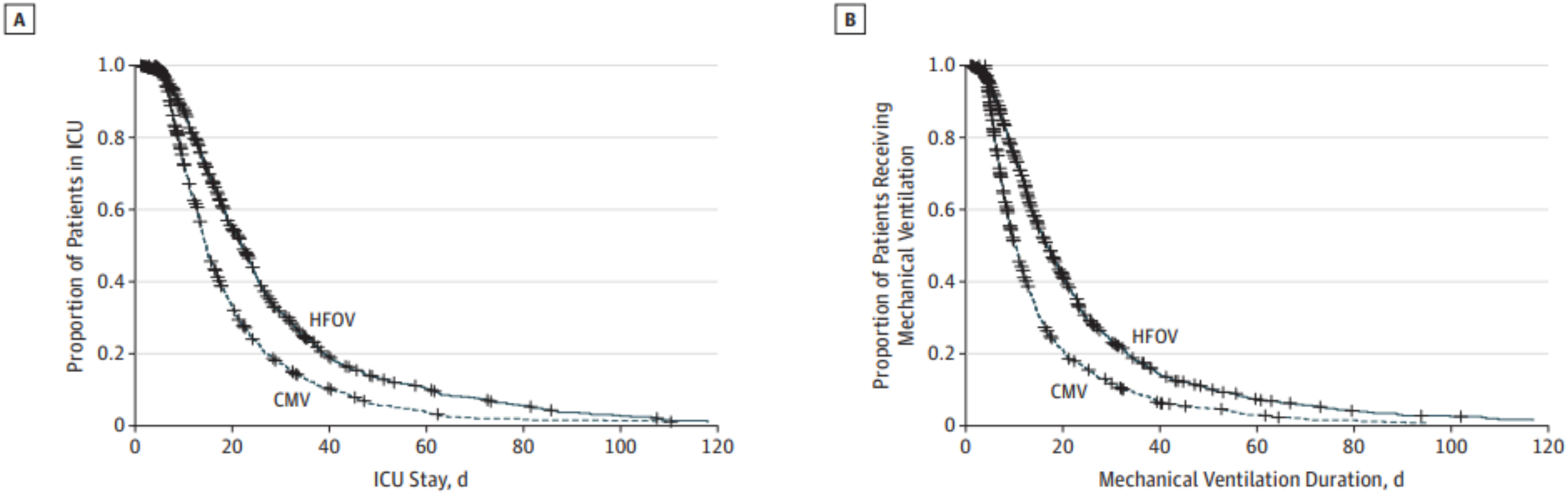
Punkaj Gupta, MBBS; Jerril W. Green, MD; Xinyu Tang, PhD; Christine M. Gall, DrPHc; Jeffrey M. Gossett, MS; Tom B. Rice, MD; Robert M. Kacmarek, PhD, RRT; Randall C. Wetzel, MBBS



CMV indicates conventional mechanical ventilation; HFOV, high-frequency oscillatory ventilation.

JAMA Pediatr. 2014;168(3):243-249. doi:10.1001/jamapediatrics.2013.4463
Published online January 20, 2014.

Figure 2. Kaplan-Meier Curves for Intensive Care Unit (ICU) Length of Stay (LOS) and Duration of Mechanical Ventilation



A

No. at risk							
HFOV	882	420	125	60	30	13	4
CMV	882	267	75	24	11	9	5

B

No. at risk							
HFOV	882	307	88	39	18	10	5
CMV	878	166	44	18	8	3	3

Risk Factors for Mortality and Outcomes in Pediatric Acute Lung Injury/Acute Respiratory Distress Syndrome*

Flávia F. Panico, MD[1]; Eduardo J. Troster, PhD[2,3]; Cindy S. Oliveira, MD[4]; Aline Faria, MD[4]; Michelle Lucena, MD[5]; Paulo R. D. João, MD[5]; Everardo D. Saad, MD[6]; Flávia A. K. Foronda, PhD[1]; Artur F. Delgado, PhD[1]; Werther Brunow de Carvalho, PhD[1]

Pediatr Crit Care Med 2015; 16:e194–e200

TABLE 4. Association Between Potential Predictive Variables and Mortality, Including the Airway Pressure Gradient on Day 1 in the Model

Variable	Multivariate OR (95% CI)	*p* for Multivariate Analysis
No. of organ dysfunctions at admission	2.08 (1.20–3.60)	0.009
Pediatric Risk of Mortality score	1.01 (0.92–1.10)	0.857
Airway pressure gradient on day 1	1.13 (1.00–1.28)	0.042

OR = odds ratio.

TABLE 5. Association Between Predictive Variables and Mortality, Including the Peak Inspiratory Pressure on Day 1 and the Airway Pressure Gradient on Day 1 in the Model

Variable	Multivariate OR (95% CI)	*p* for Multivariate Analysis
No. of organ dysfunctions at admission	2.16 (1.27–3.67)	0.005
Peak inspiratory pressure on day 1	1.13 (1.03–1.25)	0.010
Airway pressure gradient on day 1	1.09 (0.96–1.23)	0.178

OR = odds ratio.

OPEN

Outcomes for Children Receiving Noninvasive Ventilation as the First-Line Mode of Mechanical Ventilation at Intensive Care Admission: A Propensity Score-Matched Cohort Study

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Cohorte Prospectiva 2007-2014 / 31 UCIP
Pacientes ingresados a UCIP que recibieron VM desde el primer día
151.128 ingresos / 15.144 elegibles
4.804 recibieron VNI inicial
10.221 recibieron VM Invasiva inicial

Crit Care Med. 2017 Mar 21. doi: 10.1097/CCM.0000000000002369 [Epub ahead of print]

TABLE 3. Tidal Volume by Location of Measurement

Grouping	*n*	Mode	Tidal Volume mL/kg by Location of Measurement: Ventilator	Flow Sensor	Pneumotachometer	Overall *p*
All patients	51	PC	8.2 (7.1, 9.6)	8.1 (7.2, 10.0)	9.5 (8.2, 11.7)[a]	< 0.001
All patients	51	PRVC	8.0 (7.1, 9.7)	8.5 (7.3, 10.4)	10.2 (8.8, 12.4)[a]	< 0.001
Ventilator						
Servo-I	37	PC	7.9 (7.1, 9.7)	7.9 (7.3, 10.2)	9.8 (8.2, 12.2)[a]	< 0.001
Servo-I	37	PRVC	8.0 (7.1, 9.7)	8.5 (7.3, 10.7)	10.6 (8.8, 12.9)[a]	< 0.001
Avea	14	PC	8.8 (7.8, 9.4)	8.9 (7.2, 9.8)	9.3 (8.7, 11.1)[a]	< 0.01
Avea	14	PRVC	8.8 (7.1, 9.5)	8.6 (6.3, 10.2)	9.7 (8.8, 11.8)[a]	< 0.01
Circuit size						
Infant	27	PC	7.9 (6.4, 9.2)	7.7 (6.9, 10.0)	9.9 (8.2, 12.4)[a]	< 0.001
Infant	27	PRVC	7.9 (6.4, 9.7)	8.1 (6.5, 9.8)	10.6 (8.2, 13.4)[a]	< 0.001
Pediatric	13	PC	8.8 (7.5, 10.1)	8.4 (7.9, 10.9)	10.3 (8.5, 11.1)[b]	< 0.01
Pediatric	13	PRVC	8.6 (7.8, 10.0)	9.7 (7.8, 10.7)	11.7 (9.3, 13.8)[a]	< 0.001
Adult	11	PC	8.5 (7.4, 9.1)	8.8 (7.2, 9.8)	9.1 (7.9, 10.8)	0.057
Adult	11	PRVC	9.0 (7.1, 9.5)	8.7 (6.3, 10.2)	9.4 (8.8, 10.5)	0.088

Mode = the mode of ventilation, PC = pressure control, PRVC = pressure regulated volume control.
[a]The pneumotachometer measurement was different than both the ventilator measurement and the flow sensor measurement.
[b]The pneumotachometer measurement was different than ventilator measurement.
Measurements are shown for the entire group, and subgrouped by ventilator type and circuit size. Measurements are presented as median and (1st, 3rd interquartile range). *p* value from analysis of variance is presented for overall effect size. From multiple comparisons post hoc analysis with Scheffe.

Kim et al, PCCM, Nov 2015, Vol 16, n° 9

TABLE 1. **Patient Demographic and Clinical Characteristics of the Whole Cohort (n = 15,025) and Propensity Score-Matched Cohort (n = 6,002)**

	Whole Cohort (n = 15,025)			Propensity Score Matching Cohort (n = 6,002)		
Characteristics	Invasive Ventilation (n = 10,221)	Noninvasive Ventilation (n = 4,804)	p	Invasive Ventilation (n = 3,001)	Noninvasive Ventilation (n = 3,001)	p
Age in weeks, median (IQR)	66 (12–279)	27 (7–144.5)	< 0.001	33 (8–162)	28 (7–174)	0.444
Sex, n (%)						
Male	5,945 (58.1)	2,698 (56.2)	0.032	1,698 (56.6)	1,709 (57.0)	0.774
Primary diagnostic group, n (%)						
Respiratory	3,292 (32.2)	3,427 (71.3)	< 0.001	1,857 (61.9)	1,853 (61.8)	0.993
Cardiovascular	1,496 (14.6)	409 (8.5)		395 (13.2)	374 (12.5)	
Neurologic	2,217 (21.7)	182 (3.8)		141 (4.7)	148 (4.9)	
Infection	904 (8.8)	296 (6.2)		211 (7.0)	221 (7.4)	
Gastrointestinal	306 (3.0)	63 (1.3)		51 (1.7)	54 (1.8)	
Endocrine/metabolic	333 (3.3)	72 (1.5)		56 (1.9)	60 (2.0)	
Trauma	669 (6.6)	4 (0.1)		2 (0.1)	3 (0.1)	
Oncology	167 (1.6)	70 (1.5)		58 (1.9)	65 (2.2)	
Blood/lymphatic	149 (1.5)	68 (1.4)		54 (1.8)	56 (1.9)	
Other[a]	643 (6.3)	177 (3.7)		155 (5.2)	144 (4.8)	
Not recorded	45 (0.4)	36 (0.7)		21 (0.7)	23 (0.8)	
Main reason for admission,[b] n (%)						
Asthma	186 (1.8)	115 (2.4)	< 0.001	68 (2.3)	70 (2.3)	
Bronchiolitis	935 (9.2)	1,502 (31.5)		619 (20.6)	607 (20.2)	0.969
Croup	108 (1.1)	16 (0.3)		15 (0.5)	15 (0.5)	

TABLE 2. Crude Outcomes for Patients Included in the Whole Cohort ($n = 15,025$) and Propensity Score-Matched Cohort ($n = 6,002$)

Outcome	Whole Cohort ($n = 15,025$)			Propensity Score Matching Cohort ($n = 6,002$)		
	Invasive Ventilation ($n = 10,221$)	NIV ($n = 4,804$)	p	Invasive Ventilation ($n = 3,001$)	NIV ($n = 3,001$)	p
PICU mortality (%)	9.6	4.4	< 0.001	8.5	5.9	< 0.001
Length of ventilation (d), median (IQR)	4 (2–7)	4 (2–7)	< 0.001	5 (3–9)	4 (2–7)	< 0.001
Length of stay (d), median (IQR)	5 (2–9)	5 (3–8)	< 0.001	6 (4–11)	5 (3–9)	< 0.001
VFD-28—all patients, median (IQR)	8 (0–24)	12 (0–22)	0.016	0 (0–16)	8 (0–22)	< 0.001
VFD-28—survivors only, median (IQR)	12 (0–24)	12 (0–22)	0.269	0 (0–16)	12 (0–22)	< 0.001
NIV failure rate, *n* (%)	NA	1,237 (25.7)	NA	NA	948 (33.3)	NA

IQR = interquartile range, NA = not applicable, NIV = noninvasive ventilation, VFD-28 = ventilation-free days at day 28.

A Wilcoxon rank-sum test was used to compare all continuous variables presented as mean (interquartile range), a two sample *t* test was used to compare continuous variables presented as mean (SD), and chi-square test of independence compared all categorical variables presented as *n* (%).

Coeficiente Promedio de Efecto de Tratamiento para VNI Inicial				
Resultado	Análisis de propensión con el pareamiento más cercano (n=6.002)	95 % IC	Ajuste por Regresión (n=13.189)	95 % IC
Mortalidad en UCIP (%)	-3,1	-4,6 a -1,7	-1,6	-3,0 a -0,3
Días de VM	-1,6	-2,3 a -1,0	-0,1	-0,6 a 0,4
Días de Hospitalización	-2,1	-3,0 a -1,3	-0,3	-1,1 a 0,5
28 Días libres de ventilación - Todos los casos	3,7	3,1 - 4,3	1,6	1,1-2,1
28 Días libres de ventilación - Sobrevivientes	3,6	3,0 - 4,2	1,5	0,9 – 2,0

Característica	COHORTE (n=15.025)			Análisis de Propensión		
	VMI (n=10.221)	VMNI (n=4.804)	p	VMI (n=3.001)	VMNI (n=3.001)	p
Arterial or capillary blood gas taken,[b] *n* (%)						
Yes	7,588 (74.2)	2,925 (60.9)	< 0.001	2,093 (69.7)	2,133 (71.1)	0.258
Lactate,[b] median (IQR)	1.9 (1.1–3.7)	1.6 (1.1–2.6)	< 0.001	1.8 (1.0–3.5)	1.6 (1.1–2.6)	0.014
Not recorded, *n* (%)	6,798 (66.5)	3,347 (69.7)		64.9	65.4	
PaO_2/FIO_2 ratio,[b] median (IQR)	190.6 (102.6–354.6)	129.4 (85.7–200)	< 0.001	150 (86–258)	129 (84–202)	< 0.001
Not recorded, *n* (%)	5,923 (57.9)	3,998 (83.2)		64.7	78.2	
Base excess,[b] median (IQR)	−3.1 (−7.0 to 0.3)	1.0 (−2.0 to 4.8)	< 0.001	−1.4 (−5.3 to 2.1)	0.9 (−2.3 to 4.9)	< 0.001
Not recorded, *n* (%)	3,201 (31.3)	2,186 (45.5)		1,035 (34.5)	1,080 (36.0)	
Age-standardized systolic blood pressure[b] *z* score, mean (SD)	−0.03 (1.18)	0.13 (0.98)	< 0.001	0.061 (1.02)	0.089 (1.02)	0.288

Otras recomendaciones

TET

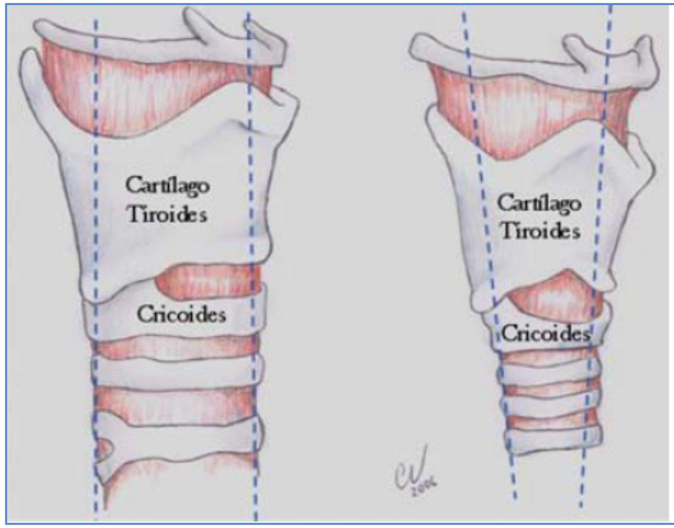

Figura 4. La laringe del adulto tiene forma cilíndrica y la del niño de embudo. En menores de ocho años, esta diferencia permite la intubación con cánulas sin globo por el sello fisiológico que ejerce el cartílago cricoides.

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SOME ANATOMIC CONSIDERATIONS OF THE INFANT LARYNX INFLUENCING ENDOTRACHEAL ANESTHESIA*

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Philadelphia, Pennsylvania

Received for publication October 10, 1950

THE endotracheal technic of administering anesthetic agents to infants and children is being employed with increasing frequency. Anesthesiologists trained in pediatric anesthesia are more often than not likely to consider this technic the one of choice for general anesthesia. Leigh and Belton (1) mentioned using the endotracheal route in over 50 per cent of their anesthesias. At the Children's Hospital of Philadelphia the method is used in over 65 per cent of all anesthesias. There the technic is employed most often with the newborn (98 per cent of all infants two weeks of age or less) and somewhat less frequently with

Anesthesiology 2003; 98:41–5

Developmental Changes of Laryngeal Dimensions in Unparalyzed, Sedated Children

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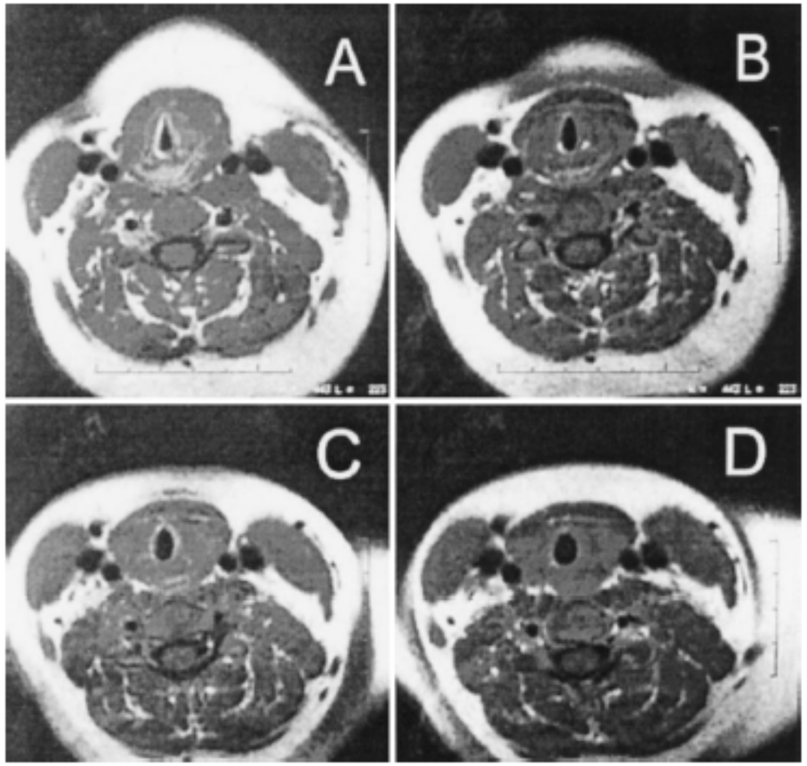

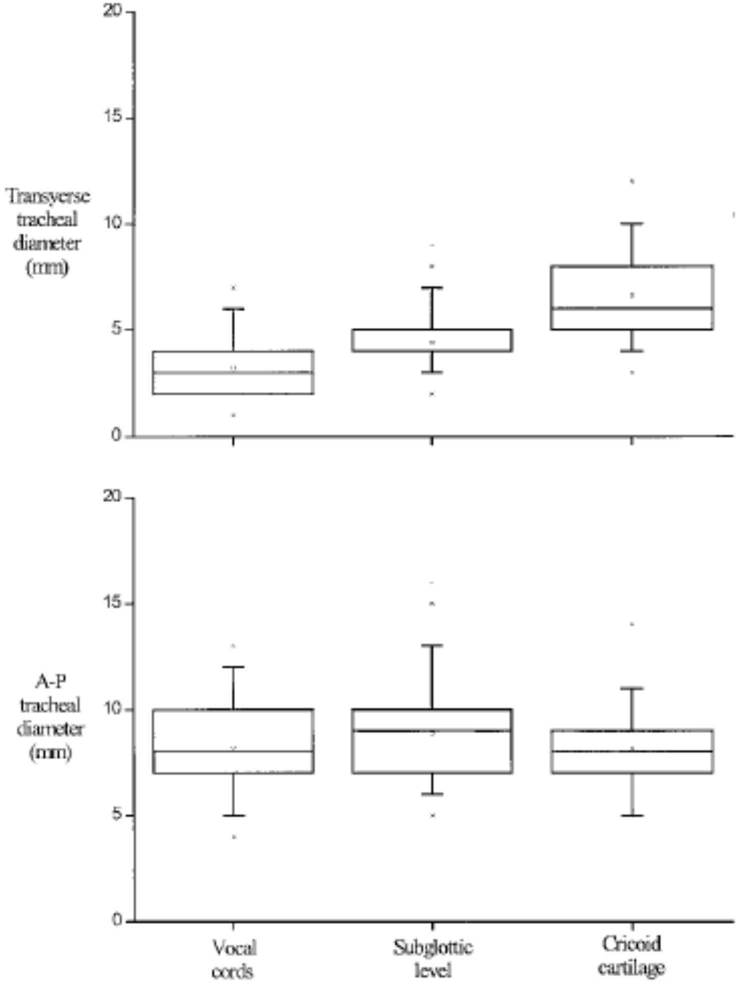

Uso de TET con cuff

Table 6 Stridor rates per age group. NS, not significant

Age groups	Cuffed tubes (final) (*n*)	Stridor (*n*)	Uncuffed tubes (final) (*n*)	Stridor (*n*)
All (A–D)	1197	53 (4.4%)	1049	49 (4.7%)[NS]
A: 0 to <8 months	326	9 (2.8%)	298	14 (4.7%)[NS]
B: 8 to <18 months	247	15 (6.1%)	234	8 (3.4%)[NS]
C: 18 to <36 months	311	15 (4.8%)	266	17 (6.4%)[NS]
D: 36 to <60 months	313	14 (4.8%)	251	10 (4.0%)[NS]

20 cmH2O (14,7 mmHg)

1 cmH2O = 1,36 mmHg

Weiss, et al Br J Anaesth 2009; 103:867-873

- En SDRAP moderado con PEEP < 10:
  SpO2 92%-95%

- En SDRAP severo con PEEP optimizado >10:
  SpO2 88%-92%

- En SDRAP moderado a severo, considerar hipercapnia permisiva para minimizar el Daño Pulmonar Inducido por la Ventilación Mecánica (pH 7,15-7,30)

Muchas Gracias

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