Aérosolthérapie dans la bronchiolite

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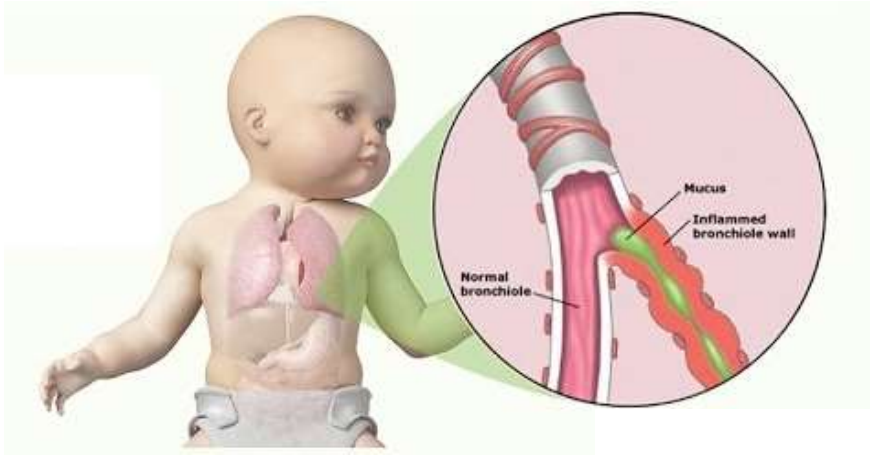
Aucun lien d'intérêt potentiel à déclarer

Physiopathologie

- Atteinte virale de l'épithélium respiratoire => nécrose
- Atteinte inflammatoire :
  - Œdème de la muqueuse, exsudation, hypersécrétion bronchique
  - Obstruction des bronchioles
- Bronchospasme associé possible



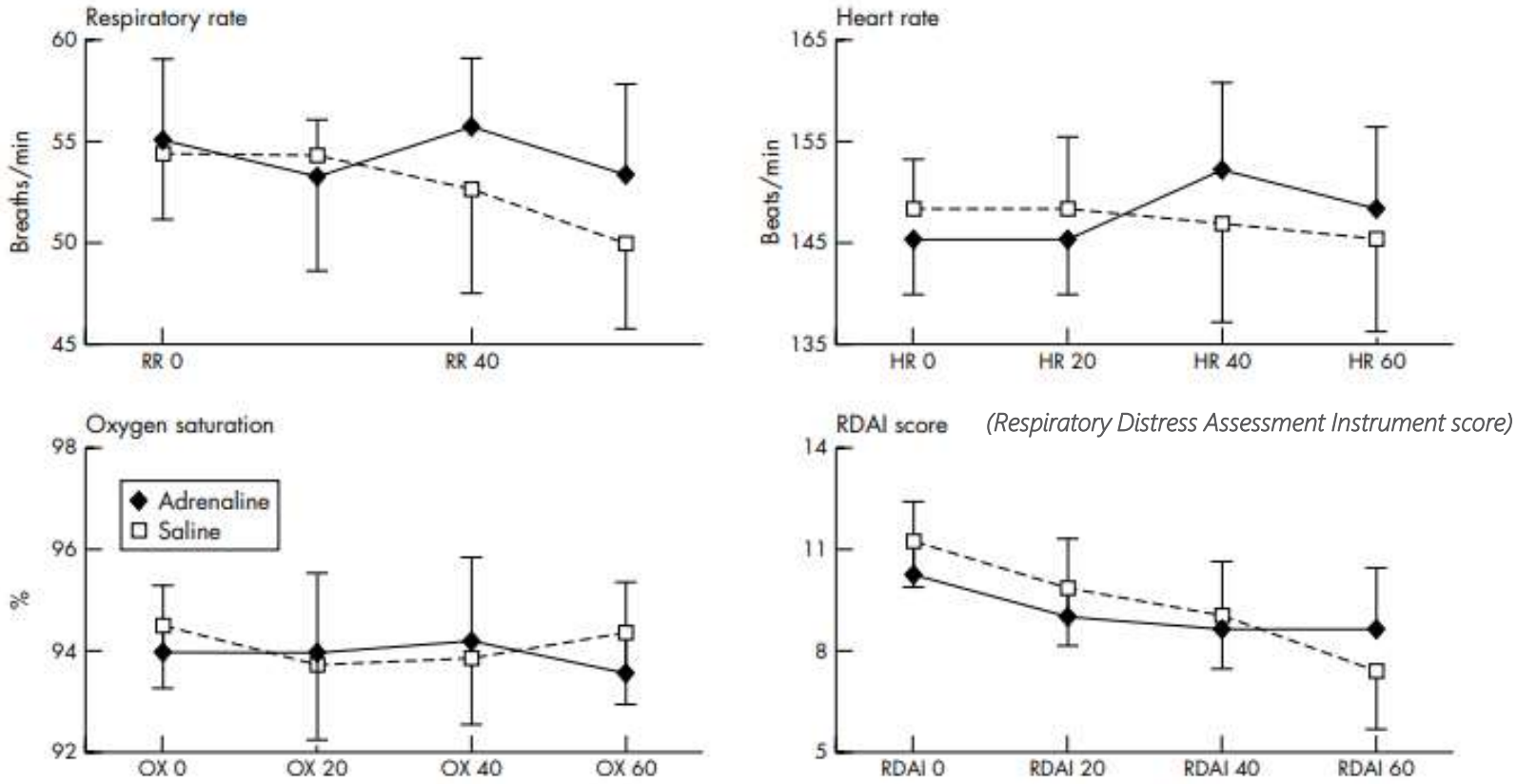
Les bronchodilatateurs

Recommendation
R32—Inhaled beta2-agonists and/or inhaled epinephrine should probably not be used routinely. In some cases, a therapeutic test could be considered to avoid intubation (**GRADE 2–, strong agreement**)

D'après Milési et al, GFRUP, 2023

ORIGINAL ARTICLE

Short term effects of adrenaline in bronchiolitis: a randomised controlled trial



(Respiratory Distress Assessment Instrument score)

Figure 1 Mean (95% CI) for respiratory rate, heart rate, oxygen saturation, and RDAI score for infants in each group at 0, 20, 40, and 60 minutes of assessment.

D'après Abul-Ainine et al, 2002

Efficacy of Salbutamol and Ipratropium Bromide in the Management of Acute Bronchiolitis – A Clinical Trial

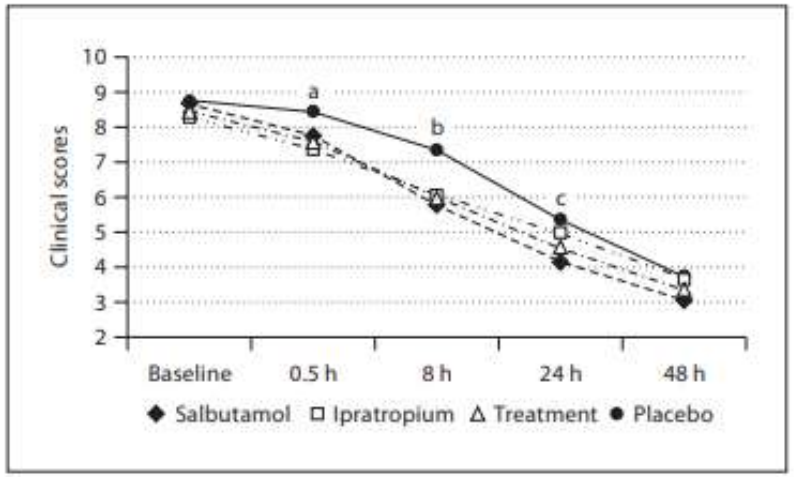


Fig. 1. Clinical scores of the treatment groups. [a]Ipratropium bromide (I) vs. placebo (P), p = 0.001, salbutamol (S) vs. P, p = 0.04, S vs. I, p > 0.05, T vs. P, p < 0.0001. [b] I vs. P, p = 0.001, S vs. P, p = 0.0001, S vs. I, p > 0.05, T vs. P, p < 0.0001. [c] S vs. P, p = 0.02, S vs. I, I vs. P, p > 0.05, T vs. P, p = 0.006.

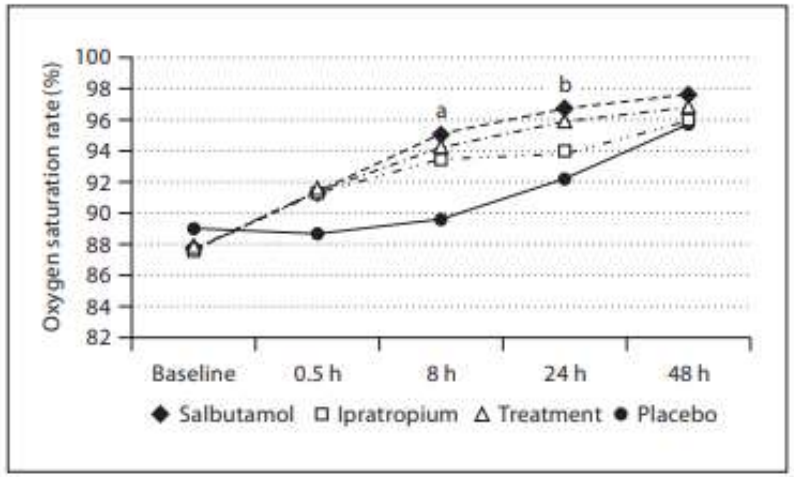


Fig. 2. Oxygen saturation measurements of the treatment groups. [a] Ipratropium bromide (I) vs. placebo (P), p = 0.005, salbutamol (S) vs. P, p = 0.0001, S vs. I, p > 0.05, T vs. P, p < 0.0001.[b] S vs. P, p = 0.001, I vs. P, p = 0.05, S vs. I, p > 0.05, T vs. P, p < 0.0001.

D'après Karadag et al, 2008

Bronchodilatateurs et SpO2

Analysis 1.1. Comparison 1 Bronchodilators compared to placebo for treatment of acute bronchiolitis, Outcome 1 Oxygen saturation measured by pulse oximetry: inpatient and outpatient settings.

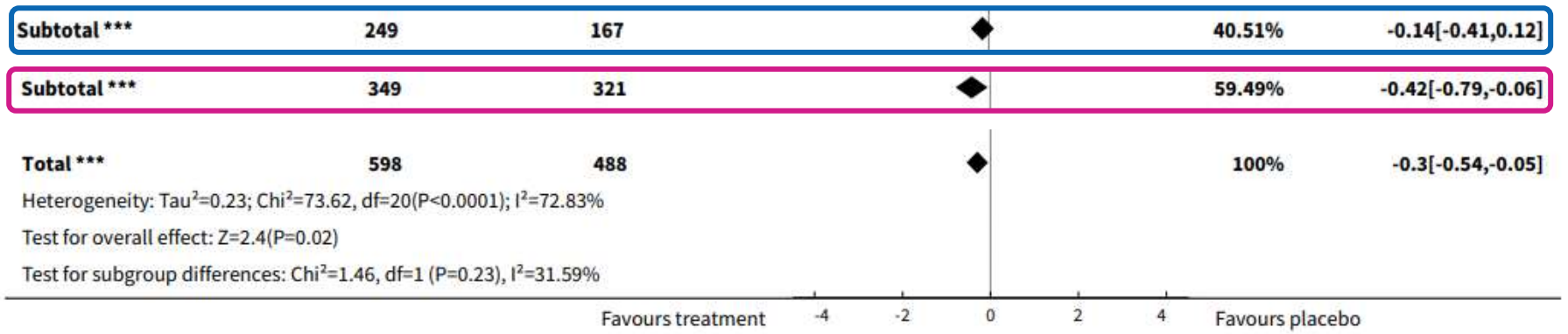
Study or subgroup	Placebo N	Placebo Mean(SD)	Bronchodilator N	Bronchodilator Mean(SD)	Mean Difference Random, 95% CI	Weight	Mean Difference Random, 95% CI
1.1.1 Inpatient studies							
Chevallier 1995	17	93.2 (0.4)	16	94.4 (0.4)		6.47%	-1.2[-1.47,-0.93]
Dobson 1998	29	93.5 (6)	23	93.2 (7.8)		1.28%	0.3[-3.58,4.18]
Gurkan 2004	12	95.6 (1.2)	18	95.8 (1.4)		5.32%	-0.2[-1.14,0.74]
Ho 1991	8	97.6 (0.7)	13	95.4 (0.8)		5.91%	2.2[1.55,2.85]
Karadag 2005 - IPR	11	92.2 (2.6)	22	93.8 (4)		2.73%	-1.6[-3.87,0.67]
Karadag 2005 - SAL	12	92.2 (2.6)	24	96.7 (4.1)		2.83%	-4.5[-6.7,-2.3]
Lines 1990	23	95.6 (2)	26	95.8 (1.9)		4.96%	-0.2[-1.3,0.9]
Lines 1992	14	93 (0.4)	17	94 (0.6)		6.39%	-1[-1.35,-0.65]
Patel 2002	48	96.2 (3.3)	51	95.8 (4.1)		4.16%	0.46[-1,1.92]
Tinsa 2009	19	97 (1.3)	16	97.2 (1.5)		5.31%	-0.2[-1.14,0.74]
Totapally 2002	9	94 (2.4)	10	95 (3.1)		2.45%	-1[-3.48,1.48]
Wang 1992	17	95.1 (2.7)	40	97.2 (1.8)		4.29%	-2.1[-3.5,-0.7]
Subtotal ***	**219**		**276**			**52.11%**	**-0.62[-1.4,0.16]**
Heterogeneity: Tau^2=1.36; Chi^2=112.89, df=11(P<0.0001); I^2=90.26%							
Test for overall effect: Z=1.57(P=0.12)							

Cochrane Library *2015*

Bronchodilatateurs et scores cliniques

Comparison 1. Bronchodilators compared to placebo for treatment of acute bronchiolitis

Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
4 Average clinical score after treatment: by treatment setting (continuous)	21	1086	Std. Mean Difference (IV, Random, 95% CI)	-0.30 [-0.54, -0.05]
4.1 Inpatient studies	9	416	Std. Mean Difference (IV, Random, 95% CI)	-0.14 [-0.41, 0.12]
4.2 Outpatient studies	12	670	Std. Mean Difference (IV, Random, 95% CI)	-0.42 [-0.79, -0.06]



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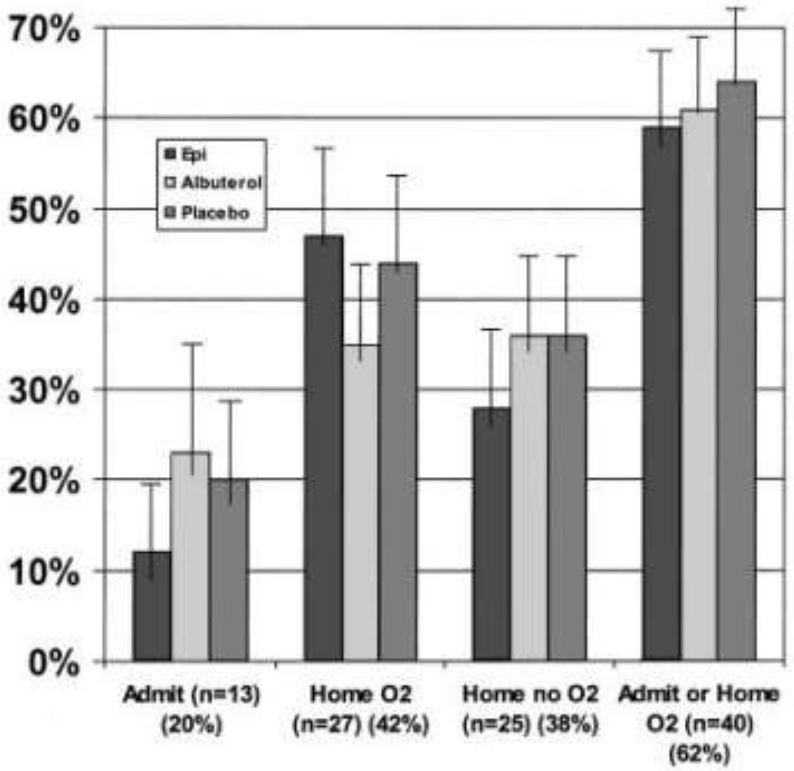
Randomized, Placebo-Controlled Trial of Albuterol and Epinephrine at Equipotent Beta-2 Agonist Doses in Acute Bronchiolitis

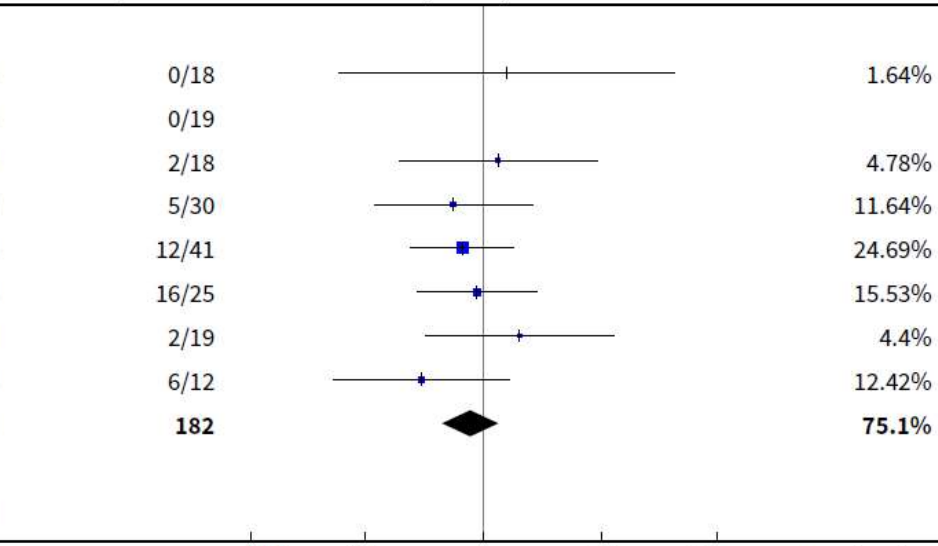


D'après Ralston et al, 2005

Bronchodilatateurs et admission

Analysis 1.6. Comparison 1 Bronchodilators compared to placebo for treatment of acute bronchiolitis, Outcome 6 Hospital admission after treatment (outpatients treated with albuterol or salbutamol).

Study or subgroup	Bronchodilator n/N	Placebo n/N	Odds Ratio M-H, Fixed, 95% CI	Weight	Odds Ratio M-H, Fixed, 95% CI
1.6.1 Nebulized					
Anil 2010 SAL 0.9%	1/36	0/18		1.64%	1.56[0.06,40.3]
Anil 2010 SAL 3%	0/36	0/19			Not estimable
Gadomski 1994b - neb	3/21	2/18		4.78%	1.33[0.2,9.02]
Ipek 2011	3/30	5/30		11.64%	0.56[0.12,2.57]
Klassen 1991	9/42	12/41		24.69%	0.66[0.24,1.79]
Ralston 2005	14/23	16/25		15.53%	0.88[0.27,2.82]
Schuh 1990	4/21	2/19		4.4%	2[0.32,12.41]
Schweich 1992	3/13	6/12		12.42%	0.3[0.05,1.67]
Subtotal (95% CI)	**222**	**182**		**75.1%**	**0.77[0.44,1.33]**
Total events: 37 (Bronchodilator), 43 (Placebo)					
Heterogeneity: $Tau^2=0$; $Chi^2=3.02$, df=6(P=0.81); $I^2=0\%$					



Test for overall effect: Z=0.94(P=0.35)

Cochrane Library 2015

A randomized, controlled trial of the effectiveness of nebulized therapy with epinephrine compared with albuterol and saline in infants hospitalized for acute viral bronchiolitis

Outcomes (h)(SD)	EPI (n = 50)	ALB (n = 51)	PLAC (n = 48)	*P* value
Mean LOS	59.8 (62)	61.4 (54)	63.3 (47)	.95
Mean time to normal oxygenation (hemoglobin oxygen saturation of ≥95% in room air)	25.0 (37)	33.0 (55)	36.6 (56)	.5
Mean time to adequate fluid intake	35.1 (44)	38.4 (42)	47.6 (48)	.4
Mean time to RDAI ≤4	34.6 (34)	45.7 (55)	36.8 (44)	.4
Mean time to infrequent nebulizations (every 4 h or less often)	16.3 (30)	31.1 (48)	34.3 (46)	.08

D'après Patel et al, 2002

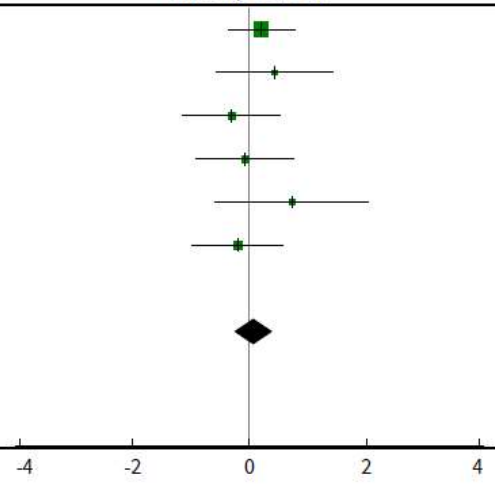
Bronchodilatateurs et LOS

Analysis 1.7. Comparison 1 Bronchodilators compared to placebo for treatment of acute bronchiolitis, Outcome 7 Duration of hospitalization (inpatients).

Study or subgroup	Bronchodilator N	Bronchodilator Mean(SD)	Placebo N	Placebo Mean(SD)	Mean Difference Fixed, 95% CI	Weight	Mean Difference Fixed, 95% CI
Chowdhury 1995	67	4.5 (1.4)	22	4.3 (1.1)		33.46%	0.2[-0.37,0.77]
Karadag 2005 - IPR	22	2.9 (1.7)	11	2.5 (1.2)		11.07%	0.43[-0.56,1.42]
Karadag 2005 - SAL	24	2.2 (1.2)	12	2.5 (1.2)		15.66%	-0.31[-1.14,0.52]
Patel 2002	51	2.6 (2.3)	48	2.6 (2)		15.72%	-0.08[-0.91,0.75]
Tinsa 2009	16	3.3 (2)	19	2.6 (2)		6.3%	0.73[-0.58,2.04]
Wang 1992	40	2.7 (1.7)	17	2.9 (1.2)		17.79%	-0.2[-0.98,0.58]
Total ***	**220**		**129**			**100%**	**0.06[-0.27,0.39]**

Heterogeneity: $Tau^2=0$; $Chi^2=3.07$, df=5(P=0.69); $I^2=0\%$

Test for overall effect: Z=0.38(P=0.7)



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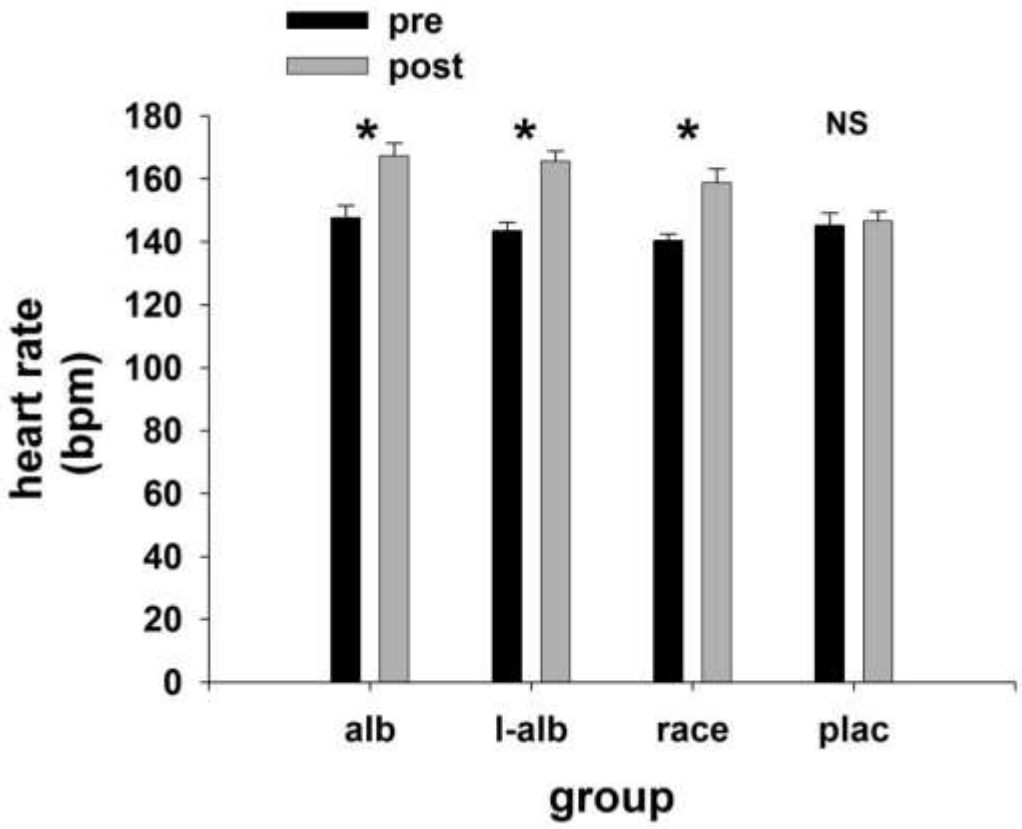
Effets secondaires



D'après Levin et al, 2008

Si nébulisation :

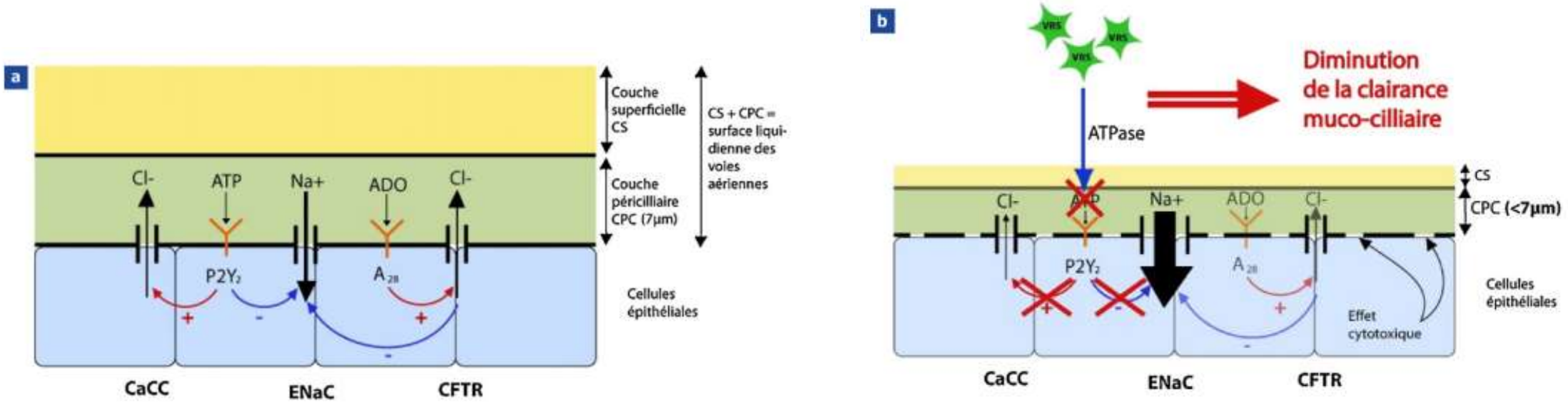
- Adrénaline : 0,1 mL/kg (max 5 mL) d'une solution de 1mg/1mL
- Salbutamol : 0,01 à 0,03 mL/kg (max 1mL) d'une solution de 5mg/1mL

La nébulisation de sérum salé hypertonique

Recommendation
R38—Nebulization of hypertonic saline should probably not be used routinely (**GRADE 2−, strong agreement**)

D'après Milési et al, GFRUP, 2023

Mécanisme



D'après Sauvaget et al, 2012

Nebulized hypertonic saline in infants hospitalized with moderately severe bronchiolitis due to RSV infection: A multicenter randomized controlled trial

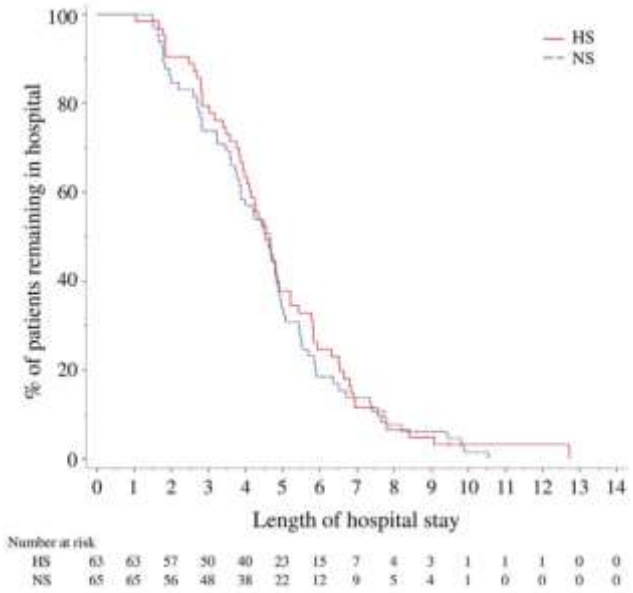


FIGURE 2 The percentage of infants remaining in hospital per group

TABLE 2 Clinical outcomes in HS and NS groups

Variable	HS (*n* = 63)	NS (*n* = 65)	*P*-value
Length of hospital stay in days (mean ± SD)	4.81 ± 2.14	4.61 ± 2.18	0.62
Duration of O2 administration in days (mean ± SD)	2.77 ± 2.68	2.50 ± 2.50	0.55
Improvement in CSS (admission−72 h), (mean ± SD)	−3.63 ± 2.30	−3.58 ± 2.56	0.91

HS, hypertonic saline; NS, normal saline; SD, standard deviation; CSS, clinical severity score.

D'après Morikawa et al, 2018

ORIGINAL ARTICLE

SABRE: a multicentre randomised control trial of nebulised hypertonic saline in infants hospitalised with acute bronchiolitis

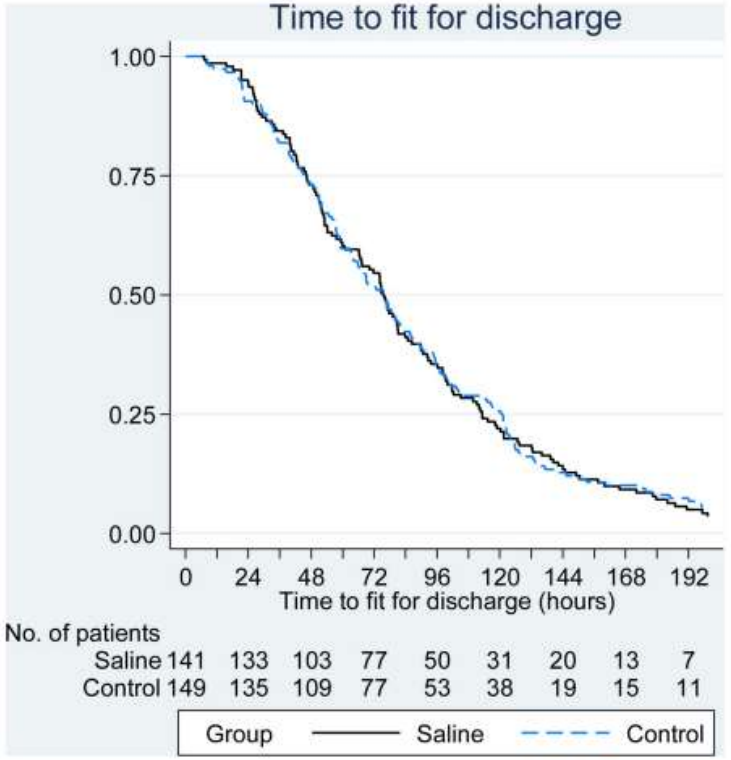


Figure 2 Cumulative survival plot for time to being declared fit for discharge.

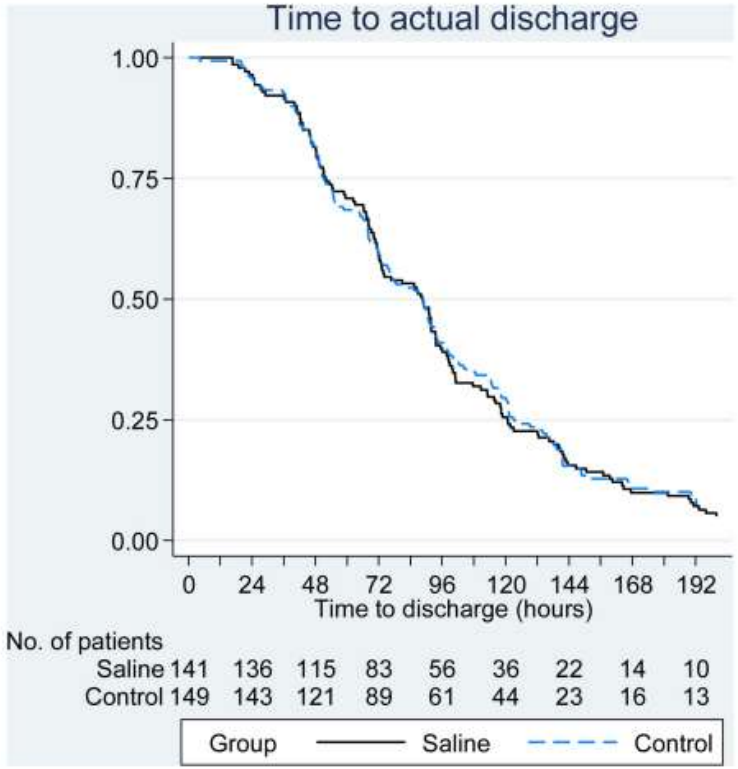
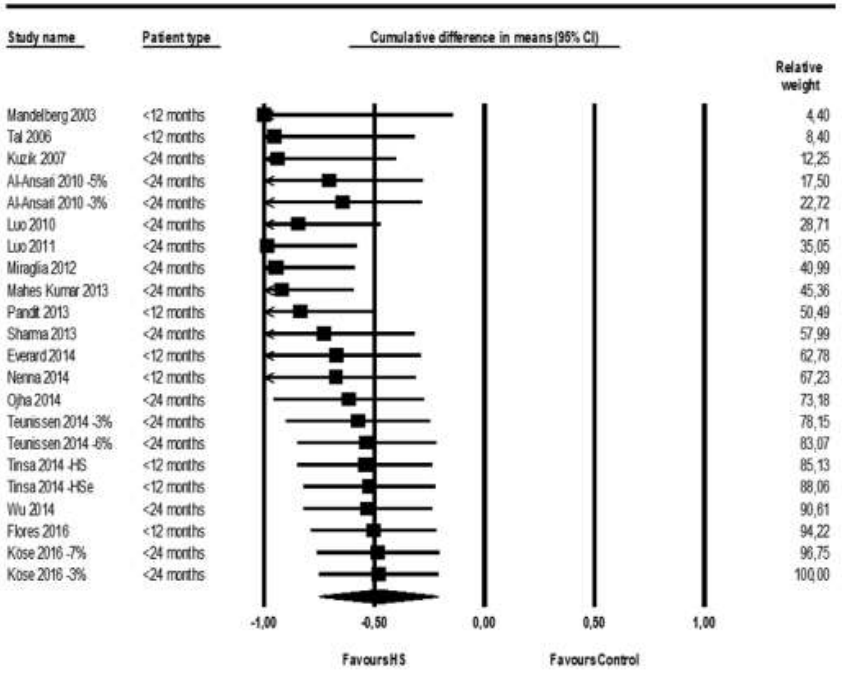


Figure 3 Cumulative survival plot for actual time to discharge.

D'après Everard et al, 2014

Hypertonic saline inhalations in bronchiolitis—A cumulative meta-analysis

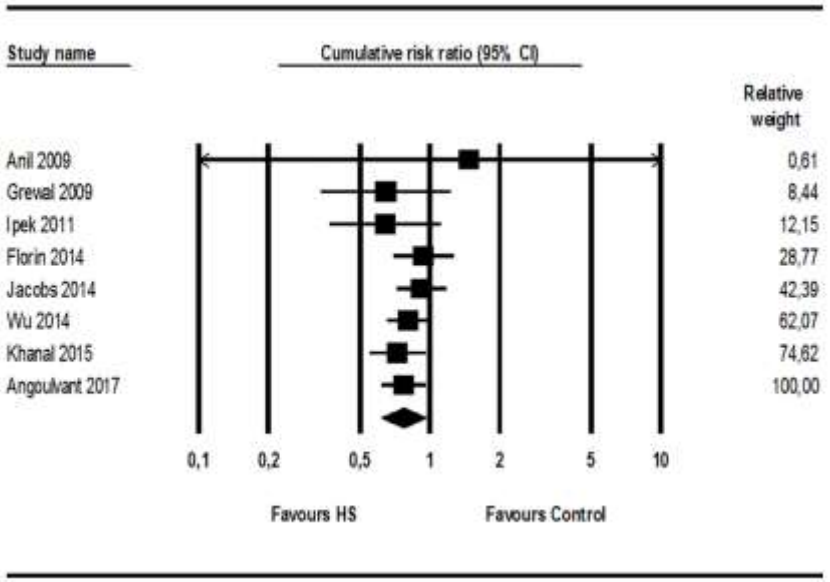
Durée d'hospitalisation



I^2 = 66,4%

D'après Heikkilä et al, 2017

Risque d'hospitalisation



I^2 = 55,8%

- Fréquence d'administration : 6h, 8h, 2x/j
- Concentration : 3%, 6% ou 7%

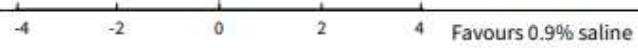
Sel hypertonique et LOS

Analysis 1.1. Comparison 1 Hypertonic saline versus normal saline (0.9%), Outcome 1 Length of hospital stay (days).

Study or subgroup	Hypertonic saline N	Hypertonic saline Mean(SD)	0.9% saline N	0.9% saline Mean(SD)	Mean Difference Random, 95% CI	Weight	Mean Difference Random, 95% CI
Mandelberg 2003	27	3 (1.2)	25	4 (1.9)		5.44%	-1[-1.87,-0.13]
Tal 2006	21	2.6 (1.4)	20	3.5 (1.7)		5.08%	-0.9[-1.86,0.06]
Kuzik 2007	45	2.6 (1.9)	46	3.5 (2.9)		4.87%	-0.9[-1.91,0.11]
Luo 2010	50	6 (1.2)	43	7.4 (1.5)		6.87%	-1.4[-1.96,-0.84]
Luo 2011	57	4.8 (1.2)	55	6.4 (1.4)		7.19%	-1.6[-2.08,-1.12]
NCT01238848	37	5.8 (2.7)	45	5.5 (2.1)		4.63%	0.33[-0.73,1.39]
Miraglia Del Giudice 2012	52	4.9 (1.3)	54	5.6 (1.6)		6.88%	-0.7[-1.25,-0.15]
Mahesh Kumar 2013	20	2.3 (0.9)	20	2.9 (1.8)		5.47%	-0.63[-1.49,0.23]
Pandit 2013	51	3.9 (1.7)	49	4.1 (1.9)		6.16%	-0.16[-0.87,0.55]
Sharma 2013	125	2.7 (0.9)	123	2.7 (0.9)		8.1%	-0.01[-0.24,0.22]
Teunissen 2014	167	3 (2)	80	2.5 (1.6)		7.3%	0.56[0.1,1.02]
Everard 2014	142	3.8 (3.1)	149	3.7 (2.8)		6.33%	0.06[-0.62,0.74]
Tinsa 2014	31	3.6 (1.7)	26	4.5 (3.8)		3.01%	-0.9[-2.48,0.68]
Ojha 2014	28	1.9 (1)	31	1.8 (1.2)		6.92%	0.05[-0.5,0.6]
Flores 2016	33	4.9 (2.4)	35	4.7 (2.3)		4.43%	0.2[-0.92,1.32]
Köse 2016	67	3.1 (2.1)	35	3.2 (2.4)		5.19%	-0.12[-1.05,0.81]
Ratajczyk-Pekrul 2016	41	3.1 (1.6)	37	3.1 (1.6)		6.12%	-0.05[-0.77,0.67]
Total ***	**994**		**873**			**100%**	**-0.41[-0.75,-0.07]**

Heterogeneity: Tau^2=0.36; Chi^2=76.46, df=16(P<0.0001); I^2=79.07%

Test for overall effect: Z=2.36(P=0.02)



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Les corticoïdes

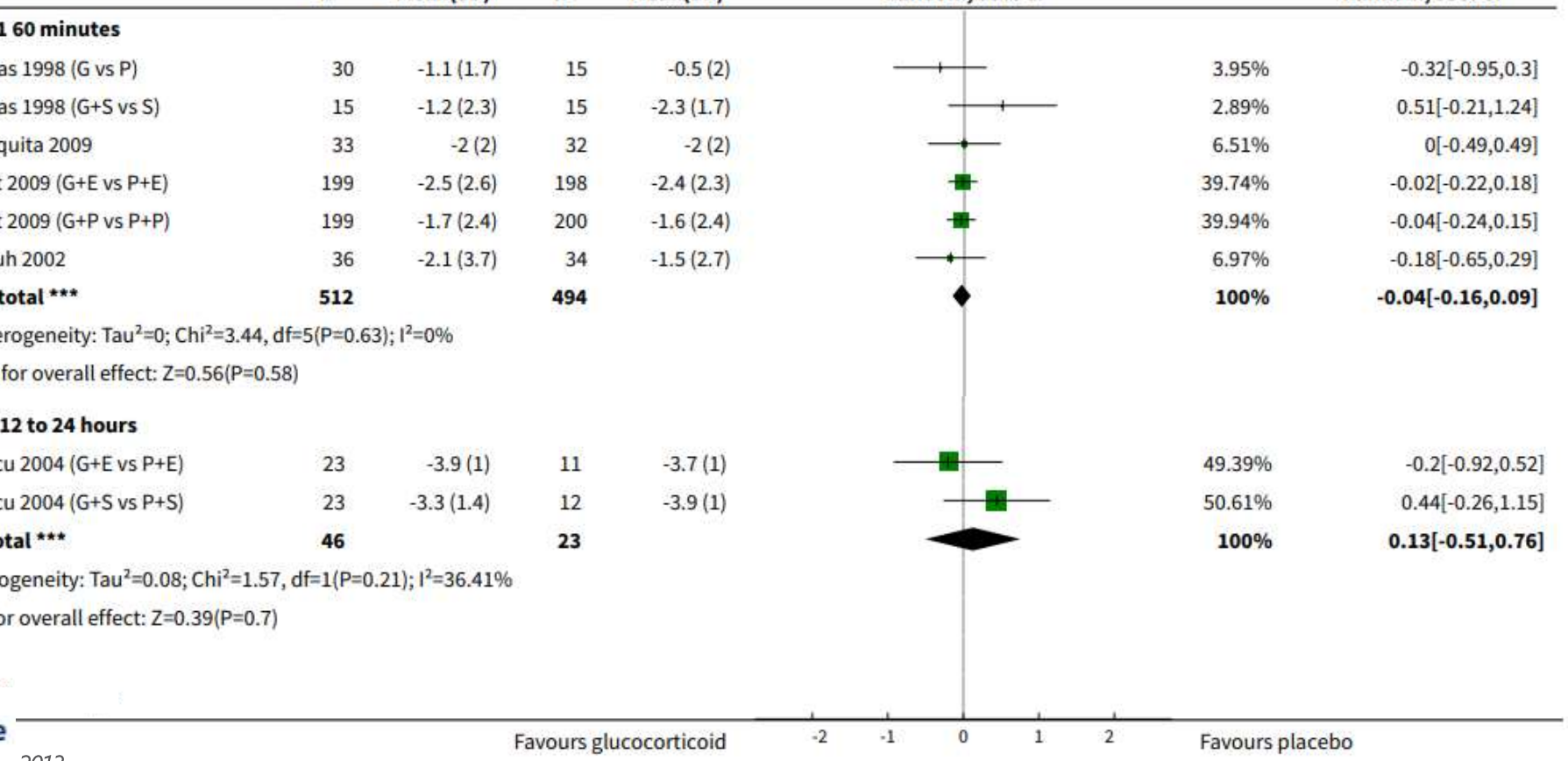
Recommendation
R31—Corticosteroids, whether inhaled or systemic, should probably not be used (**GRADE 2, strong agreement**)

D'après Milési et al, GFRUP, 2023

Les corticoïdes et scores cliniques

Analysis 1.4. Comparison 1 Glucocorticoid versus placebo, Outcome 4 Clinical scores (outpatients).

Study or subgroup	Glucocorticoid N	Glucocorticoid Mean(SD)	Placebo N	Placebo Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.4.1 60 minutes							
Barlas 1998 (G vs P)	30	-1.1 (1.7)	15	-0.5 (2)		3.95%	-0.32[-0.95,0.3]
Barlas 1998 (G+S vs S)	15	-1.2 (2.3)	15	-2.3 (1.7)		2.89%	0.51[-0.21,1.24]
Mesquita 2009	33	-2 (2)	32	-2 (2)		6.51%	0[-0.49,0.49]
Plint 2009 (G+E vs P+E)	199	-2.5 (2.6)	198	-2.4 (2.3)		39.74%	-0.02[-0.22,0.18]
Plint 2009 (G+P vs P+P)	199	-1.7 (2.4)	200	-1.6 (2.4)		39.94%	-0.04[-0.24,0.15]
Schuh 2002	36	-2.1 (3.7)	34	-1.5 (2.7)		6.97%	-0.18[-0.65,0.29]
Subtotal ***	**512**		**494**			**100%**	**-0.04[-0.16,0.09]**
Heterogeneity: Tau^2=0; Chi^2=3.44, df=5(P=0.63); I^2=0%							
Test for overall effect: Z=0.56(P=0.58)							
1.4.4 12 to 24 hours							
Kuyucu 2004 (G+E vs P+E)	23	-3.9 (1)	11	-3.7 (1)		49.39%	-0.2[-0.92,0.52]
Kuyucu 2004 (G+S vs P+S)	23	-3.3 (1.4)	12	-3.9 (1)		50.61%	0.44[-0.26,1.15]
Subtotal ***	**46**		**23**			**100%**	**0.13[-0.51,0.76]**
Heterogeneity: Tau^2=0.08; Chi^2=1.57, df=1(P=0.21); I^2=36.41%							
Test for overall effect: Z=0.39(P=0.7)							



Cochrane Library 2013

Les corticoïdes et admission

- RCT double aveugle multicentrique (Canada)
- 800 enfants (6 sem – 12 mois)
- Outpatients
- 4 groupes :
  - Aérosol Adrénaline (3mL) + dexaméthasone PO (1 mg/kg puis 5 x 0,6 mg/kg)
  - Aérosol Adrénaline + placebo PO
  - Aérosol placebo + dexa PO
  - Aérosol placebo + plabebo PO

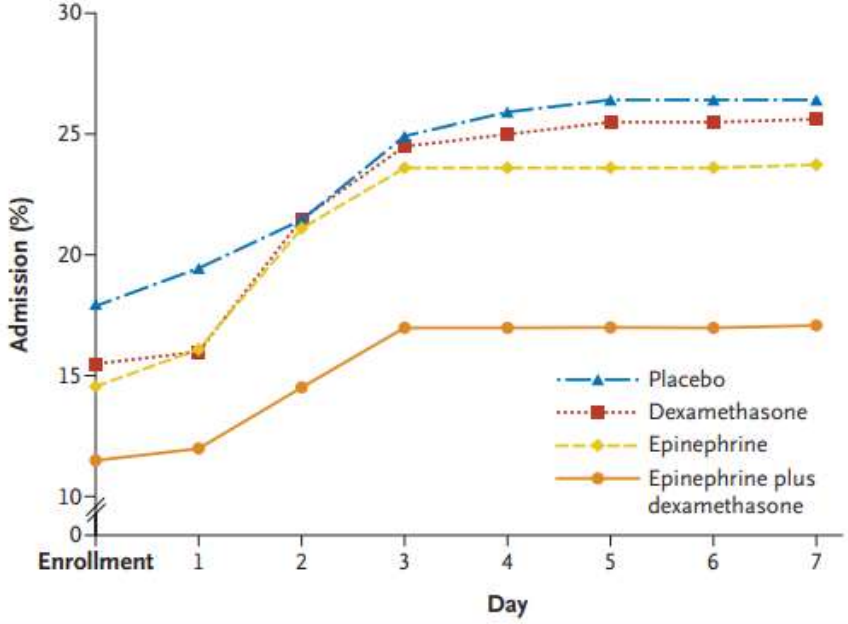


Figure 3. Cumulative Admissions during the First 7 Days after the Initial Emergency Department Visit, According to Study Group.

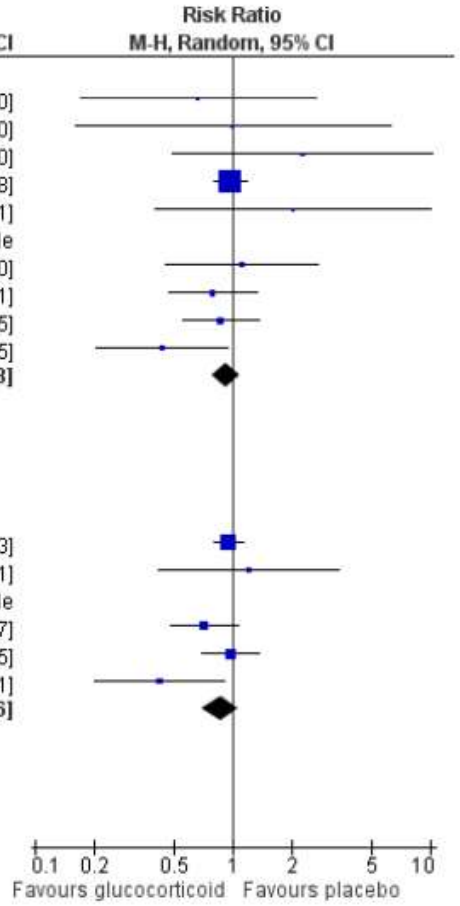
Enrollment data represent all patients admitted at their initial visit to the emergency department, and data for day 1 represent patients admitted within 24 hours of this visit.

D'après Plint, 2009

Les corticoïdes et admission

Figure 6. Forest plot of comparison: 1 Steroid versus placebo, outcome: 1.1 Admissions (days 1 and 7) (outpatients) - review primary outcome.

Study or Subgroup	Glucocorticoid Events	Total	Placebo Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
1.1.1 Admissions day 1						
Barlas 1998 (G vs P) (1)	4	30	3	15	1.3%	0.67 [0.17, 2.60]
Barlas 1998 (G+S vs S) (2)	2	15	2	15	0.7%	1.00 [0.16, 6.20]
Berger 1998	5	20	2	18	1.1%	2.25 [0.50, 10.20]
Corneli 2007	121	305	121	295	65.9%	0.97 [0.80, 1.18]
Goebel 2000	4	24	2	24	1.0%	2.00 [0.40, 9.91]
Kuyucu 2004	0	46	0	23		Not estimable
Mesquita 2009	8	33	7	32	3.1%	1.11 [0.45, 2.70]
Plint 2009 (G+E vs P+E)	23	199	29	198	9.6%	0.79 [0.47, 1.31]
Plint 2009 (G+P vs P+P)	31	199	36	201	13.0%	0.87 [0.56, 1.35]
Schuh 2002	7	36	15	34	4.3%	0.44 [0.21, 0.95]
Subtotal (95% CI)		**907**		**855**	**100.0%**	**0.92 [0.78, 1.08]**
Total events	205		217			
Heterogeneity: Tau² = 0.00; Chi² = 6.87, df = 8 (P = 0.55); I² = 0%						
Test for overall effect: Z = 1.05 (P = 0.30)						
1.1.2 Admissions day 7						
Corneli 2007	133	284	131	265	45.0%	0.95 [0.80, 1.13]
Goebel 2000	6	24	5	24	3.8%	1.20 [0.42, 3.41]
Kuyucu 2004	0	46	0	23		Not estimable
Plint 2009 (G+E vs P+E)	34	199	47	198	19.6%	0.72 [0.48, 1.07]
Plint 2009 (G+P vs P+P)	51	199	53	201	24.8%	0.97 [0.70, 1.35]
Schuh 2002	7	35	15	32	6.8%	0.43 [0.20, 0.91]
Subtotal (95% CI)		**787**		**743**	**100.0%**	**0.86 [0.70, 1.06]**
Total events	231		251			
Heterogeneity: Tau² = 0.02; Chi² = 5.84, df = 4 (P = 0.21); I² = 32%						
Test for overall effect: Z = 1.38 (P = 0.17)						



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Les corticoïdes et LOS

Analysis 1.2. Comparison 1 Glucocorticoid versus placebo, Outcome 2 Length of stay (inpatients) - review primary outcome.

Study or subgroup	Glucocorticoid N	Glucocorticoid Mean(SD)	Placebo N	Placebo Mean(SD)	Mean Difference Random, 95% CI	Weight	Mean Difference Random, 95% CI
Bentur 2005	29	5.5 (7.9)	32	6.3 (8.8)		0.27%	-0.82[-5,3.36]
Cade 2000	82	2 (1.5)	79	2 (2.2)		11.66%	0[-0.59,0.59]
De Boeck 1997	14	6 (2.6)	15	6.6 (1.2)		2.09%	-0.6[-2.09,0.89]
Gomez 2007	24	0.7 (0.2)	25	0.8 (0.2)		58.38%	-0.12[-0.24,-0.01]
Klassen 1997	35	2.4 (2.4)	32	2 (0.7)		6.32%	0.38[-0.46,1.21]
Richter 1998	21	2 (2.6)	19	3 (1.6)		2.54%	-1[-2.35,0.35]
Teeratakulpisarn 2007	89	2.3 (1.2)	85	2.8 (1.7)		17.57%	-0.56[-1.01,-0.11]
Zhang 2003	28	6 (4.1)	24	5 (3.3)		1.17%	1[-1.01,3.01]
Total ***	**322**		**311**			**100%**	**-0.18[-0.39,0.04]**

Heterogeneity: Tau^2=0.02; Chi^2=8.33, df=7(P=0.3); I^2=15.97%

Test for overall effect: Z=1.58(P=0.12)

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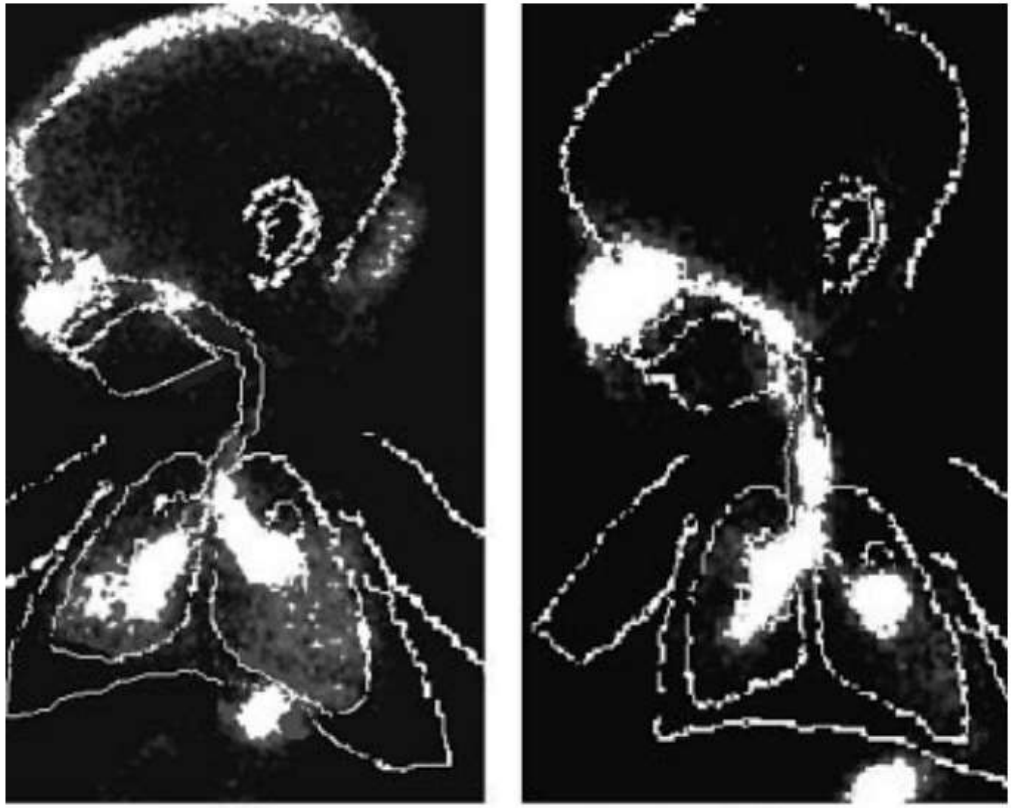
Et le nébuliseur…

Masque vs Hood



Hood

2,6%

Mask

2,4%

D'après Amirav, 2003

Aerosol Deposition in Neonatal Ventilation

JEAN C. DUBUS, LAURENT VECELLIO, MICHELE DE MONTE, JAMES B. FINK, DANIEL GRIMBERT, JEROME MONTHARU, CHANTAL VALAT, NEIL BEHAN, AND PATRICE DIOT

INSERM U618 [J.C.D., L.V., M.d.M., D.G., J.M., C.V., P.D.], 37044, Tours, France; Department of Pediatrics [J.C.D.], Timone-Enfants Hospital, 13385, Marseille, France; and Aerogen, Inc. [J.B.F., N.B.], Mountain View, California 94043

Table 1. *Deposition of 99mTc-DTPA using APN-S, APN-C, and the MistyNeb in a macaque model of neonatal ventilation*

	APN-S	APN-C	MistyNeb
Nebulizer	2.7 (1.8–3.7)*	9.9 (8.7–11.3)*	22.4 (19.7–23.7)*
T-piece	0.9 (0.7–2.0)*	9.8 (2.3–15.9)*	6.5 (2.1–10.0)*
	0.9 (0.7–2.1)†	9.8 (2.6–18)†	8.4 (2.0–12.5)†
Inspiratory limb	8.2 (0.5–9.5)*	8.4 (0.7–17.3)*	7.9 (3.7–11.3)*
	8.4 (0.6–9.8)†	9.3 (0.8–19.0)†	10.2 (3.6–14.1)†
Y-piece	3.3 (1.9–5.7)*	10.5 (5.6–17.1)*	3.5 (0.0–6.9)*
	3.4 (2.0–5.9)†	11.6 (6.3–19.3)†	4.4 (0.0–6.7)†
ETT	9.0 (3.1–9.8)*	4.4 (2.1–6.8)*	1.0 (0.5–2.1)*
	9.3 (3.1–14.0)†	4.8 (2.4–7.7)†	1.3 (0.5–2.8)
Lungs	14.0 (12.2–23.7)*	12.6 (9.6–20.6)*	0.5 (0.4–1.3)*
Expiratory limb	3.0 (1.4–4.2)*	3.3 (2.7–4.8)*	1.6 (0.6–2.3)*
	3.1 (1.4–4.3)†	3.7 (3.1–5.2)†	1.9 (0.7–2.6)†
Expiratory filter	20.1 (19.0–22.3)*	9.5 (7.7–11.1)*	10.6 (8.2–12.7)*
	20.6 (19.7–22.8)†	10.5 (8.5–12.4)†	12.0 (10.2–16.4)†

Results are expressed in percentage of the nebulizer charge (median and range)* and in percentage of the aerosol nebulized (median and range)† in the case of the circuit components.

Iloprost drug delivery during infant conventional and high-frequency oscillatory ventilation

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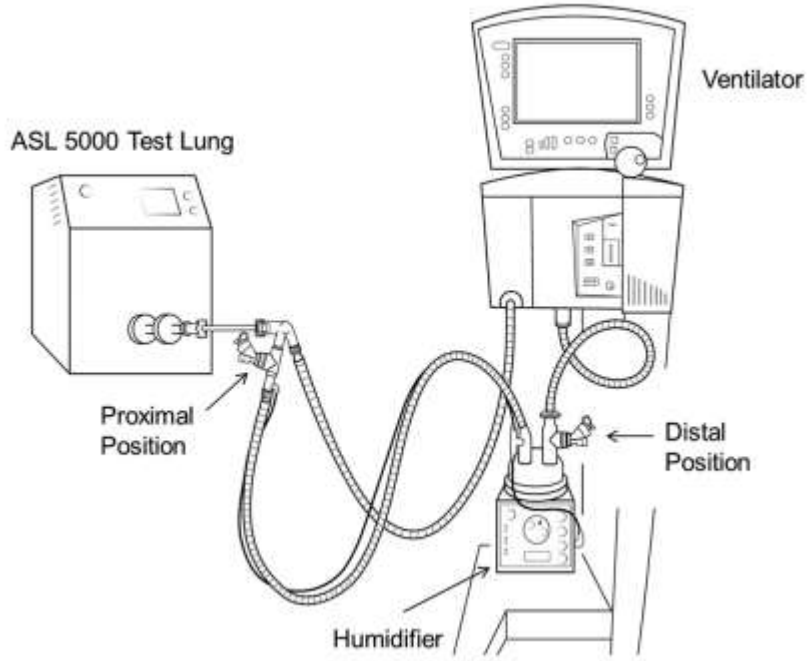

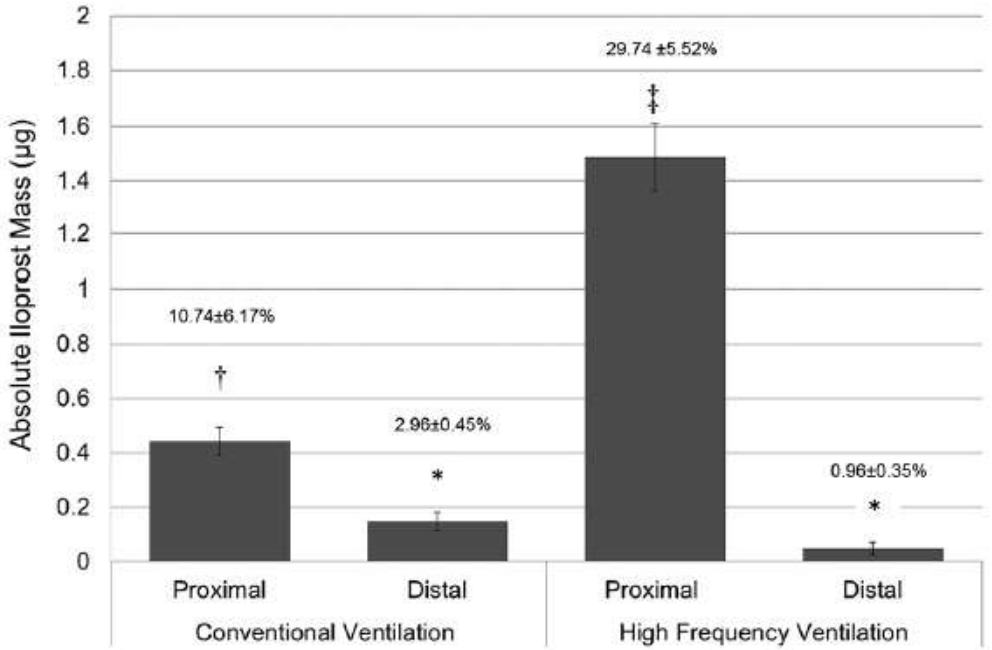

Influence of Nebulizer Type, Position, and Bias Flow on Aerosol Drug Delivery in Simulated Pediatric and Adult Lung Models During Mechanical Ventilation

Arzu Ari PhD RRT PT CPFT, Orcin Telli Atalay PhD PT, Robert Harwood MSA RRT, Meryl M Sheard MSc RRT, Essam A Aljamhan MSc RRT, and James B Fink PhD RRT FAARC

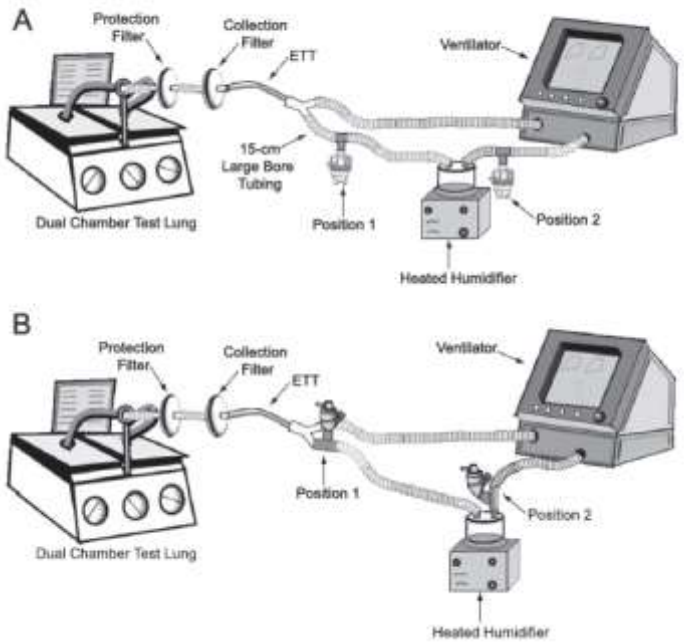

Table 1. Albuterol Sulfate Deposited Distal to the Endotracheal Tube

	Percent of Nominal or Emitted Dose (mean ± SD %)							
	Adult Lung Model				Pediatric Lung Model			
	Position 1		Position 2		Position 1		Position 2	
	Bias flow 2 L/min	Bias flow 5 L/min	Bias flow 2 L/min	Bias flow 5 L/min	Bias flow 2 L/min	Bias flow 5 L/min	Bias flow 2 L/min	Bias flow 5 L/min
Jet nebulizer	4.7 ± 0.1*	4.0 ± 0.1*	5.2 ± 0.2*	4.7 ± 0.4*	4.2 ± 0.2*	3.8 ± 0.3*	5.2 ± 0.3*	4.1 ± 0.4*
Vibrating-mesh nebulizer	13.4 ± 1.1	9.7 ± 0.6	23.8 ± 1.0	21.4 ± 0.4	11.4 ± 0.7	8.4 ± 0.2	13.6 ± 1.3	10.6 ± 0.3

* Significant difference between jet nebulizer and vibrating-mesh nebulizer ($p < .05$).

High-Percentage Lung Delivery in Children From Detergent-Treated Spacers

Johannes H. Wildhaber, MD,* Hettie M. Janssens, MD, Frédéric Piérart, MD, Nigel D. Dore, FRACP, Sunalene G. Devadason, PhD, and Peter N. LeSouëf, MD

	Group A	Group B	Group C
Actuator	12.3% (5.2)	12.4% (4.3)	8.5% (2.7)
Spacer	36.9% (2.6)	42.4% (10.3)	32.9% (2.7)
Filter	8.7% (3.9)	0.2% (0.1)	0.3% (0.2)
Mask	4.7% (2.8)		
Gastrointestinal deposition	20.9% (5.1)	16.8% (3.7)	16.5% (3.0)
Lung deposition	16.4% (5.5)	28.2% (6.7)	41.8% (3.8)

< 48 months **48 - 96 months** **> 96 months**

Babyhaler + mask **Volumatic + embout buccal**

Take home messages

Bronchodilatateurs	
C	Il n'est pas recommandé d'administrer des bêta-2mimétiques (salbutamol, terbutaline) dans la prise en charge de BA en raison de l'absence de données suffisantes sur les profils répondeurs. L'administration peut être mal tolérée chez le nourrisson de moins de 2 mois.

Adrénaline	
A	Il n'est pas recommandé d'administrer de l'adrénaline en nébulisation dans la prise en charge de la BA.

Nébulisation de sérum salé hypertonique	
A	La nébulisation de sérum salé hypertonique n'est pas recommandée dans la prise en charge de la bronchiolite aiguë aux urgences. La nébulisation de sérum salé hypertonique n'est pas recommandée dans la prise en charge de la bronchiolite aiguë en hospitalisation.

Corticoïdes	
C	Il n'est pas recommandé d'administrer des corticoïdes systémiques dans la prise en charge du nourrisson avec une BA.
B	Il n'est pas recommandé d'administrer des corticoïdes inhalés dans la prise en charge du nourrisson avec une BA, ni en prévention d'un asthme ou atopie, ni en prévention de rechute de dyspnée sifflante.

HAS
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CNP de Pédiatrie
Conseil National Professionnel de Pédiatrie

D'après recommandations HAS, 2019