



L'approche systématique permet-elle le sevrage

30 Mars 2023 - Mulhouse

Pr Stephan Ehrmann



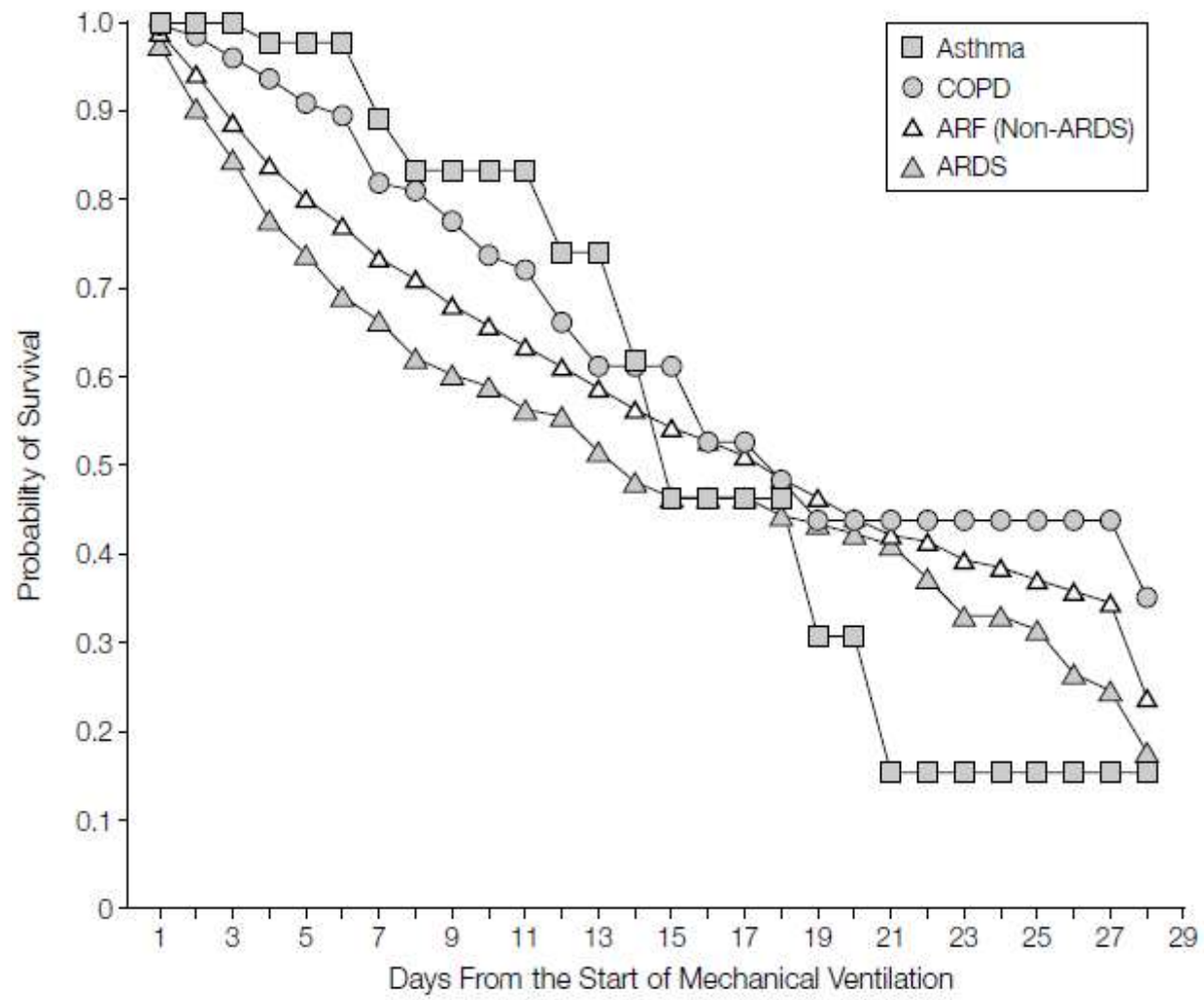
Liens d'intérêt

- Aerogen Ltd
- Fisher & Paykel Healthcare

L'approche systématique permet-elle le sevrage?

- Intérêt de protocoles de sevrage?
- Implication paramédicale dans le sevrage?
- Systèmes automatisés de sevrage?
- Sevrage ou extubation?
- Uniformité des pratiques vs personnalisation des soins?
- Démarche collective/de service vs liberté individuelle du soignant?
- ...

Enjeu capital du sevrage



A Esteban, JAMA 2002

Du sevrage au succès de l'extubation

Déclic? Intuition? Décision ? Protocole ? Systématique ? Personnalisé ?

Admission
Intubation

Début du
sevrage

1^{ère} épreuve
de VS

Epreuve de
VS réussie

Extubation

Sortie

Passage en Aide
Inspiratoire?

Echec
Sevrage difficile /
voir prolongé

Echec
Réintubation

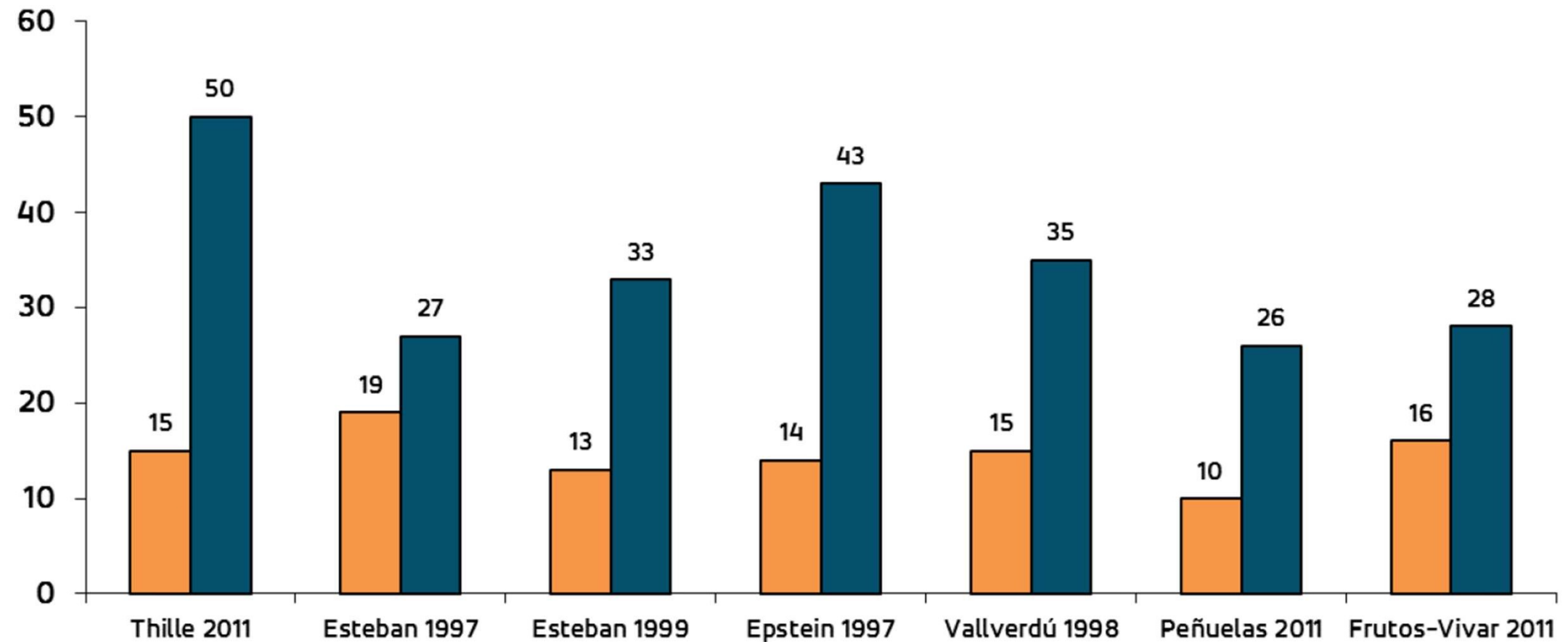
Sevrage facile

| First author [Ref.] | Yr | Subjects | Failed initial SBT | Passed Initial SBT | Re-intubated |
|---------------------|------|----------|--------------------|--------------------|----------------|
| FARIAS [24] | 2001 | 257 | 56 (22) | 201 | 28 (14) |
| ESTEBAN [22] | 1999 | 526 | 73 (14) | 453 | 61 (13) |
| VALLVERDU [17] | 1998 | 217 | 69 (32) | 148 | 23 (16) |
| ESTEBAN [25] | 1997 | 484 | 87 (18) | 397 | 74 (19) |
| ESTEBAN [16] | 1995 | 546 | 130 (24) | 416 | 58 (14) |
| BROCHARD [18] | 1994 | 456 | 109 (24) | 347 | 8 (3) |
| Total | | 2486 | 524/2486 (21%) | 1962/2486 (79%) | 252/1962 (13%) |

Pour 70% des patients il n'y a aucun problème... le seul risque est de retarder leur extubation

Usual reintubation rates 10-15%

Mortality 25-50%



Thille AW et al., Weaning from the ventilator and extubation in ICU, Current Opinion Crit Care 2013 Feb;19(1):57-64.

Du sevrage au succès de l'extubation

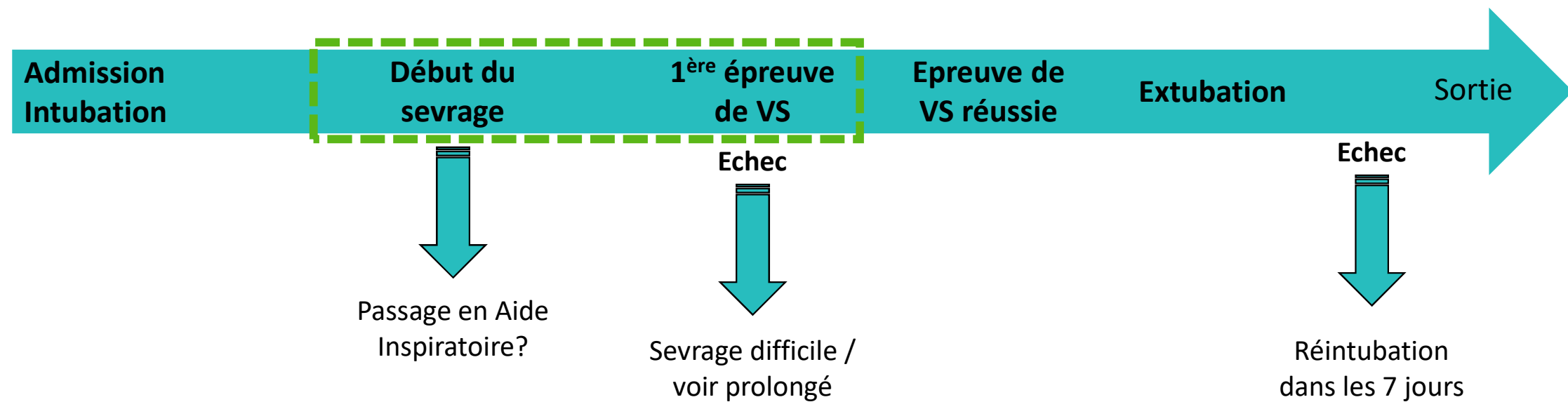


TABLE 5 Considerations for assessing readiness to wean**Clinical assessment**

Adequate cough
Absence of excessive tracheobronchial secretion
Resolution of disease acute phase for which the patient was intubated

Objective measurements

Clinical stability
Stable cardiovascular status (*i.e.* $fc \leq 140$ beats·min⁻¹, systolic BP 90–160 mmHg, no or minimal vasopressors)
Stable metabolic status
Adequate oxygenation
 $Sa_{O_2} > 90\%$ on $\leq Fi_{O_2} 0.4$ (or $Pa_{O_2}/Fi_{O_2} \geq 150$ mmHg)
PEEP ≤ 8 cmH₂O
Adequate pulmonary function
 $f_R \leq 35$ breaths·min⁻¹
MIP ≤ -20 – -25 cmH₂O
 $V_T > 5$ mL·kg⁻¹
 $VC > 10$ mL·kg⁻¹
 $f_R/V_T < 105$ breaths·min⁻¹·L⁻¹
No significant respiratory acidosis
Adequate mentation
No sedation or adequate mentation on sedation (or stable neurologic patient)

Data taken from [5, 6, 13, 16–18, 22]. *fc*: cardiac frequency; BP: blood pressure; Sa_{O_2} : arterial oxygen saturation; Fi_{O_2} : inspiratory oxygen fraction; Pa_{O_2} : arterial oxygen tension; PEEP: positive end-expiratory pressure; f_R : respiratory frequency; MIP: maximal inspiratory pressure; V_T : tidal volume; VC: vital capacity. 1 mmHg=0.133 kPa.

TABLE 5 Considerations for assessing readiness to wean

Clinical assessment

Adequate cough

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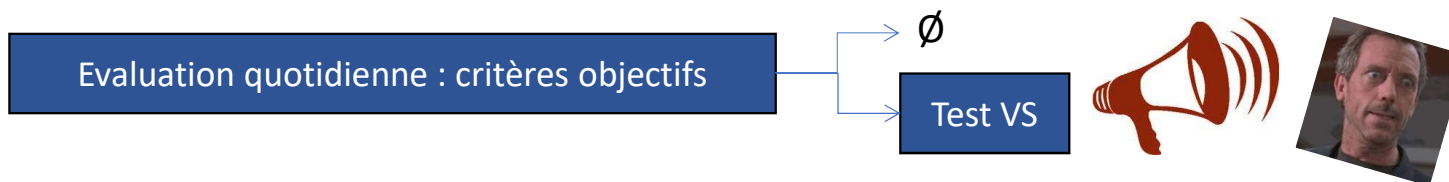
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Screening et épreuve de ventilation spontanée



Critères objectifs de suspicion :

- P/F > 200 mmHg
- PEP \leq 5 cmH₂O
- Toux à l'aspiration trachéale
- Pas de catécholamines
- Pas de sédation
- FR / Vt < 105

Screening et épreuve de ventilation spontanée

Admission
Intubation

Début du
sevrage

1^{ère} épreuve
de VS

Epreuve de
VS réussie

Extubation

Sortie

Evaluation quotidienne : critères objectifs

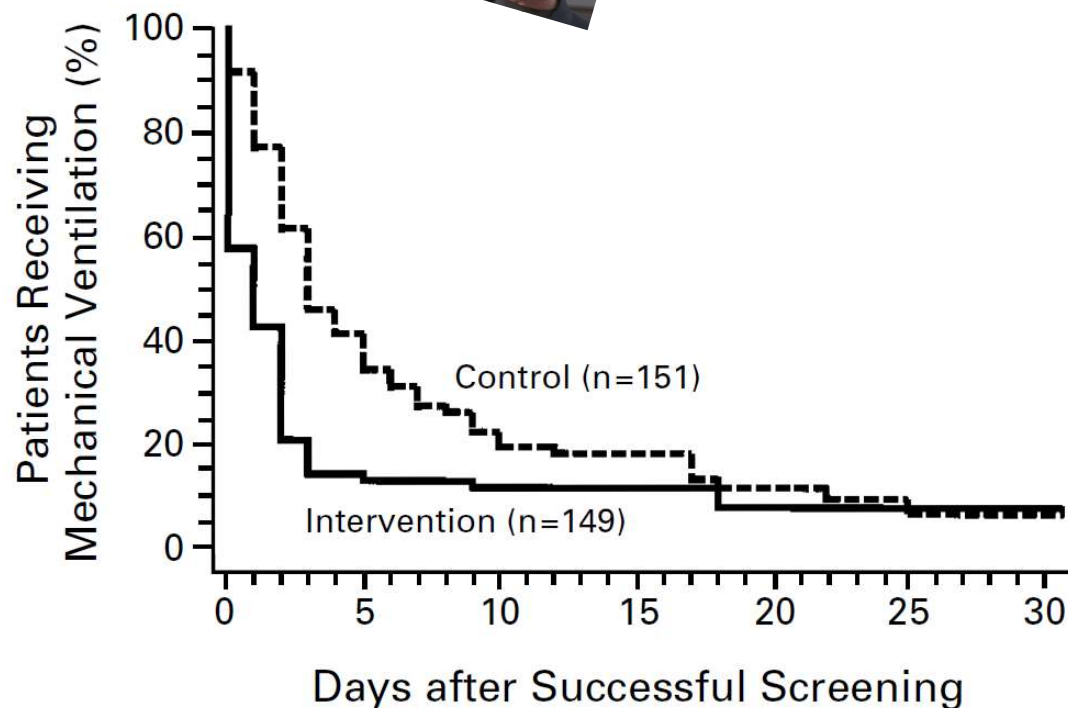
∅

Test VS



Critères objectifs de suspicion :

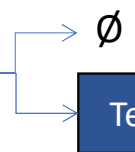
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Screening et épreuve de ventilation spontanée

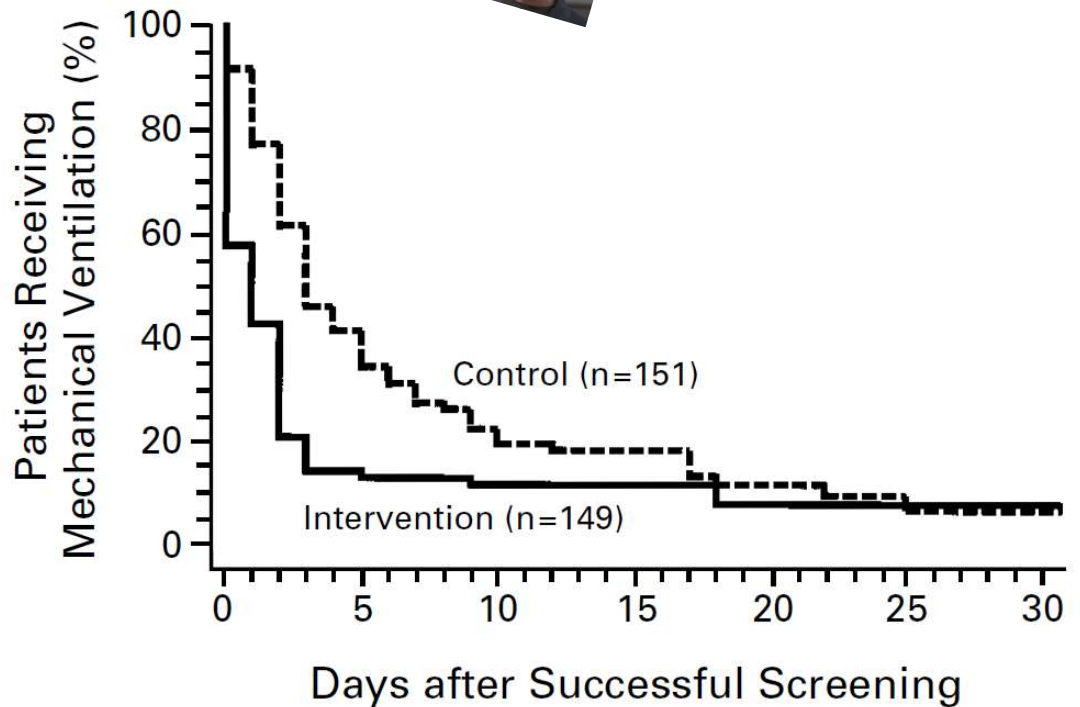


Evaluation quotidienne : critères objectifs



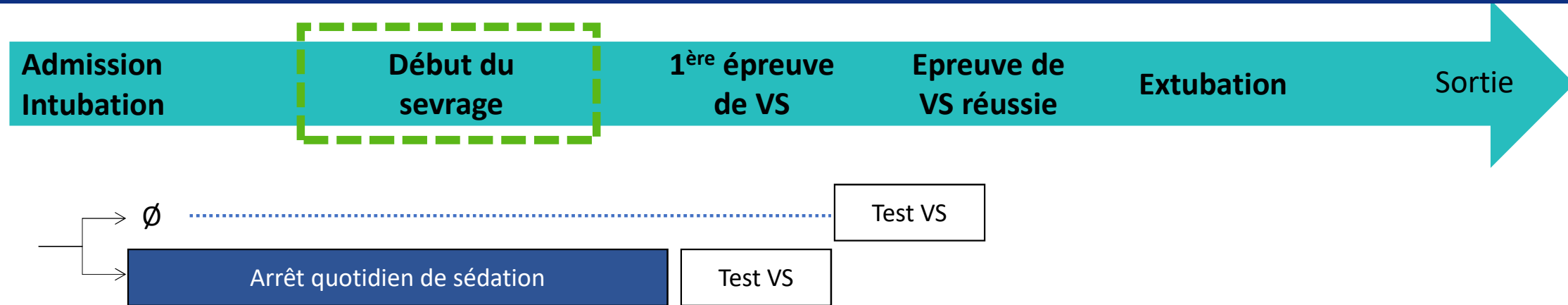
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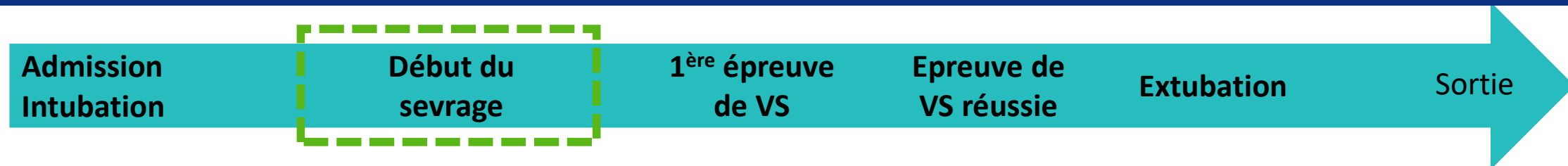
EW Ely, N Engl J Med 1996

Levée de la sédation

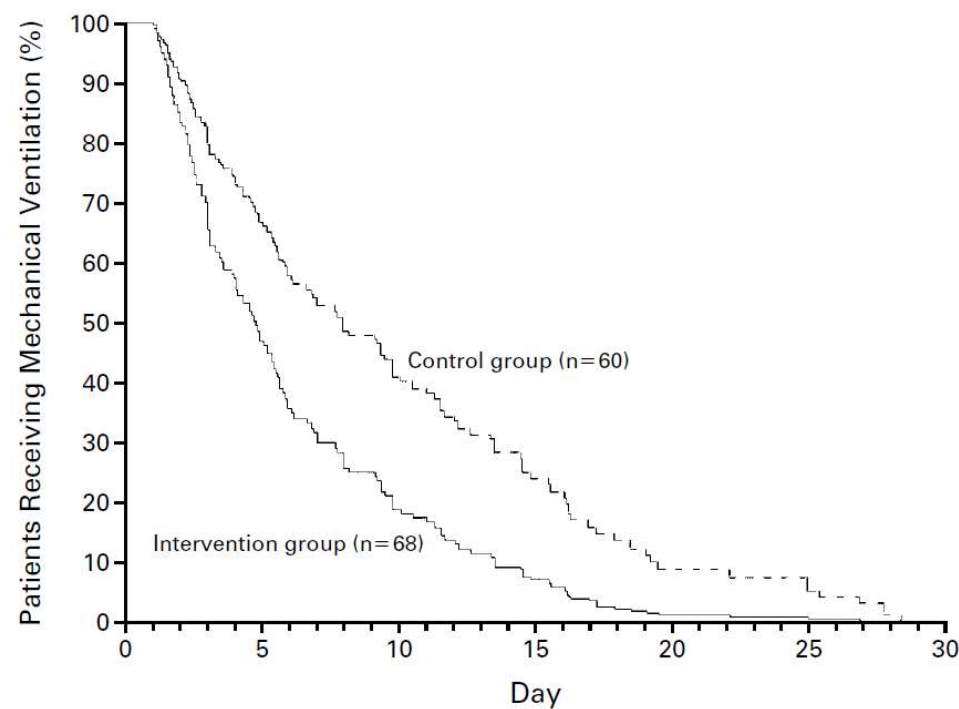


- Arrêt total des sédation le matin
- Arrêt préalable des curares
- Si agitation / problème : reprise à demi-dose
- Si RAS : pas de reprise de la sédation

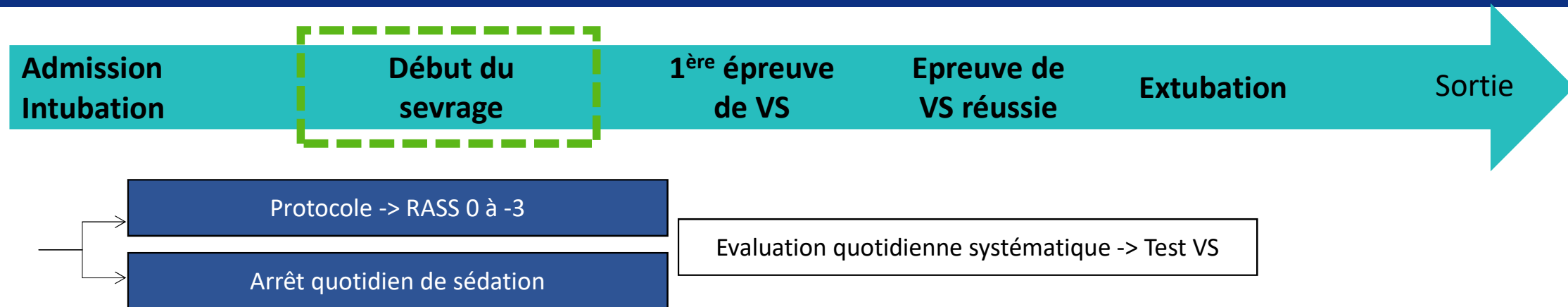
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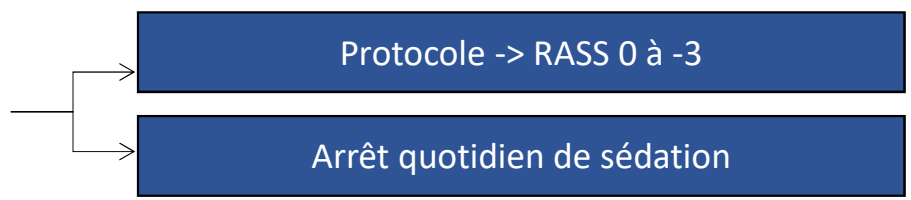
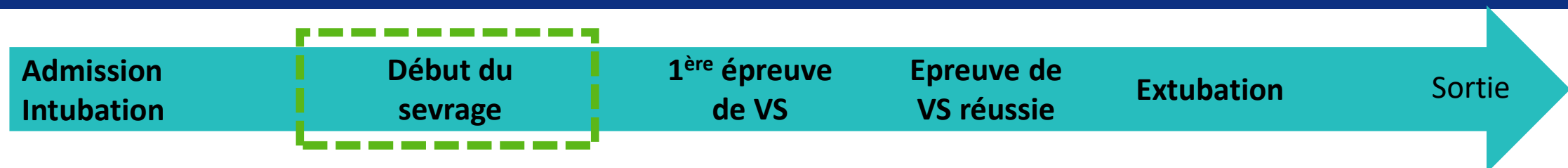
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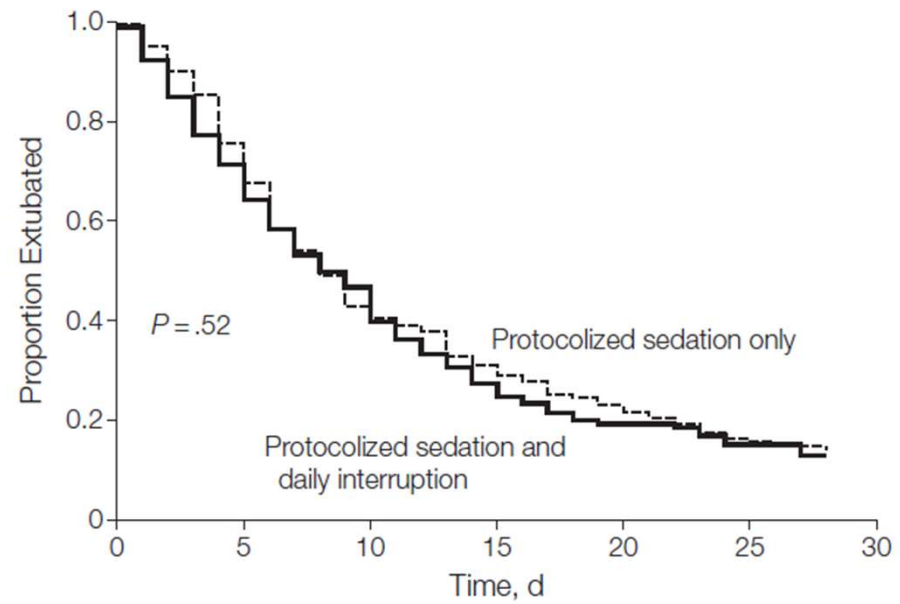
Protocole de sédation



Protocole de sédation



Evaluation quotidienne systématique -> Test VS



| No. at risk | 0 | 5 | 10 | 15 | 20 | 25 | 30 |
|--|-----|-----|----|----|----|----|----|
| Protocolized sedation only | 209 | 146 | 72 | 49 | 34 | 23 | |
| Protocolized sedation and daily interruption | 214 | 140 | 81 | 42 | 28 | 16 | |

Approche systématique / protocolisée

Qualité des soins
Efficacité

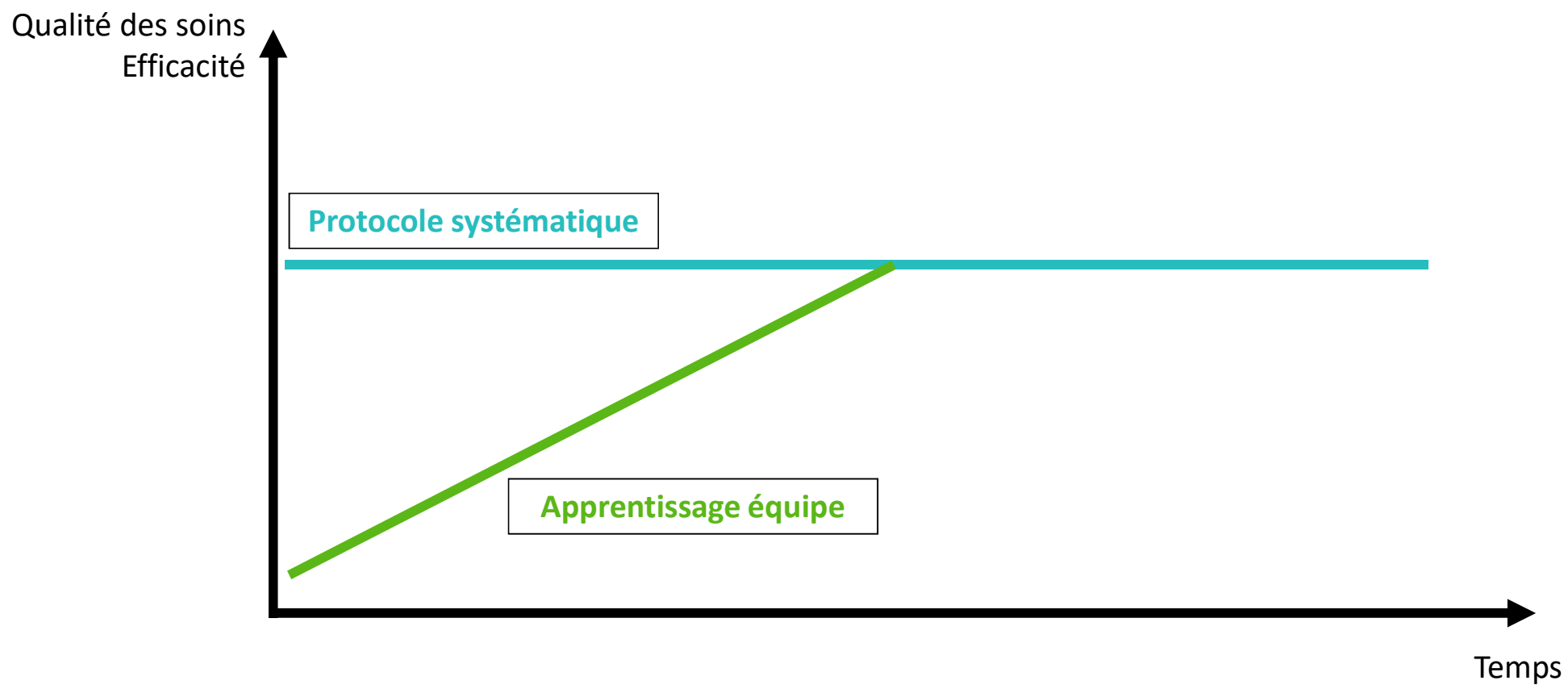


Protocole systématique

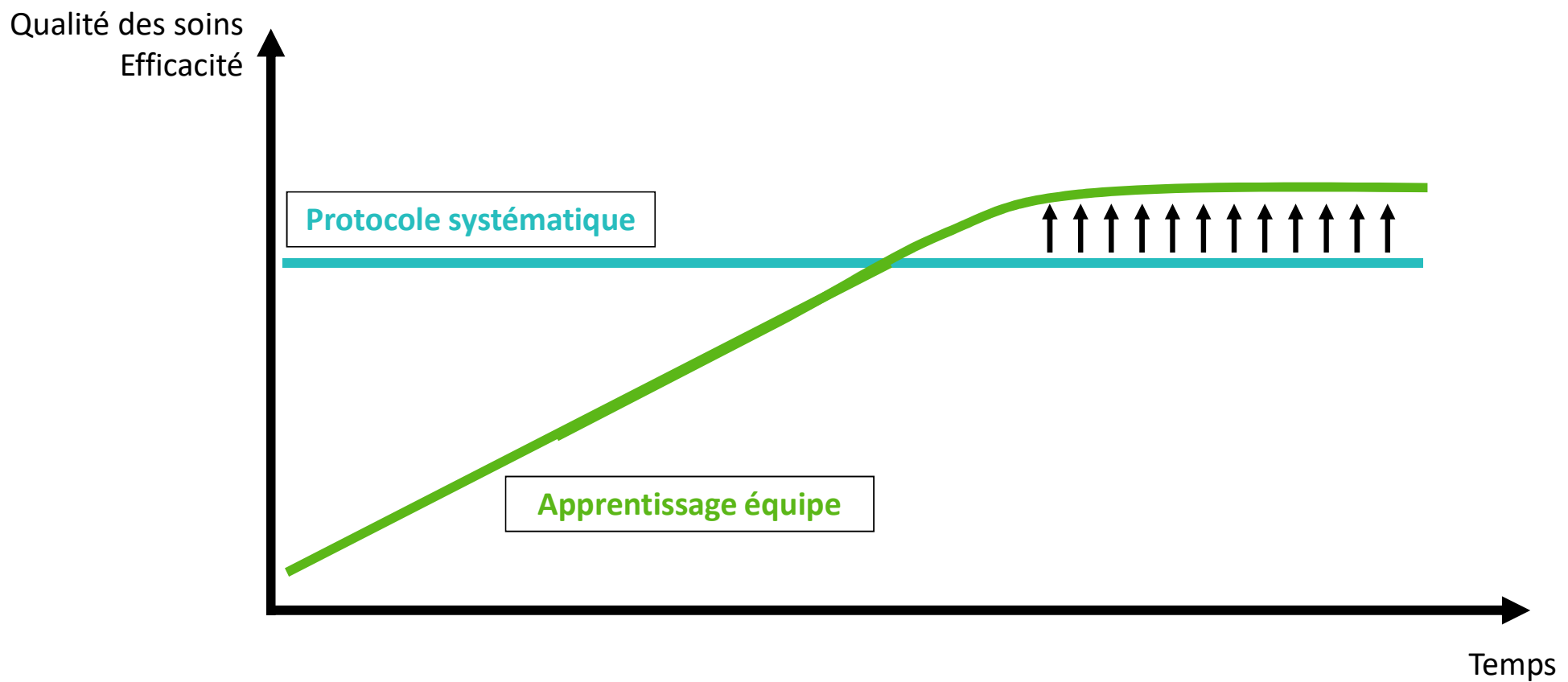


Temps

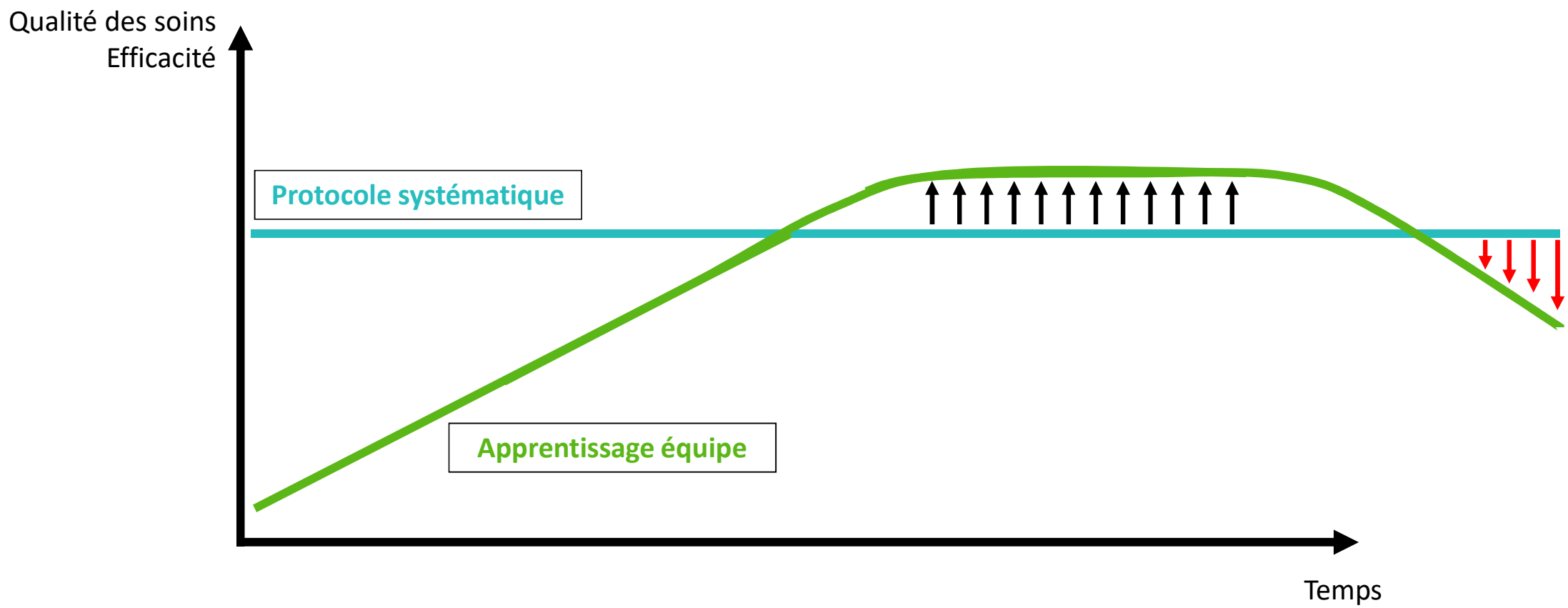
Approche systématique / protocolisée



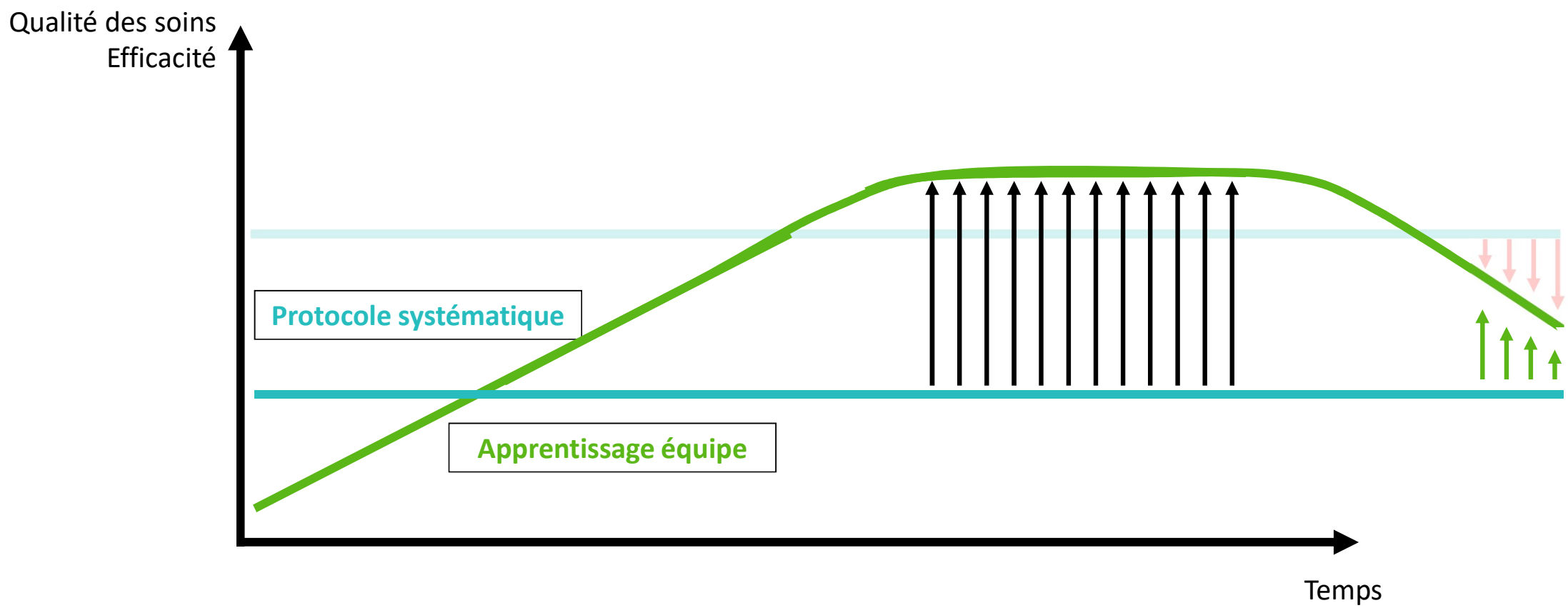
Approche systématique / protocolisée



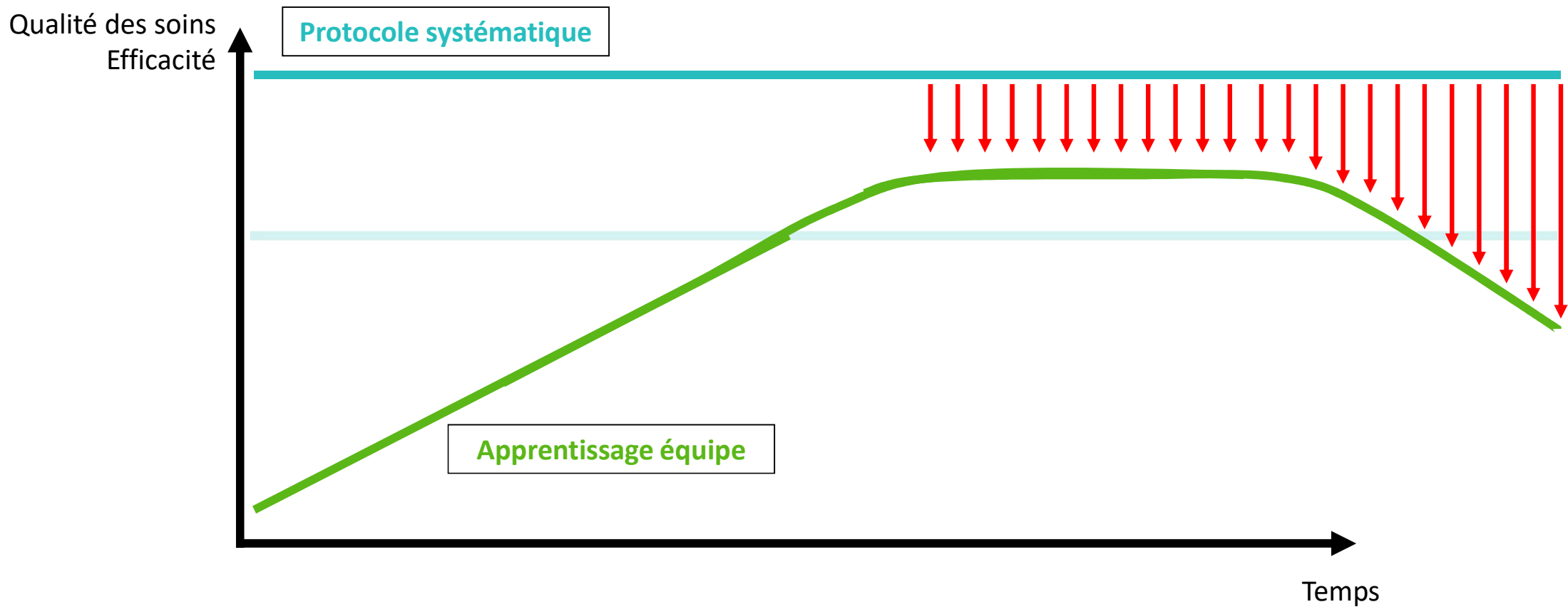
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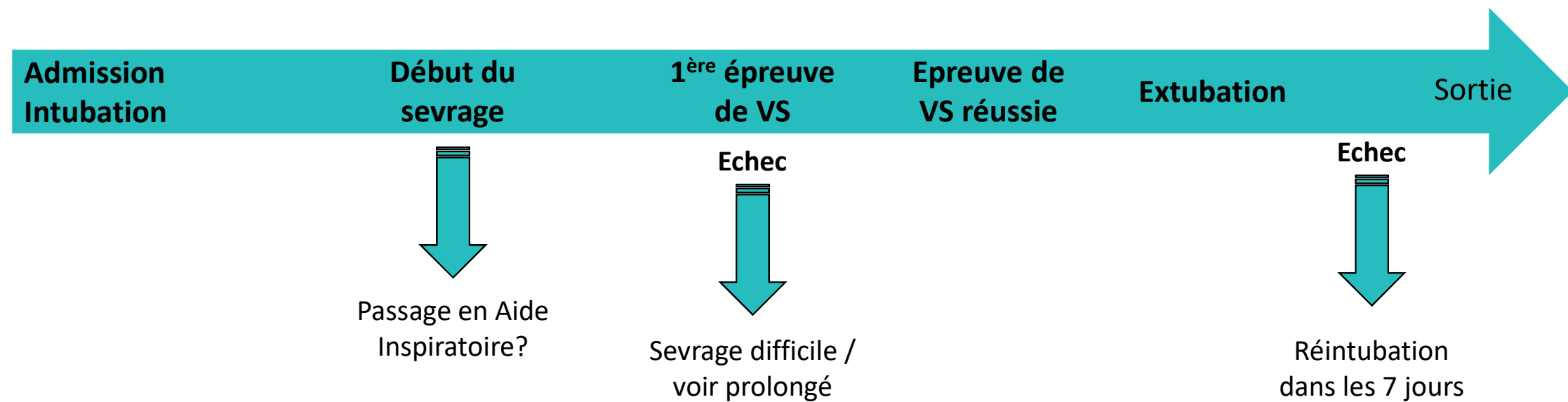
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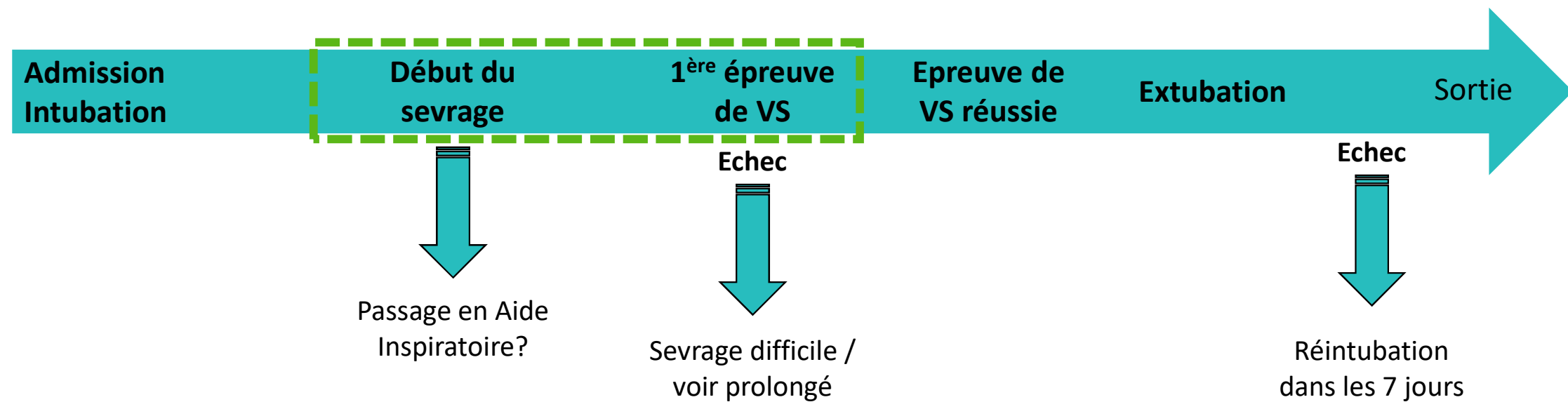
Approche systématique / protocolisée



Du sevrage au succès de l'extubation



Du sevrage au succès de l'extubation



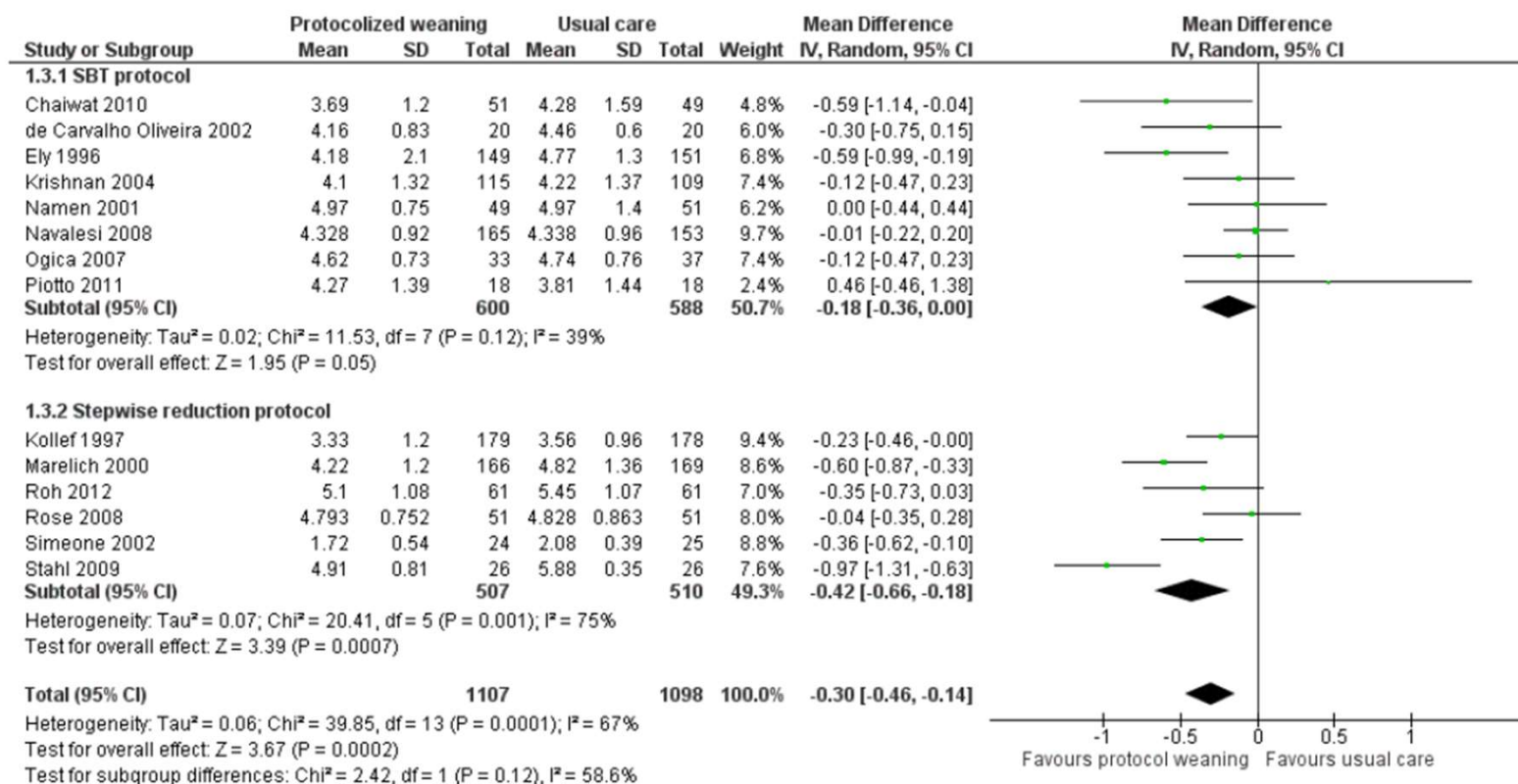
Protocolized versus non-protocolized weaning for reducing the duration of mechanical ventilation in critically ill adult patients (Review)

Blackwood B, Burns KEA, Cardwell CR, O'Halloran P

Protocoles de sevrage / systématique

OUI

Total duration of mechanical ventilation



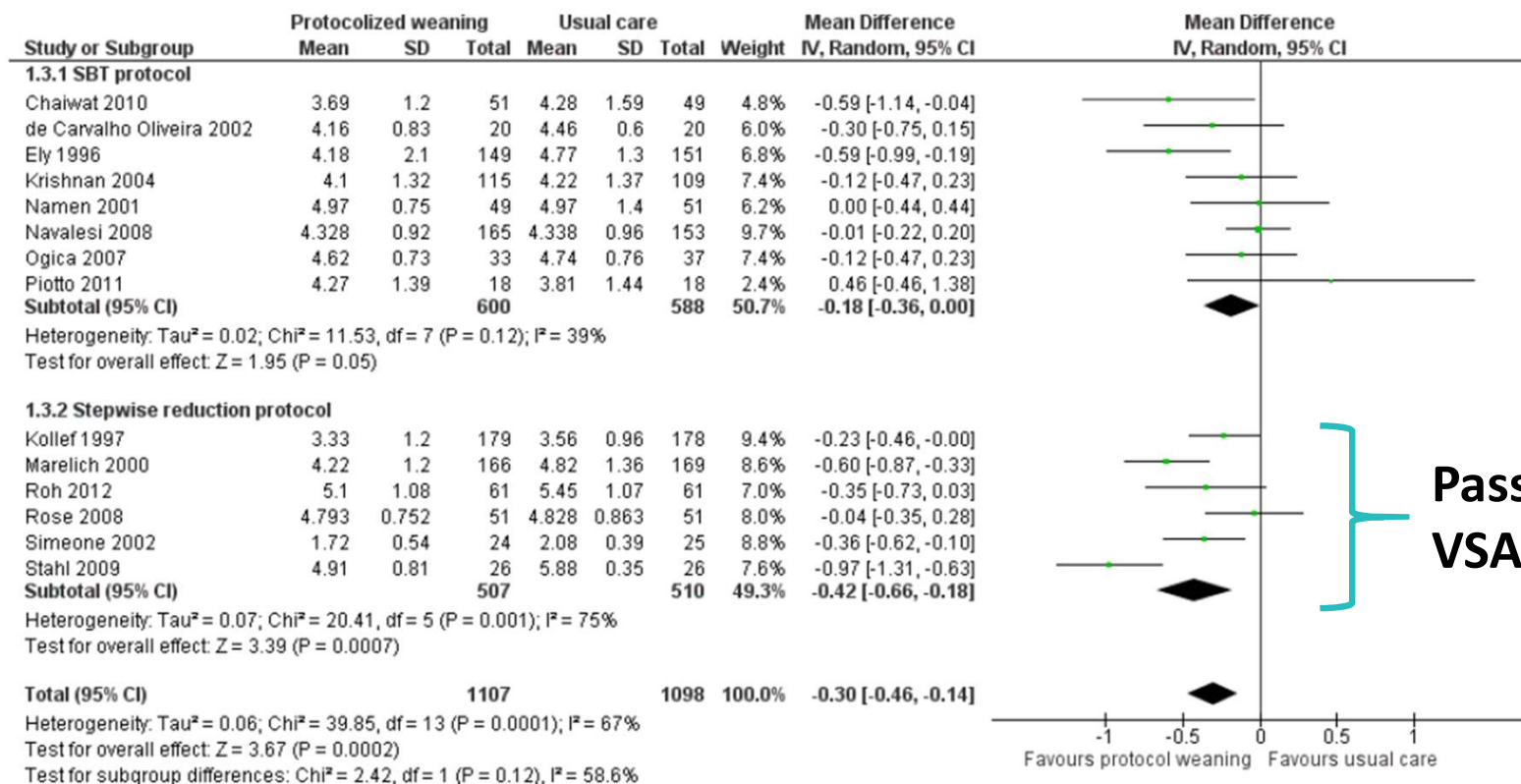
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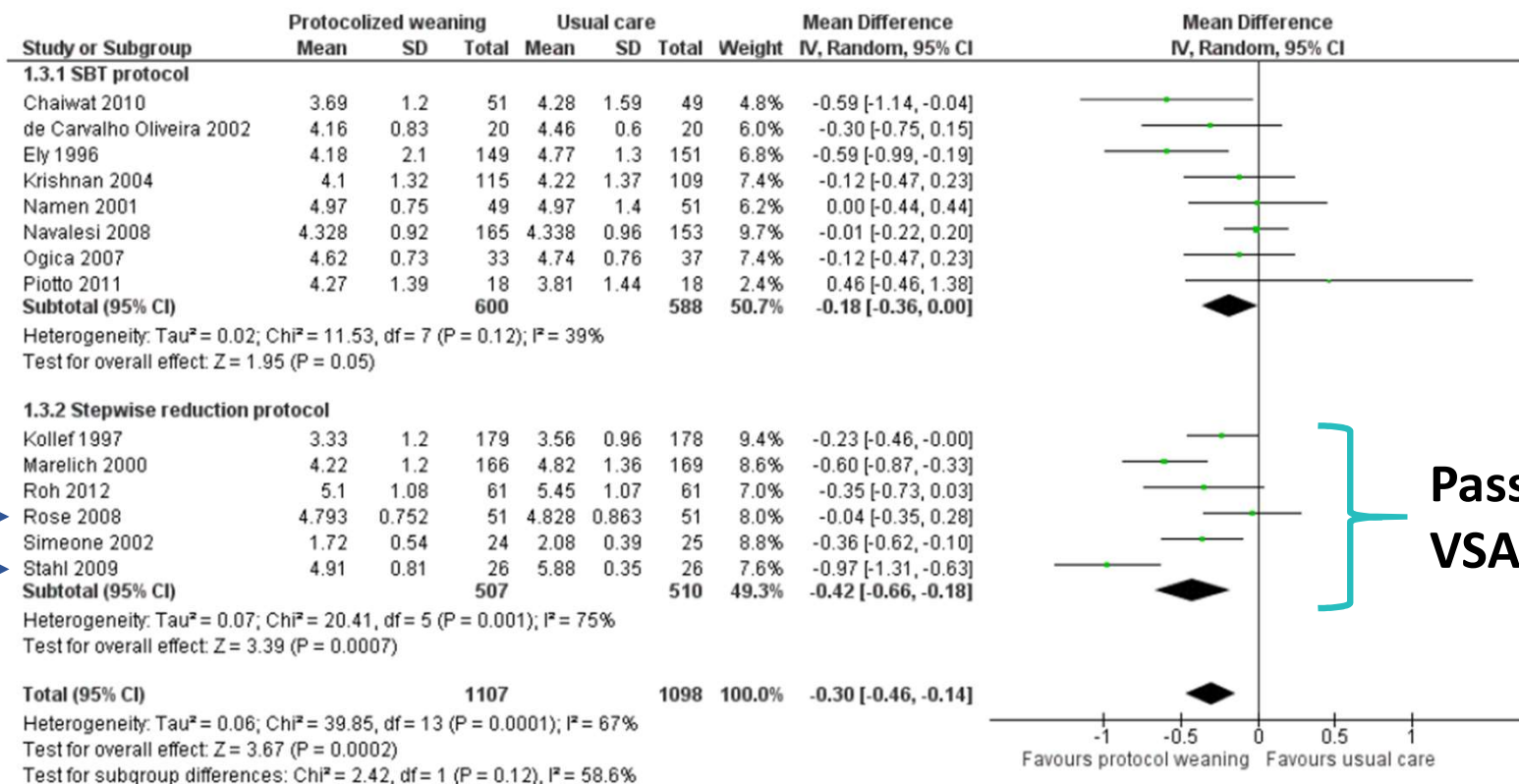
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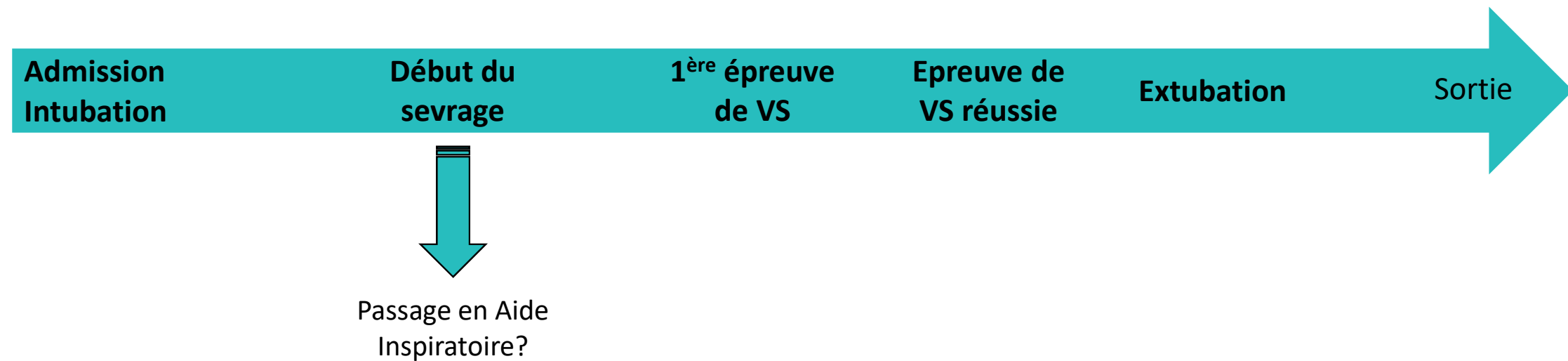


Système automatisé



Passage en VSAI ou VACI

Du sevrage au succès de l'extubation



Du sevrage au succès de l'extubation

Admission
Intubation



Passage en Aide
Inspiratoire

Début du
sevrage



Passage en Aide
Inspiratoire?

1^{ère} épreuve
de VS

Epreuve de
VS réussie



Passage en Aide
Inspiratoire

Extubation

Sortie

The New England Journal of Medicine

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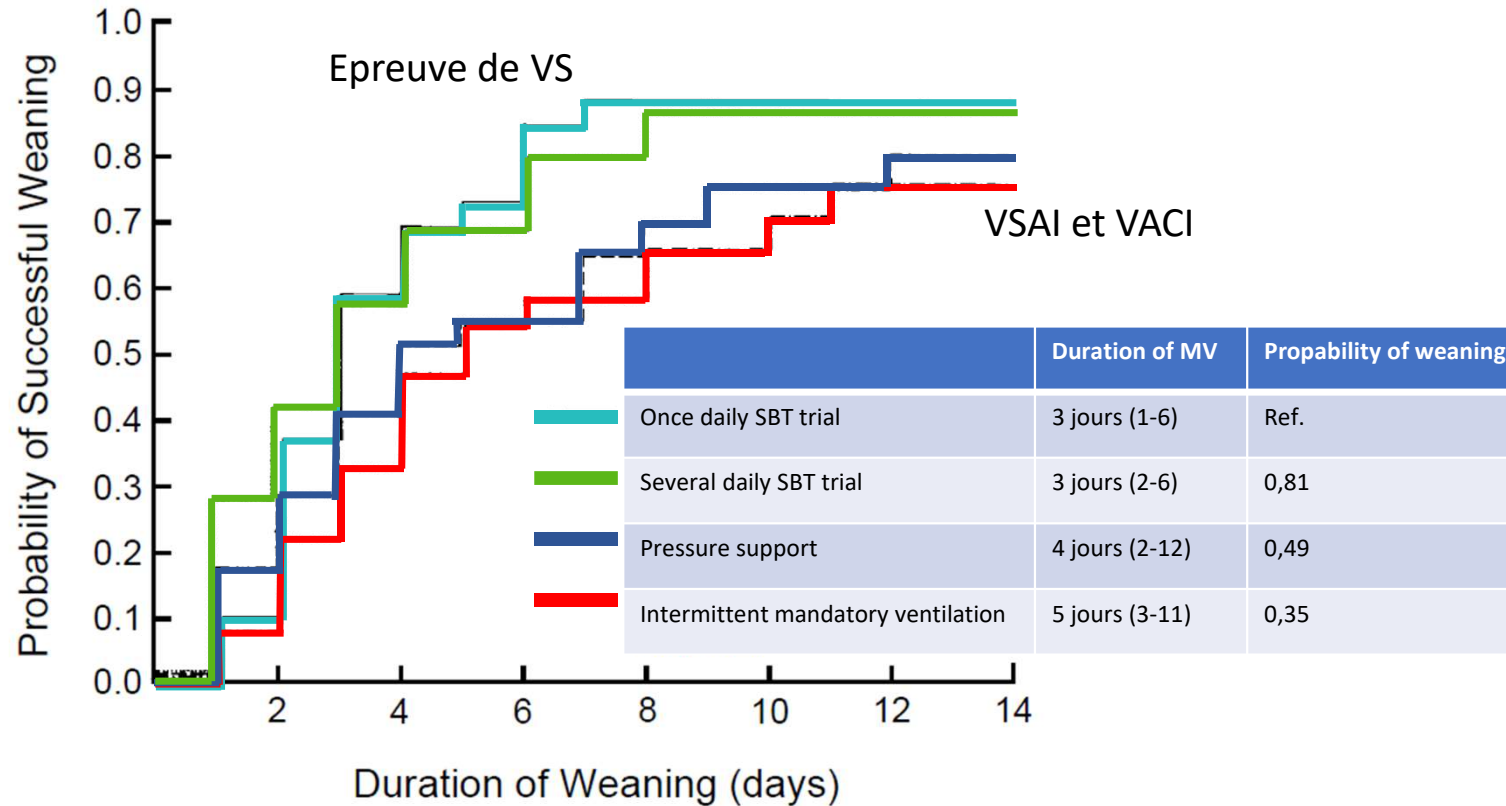
Volume 332

FEBRUARY 9, 1995

Number 6

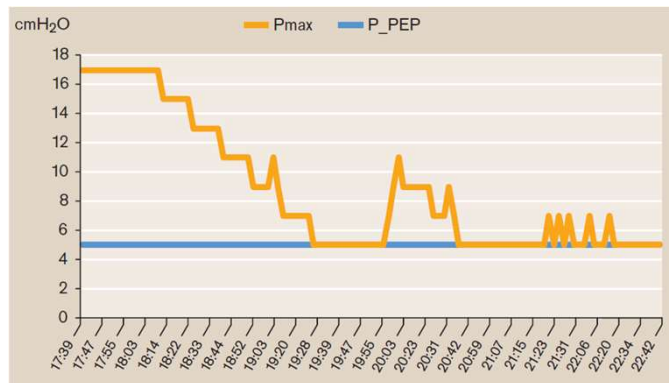
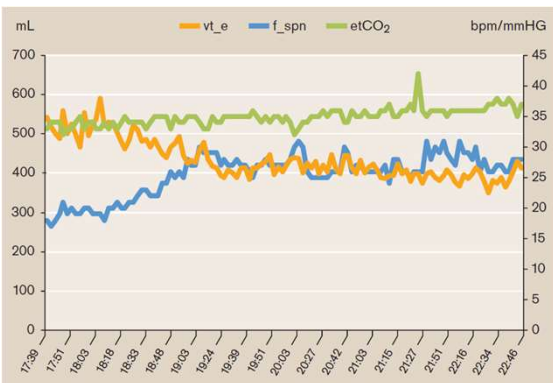
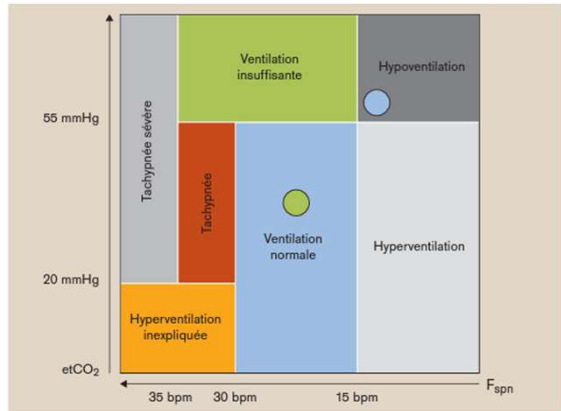
A COMPARISON OF FOUR METHODS OF WEANING PATIENTS FROM MECHANICAL VENTILATION

ANDRÉS ESTEBAN, M.D., PH.D., FERNANDO FRUTOS, M.D., MARTIN J. TOBIN, M.D., INMACULADA ALÍA, M.D., JOSÉ F. SOLSONA, M.D., INMACULADA VALVERDÚ, M.D., RAFAEL FERNÁNDEZ, M.D., MIGUEL A. DE LA CAL, M.D., SALVADOR BENITO, M.D., PH.D., ROSER TOMÁS, M.D., DEMETRIO CARRIEDO, M.D., SANTIAGO MACÍAS, M.D., AND JESÚS BLANCO, M.D., FOR THE SPANISH LUNG FAILURE COLLABORATIVE GROUP*



Le sevrage automatique

Smartcare



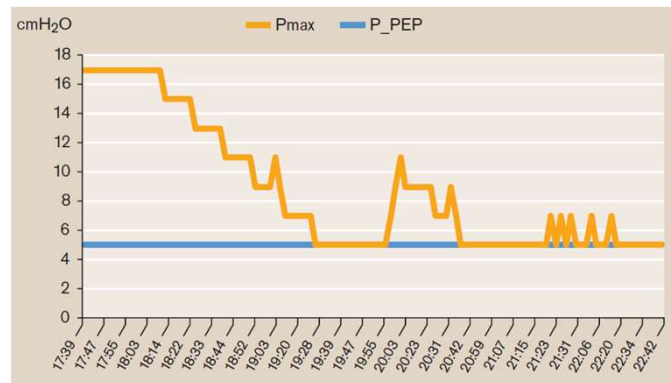
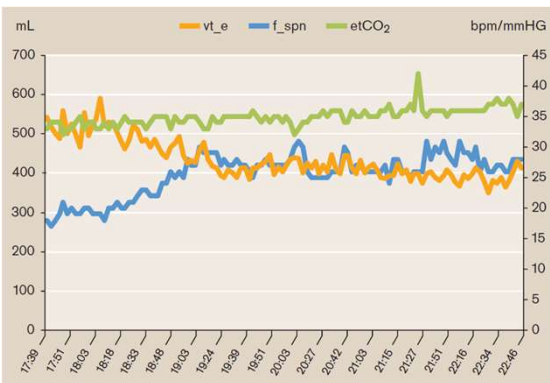
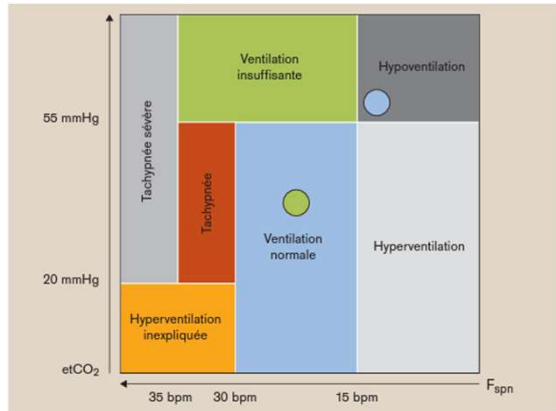
SPN-CPAP

PS

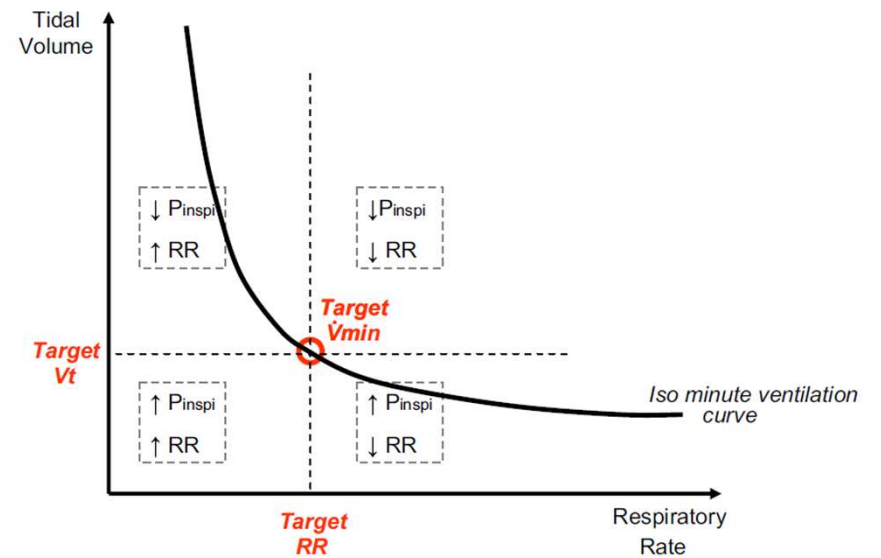
SC: SBT successful

Le sevrage automatique

Smartcare



Adaptive support Ventilation (ASV)



Smartcare

TIME SPENT WITH AN ACCEPTABLE VENTILATION* DURING AUTOMATIC PSV AND STANDARD PSV†

| | Duration of Ventilation (min) | | Ventilation | | FR | | Vt | | EtCO2 | | Modification AI | |
|-----------|-------------------------------|-------------|-------------|------|----------|------|--------|------|-------|------|-----------------|------|
| | sPSV | aPSV | sPSV | aPSV | sPSV | aPSV | sPSV | aPSV | sPSV | aPSV | sPSV | aPSV |
| 1 | 1,483 | 1,441 | 91 | 94 | 91 | 94 | 100 | 100 | 100 | 100 | 3 | 67 |
| 2 | 1,437 | 1,281 | 73 | 90 | 74 | 90 | 99 | 100 | 100 | 100 | 0 | 87 |
| 3 | 1,441 | 902 | 49 | 100 | 50 | 100 | 99 | 100 | 100 | 100 | 4 | 10 |
| 4 | 1,420 | 1,681 | 47 | 74 | 63 | 79 | 84 | 91 | 100 | 100 | 0 | 120 |
| 5 | 1,542 | 1,345 | 85 | 94 | 90 | 94 | 95 | 100 | 100 | 100 | 2 | 41 |
| 6 | 1,485 | 1,433 | 54 | 97 | 59 | 97 | 96 | 100 | 100 | 100 | 0 | 41 |
| 7 | 1,039 | 1,445 | 15 | 99 | 15 | 99 | 100 | 100 | 100 | 100 | 0 | 20 |
| 8 | 1,465 | 1,582 | 88 | 100 | 87 | 100 | 100 | 100 | 100 | 100 | 0 | 9 |
| 9 | 1,160 | 1,703 | 78 | 86 | 78 | 87 | 100 | 100 | 100 | 99 | 1 | 110 |
| 10 | 1,409 | 1,468 | 76 | 100 | 76 | 100 | 100 | 100 | 100 | 100 | 4 | 58 |
| Mean ± SD | 1,388 ± 159 | 1,428 ± 229 | 66 ± 24 | 93% | 68 ± 23† | 94% | 97 ± 5 | 99% | 100% | 100% | 1 ± 2† | 56 |

PERCENTAGE OF THE TOTAL DURATION OF VENTILATION SPENT WITH A HIGH LEVEL OF ESTIMATED P_{0.1} (≥ 4 cm H₂O) WITH AUTOMATIC PSV AND STANDARD PSV

| Patient No. | Es P _{0.1} ≥ 4 | |
|-------------|-------------------------|------|
| | sPSV | aPSV |
| 1 | 2 | 0 |
| 2 | 64 | 48 |
| 3 | 27 | 22 |
| 4 | 61 | 0.1 |
| 5 | 2 | 2 |
| 6 | 95 | 22 |
| 7 | 0.1 | 1 |
| 8 | 4 | 0.1 |
| 10 | 52 | 1 |
| Mean ± SD | 34% | 11% |

M Dojat, Am J Respir Crit Care Med 2000

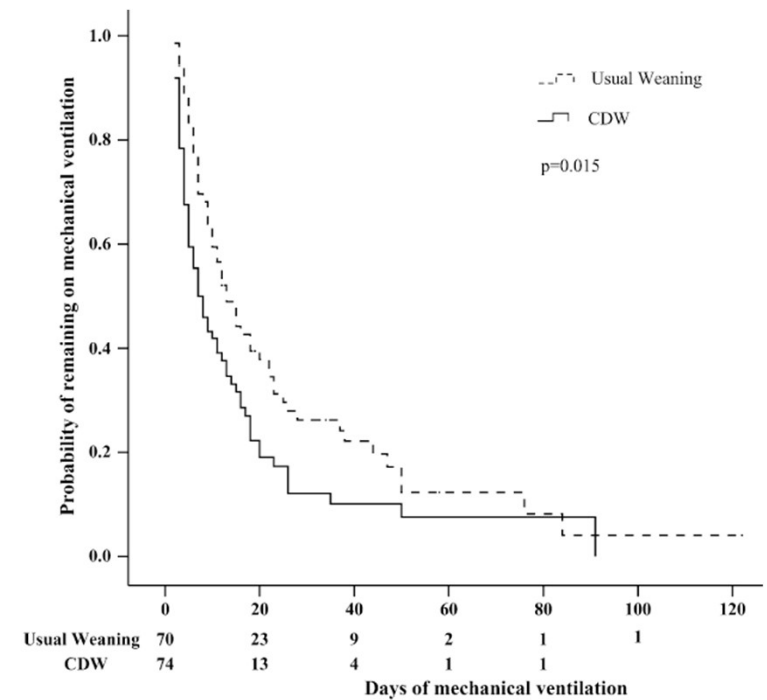
Smartcare

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| 8 | 1,465 | 1,582 | 88 | 100 | 87 | 100 | 100 | 100 | 100 | 100 | 0 | 9 |
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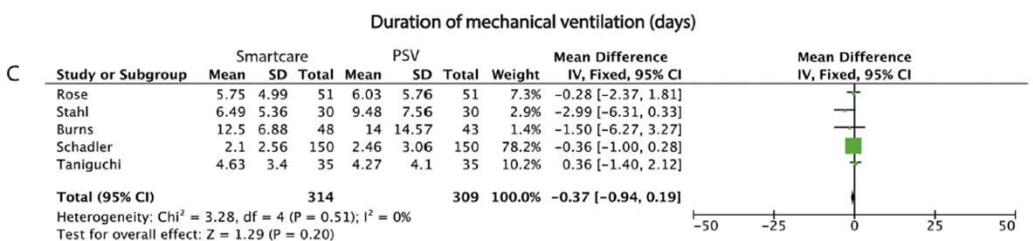
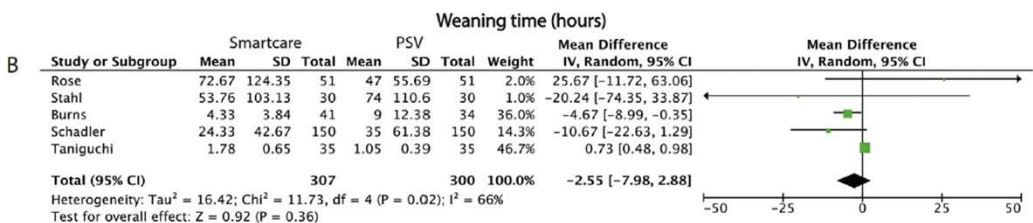
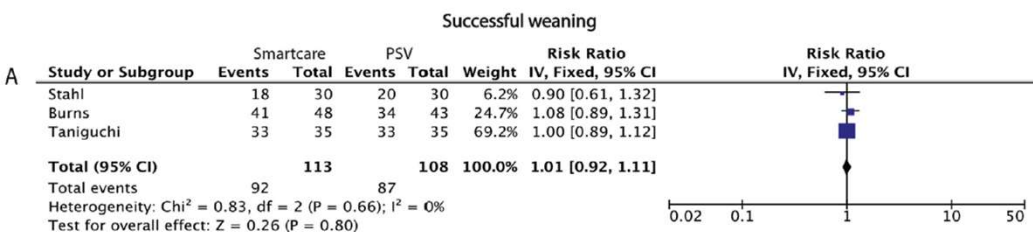
| Outcome | CDW Group (n = 74) | Usual Weaning Group (n = 70) | p Value |
|--|---------------------|------------------------------|---------|
| Time to first extubation* | 2.00 (1.75–6.25) | 4.00 (2.00–8.25) | 0.02 |
| Duration of mechanical ventilation until first extubation* | 6.50 (3.00–12.25) | 9.00 (5.75–16.00) | 0.03 |
| Time to successful extubation† | 3.00 (2.00–8.00) | 5.00 (2.00–12.00) | 0.01 |
| Total duration of mechanical ventilation† | 7.50 (4.00–16.00) | 12.00 (7.00–26.00) | 0.003 |
| Intensive care length of stay | 12.00 (6.00–22.00) | 15.50 (9.00–33.00) | 0.02 |
| Hospital length of stay | 30.00 (17.00–54.75) | 35.00 (21.00–60.25) | 0.22 |

M Dojat, Am J Respir Crit Care Med 2000

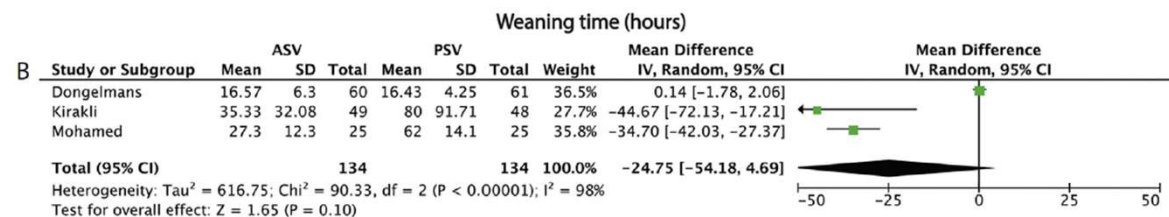
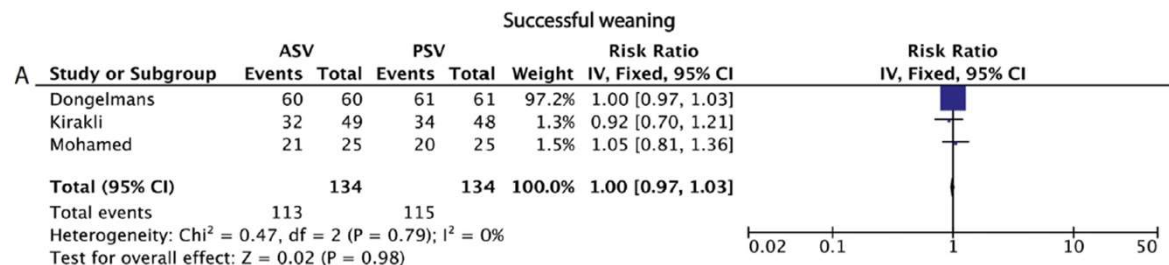
F Lellouche, Am J Respir Crit Care Med 2006

Meta-analyse ASV vs VSAI

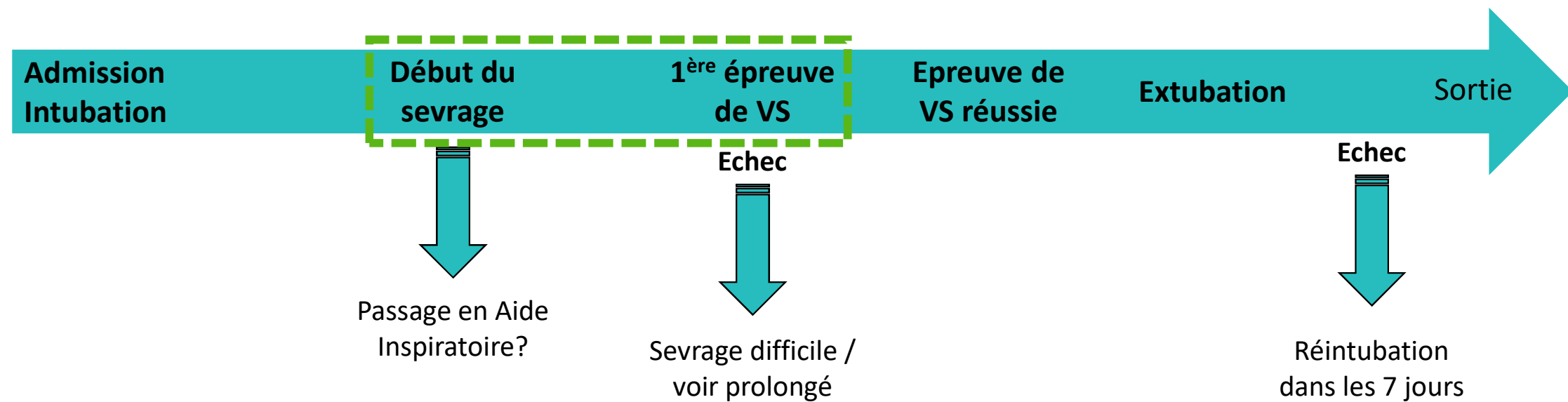
Smartcare



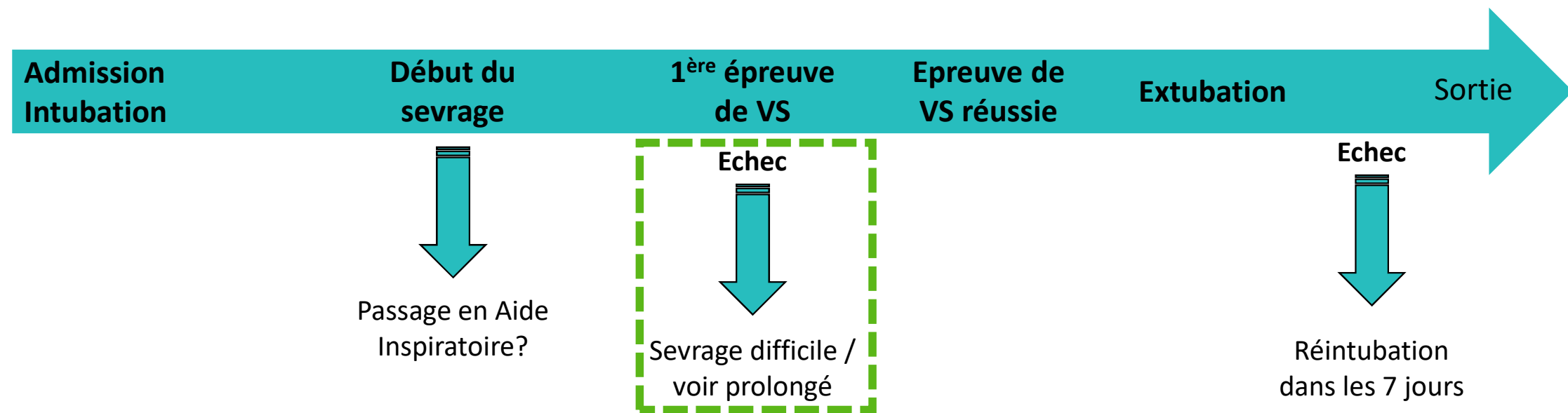
Adaptive support Ventilation (ASV)



Du sevrage au succès de l'extubation



Du sevrage au succès de l'extubation

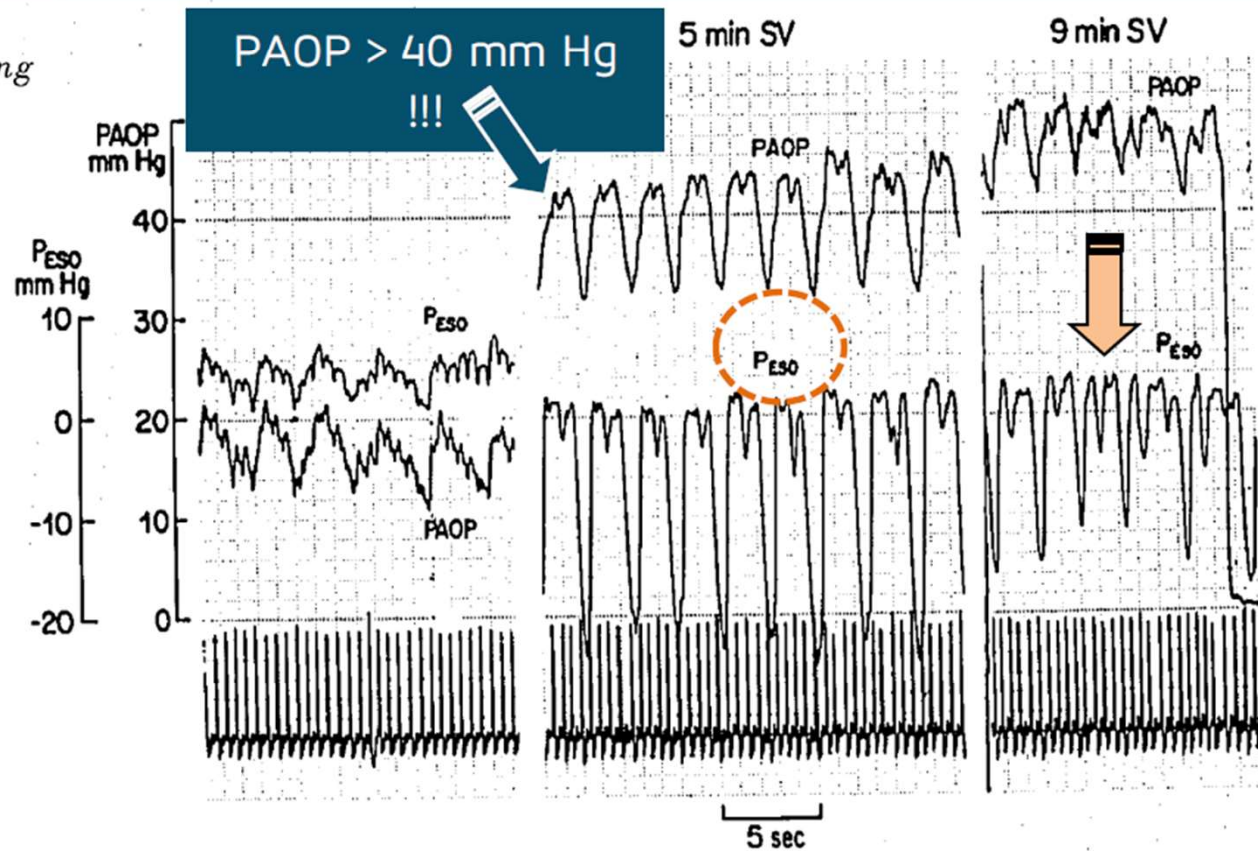


Weaning-induced pulmonary oedema

Anesthesiology
69:171-179, 1988

Acute Left Ventricular Dysfunction during Unsuccessful Weaning from Mechanical Ventilation

Francois Lemaire, M.D.,* Jean-Louis Teboul, M.D.,† Luc Cinotti, M.D.,‡ Guillen Giotto, M.D.,§
Fekri Abrouk, M.D.,§ Gabriel Steg, M.D.,§ Isabelle Macquin-Mavier, M.D.,¶ Warren M. Zapol, M.D.**



Lemaire F, Teboul JL et al., Anesthesiology 1988; 69:171-179.

Weaning-induced pulmonary oedema

Echocardiographic diagnosis of pulmonary artery occlusion pressure elevation during weaning from mechanical ventilation*

17/39

Bouchra Lamia, MD, MPH, PhD; Julien Maizel, MD; Ana Ochagavia, MD; Denis Chemla, MD, PhD; David Osman, MD; Christian Richard, MD; Jean-Louis Teboul, MD, PhD

Intensive Care Med (2008) 34:1231–1238
DOI 10.1007/s00134-008-1038-3

ORIGINAL

Nadia Anguel
Xavier Monnet
David Osman
Vincent Castelain
Christian Richard
Jean-Louis Teboul

Increase in plasma protein concentration for diagnosing weaning-induced pulmonary oedema

24/46

Incidence
48%!!

Extravascular Lung Water, B-Type Natriuretic Peptide, and Blood Volume Contraction Enable Diagnosis of Weaning-Induced Pulmonary Edema*

10/21

Martin Dres, MD^{1,2}; Jean-Louis Teboul, MD, PhD^{1,2}; Nadia Anguel, MD¹; Laurent Guerin, MD^{1,2}; Christian Richard, MD^{1,2}; Xavier Monnet, MD, PhD^{1,2}

Management de la balance hydrosodée?

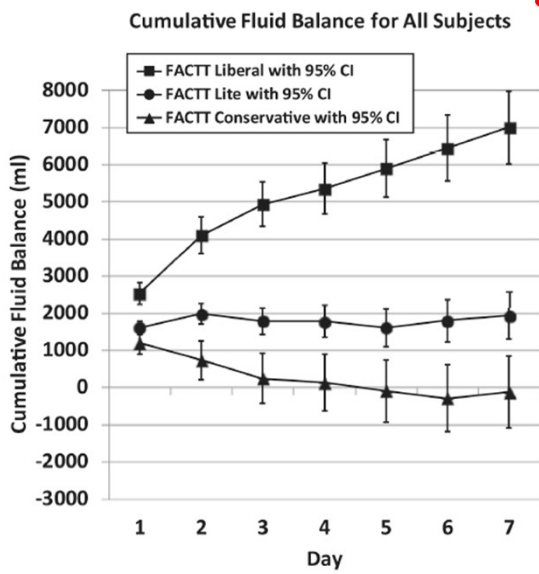
FACTT / FACTT lite

| Central Venous Pressure (Recommended) | Pulmonary Artery Occlusion Pressure (Optional) | Mean Arterial Pressure \geq 60 mm Hg and Off Vasopressors \geq 12 Hr | |
|--|---|--|--|
| | | Urine Output $<$ 0.5 mL/kg/hr | Urine Output \geq 0.5 mL/kg/hr |
| $>$ 8 | $>$ 12 | Furosemide ^a ; reassess in 1 hr | Furosemide ^a ; reassess in 4 hr |
| 4–8 | 8–12 | Give fluid bolus; reassess in 1 hr | Furosemide ^a ; reassess in 4 hr |
| $<$ 4 | $<$ 8 | Give fluid bolus; reassess in 1 hr | No intervention; reassess in 4 hr |

Management de la balance hydrosodée

FACTT / FACTT lite

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| Outcome | FACTT Lite (n = 1,124) (%) | FACTT Liberal (n = 497) (%) | p Lite Versus Liberal |
|---|----------------------------|-----------------------------|-----------------------|
| Ventilator-free days | 14.9 \pm 0.3 | 12.1 \pm 0.5 | $<$ 0.001 |
| ICU-free days | 14.4 \pm 0.3 | 11.2 \pm 0.4 | $<$ 0.001 |
| 60-day mortality | 249 (22) | 124 (28) | 0.007 |
| Adjusted 60-day mortality ^a | 272 (24) | 127 (25) | 0.007 |
| New onset shock ^b | 104 (9) | 55 (11) | 0.007 |
| Acute kidney injury before adjustment for fluid balance | 653 (58) | 253 (51) | 0.006 |
| Acute kidney injury after adjustment for fluid balance | 631 (56) | 328 (66) | $<$ 0.001 |

2 jours gagnés

Management de la balance hydrosodée

BNP \pm 200

TABLE 2. FLUID MANAGEMENT DURING WEANING

| | Usual Care Group (n = 152) | BNP-guided Group (n = 152) | P Value |
|---|----------------------------|----------------------------|---------|
| Patients with at least one daily BNP value \geq 200 pg/ml during weaning, n (%) | 105 (69.1%) | 100 (65.8%) | 0.541 |
| Patients treated at least once with furosemide during weaning, n (%) | 108 (71.1%) | 124 (81.6%) | 0.031 |
| Patients treated at least once with acetazolamide during weaning, n (%) | 33 (21.7%) | 65 (42.8%) | <0.0001 |
| Patients treated at least once with any diuretic during weaning, n (%) | 110 (72.4%) | 127 (83.6%) | 0.019 |
| Cumulative furosemide dose during weaning, mg | | | 0.003 |
| Median (IQR) | 70 (0-160) | 118 (23-229) | |
| Mean (SD) | 180 (544) | 180 (231) | |
| Average daily furosemide dose during weaning, mg | | | <0.0001 |
| Median (IQR) | 14 (0 to 40) | 40 (9 to 78) | |
| Mean (SD) | 30 (50) | 47 (41) | |
| Cumulative fluid balance during weaning, ml | | | <0.0001 |
| Median (IQR) | -180 (-2,556 to 2,832) | -2,320 (-4,735 to 738) | |
| Mean (SD) | 847 (6,569) | -1,402 (5,818) | |
| Average daily fluid balance during weaning, ml | | | <0.0001 |
| Median (IQR) | -37 (-731 to 586) | -640 (-1,811 to 225) | |
| Mean (SD) | -136 (1,312) | -852 (1,456) | |
| Average daily fluid intake during weaning, ml | | | 0.105 |
| Median (IQR) | 2,226 (1,758 to 2,730) | 2,040 (1,650 to 2,629) | |
| Mean (SD) | 2,324 (876) | 2,188 (774) | |
| Average daily urine output during weaning, ml | | | <0.0001 |
| Median (IQR) | 2,273 (1,838 to 2,973) | 2,836 (2,057 to 3,905) | |
| Mean (SD) | 2,461 (1,039) | 3,044 (1,240) | |
| Fluid balance on extubation day,* ml | | | 0.318 |
| Median (IQR) | -1,180 (-2,124 to 42) | -1,047 (-2,540 to -350) | |
| Mean (SD) | -1,078 (1,639) | -1,263 (1,759) | |
| Fluid balance the day after extubation,* ml | | | 0.223 |
| Median (IQR) | -715 (-1,526 to 30) | -479 (-1,360 to 277) | |
| Mean (SD) | 751 (1,339) | -646 (1,469) | |

+ de diurétiques

- 2140 mL durant sevrage

- 603 mL / jour durant sevrage

Management de la balance hydrosodée

BNP ± 200

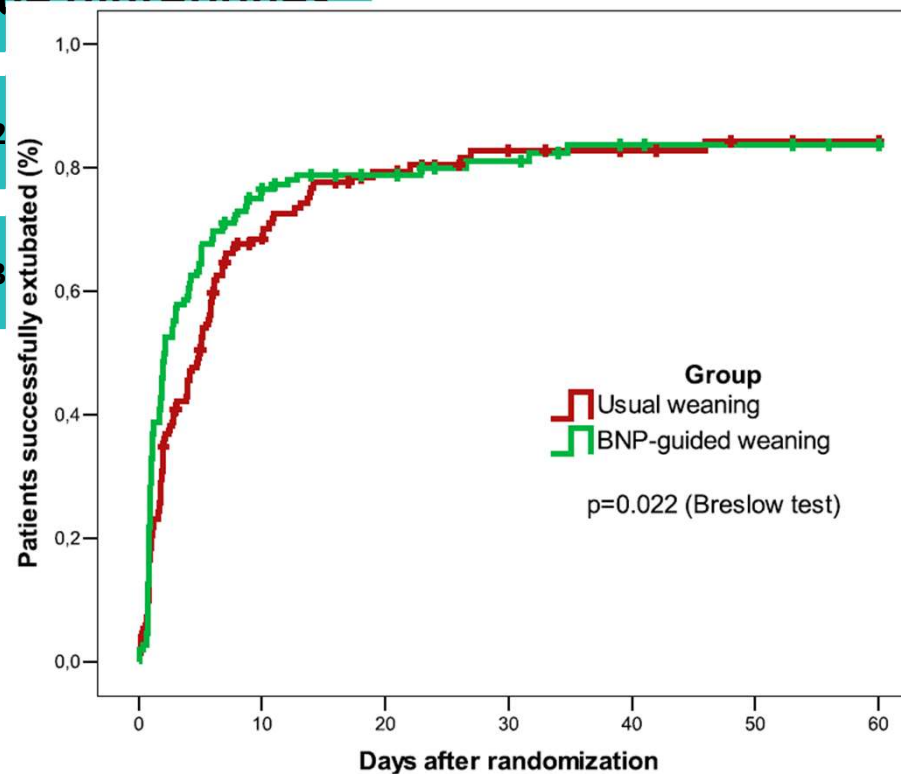
TABLE 2. FLUID MANAGEMENT DURING WEANING

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| Mean (SD) | 2,461 (1,039) | 3,044 (1,240) | |
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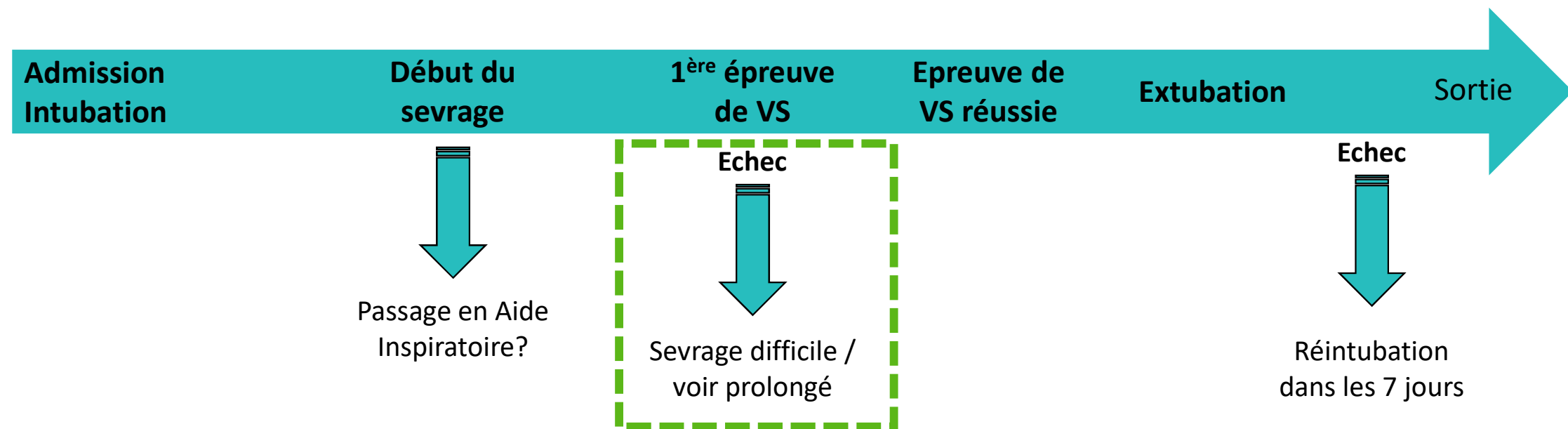
+ de diurétiques

- 2

- 603



Du sevrage au succès de l'extubation



Du sevrage au succès de l'extubation

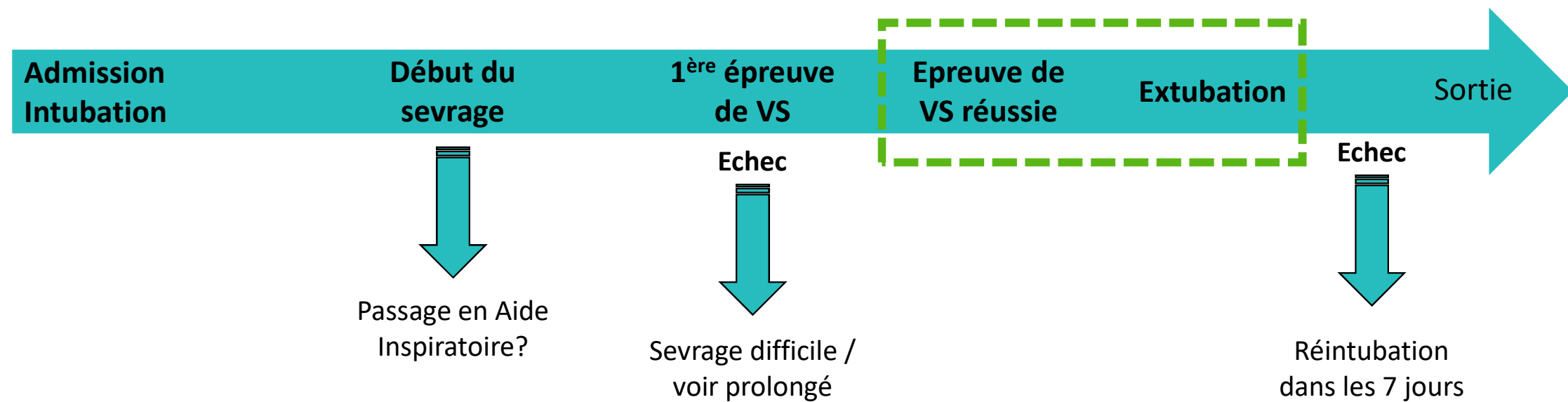


TABLE 5 Considerations for assessing readiness to wean

Clinical assessment

Adequate cough

Absence of excessive tracheobronchial secretion

Resolution of disease acute phase for which the patient was intubated

Objective measurements

Clinical stability

Stable cardiovascular status (i.e. $fc \leq 140$ beats·min⁻¹, systolic BP 90–160 mmHg, no or minimal vasopressors)

Stable metabolic status

Adequate oxygenation

$Sa,O_2 > 90\%$ on $\leq Fi,O_2 0.4$ (or $Pa,O_2/Fi,O_2 \geq 150$ mmHg)

PEEP ≤ 8 cmH₂O

Adequate pulmonary function

$f_R \leq 35$ breaths·min⁻¹

MIP ≤ -20 – -25 cmH₂O

$V_T > 5$ mL·kg⁻¹

VC > 10 mL·kg⁻¹

$f_R/V_T < 105$ breaths·min⁻¹·L⁻¹

No significant respiratory acidosis

Adequate mentation

No sedation or adequate mentation on sedation (or stable neurologic patient)

Data taken from [5, 6, 13, 16–18, 22]. fc : cardiac frequency; BP: blood pressure; Sa,O_2 : arterial oxygen saturation; Fi,O_2 : inspiratory oxygen fraction; Pa,O_2 : arterial oxygen tension; PEEP: positive end-expiratory pressure; f_R : respiratory frequency; MIP: maximal inspiratory pressure; V_T : tidal volume; VC: vital capacity. 1 mmHg=0.133 kPa.

Spontaneous-Breathing Trials with Pressure-Support Ventilation or a T-Piece

A.W. Thille, A. Gacouin, R. Coudroy, S. Ehrmann, J.-P. Quenot, M.-A. Nay, C. Guitton, D. Contou, G. Labro, J. Reignier, G. Pradel, G. Beduneau, L. Dangers, C. Saccheri, G. Prat, G. Lacave, N. Sedillot, N. Terzi, B. La Combe, J.-P. Mira, A. Romen, M.-A. Azais, A. Rouzé, J. Devaquet, A. Delbove, M. Dres, J. Bourenne, A. Lautrette, J. de Keizer, S. Ragot, and J.-P. Frat, for the REVA Research Network*

N Engl J Med 2022

- $FR \leq 35$
- $P/F \geq 150$
- $PEP \leq 8$
- Toux efficace
- RASS -2 à +1
- Pas de sédation
- Doses minimales de vasopresseurs

Spontaneous-Breathing Trials with Pressure-Support Ventilation or a T-Piece

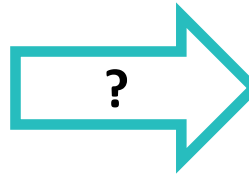
A.W. Thille, A. Gacouin, R. Coudroy, S. Ehrmann, J.-P. Quenot, M.-A. Nay, C. Guitton, D. Contou, G. Labro, J. Reignier, G. Pradel, G. Beduneau, L. Dangers, C. Saccheri, G. Prat, G. Lacave, N. Sedillot, N. Terzi, B. La Combe, J.-P. Mira, A. Romen, M.-A. Azais, A. Rouzé, J. Devaquet, A. Delbove, M. Dres, J. Bourenne, A. Lautrette, J. de Keizer, S. Ragot, and J.-P. Frat, for the REVA Research Network*

N Engl J Med 2022

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Inclusion



Epreuve VS



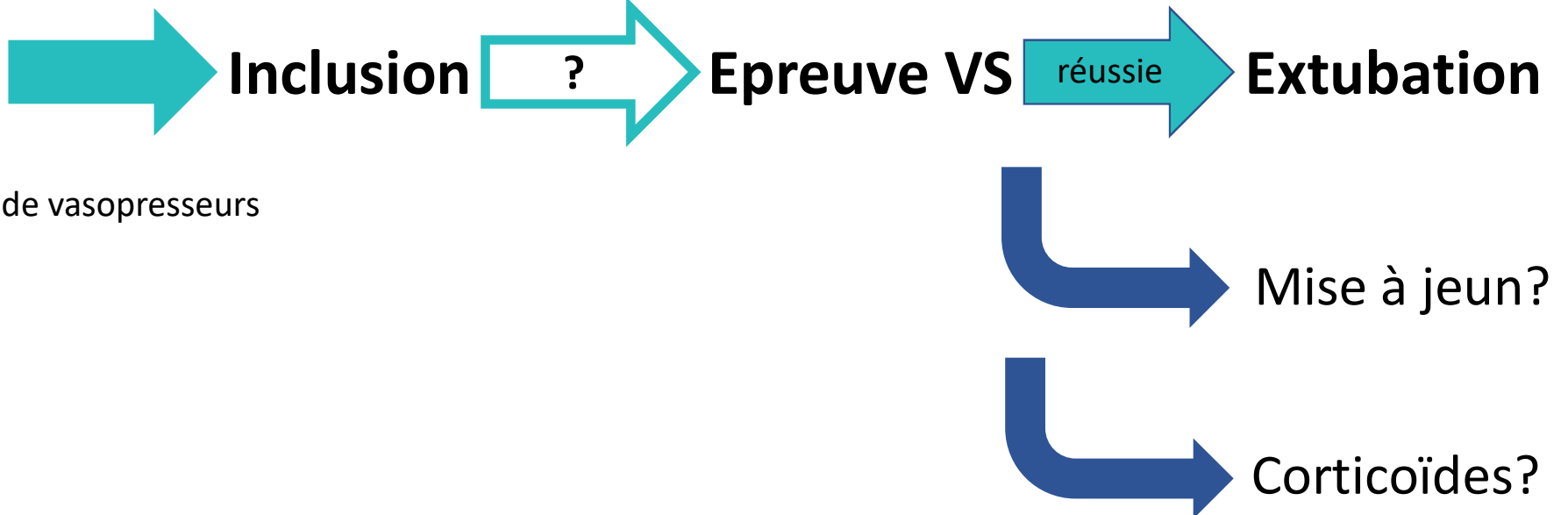
Extubation

Spontaneous-Breathing Trials with Pressure-Support Ventilation or a T-Piece

A.W. Thille, A. Gacouin, R. Coudroy, S. Ehrmann, J.-P. Quenot, M.-A. Nay, C. Guitton, D. Contou, G. Labro, J. Reignier, G. Pradel, G. Beduneau, L. Dangers, C. Saccheri, G. Prat, G. Lacave, N. Sedillot, N. Terzi, B. La Combe, J.-P. Mira, A. Romen, M.-A. Azais, A. Rouzé, J. Devaquet, A. Delbove, M. Dres, J. Bourenne, A. Lautrette, J. de Keizer, S. Ragot, and J.-P. Frat, for the REVA Research Network*

N Engl J Med 2022

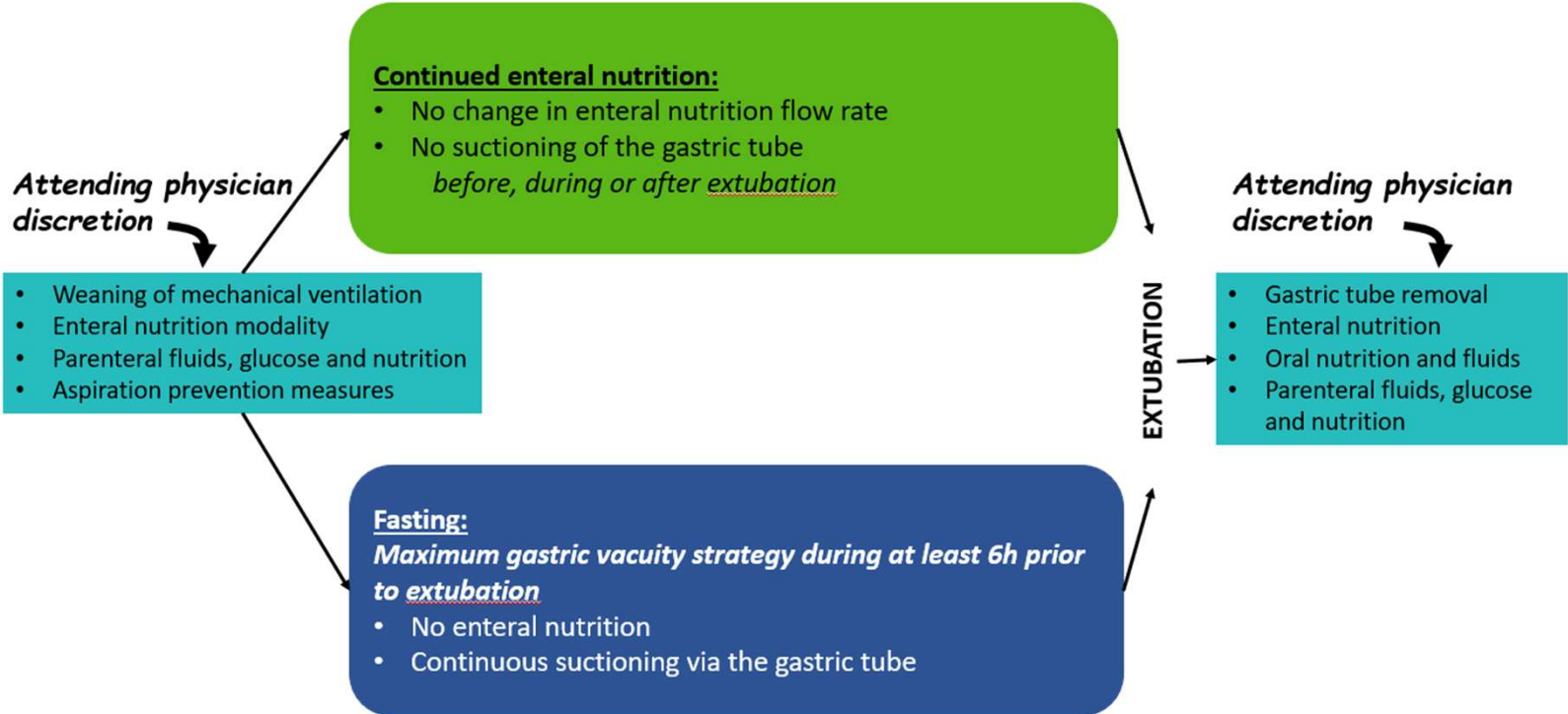
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- Doses minimales de vasopresseurs



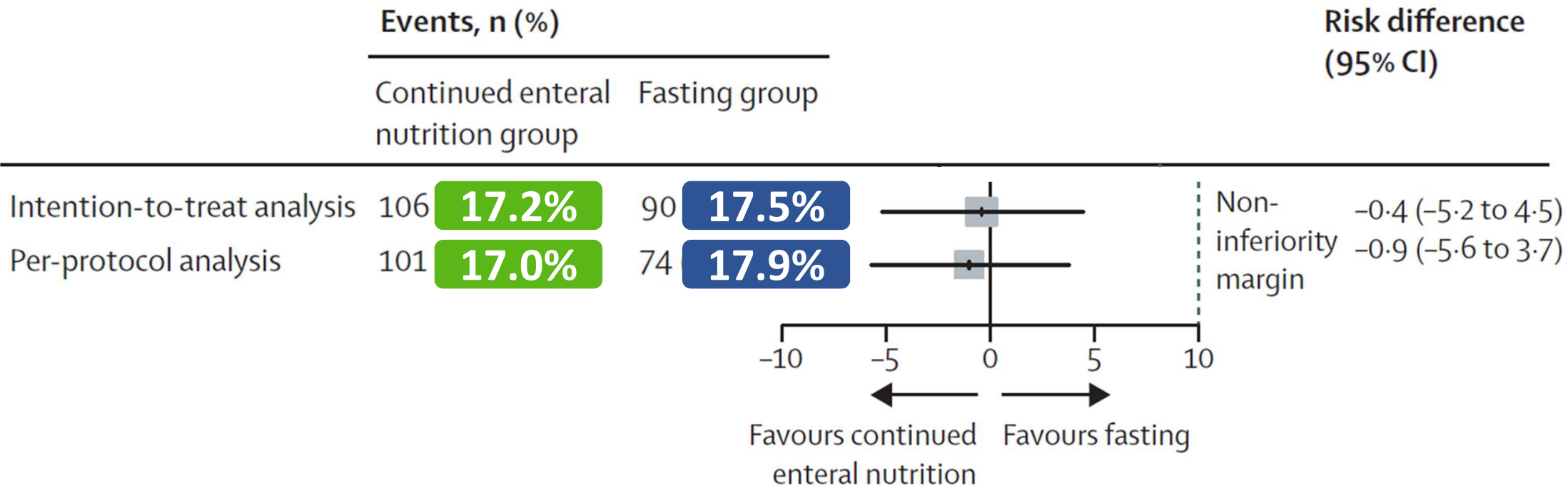
Continued enteral nutrition until extubation compared with fasting before extubation in patients in the intensive care unit: an open-label, cluster-randomised, parallel-group, non-inferiority trial

Mickaël Landais*, Mai-Anh Nay*, Johann Auchabie*, Noemie Hubert, Aurélien Frerou, Aihem Yehia, Alain Mercat, Maud Jonas, Frédéric Martino, Mikael Moriconi, Anne Courte, Vincent Robert-Edan, Alexandre Conia, Florent Bavoze, Pierre-Yves Egreteau, Cédric Bruel, Anne Renault, Olivier Huet, Marc Feller, Nicolas Chudeau, Martine Ferrandiere, Anne Rebion, Alain Robert, Bruno Giraudeau, Jean Reignier, Arnaud W Thille, Elsa Tavernier, Stephan Ehrmann, on behalf of the REVA network and CRICS-TriggerSEP F-CRIN research network†

Lancet Respir Med 2022



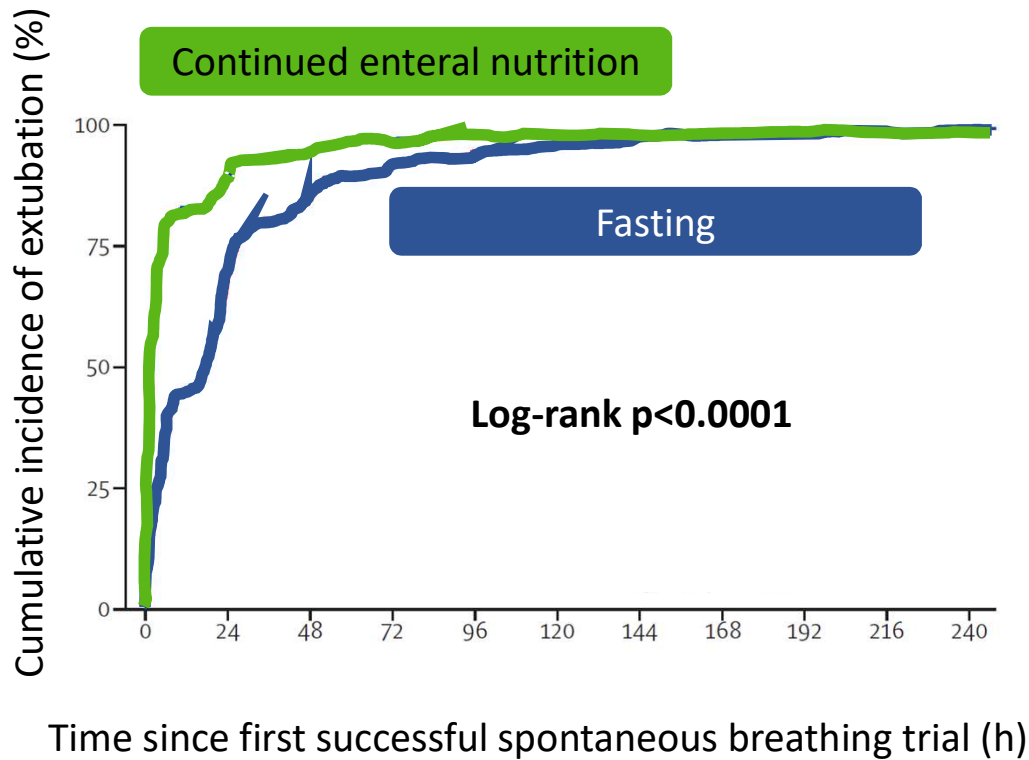
Results: Primary outcome



Non inferiority criteria met

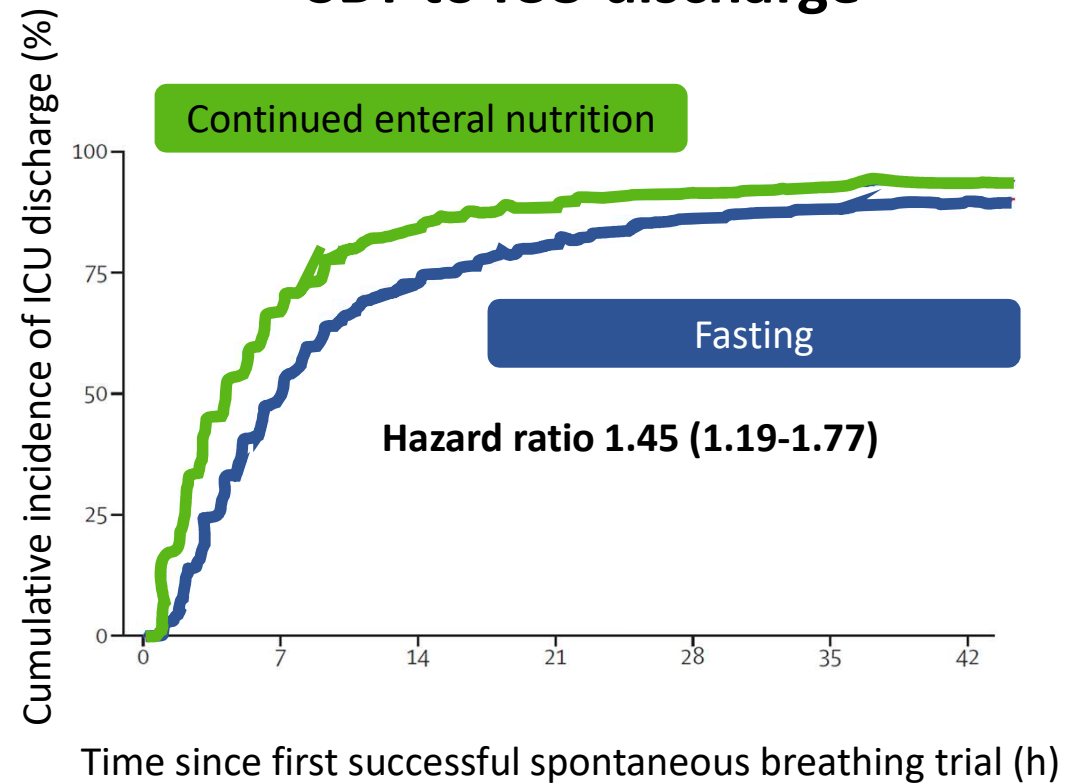
Results: Secondary outcomes

SBT to extubation



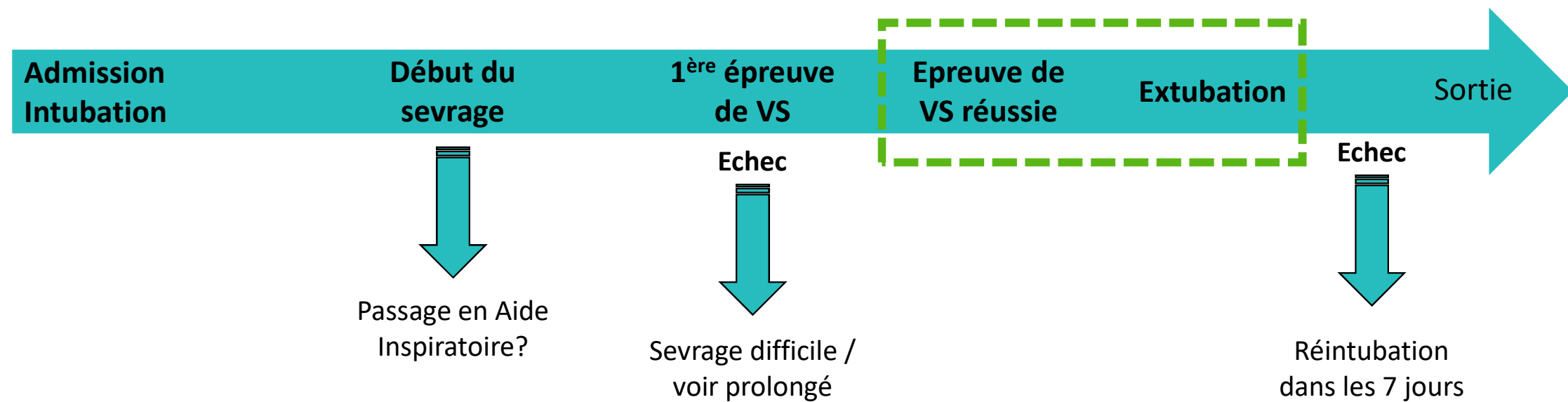
16h gagnées

SBT to ICU discharge

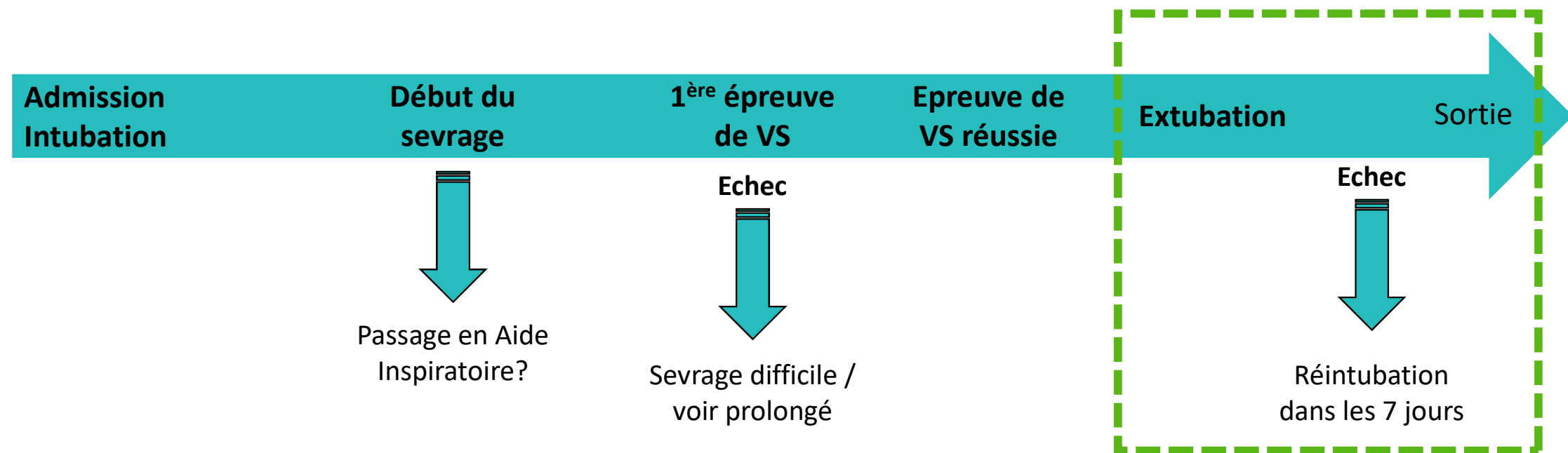


2^{1/2} jour gagnées

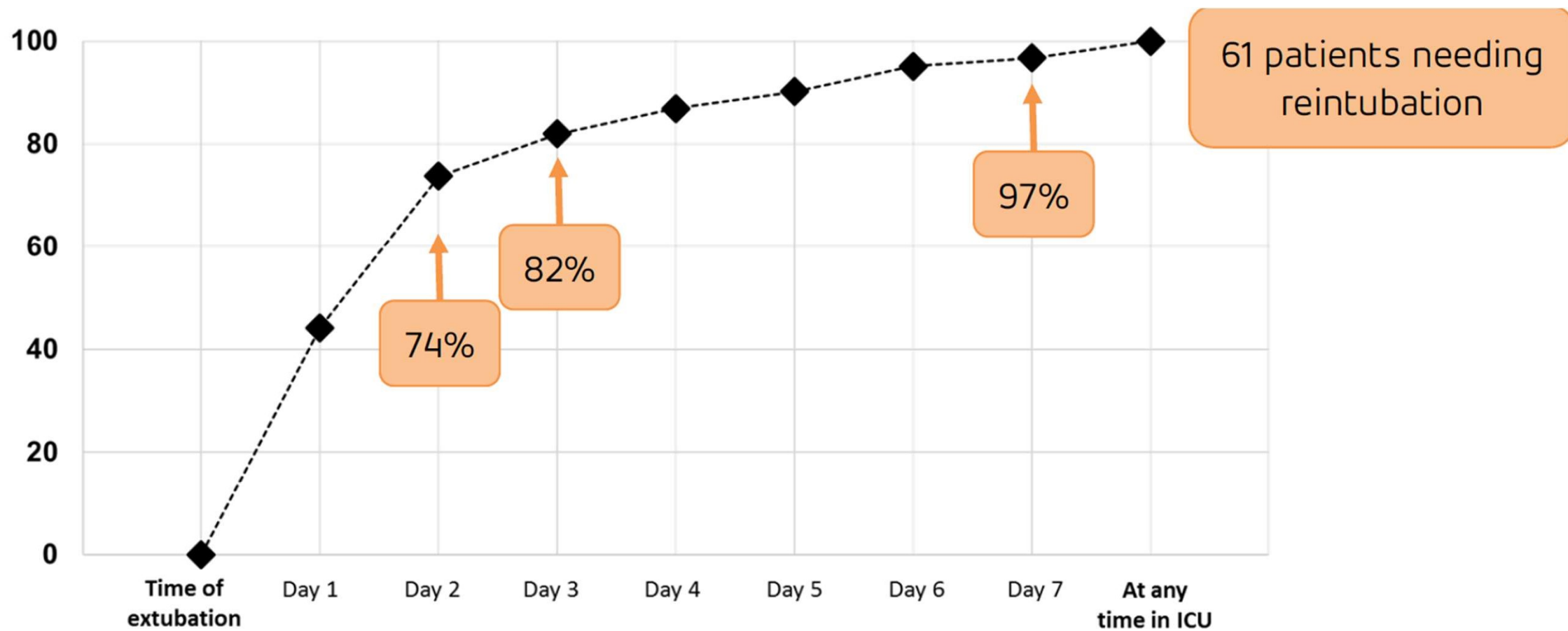
Du sevrage au succès de l'extubation



Du sevrage au succès de l'extubation



Succès / Echec de l'extubation



ERS Clinical Practice Guidelines: High-flow nasal cannula in acute respiratory failure

Simon Oczkowski, Begüm Ergan, Lieuwe Bos, Michelle Chatwin, Miguel Ferrer, Cesare Gregoretti, Leo Heunks, Jean-Pierre Frat, Federico Longhini, Stefano Nava, Paolo Navalesi, Aylin Ozsancak Uğurlu, Lara Pisani, Teresa Renda, Arnaud W. Thille, João Carlos Winck, Wolfram Windisch, Thomy Tonia, Jeanette Boyd, Giovanni Sotgiu, Raffaele Scala

Hypoxemic patients at low-risk of extubation failure

Risk of reintubation < 10%

High-flow nasal oxygen



EUROPEAN RESPIRATORY *journal*

FLAGSHIP SCIENTIFIC JOURNAL OF ERS

Patients at high-risk of extubation failure

Risk of reintubation > 20%

Prophylactic NIV
+/- OHD between NIV sessions

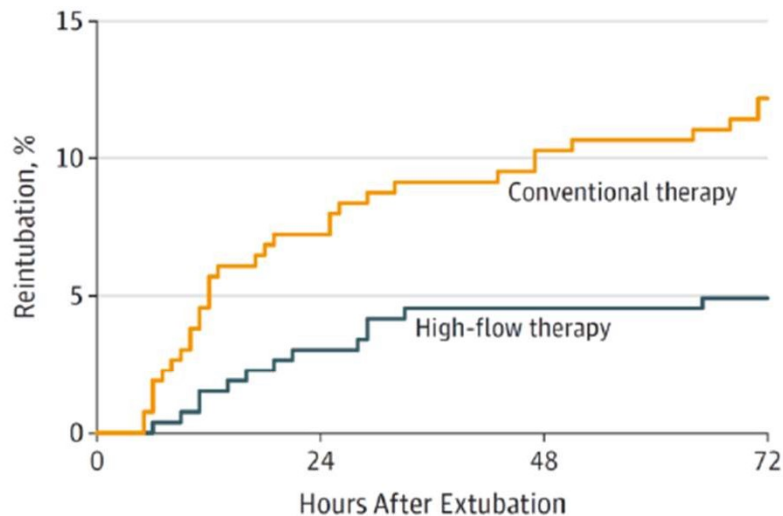
Effect of Postextubation High-Flow Nasal Cannula vs Conventional Oxygen Therapy on Reintubation in Low-Risk Patients

A Randomized Clinical Trial

Gonzalo Hernández, MD, PhD; Concepción Vaquero, MD; Paloma González, MD; Carles Subira, MD; Fernando Frutos-Vivar, MD; Gemma Rialp, MD; Cesar Laborda, MD; Laura Colinas, MD; Rafael Cuenca, MD; Rafael Fernández, MD, PhD

527 ICU-patients at low-risk of reintubation:
a majority of postoperative patients

Figure 2. Kaplan-Meier Analysis of Time From Extubation to Reintubation



| No. at risk | 0 | 24 | 48 | 72 |
|----------------------|-----|-----|-----|-----|
| Conventional therapy | 263 | 244 | 236 | 231 |
| High-flow therapy | 264 | 256 | 252 | 251 |



O₂: 12%



High-flow oxygen: 5%

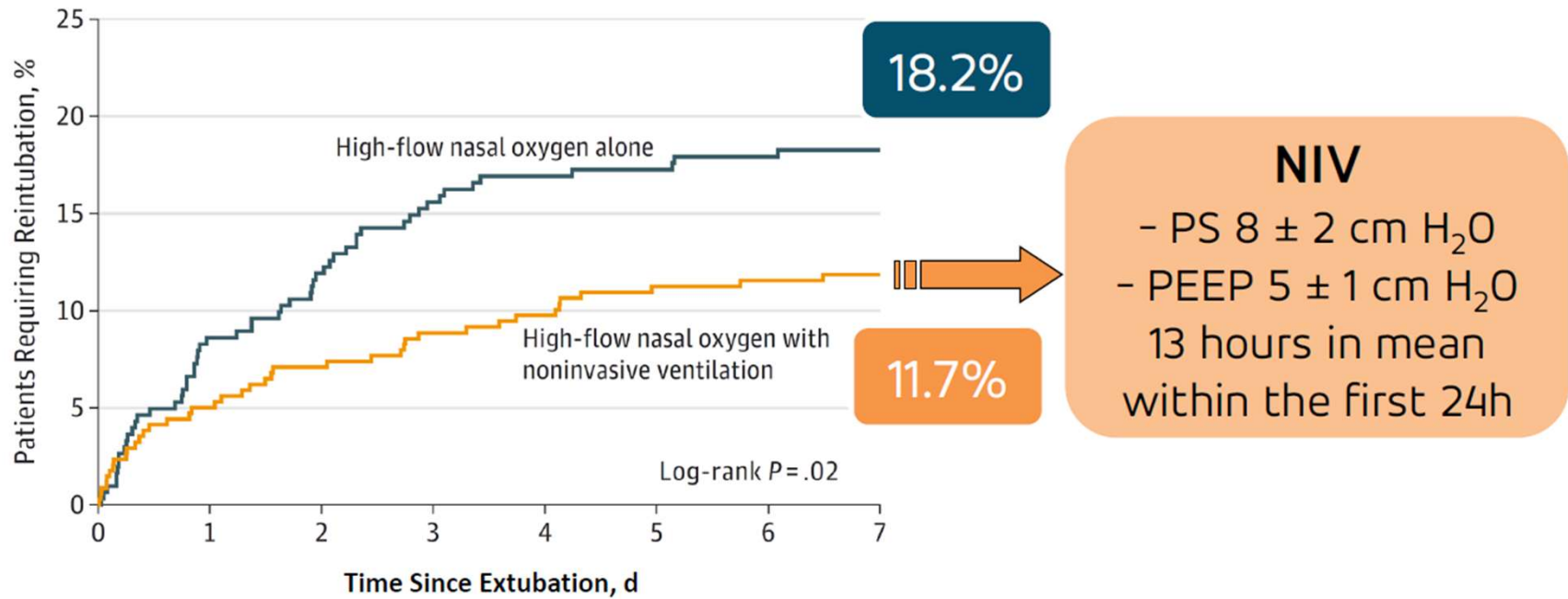
Hernandez G et al., JAMA 2016; 315:1354-1361.

Effect of Postextubation High-Flow Nasal Oxygen With Noninvasive Ventilation vs High-Flow Nasal Oxygen Alone on Reintubation Among Patients at High Risk of Extubation Failure A Randomized Clinical Trial

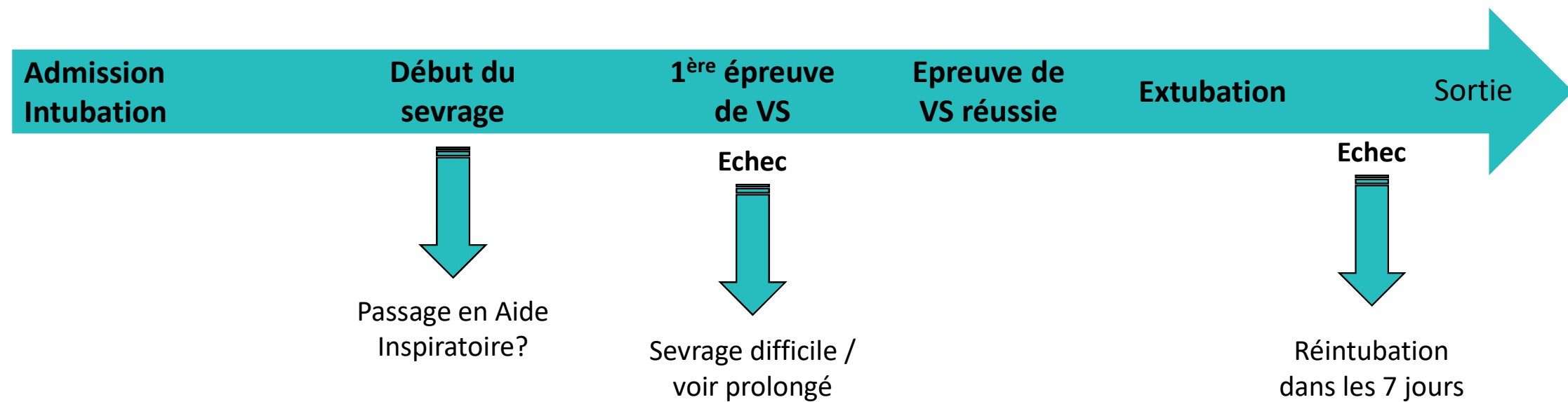
High-Wean study

Arnaud W. Thille, MD, PhD; Grégoire Muller, MD; Arnaud Gacouin, MD; Rémi Coudroy, MD; Maxens Decavèle, MD; Romain Sonnevill, MD, PhD; François Beloncle, MD; Christophe Girault, MD; Laurence Dangers, MD; Alexandre Lautrette, MD, PhD; Séverin Cabasson, MD; Anahita Rouzé, MD; Emmanuel Vivier, MD; Anthony Le Meur, MD; Jean-Damien Ricard, MD, PhD; Keyvan Razazi, MD; Guillaume Barberet, MD; Christine Lebert, MD; Stephan Ehrmann, MD, PhD; Caroline Sabatier, MD; Jeremy Bourenne, MD; Gael Pradel, MD; Pierre Bailly, MD; Nicolas Terzi, MD, PhD; Jean Dellamonica, MD, PhD; Guillaume Lacave, MD; Pierre-Éric Danin, MD; Hodanou Nanadoumgar, MD; Aude Gibelin, MD; Lassane Zanre, MD; Nicolas Deye, MD, PhD; Alexandre Demoule, MD, PhD; Adel Maamar, MD; Mai-Anh Nay, MD; René Robert, MD, PhD; Stéphanie Ragot, PharmD, PhD; Jean-Pierre Frat, MD; for the HIGH-WEAN Study Group and the REVA Research Network

Figure 2. Kaplan-Meier Analysis of Time From Extubation to Reintubation for the Overall Study Population



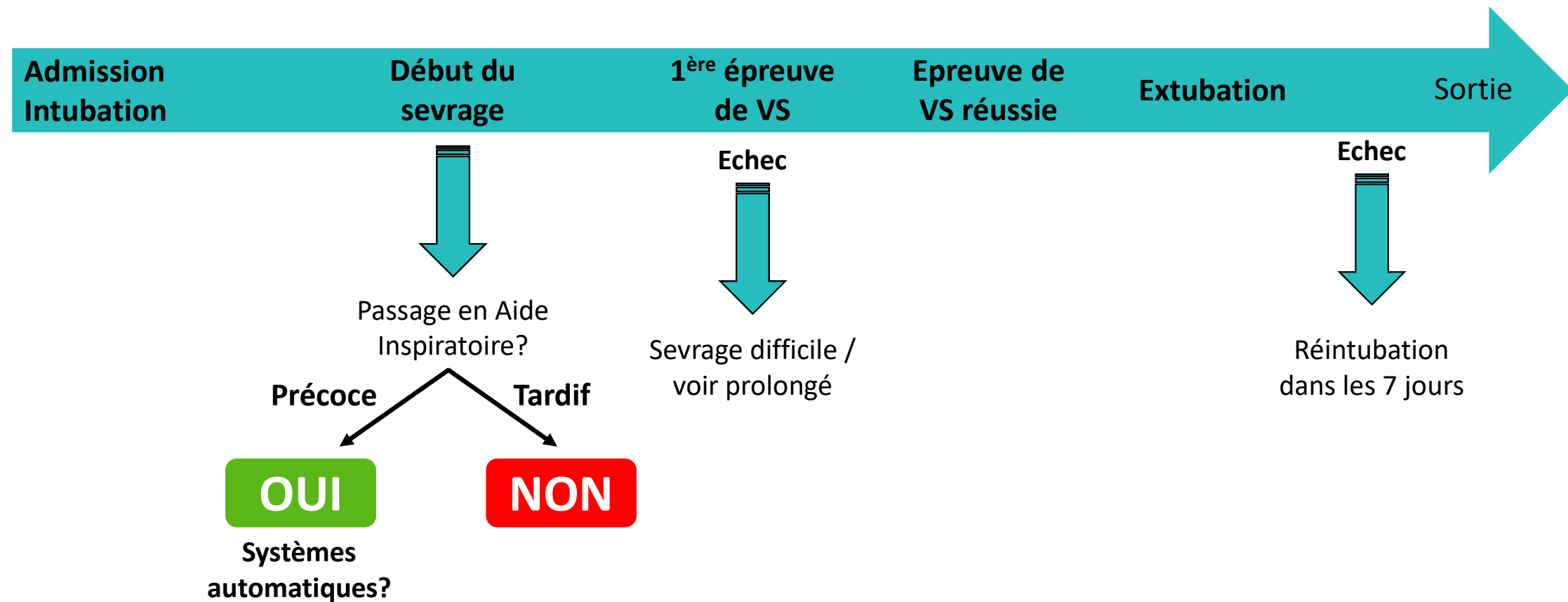
L'approche systématique permet-elle le sevrage?



L'approche systématique permet-elle le sevrage?

Critères objectifs
+ protocole
= systématique

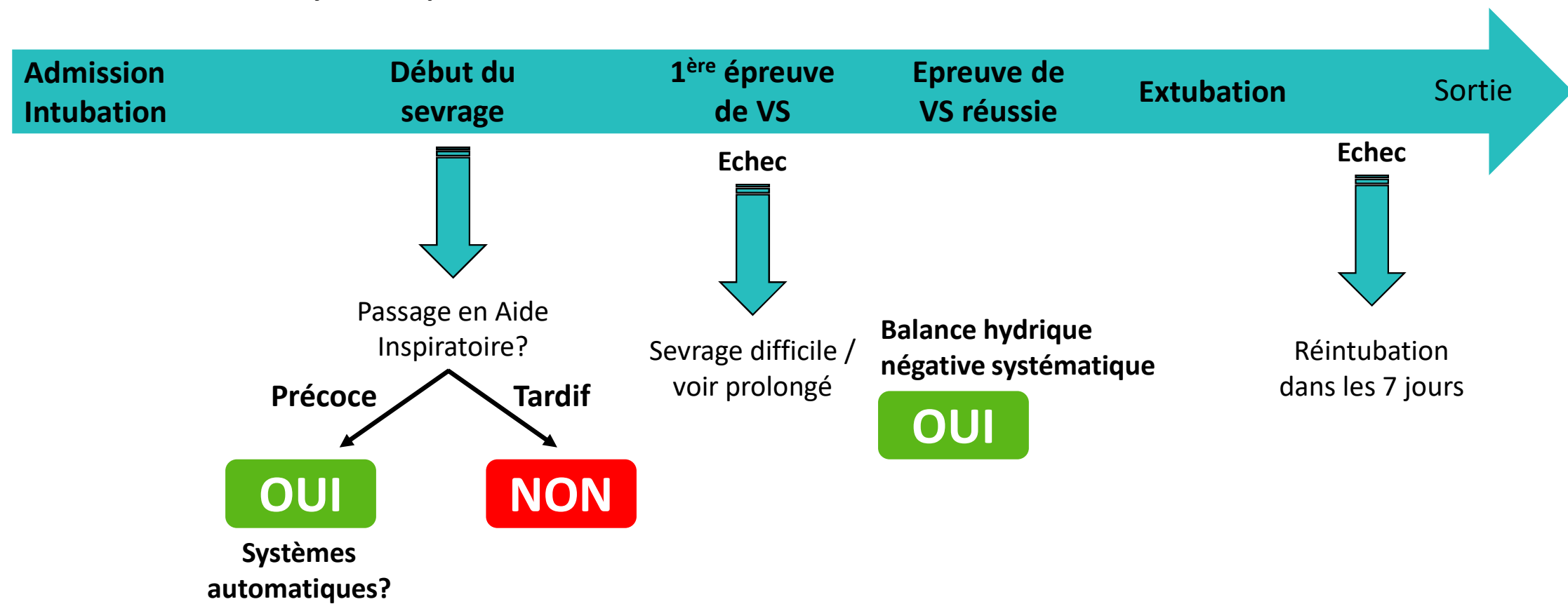
OUI



L'approche systématique permet-elle le sevrage?

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OUI



L'approche systématique permet-elle le sevrage?

Critères objectifs
+ protocole
= systématique

OUI

OUI

Admission
Intubation

Début du
sevrage

1^{ère} épreuve
de VS

Epreuve de
VS réussie

Extubation
systématique

Sortie



Passage en Aide
Inspiratoire?

Précoce

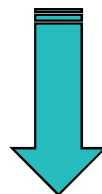
Tardif

OUI

Systemes
automatiques?

NON

Echec



Sevrage difficile /
voir prolongé

Jeune & corticoïdes
systématiques

NON

Balance hydrique
négative systématique

OUI

Echec



Réintubation
dans les 7 jours

L'approche systématique permet-elle le sevrage?

Critères objectifs
+ protocole
= systématique

OUI

Haut débit & VNI
prophylactiques

OUI

OUI

Sortie

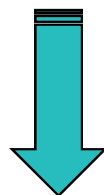
Admission
Intubation

Début du
sevrage

1^{ère} épreuve
de VS

Epreuve de
VS réussie

Extubation
systématique



Passage en Aide
Inspiratoire?

Précoce

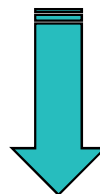
Tardif

OUI

Systemes
automatiques?

NON

Echec



Sevrage difficile /
voir prolongé

Jeune & corticoïdes
systématiques

NON

Balance hydrique
négative systématique

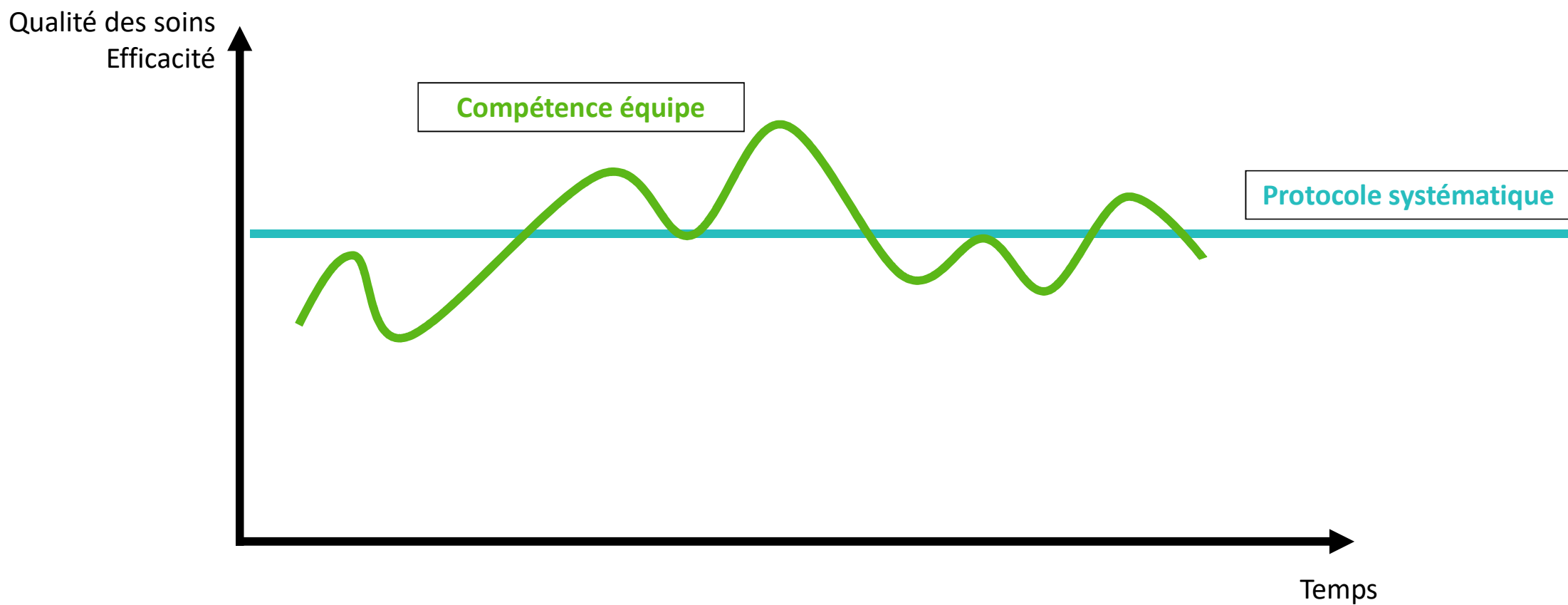
OUI

Echec



Réintubation
dans les 7 jours

Approche systématique / protocolisée





stephanEHRMANN@gmail.com

Merci pour votre attention,