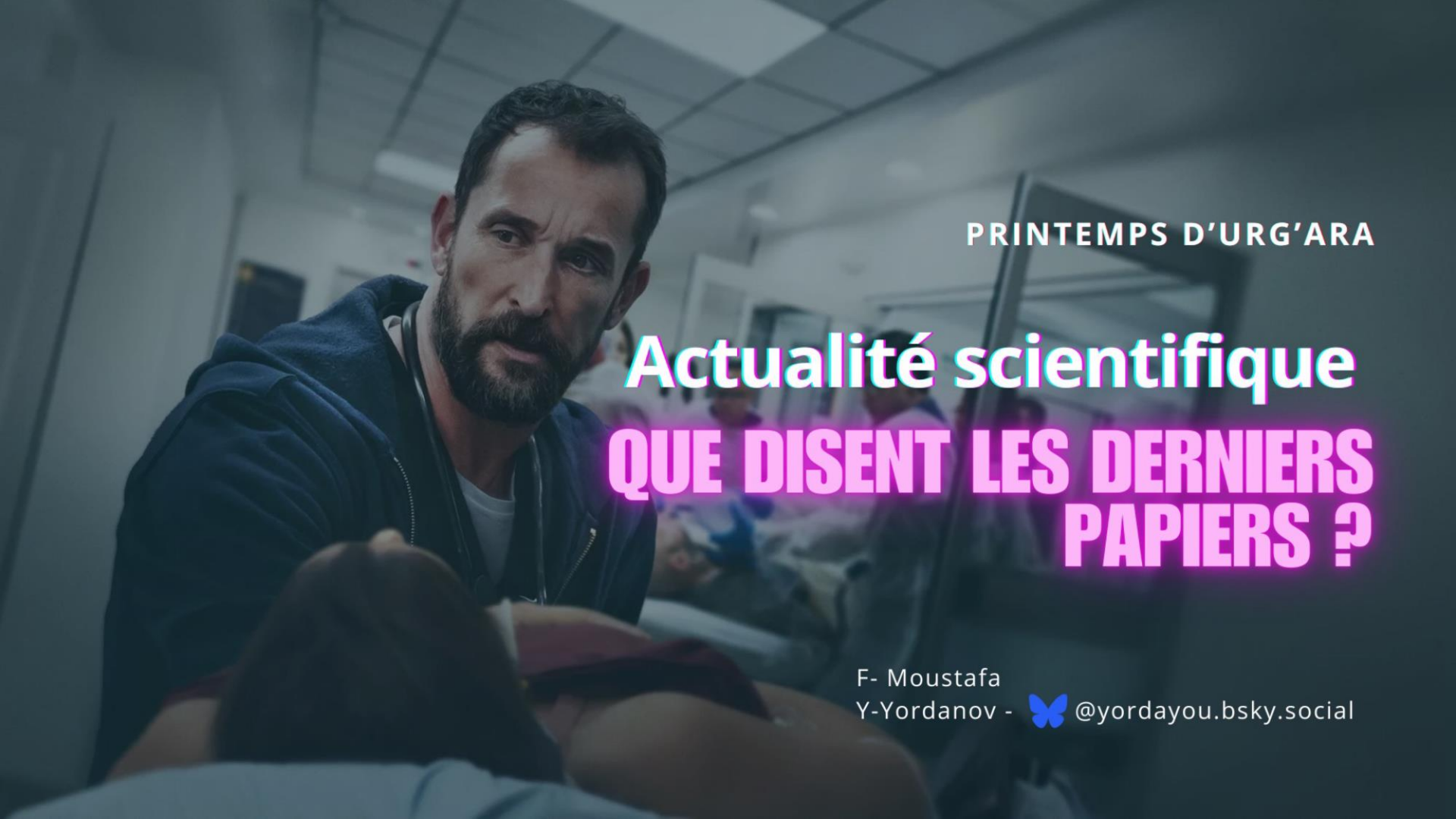


PRINTEMPS D'URG'ARA

# Actualité scientifique

# QUE DISENT LES DERNIERS PAPIERS ?

F- Moustafa
Y-Yordanov - @yordayou.bsky.social

# Intubation au vidéo-laryngoscope : pour tous ?


# État des lieux sur l'usage de la vidéolaryngoscopie par les médecins préhospitaliers en France

5 avril 2024

| Disponibilité et modèle de VL en SMUR | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Disponibilité de la VL | S+D | | SMUR | | SAUV** | Aucun | NI | N |
| Nombre de SAU-SMUR | **173** | | **24** | | **17** | **43** | **2** | **259** |
| Pourcentage | 67 | | 9 | | 7 | 17 | 1 | 100 |
| Vidéolaryngoscope disponible | | (%)* | | (%)* | | | | |
| McGrath Mac | **86** | 43 | **14** | 7 | 6 | | | 106 |
| Airtraq | **33** | 16 | **7** | 4 | 1 | | | 41 |
| Glidescope | **12** | 6 | **0** | 0 | 5 | | | 17 |
| I View | **1** | 0,5 | **1** | 0,5 | 0 | | | 2 |
| NSP | **35** | 17 | **1** | 0,5 | 5 | | | 41 |
| Plus d'une réponse | **6** | 3 | **1** | 0,5 | 0 | | | 7 |

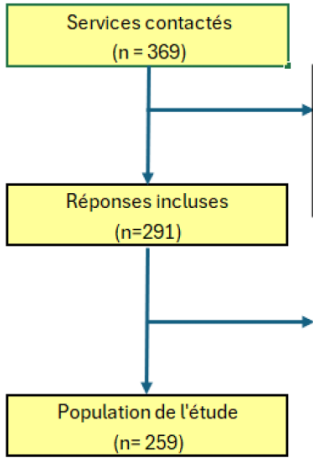
** Le pourcentage est exprimé sur l'ensemble des VI disponibles en SMUR qui est l'objet de l'étude.*

***Les modèles disponibles uniquement en intra-hospitalier ne sont donnés qu'à titre informatif.*

| Expérience des médecins urgentistes avec la vidéolaryngoscopie | | |
|---|---|---|
| Nombre de modèles utilisés en simulation | N (259) | % |
| Non | 54 | 20,8 |
| Un seul | 137 | 52,9 |
| Plusieurs | 68 | 26,6 |
| Nombre d'intubation en simulation | | |
| 0 | 54 | 20,8 |
| <5 | 108 | 41,6 |
| 5 à 20 | 58 | 22,3 |
| >20 | 32 | 12,3 |
| NI | 7 | 2,7 |
| Intérêt d'une nouvelle fomration à la VL | | |
| Indispensable | 70 | 27 |
| Plutôt utile | 152 | 58,8 |
| Inutile | 37 | 14,3 |

| Recommandations selon les urgentistes | | | |
|---|---|---|---|
| **Première intention** | **n (259)** | **Deuxième intention** | **n (258)** |
| LD | 157 (61%) | LM | 93 (36%) |
| | | VL | 39 (15%) |
| | | VM | 18 (7%) |
| | | ML | 7 (3%) |
| LM | 66 (25%) | VL | 32 (12%) |
| | | VM | 16 (6%) |
| | | ML | 18 (7%) |
| VL | 23 (9%) | VM | 18 (7%) |
| | | ML | 4 (2%) |
| VM | 12 (5%) | LM | 1 (0,5%) |
| | | ML | 11 (4%) |

*LD : Laryngoscopie Direct, LM : Laryngoscopie + Mandrin*
*VL : Vidéolaryngoscopie, VM = Vidéolaryngoscope + Mandrin*
*ML : Masque Laryngé*



PLOS ONE 2022

RESEARCH ARTICLE

# The use of video laryngoscopy outside the operating room: A systematic review

**Emma J. Perkins[1]*, Jonathan L. Begley[1,2], Fiona M. Brewster[3], Nathan D. Hanegbi[1], Arun A. Ilancheran[1], David J. Brewster[2,4]**

**1** Alfred Health, Melbourne, VIC, Australia, **2** Intensive Care Unit, Cabrini Hospital, Malvern, VIC, Australia, **3** Department of Anaesthesia, Royal Women's Hospital, Parkville, VIC, Australia, **4** Central Clinical School, Monash University, Melbourne, VIC, Australia

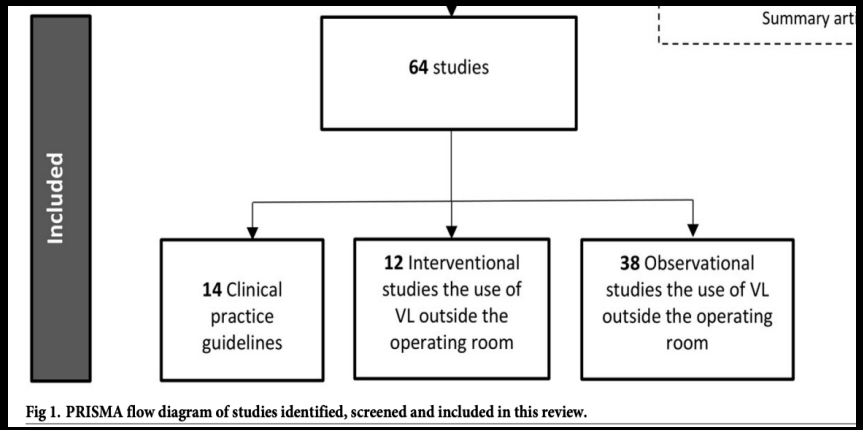



Fig 1. PRISMA flow diagram of studies identified, screened and included in this review.

## Conclusion

Ultimately, our results suggest that the use of VL outside the OR has increased in recent years, and particularly through the COVID-19 pandemic. The early use of VL is recommended in most published clinical practice guidelines and is unanimously recommended for management of COVID-19 intubations. It appears that VL is likely to improve glottic view and decrease incidence of oesophageal intubations; however, it remains unclear as to how this contributes to first-pass success. Within the limitations of our research, we found that VL has yet to show significant improvement in overall intubation success or clinical outcomes such as mortality outside the OR. More directed research is required to further characterise the use of VL outside the OR, the type of blade used and the clinical outcomes associated with its use.

March 18, 2024

# Video Laryngoscopy vs Direct Laryngoscopy for Endotracheal Intubation in the Operating Room

## A Cluster Randomized Clinical Trial

Kurt Ruetzler, MD[1,2]; Sergio Bustamante, MD[3]; Marc T. Schmidt[1]; Federico Almonacid-Cardenas, MD[1]; Andra Duncan, MD[1,3]; Andrew Bauer, MD[3]; Alparslan Turan, MD[1,2]; Nikolaos J. Skubas, MD[3]; Daniel I. Sessler, MD[1]; for the Collaborative VLS Trial Group

» Author Affiliations | Article Information

*JAMA*. 2024;331(15):1279-1286. doi:10.1001/jama.2024.0762

single US academic hospital.

**Figure. Study Flow Diagram**

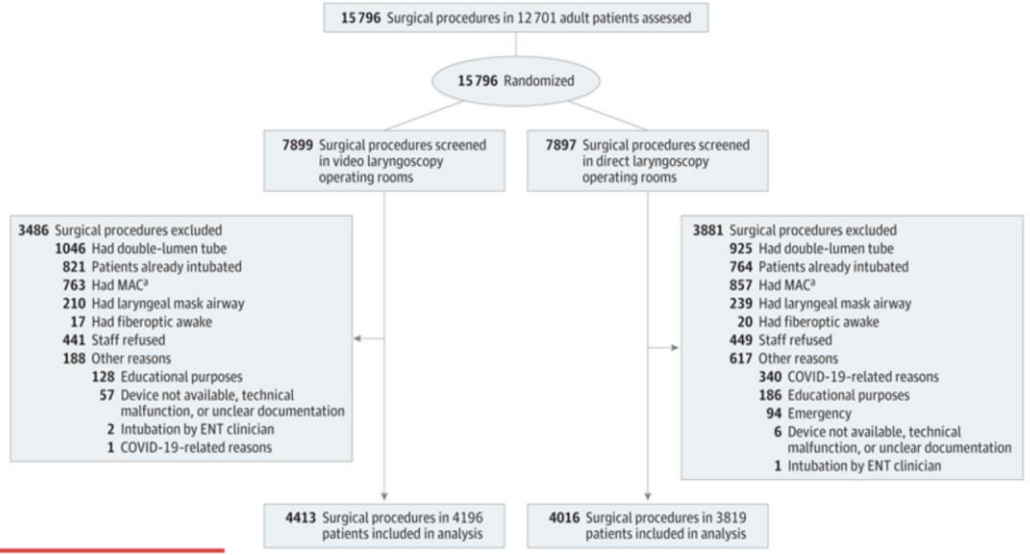



**Table 2. Treatment Effect on the Primary and Secondary Outcomes**

Table 2. Treatment Effect on the Primary and Secondary Outcomes

| Outcome | Video laryngoscopy (n = 4413) | Direct laryngoscopy (n = 4016) | Treatment effect estimate (95% CI)[a] | *P* value[b] |
|---|---|---|---|---|
| Primary outcome | | | | |
| Intubation attempts per patient, No. (%) | | | | |
| 1 | 4336 (98.3) | 3710 (92.4) | 0.20 (0.14-0.28)[c] | <.001 |
| 2 | 70 (1.6) | 277 (6.9) | | |
| 3 | 3 (0.07) | 27 (0.67) | | |
| >3 | 4 (0.09) | 2 (0.05) | | |

**Findings** In this cluster randomized trial including 8429 surgical procedures in 7736 patients, more than 1 intubation attempt was required in 1.7% of patients randomized to receive video laryngoscopy. More than 1 intubation attempt was required in 7.6% of patients randomized to receive direct laryngoscopy.

Cochrane Library

[590 pages]

Cochrane Database of Systematic Reviews

# Videolaryngoscopy versus direct laryngoscopy for adults undergoing tracheal intubation (Review)

Hansel J, Rogers AM, Lewis SR, Cook TM, Smith AF.

Videolaryngoscopy versus direct laryngoscopy for adults undergoing tracheal intubation.
*Cochrane Database of Systematic Reviews* 2022, Issue 4. Art. No.: CD011136.
DOI: 10.1002/14651858.CD011136.pub3.

| Study or Subgroup | VL Events | VL Total | DL Events | DL Total | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|---|
| Abdallah 2019 | 0 | 35 | 0 | 35 | | Not estimable |
| Abdelgalel 2018 | 0 | 80 | 1 | 40 | 0.5% | 0.17 [0.01 , 4.05] |
| Abdelgawad 2015 | 0 | 40 | 0 | 40 | | Not estimable |
| Acarel 2018 | 0 | 30 | 0 | 30 | | Not estimable |
| Aggarwal 2019 | 0 | 50 | 0 | 50 | | Not estimable |
| Agrawal 2020 | 0 | 40 | 0 | 40 | | Not estimable |
| Ahmadi 2015 | 1 | 49 | 3 | 48 | 1.0% | 0.33 [0.04 , 3.03] |
| Akbar 2015 | 0 | 45 | 2 | 45 | 0.6% | 0.20 [0.01 , 4.05] |
| Al-Ghamdi 2016 (1) | 0 | 65 | 0 | 22 | | Not estimable |
| Aleksandrowicz 2018 | 0 | 20 | 5 | 20 | 0.7% | 0.09 [0.01 , 1.54] |
| Ali 2017 | 0 | 30 | 0 | 30 | | Not estimable |
| Altaiee 2020 | 0 | 50 | 0 | 50 | | Not estimable |
| Amor 2013 | 0 | 60 | 0 | 60 | | Not estimable |
| Anandraja 2021 | 0 | 30 | 0 | 30 | | Not estimable |
| Ander 2017 | 0 | 39 | 5 | 39 | 0.7% | 0.09 [0.01 , 1.59] |
| Andersen 2011 | 0 | 50 | 2 | 50 | 0.6% | 0.20 [0.01 , 4.06] |
| Aoi 2010 | 1 | 18 | 1 | 18 | 0.7% | 1.00 [0.07 , 14.79] |
| Aqil 2016 | 0 | 40 | 0 | 40 | | Not estimable |
| Aqil 2017 | 0 | 70 | 0 | 70 | | Not estimable |
| Arici 2014 | 0 | 40 | 0 | 40 | | Not estimable |
| Arora 2013 (2) | 0 | 54 | 0 | 54 | | Not estimable |
| Arslan 2017 (1) | 0 | 80 | 0 | 40 | | Not estimable |
| Aziz 2012 | 6 | 149 | 12 | 147 | 3.6% | 0.49 [0.19 , 1.28] |
| Bakshi 2 | | | | | | |
| Bakshi 2 | | | | | | |
| Barak 20 | | | | | | |
| Bashir 2 | | | | | | |
| Bensghi | | | | | | |
| Bensghi | | | | | | |
| Bhandar | | | | | | |
| Bhat 201 | | | | | | |
| Bilehjan | | | | | | |
| Blajic 20 | | | | | | |
| Cakir 20 | | | | | | |
| Carassiti | | | | | | |
| Castillo- | | | | | | |
| Cavus 20 | | | | | | |
| Chalkeid | | | | | | |
| Chen 20 | | | | | | |
| Colak 20 | | | | | | |
| Cordova | | | | | | |
| Dey 202 | | | | | | |
| Driver 2 | | | | | | |
| El-Tahar | | | | | | |
| El-Tahar | | | | | | |
| Enomoto 2008 | 0 | 99 | 11 | 104 | 0.7% | 0.05 [0.00 , 0.76] |
| Erden 2010 | 1 | 17 | 0 | 16 | 0.6% | 2.83 [0.12 , 64.89] |
| Erdivanli 2018 | 13 | 388 | 22 | 388 | 5.0% | 0.59 [0.30 , 1.16] |
| Erturk 2015 | 0 | 40 | 0 | 40 | | Not estimable |
| Ferrando 2011 | 1 | 30 | 0 | 30 | 0.5% | 3.00 [0.13 , 70.83] |
| Foulds 2016b | 0 | 24 | 7 | 25 | 0.7% | 0.07 [0.00 , 1.15] |
| Frohlich 2011 | 12 | 30 | 0 | 30 | 0.7% | 25.00 [1.55 , 403.99] |
| Gao 2018 | 6 | 81 | 8 | 82 | 3.4% | 0.76 [0.28 , 2.09] |
| Gunes 2020 | 0 | 90 | 0 | 90 | | Not estimable |
| Gupta 2013 | 0 | 60 | 0 | 60 | | Not estimable |
| Hirabayashi 2009 | 0 | 264 | 2 | 256 | 0.6% | 0.19 [0.01 , 4.02] |
| Hosalli 2017 | 0 | 30 | 0 | 30 | | Not estimable |
| Hostic 2016 | 1 | 100 | 1 | 40 | 0.7% | 0.40 [0.03 , 6.24] |
| Hu 2017 (4) | 0 | 100 | 0 | 96 | | Not estimable |
| Ilyas 2014 | 5 | 64 | 0 | 64 | 0.7% | 11.00 [0.62 , 194.90] |
| Inal 2016 | 0 | 50 | 0 | 50 | | Not estimable |
| Jafra 2018 | 0 | 100 | 0 | 100 | | Not estimable |
| Jungbauer 2009 | 1 | 100 | 8 | 100 | 1.2% | 0.13 [0.02 , 0.98] |
| Kaur 2020 | 0 | 80 | 0 | 40 | | Not estimable |



| | | | | | | |
|---|---|---|---|---|---|---|
| Jungbauer 2009 | 1 | 100 | 8 | 100 | 1.2% | 0.13 [0.02 , 0.98] |
| Kaur 2020 | 0 | 80 | 0 | 40 | | Not estimable |
| Kido 2015 | 0 | 25 | 0 | 25 | | Not estimable |
| Kill 2013 | 0 | 30 | 3 | 30 | 0.6% | 0.14 [0.01 , 2.65] |
| Kim 2013 | 0 | 22 | 0 | 23 | | Not estimable |
| Kim 2018 | 0 | 110 | 0 | 110 | | Not estimable |
| Kleine-Brueggeney 2017 | 64 | 360 | 52 | 120 | 7.3% | 0.41 [0.30 , 0.55] |
| Koennecke 2014 (1) | 10 | 83 | 10 | 30 | 4.5% | 0.36 [0.17 , 0.78] |
| Koh 2010 | 1 | 25 | 4 | 25 | 1.1% | 0.25 [0.03 , 2.08] |
| Komatsu 2010 | 1 | 50 | 0 | 50 | 0.5% | 3.00 [0.13 , 71.92] |
| Kucukosman 2020 | 0 | 30 | 0 | 30 | | Not estimable |
| Lascarrou 2017 | 3 | 186 | 2 | 185 | 1.5% | 1.49 [0.25 , 8.83] |
| Lee 2009 | 0 | 41 | 0 | 44 | | Not estimable |
| Lee 2012 (1) | 3 | 75 | 1 | 25 | 1.0% | 1.00 [0.11 , 9.18] |
| Lim 2005 | 0 | 30 | 0 | 30 | | Not estimable |
| Lin 2012 | 2 | 85 | 3 | 85 | 1.5% | 0.67 [0.11 , 3.89] |
| Liu 2016 | 2 | 90 | 1 | 90 | 0.9% | 2.00 [0.18 , 21.67] |
| Liu 2019 | 0 | 179 | 10 | 181 | 0.7% | 0.05 [0.00 , 0.82] |
| Maassen 2012 | 0 | 40 | 0 | 40 | | Not estimable |
| Macke 2020 | 0 | 76 | 3 | 76 | 0.6% | 0.14 [0.01 , 2.72] |
| Maharaj 2006 | 0 | 30 | 0 | 30 | | Not estimable |
| Maharaj 2007 | 0 | 20 | 1 | 20 | 0.6% | 0.33 [0.01 , 7.72] |
| Maharaj 2008 | 0 | 20 | 4 | 20 | 0.7% | 0.11 [0.01 , 1.94] |
| Malik 2008 (1) | 3 | 90 | 2 | 30 | 1.6% | 0.50 [0.09 , 2.85] |
| Malik 2009a | 0 | 30 | 0 | 30 | | Not estimable |
| Malik 2009b | 1 | 50 | 4 | 25 | 1.1% | 0.13 [0.01 , 1.06] |
| Mathew 2018 | 0 | 33 | 0 | 33 | | Not estimable |
| Shah 2016 (5) | 0 | 30 | 1 | 30 | 0.5% | 0.33 [0.01 , 7.87] |
| Shimazaki 2018 | 0 | 20 | 0 | 20 | | Not estimable |
| Shippey 2013 | 0 | 24 | 1 | 25 | 0.6% | 0.35 [0.01 , 8.12] |
| Shukla 2017 | 0 | 40 | 2 | 40 | 0.6% | 0.20 [0.01 , 4.04] |
| Siddiqui 2009 | 0 | 20 | 0 | 20 | | Not estimable |
| Silverberg 2015 | 5 | 57 | 16 | 60 | 3.7% | 0.33 [0.13 , 0.84] |
| Sun 2005 | 0 | 100 | 1 | 100 | 0.5% | 0.33 [0.01 , 8.09] |
| Takenaka 2011 | 0 | 35 | 5 | 34 | 0.7% | 0.09 [0.01 , 1.54] |
| Taylor 2013 | 0 | 44 | 18 | 44 | 0.7% | 0.03 [0.00 , 0.43] |
| Tempe 2016 | 1 | 40 | 1 | 20 | 0.7% | 0.50 [0.03 , 7.59] |
| Teoh 2010 | 0 | 300 | 0 | 100 | | Not estimable |
| Tolon 2012 | 0 | 20 | 0 | 20 | | Not estimable |
| Tosh 2018 | 0 | 65 | 0 | 65 | | Not estimable |
| Tsan 2020 | 0 | 69 | 0 | 69 | | Not estimable |
| Turkstra 2009 | 0 | 24 | 0 | 24 | | Not estimable |
| Varsha 2019 | 0 | 35 | 0 | 35 | | Not estimable |
| Vijayakumar 2016 | 0 | 45 | 0 | 45 | | Not estimable |
| Walker 2009 | 1 | 60 | 0 | 60 | 0.5% | 3.00 [0.12 , 72.20] |
| Wallace 2015 | 0 | 52 | 0 | 53 | | Not estimable |



| | | | | | | |
|---|---|---|---|---|---|---|
| Walker 2009 | 1 | 60 | 0 | 60 | 0.5% | 3.00 [0.12 , 72.20] |
| Wallace 2015 | 0 | 52 | 0 | 53 | | Not estimable |
| Wasem 2013 | 0 | 30 | 0 | 30 | | Not estimable |
| Wasinwong 2017 | 0 | 23 | 1 | 23 | 0.6% | 0.33 [0.01 , 7.78] |
| Woo 2012 | 0 | 50 | 0 | 109 | | Not estimable |
| Xue 2007 | 0 | 30 | 0 | 27 | | Not estimable |
| Yao 2015 | 0 | 48 | 0 | 48 | | Not estimable |
| Yoo 2018 | 1 | 22 | 5 | 22 | 1.2% | 0.20 [0.03 , 1.58] |
| Yousef 2012 | 0 | 30 | 6 | 30 | 0.7% | 0.08 [0.00 , 1.31] |
| Yumul 2016 | 6 | 90 | 7 | 31 | 3.4% | 0.30 [0.11 , 0.81] |
| Zhao 2014 | 9 | 74 | 25 | 75 | 4.9% | 0.36 [0.18 , 0.73] |
| **Total (95% CI)** | | **8800** | | **7428** | **100.0%** | **0.44 [0.35 , 0.56]** |
| Total events: | 221 | | 375 | | | |

Heterogeneity: Tau² = 0.19; Chi² = 97.56, df = 76 (P = 0.05); I² = 22%
Test for overall effect: Z = 6.60 (P < 0.00001)
Test for subgroup differences: Not applicable

0.002 0.1 1 10 500
Favours VL Favours DL

# Analysis 4.1. Comparison 4: VL versus DL (all devices combined), Outcome 1: Failed intubation

| | | | | | |
|---|---|---|---|---|---|
| **Total (95% CI)** | **8800** | **7428** | **100.0%** | **0.44 [0.35 , 0.56]** |
| Total events: | 221 | 375 | | |

Heterogeneity: Tau² = 0.19; Chi² = 97.56, df = 76 (P = 0.05); I² = 22%

Test for overall effect: Z = 6.60 (P < 0.00001)

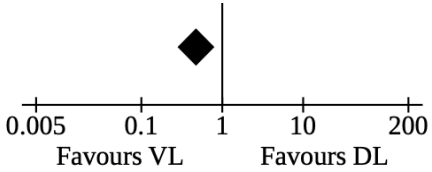
0.002 0.1 1 10 500
Favours VL Favours DL

## Analysis 4.4. Comparison 4: VL versus DL (all devices combined), Outcome 4: Oesophageal intubation

| | | | | |
|---|---|---|---|---|
| **Total (95% CI)** | **3143** | **2625** | **100.0%** | **0.47 [0.29 , 0.77]** |
| Total events: | 37 | 85 | | |

Heterogeneity: $Tau^2 = 0.22$; $Chi^2 = 28.44$, df = 24 (P = 0.24); $I^2 = 16\%$

Test for overall effect: Z = 3.01 (P = 0.003)

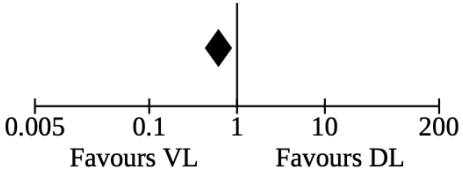



## Analysis 4.2. Comparison 4: VL versus DL (all devices combined), Outcome 2: Hypoxia

| | | | | |
|---|---|---|---|---|
| **Total (95% CI)** | **2870** | **2564** | **100.0%** | **0.61 [0.44 , 0.85]** |
| Total events: | 110 | 169 | | |

Heterogeneity: $Tau^2 = 0.13$; $Chi^2 = 25.64$, df = 17 (P = 0.08); $I^2 = 34\%$

Test for overall effect: Z = 2.92 (P = 0.003)




Hansel et al. *Cochrane Database Syst Rev. 2022*

Y a-t-il des differences?

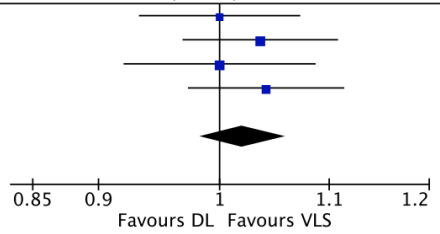
Can J Anesth/J Can Anesth (2021) 68:546–565
https://doi.org/10.1007/s12630-020-01908-w

REVIEW ARTICLE/BRIEF REVIEW

# Comparison of videolaryngoscopy and direct laryngoscopy for tracheal intubation in obstetrics: a mixed-methods systematic review and meta-analysis

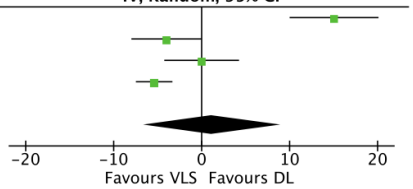
| Study or Subgroup | VLS Events | VLS Total | DL Events | DL Total | Weight | Risk Ratio M-H, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| Arici et al, 2014 | 39 | 40 | 39 | 40 | 19.5% | 1.00 [0.93, 1.07] |
| Blajic et al, 2019_C-MAC | 59 | 60 | 56 | 59 | 28.2% | 1.04 [0.97, 1.11] |
| Blajic et al, 2019_KVL | 56 | 59 | 56 | 59 | 28.0% | 1.00 [0.92, 1.09] |
| Toker et al, 2019 | 50 | 50 | 48 | 50 | 24.3% | 1.04 [0.97, 1.11] |
| **Total (95% CI)** | | **209** | | **208** | **100.0%** | **1.02 [0.98, 1.06]** |
| Total events | 204 | | 199 | | | |

Heterogeneity: $Chi^2 = 1.08$, df = 3 (P = 0.78); $I^2 = 0\%$
Test for overall effect: Z = 1.06 (P = 0.29)




| Study or Subgroup | VLS Mean | VLS SD | VLS Total | DL Mean | DL SD | DL Total | Weight | Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Arici et al, 2014 | 47.25 | 14.92 | 40 | 32.2 | 6.58 | 40 | 24.0% | 15.05 [10.00, 20.10] |
| Blajic et al, 2019_C-MAC | 25 | 7 | 60 | 29 | 14 | 59 | 25.0% | -4.00 [-7.99, -0.01] |
| Blajic et al, 2019_KVL | 29 | 9 | 59 | 29 | 14 | 59 | 24.8% | 0.00 [-4.25, 4.25] |
| Toker et al, 2019 | 34.7 | 5.2 | 50 | 40.1 | 5.4 | 50 | 26.2% | -5.40 [-7.48, -3.32] |
| **Total (95% CI)** | | | **209** | | | **208** | **100.0%** | **1.20 [-6.63, 9.04]** |

Heterogeneity: $Tau^2 = 59.79$; $Chi^2 = 55.65$, df = 3 (P < 0.00001); $I^2 = 95\%$
Test for overall effect: Z = 0.30 (P = 0.76)




Howle et al. *Can J Anesth.* 2021

**Analysis 1.1. Comparison 1 Indirect videolaryngoscope vs conventional laryngoscope for intubation of children, Outcome 1 Unsuccessful or more than 2 intubation attempts.**

| Study or subgroup | Indirect laryngoscopy N | Indirect laryngoscopy Mean(SD) | Direct laryngoscopy N | Direct laryngoscopy Mean(SD) | Mean Difference Random, 95% CI | Weight | Mean Difference Random, 95% CI |
|---|---|---|---|---|---|---|---|
| **Total ***** | **400** | | **398** | | ◆ | **100%** | **5.49[1.37,9.6]** |

Heterogeneity: $Tau^2$=42.4; $Chi^2$=114.1, df=11(P<0.0001); $I^2$=90.36%

Test for overall effect: Z=2.61(P=0.01)

Test for subgroup differences: $Chi^2$=3.07, df=1 (P=0.22), $I^2$=34.76%

Indirect laryngoscopy -40 -20 0 20 40 Direct laryngoscopy

Abdelgadir et al. *Cochrane Database Syst Rev. 2017*

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

# Video versus Direct Laryngoscopy for Tracheal Intubation of Critically Ill Adults

M.E. Prekker, B.E. Driver, S.A. Trent, D. Resnick-Ault, K.P. Seitz, D.W. Russell,

AUGUST 3, 2023

étude multicentrique, randomisée sur un ratio 1/1 qui pour des raisons évidentes n'est pas menée en double aveugle

population concernée est Nord-Américaine, répartie sur 17 sites dans 11 hôpitaux (7 services d'urgences et 10 services de réanimation)

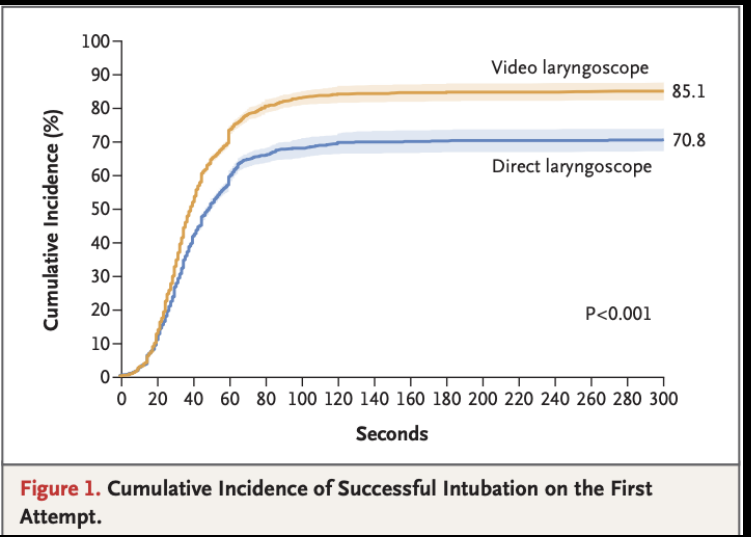
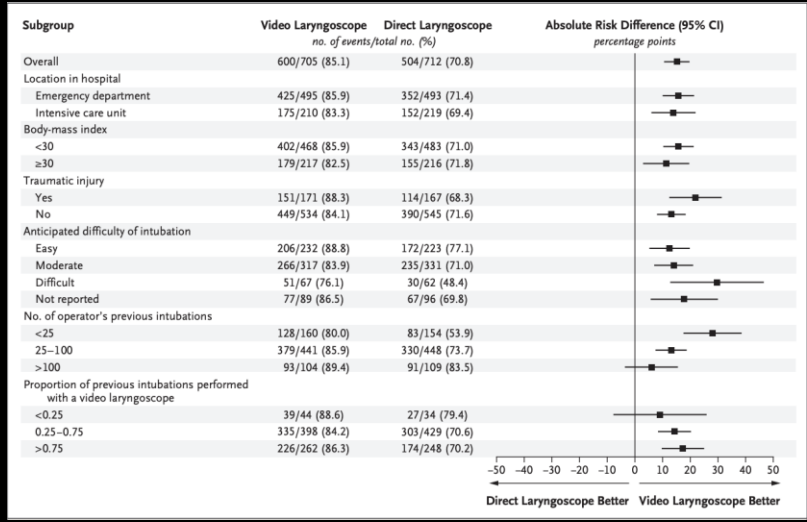



**Figure 1.** Cumulative Incidence of Successful Intubation on the First Attempt.



| Subgroup | Video Laryngoscope | Direct Laryngoscope |
|---|---|---|
| | no. of events/total no. (%) | |
| Overall | 600/705 (85.1) | 504/712 (70.8) |
| Location in hospital | | |
| Emergency department | 425/495 (85.9) | 352/493 (71.4) |
| Intensive care unit | 175/210 (83.3) | 152/219 (69.4) |
| Body-mass index | | |
| <30 | 402/468 (85.9) | 343/483 (71.0) |
| ≥30 | 179/217 (82.5) | 155/216 (71.8) |
| Traumatic injury | | |
| Yes | 151/171 (88.3) | 114/167 (68.3) |
| No | 449/534 (84.1) | 390/545 (71.6) |
| Anticipated difficulty of intubation | | |
| Easy | 206/232 (88.8) | 172/223 (77.1) |
| Moderate | 266/317 (83.9) | 235/331 (71.0) |
| Difficult | 51/67 (76.1) | 30/62 (48.4) |
| Not reported | 77/89 (86.5) | 67/96 (69.8) |
| No. of operator's previous intubations | | |
| <25 | 128/160 (80.0) | 83/154 (53.9) |
| 25–100 | 379/441 (85.9) | 330/448 (73.7) |
| >100 | 93/104 (89.4) | 91/109 (83.5) |
| Proportion of previous intubations performed with a video laryngoscope | | |
| <0.25 | 39/44 (88.6) | 27/34 (79.4) |
| 0.25–0.75 | 335/398 (84.2) | 303/429 (70.6) |
| >0.75 | 226/262 (86.3) | 174/248 (70.2) |

[ Critical Care Original Research ]

CHEST

CHEST 2025; 167(5):1408-1415

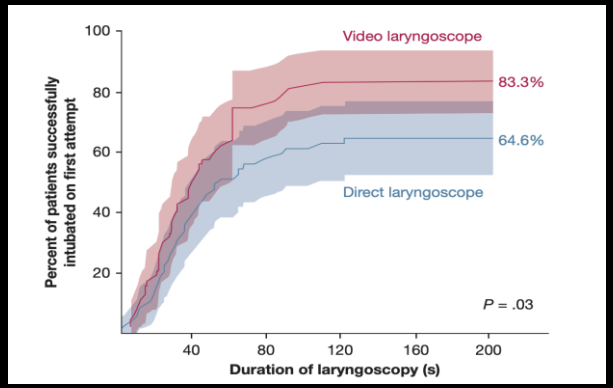
# Video vs Direct Laryngoscopy for Tracheal Intubation After Cardiac Arrest

## A Secondary Analysis of the Direct vs Video Laryngoscope Trial

Check for updates

We conducted a secondary analysis of the DEVICE trial. The DEVICE trial was a randomized controlled study that enrolled adults who were critically ill undergoing intubation at 17 sites in the Pragmatic Critical Care Research Group, including 7 EDs and 10 ICUs.[9] All

Sur 1417 patients, 113 avec arrêt cardiaque




**Results:** Among adults undergoing tracheal intubation after experiencing cardiac arrest, use of video laryngoscopy increased the incidence of successful intubation on the first attempt by 18.7% and shortened the mean duration of laryngoscopy by 50.0 seconds compared with use of direct laryngoscopy.

**TABLE 2** ] Outcomes

| Outcome | Video Laryngoscope Group | Direct Laryngoscope Group | Absolute Risk Difference or Mean Difference (95% CI) | *P* Value |
|---|---|---|---|---|
| Overall | | | | |
| No. of patients | 48 | 65 | NA | NA |
| Successful intubation on the first attempt | 40 (83.3%) | 42 (64.6%) | 18.7 (1.2-36.2) | .03 |
| Duration of laryngoscopy, s | 48.0 (37.3) | 98.0 (122.4) | −50.0 (−86.8 to −13.3) | .004 |
| Grade I view | 34 (70.8%) | 30 (46.2%) | 24.7 (5.2-44.2) | .01 |
| Death | | | | |
| By 1 h | 11 (22.9%) | 24 (36.9%) | −14.0 (−32.5 to 4.5) | .11 |
| By ICU discharge | 33 (68.8%) | 45 (69.2%) | −0.5 (−18.2 to 17.3) | .96 |
| By 28 d | 35 (72.9%) | 46 (70.8%) | 2.1 (−16.4 to 20.7) | .80 |
| Among those who did not receive sedation | | | | |
| No. of patients | 24 | 28 | NA | NA |
| Successful intubation on the first attempt | 21 (87.5%) | 16 (57.1%) | 30.4 (7.8-53.0) | .02 |
| Duration of laryngoscopy, s | 44.4 (40.6) | 111.1 (115.4) | −66.7 (−15.4 to −118.0) | .006 |
| Death | | | | |
| By 1 h | 8 (33.3%) | 20 (71.4%) | −38.1 (−63.3 to −12.9) | .006 |
| By ICU discharge | 18 (75.0%) | 27 (96.4%) | −21.4 (−40.1 to −2.8) | .02 |
| By 28 d | 20 (83.3%) | 27 (96.4%) | -13.1 (-29.5 to 3.3) | .11 |

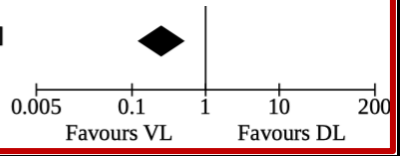
# Intubation au vidéo-laryngoscopeS : pour tous ?

## Analysis 3.2. Comparison 3: Channelled VL versus DL, Outcome 2: Hypoxaemia

| | | | | | |
|---|---|---|---|---|---|
| **Total (95% CI)** | **985** | **981** | **100.0%** | **0.25 [0.12 , 0.50]** | |
| Total events: | 8 | 41 | | | |

Heterogeneity: Tau² = 0.00; Chi² = 4.01, df = 6 (P = 0.68); I² = 0%

Test for overall effect: Z = 3.94 (P < 0.0001)

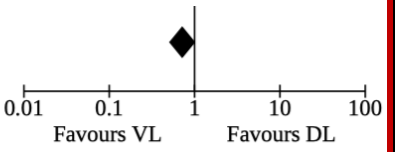



## Analysis 1.2. Comparison 1: Macintosh-style VL versus DL, Outcome 2: Hypoxaemia

| | | | | | |
|---|---|---|---|---|---|
| **Total (95% CI)** | **1070** | **1057** | **100.0%** | **0.72 [0.52 , 0.99]** | |
| Total events: | 81 | 112 | | | |

Heterogeneity: Tau² = 0.05; Chi² = 8.11, df = 6 (P = 0.23); I² = 26%

Test for overall effect: Z = 2.02 (P = 0.04)

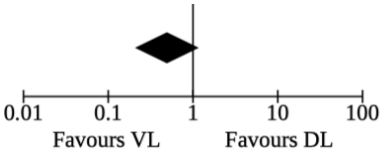



## Analysis 2.2. Comparison 2: Hyperangulated VL versus DL, Outcome 2: Hypoxaemia

| | | | | | |
|---|---|---|---|---|---|
| **Total (95% CI)** | **850** | **841** | **100.0%** | **0.49 [0.22 , 1.11]** | |
| Total events: | 21 | 37 | | | |

Heterogeneity: Tau² = 0.38; Chi² = 8.24, df = 5 (P = 0.14); I² = 39%

Test for overall effect: Z = 1.70 (P = 0.09)




Hansel et al. *Cochrane Database Syst Rev. 2022*


**Analysis 4.8. Comparison 4: VL versus DL (all devices combined), Outcome 8: Subgroup analysis of failed intubation: intubator experience**

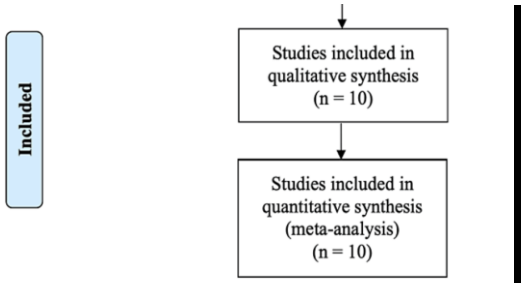
| Study or Subgroup | VL Events | VL Total | DL Events | DL Total | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|---|
| **4.8.1 Expert** | | | | | | |
| **Subtotal (95% CI)** | | **5987** | | **4952** | **71.8%** | **0.41 [0.33 , 0.50]** |
| Total events: | 145 | | 223 | | | |
| Heterogeneity: Tau² = 0.00; Chi² = 42.74, df = 47 (P = 0.65); I² = 0% | | | | | | |
| **4.8.2 Non-expert** | | | | | | |
| **Subtotal (95% CI)** | | **1099** | | **1057** | **28.2%** | **0.62 [0.32 , 1.18]** |
| Total events: | 66 | | 110 | | | |
| Heterogeneity: Tau² = 0.58; Chi² = 32.21, df = 13 (P = 0.002); I² = 60% | | | | | | |
| Test for overall effect: Z = 1.46 (P = 0.14) | | | | | | |

Hansel et al. *Cochrane Database Syst Rev.* 2022

# Video Versus Direct Laryngoscopy in Novice Intubators: A Systematic Review and Meta-Analysis

Published 09/25/2022

Shreya Nalubola [1], Evan Jin [2], Elizabeth D. Drugge [3], Garret Weber [2, 1], Apolonia E. Abramowicz [2, 1]



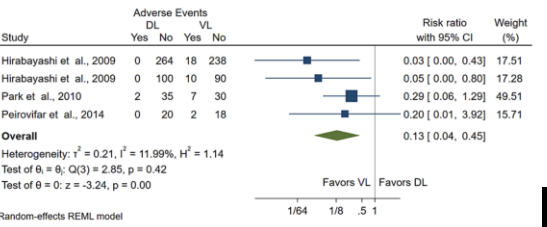




**FIGURE 6: Forest plot of pooled risk ratios for the rate of esophageal intubation in novices using VL versus DL.**

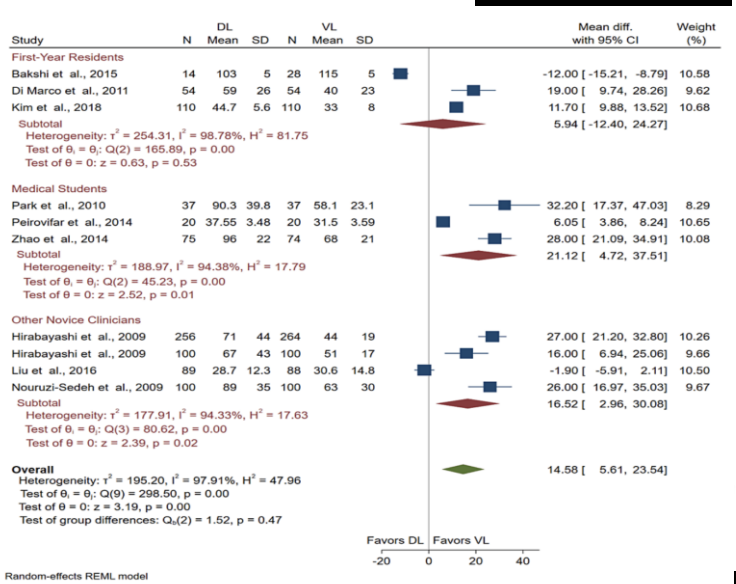



**FIGURE 4: Forest plot of the difference in the mean time to intubate (seconds) for novices using VL or DL.**

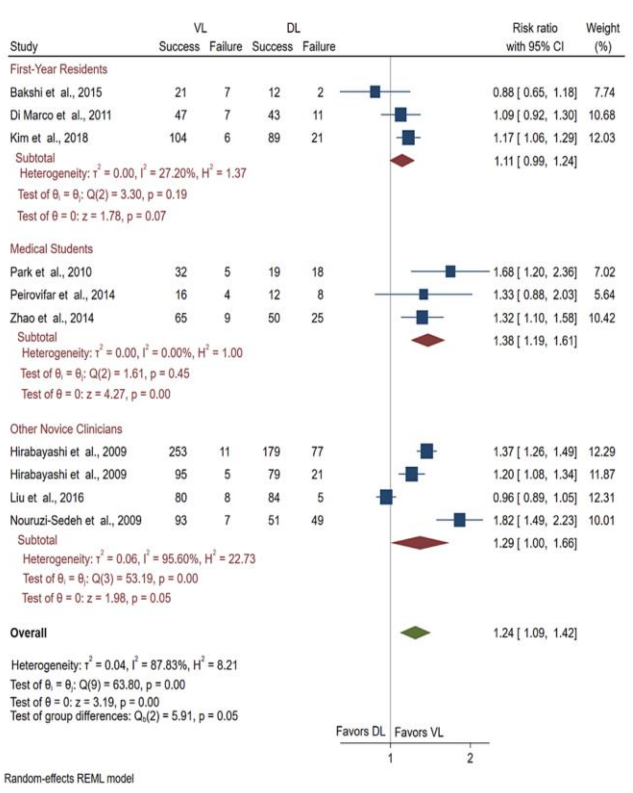



**FIGURE 2: Forest plot of pooled risk ratios for the success of novices using VL or DL.**

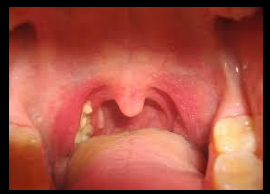
# Effets secondaires

## Review of Videolaryngoscopy Pharyngeal Wall Injuries

Devon Greer, MD; Kathryn E. Marshall, PhD; Scott Bevans, MD; Aurora Standlee, MD; Patricia McAdams, MD; Wayne Harsha, MD

13147 intubations au DL vs. 1713 au VL

Lésions oro-pharyngées : 0,015% vs. 0,23%



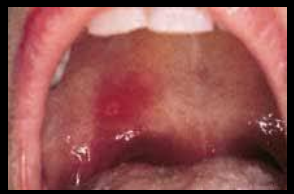
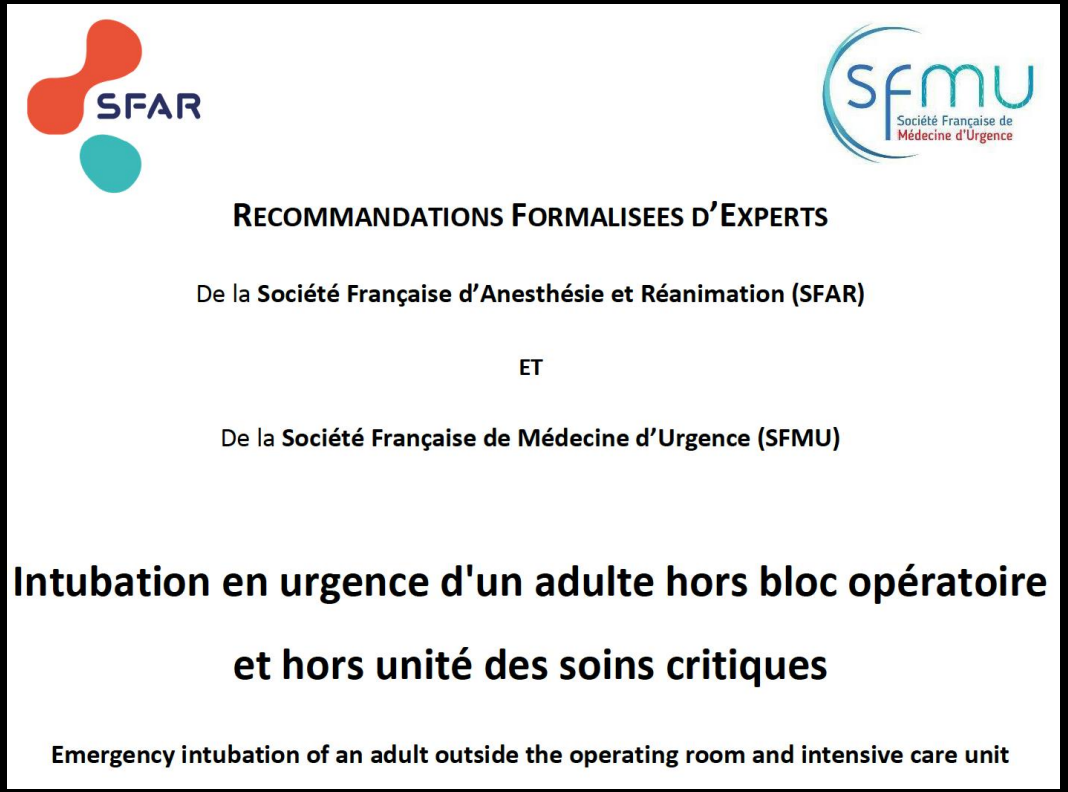


TABLE III.
Site of Injury and Type of Repair.

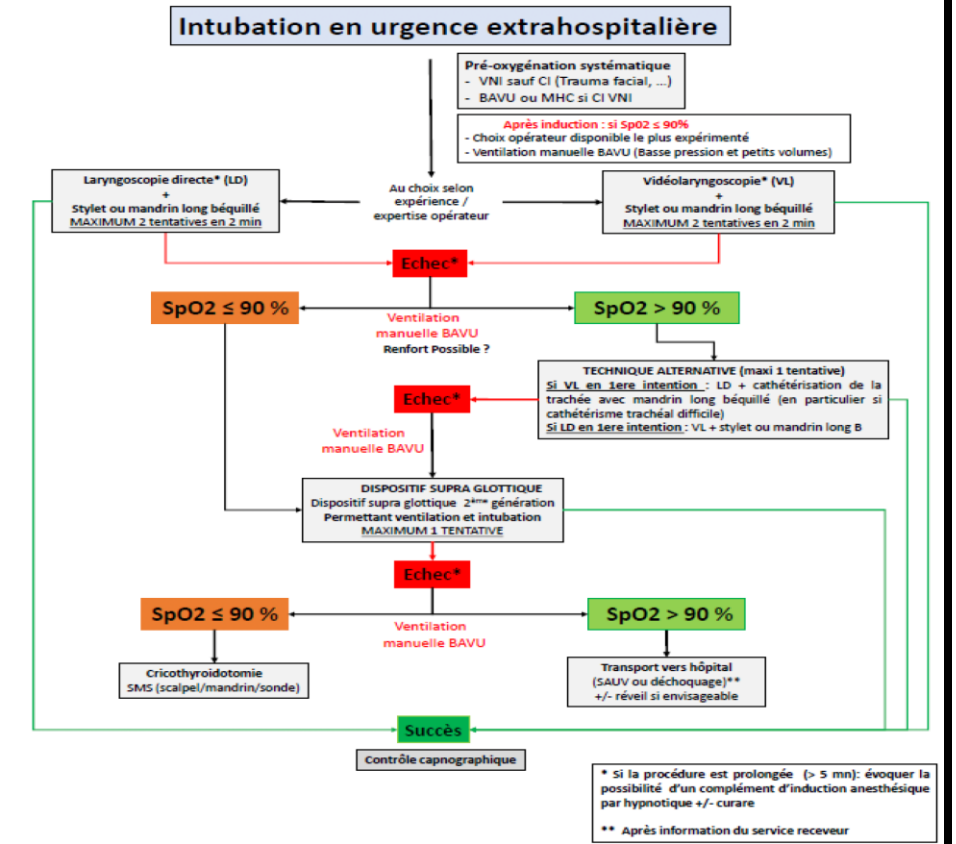
| Patient Number | Injury Location | Repair |
|---|---|---|
| 1 | Right tonsillar pillar | Primary |
| 2 | Right soft palate | Primary |
| 3 | Right palatopharyngeal fold | Electrocautery |
| 4 | Right palatopharyngeal arch | Primary |
| 5 | Right palatopharyngeal arch | Electrocautery |
| 6 | Soft palate | None |
| 7 | Base of tongue | NR |
| 8 | Palatoglossal arch | None |
| 9 | Right soft palate | None |
| 10 | Right palatoglossal arch | NR |
| 11 | Tonsillar pillar perforation | Primary |
| 12 | Right palatopharyngeal wall perforation | None |
| 13 | Right retromolar trigone | None |
| 14 | Soft palate | NR |
| 15 | Right soft palate | Primary |
| 16 | Right anterior tonsillar pillar | Primary |
| 17 | Right soft palate | None |
| 18 | Right soft palate | Primary |
| 19 | Right soft palate | Primary |
| 20 | Right soft palate | Primary |
| 21 | Right tonsillar pillar | Palatoplasty |
| 22 | Right soft palate | Primary |
| 23 | Right tonsillar pillar | Primary |

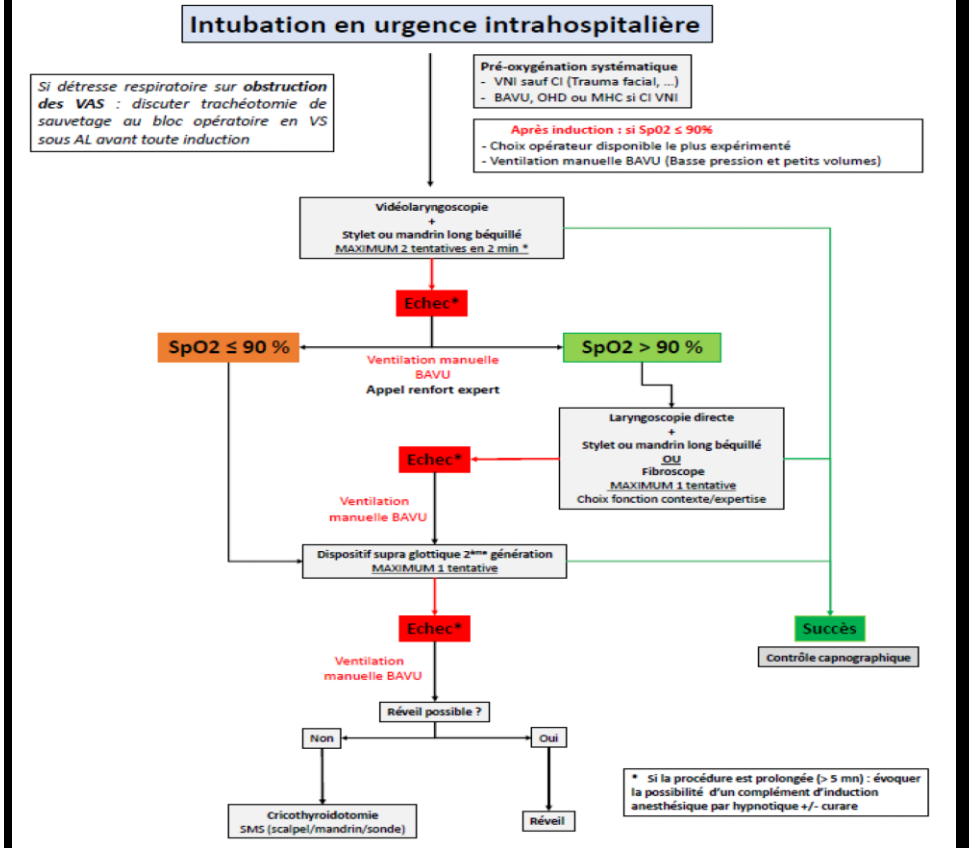
Greer et al. *Laryngoscope. 2015*

# CONCLUSION


SFAR
SFMU
Société Française de Médecine d'Urgence
RECOMMANDATIONS FORMALISEES D'EXPERTS
De la Société Française d'Anesthésie et Réanimation (SFAR)
ET
De la Société Française de Médecine d'Urgence (SFMU)
Intubation en urgence d'un adulte hors bloc opératoire et hors unité des soins critiques
Emergency intubation of an adult outside the operating room and intensive care unit

# Extra VS Intra



**VL = expérience de 50**
**Video = expérience de 15**

| |
|---|
| **R2.4.1 – Si la procédure d'intubation en urgence repose sur la laryngoscopie directe, il est probablement recommandé que l'expérience minimale de l'opérateur positionné en 1ère ligne sur cette procédure soit d'au moins 50 laryngoscopies directes réussies sur des patients afin de réduire la morbi-mortalité.** |
| **GRADE 2 (Accord Fort)** |
| **R2.4.2 – Si la procédure d'intubation en urgence repose sur la vidéolaryngoscopie, les experts suggèrent que l'expérience minimale de l'opérateur positionné en 1ère ligne sur cette procédure soit d'au moins 15 vidéo-laryngoscopies réussies sur des patients afin de réduire la morbi-mortalité.** |
| **AVIS D'EXPERTS (Accord Fort)** |

De nombreuses études montrent que le taux de succès à la 1ère tentative est plus élevé avec un vidéolaryngoscope qu'en laryngoscopie directe chez les médecins en formation intubant en dehors du bloc opératoire [11-13]. Ces travaux suggèrent ainsi que l'acquisition de la compétence d'intuber en vidéolaryngoscopie est plus rapide à acquérir que celle d'intuber en laryngoscopie directe, avec un nombre d'intubations réussies probablement moindre pour estimer que l'opérateur est compétent.

| Expérience des médecins urgentistes avec la vidéolaryngoscopie | | |
|---|---|---|
| Nombre de modèles utilisés en simulation | N (259) | % |
| Non | 54 | 20,8 |
| Un seul | 137 | 52,9 |
| Plusieurs | 68 | 26,6 |
| Nombre d'intubation en simulation | | |
| 0 | 54 | 20,8 |
| <5 | 108 | 41,6 |
| 5 à 20 | 58 | 22,3 |
| >20 | 32 | 12,3 |
| NI | 7 | 2,7 |
| Intérêt d'une nouvelle fomration à la VL | | |
| Indispensable | 70 | 27 |
| Plutôt utile | 152 | 58,8 |
| Inutile | 37 | 14,3 |

*Tu vas plus vite en NRI, place de l'Actilyse et de la Métalyse*

# *Rappels*

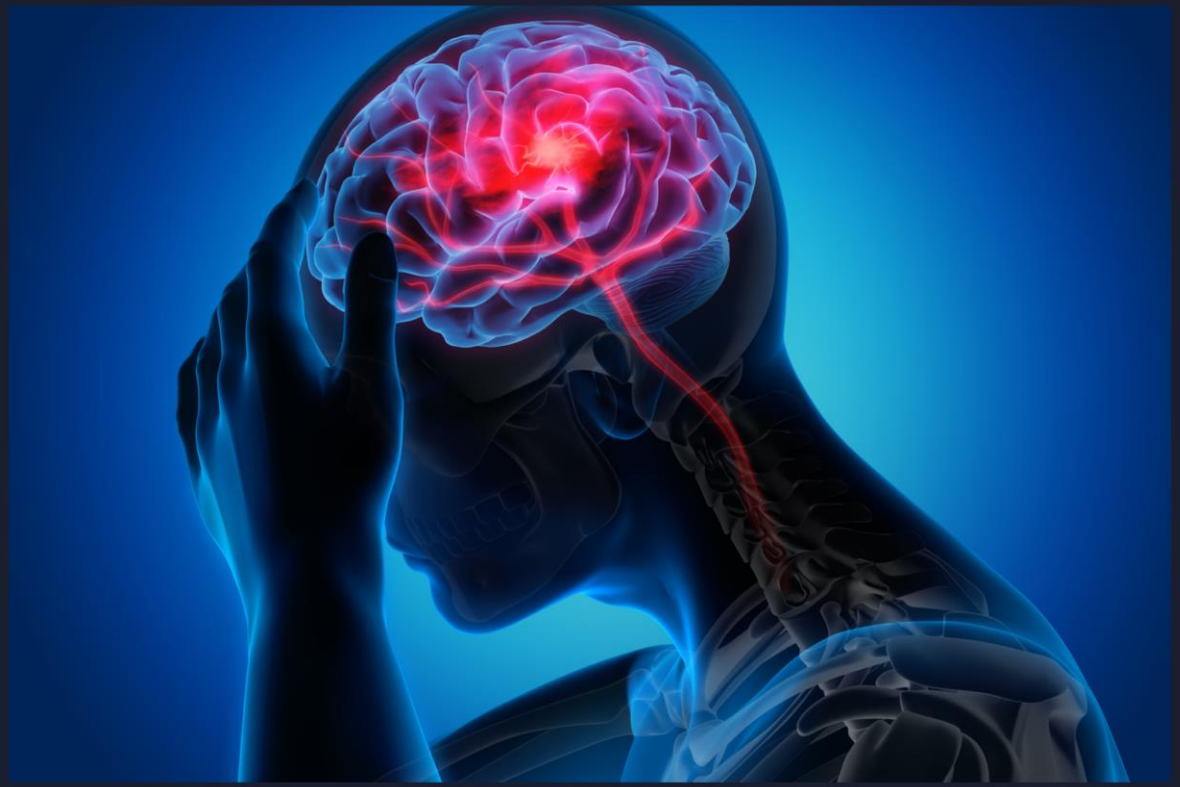
Généralités

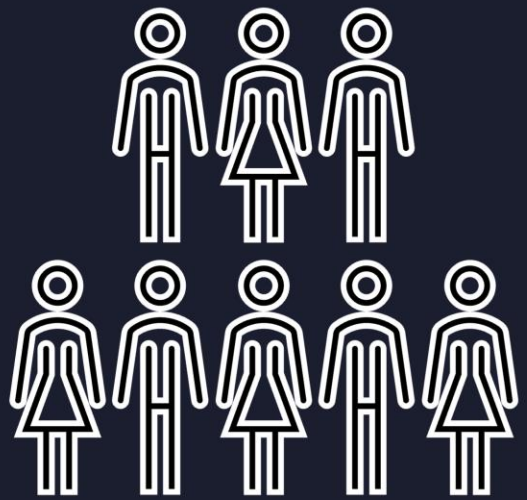
*1 AVC toutes les 4 minutes en France !*

---

→ AVC ischémique = infarctus cérébral = 80%

→ AVC hémorragique = rupture d'un vaisseau = 20%





→ Age moyen = 73 ans  MAIS 25% ont moins de 65 ans !!!

→ Plus d’une personne sur 10 après 85 ans

→ INCIDENCE EN FRANCE = 130 000 cas par an

→ > 110 000 hospitalisations/an

→ Vieillissement de la population

→ 1ère cause de handicap

→ = PROBLÈME DE SANTÉ PUBLIQUE +++

# *Mortalité*

→ 2ème cause de décès dans le monde (OMS 2016)

→ 3ème cause en France pour l'homme et 1ère cause chez la femme (HAS 2019)

→ Environ 20% des patients décèdent dans le mois suivant l'AVC, 40 à 50% des survivants décèdent dans les 5 ans suivants

Urg'Ara

# Thrombolyse AVC hors UNV

| | |
|---|---|
| Rédaction : | Filière Neurovasculaire |
| Validation : | Comité scientifique Urg'Ara |
| Date : | 06/2024 |
| Version : | V 1.0 |

**Dans le cadre d'une télé-expertise ou télémédecine (TéléAVC)**

Dès la sortie de l'imagerie avec confirmation d'un AVC ischémique et dans l'attente de la décision thérapeutique du médecin neurovasculaire

**IDE**
- Reprendre les constantes (PA, pouls, SpO2, température +/- glycémie capillaire)
- Mise en place scope
- Peser ou récupérer le poids du patient
- S'assurer de l'absence de globe vésical (bladder scan)

**Médecin**
NIHSS de sortie d'imagerie
Rechercher les CI à une TIV
Vérifier les traitements habituels du patient

**Stratégie de reperfusion indiquée par le neurovasculaire**

Si nécessité de **transfert secondaire urgent (TM)** => **alerter immédiate Centre15**

TIV Indiquée

oui

Obtention prudente d'une tension < 185/110 mmHg avant toute TIV
Au besoin protocole Nicardipine (Loxen®) et/ou Urapidil (Eupressyl®)
Mesures associées : pose de SAD, antalgiques

Présence d'anti-coagulant

non

Sans attendre les résultats du bilan de coagulation

oui

Bilan de coagulation compatible avec TIV?
Résultat rendu en urgence

oui

Tenecteplase (Metalyse®) selon fiche médicament AVC
0,25 mg/kg, 5mg = 1000 UI
ou
Alteplase (Actilyse®) selon fiche médicament AVC
0,9 mg/kg avec 10 % de la dose totale en bolus
et 90 % de la dose restante en 1 heure

Surveillance post TIV selon référentiel

Thrombectomie mécanique indiquée

oui

Relancer centre 15 pour transfert **URGENT**

non

Si transfert et hospitalisation en UNV indiqués
Appel C15 pour transfert non urgent

non

non

TIV : Thrombolyse Intra-Veineuse / TM : Thrombectomie Mécanique / NRI : Neuro-Radiologie Interventionnelle



4H30

6h00

# *Et la littérature alors?*

# Tenecteplase versus alteplase for acute stroke within 4·5 h of onset (ATTEST-2): a randomised, parallel group, open-label trial

*Lancet Neurol* 2024; 23: 1087–96

*Keith W Muir, Gary A Ford, Ian Ford, Joanna M Wardlaw, Alex McConnachie, Nicola Greenlaw, Grant Mair, Nikola Sprigg, Christopher I Price, Mary Joan MacLeod, Sofia Dima, Marius Venter, Liqun Zhang, Eoin O'Brien, Ranjan Sanyal, John Reid, Laszlo K Sztriha, Syed Haider, William N Whiteley, James Kennedy, Richard Perry, Sekaran Lakshmanan, Annie Chakrabarti, Ahamad Hassan, Richard Marigold, Senthil Raghunathan, Don Sims, Mohit Bhandari, Ivan Wiggam, Khalid Rashed, Chris Douglass, on behalf of the ATTEST-2 Investigators**

**Pkoi:**
La ténectéplase présente des avantages potentiels par rapport à l'altéplase: administrée en un seul bolus et pourrait être plus efficace.

L'essai ATTEST-2 a évalué si la ténectéplase était non inférieure ou supérieure à l'altéplase lorsqu'elle est administrée dans un délai de 4,5 heures après le début des symptômes.

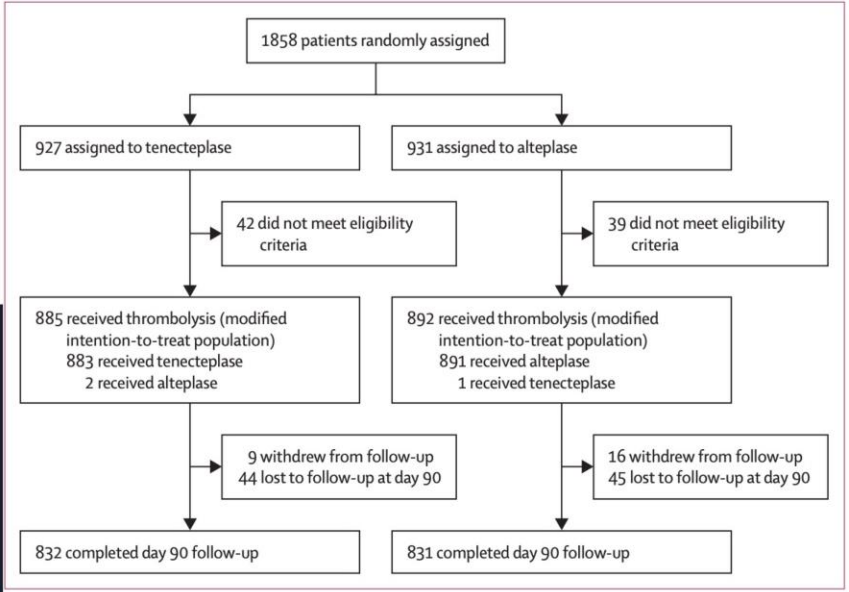



*Figure 1*: **Patient flowchart**
Safety was analysed in participants according to the treatment received (ie, 884 received tenecteplase and 893 received alteplase).

| | Tenecteplase (n=885) | Alteplase (n=892) | Tenecteplase *vs* alteplase | p value |
|---|---|---|---|---|
| **Primary outcome** | | | | |
| Modified Rankin Scale score distribution at day 90 | .. | .. | 1·07 (0·90 to 1·27) | <0·0001 (non-inferiority); 0·43 (superiority) |
| **Secondary outcomes** | | | | |
| Excellent neurological recovery (modified Rankin Scale score 0–1) at day 90 | 369/832 (44%) | 352/831 (42%) | Absolute difference 2·03 (−2·71 to 6·77); OR 1·05 (0·85 to 1·30) | 0·0018 (non-inferiority); 0·40 (superiority)*; 0·66 for the OR |
| Independent neurological recovery (modified Rankin Scale score 0–2) at day 90 | 565/832 (68%) | 536/831 (65%) | Absolute difference 3·41 (−1·14 to 7·95); OR 1·15 (0·92 to 1·45) | 0·14*; 0·23 for the OR |

ATTEST-2 corroborates the non-inferiority of tenecteplase (0·25 mg/kg) compared with alteplase (0·9 mg/kg) in acute ischaemic stroke. Taken together with all available trial evidence, tenecteplase (0·25 mg/kg) is associated with a better likelihood of excellent recovery compared with alteplase (superiority of tenecteplase for excellent recovery: mRS 0–1 *vs* 2–6, pooled OR 1·15 [95% CI 1·03–1·28], p=0·013; appendix 2

| | Tenecteplase (n=884) | Alteplase (n=893) | Tenecteplase *vs* alteplase | p value |
|---|---|---|---|---|
| Mortality | 68 (8%) | 75 (8%) | HR 0·96 (0·69–1·33) | 0·80 |
| Symptomatic intracerebral haemorrhage—SITS-MOST criteria | 20 (2%) | 15 (2%) | 1·37 (0·69–2·70) | 0·37 |
| Symptomatic intracerebral haemorrhage—ECASS-3 criteria | 29 (3%) | 21 (2%) | 1·44 (0·81–2·56) | 0·21 |
| Parenchymal haematoma type 2 | 37 (4%) | 26 (3%) | 1·48 (0·89–2·48) | 0·14 |
| Any intracerebral haemorrhage | 94 (11%) | 78 (9%) | 1·26 (0·91–1·74) | 0·16 |
| Significant extracranial haemorrhage | 13 (1%) | 6 (1%) | 2·39 (0·89–6·39) | 0·083 |
| Neurological deterioration >3 NIHSS points by day 1 or day 5 | 81 (9%) | 84 (9%) | 0·98 (0·71–1·35) | 0·90 |
| Angioedema | 6 (1%) | 6 (1%) | 1·03 (0·33–3·20) | 0·96 |

Data are n (%) and OR (95% CI), unless otherwise stated. All analyses are adjusted for the variables used in the randomisation minimisation (age group, stroke severity, and onset to randomisation time) and sex. HR=hazard ratio. NIHSS=National Institutes of Health Stroke Scale score. OR=odds ratio. SITS-MOST=Safe Implementation of Stroke Thrombolysis, Monitoring Study. ECASS-3=third European Cooperative Acute Stroke Study.

*Table 3*: **Safety outcomes**

Journal of the Neurological Sciences 458 (2024) 122912

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journal homepage: www.elsevier.com/locate/jns

Review Article

# Efficacy and safety outcomes of Tenecteplase versus Alteplase for thrombolysis of acute ischemic stroke: A meta-analysis of 9 randomized controlled trials

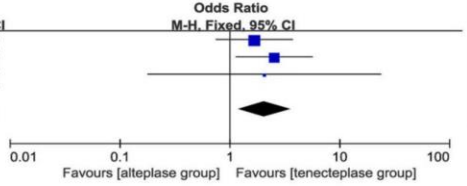
9 études

In this analysis of nine RCTs in patients with AIS, we found that TNK and alteplase had similar rates of efficacy outcomes and safety outcomes. Our study supports the conclusion that TNK is comparable to alteplase when applied within a 4.5-h occurrence of AIS. TNK 0.25 mg/kg significantly increased the possibility of early vessel recanalization and excellent recovery relative to TNK 0.9 mg/kg, which suggested that TNK might be a better choice for patients with major artery disease with a large volume of salvageable tissue.

**A:Early vessel recanalization**

| Study or Subgroup | tenecteplase group Events | Total | alteplase group Events | Total | Weight | Odds Ratio M-H, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| ATTEST,2015 | 28 | 47 | 23 | 49 | 51.0% | 1.67 [0.74, 3.74] |
| EXTEND-IA TNK,2018 | 22 | 101 | 10 | 101 | 43.8% | 2.53 [1.13, 5.67] |
| TASTE-A,2022 | 34 | 35 | 33 | 35 | 5.3% | 2.06 [0.18, 23.83] |
| **Total (95% CI)** | | **183** | | **185** | **100.0%** | **2.07 [1.19, 3.59]** |
| Total events | 84 | | 66 | | | |

Heterogeneity: Chi² = 0.52, df = 2 (P = 0.77); I² = 0%
Test for overall effect: Z = 2.57 (P = 0.01)




**B:Excellent recovery (90 days mRS 0-1)**

| Study or Subgroup | tenecteplase group Events | Total | alteplase group Events | Total | Weight | Odds Ratio M-H, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| ACT,2022 | 296 | 802 | 266 | 765 | 44.4% | 1.10 [0.89, 1.35] |
| ATTEST,2015 | 13 | 47 | 10 | 49 | 1.8% | 1.49 [0.58, 3.83] |
| EXTEND-IA TNK,2018 | 49 | 101 | 41 | 101 | 5.5% | 1.38 [0.79, 2.41] |
| Haley,2010 | 15 | 31 | 13 | 31 | 1.7% | 1.30 [0.48, 3.54] |
| TASTE-A,2022 | 24 | 55 | 22 | 49 | 3.4% | 0.95 [0.44, 2.06] |
| TRACE,2021 | 35 | 57 | 35 | 59 | 3.4% | 1.09 [0.52, 2.30] |
| TRACE-2,2023 | 439 | 705 | 405 | 696 | 39.8% | 1.19 [0.96, 1.47] |
| **Total (95% CI)** | | **1798** | | **1750** | **100.0%** | **1.15 [1.01, 1.32]** |
| Total events | 871 | | 792 | | | |

Heterogeneity: Chi² = 1.28, df = 6 (P = 0.97); I² = 0%
Test for overall effect: Z = 2.06 (P = 0.04)

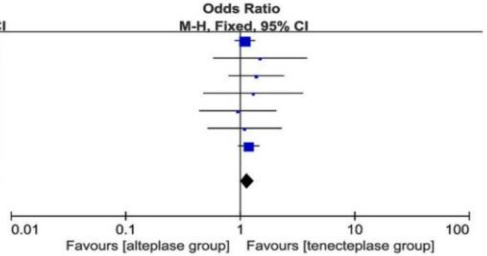



**Fig. 2.** Forest plots for the meta-analysis of the efficacy outcomes between alteplase(0.9 mg/kg) and TNK(0.25 mg/kg) groups. ENI: early neurological improvement.

Journal of Stroke and Cerebrovascular Diseases 34 (2025) 108338

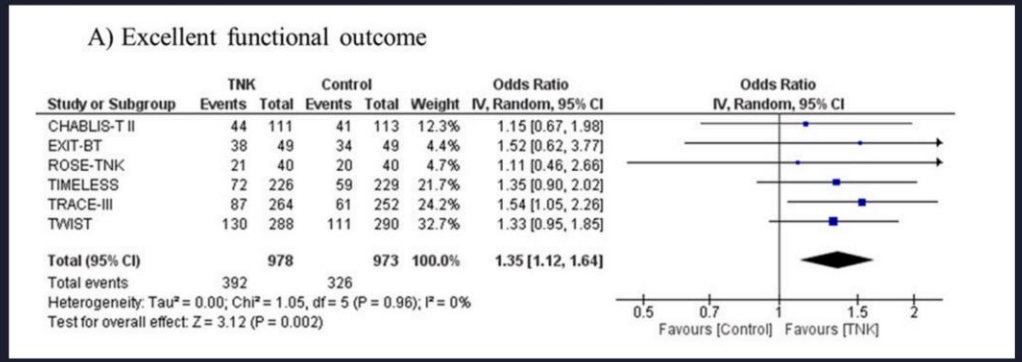
Contents lists available at ScienceDirect

Journal of Stroke and Cerebrovascular Diseases

journal homepage: www.elsevier.com/locate/jstroke

# Efficacy and safety of tenecteplase administration in extended time window for acute ischemic stroke: An updated meta-analysis of randomized controlled trials

6 études RCTs




TNK (0.25 mg/kg) vs 0. après 4h30

*Conclusion:* TNK administration in an extended time window for AIS patients leads to favorable neurological outcomes with a good safety profile.

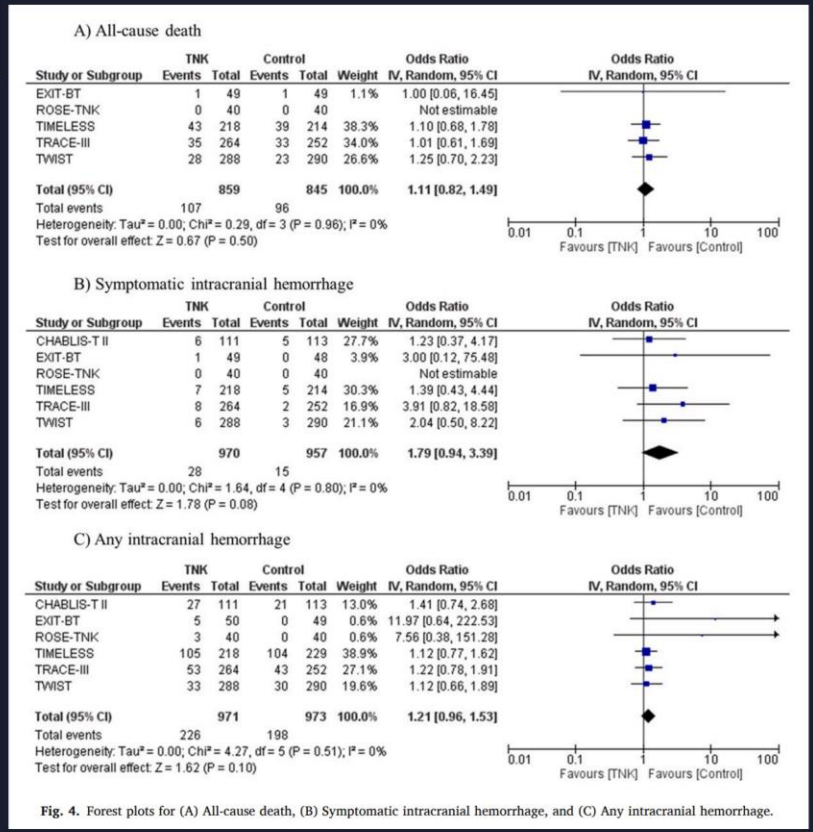



**Fig. 4.** Forest plots for (A) All-cause death, (B) Symptomatic intracranial hemorrhage, and (C) Any intracranial hemorrhage.

Stroke
Volume 55, Issue 7, July 2024; Pages 1767-1775
https://doi.org/10.1161/STROKEAHA.124.046495

American Heart Association.

CLINICAL AND POPULATION SCIENCES

# Outcomes of Bridging Intravenous Thrombolysis Versus Endovascular Therapy Alone in Late-Window Acute Ischemic Stroke

2749 patients : 549 Thrombolyse avant thrombectomie

- AVC par occlusion d'un gros vaisseau
- Score NIHSS ≥6
- 20 centres répartis dans 10 pays
- dans le cadre de l'étude multicentrique rétrospective CLEAR (CT for Late Endovascular Reperfusion)
- entre janvier 2014 et mai 2022.

**Table 1.** Characteristics of Acute Ischemic Stroke Patients in the 6- to 24-Hour Time Window, According to Treatment Modality (Direct Endovascular Therapy [EVT] Versus Bridging Intravenous Thrombolysis [Bridging IVT+EVT]) (Table view)

| | Direct EVT, n=2200 | Bridging IVT+EVT, n=549 | *P* value |
|---|---|---|---|
| Age, y, mean (SD) | 70 (14.3) | 70 (14.7) | 0.52 |
| Female, n (%) | 1189 (54) | 311 (57) | 0.27 |
| Prestroke mRS, median (IQR) | 0 (0–2) | 0 (0–1) | <0.01 |
| Atrial fibrillation, n (%)* | 733 (36) | 162 (31) | 0.04 |
| Diabetes, n (%)† | 552 (25) | 123 (23) | 0.19 |
| Hypertension, n (%)‡ | 1607 (73) | 394 (72) | 0.53 |
| Baseline NIHSS, median (IQR) | 16 (10–20) | 16 (12–20) | 0.05 |
| ASPECTS, median (IQR) | 8 (7–9) | 8 (7–9) | 0.22 |
| Occlusion site, n (%) | | | 0.08 |
| Cervical carotid | 167 (8) | 54 (10) | |
| Carotid terminus | 391 (18) | 112 (20) | |
| M1-segment MCA | 1241 (56) | 298 (54) | |
| M2-segment MCA | 401 (18) | 85 (15) | |
| Baseline imaging modality, n (%) | | | <0.01 |
| NCCT+CTA | 773 (35) | 187 (34) | |
| NCCT+CTA+CTP | 1097 (50) | 185 (34) | |
| MRI | 330 (15) | 177 (32) | |
| Transferred from non-EVT stroke center, n (%) | 1212 (55) | 425 (77) | <0.01 |
| Witnessed stroke onset, n (%)§ | 213 (12) | 117 (25) | <0.01 |
| TLKW pre-EVT brain imaging, min, median (IQR)‖ | 666 (482–864) | 498 (382–701) | <0.01 |
| TLKW-CSC arrival, min, median (IQR) | 725 (544–911) | 560 (432–791) | <0.01 |
| TLKW-groin puncture, min, median (IQR)¶ | 724 (544–912) | 560 (432–791) | <0.01 |
| EVT procedure time, min, median (IQR)# | 43 (27–72) | 44 (26–67) | 0.13 |
| General anesthesia, n (%)** | 556 (27) | 162 (31) | 0.06 |
| Balloon-guide catheter, n (%)†† | 1080 (55) | 234 (47) | 0.002 |

**Table 2.** Inverse Probability of Treatment Weighting (IPTW) Analysis of Clinical and Safety Outcomes, According to Treatment Modality (Direct EVT Versus Bridging IVT+EVT) in Patients in the 6- to 24-Hour Window (Table view)

| | Direct EVT | Bridging IVT+EVT | OR (95% CI) | *P* value |
|---|---|---|---|---|
| 90-d mRS, median (IQR) | 3 (2–5) | 3 (2–5) | 1.03 (0.89–1.19)* | 0.72 |
| Functional independence (mRS, 0–2, 3 mo), n (%) | 764 (38) | 215 (41) | 1.09 (0.87–1.38) | 0.44 |
| Good outcome (mRS, 0–2 or return to baseline mRS), n (%) | 887 (44) | 234 (45) | 1.06 (0.88–1.28) | 0.52 |
| Successful reperfusion (eTICI score, 2b–3), n (%)† | 1873 (86) | 458 (84) | 1.19 (0.81–1.75) | 0.39 |
| sICH, n (%)‡ | 134 (6) | 28 (5) | 0.75 (0.38–1.48) | 0.40 |
| Mortality, n (%)§ | 471 (23) | 126 (24) | 1.14 (0.89–1.46) | 0.31 |

In conclusion, in this large, multicenter, retrospective study of patients with acute ischemic stroke due to occlusion of the internal carotid artery or proximal middle cerebral artery, we found no difference with regards to clinical outcomes or safety between patients who underwent EVT 6 to 24 hours after TLKW with versus without prior IVT.

Radiology

ORIGINAL RESEARCH • NEURORADIOLOGY

# Endovascular Thrombectomy Outcomes with and without Intravenous Thrombolysis for Large Ischemic Cores Identified with CT or MRI

Radiology 2023; 309(1):e230440

*Imad Derraz, MD • Solène Moulin, MD • Benjamin Gory, MD • Maéva Kyheng, BST • Caroline Arquizan, MD • Vincent Costalat, MD • Bertrand Lapergue, MD • for the ETIS Investigators*

1408 patients (mean age, 68.3 years ± 15.4)

654 (46.4%) were treated with IVT prior to EVT

January 2015 and January 2022

**Table 2: Outcomes according to IVT Use in Unadjusted and IPTW-adjusted Analyses in the Overall Study Sample**

| | Study Group* | | Unadjusted Analysis | | IPTW-adjusted Analysis | |
|---|---|---|---|---|---|---|
| Outcome | No IVT (*n* = 754) | IVT (*n* = 654) | Odds Ratio† | *P* Value | Odds Ratio† | *P* Value |
| Primary outcome | | | | | | |
| Favorable outcome (mRS score 0–3) | 267 (35.4) | 291 (44.5) | 1.46 (1.17, 1.82) | <.001 | 1.24 (1.05, 1.46) | .01 |
| Secondary outcomes | | | | | | |
| Functional independence (mRS score 0–2) | 167 (22.1) | 214 (32.7) | 1.71 (1.34, 2.18) | <.001 | 1.47 (1.22, 1.77) | <.001 |
| Early neurologic improvement | 246 (32.6) | 251 (38.4) | 1.29 (1.03, 1.60) | .02 | 1.26 (1.07, 1.49) | .005 |
| Successful reperfusion (mTICI score 2b–3) | 590 (78.2) | 552 (84.4) | 1.50 (1.13, 1.98) | .005 | 1.43 (1.14, 1.79) | .002 |
| Complete reperfusion (mTICI score 3) | 259 (34.4) | 240 (36.7) | 1.11 (0.88, 1.38) | .38 | 1.18 (0.99, 1.39) | .06 |
| Safety outcomes | | | | | | |
| 90-day mortality | 287 (38.1) | 211 (32.3) | 0.78 (0.61, 0.98) | .04 | 0.88 (0.75, 1.04) | .13 |
| Hemorrhagic complications | | | | | | |
| Any ICH | 434 (57.6) | 384 (58.7) | 1.05 (0.83, 1.33) | .66 | 1.18 (0.95, 1.47) | .12 |
| sICH | 109 (14.5) | 103 (15.7) | 1.11 (0.81, 1.52) | .53 | 1.16 (0.85, 1.60) | .34 |
| PH | 154 (20.4) | 153 (23.4) | 1.19 (0.89, 1.59) | .23 | 1.17 (0.88, 1.56) | .28 |

Note.—Descriptive parameters and odds ratios were calculated after handling missing values for variables included in the propensity score and each outcome using a multiple imputation procedure. The propensity score was calculated with all parameters in Table 1. ICH = intracerebral hemorrhage, IPTW = inverse probability of treatment weighting, IVT = intravenous thrombolysis, mRS = modified Rankin Scale, mTICI = modified Thrombolysis in Cerebral Ischemia, PH = parenchymal hemorrhage, sICH = symptomatic ICH.

* Data are numbers of patients, with percentages in parentheses.

† Data in parentheses are 95% CIs.

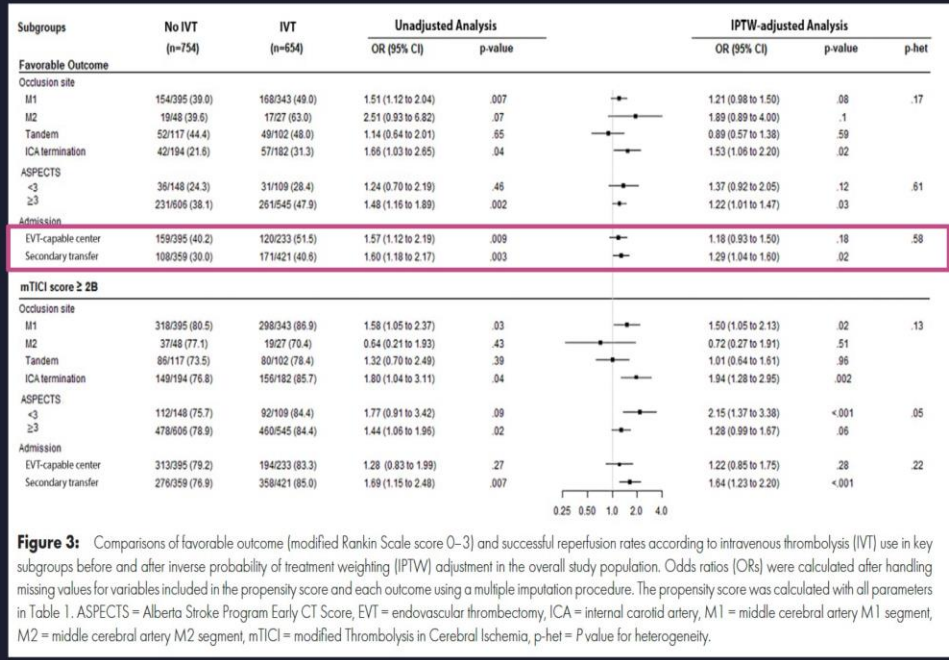



**Figure 3:** Comparisons of favorable outcome (modified Rankin Scale score 0–3) and successful reperfusion rates according to intravenous thrombolysis (IVT) use in key subgroups before and after inverse probability of treatment weighting (IPTW) adjustment in the overall study population. Odds ratios (ORs) were calculated after handling missing values for variables included in the propensity score and each outcome using a multiple imputation procedure. The propensity score was calculated with all parameters in Table 1. ASPECTS = Alberta Stroke Program Early CT Score, EVT = endovascular thrombectomy, ICA = internal carotid artery, M1 = middle cerebral artery M1 segment, M2 = middle cerebral artery M2 segment, mTICI = modified Thrombolysis in Cerebral Ischemia, p-het = *P* value for heterogeneity.

JAMA | Original Investigation

# Time to Treatment With Intravenous Thrombolysis Before Thrombectomy and Functional Outcomes in Acute Ischemic Stroke

## A Meta-Analysis

JAMA. 2024;331(9):764-777. doi:10.1001/jama.2024.0589

6 RCT incluses

*2 hours 20 minutes = Bénéfice*

Table 3. Interaction of Symptom Onset to Expected Administration of Intravenous Thrombolysis (IVT) With the Association of Treatment Allocation and Outcomes

| | Estimated association for time from symptom onset to expected treatment with IVT + thrombectomy, adjusted OR (95% CI)[a] | | | | Ratio of adjusted OR (95% CI) per 1-h delay | *P* value for interaction | Direction of the association with increasing time from symptom onset to expected administration of IVT |
|---|---|---|---|---|---|---|---|
| | At 1 h | At 2 h | At 3 h | At 4 h | | | |
| **Primary outcome** | | | | | | | |
| Shift in modified Rankin Scale score, adjusted common OR (95% CI) | 1.49 (1.13 to 1.96) | 1.25 (1.04 to 1.49) | 1.04 (0.88 to 1.23) | 0.87 (0.68 to 1.13) | 0.84 (0.72 to 0.97) | .02 | The benefit associated with IVT + thrombectomy lessened |
| **Predictions based on the primary outcome** | | | | | | | |
| Predicted ARD for participants with better outcomes (≥1 point lower on modified Rankin Scale), % (95% CI)[b,c] | 12 (3 to 21) | 7 (1 to 12) | 1 (−4 to 6) | −4 (−13 to 4) | | | |
| Predicted NNT (95% CI) so that 1 additional patient has a better outcome (≥1 point lower on modified Rankin Scale)[c,d] | 9 (5 to 30) | 16 (9 to 99) | 91 (16 to −23) | −22 (27 to −7) | | | |
| Predicted ARD for participants with a modified Rankin Scale score of 0, 1, or 2, % (95% CI)[e] | 9 (3 to 16) | 5 (1 to 9) | 1 (−3 to 5) | −3 (−8 to 3) | | | |
| Predicted NNT (95% CI) so that 1 additional patient has a modified Rankin Scale score of 0, 1, or 2 | 11 (7 to 35) | 20 (11 to 106) | 107 (22 to −35) | −34 (40 to −11) | | | |
| **Secondary outcomes** | | | | | | | |
| Modified Rankin Scale score of 0, 1, or 2[f] | 1.54 (1.10 to 2.17) | 1.26 (1.02 to 1.56) | 1.03 (0.84 to 1.27) | 0.84 (0.61 to 1.17) | 0.82 (0.68 to 0.98) | .03 | The benefit associated with IVT + thrombectomy lessened |
| Early recanalization | 0.95 (0.36 to 2.54) | 1.82 (0.89 to 3.73) | 3.48 (1.44 to 8.42) | 6.66 (1.76 to 25.15) | 1.91 (1.05 to 3.48) | .03 | The benefit associated with IVT + thrombectomy increased |
| Expanded Thrombolysis in Cerebral Infarction score of 2b, 2c, or 3 at the end of the intervention[g] | 2.06 (1.29 to 3.29) | 1.77 (1.26 to 2.47) | 1.52 (1.10 to 2.08) | 1.30 (0.85 to 1.99) | 0.86 (0.66 to 1.11) | .26 | No statistically significant interaction |
| Intracranial hemorrhage | | | | | | | |
| Any | 1.10 (0.76 to 1.58) | 1.17 (0.93 to 1.47) | 1.25 (1.02 to 1.52) | 1.33 (0.98 to 1.80) | 1.07 (0.89 to 1.28) | .49 | No statistically significant interaction |
| Symptomatic | 1.46 (0.68 to 3.11) | 1.42 (0.83 to 2.40) | 1.37 (0.88 to 2.15) | 1.33 (0.74 to 2.39) | 0.97 (0.70 to 1.35) | .86 | No statistically significant interaction |

Abbreviations: ARD, absolute risk difference; NNT, number needed to treat; OR, odds ratio.

[a] The associations were derived from the primary analysis model. Instead of an adjusted OR, the first row contains adjusted common ORs (as indicated in column 1). Under predictions based on the primary outcome, 2 of the rows contain NNTs and 2 of the rows contain ARDs (as indicated in column 1). The bottom half of the Table (under secondary outcomes) contains adjusted ORs.

[b] Positive values represent patients having a better outcome (≥1 point lower on the modified Rankin Scale indicates less disability) if treated with IVT plus thrombectomy. Negative values represent patients having a poorer outcome (≥1 point higher on the modified Rankin Scale indicates more disability).

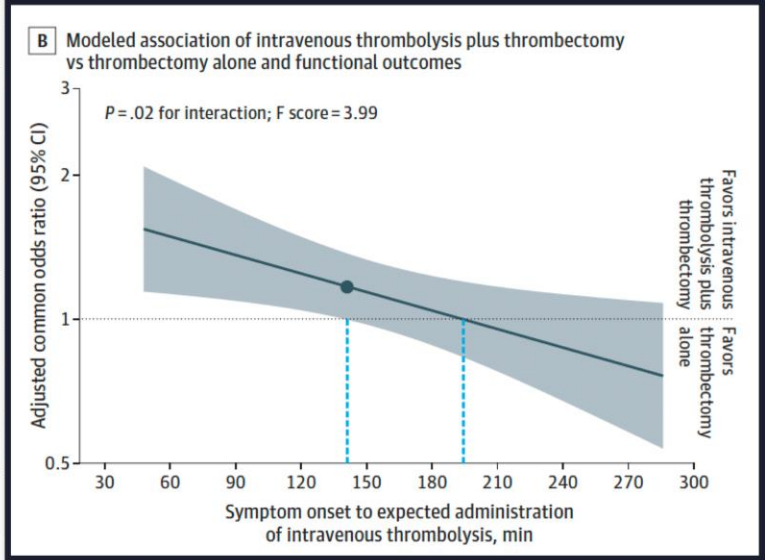
[c] The ARDs and NNTs were estimated using simulation processes, marginal probabilities at the mean, and generalized ORs (eMethods 4 in Supplement 1), therefore, the results and cutoff points may differ slightly compared with the model presented in Figure 1.

[d] The NNTs are expressed so that 1 patient has at least 1 point lower on the modified Rankin Scale (less disability) if treated with IVT plus thrombectomy. Negative values represent the number needed to harm so that 1 patient has at least 1 point higher on the modified Rankin Scale (more disability) if treated with IVT plus thrombectomy.

[e] The ARDs were derived from predicted probabilities of a modified Rankin Scale score of 0, 1, or 2 derived directly from the ordinal model (primary analysis) using marginal probabilities at the mean (eMethods 4 in Supplement 1).

[f] Scores of 0, 1, and 2 indicate functional independence.

[g] A score of 2b indicates a good recanalization result; 2c, near-perfect reperfusion; and 3, complete or 100% reperfusion.




**CONCLUSIONS AND RELEVANCE** In patients presenting at thrombectomy-capable stroke centers, the benefit associated with IVT plus thrombectomy vs thrombectomy alone was time dependent and statistically significant only if the time from symptom onset to expected administration of IVT was short.

CURRENT OPINION

# Prehospital stroke management and mobile stroke units

Curr Opin Neurol 2023, 36:140–146

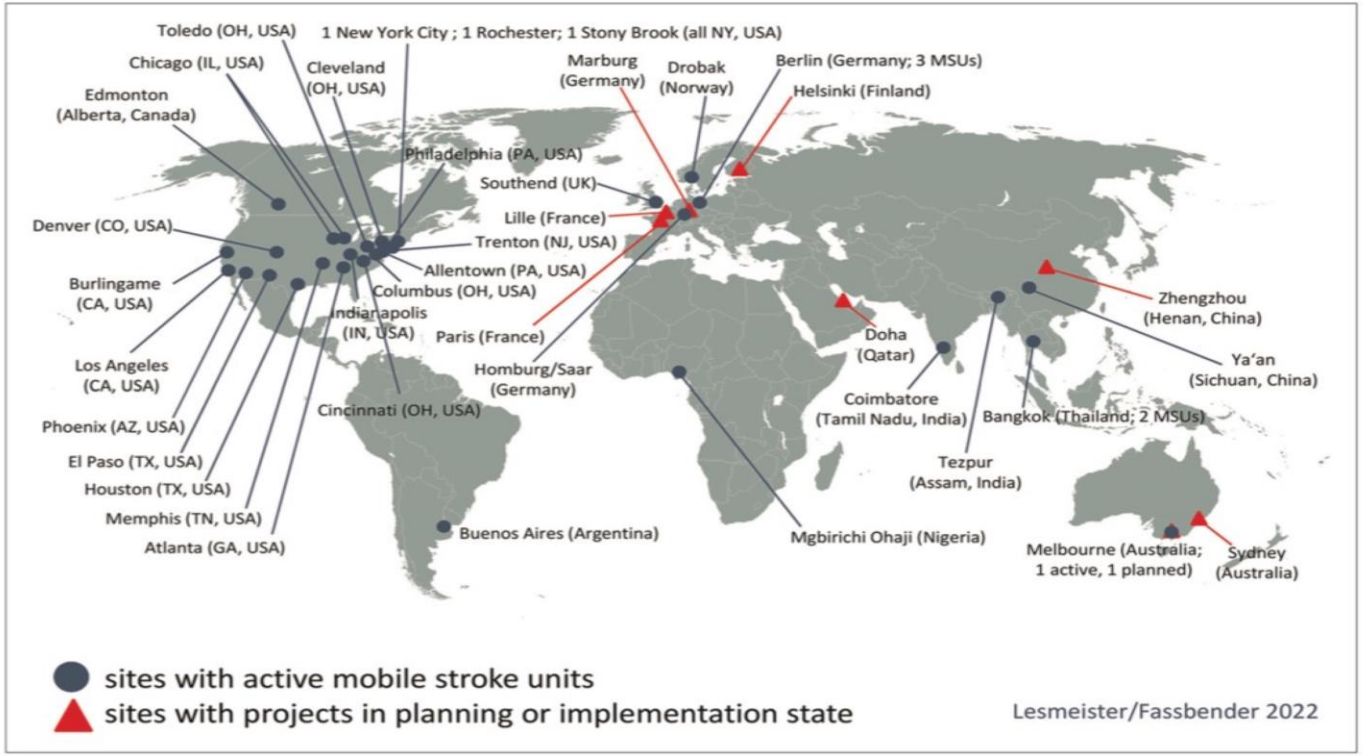



**FIGURE 2.** World map of Mobile Stroke Unit projects [28▪▪].

# *En conclusion*

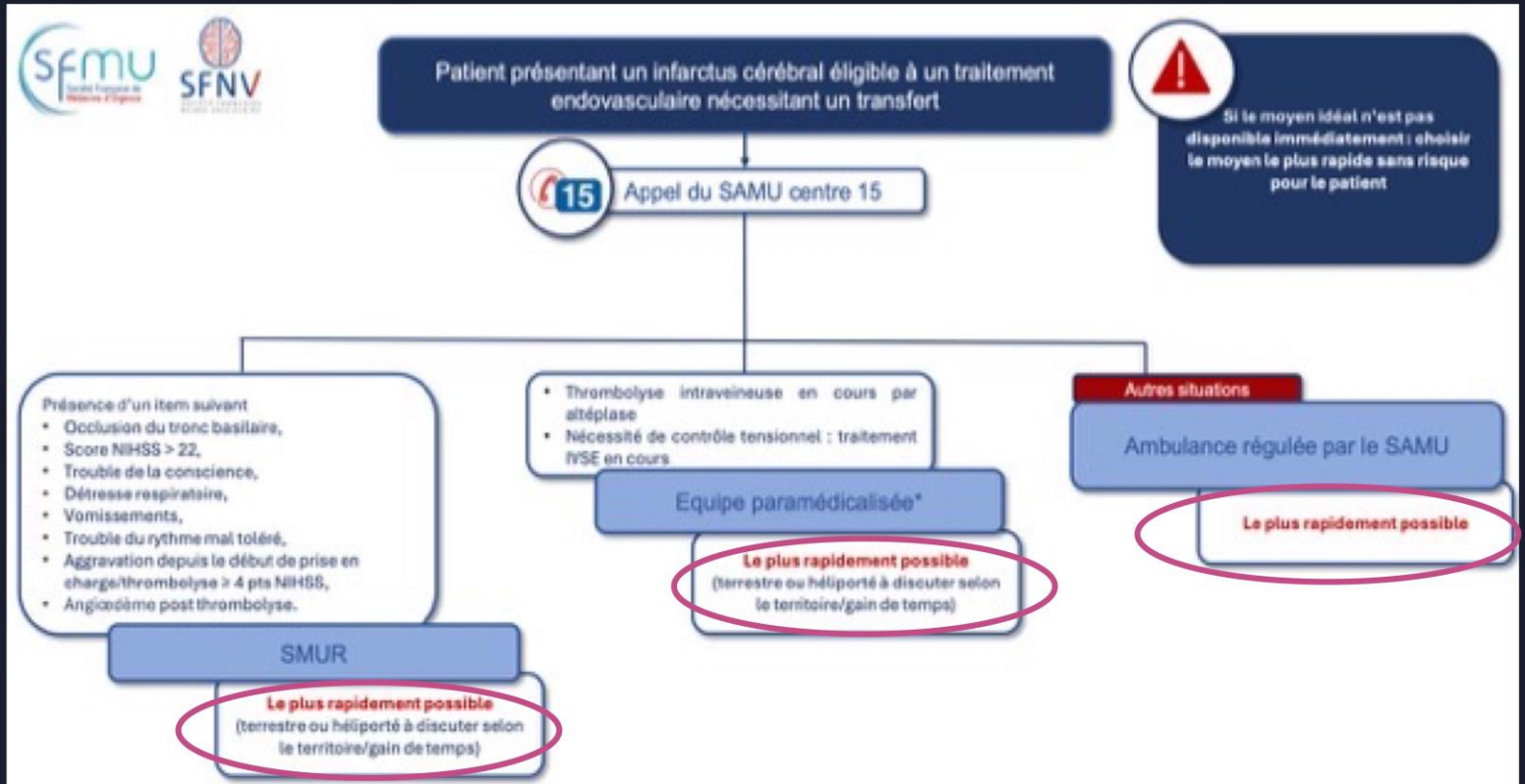



Figure 1. Algorithme de prise en charge d'un patient présentant un accident vasculaire ischémique éligible à un traitement endovasculaire nécessitant un transfert vers un centre de neuroradiologie interventionnelle.
* Equipe paramédicalisée : SMUR ou ambulance paramédicalisés

SOCIETE FRANCAISE DE NEURORADIOLOGIE

### 2 Thrombolyse IV

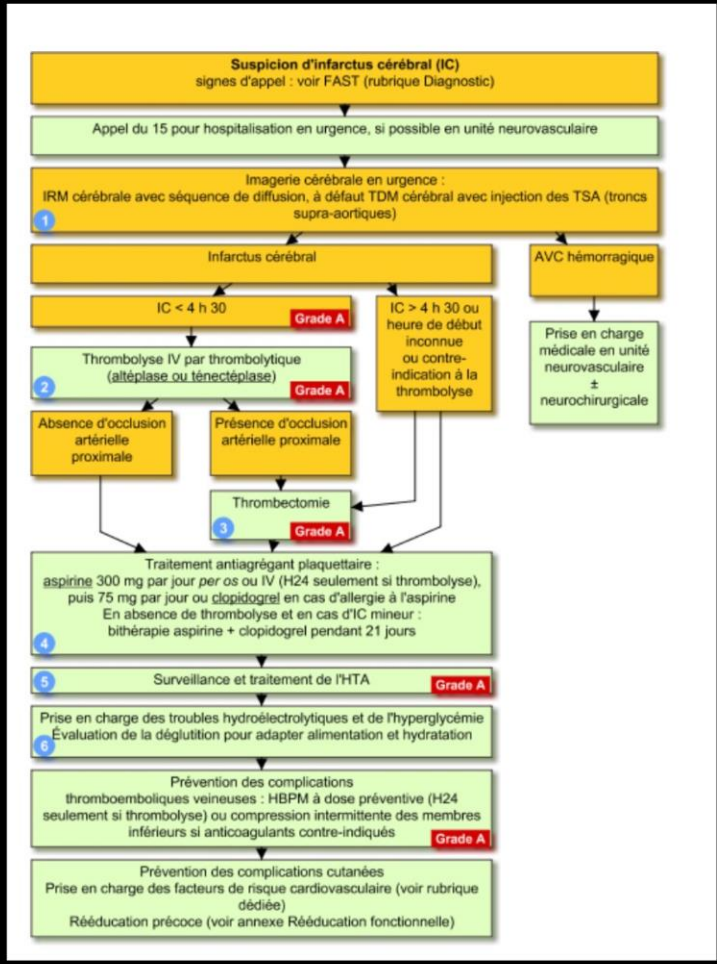
Elle est recommandée pour les IC datant < 4h30, en l'absence de contre-indication (hémorragie cérébrale). L'altéplase et la ténectéplase sont à administrer par un personnel spécialisé. Grade A

### 3 Thrombectomie

Elle est recommandée jusqu'à 6 heures après le début des symptômes si l'occlusion des artères cérébrales est proximale (carotide, cérébrale moyenne, tronc basilaire), en complément de la thrombolyse IV, ou en cas de contre-indication à la thrombolyse IV. Grade A Lorsque l'heure de début de l'IC est inconnue ou que le déficit neurologique est constaté au réveil, elle peut être discutée en cas de normalité de la séquence FLAIR de l'IRM, en centre spécialisé.

2. La TM est réalisée en complément de la thrombolyse intraveineuse (TIV) lorsqu'elle est indiquée (4h30) ou d'emblée en cas de contre-indications à la TIV. (Grade A, Niveau 1a)

3. La décision de réaliser une TM ne doit pas retarder la réalisation de la TIV. De même, la réalisation de la TIV ne doit pas retarder la TM (Grade A, Niveau 1a).



# Le bon usage des anticoagulant

# Etude TRiP CAST

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# Conflits d'intérêt

**Speaker: Pr MOUSTAFA Farès**

**Member of a scientific committee** ■ YES ☐ NO

Bayer Healthcare, Boehringer Engelheim

**Speaking or writing in exchange for remuneration** ■ YES ☐ NO

Bayer Healthcare, Sanofi-Aventis, Boehringer Engelheim, Aspen, Roche, Viatris

**Travel expenses and/or registration to congresses or other events covered** ■ YES ☐ NO

Sanofi-Aventis, Bayer Health Care, Daiichy Sankio, Boehringer Engelheim, Mundipharma

**Leader of research of clinical study** ☐ YES ■ NO

If so: …

# Traumatologie Urgences et MTEV

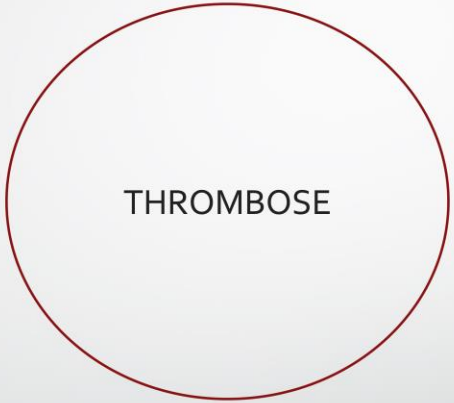
# Thromboprophylaxie

# Traumatologie des membres inférieurs aux urgences

- 49% (médiane; [28-72%]) de l'activité des services d'urgence (2004)*
- Une majorité traitée en ambulatoire par une immobilisation orthopédique et décharge*.
- Responsable de complications thrombotiques (4,3% à 40%)**
  - TVP asymptomatique*
  - TVP symptomatique* (0 à 5,5%)***
  - Embolie pulmonaire*
- MVTE = cause majeure de morbidité et mortalité* en Europe
  - Embolie pulmonaire (12% des décès)****

*Société Française de Médecine d'Urgence. Le Gall et al Traumatologie des membres inférieurs : prévention de la maladie veineuse thromboembolique. Urgences 2012; 52:1-16.
** Testroote M, Stigter W, de Visser DC, Janzing H. Low-molecular-weight heparin for prevention of venous thromboembolism in patients with lower-leg immobilization. Cochrane Database Syst Rev 2011; 4: CD006681,
*** Van Adrichem Ra et al. Below-knee cast immobilization and the risk of venous thrombosis: results from a large population based case–control study. J Thromb Haemost 2014; 12: 1461–9.
****Cohen A.T., Agnelli G., Anderson F.A. et al. Venous thromboembolism (VTE) in Europe. The number of venous thromboembolism events associated morbidity and mortality. Thromb Haemost 2007 ; 98 : 756-64.

- **Facteurs de risque de thrombose veineuse: triade de Virchow (stase veineuse, lésions de la paroi veineuse et hypercoagulabilité)**




Hypercoagulabilité

Acquise ou congénitale :
- Patient : **âge, obésité, antécédent de MTEV,** etc.
- Comorbidités
- Thrombophilies

Stase veineuse

**Immobilisation, absence d'appui, alitement, chirurgie**

Altération endothéliale

**Traumatisme (fractures, lésions des tissus mous)**, inflammation chronique

*SFMU. Alipour et al. Traumatisme bénin : quand anticoaguler ? Urgences 2010; 56:647-661.

# Traumatologie

*C.-M. Samama et al. Prévention de la maladie thromboembolique veineuse postopératoire. Actualisation 2011. Annales Françaises d'Anesthésie et de Réanimation 30 (2011) 947–951*

| | TVP TOTALES | ETE SYMPTO | Niveau de risque |
|---|---|---|---|
| **PTH** | 50-60% | 3-5% | Elevé |
| **PTG** | 50-60% | 2-3% | Elevé |
| **Fracture hanche** | 50-60% | 4-6% | Elevé |
| **Polytrauma Grave** | 50-70% | - | Elevé |
| **Fracture plateau tibial, fémur** | 30-40% | 1% | Elevé |
| • **Ligamentoplastie**<br>• **Rotule**<br>• **Fracture Tibia, cheville**<br>• **tendon Achille**<br>• **plâtre** | 10-20% | 1% | Modéré |
| • **Trauma mb inf sans fracture**<br>• **Arthroscopie simple**<br>• **Meniscectomie**<br>• **Chirurgie du pied**<br>• **Ablation de matériel** | 0-5% | | Faible |

# Revue des guidelines

**Table 1** Overview of guidelines on prevention of thromboembolism

| Intervention | Prophylaxis | ACCP | AAOS | Australia/ New Zealand | Nice | ICS | France | Brazil | South Africa | Japan | Germany | SIGN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total hip arthroplasty | Heparin | x | x | x | x | x | x | x | x | x | x | x |
| | Fondaparinux | x | x | x | x | x | x | | | | x | |
| | VKA | x | x | | | x | | x | x | | x | x |
| | Aspirin | | x | | | | | x | | | | x |
| Total knee arthroplasty | Heparin | x | x | x | x | x | x | x | x | x | x | x |
| | Fondaparinux | x | x | x | x | x | x | | | | x | |
| | VKA | x | x | | | x | | x | x | | x | x |
| | Aspirin | | x | | | | | | | | | x |
| Hip fracture surgery | Heparin | x | | x | x | x | x | | | | x | x |
| | Fondaparinux | x | | x | x | x | x | | | | x | |
| | VKA | x | | | | x | | | | | x | |
| | Aspirin | | | | | | | | | | | x |
| Knee arthroscopy | None | x | | | | x | x | x | | | | x |
| | Heparin | RF | | | | RF | RF | | | | | |
| Immobilization of lower extremities | None | x | | | | x | | | | | x | |
| | Heparin | | | | | RF | x | | | | | |
| | Fondaparinux | | | | | | | | | | x | |
| | VKA | | | | | | | | | | x | |

VKA, vitamin K antagonist; RF, risk factors present.



Struijk-Mulder MC, Ettema HB, Verheyen CC, Buller HR. Comparing consensus guidelines on thromboprophylaxis in orthopedic surgery. J Thromb Haemost 2010; 8: 678–83

# Evaluation du risque

# Immobilisation avec plâtre
# Facteur de risque ?

ORIGINAL ARTICLE

**Below-knee cast immobilization and the risk of venous thrombosis: results from a large population-based case–control study**

R. A. VAN ADRICHEM,*† J. DEBEIJ,* R. G. H. H. NELISSEN,† I. B. SCHIPPER,‡ F. R. ROSENDAAL*§ and S. C. CANNEGIETER*§

*Department of Clinical Epidemiology, Leiden University Medical Center; †Department of Orthopedic Surgery, Leiden University Medical Center; ‡Department of Trauma Surgery, Leiden University Medical Center; and §Department of Thrombosis and Hemostasis, Leiden University Medical Center, Leiden, the Netherlands

**Table 2** Treatment type and indication for below-knee cast immobilization, and the risk of venous thrombosis within 1 year

| Treatment | Patients* | Controls | $OR_{adj}$ (95% CI) | $OR_{adj}$ (95% CI) |
|---|---|---|---|---|
| None | 4191 | 6073 | 1 (Reference) | 1 (Reference) |
| Below-knee cast | 134 | 23 | 8.5 (5.4–13.2) | 8.3 (5.3–12.9) |
| Operative | 41 | 11 | 5.4 (2.7–10.4) | 4.9 (2.5–9.6) |
| Conservative | 93 | 12 | 11.4 (6.2–20.7) | 11.4 (6.2–20.9) |
| Traumatic | 86 | 10 | 12.6 (6.5–24.3) | 12.7 (6.6–24.6) |
| Non-traumatic | 5 | 1 | 7.6 (0.9–65.5) | 7.6 (0.9–66.4) |

CI, confidence interval; $OR_{adj}$, adjusted odds ratio (adjusted for sex and age); $OR_{adj}$, adjusted odds ratio (adjused for sex, age, BMI, and regular exercise). *For two patients, no information on indication for cast immobilization was available.

Data based from a large based case control study (MEGA Study)

**Plâtre sous le genou** = augmentation du risque de MTEV (ORajusté = 8,5)

Van Adrichem RA, Debeij J, Nelissen RGHH, Schipper IB, Rosendaal FR, Cannegieter SC. Below-knee cast immobilization and the risk of venous thrombosis: results from a large population based case–control study. J Thromb Haemost 2014; 12: 1461–9.

# Facteurs de risques
# Patients avec traumatisme du MI avec immobilisation

- Objectif : analyse des facteurs de risque de survenue de thrombose
- Étude prospective, multicentrique
- Patients pris en charge pour traumatisme du membre inférieur traité de façon orthopédique/plâtre/attelle
- Pratiques des urgences français en terme de prévention des MVTE

ELSEVIER

The American Journal of Emergency Medicine

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Original Contribution

**Incidence and risk factors for venous thromboembolism in patients with nonsurgical isolated lower limb injuries**☆,☆☆

Bruno Riou MD, PhD[a,*], Christophe Rothmann MD[b], Nathalie Lecoules MD[c], Eric Bouvat MD[d], Jean-Luc Bosson MD[e], Philipe Ravaud MD, PhD[f], Charles Marc Samama MD, PhD[g], Moussa Hamadouche MD[h]

*3698 Patients* — **INCLUSION**

↓

*3358 Patients* — **FIN IMMOBILISATION**

↓

*2761 Patients* — **ECHO-DOPPLER**

*2584 Patients sans MVTE*

*177 Patients Avec MVTE (6.4%)*

**Table 3** Multivariate analysis of risk factors for VTE (n = 2755 patients)

| Variables | Odds ratio (95% confidence interval) | *P* |
|---|---|---|
| No weight bearing | 4.11 (1.72-9.86) | .0015 |
| Age >50 y | 3.14 (2.27-4.33) | <.0001 |
| Rigid immobilization | 2.70 (1.66-4.38) | <.0001 |
| Severe injury | 1.88 (1.34-2.62) | .0002 |

See text for definitions.

**La décharge, l'âge, l'immobilisation et la sévérité du traumatisme = facteurs de risque de MVTE**

Riou B, Rothmann C, Lecoules N, Bouvat E, Bosson JL, Ravaud P, Samama CM, Hamadouche M. Incidence and risk factors for venous thromboembolism in patients with nonsurgical isolated lower-limb injuries. Am J Emerg Med 2007; 25: 502–8.

# L-TRIP(CAST) score

- Médecine personnalisée
- Balance bénéfice-risque

PLOS | MEDICINE

November 10, 2015

RESEARCH ARTICLE

## Venous Thrombosis Risk after Cast Immobilization of the Lower Extremity: Derivation and Validation of a Clinical Prediction Score, L-TRiP(cast), in Three Population-Based Case–Control Studies

Banne Nemeth[1,2], Raymond A. van Adrichem[1,2], Astrid van Hylckama Vlieg[1], Paolo Bucciarelli[3], Ida Martinelli[3], Trevor Baglin[4], Frits R. Rosendaal[1,5], Saskia le Cessie[1,6], Suzanne C. Cannegieter[1]*

4446 cas. Vs 6118 sans VTE

**Table 4. L-TRiP(cast) score based on the clinical risk prediction model.**

| Environmental Predictor Variable | Point Value |
|---|---|
| Age ≥ 35 and < 55 y | 2 |
| Age ≥ 55 y | 3 |
| Male sex | 1 |
| Current use of oral contraceptives | 4 |
| Cancer within the past 5 y | 3 |
| Pregnancy or puerperium | 3 |
| BMI ≥ 25 and < 35 kg/m$^2$ | 1 |
| BMI ≥ 35 kg/m$^2$ | 2 |
| Pneumonia | 3 |
| Family history of VTE (first-degree relative) | 2 |
| Comorbidity (rheumatoid arthritis, chronic kidney disease, COPD, multiple sclerosis) | 1 |
| Hospital admission within the past 3 mo | 2 |
| Bedridden within the past 3 mo | 2 |
| Surgery within the past 3 mo | 2 |
| Superficial vein thrombosis | 3 |
| Plaster cast: complete leg | 5 |
| Plaster cast: circular knee cast (ankle free) | 2 |
| Plaster cast: foot | 2 |
| Plaster cast: lower leg | 4 |

This L-TRiP(cast) score was derived from the regression coefficients (betas) of the clinical prediction model: 0.20 < beta ≤ 0.75, 1 point; 0.75 < beta ≤ 1.25, 2 points; 1.25 < beta ≤ 1.75, 3 points; 1.75 < beta ≤ 2.25, 4 points; beta > 2.25, 5 points

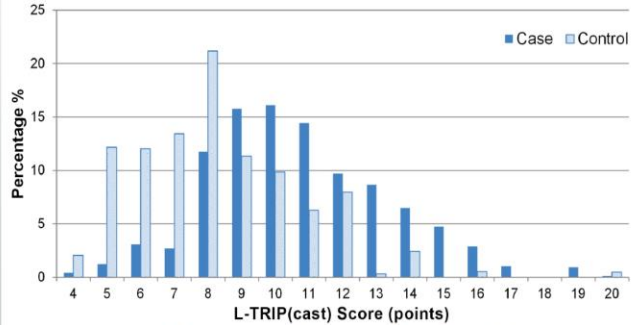


Fig 3. Distribution of individual L-TRiP(cast) scores in the plaster cast subgroup derived from the MEGA study.

**Score > ou = 7 points , haut risque**
**→ Thromboprophylaxie**

*Nemeth B et al . Venous Thrombosis Risk after Cast Immobilization of the Lower Extremity: Derivation and Validation of a Clinical Prediction Score, L-TRiP(cast), in Three Population-Based Case-Control Studies. PLoS Med. 2015 Nov 10;12(11):e1001899*

EClinicalMedicine 20 (2020) 100270

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journal homepage: https://www.journals.elsevier.com/eclinicalmedicine

# Clinical risk assessment model to predict venous thromboembolism risk after immobilization for lower-limb trauma

Banne Nemeth[a,b,1,*], Delphine Douillet[c,1], Saskia le Cessie[a,d], Andrea Penaloza[e], Thomas Moumneh[c], Pierre-Marie Roy[c], Suzanne Cannegieter[a,f]

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[e] Department of Emergency Medicine, Cliniques Universitaires Saint Luc, Université Catholique de Louvain, Brussels, Belgium
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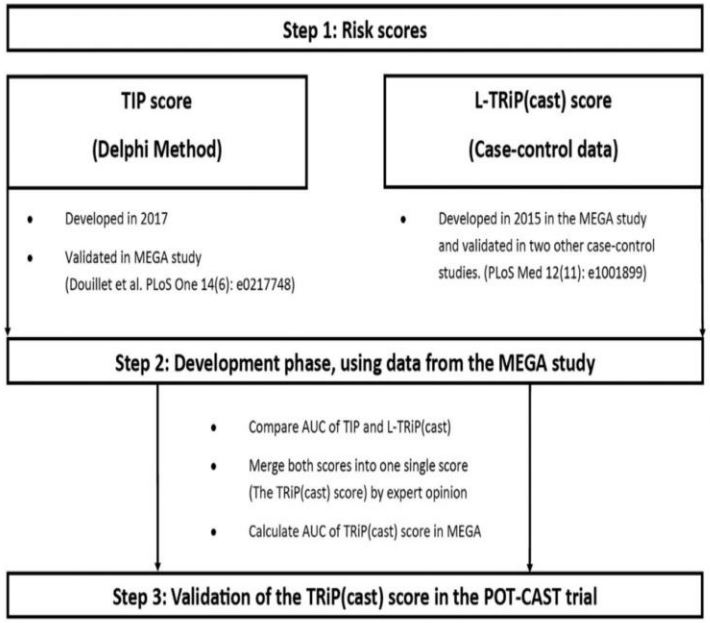
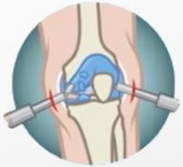



# TRIP(CAST) score

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 FEBRUARY 9, 2017 VOL. 376 NO. 6

Thromboprophylaxis after Knee Arthroscopy and Lower-Leg Casting

Raymond A. van Adrichem, M.D., Banne Nemeth, M.D., Ale Algra, M.D., Ph.D., Saskia le Cessie, Ph.D., Frits R. Rosendaal, M.D., Ph.D., Inger B. Schipper, M.D., Ph.D., Rob G.H.H. Nelissen, M.D., Ph.D., and Suzanne C. Cannegieter, M.D., Ph.D., for the POT-KAST and POT-CAST Group*



Using a cutoff score of 7 points in the POTCAST trial (incidence 1.6%):

Se : 76.1%,
Sp : 51.2%,
VPP : 2.5%,
VPN: 99.2%,

**Table 1**
TRiP(cast) score.[a]

| | Points |
|---|---|
| **Trauma**[b] | |
| ***High-risk trauma*** | **3** |
| *Fibula and/or tibia shaft fracture* | |
| *Tibial plateau fracture* | |
| *Achilles tendon rupture* | |
| ***Intermediate-risk trauma*** | **2** |
| *Bi or tri-malleolar ankle fracture* | |
| *Patellar fracture* | |
| *Ankle dislocation, Lisfranc injury* | |
| *Severe knee sprain (with edema/haemarthrosis)* | |
| *Severe ankle sprain (grade 3)* | |
| ***Low-risk trauma*** | **1** |
| *Single malleolar ankle fracture* | |
| *Patellar dislocation* | |
| *(Meta)Tarsal bone(s) or forefoot fracture* | |
| *Non-severe knee sprain or ankle sprain (grade 1 or 2)* | |
| *Significant muscle injury* | |
| **Immobilization**[c] | |
| Upper-leg cast | **3** |
| Lower-leg cast | **2** |
| Foot cast (ankle free) or any semi-rigid without plantar support | **1** |
| Other cast or bracing with plantar support | **0** |
| **Patient characteristics**[d] | |
| Age <35 years | **0** |
| Age ≥35 and <55 years | **1** |
| Age ≥55 and <75 years | **2** |
| Age ≥75 years | **3** |
| Male sex | **1** |
| Body Mass Index BMI ≥25 and <35 kg/m$^2$ | **1** |
| Body Mass Index BMI ≥35 kg/m$^2$ | **2** |
| Family history of VTE (first-degree relative) | **2** |
| Personal history of VTE or known major thrombophilia | **4** |
| Current use of oral contraceptives or Estrogenic hormone therapy | **4** |
| Cancer diagnosis within the past 5 years | **3** |
| Pregnancy or puerperium | **3** |
| Immobilization (other) within the past 3 months[e] | **2** |
| *Hospital admission, bedridden or flight > 6 h, Lower limb paralysis* | |
| Surgery within the past 3 months | **2** |
| Comorbidity | **1** |
| *Heart failure, rheumatoid arthritis, chronic kidney disease, COPD, IBD* | |
| Chronic venous insufficiency *(varicose veins)* | **1** |

[a] Thrombosis Risk Prediction in patients with cast immobilization score TRiP (cast) score is the sum of the Trauma, Immobilization and Patient components.
[b] Trauma: Choose one, (the most severe trauma).
[c] Immobilization: Choose one.
[d] Patient: multiple points can be scored.
[e] Other immobility next to cast immobilization.

# Targeted prophylactic anticoagulation based on the TRiP(cast) score in patients with lower limb immobilisation: a multicentre, stepped wedge, randomised implementation trial

*Delphine Douillet, Andrea Penaloza, Damien Viglino, Jean-Jacques Banihachemi, Anmar Abboodi, Mathilde Helderlé, Emmanuel Montassier, Fréderic Balen, Christian Brice, Saïd Laribi, Thibault Duchenoy, Philippe Vives, Louis Soulat, Nicolas Marjanovic, Thomas Moumneh, Dominique Savary, Jérémie Riou, Pierre-Marie Roy*


*Lancet* 2024; 403: 1051–60
Published Online February 15, 2024
https://doi.org/10.1016/S0140-6736(23)02369-3

2024

Etude CASTING

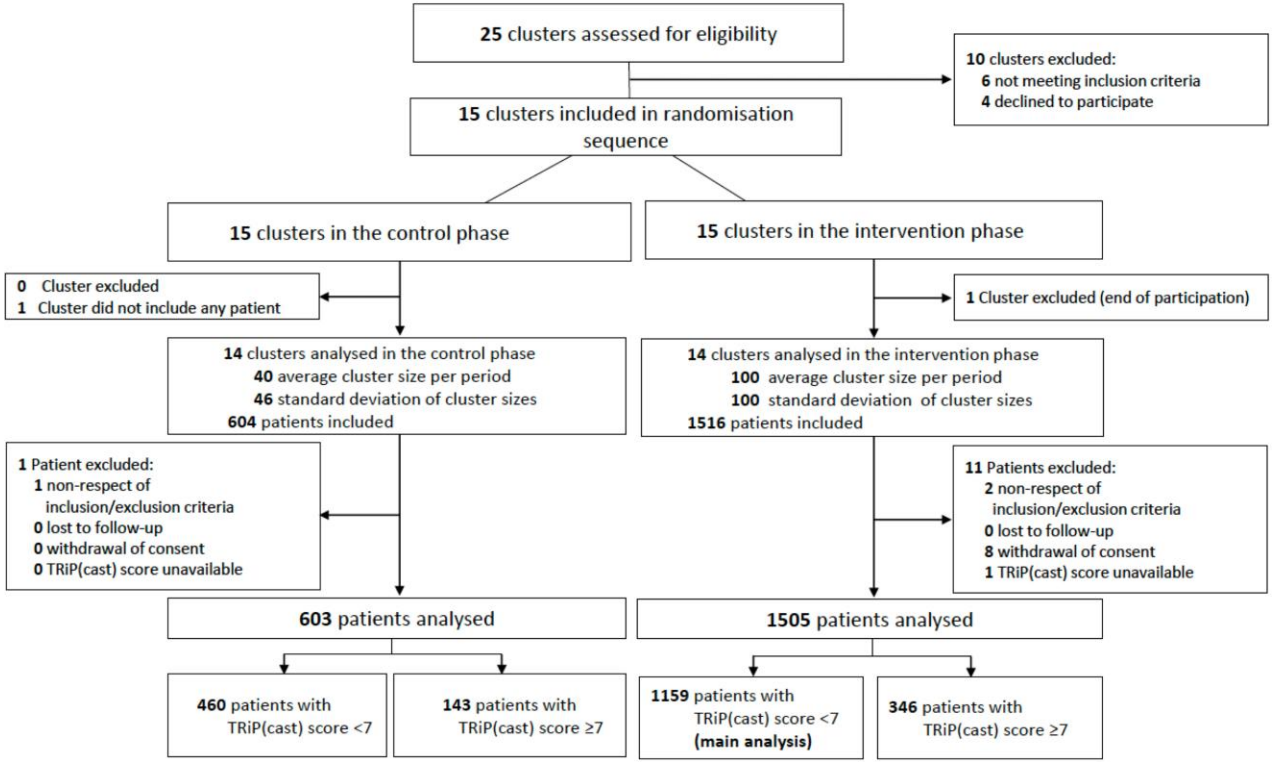



*Figure 1:* Flow chart

## Essai randomisé stepped-wedge
## 15 centres en France et en Belgique

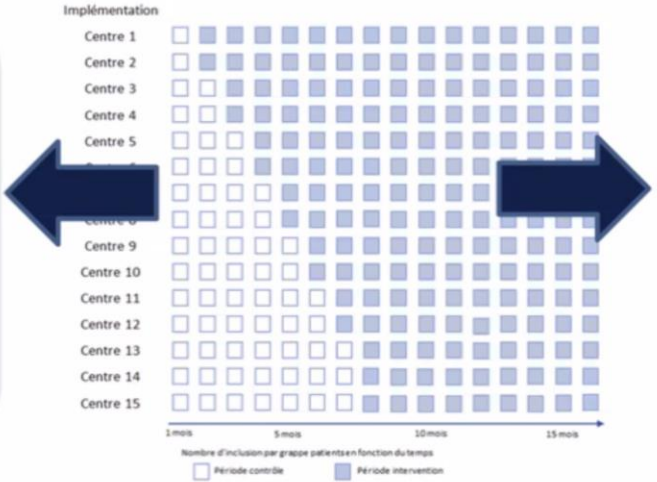
**2120 patients**

### Control group

Selon le choix du médecin

D30 D90

Hospital and deaths records




### Interventional group

selon le score TRiP(cast)

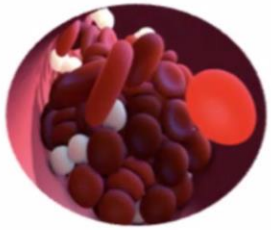
- No treatment < 7
- Treatment ≥ 7

D30 D90

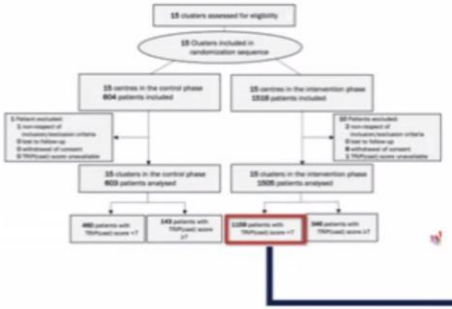
Hospital and deaths records

Comité d'adjudication

Merci au Dr DOUILLET Delphine

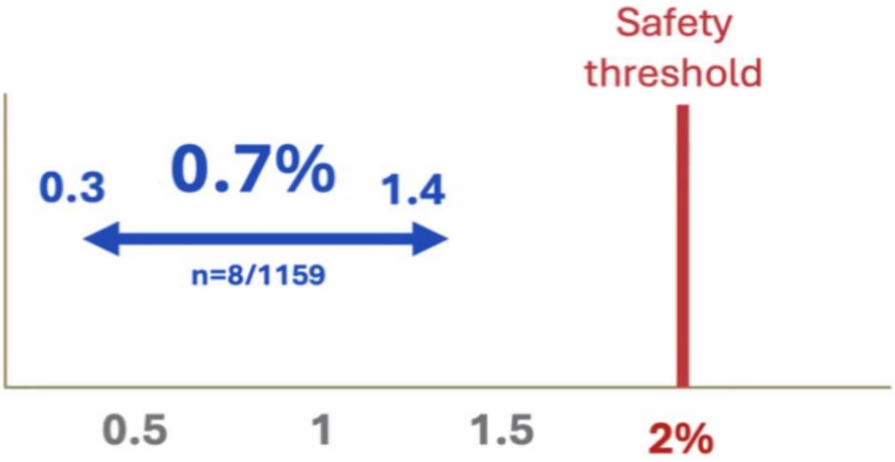


# Taux d'ETEV symptomatique à 3 mois



## As randomized

1159 patients à faible risque pendant la période d'intervention




**Le critère de jugement principal:**

**le taux cumulé de MTEV symptomatique à 3 mois pendant la phase d'intervention chez les patients ayant un score TRiP(cast) <7**

## Per-Protocol

**0.8% (95%CI 0.3 to 1.5)**

n=8/1048

Merci au Dr DOUILLET Delphine

*Table 3:* **Primary and Secondary Outcomes**

| Outcome | As-Randomised Population | | | Per-Protocol Population |
|---|---|---|---|---|
| | Intervention phase (N=1505) | Control phase (N=603) | Difference (CI) | Intervention phase (N=1382) |
| | *no· (% 90-day probability)* | | *percentage points* | |
| **Primary outcome**: symptomatic VTE in low-risk* patients | 8/1159 (0·7; 95%CI 0·3 to 1·4) | - | - | 8/1048 (0·8; 95%CI 0·3 to 1·5) |
| **Secondary outcomes** | | | | |
| Anticoagulant prescription rate, no· of patients (%) | 368 (24·5) | 304 (50·4) | - 26·0 (-30·2 to -21·7) | - |
| VTE rate at 3 months, no. of patients (%) | 17 (1·1)† | 6 (1·0) | 0·1 (-0·8 to 1·1) | - |
| VTE rate at 3 months in low-risk patients | 8/1159 (0·7) | 2/460 (0·4) | 0·3 (-0·2 to 0·5) | |
| VTE rate at 3 months in high-risk patients | 9/346 (2·6) | 4/143 (2·8) | - 0·02 (-0·3 to 0·3) | |
| Fatal PE | 0 (0) | (0) | - | - |
| Unexplained sudden death | 0 (0) | 1 (0·2) | - | - |
| Symptomatic PE | 2 (0·1) | 0 (0) | - | - |
| Symptomatic proximal DVT | 2 (0·1) | 1 (0·2) | - | - |
| Symptomatic distal DVT | 11 (0·7) | 4 (0·7) | - | - |
| Major bleeding | 1 (0·1) | 0 (0) | - | - |
| Clinically relevant non-major bleeding | 1 (0·1) | 0 (0) | - | - |

Abbreviations: CI= confidence interval; DVT=deep-vein thrombosis; PE=pulmonary embolism; VTE=venous thrombo-embolism

* Low-risk patients identified by a TRiP(cast) score <7, high-risk patients identified by a score ≥7.

† Limited information on symptomatic DVT as defined by the Adjudication Committee was available for 2 patients (no ultrasound results).

Abbreviations: CI= confidence interval; DVT=deep-vein thrombosis; PE=pulmonary embolism; VTE=venous thrombo-embolism

# Taux d'anticoagulation préventive





Absolute difference
**- 26% (95%CI -30.2 to -21.7)** (p<0.001)

Merci au Dr DOUILLET Delphine

Annales françaises de médecine d'urgence

RECOMMANDATION POUR LA PRATIQUE CLINIQUE / *RECOMMENDATION FOR CLINICAL PRACTICE*

# Recommandations sur la gestion de la prévention antithrombotique dans les structures d'urgence

2024

- **Champ 1. Traumatisme des membres inférieurs nécessitant une immobilisation**

Question 1 : Chez les patients ayant un traumatisme d'un membre inferieur, non opérés, nécessitant une immobilisation et pris en charge en ambulatoire, l'anticoagulation préventive permet-elle de réduire le taux d'évènements thromboemboliques veineux et la morbi-mortalité associée ?

R1.1.1. Chez les patients pris en charge aux urgences ayant un traumatisme isolé d'un membre inférieur nécessitant une immobilisation orthopédique par orthèse amovible ou immobilisation rigide et ne nécessitant *a priori* pas de prise en charge chirurgicale : il n'est probablement pas recommandé de prescrire systématiquement un traitement anticoagulant préventif.

**GRADE 2 – (Accord fort)**

R1.1.2. Il est recommandé de réaliser une évaluation du risque thromboembolique veineux en prenant en compte les facteurs de risque thromboembolique liés au patient (âge, antécédents personnels de thrombose…), le type de traumatisme (rupture du tendon d'Achille, fracture…) et le type d'immobilisation (immobilisation rigide, absence d'appui…) afin de juger de l'indication éventuelle d'une thromboprophylaxie.

**GRADE 1+ (Accord fort)**

R1.1.3. Il est probablement recommandé de se baser sur un score évaluant le risque thromboembolique.

**GRADE 2 + (Accord fort)**

R1.1.4. Les experts suggèrent de se baser sur le score TRiP(cast) pour évaluer le risque thromboembolique.

**AVIS D'EXPERTS (Accord fort)**

**Borne ≥ 7 anticoagulation**

# Take home message


We know that patients with lower limb fractures are particularly vulnerable to thromboembolism and we know that the vast majority of these patients present initially to the Emergency Department. Initiation of prophylactic therapy may or may not be appropriate at this time but we do have a responsibility to ensure that the risk of harm from the treatment we provide – the plaster cast – is minimised.

- **Recommandations Françaises modifiées en 2024**
- **Etude CASTING, Lancet 2024**

→ **TRIP CAST score > ou= à 7 → bénéfice de la Thromboprophylaxie**

- **Prise en charge personnalisée**

# Fractures de l’enfant


C’est cassé !

# Immobilisation of torus fractures of the wrist in children (FORCE): a randomised controlled equivalence trial

Lancet 2023
Perry et al

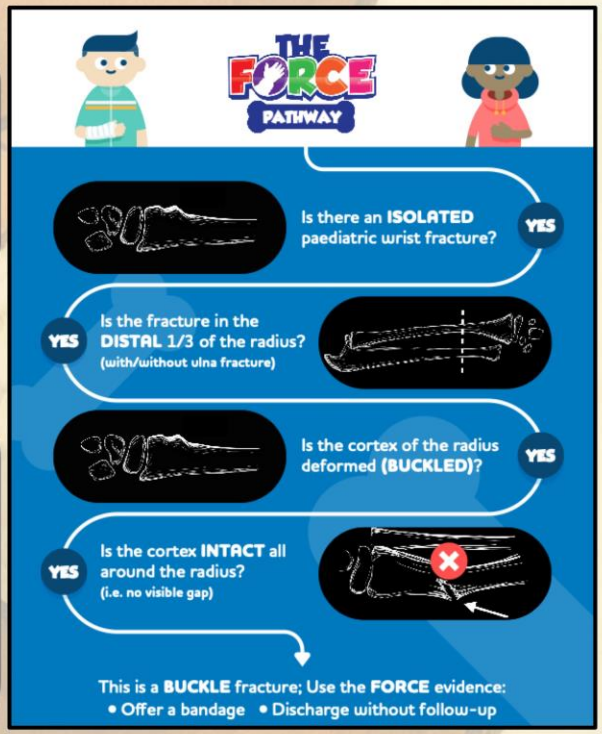
## Rationnel

Fracture en motte de beurre, de l'extrémité inférieur du radius
**Plus** commune
Prise en charge souvent maximaliste (immobilisation + suivi)

## Méthode

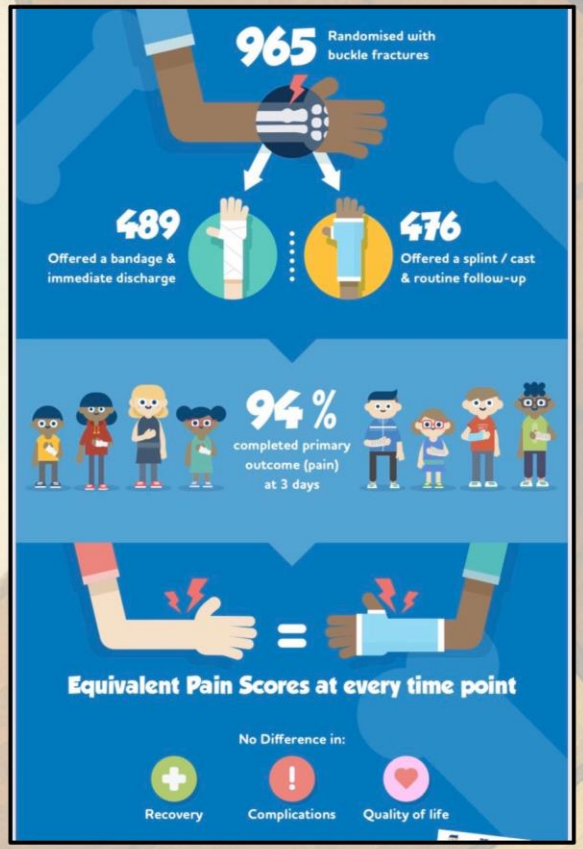
Essai contrôlé randomisé, d'**EQUIVALENCE**
Enfants de 5 à 15 ans, Fracture isolée ou avec fracture ulnaire
CJP : Wong-Baker scale, douleur à J 3, recueillie par sms/web

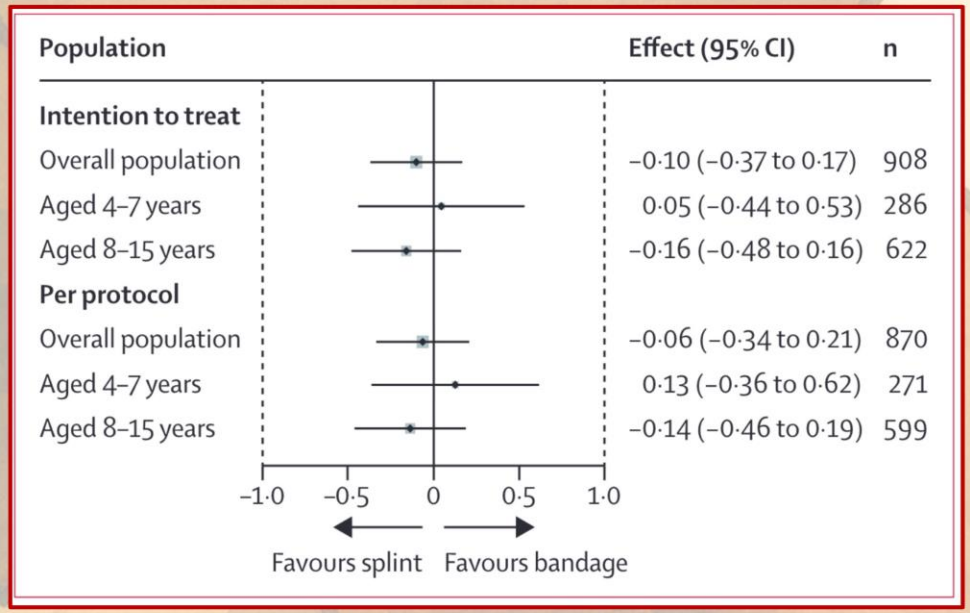
Immobilisation rigide et suivi
Proposer un bandage, et RAD

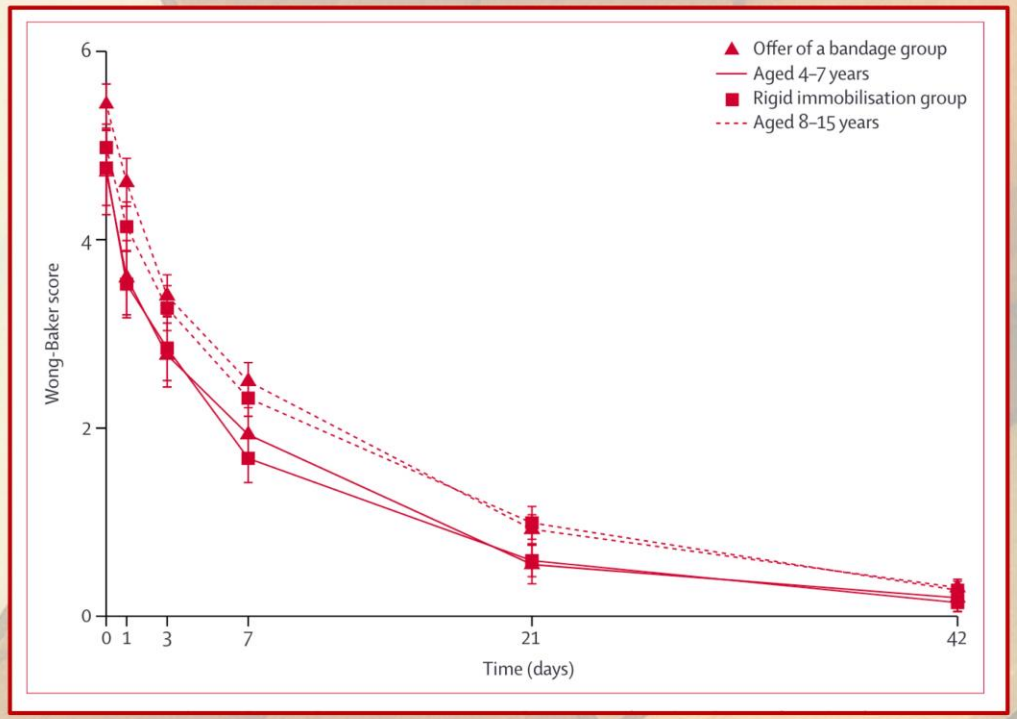
# Immobilisation of torus fractures of the wrist in children (FORCE): a randomised controlled equivalence trial

Lancet 2023
Perry et al

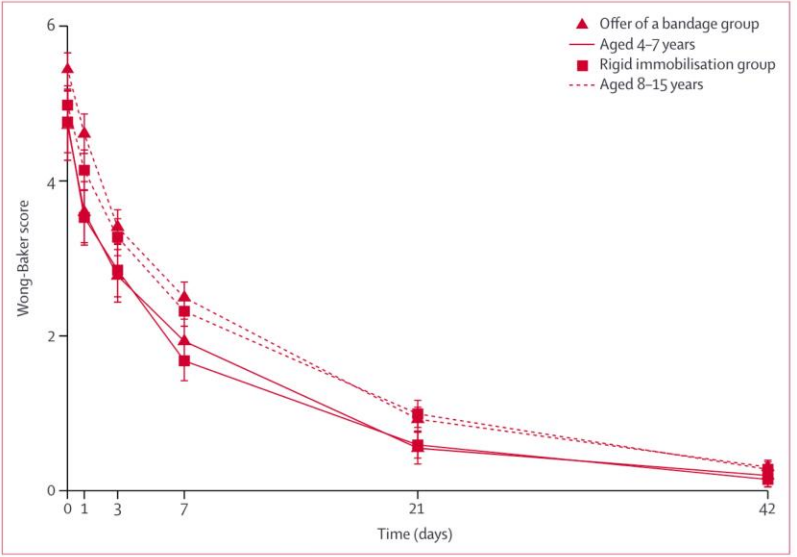


# Immobilisation of torus fractures of the wrist in children (FORCE): a randomised controlled equivalence trial

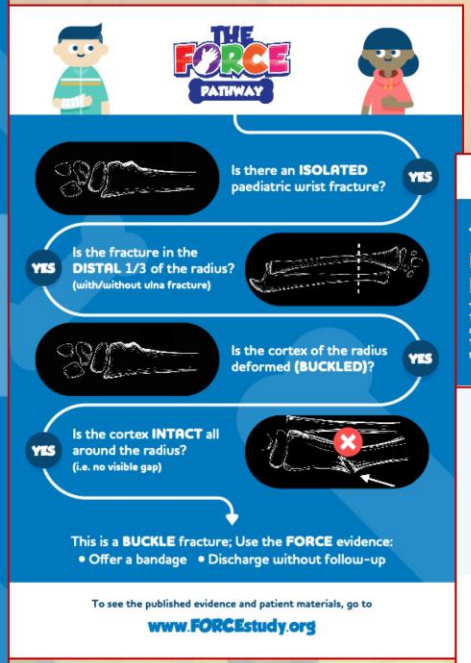


# Immobilisation of torus fractures of the wrist in children (FORCE): a randomised controlled equivalence trial

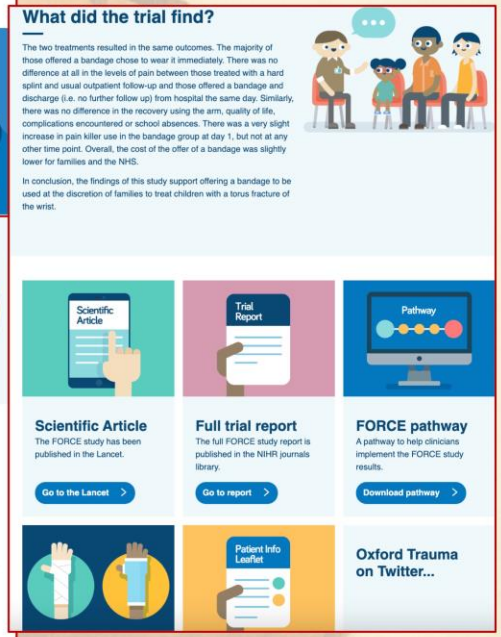



| | Offer of bandage group (n=489) | Rigid immobilisation group (n=476) | Effect size (95% CI)* | p value |
|---|---|---|---|---|
| Satisfaction | | | | |
| Day 1 | 2 (1, 2), 406 | 1 (1, 2), 380 | .. | <0·0001 |
| Day 42 | 1 (1, 2), 433 | 1 (1, 2), 425 | .. | 0·12 |
| Use of any analgesia within the previous 24h | | | | |
| Day 1 | 337/408 (83%) | 297/382 (78%) | OR 0·53 (0·28 to 0·98) | 0·04 |
| Day 3 | 264/465 (57%) | 227/442 (51%) | OR 0·60 (0·36 to 0·99) | 0·05 |
| Day 7 | 116/459 (25%) | 100/439 (23%) | OR 0·70 (0·40 to 1·22) | 0·21 |
| School absence | | | | |
| Participants who missed school | 112/430 (26%) | 93/425 (22%) | OR 0·79 (0·57 to 1·08) | 0·14 |
| Number of days of school missed | 1·5 (1–2); n=112 | 1·5 (1–2); n=93 | .. | 0·37 |
| Any complication | 5 (1·0%) | 3 (0·6%) | .. | .. |
| Alternative fracture: greenstick | 1 (0·2%) | 1 (0·2%) | .. | .. |
| Alternative fracture: complete but remains undisplaced | 3 (0·6%) | 2 (0·4%) | .. | .. |
| Other | 1 (0·2%) | 0 | .. | .. |


THE FORCE STUDY
Co-ordinated by KADOORIE
965 Randomised with buckle fractures
489 Offered a bandage & immediate discharge
476 Offered a splint / cast & routine follow-up
94 % completed primary outcome (pain) at 3 days
Equivalent Pain Scores at every time point
No Difference in:
Recovery
Complications
Quality of life
Use the force pathway
www.FORCEstudy.org
UNIVERSITY OF OXFORD


THE FORCE PATHWAY
Is there an ISOLATED paediatric wrist fracture?
YES
Is the fracture in the DISTAL 1/3 of the radius? (with/without ulna fracture)
YES
Is the cortex of the radius deformed (BUCKLED)?
YES
Is the cortex INTACT all around the radius? (i.e. no visible gap)
YES
This is a BUCKLE fracture; Use the FORCE evidence:
• Offer a bandage • Discharge without follow-up
To see the published evidence and patient materials, go to
www.FORCEstudy.org


THE FORCE STUDY
The FOrearm fracture Recovery in Children Evaluation Study
Torus Fractures: Evidence from the FORCE study
Torus fractures (also called buckle fractures) of the wrist are the most common type of broken bone in children. They are also the mildest form of broken bone, in which the bone crushes (or buckles), instead of breaking.
Treatment
Despite being so common, there is no 'standard' or 'agreed' treatment. Traditionally doctors have used plaster casts and arranged outpatient follow-up. However, medical research suggested that wearing a bandage, or even having no treatment, might be similarly good.
About the FORCE Study
The FORCE study looked into whether or not a bandage (which was optional to wear) and no further follow-up resulted in the same levels of pain and speed of recovery as a hard splint and usual follow-up.
A total of 965 children aged 4–15 years from 23 emergency departments in the UK took part in the study. Children were fairly divided between the bandage and hard splint groups in a process called randomisation. Prior to the study, families told us that managing pain after injury was the most important issue to them. We asked children and their families to tell us about pain, recovery using the arm, quality of life, complications encountered and school absences. We also looked at the financial costs to families and the NHS.


What did the trial find?
The two treatments resulted in the same outcomes. The majority of those offered a bandage chose to wear it immediately. There was no difference at all in the levels of pain between those treated with a hard splint and usual outpatient follow-up and those offered a bandage and discharge (i.e. no further follow up) from hospital the same day. Similarly, there was no difference in the recovery using the arm, quality of life, complications encountered or school absences. There was a very slight increase in pain killer use in the bandage group at day 1, but not at any other time point. Overall, the cost of the offer of a bandage was slightly lower for families and the NHS.
In conclusion, the findings of this study support offering a bandage to be used at the discretion of families to treat children with a torus fracture of the wrist.
Scientific Article
Trial Report
Pathway
Scientific Article
The FORCE study has been published in the Lancet.
Go to the Lancet
Full trial report
The full FORCE study report is published in the NIHR journals library.
Go to report
FORCE pathway
A pathway to help clinicians implement the FORCE study results.
Download pathway
Patient Info Leaflet
Oxford Trauma on Twitter...

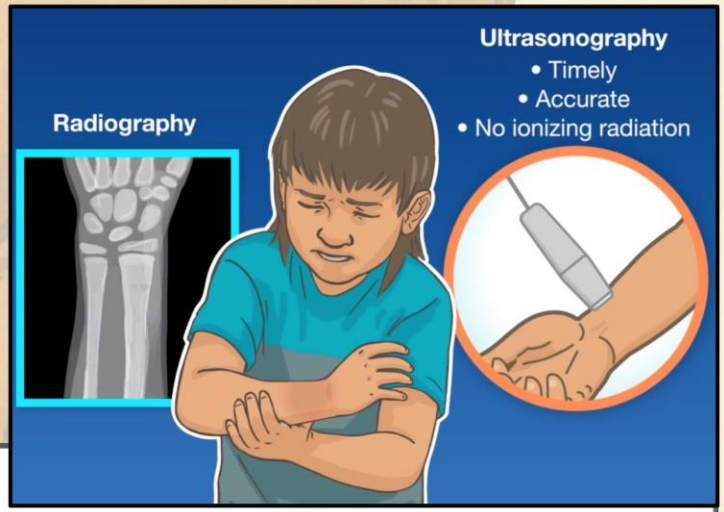

C’est cassé ?

# Ultrasonography or Radiography for Suspected Pediatric Distal Forearm Fractures

NEJM 2023
Snelling et al

## Rationnel

La fracture en motte de beurre, de l'extrémité inférieur du radius est toujours la **Plus** commune
La radio est l'examen de référence mais expose à un rayonnement et reste inacssessible à 2/3 de la population
Echographie ?



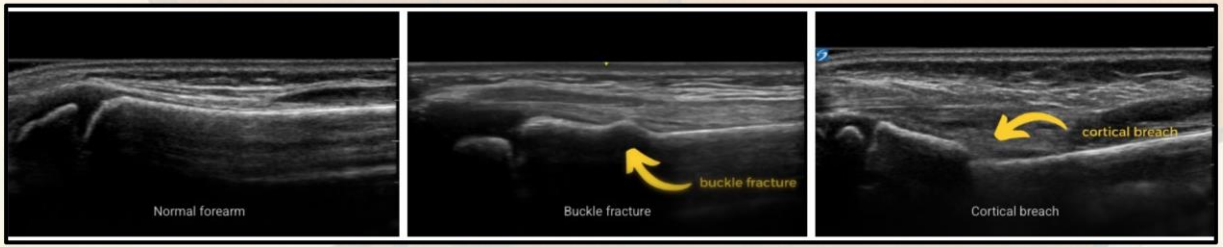

## Méthode

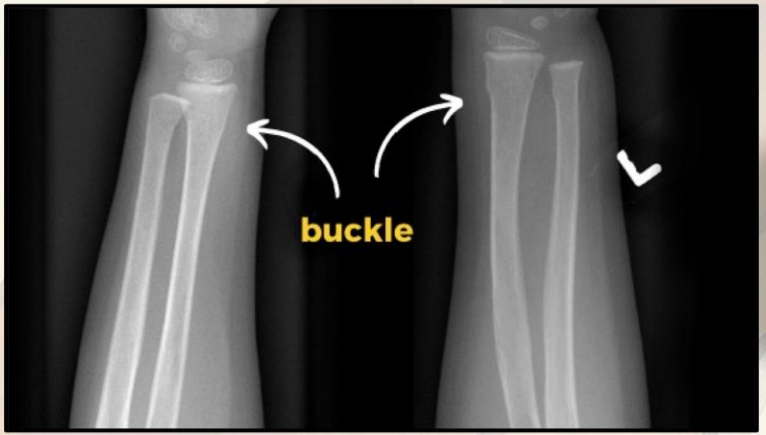
Essai contrôlé randomisé, multicentrique, ouvert et de non-inf
Mené en Australie – Su pédiatriques ou mixtes
Enfants de 5 à 15 ans, traumatisme isolée ou non déformé de l'avant bras

CJP :PROMIS, à 4 semaines
CJS: diagnostics , suivi des complications, de la douleur, de la satisfaction et des temps de prise en charge.

# Ultrasonography or Radiography for Suspected Pediatric Distal Forearm Fractures

NEJM 2023
Snelling et al



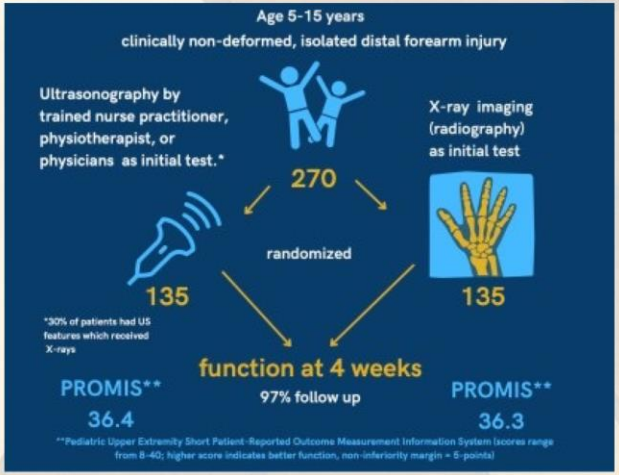

CJP: Fonction physique du bras à 4 semaines, mesurée par le score PROMIS (8 à 40, plus élevé = meilleure fonction), via questionnaire en ligne chez les enfants de 5 à 15 ans.

**Sources:** Don't Forget the bubbles, SKGEM

# Ultrasonography or Radiography for Suspected Pediatric Distal Forearm Fractures

NEJM 2023
Snelling et al

Résultats




| Outcome | Radiography | Ultrasonography |
|---|---|---|
| | *no. of patients* | |
| Primary outcome | | |
| Per-protocol population | 132 | 130 |
| Intention-to-treat population | 133 | 133 |
| Secondary outcomes | | |
| PROMIS score at 1 wk | 126 | 129 |
| PROMIS score at 8 wk | 117 | 120 |
| Diagnostic category | | |
| No fracture | 42 | 45 |
| Buckle fracture | 53 | 51 |
| Other fracture | 37 | 34 |
| Age | | |
| 5–9 yr | 59 | 55 |
| 10–15 yr | 73 | 75 |

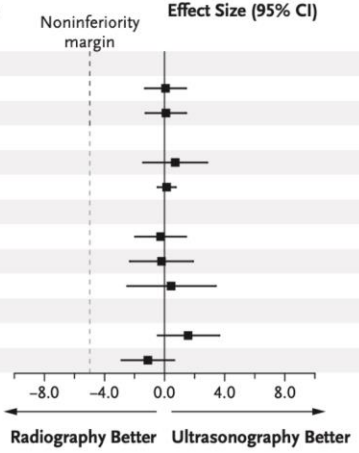



**Figure 1. PROMIS Scores at 4 Weeks.**

Children and adolescents with forearm injuries were randomly assigned to initially undergo point-of-care ultrasonography or radiography. The primary outcome was physical function of the affected arm at 4 weeks as assessed with the use of the validated Pediatric Upper Extremity Short Patient-Reported Outcomes Measurement Information System (PROMIS; scores range from 8 to 40, with higher scores indicating better function); the noninferiority margin was 5 points.

**Sources:** Don't Forget the bubbles, SKGEM

# Ultrasonography or Radiography for Suspected Pediatric Distal Forearm Fractures

NEJM 2023
Snelling et al

## Résultats

↑ **satisfaction du patient/parent**
↓ douleur à 1, 4 et 8 semaines
↓ **durée du séjour aux urgences**
↓ durée du traitement
↓ **jours d'absence scolaire**

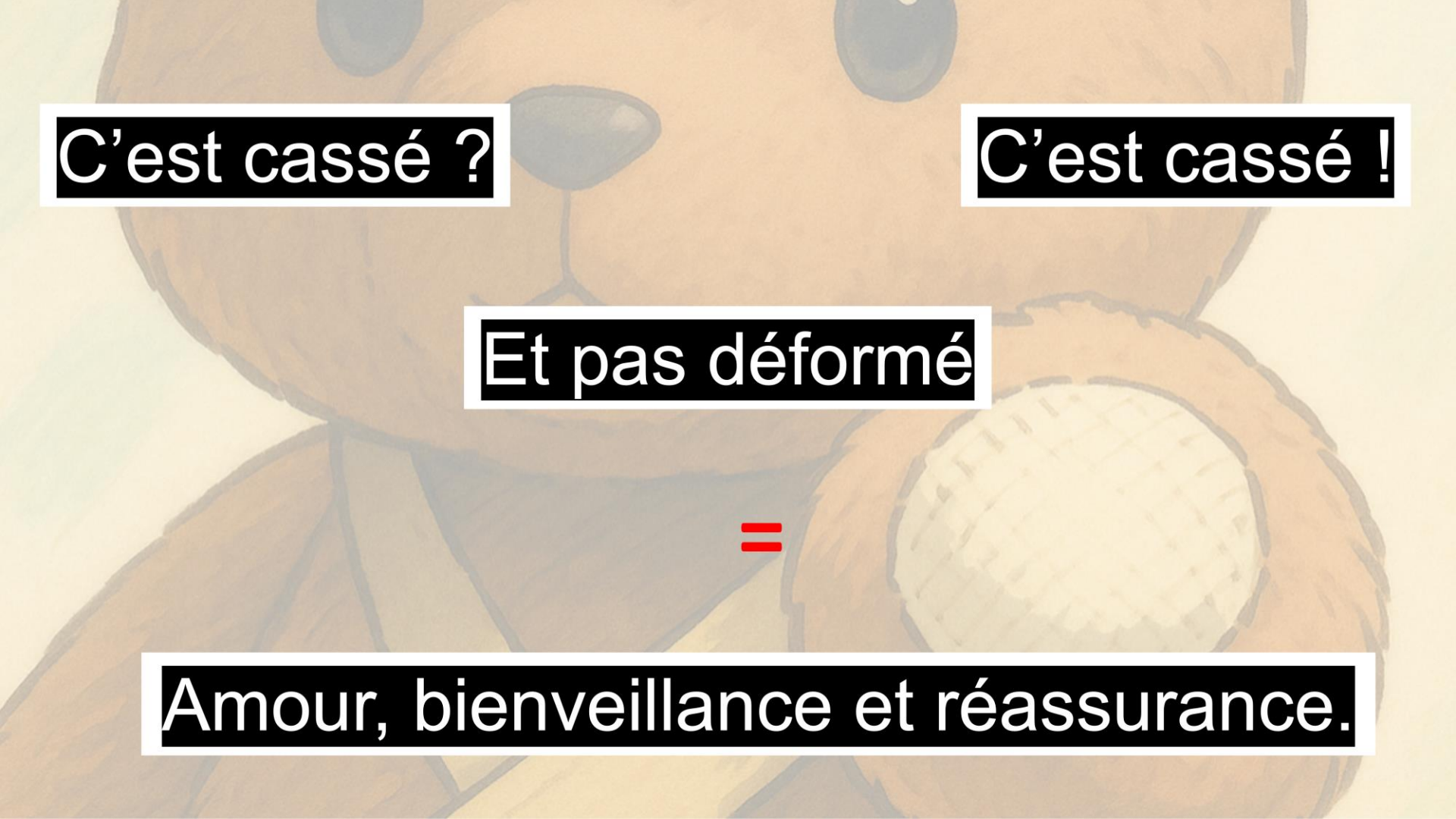
## Conclusion

**Des auteurs:**

Chez les enfants et adolescents présentant un traumatisme distal de l'avant-bras, l'utilisation de l'échographie comme méthode d'imagerie initiale s'est révélée non inférieure à la radiographie en ce qui concerne la fonction physique du bras à 4 semaines.

**La mienne:**
**L'échographie peut être une méthode appropriée** pour diagnostiquer les fractures en cas de **traumatismes distaux de l'avant-bras sans déformation clinique**, notamment lorsque l'accès à la radiographie est difficile.

**Sources:** Don't Forget the bubbles, SKGEM


C’est cassé ?
C’est cassé !
Et pas déformé
=
Amour, bienveillance et réassurance.


# IA et triage : gadget, aide ou danger ?

# IA et triage : gadget, aide ou danger ?

## Rationnel

⏱️ Triage = étape critique, souvent sous pression.

⚠️ Problèmes : subjectivité, sous/sur-triage, surcharge.

🤖 IA permetrait de :

- Réduire les biais
- Identifier les patients critiques
- Optimiser les ressources

# IA et triage : gadget, aide ou danger ?

## Rationnel

🤖 L'IA analyse des données cliniques structurées et non structurées.

💬 Exemples : motif de consultation, paramètres vitaux, mais aussi texte libre du dossier.

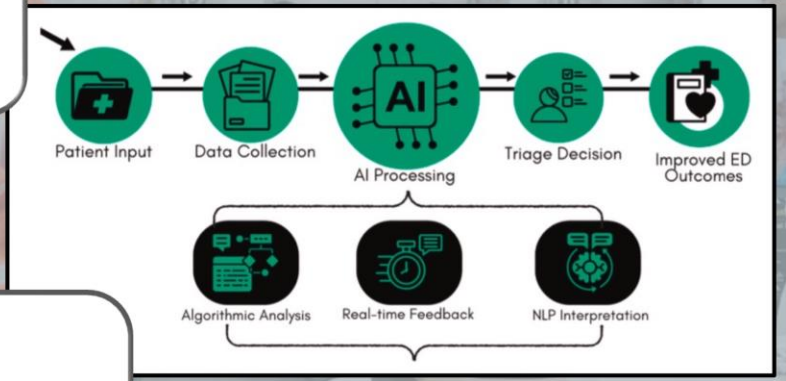
🛠️ Outils : NLP, modèles prédictifs, LLM (grands modèles de langage).

# AI-driven triage in emergency departments: A review of benefits, challenges, and future directions

Int J Med Inform
2024
Da'Costa et al

## Rationnel

**Objectif :** Faire le point sur les **bénéfices, défis, composants techniques et perspectives** des systèmes de tri basé sur de l'IA




## Méthode

- Revue narrative de la littérature (2015–2024) sur l'IA appliquée au tri en MU
- Sources : PubMed, Scopus, IEEE Xplore, Google Scholar

# AI-driven triage in emergency departments: A review of benefits, challenges, and future directions

Int J Med Inform
2024
Da'Costa et al

Résultats

**Composants clés des systèmes IA de triage**

📊 Collecte et traitement des données (antécédents, paramètres vitaux, données démographiques)

🤖 Modèles algorithmiques : arbres de décision, réseaux de neurones, régression

⏱️ Analyse en temps réel : priorisation dynamique selon les ressources disponibles

📄 NLP : analyse des observations cliniques et données non structurées

1. Amélioration de la priorisation des patients et réduction des délais de soins
2. Décisions moins subjectives
3. Allègement de la charge cognitive des soignants
4. Optimisation des ressources (filières, personnel etc.)

# AI-driven triage in emergency departments: A review of benefits, challenges, and future directions

Int J Med Inform
2024
Da'Costa et al

MAIS

🔎 Qualité et diversité des données
⚖️ Biais algorithmiques (ex. sous-évaluation de patients selon genre/ethnie)
🔐 Enjeux éthiques et de confidentialité des données
❓ Acceptabilité par les soignants (manque de transparence, "boîte noire")

Et après

🎯 Amélioration continue des algorithmes avec données diversifiées
⌚ Intégration avec dispositifs connectés (wearables)
🎓 Formation des soignants à l'usage de l'IA
📜 Développement de cadres éthiques (transparence, supervision humaine)

# Use of a Large Language Model to Assess Clinical Acuity of Adults in the Emergency Department

Jama Open 2024
Williams et al

## Rationnel

**Objectif :** Évaluer si un grand modèle de langage (LLM, ici GPT-4) peut correctement classer l'acuité des patients

## Méthode

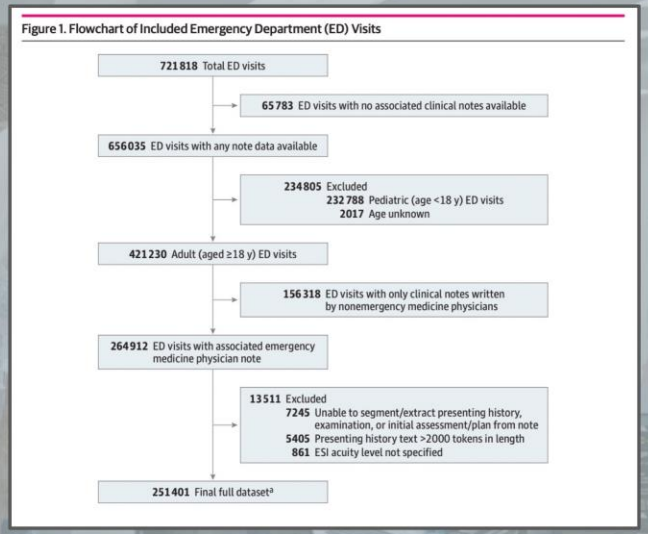
- Analyse de 251 401 passages aux urgences adultes (UCSF, 2012–2023)
- Constitution de 10 000 paires de patients avec niveaux ESI différents (5 niveaux)
- Le LLM devait désigner, à partir du texte seul, le patient le plus grave dans chaque paire
- Comparaison avec un médecin humain sur un sous-échantillon de 500 paires

# Use of a Large Language Model to Assess Clinical Acuity of Adults in the Emergency Department

Jama Open 2024
Williams et al

Résultats

**GPT-4 : 89 % de précision** globale (vs 84 % pour GPT-3.5)
**Comparable à un médecin** (88 % LLM vs 86 % humain sur 500 paires)
Performance maximale (100 %) sur les cas très contrastés (ex : ESI 1 vs ESI 5)



# Use of a Large Language Model to Assess Clinical Acuity of Adults in the Emergency Department

Jama Open 2024
Williams et al

**Interprétation**

LLM capable de **stratifier**

**Comparable au raisonnement clinique humain** sur des tâches de catégorisation

**Mais**

Utilisation de l'histoire clinique seule

Données post-tri

Performances moindres pour les distinctions fines tri 4 vs 5

# Impact of Artificial Intelligence–Based Triage Decision Support on Emergency Department Care

NEJM AI 2025
Taylor et al

## Rationnel

**Objectif :** Évaluer évaluer l'impact de la mise en place d'un outil de tri, se basant sur l'IA, sur la performance du tri et la fluidité des parcours patients.

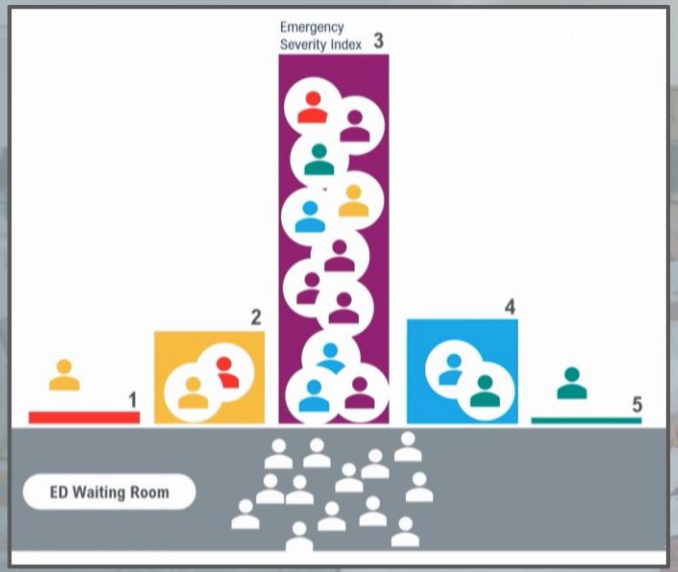
## Méthode

- Etude Avant/Après, dans 3 SU, sur un an (180 jours avant et après)
- Algo/outil TriageGO: intégré au dossier patient, utilisant ; âge, sexe, paramètres vitaux, mode d'arrivée, antécédents, motif de recours
- **CJP:** sensibilité/spécificité du besoin en soins critiques, chirurgie urgente et hospi.
- **CJP « flux »:** temps avant prise en charge, avant décision et avant sortie.

# Impact of Artificial Intelligence–Based Triage Decision Support on Emergency Department Care

NEJM AI 2025
Taylor et al

Résultats




# Impact of Artificial Intelligence–Based Triage Decision Support on Emergency Department Care

NEJM AI 2025
Taylor et al

**Résultats**

- Sensibilité et Spécificité améliorée: 78,8 % à 83,1 % (soins critiques)
- Impact sur les flux patients (médianes) :
  Temps arrivée → prise en charge :–33 %
  Temps arrivée → décision d'orientation : –4,2 %
  Temps arrivée → sortie des urgences : –6,1 %

**Mais**

- Taux d'adhésion médian : **70 %**, avec forte variabilité inter-individuelle

**Lien homme/machine**

IDE + IA : surpassaient IA seule

À l'inverse, IDE qui ne suivaient jamais l'IA : moins bonne performance que le modèle seul.

# IA et triage : gadget, aide ou danger ?

## Conclusion

⏱️ Amélioration des patients les plus graves
⏱️ Optimisation des flux

Mais quel est le bon critère?

⚠️ Acceptabilité variable
🤖 Outils d'aide et non remplaçants