

## Amsterdam University of Applied Sciences

### Body weight-supported bedside treadmill training facilitates ambulation in ICU patients

*an interventional proof of concept study*

Sommers, Juultje; Wieferink, DC; Nollet, F; Dongelmans, Dave A; Engelbert, R.H.H.; van der Schaaf, M.

**Publication date**

2017

**Document Version**

Final published version

**License**

CC BY

[Link to publication](#)

**Citation for published version (APA):**

Sommers, J., Wieferink, DC., Nollet, F., Dongelmans, D. A., Engelbert, R. H. H., & van der Schaaf, M. (2017). *Body weight-supported bedside treadmill training facilitates ambulation in ICU patients: an interventional proof of concept study*. Poster session presented at WCPT , Capetown, .  
<http://www.abstractstosubmit.com/wcpt2017/abstracts/main.php?do=YToyOntzOjU6Im1vZHVsljzOjY6ImRldGFpbCI7czo4OiJkb2N1bWVudCI7aTo1MDY7fQ==&>

**General rights**

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

**Disclaimer/Complaints regulations**

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please contact the library:

<https://www.amsterdamuas.com/library/contact/questions>, or send a letter to: University Library (Library of the University of Amsterdam and Amsterdam University of Applied Sciences), Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.



# Body weight-supported bedside treadmill training facilitates ambulation in ICU patients: An interventional proof of concept study

J. Sommers, PT, MSc<sup>1</sup>, D.C. Wieferink, PT<sup>1</sup>, D.A. Dongelmans, MD, PhD.<sup>2</sup>, F. Nollet, MD, PhD.<sup>1,3</sup>, RHH. Engelbert, PT, PhD.<sup>1,3</sup>, M. van der Schaaf, PT, PhD.<sup>1,3</sup>

<sup>1</sup>:Department of Rehabilitation, <sup>2</sup>: Department of Intensive Care Academic Medical Center, University of Amsterdam, The Netherlands.

<sup>3</sup>: ACHIEVE-Centre of Applied Research, Faculty of Health University of Applied Sciences, Amsterdam, The Netherlands.

Journal of Critical Care, 2017



## Background

- Intensive Care Unit-acquired weakness (ICU-AW) is associated with short- and long- term physical impairments and impaired functional status.
- Early mobilisation and ambulation of patients admitted to the ICU improve functional recovery.
- Severe weakness in combination with tubes, lines and machinery are practical barriers for the implementation of ambulation of critically ill patients.

## Objective

- To explore the feasibility of Body Weight- Supported Treadmill Training (BWSTT) at the bedside in the ICU.

## Methods

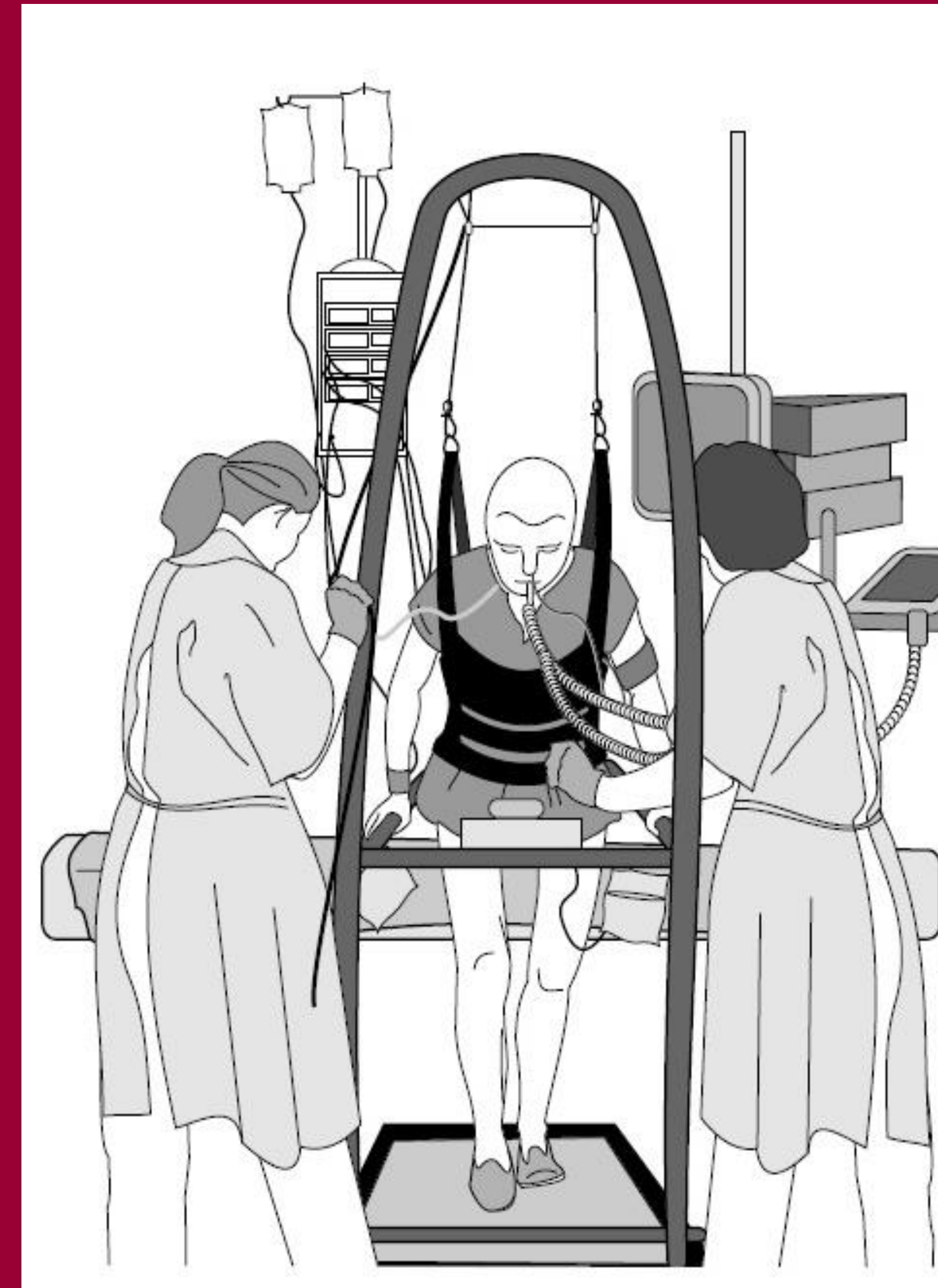
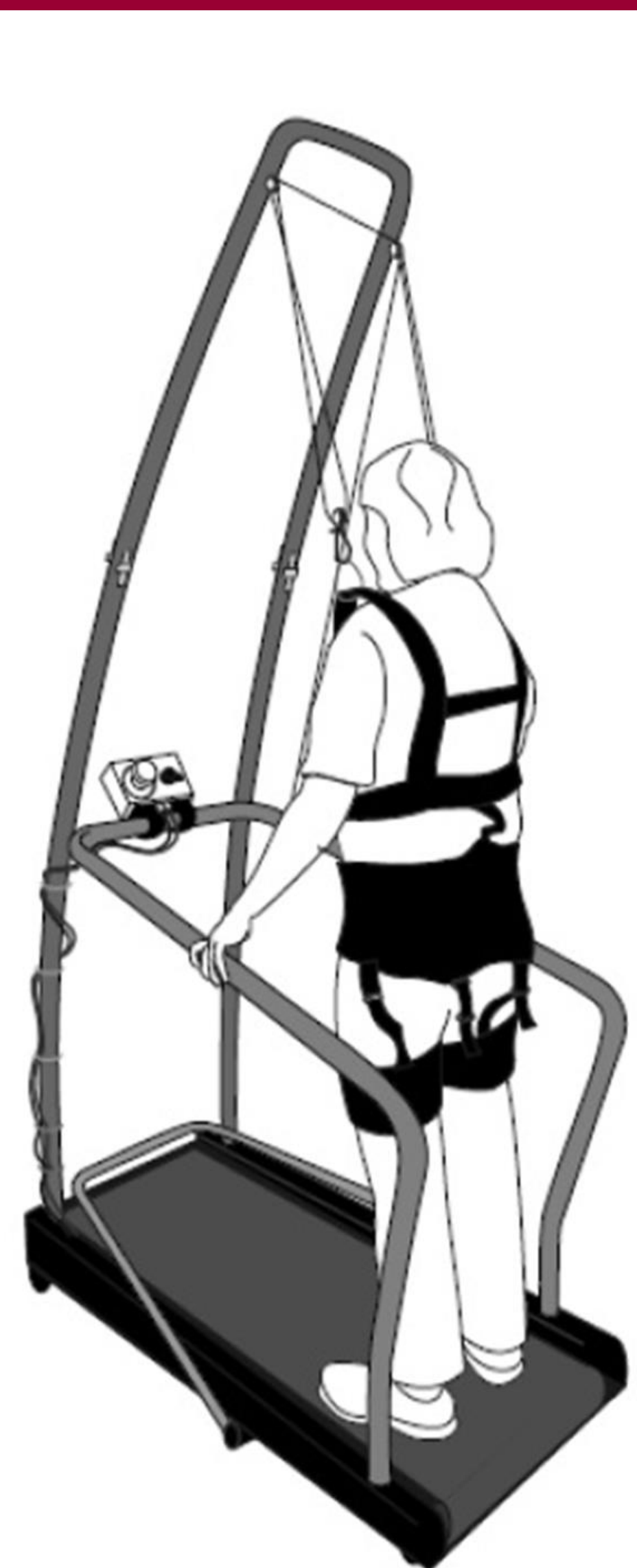
- Single centre interventional study
- Tertiary 34-bed mixed medical-surgical ICU of the Academic Medical Center, University of Amsterdam, the Netherlands

### Inclusion criteria:

- Adult ICU-patients, mechanically ventilated for  $\geq 48$  hours
- No contra-indication for mobilisation or activation
- Able to follow instructions
- Muscle strength m. quadriceps MRC  $\geq 2$
- Independent sitting balance

## Intervention

- The BWST enables ambulation at the bedside within the range of ventilator tubes, lines and monitoring equipment.
- In patients with insufficient motor control or muscle strength for ambulation, a harness is used in combination with a weight bearing construction.



## Measurements

- Feasibility was evaluated according to:
  - Eligibility
  - Successful number of BWSTT
  - Number of staff needed
  - Adverse events
  - Number of patients that could not have walked without BWSTT
  - Patient satisfaction and anxiety

## Results

Patients characteristics at the first time of BWSTT		
	median (IQR) or n	n=20
Age, years	69.5 (52.8 – 77.5)	
Male	12 (60%)	
<b>Medical category</b>		
• Medical	9 (45%)	
• Non-elective surgery	4 (20%)	
• Elective surgery	7 (35%)	
APACHE II	18 (15 – 20)	
Time in ICU to first BWSTT, days	23.0 (10.0 – 56.3)	
Mechanical ventilation, days	10.0 (7.1 – 31.5)	
MRC sum score	40 (32.5 – 47.5)	
ICU-AW (MRC < 48)	15 (75%)	
Functional Ambulation Categories (FAC range 0-5)	0.0 (0.0 – 1.0)	
Functional Ambulation Categories 0	13 (65%)	
<b>Characteristics of ICU treatment devices during BWSTT</b>		
Continuous monitoring	20 (100%)	
Patients with mechanical ventilation	4 (20%)	
Patients with tracheostomy	8 (40%)	
Surgical wounds	11(55%)	
-Sternotomy	6 (55%)	
-Abdominal	3 (27%)	
-neck	2 (18%)	
Patients with infusion lines or drains	20 (100%)	

## Results

- BWSTT was performed in:
  - 20 patients and 54 sessions
  - 53 sessions were successfully performed
- Two numbers off staff needed
- BWSTT is feasible and safe:
  - Median treatment time 25 minutes
  - No adverse events
  - Patients are not anxious
  - Patients are very satisfied
  - All patients were not able to walk or would have walked shorter distance without the BWSTT

## Conclusion

- BWSTT is feasible and safe and facilitates early ambulation with critically ill patients in the ICU.
- To perform BWSTT less staff is needed compared to ambulation without BWSTT.

## References

- Hermans G, Crit. Care 2015;19:274.
- Needham DM, Crit Care Med. 2009;37(10 Suppl):S436-S441
- Harrold ME, Crit. Care. 2015;19:336.
- Burtin C, Crit Care Med 2009; 37: 2499-505.
- Sommers J, Clinical Rehabilitation. 2015; DOI: 10.1177/0269215514567156

## Contact

Juultje Sommers: [j.sommers@amc.uva.nl](mailto:j.sommers@amc.uva.nl)