THE LEARNING CURVE IN HAND HYGIENE TECHNIQUE – A MULTI-INSTITUTIONAL STUDY

FIS-HIS 2016

T. Haidegger[a,b], Á. Lehotsky[c], Sz. Bánsághi[b], P. Sraud[b], P. Róna[b], P. Szerémy[b], L. Szilágyi[d]

[a] Obuda University, Budapest, Hungary / Austrian Centre for Medical Innovation and Technology, Wiener Neustadt, Austria
[b] HandInScan Zrt.
[c] Dept. of Surgical Research and Techniques, Semmelweis University, Budapest, Hungary
[d] Computational Intelligence Research Group, Dept. of Electrical Engineering, Sapientia University of Transylvania, Tîrgu Mures, Romania

INTRODUCTION

- Implementation of proper hand hygiene is the real challenge in hospital settings.

- Our study was focused on the **quality of hand rubbing**, employing an innovative imaging-based device, deriving the **learning curve in hand rubbing**, measuring the time to achieve optimal performance.

- Learning curves is a graphical presentation of learning, usually used when the same task is repeated in a series, like hand hygiene during patient care.

- Aim of the study was to test the learning curves through observing the **effect of immediate, direct feedback** on hand hygiene technique.

METHODS

- **168 healthcare workers** (HCW) were involved from **3 Hungarian hospitals**, on a voluntary basis

- Computer-enhanced fluorescein trials were conducted by the Semmelweis Scanner, a novel hand hygiene control device was employed, providing instantaneous, **objective visual feedback** on hand hygiene performance

- Records were conducted in **2–3-day intervals**

- Every hand hygiene occasion was recorded and analyzed.

- HCW failed if there was at least one missed area on hands

- To specify frequently missed area during hand hygiene hands were divided to 10 regions

OBJECTIVE HAND SCANNING METHOD

reddot award winner

Insert your right hand

Passed   Failed

Semmelweis Scanner assessment protocol:

- Logging in with unique, personal identifier (RFID)
- Performing alcoholic hand disinfection (with UV-dyed ABHR)
- Inserting hands for scanning, digital record is taken
- The device performs the evaluation: it highlights the missed areas during disinfection

RESULTS

- Average **success rate increased significantly; from 58% to 87%** (Fig. A)

- Significant improvement in hand hygiene performance were observed for the 5th measurement

- 97% of not correctly rubbed areas were located on the backhands

- **Most frequently missed** areas were **thumbs and fingertips** (Fig. B)

A

B

Most frequently missed (>10%)
Frequently missed (2–10%)
Less frequently missed (<2%)

Left backhand   Right backhand
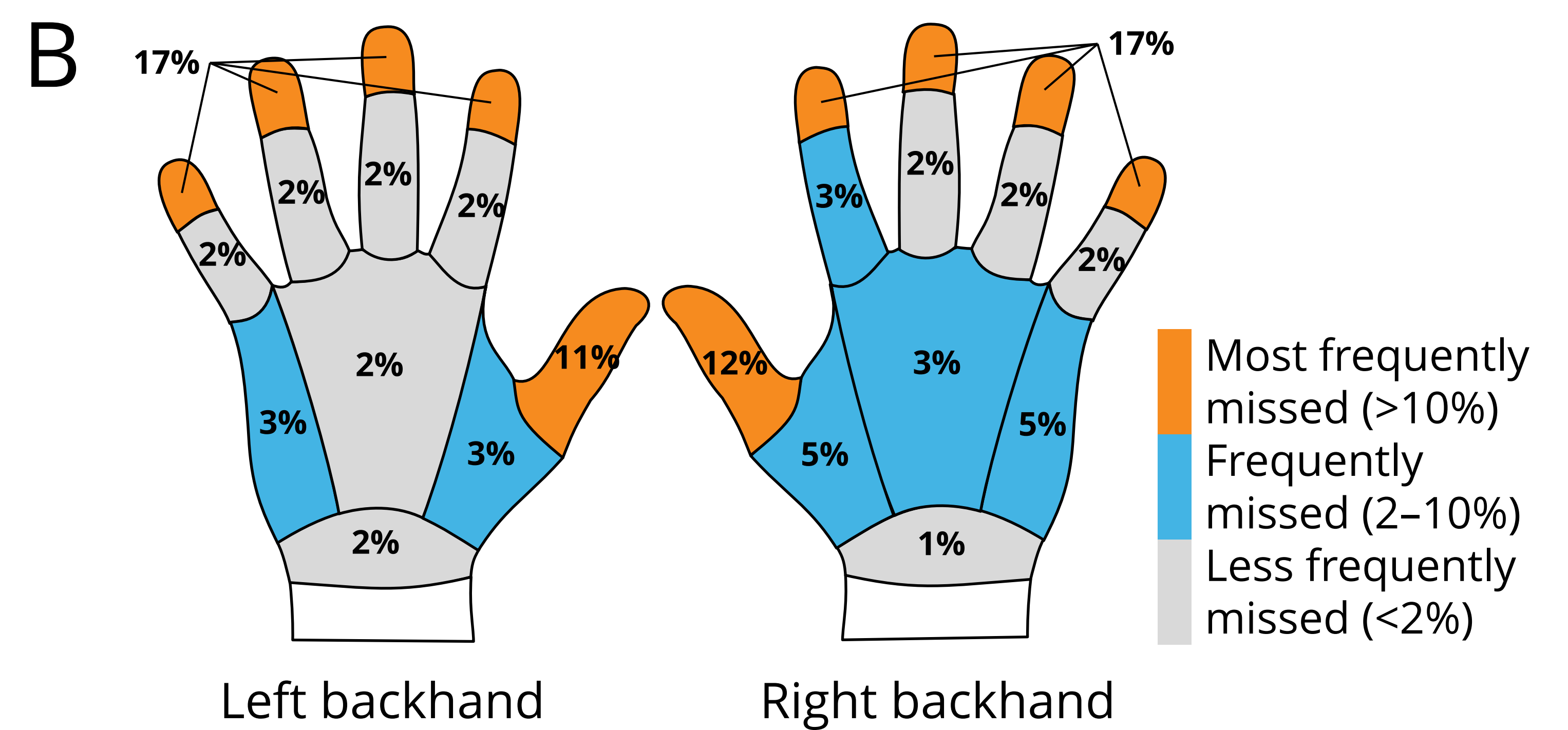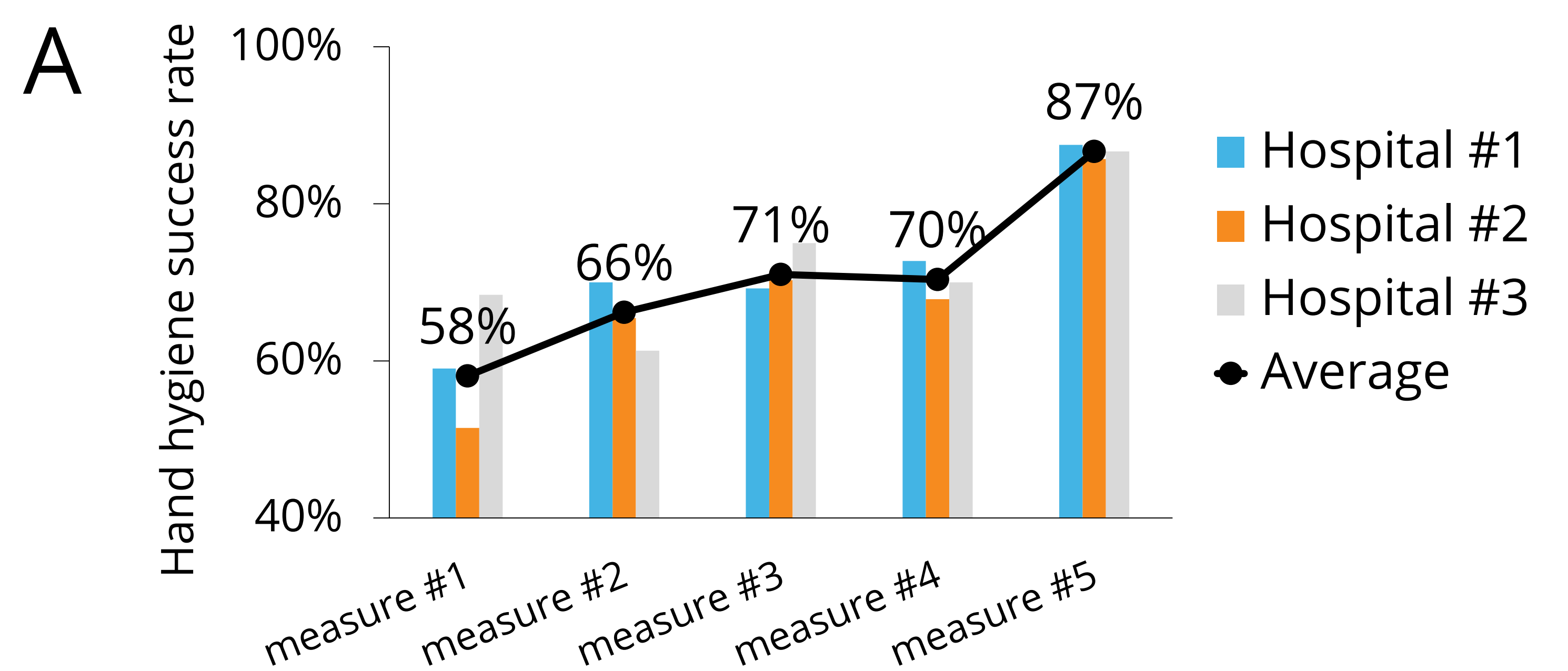
CONCLUSION

- **Continuous monitoring** can eliminate erroneous habits in hand hygiene technique

- **Repetitive practice**—on average 5 consecutive measurements—**required to significantly improve hand hygiene technique**

- **Visualization of mistakes and direct feedback** on the quality of hand rubbing can be used efficiently to acquire the skills for proper hand hygiene.

REFERENCES

- T. Haidegger, V. Varga et al. "Information Technology Tools Employed in Infection Control," in Proc. of the 16th IEEE Intl. Symp. on Computational Intelligence and Informatics (CINTI), Budapest, pp. 339–344, 2015
- A. Lehotsky, L. Szilagyi, et al. "The quantitative impact of direct, personal feedback on hand hygiene technique," J. of Hospital Infection (IF:2.78) vol. 91, issue 1, pp. 81–84, 2015
- L. Szilagyi, T. Haidegger et al, "A large-scale assessment of hand hygiene quality and the effectiveness of the WHO 6-steps," BMC Infectious Diseases, vol. 13, art. 249, 2013

CONTACT

Hand·in·Scan Hand Hygiene Matters

www.handinscan.com
info@handinscan.com

MŰEGYETEM 1782

acmit AUSTRIAN CENTER FOR MEDICAL INNOVATION AND TECHNOLOGY

AÖU