Title:	Intelligent IT makes automated HAI monitoring, surveillance, and reporting feasible and reliable
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Background

Due to quality management and patient safety reasons, HAI surveillance (HAIS) in hospitals has become a legal demand in many regions of the world. However, HAIS is a time-consuming task for highly trained experts, and unavailability of suitable workforce often meets with financial constraints. The clue question remains how to obtain reliable surveillance results without urging on doctor's or nurse's sparse time resources for documentation of the necessary surveillance data.

Objective

We took this challenge by developing and implementing intelligent information technology (IT) software for extracting and interpreting HAI-related surveillance information from structured clinical data held in electronic patient data management systems (PDMSs) of intensive care units (ICUs) and in microbiology laboratory systems.

Method

Our software is called MONI and builds on computerized and highly structured medical knowledge about all relevant clinical entities plus processing algorithms that evaluate, aggregate, and interpret clinical & microbiology data in a stepwise manner until it can automatically be mapped into consented HAI definitions (HELICS or CDC/NHSN). Fuzzification in several steps of the algorithms allows for interpretations that closely resemble human reasoning.

Results

Comparative clinical studies revealed high precision of MONI surveillance diagnoses (sensitivity >90%, specificity >99%). Featuring a day-to-day follow-up of infections, MONI can back clinical decision support (CDS). Key prerequisites are a capable PDMS embedded in a well-maintained hospital IT system as well as good communication between surveillance and IT managers.

Conclusion

Automated MONI surveillance saves 85% of doctors' and nurses' time consumed by conventional surveillance. Precision and capabilities of the system offer new approaches for CDS and research on HAIS. Extending PDMS from ICUs to other ward types augments the merits of automated intelligent HAIS.