Healthcare-associated infection surveillance and bedside alerts

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eHealth 2014, Vienna/Austria, 23 May 2014
**Target**

Development and implementation of intelligent, knowledge-based software able to extract and analyze healthcare-associated infection (HAI)-related surveillance information from structured clinical and laboratory data held in PDMSs and LISs.

**Moni-ICU and Moni-NICU**

Monitoring (for surveillance and alerts) of HAIs in ICUs with adult patients and in NICUs with neonatal patients.

**Characteristics**

1. PDMSs and LISs as electronic data sources provide structured medical data.
2. Medical knowledge bases containing computerized knowledge of every clinical entity involved.
3. Processing algorithms evaluate, aggregate, and interpret clinical data stepwise until raw data can be mapped into the given HAI definitions.
linguistic HAI definitions

 basic concepts:
symptoms, signs, test results, clinical findings

 intermediate concepts:
pathophysiological states

 abstraction:
rules, type-1 & type-2 fuzzy sets, temporal abstraction

 feature extraction:
mean values, scores, …

 preprocessing:
missing data, plausibility, …

 ICU, NICU, and microbiology patient data bases

 patient-specific cockpit

 legal reporting

 quality benchmarking
Standard ward reporting (example)

healthcare-associated infection by syndrome

catheter-related infection (CRI) by type

central-venous-catheter (CVC)-associated CRI rate
(n/1000 device days)
Two different hyperglycemia definitions

- Crisp threshold for surveillance
- Fuzzified threshold (gradual rise) for alert

Graph showing glucose levels and corresponding DoC:
- X-axis: glucose levels (mg/dl)
- Y-axis: DoC
- Thresholds indicated at different glucose levels.