

Healthcare-associated infection surveillance and bedside alerts

Klaus-Peter Adlassnig ^{a,b}, Angelika Berger ^c, Walter Koller ^d, Alexander Blacky ^d, Harald Mandl ^b, Lukas Unterasinger ^c, and Andrea Rappelsberger ^a

^a Section for Medical Expert and Knowledge-Based Systems
Center for Medical Statistics, Informatics, and Intelligent Systems
Medical University of Vienna
Spitalgasse 23, A-1090 Vienna, Austria

^b Medexter Healthcare
Borschkegasse 7/5, A-1090 Wien, Austria

^c Division of Pediatric Neonatology, Intensive Care, and Neuropediatrics
Department of Pediatrics and Adolescent Medicine
Medical University of Vienna
Währinger Gürtel 18-20, A-1090 Vienna, Austria

^d Clinical Institute of Hospital Hygiene
Medical University of Vienna and Vienna General Hospital
Währinger Gürtel 18-20, A-1090 Vienna, Austria



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 entities involved
 - (3) processing algorithms evaluate, aggregate, and interpret clinical data stepwise until raw data can be mapped into the given HAI definitions
-

Philips ICIP - [TEST_HUBER_Z-Zwei-Knabe | PatNr. ...] - TEST_HUBER_Z-Zwei-Knabe

carevuetest

TEST_HUBER_Z-Zwei-Kn

Aufnahme | Übersichten | Anästhesie | Verordnungen | Krankenblätter | Pflege | Formulare | Notizen | Konsil | Befunde | Weitere | Entlassung | OFF | Arbeitsordner

Krankenblatt (Neo) 07.07.2011 08.07.2011

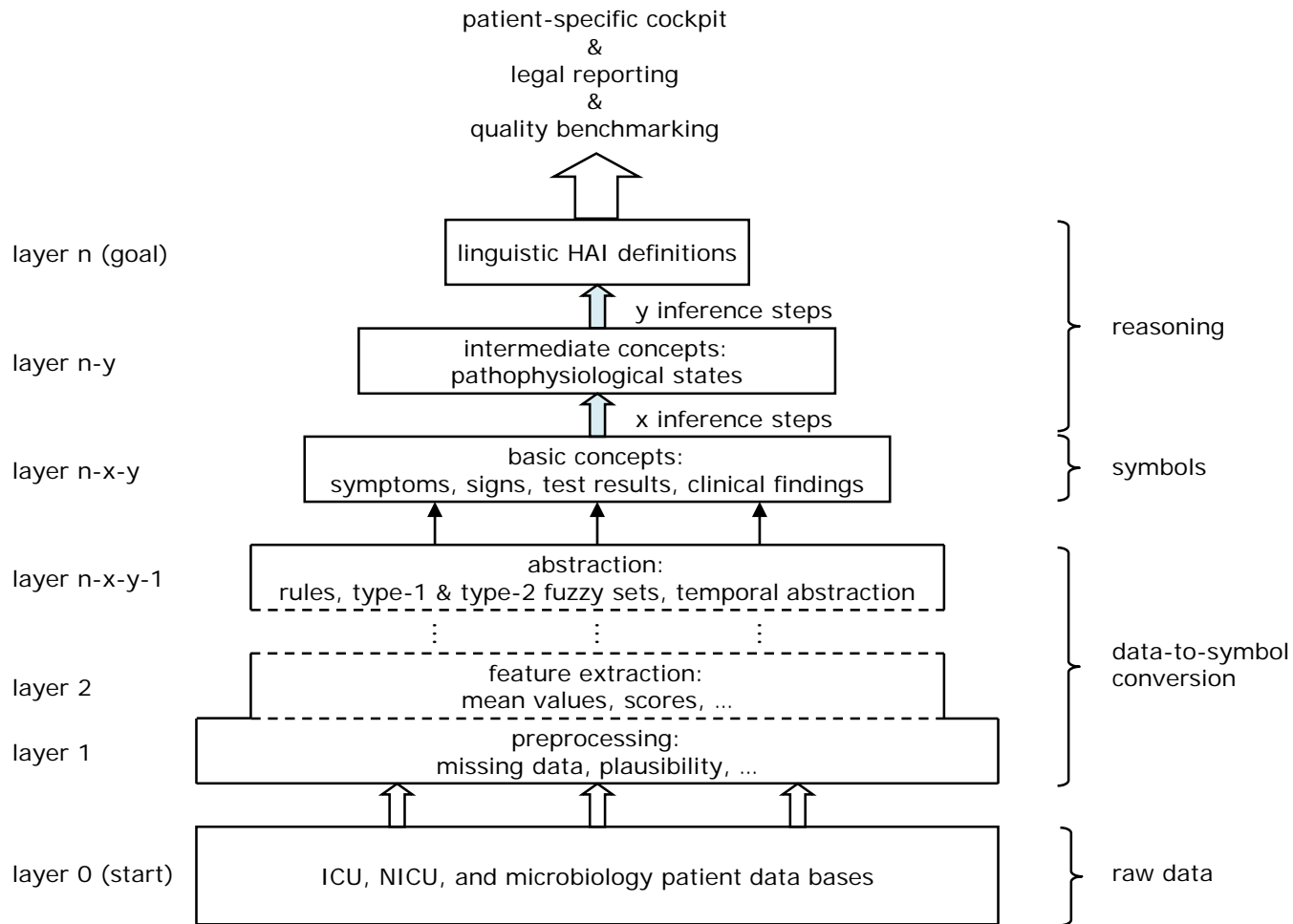
[Auto-Dokumentation alle 15 Minu] 17:00 19:00 21:00 23:00 01:00 03:00 05:00 07:00

AF Monitor...
 HF [1/min]...
 NBP [mmHg]
 ART [mmHg]
 SaO2 Pulso...

HF [1/min]	189	190	191	170	172	167	172	166
Puls [1/min]	189	190	191	170	181	168	172	167
AF Monitor [1/min]	50	55	49	47	54	52	66	51
ART [mmHg]								
NBP [mmHg]	63/41 (51)		/ (50)		65/44 (52)			
SaO2 Pulsoxym. [%]	92	98	90	93	90	93	85	88
SaO2 Messort								
Ta [°C]	37,3	37,6	37,6	36,8	36,9	37,4	36,9	36,4
Temp [°C]								
Hautfarbe (Neo)								
Stamm (Neo)								
Summe Urin (24h)								
Summe Windel (24h)								
Summe Einfuhr (24h)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Summe Ausfuhr (24h)								
Nettobilanz (24h)	0	0	0	0	0	0	0	0

Start | Philips ICIP - [NICU_E...]

08.07.2011 08:20





from 2011-12-01 to 2011-12-05 show clinic show department diagram fixed table width

department / patient	
Stat. 11857	
Stat. 11888	
Stat. 11889	
Stat. 11890	
Stat. 12043	
Stat. 12045	
Stat. 12074	
Stat. 12075	
Stat. 83644	
Stat. 62354	
Pat. 145107	
Pat. 145132	
Pat. 145114	
Pat. 145126	
Pat. 145124	
Pat. 145121	
Pat. 145119	
Pat. 145109	
Pat. 145130	
Pat. 145112	
Pat. 145128	
Stat. 62621	
Stat. 11408	
Stat. 30488	
Stat. 88879	

Pat. 145114	
2011-12-14 (Stat. 62354) no data	
2011-12-13 (Stat. 62354) no data	
2011-12-12 (Stat. 62354) no data	
A 2011-12-11 (Stat. 62354)	
A 2011-12-10 (Stat. 62354)	
A 2011-12-09 (Stat. 62354)	
A 2011-12-08 (Stat. 62354)	
A 2011-12-07 (Stat. 62354)	
A 2011-12-06 (Stat. 62354)	
A 2011-12-05 (Stat. 62354)	
A 2011-12-04 (Stat. 62354)	
A 2011-12-03 (Stat. 62354)	
BSI-3 (KISS) 100 %DoC	
BSI-3 (Alert) 100 %DoC	
klin. Anzeichen f. Pneumonie (KISS) 85 %DoC	
klin. Anzeichen f. Pneumonie (Alert) 85 %DoC	
2 klin. Anzeichen f. Sepsis (KISS) 100 %DoC	
2 klin. Anzeichen f. Sepsis (Alert) 85 %DoC	
2 Labor- und klin. Anz. f. Sepsis (KISS) 100 %DoC	
2 Labor- und klin. Anz. f. Sepsis (Alert) 100 %DoC	
andere Sepsiszeichen (KISS) 85 %DoC	
andere Sepsiszeichen (Alert) 85 %DoC	
laborchem. Zeichen für Pneumonie (Alert) 100 %DoC	
laborchem. Zeichen für Entzündung (Alert) 100 %DoC	
erhöhter Beatmungsaufwand (Alert) 85 %DoC	
erhöhtes CRP (abs., Alert) 100 %DoC	
eitriges Trachealsekret 100 %DoC	
imp.: kein Erreger in nicht-Blut ja	
imp.: nicht beatmet (KISS) ja	
imp.: Antinfektivum ja	
imp.: ZVK (Zentralvenenkath.) ja	
A 2011-12-02 (Stat. 62354)	
A 2011-12-01 (Stat. 62354)	
2011-11-30 (Stat. 62354)	
2011-11-29 (Stat. 62354)	
2011-11-28 (Stat. 62354)	
2011-11-27 (Stat. 62354) no data	
2011-11-26 (Stat. 62354) no data	
2011-11-25 (Stat. 62354) no data	

BSI-3 (KISS)	
UND 100 %DoC	
imp.: keine Blutkultur ja	
imp.: kein Erreger in nicht-Blut ja	
Antinfektiva für 5 Tage ja	
2 Labor- und klin. Anz. f. Sepsis (KISS) 100 %DoC	

2 Labor- und klin. Anz. f. Sepsis (KISS)	
MIND. 2 VON 100 %DoC	
pathol. Körpertemperatur 100 %DoC	
neue Hyperglykämie (KISS) 100 %DoC	
ODER 100 %DoC	
laborchem. Zeichen für Entzündung (KISS) 100 %DoC	
andere Sepsiszeichen (KISS) 85 %DoC	

neue Hyperglykämie (KISS)	
UND 100 %DoC	
NICHT 100 %DoC	
Hyperglykämie (KISS) (t-1d) 100 %DoC	
Hyperglykämie (KISS) 100 %DoC	

Hyperglykämie (KISS)	
maximale Glukose 178 mg/dl	

maximale Glukose	
imp.: Glukose 89 mg/dl	
imp.: Glukose 154 mg/dl	
imp.: Glukose 178 mg/dl	
imp.: Glukose 160 mg/dl	

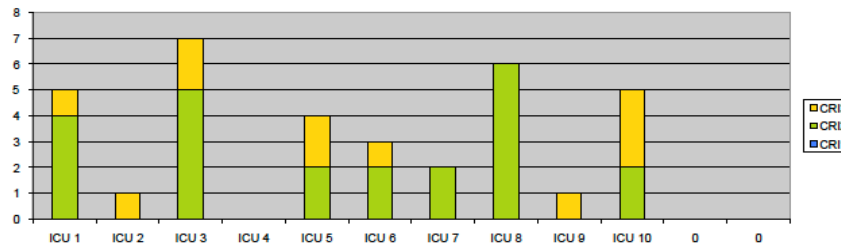
Standard ward reporting (example)

healthcare-associated infection by syndrome

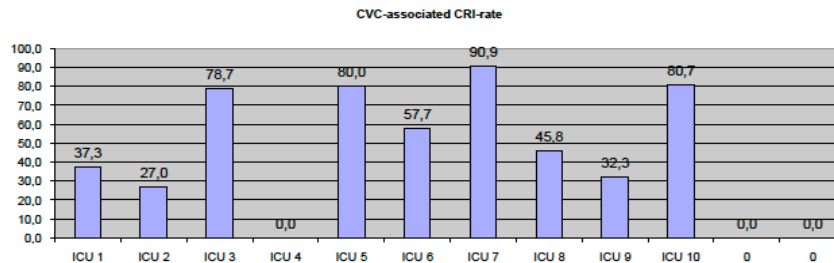
CVC-associated infections

	ICU 1	ICU 2	ICU 3	ICU 4	ICU 5	ICU 6	ICU 7	ICU 8	ICU 9	ICU 10		
CRI1												
CRI2	4		5		2	2	2	6		2		
CRI3	1	1	2		2	1			1	3		
total CRI	5	1	7		4	3	2	6	1	5		

catheter-related infection (CRI) by type



central-venous-catheter (CVC)-associated CRI rate (n/1000 device days)



Two different hyperglycemia definitions

