Università degli Studi di Padova
Scuola di Specializzazione in Biochimica Clinica (A.A. 2005-2006)
INDIRIZZI: DIAGNOSTICO E ANALITICO TECNOLOGICO

Biochimica Clinica e Biologia Molecolare Clinica:
automazione ed informatica in Biochimica Clinica
area D SSD BIO/12 ex E05C ore 20 anno IV
-OBIETTIVO FORMATIVO: Acquisire le conoscenze informatiche per la gestione del laboratorio

Informatica per la comunicazione nel laboratorio medico

Informatica per la comunicazione nel laboratorio medico

Marco Pradella
Castelfranco veneto

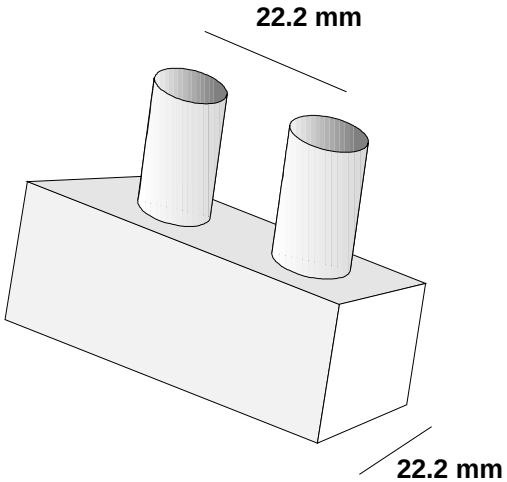
sommario

- direttive per la comunicazione
- comunicazione e standardizzazione
- automazione, la teoria
- standard CLSI - NCCLS
- ISO e CEN
  - ISO 17113
  - CEN prEN 1614
  - CEN pEN 14720 service request report
  - ISO 18812 analyzer interface
- HL7 & LOINC
- SNOMED
- Applicazioni: CDC, IHE, ELINKs, CALINX

CLSI-NCCLS: Laboratory automation

- **AUTO1 contenitore carrier**
- **AUTO2 codice barre**
- **AUTO3 comunicazione strumenti**
- **AUTO4 cruscotto sistemi**
- **AUTO5 interfacce elettromeccaniche**
- **AUTO6 poct (ora POCT01)**
- **AUTO7 identificazione campione**
- **AUTO8 validazione LIS**
- **AUTO9 accesso remoto internet**
- **AUTO10 autoverifica**
- **AUTO11 IVD software**
- **LIS1 interfaccia strumento**
- **LIS2 interfaccia LIS-HIS**
- **POCT1 connettività point-of-care**
- **M39 statistica resistenze**

NCCLS AUTO1-A 2000: *il supporto*



CODE-128

1234567890

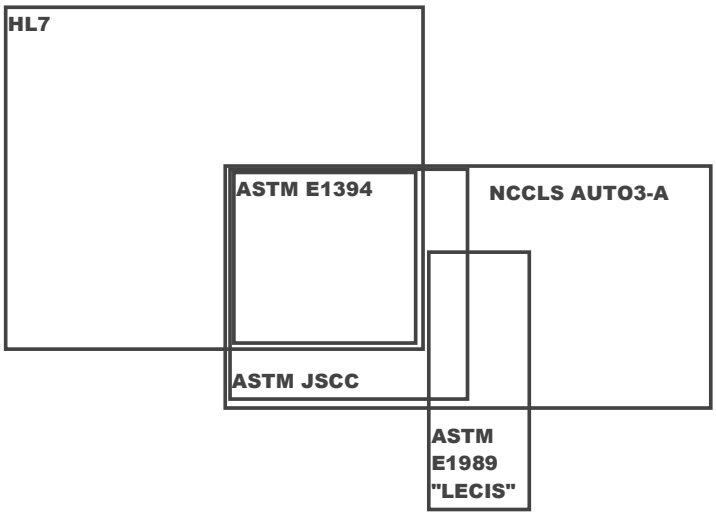
NCCLS AUTO2-A

Proposed Standard for <u>Laboratory Automation: Bar Codes for Specimen Container Identification</u>

Razionale della proposta

- **codice 128: più denso, sicuro, largamente usato, robusto per la stampa**
- **altezza min. 10 mm: garantisce sicurezza nella posizione del contenitore, anche un po' obliqua**
- **barra sottile min. 0.191 mm: con stampanti moderne**
- **zona morta min 10 x 0.191; raccomandato 3.5 mm**
- **minimo 3 caratteri: la trasposizione deve essere rivelata da un checksum**
- **no caratteri o spazi in più**
- **area riservata del contenitore: 20 mm dal fondo e 14 mm dall'apertura**
- **max 4 etichette per contenitore**
- **larghezza etichetta min 5 mm meno della circonferenza del contenitore**

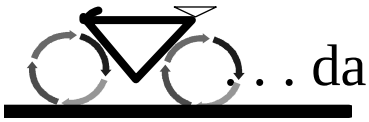
Schema relazioni tra standard (da NCCLS AUTO3-A 2000)



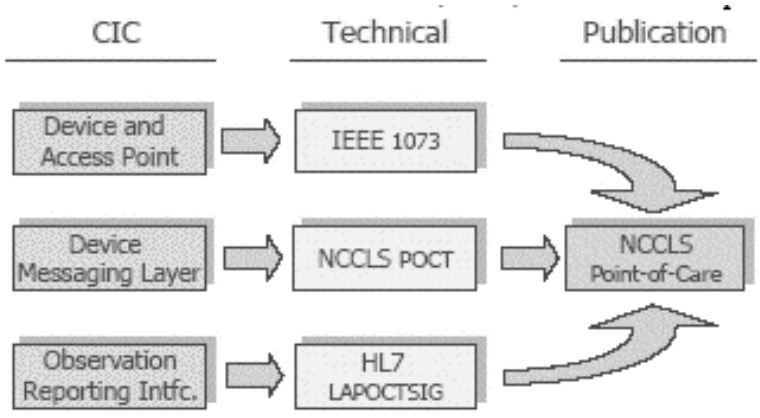
E1238-97 Standard Specification for Transferring Clinical Observations Between Independent Computer Systems

Developed by ASTM Subcommittee: E31.13

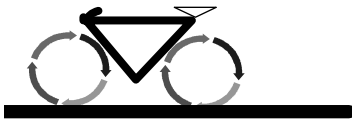
10 Record dei risultati
10.1 contenuti
10.1.1 tipo record: R
10.1.2 sequenza: numero del paziente nel messaggio
10.1.3 ID dell'esame
10.1.3.1 codice internazionale
10.1.3.2 nome (associato al codice)
10.1.3.3 schema di codificazione
10.1.3.4 codice locale o del produttore
10.1.4 risultato: uno per record (di regola)
10.1.5 unità: ISO 2955
10.1.6 intervallo di riferimento:
10.1.6.1 da XX a YY (precedente: XX-YY)
10.1.6.2 intervalli multipli: delimitatori di ripetizione (\) con descrizione (sotto-sottocampo: ^)
10.1.7 segno di normalità (N, A, >, <, H, L, HH, LL, U, D, B, W)
10.1.8 tipo di intervallo di riferimento: età (A), sesso (S), razza ®
10.1.9 stato del risultato: finale F, preliminare P, correzione C, non eseguibile X, parziale S, ripetizione R, per reflex N, MIC M, su richiesta Q, validato V, dubbio W
10.1.10 data di variazione dell'intervallo di riferimento
10.1.11 operatori:
10.1.11.1 esecutore
10.1.11.2 validatore
10.1.12 ora inizio dell'analisi
10.1.13 ora completamento dell'analisi
10.1.14 identificativo strumento



. . da CIC a POCT1



Collegamento a slideISO DIS 11073-90101_POCT.pdf.lnk



Esempio di messaggio POCT1

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE OBS.R01 SYSTEM "OBS.R01.dtd">
<OBS.R01>
<HDR>
<HDR.control_id V="10003"/>
<HDR.version_id V="POCT1"/>
<HDR.creation_dttm V="2001-11-01T16:30:06-08:00"/>
</HDR>
<SVC>
<SVC.role_cd V="OBS"/>
<SVC.observation_dttm V="2001-11-01T16:29:54-08:00"/>
<SVC.status_cd V="NRM"/>
<SVC.reason_cd V="NEW"/>
<SVC.sequence_nbr V="2524"/>
<PT>
<PT.patient_id V="PT222-55-7777"/>
<PT.location V="ICU-4"/>
<PT.name V="Jan Patient">
<GIV V="Janet"/>
<FAM V="Patient"/>
</PT.name>
<PT.birth_date V="1960-08-29"/>
<PT.gender_cd V="F"/>
<PT.weight V="110" U="lbs"/>
<PT.height V="66" U="inches"/>
<OBS>
<OBS.observation_id V="1517-2" SN="LN" DN="Glucose"/>
<OBS.value V="85" U="mg/dL"/>
<OBS.method_cd V="M"/>
<OBS.status_cd V="A"/>
```

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ISO e CEN: recenti per informatica

- **prEN 14720:2003 service request report**
- **prEN 12251:2003 password**
- **ISO/IS 17113:2003 sviluppo messaggi**
- **ISO/FDIS 18812:2003 interfaccia analizzatore**
- **ISO/DIS 17115:2005 vocabulary**
- **ISO/IEC 17799:2005 security**
- **prEN 12264:2005 strutture concetti**
- **prEN 1614:2005 nomenclatura laboratorio**

CEN TC251

European Standardization of Health Informatics

CEN/TC 251 - working groups

- Information models (WG I)
- Terminology and knowledge representation (WG II)
- Security, Safety and Quality (WG III)
- Technology for Interoperability (WG IV)

CEN/TC 251

Working Group I Information Models

- **ENV 13730-1 Blood Transfusion Related MessagesPart 1: Patient Related Messages**
- **EN 13730-2 Blood Transfusion Related MessagesPart 2: Product Related Messages**
- **CR Maintenance of the Message Standards produced by CEN/TC 251**
- **EN 1613 Messages for exchange of laboratory information**
- **EN 12018 Patient healthcard data - Part 1: General structurePart 2: Common objects Part 3: Limited clinical data Part 4: Extended clinical data Part 5: Identification data Part 6: Administrative data Part 7: Electronic prescription Part 8: Linkage and reference data Previous name of ENV 12018Identification, administrative and common clinical data structure for Intermittently Connected Devices used in Healthcare (including machine-readable cards)**
- **EN 12443 Health Informatics -Medical informatics Healthcare Information Framework (HIF)**
- **EN 12537-1 Registration of information objects used for EDI in healthcare - Part 1: The Register**
- **EN 12537-2 Registration of information objects used for EDI in healthcare - Part 2: Procedures for the registration of information objects used for electronic data interchange (EDI) in healthcare**
- **EN 12538 Messages for patient referral and discharge**
- **EN 12539 Request and report messages for diagnostic service departments**
- **EN 12612 Messages for the exchange of healthcare administrative information**
- **EN 13609-1 Messages for Maintenance of Supporting Information in Healthcare SystemsPart 1. Updating of Coding Schemes**
- **EN 13606 Health informatics – Electronic health record communicationPart 1: Reference architecturePart 2: Methodology for clinical domain modellingPart 3: Security requirements and distribution rulesPart 4: Methods for the exchande of information**

CEN/TC 251

Working Group II Terminology and Knowledge Bases

- **EN 12435 Expression of the results of measurements in health sciences**
- **EN 12264 Categorical structures for systems of concepts**
- **EN 12381 Time standards for healthcare specific problems**
- **EN 1614 Structure for nomenclature, classification and coding of properties in clinical laboratory sciences**
- **EN 12610 Medicinal product identification**
- **EN 12611 Categorial structure of systems of concepts - Medical devices**
- **EN 1068 Health informatics – Registration of coding schemes**
- **ENV 13940 System of Concepts to Support Continuity of Care**
- **ENV 14302 System of Concepts to Support Nursing**

CEN/TC 251

Working Group III Security, Safety and Quality

- **EN 12251 2004 Health Informatics - Secure User Identification for Healthcare - Management and Security of Authentication by Passwords**
- **EN 14485 2003 Health Informatics - Guidance for handling personal health data in international application in the context of the EU data protection directive**
- **EN 14484 2003 Health Informatics - International tranfer of personal health data covered by the EU data protection directive - High level security policy**
- **ENV 13608-1 1999 Health informatics - Security for healthcare communication - Part 1: Concepts and terminology**
- **ENV 13608-2 1999 Health informatics - Security for healthcare communication - Part 2: Secure data objects**
- **ENV 13608-3 1999 Health informatics - Security for healthcare communication - Part 3: Secure data channels**
- **CR 13694 1999 Health informatics - Safety and security related software quality standards for healthcare**
- **ENV 13729 1999 Health informatics - Secure user identification for healthcare strong authentication using microprocessor cards**
- **ENV 12924 1997 Medical Informatics - Security Categorisation and Protection for Healthcare Information Systems**
- **ENV 12388 1996 Medical Informatics - Algoritm for Digital Signature Services in Health Care**

CEN/TC 251

Working Group IV Technology for Interoperability

- **EN 12052 Medical Imaging Communication**
- **EN 12623 Media Interchange in Medical Imaging Communications**
- **EN 12922-1 Medical Image Management - Part 1: Storage Commitment Service Class**
- **EN 12967-1 Healthcare Information System Architecture - Part 1: Healthcare Middleware Layer**
- **EN 1064 Standard communication protocol - Computer-assisted electrocardiography**
- **ENV 14271PT40 File exchange format for Vital Signs**
- **EN-ISO 18811 Point-of-Care medical devices - Framework and overview**
- **EN-ISO 17116 Point-of-Care medical devices - Domain Information Model**
- **EN-ISO 1 7109 Point-of-Care medical devices - Nomenclature**
- **EN-ISO 17110 Point-of-Care medical devices - Transport Profile - Cable Connected**
- **EN-ISO 17111 Point-of-Care medical devices - Physical Layer - Cable Connected**
- **EN-ISO 18813 Point-of-Care medical devices - Transport Profile - Infra-Red Based Protocol**
- **EN 1064 Standardized computer protocols for ECG**
- **EN-ISO 13728 Instrument interfaces to laboratory information systems**

ISO TC215 - Health informatics

- **WG 1 Data Structure**
- **WG 2 Data Interchange**
- **WG 3 Semantic Content**
- **WG 4 Privacy and Security**
- **WG 5 Health Cards**
- **WG 6 Pharmacy and Medication Business**
- **WG 7 Devices**
- **WG 8 Business Requirements for E-Health Records**

ISO TC215

WG 1 Data Structure

Active Items after NWIP Approval

- **HI: Electronic health record communication - Part 1: Referencemodel D. Kalra ISO/IS 13606-1 CD Ballot DIS On ballot until 2005-10-05**
- **HI: Principles and practices for a clinical data warehouse A. Grant ISO/TR 22221 DTR Ballot DTR WG's 3 & 4 WD for comments until 2005-07-22.**
- **HI: Proposed Identification of Subjects of Health Care Heather Grain ISO/TS 22220 Awaiting revisions for DTS ballot DTS In Work Group**

Published Items

- **Requirements for EHR reference architecture Peter Schloeffel ISO#18308 Published**
- **Health Indicators for Conceptual Framework I. Pulcins ISO#21667 Published**
- **Health Informatics:Country Identifier Standards R. Alvarez/D.**
- **Newsham ISO# 17120 Published**
- **EHR Definition, Scope and Context P.Schloeffel/K. Toyoda TR#20514 Published in the Fall**
- **'05**
- **Health Informatics: Profiling Framework Laura Sato/Grant Gillis ISO#17119 Published**

ISO TC215

WG 2 Data Interchange

Active Items after NWIP Approval

- Exchange of Info between Healthcare Info Systems Marley IS 17113 Informal Comments FDIS comments til 2005-08-15

DIS and FDIS Ballots

- HI: Digital Imaging - DICOM Communications, workflow and data management Parisot waiting on formating DIS In work group

Sent for Publication

- Msg & Communication procedure result data objects UID Brown/Marley IS 18232 sent for publication waiting on formating
- Pilot Project HL7 RIM V-3 R-1 Beeler/Hammond IS 21731 Working on revision publication

Published Items

- Web access to DICOM Persistent Objects Brown/Marley IS 17432 published/ISO
- Interoperability and compatibility in messaging and communication standards TR 18307 Published
- Clinical analyzer interfaces to laboratory information systems - Use profiles IS 18812 Published
- Interoperability of telehealth Syst & Networks P. 1 T. Craddock TR 16056-1 Publication
- Interoperability of telehealth Syst & Networks P. 2 T. Craddock TR 16056-2 Publication
- Interoperability of telelearning systems T. Craddock TS 16058 Publication
- Trusted end-to-end information flows Dickinson TR 21089 Publication

ISO/TC 215 Health informatics

Business plan 2005

- sanità 7-14% PIL, ma informatica molto meno che assicurazioni, banche, finanza
  - mancanza standard
- sistemi dipartimentali (Farm, Rad, Lab), ospedale (HIS), POCT: frammentazione, scarsa efficienza, costi
- LOINC, NCPDP, DICOM, HL7, però manca ambiente coerente

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messaggi

- ISO/IS 17113:2004 Mehod for Development of Messages
- prEN 1614:2004
- prEN 12435 - Expression of results

Collegamento a ict4cb-nomen.ppt.lnk

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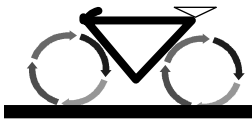
prEN 14720: Health informatics - Service request and report messages - Basic services including referral and discharge

- laboratory services, such as Clinical biochemistry, Clinical Microbiology and Haematology
- diagnostic services, such as Radiology, Anatomical pathology and Nuclear medicine
- specialist services, such as Referral and Discharge messages.

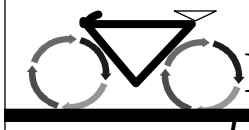
prEN 14720: messages

- The messages it specifies support the communication of partial, supplementary, complete and cumulative reports. Reporting modes which may be implemented using this EN include:
  - sending a requested healthcare service report only when all investigation results are available;
  - sending individual results as they become available;
  - sending new results as part of a cumulative report;
  - sending partial results.



EN ISO 18812:2003

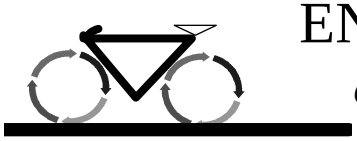
- **Health informatics - Clinical analyser interfaces to laboratory information systems - Use profiles**
  - ***". . . AIs are mainly used in hospital laboratories to analyse samples from patients. Most of these are interfaced to LISs that process the result data and produce reports for use by healthcare practitioners. In the absence of standards for the interface, each LIS supplier has to write a new interface for each new analytical instrument. The cost of writing these interfaces can amount to between 10 % and 20 % of the total cost of the LIS. One of the most effective ways of reducing this cost is to implement a standard interface between the AI and the LIS. . . ."***



EN ISO 18812:2003

analyser interfaces - ASTM E1394

- **A.2.2 Profiles of ASTM E1394**
  - ***". . .The ASTM E1394 standard was originally written to allow almost any type of AI to communicate with any type of LIS for almost any purpose. This has been its strength, the fact that it can be used in any situation. It has also been its weakness in that every implementation is different and cannot easily work with a different implementation. However, most implementations only need a limited range of the information that can be carried in ASTM E1394, and only need it for a limited number of purposes. . . ."***



EN ISO 18812:2003

esempi di messaggi

Message examples:	***or:***
H|\^&	**H|\^&**
P|1	**P|1**
O|1||235	**O|1||\^\^34**
R|1|\^\^\^GLU|5.5	**R|1|\^\^\^NA|139|mmol/L**
L|1|N	**R|2|\^\^\^K|4.2|mmol/L**
	R|3|\^\^\^CL|111|mmol/L
	P|2
	O|1||\^\^35
	R|1|\^\^\^K|4.8|mmol/L
	L|1|N

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Schema relazioni tra standard
(da NCCLS AUTO3-A 2000)

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Developed by ASTM Subcommittee: E31.13

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Logical Observation Identifier Names and Codes (LOINC®)

Updated June 13, 2000

Table 21: Columns Appearing on Printed Reports

LOINC
c/o Regenstrief Institute
1050 Wishard Boulevard
Indianapolis, IN 46202

Status
Class
Loinc Number
Map To
Analyte/Component Name
Type of Property
Time Aspect
System/Specimen
Type of Scale

Method
Related Names
Exact Core Component
Synonym
Date Last Changed
Reason for Change
Answer List
EUCLIDES Code
IUPAC Analyte Code
Molar Mass

complete table: 49 columns

Logical Observation Identifiers Names and Codes (LOINC®)

- The purpose of the LOINC database is to facilitate the **exchange and pooling of results**, such as blood hemoglobin, serum potassium, or vital signs, for clinical care, outcomes management, and research.
- Currently, most laboratories and other diagnostic services use **HL7** to send their results electronically from their reporting systems to their care systems. However, most laboratories and other diagnostic care services identify tests in these messages by means of their internal and idiosyncratic code values. Thus, the care system cannot fully "understand" and properly file the results they receive unless they either adopt the producer's laboratory codes (which is impossible if they receive results from multiple sources), or invest in the work to map each result producer's code system to their internal code system.
- **LOINC codes are universal identifiers for laboratory and other clinical observations** that solve this problem

www.loinc.org

LOINC® 2003

- 30.000 voci (LOINC 2.10, released October 6, 2003)
- RELMA™ REgenstrief LOINC Mapping Assistant (RELMA 3.9.15, released October 8, 2003)

LOINC, a Universal Standard for Identifying Laboratory Observations: A 5-Year Update
Clement J. McDonald,1,2 Stanley M. Huff,3 Jeffrey G. Suico,1,2 Gilbert Hill,4 Dennis Leavelle,5 Raymond Aller,6 Arden Forrey,7 Kathy Mercer,1 Georges DeMoor,8 John Hook,1 Warren Williams,9 James Case,10 and Pat Maloney11 for the Laboratory LOINC Developers†*
Clinical Chemistry 49:4 624–633 (2003)

http://www.loinc.org/news/whitepaper

Esempi di codici LOINC per laboratorio

LOINC code LOINC name
(component:property:timing:specimen:scale)

- **2951-2 SODIUM:SCNC:PT:SER/PLAS:QN**
- **2955-3 SODIUM:SCNC:PT:UR:QN**
- **2956-1 SODIUM:SRAT:24H:UR:QN**
- **2164-2 CREATININE RENAL CLEARANCE:VRAT:24H:UR:QN**
- **1514-9 GLUCOSEˆ2H POST 100 G GLUCOSE**
- **PO:MCNC:PT:SER/PLAS:QN**
- **3665-7 GENTAMICINˆTROUGH:MCNC:PT:SER/PLAS:QN**
- **17863-2 CALCIUM.IONIZED:MCNC:PT:SER/PLAS:QN**
- **2863-9 ALBUMIN:MCNC:PT:SNV:QN:ELECTROPHORESIS**

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SNOMED RT Integration with LOINC - Defining Characteristics

With LOINC there's hope for mining lab data

The LOINC-SNOMED connection

In British Columbia, LOINC is the answer

Eric Skjei

Archive: June 1999
Feature Story

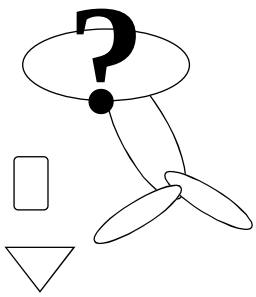
CAP TODAY

SNOMED Clinical Terms® aggiunti a UMLS® Metathesaurus®

- Tommy G. Thompson, Secretary of Health and Human Services, announced on July 1, 2003, (press release) an agreement with the **College of American Pathologists (CAP)** that will make SNOMED Clinical Terms (SNOMED CT®) available to U.S. users at no cost through the **National Library of Medicine's Unified Medical Language System® (UMLS)**.

- Produced by the College of American Pathologists (CAP), SNOMED CT (Systematized Nomenclature of Medicine--Clinical Terms) was formed by the convergence of SNOMED RT® and the **United Kingdom's Clinical Terms Version 3** (formerly known as the **Read Codes**). With terms for more than 344,000 concepts, SNOMED CT is the most comprehensive clinical terminology available. It is being implemented throughout the **National Health Service** in the **United Kingdom**.

. . . SNOMED Terminologia clinica® . . .



SNOMED RT Integration with LOINC - Defining Characteristics

- **"is-a" relationships**
- **"has-measured component"**
- **"has property"**
- **"has-time-aspect"**
- **"has-scale-type"**
- **"has specimen"**
- **Standardize data dictionary variables using SNOMED**
- **Encode clinical findings, diagnoses, and other "results" using SNOMED**
- **Encode the name of tests and test attributes using LOINC, if desired**
- **Retrieve using SNOMED functionality**

http://www.snomed.org/benefits/LOINC_txt.html

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CDC

PHIN Presentations: May 14, 2003

- Session 4C: PHIN and Data Routing for Health Departments and Public Health Labs
- Session 5E: PHIN and Public Health Laboratories - Meeting the Challenges of Electronic Information Exchange with Multiple Partners

1st Public Health Information Network Stakeholders' Conference
Atlanta, Georgia May 13 - 15 , 2003

http://www.cdc.gov/phin/conference_presentations/05-14-03/

Electronic Laboratory Reporting and Communication

The Massachusetts State Laboratory Institute - A Conceptual Design
Dina Caloggero

Electronic Laboratory Communication and Reporting Component (ELR)

- ***An extranet application that extends SLIS functionality securely to the Internet***
- ***Remote Order Entry (ROE) and Reporting***
- ***Standardized data exchange with organizations (HL7, LOINC, SNOMED)***
- ***Reception of remote orders from hospitals sending specimen batches to the State Laboratory Institute (SLI) (HL7)***

http://www.cdc.gov/phin/conference_presentations/05-14-03/

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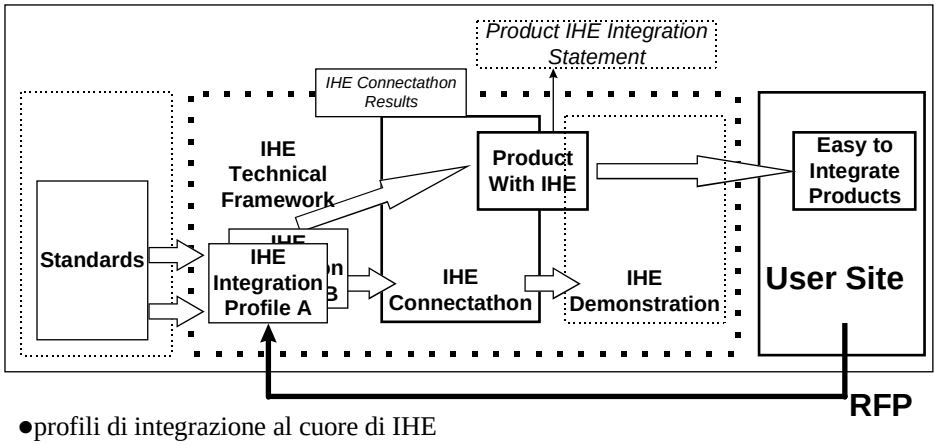
Integrating the Healthcare Enterprise

Integrating the Laboratory
into the Healthcare Enterprise

IHE norma guida

- iniziativa per promuovere l'integrazione dei sistemi informativi sanitari
- progetto sponsorizzato da RSNA, Radiological Sociey of North America e da HIMSS, Healthcare Information and Management Systems Society
- raccoglie gli sforzi congiunti di professionisti della sanità e produttori di apparecchiature diagnostiche, tesi **all'individuazione, alla documentazione ed alla dimostrazione di metodi standard di condivisione delle informazioni**, a supporto di una migliore assistenza sanitaria per il paziente.

Un processo sperimentato per l'adozione di standard



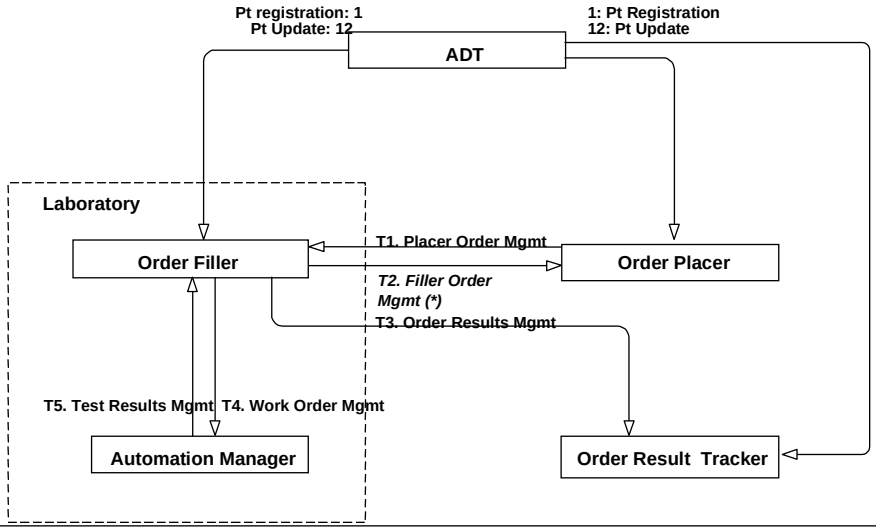
- profili di integrazione al cuore di IHE
  - Selezione puntuale di standard ed opzioni per risolvere specifici problemi di integrazione
  - numero crescente di soluzioni efficaci concordate con i fornitori
  - Garanzie per fornitori e utilizzatori

8

Profili di integrazione

- **Flusso operativo del laboratorio (Laboratory Scheduled Workflow LSWF)**
- **Riconciliazione anagrafiche (Patient Information Reconciliation LPIR)**
- **Point of Care Testing (POCT)**
- **Esternalizzazione (Outside Healthcare Enterprise Testing OHET)**

Flusso operativo del laboratorio Lab Scheduled Workflow



IHE: scelta dello standard . . .

- HL7 Version 2.5
- profili dei messaggi
- codificazione “pipe” obbligata e codificazione xml facoltativa
- tipi di messaggio: OML, ORL, OUL, ACK

Pianificazione 2004

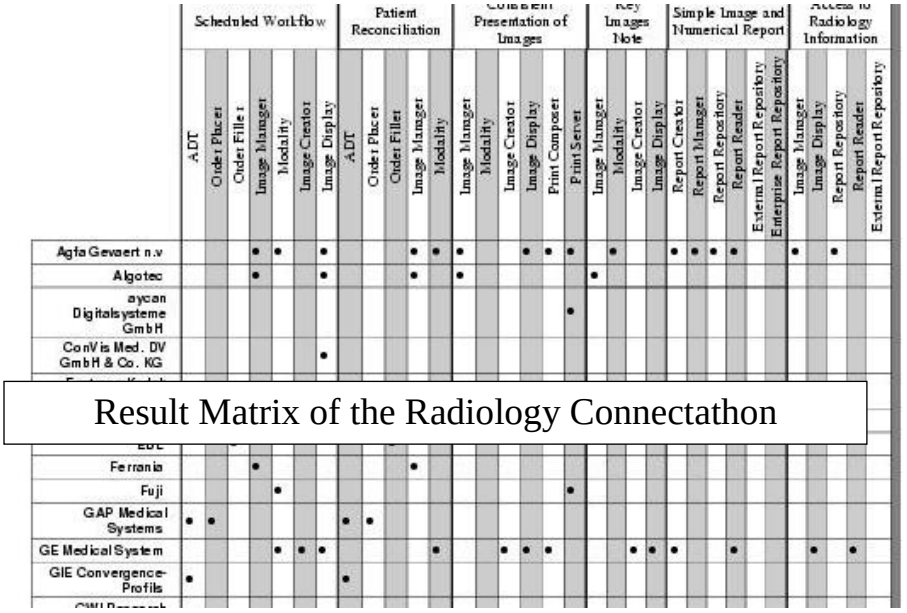
- October 15th Start of public comments
- November 15th End of public comments
- November 17th-19th Paris : Review of Public Comments
- January 2004 Vendor registration
- April 2004 European Connectathon
- May 2004 Demonstration at Hopital Expo (F)
- November 2004 Demonstration at Medica (D)

IHE: Paesi coinvolti

- Japan
- France
- Italy
- Germany
- Netherlands

Cosa NON è IHE (!)

- Una organizzazione che produce standard (SDO)
  - Utilizza standard consolidati (HL7, DICOM, RFCs, others) per soddisfare specifiche esigenze cliniche
  - Attività complementari alle SDOs, relazioni formali con HL7 e DICOM.
- Una semplice attività dimostrativa
  - Le DEMO solo una verifica delle specifiche
  - Accompagnamento con documentazione, strumenti, prove, pubblicazione di informazioni



Result Matrix of the Radiology Connectathon

10

La "Connectathon" annuale

- ***Verifica incrociata tra fornitori, senza precedenti***
- partecipazione volontaria
- né DEMO né certificazione
- scenari End-to-End ben definiti
- strumenti di verifica avanzati
- crogiolo di capacità tecniche mai visto prima

- Connectathon for IT Infrastructure
  San Diego January 26-30, 2004
- Connectathon for Radiology Tokyo – February 2004
- **Connectathon for IT Infrastructure, Laboratory & Radiology - Padova (Italy) March 29-April 2, 2004**
- Connectathon for IT, Lab, Cardiology, Radiology - January 2005

11

Connectathon for IT Infrastructure, Laboratory & Radiology

Padova (Italy) March 29-April 2, 2004

12

Domini e Regioni

IT Infrastructure

Radiology | ***Laboratory*** | ***Cardiology*** |

IHE Technical Framework

Global Development

National Extensions ***National Extensions*** ***National Extensions*** ***National Extensions*** ***National Extensions*** ***National Extensions*** ***National Extensions*** ***National Extensions***

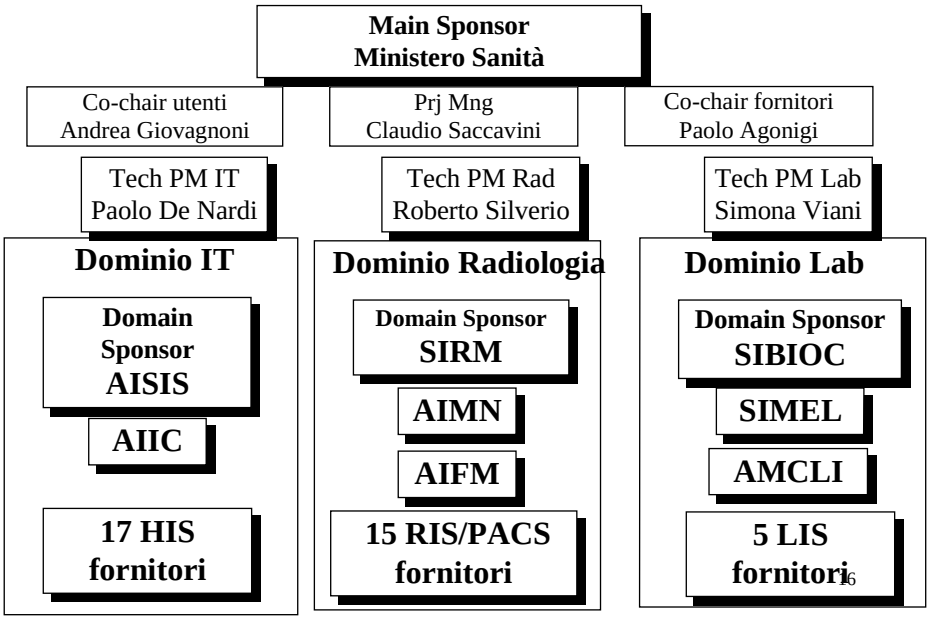
IHE North America	***IHE Europe***	***IHE Asia***
United States of America HIMSS, RSNA, ACCE, ACC **Canada** Infoway, CAR,	EAR, ECR, COCIR **France** GMSIH, SFR, SFL, **Germany** DRG, ZVEI **Italy** SIRM, SIBIOC **United Kingdom** BIR, RCR, NHS, **Norway, Sweden, Danemark, Netherland**	**Japan** JIRA, JAHIS, METI, JRS, JSRT, JAMI **Korea** **Taiwan**

Local Deployment

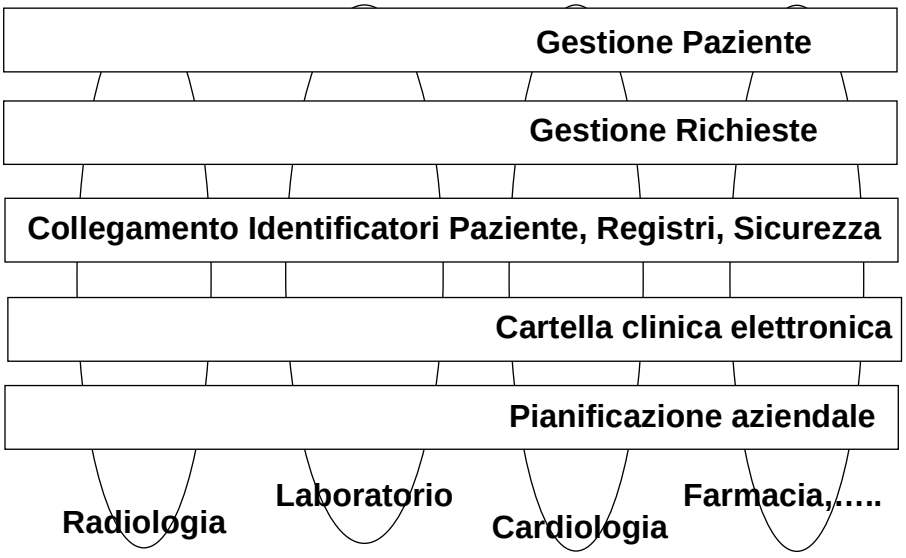
IHE Connectathons, Education, Demonstrations

14

IHE-Italia Organizzazione



IHE: un approccio in fasi successive



Laboratory Information Reconciliation (LIR) Integration Profile

Integrating the Healthcare Enterprise

IHE Laboratory Technical Framework

Supplement 2005-2006

October 10, 2005

Draft For Trial Implementation

Laboratory Information Reconciliation (LIR) Integration Profile

- *NO IDENTIFICAZIONE*
  - inserimento esami da Order Placer
  - inserimento esami da Order Filler
- NO ADT
  - inserimento esami da Order Placer
  - inserimento esami da Order Filler
- NO ESAMI
  - risultati da Analizzatore
  - risultati da Automation Manager

Collegamento a IHE_LIR_estratto.pdf.lnk

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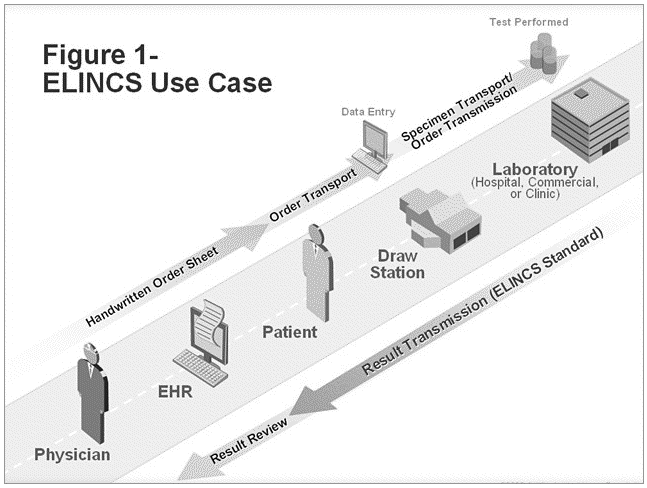
ELINCS: a National Lab Data Standard for EHRs



CALINX vs. ELINCS: What's the Difference?

- The California HealthCare Foundation has two initiatives to promote the electronic transfer of laboratory results data to clinical settings: CALINX and ELINCS.
  - ELINCS handles the immediate test-by-test reporting of lab results to physicians' electronic medical record systems; it is intended to support direct patient care and to replace the paper-based reporting of lab results.
  - CALINX handles the periodic retrospective batch reporting of lab results to populate data warehouses and disease registries; it is intended to support population-based quality-improvement programs and to supplement the paper-based reporting of lab results.

ELINKS: esempi di messaggi

Message List

- Result Status (MT-ORU-1)
  - Specimen Received
  - Test Cancelled
- Result Available (MT-ORU-2)
  - Preliminary Result
  - Final Result
  - Final Result w/ Reflex
  - Final Result w/ Add-on
  - Final Result w/ Analyte Cancellation
- Result Correction (MT-ORU-3)
  - Result Corrected
  - Result Deleted

ELINKs esempio: Preliminary Result

Result Message File: /combo/prelim.txt
Acknowledgement Message File: /combo/ack/prelim_ack.txt
Type: MT-ORU-2
Description: **A positive value for urine leukocytes was discovered in an initial sample work-up. The preliminary results are reported to the EHR. Refinement of the data and additional information about the positive leukocyte screen is expected later**.
Result Message Data:

General Result Data		
Date/Time Of Message	20051111170000-0800	MSH-5
Message Control ID	1236300	MSH-10
Filler Order Number	5788124-041684 (387564 [L-CL])	OBR-3
Observation Date/Time	20051111170000-0800	OBR-7
Specimen Action Code	L	OBR-11
Specimen Received Date/Time	20051111130500-0800	OBR-14
Results Rpt/Status Chng Date/Time	20051111170000-0800	OBR-22
Result Status	P	OBR-25

Test Data	
5778-6 – GROSS DESCRIPTION (LN)	Straw, Clear
5803-2 – URINE PH (LN)	7.1
2887-8 – URINE PROTEIN (LN)	G100 – NEGATIVE (SNM)
22705-8 – URINE GLUCOSE (LN)	G100 – NEGATIVE (SNM)
5797-6 – URINE KETONE (LN)	G100 – NEGATIVE (SNM)
5770-3 – URINE BILIRUBIN (LN)	G100 – NEGATIVE (SNM)
20409-9 – URINE BLOOD (LN)	G100 – NEGATIVE (SNM)
5818-0 – URINE UROBILINOGEN (LN)	0.2 EU/DL (P – Preliminary)
20407-3 – URINE NITRATES (LN)	G100 – NEGATIVE (SNM)
5811-5 – URINE SPECIFIC GRAVITY (LN)	1.003 (P – Preliminary)
5821-4 – URINE LEUKOCYTES (LN)	G200 – POSITIVE (SNM) (P – Preliminary)

Collegamento a SampleLOINCinELINKSspecifications.pdf.lnk

appendice

- **prEN 14822** Health informatics - General purpose information components
- UML
- PIR

Collegamento a ICT4CB-IHE-HL7.ppt.lnk

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