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Electronic Healthcare Records: Global Convergence

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Barriers to wide HIT* adoption

- Direct and indirect costs
- Privacy and confidentiality concerns
- Lack of **interoperability**

* HIT: Health Information Technology

Semantic interoperability

The ability of two or more IT systems to exchange information and to make mutual use of the information that has been exchanged.

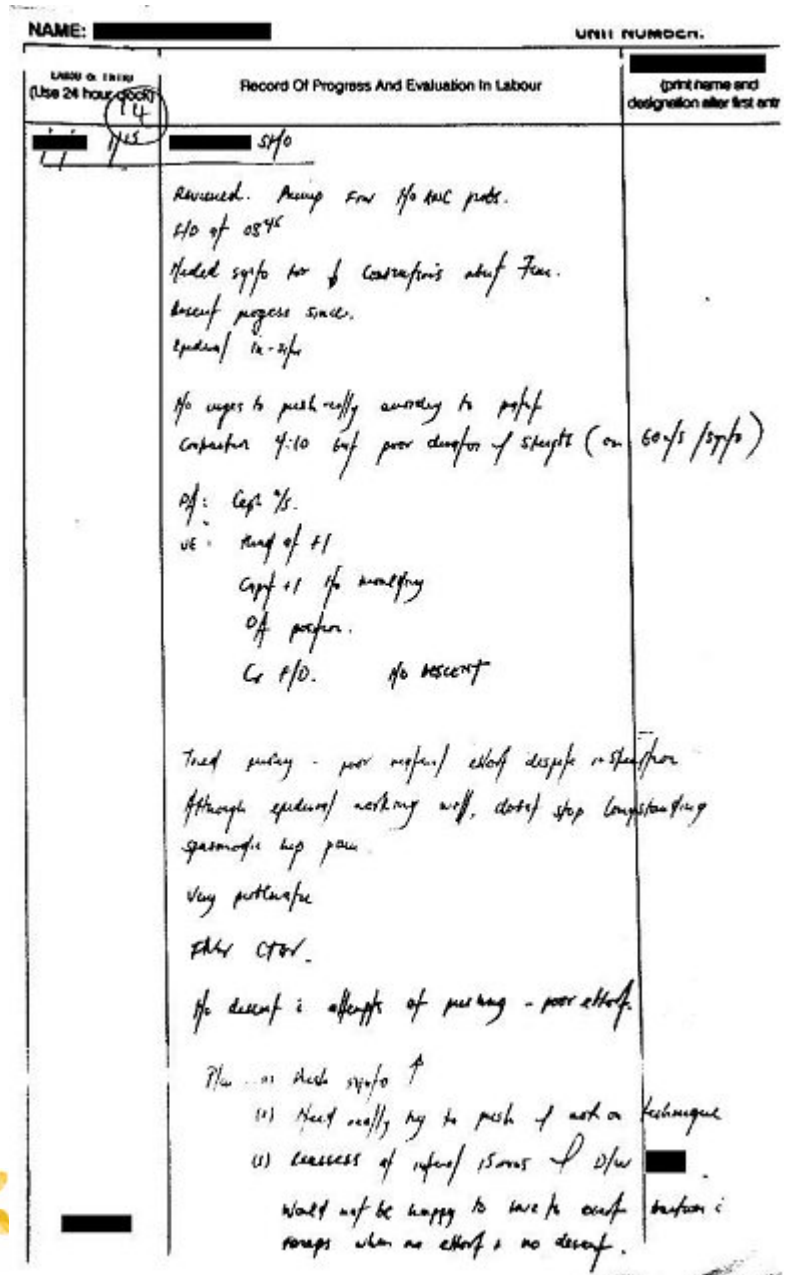
"the value of a particular HIT system installed by one stakeholder tends to increase with the number of other HIT systems installed elsewhere with which that stakeholder's HIT system can communicate".

Anderson et al., 2006

EHR* Interoperability : current status

* EHR: Electronic Healthcare Record

Most clinical data still on paper..


NAME: [redacted] UNIT NUMBER:

Record Of Progress And Evaluation In Labour

(print name and designation after first entry)

Reviewed. Primip FT No ANC probs
F/D at 08:45
Needed synto for ↓contractions about 7cm
Decent progress since.
Epidural in-situ
No urges to push really according to patient
Contractions 4:10 but poor duration & strength (on 60 u/s /synto

PA: Ceph 0/5
VE: Head at +1
Caput +1 No ???
OA position
Cx F/D NO DESCENT

Tried pushing – poor maternal effort despite instruction
Although epidural working well, doesn't stop longstanding spasmodic hip pain.
Very problematic
FHR✓ CTG ✓

No descent with attempts at pushing – poor effort.
Plan… a) Push synto ↑
b) Need really try to push & work on technique
c) reassess at interval 15 mins & D/W consultant
Would not be happy to have to exert traction with Forceps when no effort & no descent

From: Pieter Zanstra – Eurorec Conference, October 200

EHR Interoperability : current status

Installed systems are **not** interoperable.

Why?

- Most vendors are SME's specialised in small niche markets
- International players do not offer interoperability of EHRs produced by their systems in different markets or institutions.
- Interoperability was not a requirement when most current systems were designed

EHR Interoperability : current status

Installed systems are **not** interoperable.

Why?

- Technical difficulty: clinical data are extremely complex
- Financial difficulty: who will pay?
- Absence of formal EHR exchange standards

EHR Interoperability : developing EHR exchange standards

Required:

Data architecture models

Clinical contents:

- Terminologies
- Representation of clinical concepts

Developing EHR exchange standards: Europe

- R & D projects: « GEHR »: the Good European Healthcare Record
  - EU funded (4th Framework Program)
  - 1992-1994
  - Produced a data architecture enabling portability and communication of EHRs

Developing EHR exchange standards: Europe

- Standardisation: CEN Technical Committee 251, Working Group 1:
  - Progressive development of a standard based on the GEHR architecture
    - ENV 12265
    - ENV 13606
    - EN 13606: « Electronic Health Record Communication »

Developing EHR exchange standards: Europe

EN 13606:

« Electronic Health Record Communication »

> "The overall goal of this standard is to define a rigorous and stable information architecture for communicating part or all of the electronic health record (EHR) of a single subject of care (patient). This is to support the **interoperability** of systems and components that need to communicate (access, transfer, add or modify) EHR data via electronic messages or as distributed objects"

Developing EHR exchange standards: USA

The HL7 Version 3 project

"represents a new approach to **clinical information exchange**. It is built from the ground up around a single object model (Reference Information Model - RIM) and a rigorous UML-based methodology that ties model to messages and finally to the message's expression in XML syntax."

The RIM was accepted as a standard by ANSI in 2003

Developing EHR exchange standards: USA

The HL7 « Clinical Document Architecture »

- Provides an **exchange model** for clinical documents (such as discharge summaries and progress notes)
- Is based on the HL7 V3 RIM, XML, and coded vocabularies

Release2 was adopted as an ANSI standard on April 21, 2005

Developing EHR exchange standards: openEHR

***open*EHR is an international not-for-profit Foundation, working towards:**

- Making the **interoperable**, life-long electronic health record a reality
- Improving health care in the information society.

Developing EHR exchange standards: openEHR

EHR Interoperability : global convergence

Informal co-operation

- Overlapping membership
- Academic initiatives
- Industrial initiatives

Formal co-operation

- HL7 /CEN TC251 memorandum of understanding
- ISO umbrella

EHR Interoperability : global convergence

Technical Committee 215: Health Informatics

Projects:

…

ISO/DIS 13606-1: Electronic health record communication – Part 1: Reference model

ISO/HL7 NP 27932: Clinical document architecture, release 2

EHR Interoperability : global convergence

Brussels (6 November 2006) – CEN, the International Organization for Standardization, ISO and the Standards Developing Organization HL 7 decided to further advance shared plans to coordinate and collaborate in delivering global standards that enable interoperable capabilities in the healthcare domain. These plans will enhance the contributions of the three standards development organizations (SDOs), strengthen the delivery of standards-based solutions to all customers and support the goal of safe, accessible, quality and effective health service delivery.

Global convergence : On-going work

- CEN 13606 / HL7 v3 harmonization project
  Deliverable: an implementation guide which will allow the re-use and sharing of clinical information by stakeholders that need to support HL7 and CEN and ISO standards

- Detailed Clinical Models (CEN / HL7 / openEHR)
  Deliverable: a repository of detailed clinical models, held in a single formalism (e.g. CEN/openEHR archetypes) Convertible in other formalisms such as HL7 templates With reasonable ease.

EHR Interoperability : can it work?

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An EHR server and system

- based on the GEHR architecture
- with progressive architecture enrichments towards
  - CEN EN 13606 compatibility
  - HL7 CDA rel. 2 compatibility
  - openEHR archetypes compatibility

EHR Interoperability : can it work?

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Adaptable to a variety of
- different medical specialities
- different healthcare organizations

Yet fully interoperable between these sites

South Africa

The AIDS team of the healthcare services of a mining company, South Africa

USA

An 80 physician healthcare center,

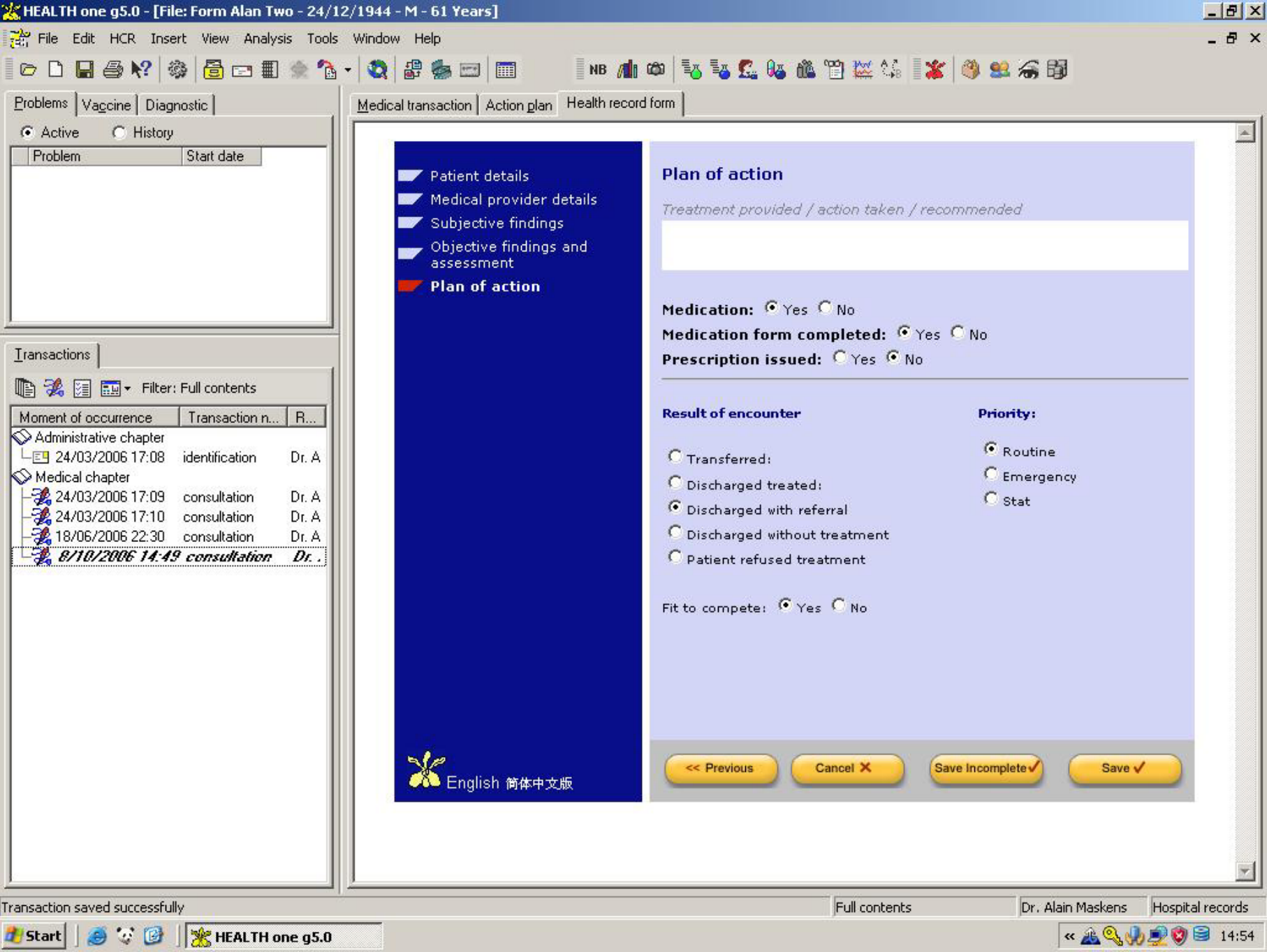
Washington State, USA

Europe

A 250-bed hospital
in Brussels, Belgium

China

The EHR services for The Special Olympics World Summer Games, Shanghai October 2007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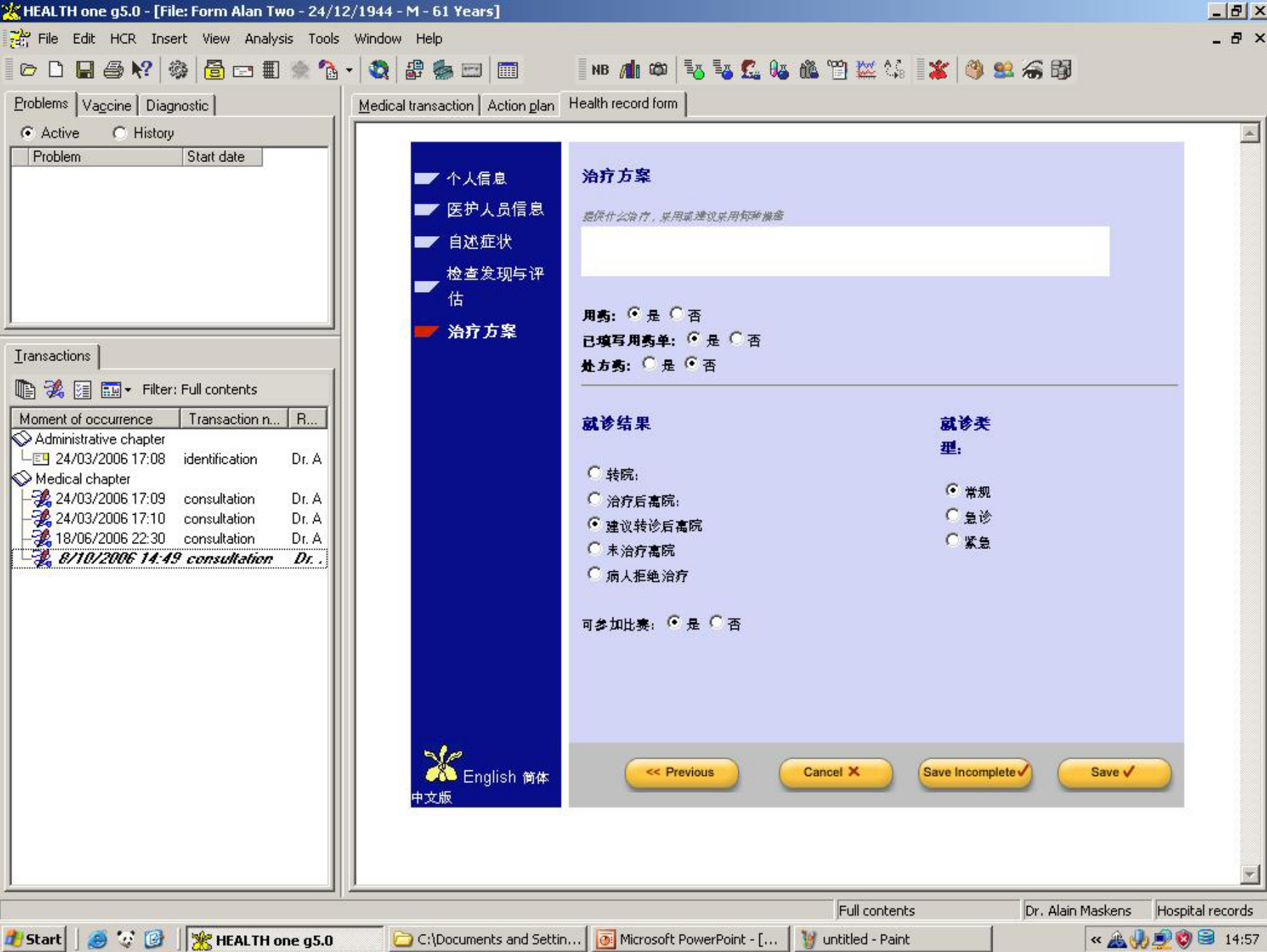
File Edit HCR Insert View Analysis Tools Window Help
Problems Vaccine Diagnostic
Active History
Problem Start date
Transactions
Filter: Full contents
Moment of occurrence Transaction n... R...
Administrative chapter
24/03/2006 17:08 identification Dr. A
Medical chapter
24/03/2006 17:09 consultation Dr. A
24/03/2006 17:10 consultation Dr. A
18/06/2006 22:30 consultation Dr. A
8/10/2006 14:49 consultation Dr. .
Medical transaction Action plan Health record form
Patient details
Medical provider details
Subjective findings
Objective findings and assessment
Plan of action
English 简体中文版
Plan of action
Treatment provided / action taken / recommended
Medication: Yes No
Medication form completed: Yes No
Prescription issued: Yes No
Result of encounter
Transferred:
Discharged treated:
Discharged with referral
Discharged without treatment
Patient refused treatment
Priority:
Routine
Emergency
Stat
Fit to compete: Yes No
<< Previous
Cancel
Save Incomplete
Save
Transaction saved successfully
Full contents
Dr. Alain Maskens
Hospital records
Start
HEALTH one g5.0
14:54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18/06/2006 22:30 consultation Dr. A
8/10/2006 14:43 consultation Dr. .
Medical transaction
Action plan
Health record form
个人信息
医护人员信息
自述症状
检查发现与评估
治疗方案
English 简体中文版
治疗方案
提供什么治疗，采用或建议采用何种措施
用药: 是 否
已填写用药单: 是 否
处方药: 是 否
就诊结果
转院:
治疗后离院:
建议转诊后离院
未治疗离院
病人拒绝治疗
就诊类型:
常规
急诊
紧急
可参加比赛: 是 否
<< Previous
Cancel
Save Incomplete
Save
Full contents
Dr. Alain Maskens
Hospital records
Start
HEALTH one g5.0
C:\Documents and Settin...
Microsoft PowerPoint - [...
untitled - Paint
14:57

Conclusion

International, standards-based interoperability of EHRs has become an achievable goal .

An immense effort involving industry, healthcare providers, patients, insurers and authorities is now required for implementing the new standards as widely as possible.