Exchange Standards: Document exchange

HL7v3-Clinical Document Architecture (CDA)

HL7: Exchange Standards

HL7 Versions

- HL7 Version 2.x messaging
- HL7 Version 3 messaging
- HL7 Clinical Document Architecture (CDA)
- HL7 Fast Healthcare Interoperability Resources (FHIR)

Exchange is a Need in Healthcare

Vast amounts of patient data collected through direct clinical interactions

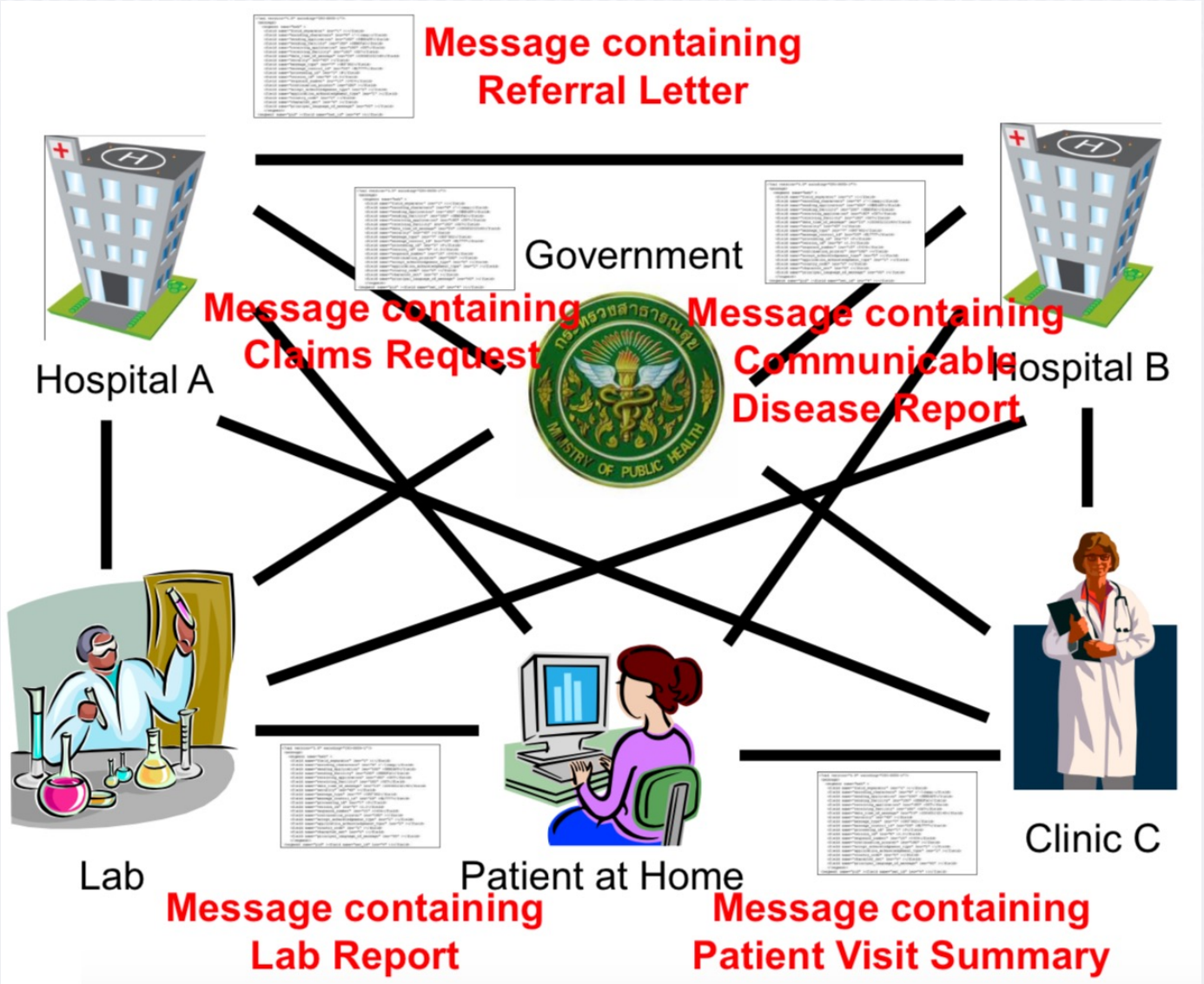
Medical information such as vitals, orders, prescriptions, discharge summaries, etc. dictated or recorded by hand

All of this clinical data was stored as paper records (documents) at each point of care

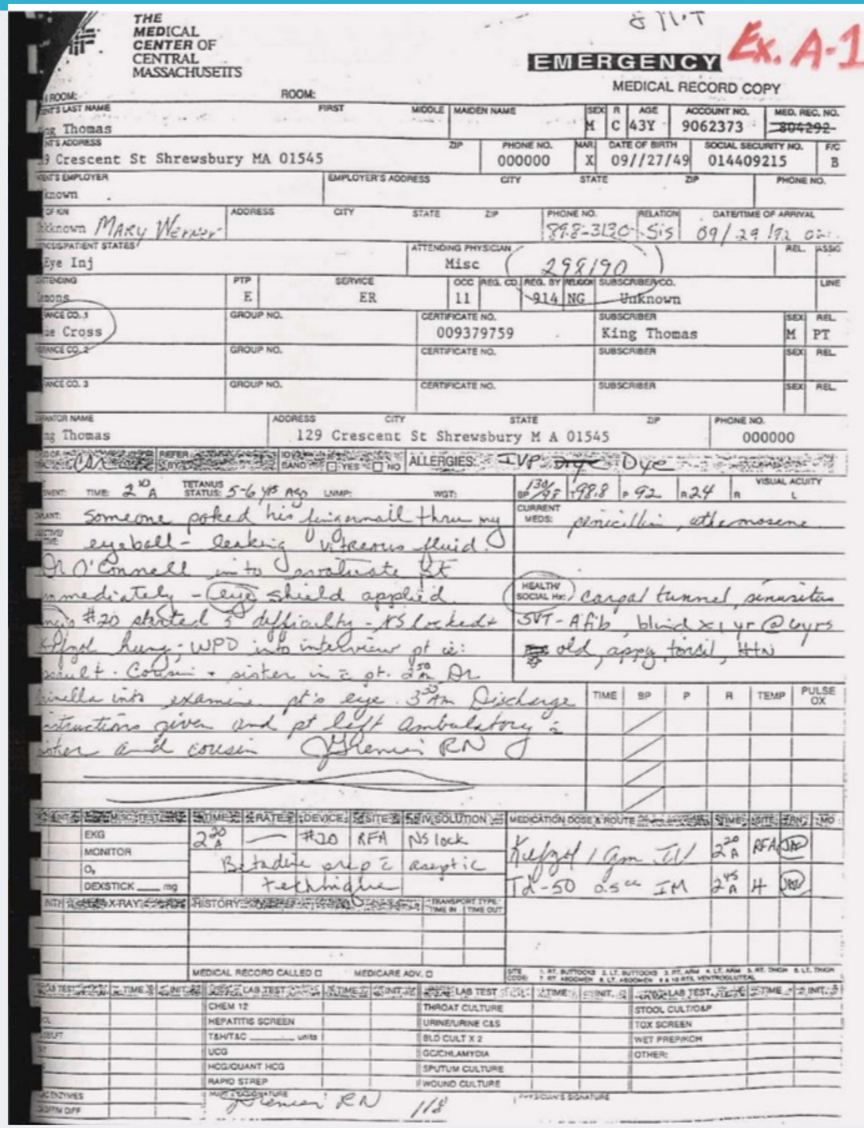
If patient health records needed to be shared between providers, they usually required manual exchange (e.g. fax, "snail mail")

- Coordination of care between providers slow, costly; patient outcomes inconsistent
- Duplicative healthcare services (e.g. labs imaging) frequent

Clinical Document Exchange



Clinical Documents



THE MEDICAL CENTER OF CENTRAL MASSACHUSETTS

EMERGENCY

Ex. A-1

MEDICAL RECORD COPY

Last Name	First	Middle	Maiden Name	Sex	R	Age	Account No.	Med. Rec. No.
ng Thomas				M	C	43Y	9062373	804292

Address	Zip	Phone No.	Mar	Date of Birth	Social Security No.	F/C
9 Crescent St Shrewsbury MA 01545		000000	X	09//27/49	014409215	B

Employer	Employer's Address	City	State	Zip	Phone No.
known					

Of Kin	Address	City	State	Zip	Phone No.	Relation	Date/Time of Arrival
known Mary Werner					898-3130	Sis	09/29/92

Patient States	Attending Physician	Rel.	Assig
Eye Inj	Misc 298190		

Attending	PTP	Service	OCC	Reg. CD	Reg. By	Region	Subscriber/Co.	Line
mons	E	ER	11		914	NG	Unknown	

Insurance Co.	Group No.	Certificate No.	Subscriber	Sex	Rel.
ue Cross		009379759	King Thomas	M	PT
Insurance Co. 2					
Insurance Co. 3					

Guarantor Name	Address	City	State	Zip	Phone No.
ng Thomas	129 Crescent St Shrewsbury M A 01545				000000

ALLERGIES: IVP Dye

Time: 2^{10} A Tetanus Status: 5-6 yrs ago BP 130/98 T 98.8 P 92 R 24

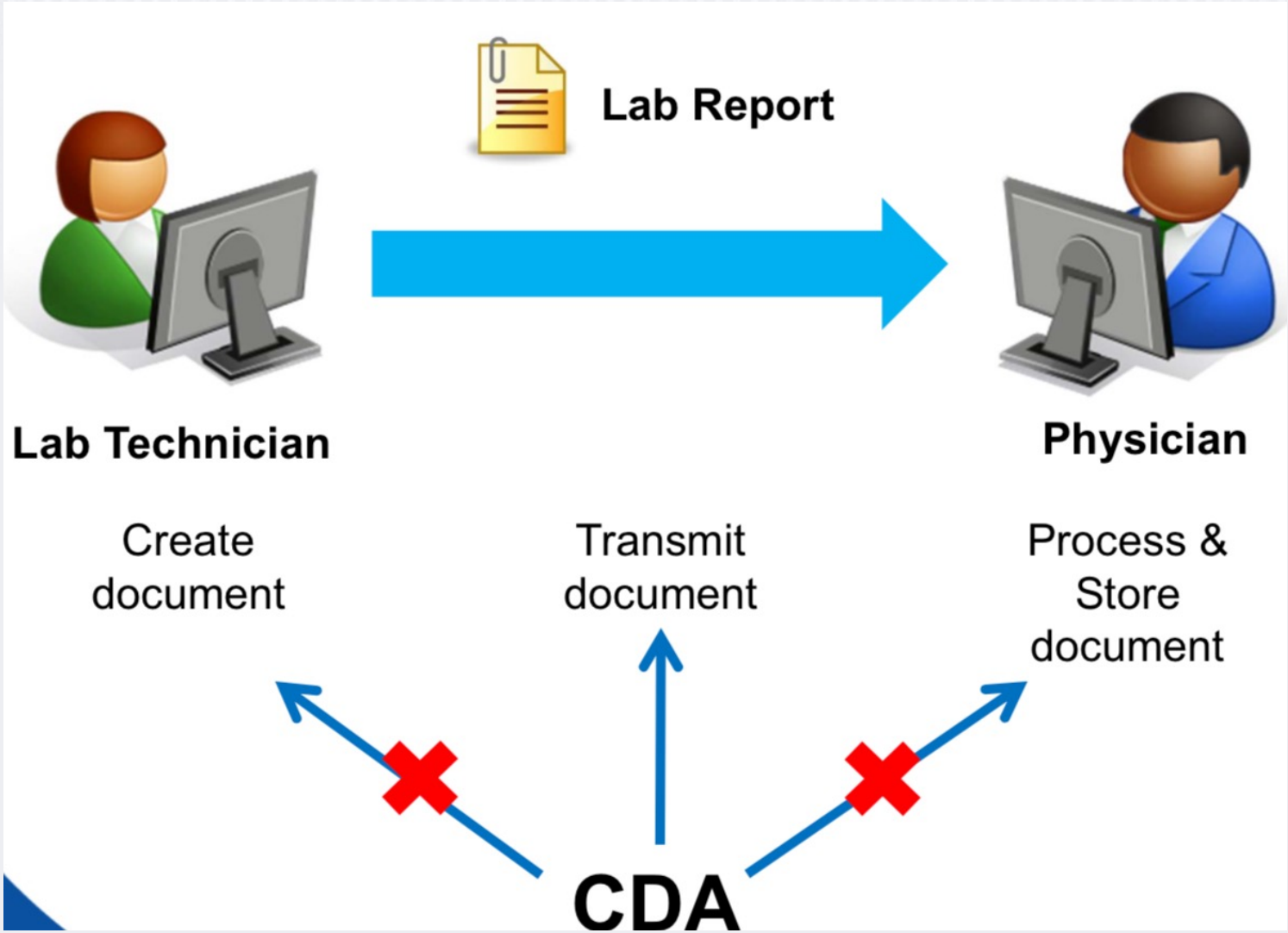
Someone poked his fingernail thru my eyeball - leaking vitreous fluid.

Current meds: penicillin

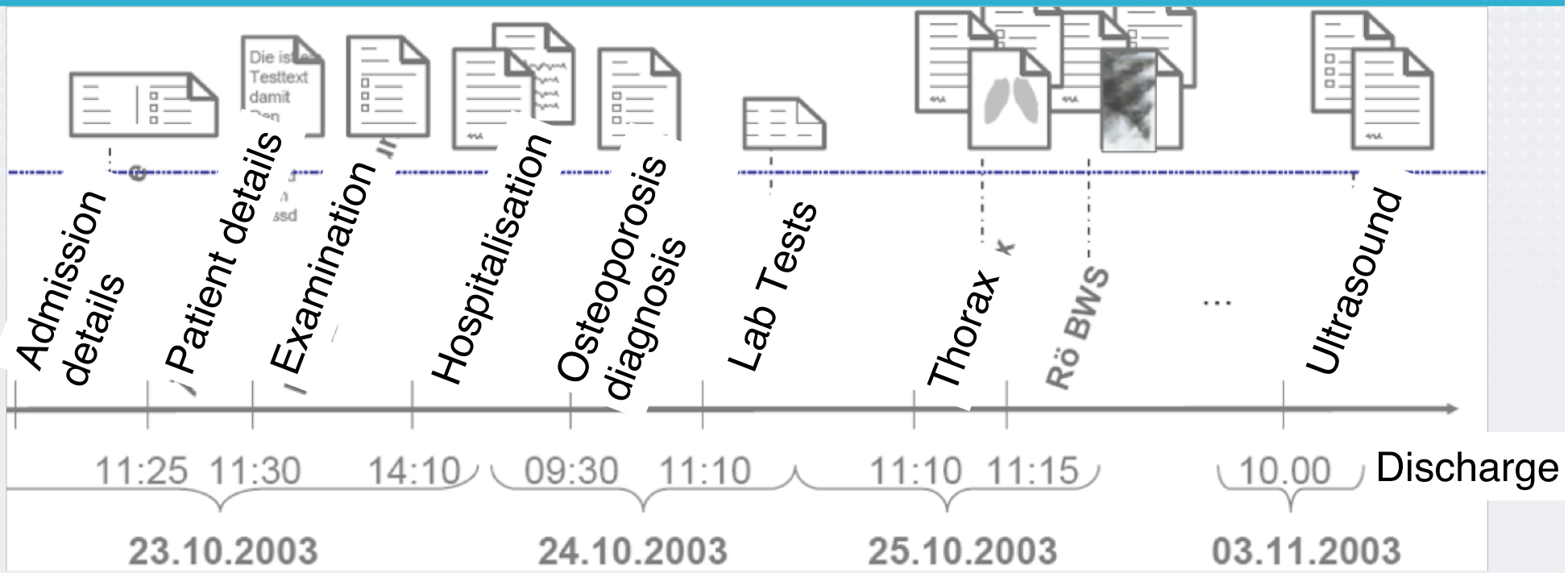
Health/Social Hx: carpal tunnel

HiCure
Excellence in Health Informatics Integrated Curricula

Clinical Documents



Clinical Process vs Clinical Documents



Documents in the clinical process from admission to discharge

Registration → Admission → Diagnostics → Therapy → Discharge

Clinical Process

HL7: Document Exchange Standards

- HL7 CDA (Clinical Document Architecture)
  - CDA has Release 1 and 2.
  - Provides an exchange model for clinical documents e.g. discharge summaries and progress clinical notes
  - Aims at bringing a real-world view to patient medical records in which:
    - Healthcare providers can understand
    - Healthcare applications can **atomically process**
  - HL7 CDA is a subset of HL7 v2.x or HL7 v3 message

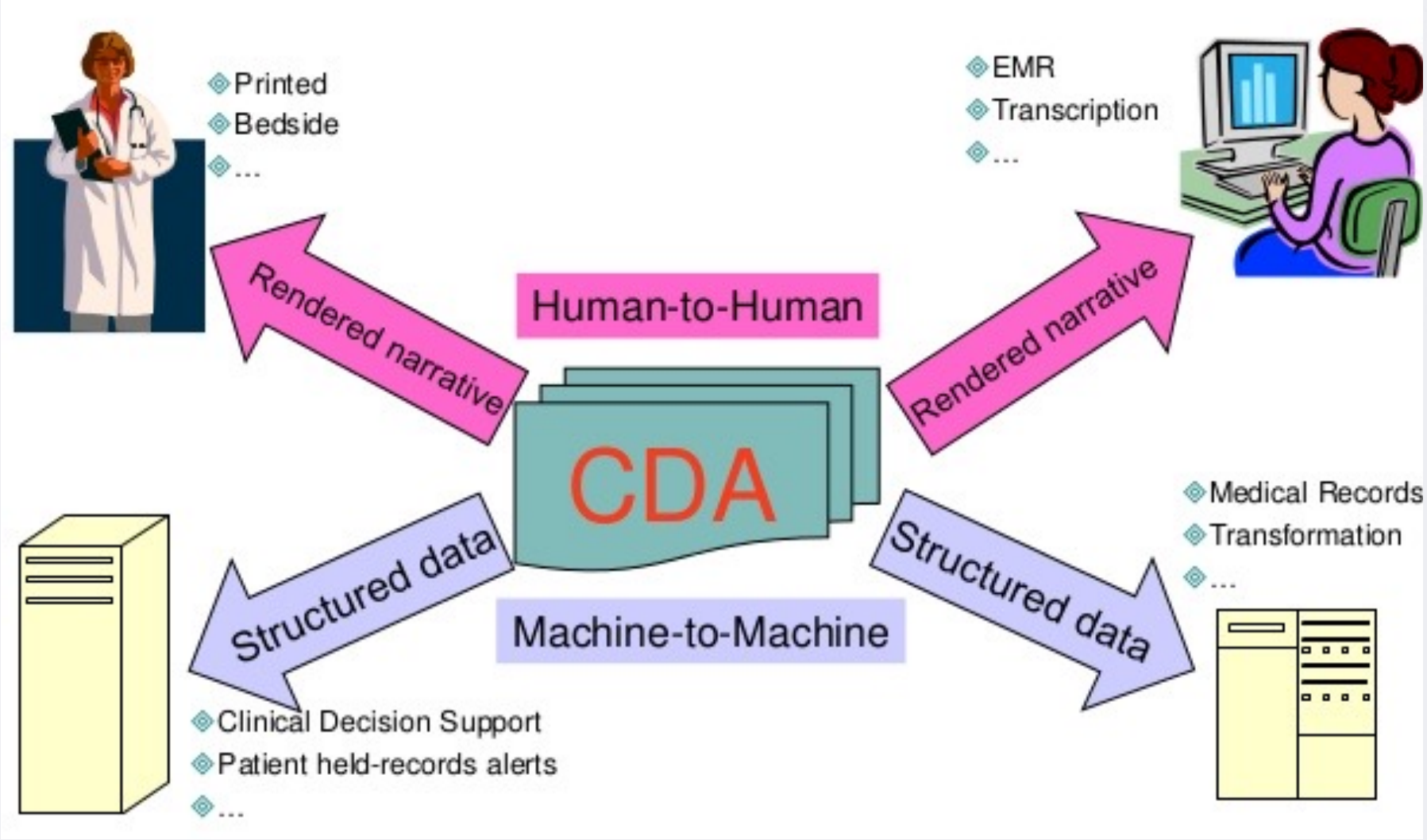
Clinical Documents: Different formats

HL7: Document Exchange Standards

- HL7 CDA (Clinical Document Architecture)
  - " A document markup standard that specifies structure & semantics of clinical documents for the purpose of exchange"
  - Focuses on document exchange,
  - A document is packaged in a message during exchange
  - A patient medical record as an XML-based documents

=> CDA is not designed for document storage, just exchange?!

HL7: Document Exchange Standards



A Clinical Document

- A CDA document is a complete information record that can include:
  - Text
  - Images
  - Sounds
  - Other information or media

- Clinical content of the document is defined by the HL7 V3 RIM – CDA only standardizes/defines the structure required to exchange documents.

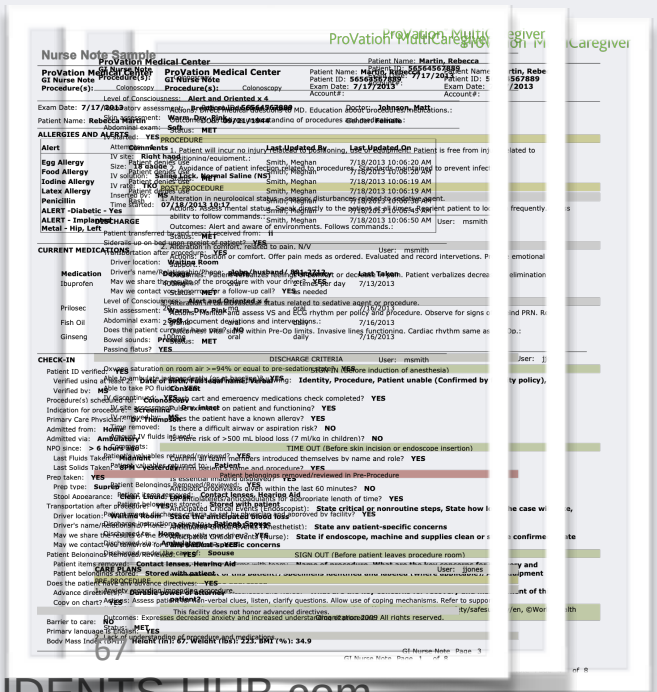
CDA

- CDA = Clinical Document Architecture
- CDA is a HL7-standard
- XML-standard to exchange structured documents

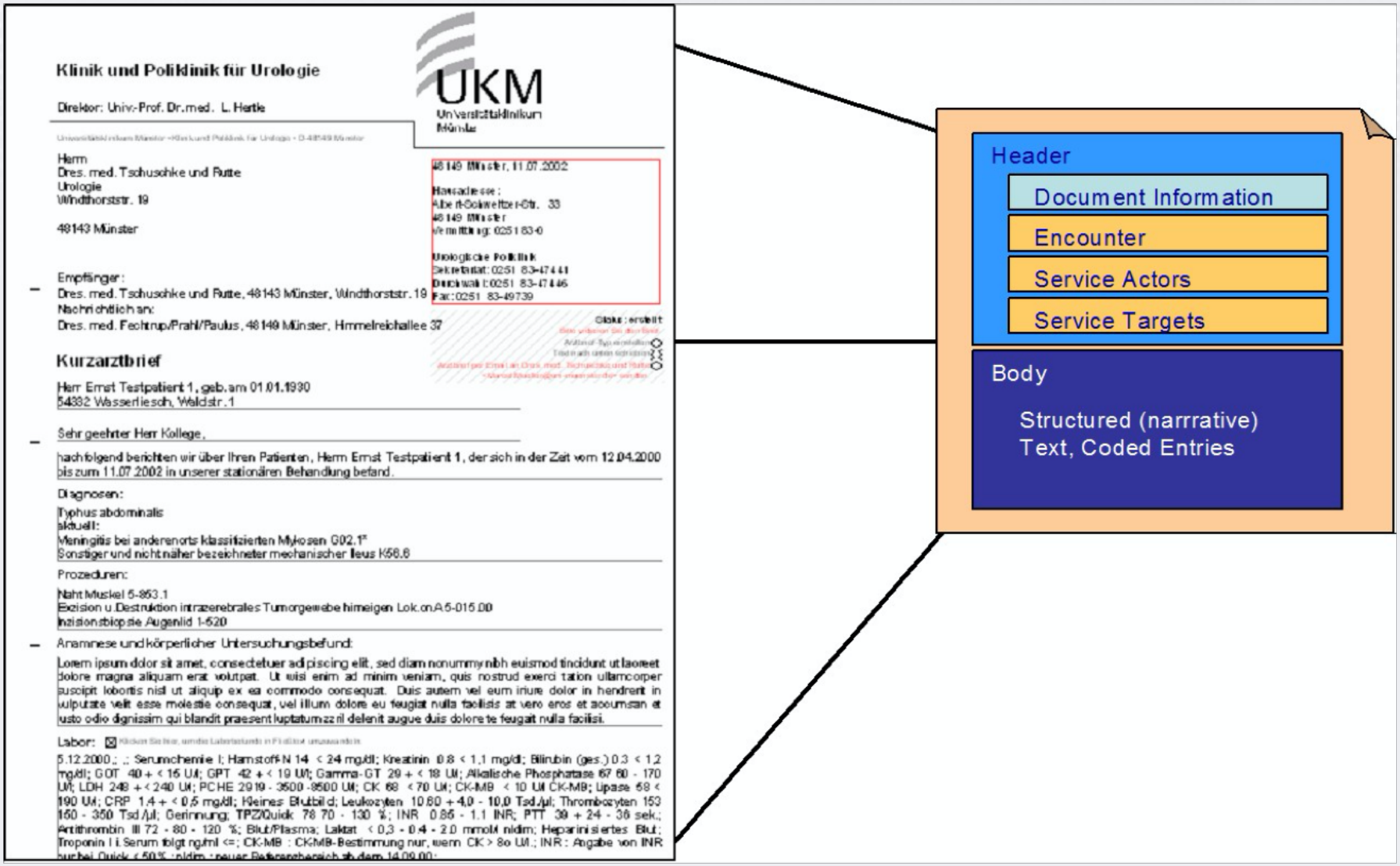
- A key distinction between **HL7 messages** and **HL7 CDA** documents
  - **messages** are packets of data sent from one system to another, get incorporated into the receiving system.
  - **documents** are basically electronic versions of physical clinical documents

CDA

- An electronic equivalent of a paper document
- Has an author/attester
- Represents a point in time view of data
- Persists as an artifact over time
- Supports simple to very complex document types



Example- Physician Letter as a CDA



Klinik und Poliklinik für Urologie

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Universitätsklinikum Münster

Direktor: Univ.-Prof. Dr. med. L. Hertle

Herrn
Dres. med. Tschuschke und Rutte
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48143 Münster

48149 Münster, 11.07.2002

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Vermittlung: 0251 83-0

Urologische Poliklinik
Sekretariat: 0251 83-47441
Durchwahl: 0251 83-47446
Fax: 0251 83-49739

Empfänger:
Dres. med. Tschuschke und Rutte, 48143 Münster, Windthorststr. 19
Nachrichtlich an:
Dres. med. Fechtrup/Prahl/Paulus, 48149 Münster, Himmelreichallee 37

Diktat: erstellt

Kurzarztbrief

Herr Ernst Testpatient 1, geb. am 01.01.1930
54332 Wasserliesch, Waldstr. 1

Sehr geehrter Herr Kollege,

nachfolgend berichten wir über Ihren Patienten, Herrn Ernst Testpatient 1, der sich in der Zeit vom 12.04.2000 bis zum 11.07.2002 in unserer stationären Behandlung befand.

Diagnosen:

Typhus abdominalis
aktuell:
Meningitis bei anderenorts klassifizierten Mykosen G02.1*
Sonstiger und nicht näher bezeichneter mechanischer Ileus K56.6

Prozeduren:

Naht Muskel 5-853.1
Exzision u. Destruktion intrazerebrales Tumorgewebe hirneigen Lok.on A5-015.00
Inzisionsbiopsie Augenlid 1-620

Anamnese und körperlicher Untersuchungsbefund:

Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugait nulla facilisi.

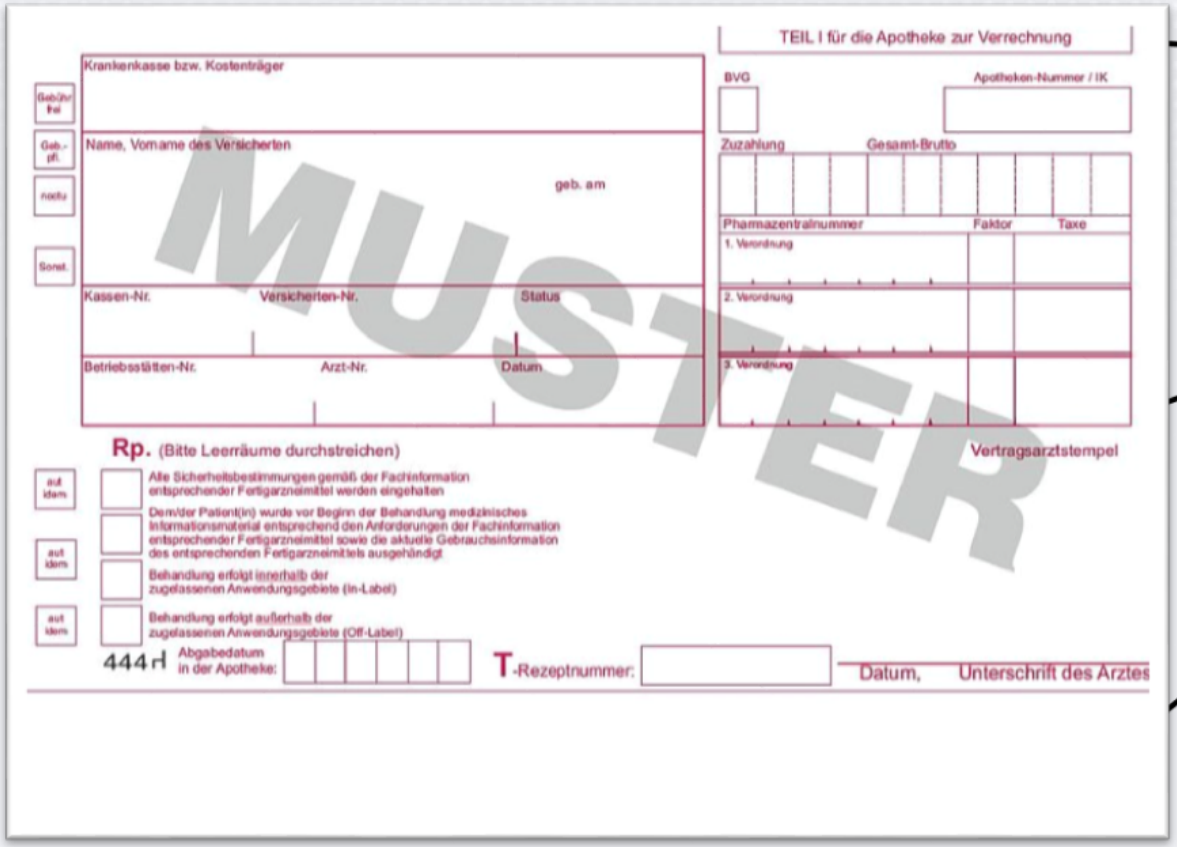
Labor: ☒

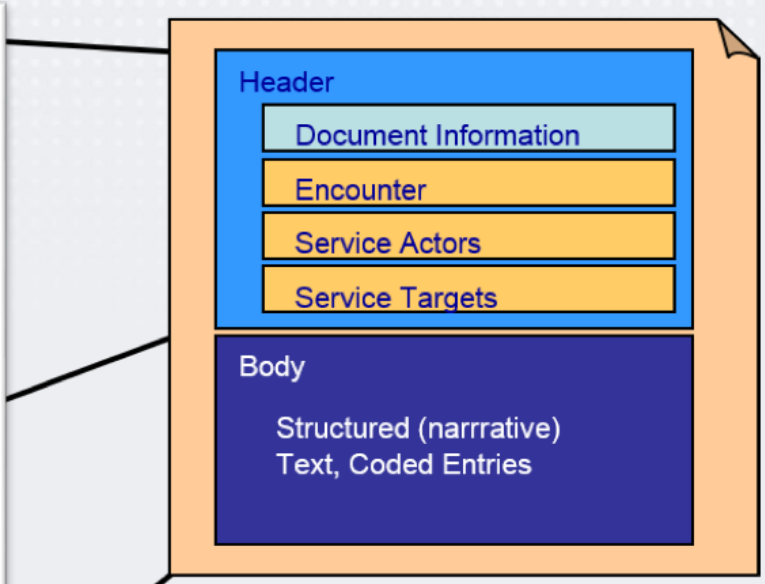
5.12.2000 ; ; Serumchemie I; Harnstoff-N 14 < 24 mg/dl; Kreatinin 0.8 < 1,1 mg/dl; Bilirubin (ges.) 0.3 < 1,2 mg/dl; GOT 40 + < 15 U/l; GPT 42 + < 19 U/l; Gamma-GT 29 + < 18 U/l; Alkalische Phosphatase 67 60 - 170 U/l; LDH 248 + < 240 U/l; PCHE 2919 - 3500 -8500 U/l; CK 68 < 70 U/l; CK-MB < 10 U/l CK-MB; Lipase 58 < 190 U/l; CRP 1,4 + < 0,5 mg/dl; Kleines Blutbild; Leukozyten 10.60 + 4,0 - 10,0 Tsd./µl; Thrombozyten 153 150 - 350 Tsd./µl; Gerinnung; TPZ/Quick 78 70 - 130 %; INR 0.85 - 1.1 INR; PTT 39 + 24 - 36 sek.; Antithrombin III 72 - 80 - 120 %; Blut/Plasma; Laktat < 0,3 - 0.4 - 2.0 mmol/l n/dm; Heparinisiertes Blut; Troponin I i.Serum folgt ng/ml <=; CK-MB : CKMB-Bestimmung nur, wenn CK > 80 U/l.; INR : Angabe von INR nur bei Quick < 50 % ; n/dm : neuer Referenzbereich ab dem 14.09.00:

Header
- Document Information
- Encounter
- Service Actors
- Service Targets

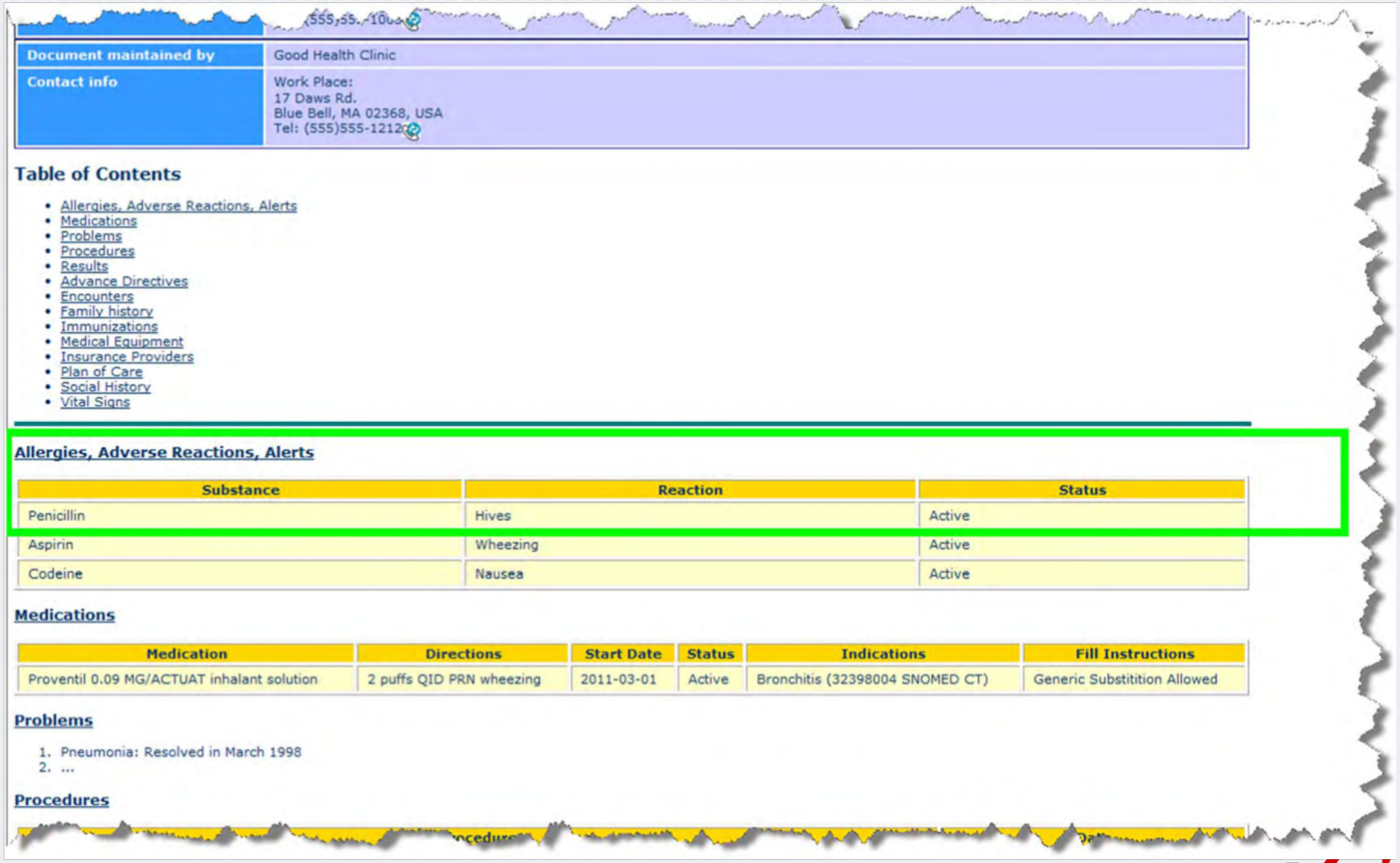
Body
Structured (narrrative)
Text, Coded Entries

Example- medical order as a CDA





Example: CCD (Continuity of Care Document)



Document maintained by	Good Health Clinic
Contact info	Work Place: 17 Daws Rd. Blue Bell, MA 02368, USA Tel: (555)555-1212

Table of Contents

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- Immunizations
- Medical Equipment
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- Plan of Care
- Social History
- Vital Signs

Allergies, Adverse Reactions, Alerts

Substance	Reaction	Status
Penicillin	Hives	Active
Aspirin	Wheezing	Active
Codeine	Nausea	Active

Medications

Medication	Directions	Start Date	Status	Indications	Fill Instructions
Proventil 0.09 MG/ACTUAT inhalant solution	2 puffs QID PRN wheezing	2011-03-01	Active	Bronchitis (32398004 SNOMED CT)	Generic Substitition Allowed

Problems

1. Pneumonia: Resolved in March 1998
2. ...

Procedures

Example: CCD -underlying XML