



# Standar informatika kesehatan

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Minat Sistem Informasi dan Manajemen Kesehatan (SIMKES)

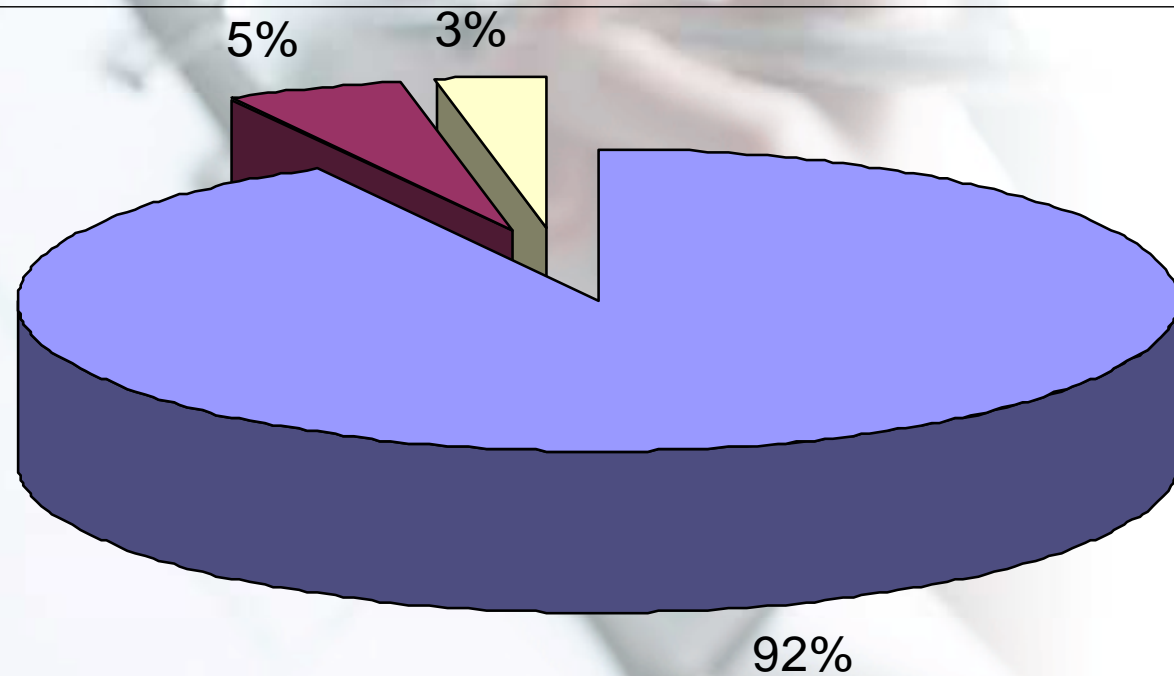
Program Studi S2 Ilmu Kesehatan Masyarakat

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# 1292 rumah sakit



■ manual ■ komputerisasi ■ komputerisasi canggih



Variasi dalam sistem informasi rumah sakit



KARIBU BAWAL JALAN

Nama: Bp. Bimo (Lk/Po) Umur: 64  
 Nama Kep. Kel: Gentan Agama: \_\_\_\_\_  
 Alamat: \_\_\_\_\_

Tanggal	Pemeriksaan / Diagnosis	Pengobatan	Keterangan	Patil Petugas
28 MAY 2005	T: 100/60	T. Dan ... Dokter ...	3 111	
08 JUN 2005	T: 120/90 mmHg		ff per-11 istirahat 2 2x1 Gg asimet 2 Kop 3x1	
13 JUN 2005	T: 120/90 ke-pada 2, panti panti Kuri Bess-	Y. Dokter Bism ... Kop Dokter	3 3x1	
21 JUN 2005	T: 100/70 Anemia.		ff: Antena 2 3x1 Pamol 2 Beoup 2 Gg 2	9 CNOVIA
27 JUL 2005	T: 90/60 Gashine		ff- Antena 2 3x1 (6m) - Pamol 2 - Ermetone 2 - Gg 2	3x1



PUSKESMAS KEC. ...  
 DINAS KESEHATAN ...  
 Nomor II. Rata ...  
 Yth: KEPADA

Handwritten notes on a yellow sticky note:  
 3 7/2  
 3 ...  
 3 ...  
 11/11  
 11/11/01:1





	<ul style="list-style-type: none"> <li>1 Administrasi medikasi: parenteral - inf 1 amp SIKAPLPP 100 1,2JT 0,5 AM</li> <li>1 Laporan shift - 080 DUBUKI MASUK, DM HAKDI 080,0AM VISIT</li> <li>1 Monitor nutrisi - dit sonde</li> <li>1 Monitor cairan - D5%+diazepam 1 amp</li> <li>1 Administrasi medikasi: oral - amoksisil 1x 1 dbi</li> <li>1 Laporan shift - 080 diturunkan jam 1 amoksisil diturunkan amoksisil 1x 1 amp</li> <li>1 Administrasi medikasi: parenteral - MDT</li> <li>1 Memberikan makan melalui slang NGT - 122,00</li> <li>1 Administrasi medikasi: parenteral - PP 1,2 300 0H</li> </ul>	
06/12/06	<ul style="list-style-type: none"> <li>1 Laporan shift - sore keping 1x,sonde masak</li> <li>1 Monitor vital sign - TD:110/70,5,17,5,18,90</li> <li>1 Monitor nutrisi - dit sonde</li> <li>1 Monitor cairan - D5%</li> <li>1 Dressing - TANDA INF (-)</li> <li>1 Monitor cairan - KN 38+1AP DIAZEPAM</li> <li>1 Manajemen pressure - DEKUBITUS DEBATTI DG BETHADIN</li> <li>1 Memberikan makan melalui slang NGT - DIET HBS 100CC</li> <li>1 Administrasi medikasi: parenteral - INJ PP 1,2 300 1X,INJ RADIN 1AP JAM 1,2,EXTRA DIAZEPAM 1AP 3V</li> <li>1 Administrasi medikasi: enteral - AMERODOL SYM 1SDM VIA NGT</li> <li>1 Laporan shift - THERAPI +INJ RADIN,MTD INF HBS,SONDE(+),KEJANG(-) KAKU(+),RAWAT DEKUBITUS (+),INFUS 1 SALLUR RL/D5%+1AP DZP</li> <li>2 Monitor cairan - ganti infus : D5% TAMBAH DIAZEPAM 1 APL</li> <li>1 Memberikan makan melalui slang NGT - DIET MASUK 250 CC</li> <li>1 Terapi oksigen - memberikan oksigen 2-3 liter /menit</li> <li>1 Laporan shift - sore tdk kejang,dzp drip 1 apl,</li> <li>1 Administrasi medikasi: parenteral - inj diazepam 1 amp bokus</li> <li>1 Memberikan makan melalui slang NGT -</li> <li>1 Administrasi medikasi: parenteral - PP 1,2 300,radin 1ampul</li> </ul>	<ul style="list-style-type: none"> <li>1 Kontrol risiko</li> <li>Risiko keselamatan</li> <li>Monitor faktor risiko lingkungan</li> <li>Monitor faktor risiko lingkungan</li> </ul>
07/12/06	<ul style="list-style-type: none"> <li>1 Monitor vital sign - T:130/60 n:84 s:36</li> <li>1 Monitor cairan - D5%+diazepam 1 ampul</li> <li>1 Laporan shift - kaku2, inf drip 1 amp DZP, NGT dilepas bim dipsg lg, dit sonde (-)</li> <li>2 Bantu perawatan diri - ganti alat tenun</li> <li>2 Rawat luka - rawat luka dekubitus</li> <li>2 Intubasi gastrointestinal - NGT no 16,sarung tangan 2</li> <li>2 Administrasi medikasi: parenteral - inj, valium 1amp</li> <li>2 Monitor cairan - RL</li> <li>1 Terapi oksigen - 1500 LITER,2LTR/MNT</li> <li>1 Manajemen pressure - RAWAT LUKA DEKUBITUS</li> </ul>	

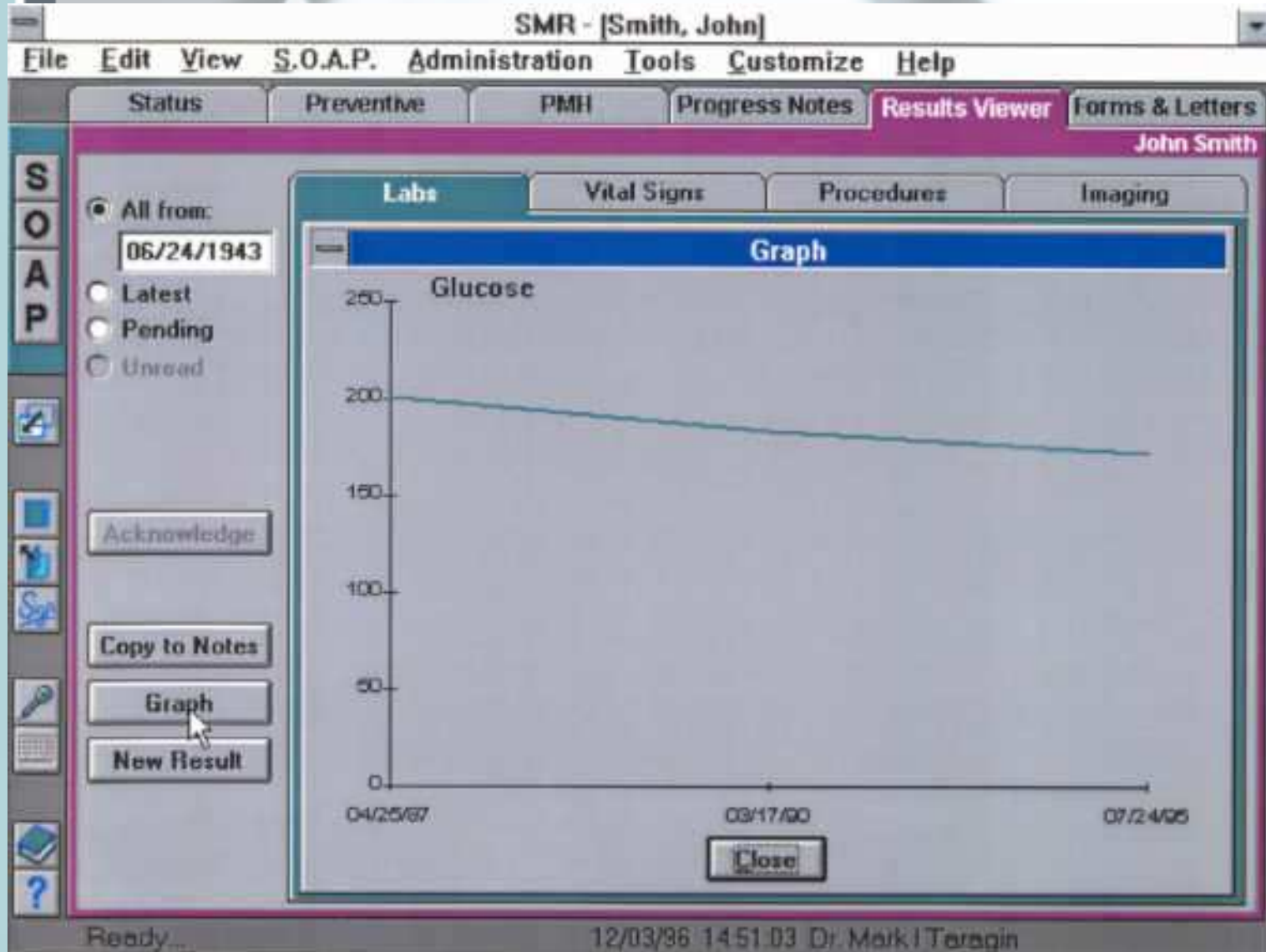
11/12/2006 21:02:15

Model status asuhan keperawatan berbasis komputer

The screenshot displays a medical software interface with several key sections:

- Imaging Display:** A grid of 12 chest X-ray images. The first image is highlighted with a blue border. Below each image is a label with a date, such as "19 OBSTRUCTIVE SERIES [STL] RAD RAD 09/06/2001".
- Medications:** A list of active medications:
  - Rabeprazole Na 20mg Ec Tab - Active
  - Nitroglycerin 0.4mg Sl Tab - Active
  - Warfarin (coumadin) Na 5mg Tab - Active
  - Spironolactone 25mg Tab - Active
  - Furosemide 20mg Tab - Active
- Recent Lab Results:**
  - Urinalysis (stl) Urine Collection Tube Wc Lb #931
  - Cell Count (fluid) Pleural Fluid Wc Lb #978148
  - Ldh Pleural Fluid Wc Lb #978148 Feb 19
  - Protein Pleural Fluid Wc Lb #978148 Feb 19
  - Glucose Pleural Fluid Wc Lb #978148 Feb 19
  - Abo/Rh Typing Blood Wc Lb #978074 Feb 19
  - Type & Screen Blood Wc Lb #978074 Feb 19
- Vitals:**
  - T 96.7 F Feb 20,02 13:35 (35.9 C)
  - P 101 Feb 20,02 13:35
  - R 20 Feb 20,02 13:35
  - BP 112/70 Feb 20,02 13:35
  - HT 70 in Feb 19,02 14:41 (177.8 cm)
  - WT 156 lb Feb 19,02 14:41 (70.9 kg)
  - PN 0 Feb 20,02 13:35
- Appointments/Visits/Admissions:**
  - Jul 03,02 10:30 Jc-7b Derm Follow-Up
  - Mar 21,02 14:50 Jc-Pc 5-N \* Babu Cons \* Tm-4
  - Mar 11,02 14:40 Jc-Bronze \* Pulm Daughaday
  - Mar 05,02 15:20 Jc-Pc 5-N \* Babu \* Tm-4
  - Mar 04,02 11:00 Jc-5-N \* Pharm Corr Therapy
  - Feb 20,02 14:53 Jc-Pc 5-N \* Nurse Coor \* Tm-4
  - Feb 19,02 16:17 Inpatient Stay 7-S M
- Navigation and System:**
  - Navigation tabs: Cover Sheet, Problems, Meds, Orders, Notes, Consults, D/C Summ, Labs, Reports.
  - Windows: Start, Singlesession01 - Microsof..., CPRS - Patient Chart, Imaging Display.
  - System tray: 5:05 PM.

Atau sudah berupa rekam medis multimedia (filmless)





# PDA sebagai rekam medis

The screenshot displays the 'Pocket Torex 1.1' application on a PDA. The interface is organized into several sections:

- Header:** 'Pocket Torex 1.1' with a volume icon and the time '12:09'.
- Patient Information:** A green box containing the name 'Ms Kristy Jaydene Smith', 'Date of Birth: 16/07/1976', and address '99 English Drive Aberford Leeds West Yorkshire LS21 3AB Tel: 0267 349675'.
- Navigation:** A grid of buttons for 'Medication', 'Sensitivities', 'Summary', 'Current', 'Dormant', and 'Journal'.
- Medication List:** A table with two columns. The first column lists conditions: 'Asthma', 'Iud Fitte...', 'C/O Para...', 'Delivery -...', 'New Pati...', and 'Threadw...'. The second column shows 'M Benadryl Plus Capsules' highlighted in red.
- Medication Details:** A yellow box showing the date '12/07/2002', frequency '1/day', and medication name 'Benadryl Plus Capsules'.
- Footer:** 'Patient Action Filter User' with a help icon and a keyboard icon.

Fig 1 Torex produces software for keeping track of patients' records.

Direct warning secara otomatis melalui SMS dokter jika kondisi klinis pasien memburuk...

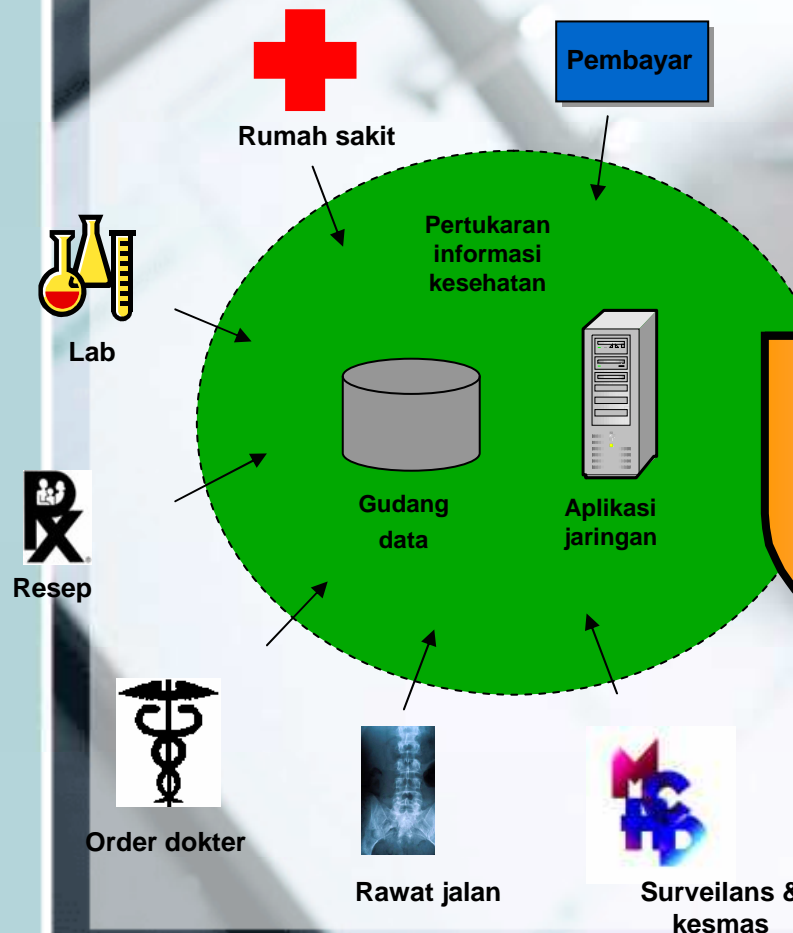


# TeleCare

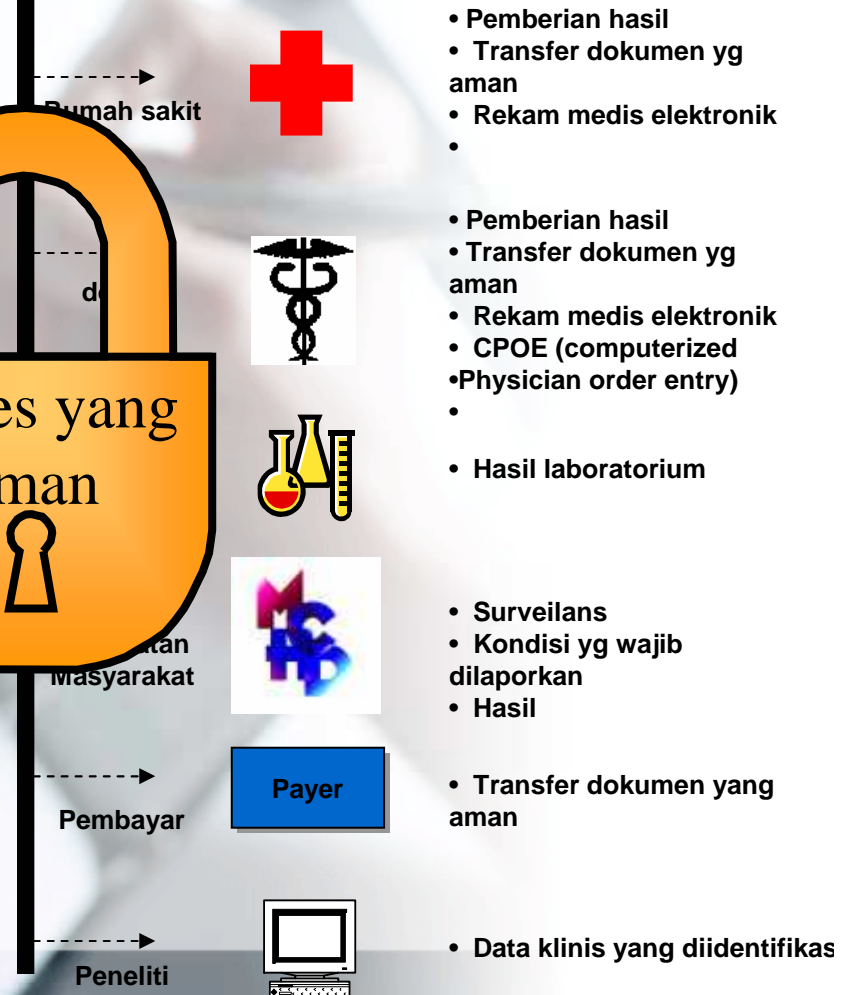


# Lingkup manajemen data rumah sakit

## Manajemen data



## Akses dan penggunaan data





**Sleman2 : Table Database DHF Sleman**

No	NAMA	SEX	UMUR	KK	JLN	DESA	KEC	WIL_PKM	THN	BLN
1		1	6		Ponowaren RT 16 RV	4	Gamping	2	2005	1
2		1	41		Kwarasan, RT 7 RW	4	Gamping	2	2005	1
3		2	20		Pelemgurih, RT 11 B:	5	Gamping	2	2005	1
4		2	2	Arif	Patukan RT 21/RW 4	2	Gamping	1	2005	2
5		1	21		Patukan 20/2, Ambar	2	Gamping	1	2005	4
6		1	10		Nusupan Rt 3 Rw 28	3	Gamping	2	2005	4

Record: 1 of 120

**Microsoft Access - [Kota : Table] Database DHF Kota Yogya**

File Edit View Insert Format Records Tools Window Help

Type a question for help

ID	No	NAMA	L	P	ALAMAT	KELURAHAN	PUSKESMAS	TGL
93	93			20	JL SURENGJURITAN PA I/605	GUNUNGKETU	PAKUALAMAN	PANTI RAPIH 13-Jan-05
12	12		23		JL CANTEL 353	BACIRO	GONDOKUSUMAN I	PANTI RAPIH 15-Jan-05
114	114		21		NITIKAN BARU UH V/49	SOROSUTAN	UMBULHARJO I	RSUP DR. SAF 17-Jan-05
35	35		8		BUMIJO KIDUL JT I/1139 JL SURYONEG.	BUMIJO	JETIS	PANTI RAPIH 20-Jan-05
129	129		13		JL LOKANANTA 18 RT 37 RW 07	PATANGPULUI	WIROBRAJAN	RSUD WIROSA 21-Jan-05
127	127		13		WB I/493 RT 22 RW 05	PAKUNCEN	WIROBRAJAN	RSUD WIROSA 24-Jan-05
128	128		14		TEGALMULYO RT 12 RW 03 NO 128 C	PAKUNCEN	WIROBRAJAN	RSUD WIROSA 24-Jan-05
130	130		15		KOMPL. BNI 46/4	PATANGPULUI	WIROBRAJAN	PANTI RAPIH 28-Jan-05

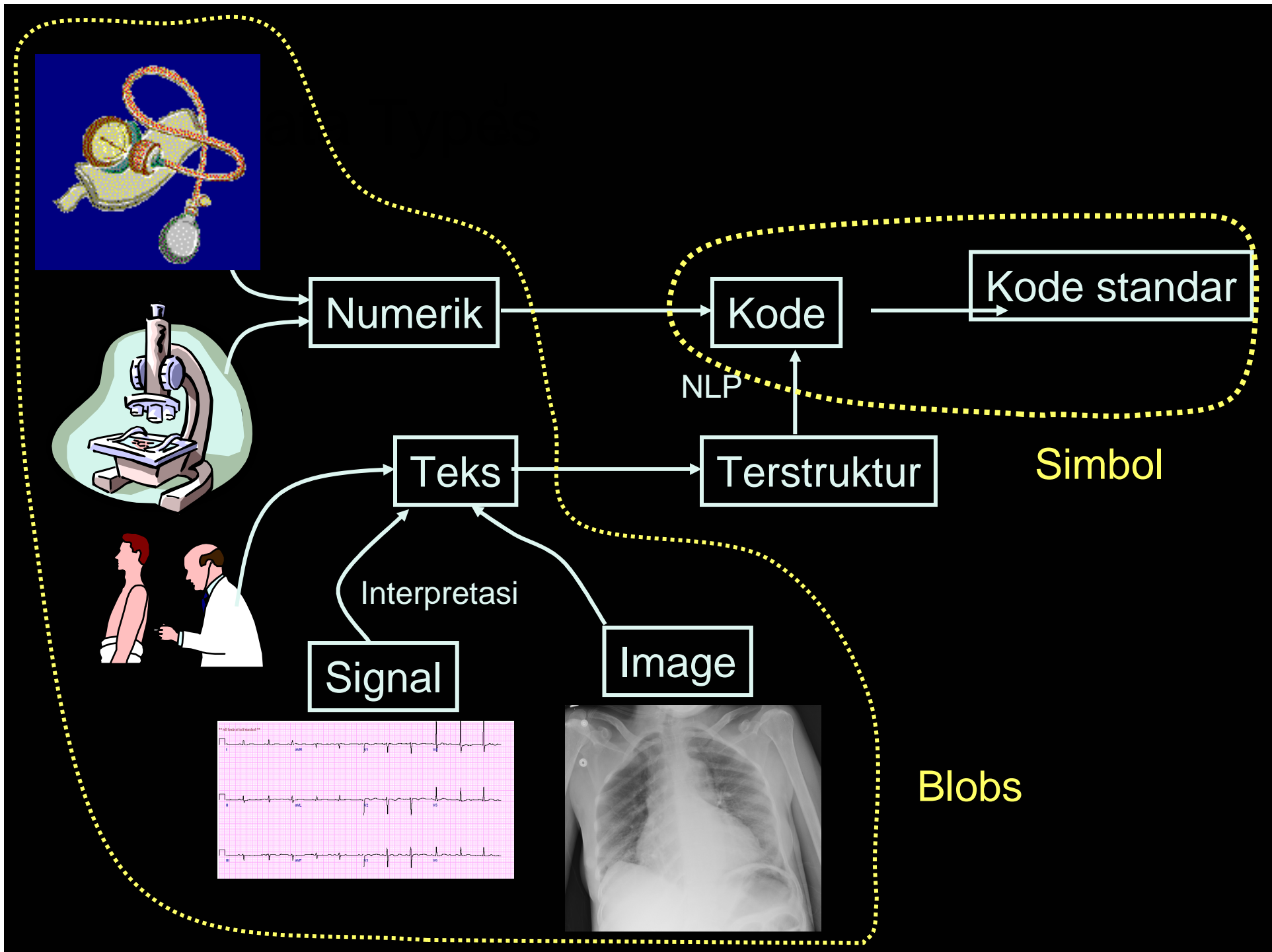
**Elektronik, Tidak Standar --> Manual**

# ~~sistem~~ informasi asimetri



**rumah sakit** --- pasien

rumah sakit --- **vendor**



# Standar di rumah sakit

- Standar pelayanan medis → *clinical guideline*
- Standar pelayanan → ISO
- Standar sistem informasi rumah sakit?  
→ standar informatika kesehatan



A close-up, slightly blurred photograph of a person's hand holding a pen and writing on a document. The document has some faint lines and text. The image is overlaid with a semi-transparent white box containing bold black text. The overall background is a light teal color.

**The nice thing about standard is...  
There are so MANY to choose from**

Ketiadaan standar akan menghambat komputerisasi secara luas

&

Ketiadaan standar akan menghambat pelayanan kesehatan yang efektif dan efisien berbasis IT



**Ketiadaan standar akan menghambat pelayanan kesehatan**

# Standar informatika kesehatan

- **Berbagai tujuan**
  - Transaksi keuangan, klaim asuransi, data klinis, data demografis, *images*, alat kedokteran, .....dll.
- **Berbagai organisasi pengembang standar** (*SDO = standard development organization*)
  - WHO, ANSI, ISO (TC215), CEN (TC251), IEEE, ASTM, HL7, DICOM (ACR-NEMA), berbagai perhimpunan profesi dokter .... dll.

# Standar informatika kesehatan (lanj)

- **Standar istilah, kode dan perbendaharaan kata (*vocabulary*)**
  - Berbagai kode yang mewakili istilah medis
  - misalnya **ICD, SNOMED, LOINC...**dll.
- **Standar pertukaran data**
  - Memungkinkan pertukaran data antar berbagai sistem yang berbeda baik di dalam maupun antar rumah sakit
  - misalnya. **HL7, DICOM...**dll.



# Standar informatika kesehatan bersifat nasional dan lokal

- **Kepmenkes 844/2006** tentang **Kode Kesehatan** memuat:
  - Kode identifier rumah sakit, puskesmas
  - Kode obat
  - Kode alat/inventory
  - Kode wilayah
  - *Belum memuat standar data klinis yang rinci*
- Kode lokal dalam aplikasi komputer (software)
- Berbagai format output/laporan berbasis kertas (SP2RS)



# dari **Integrasi** ke **Interoperabilitas**

“**interoperabilitas** adalah kemampuan sistem teknologi informasi dan aplikasi software yang berbeda untuk saling berkomunikasi, tukar menukar data secara akurat, efektif, konsisten dan menggunakan informasi yang telah dipertukarkan.”

National Alliance for Health Information Technology (NAHIT), 2005

[http://www.nahit.org/cms/index.php?option=com\\_content&task=view&id=220&Itemid=115](http://www.nahit.org/cms/index.php?option=com_content&task=view&id=220&Itemid=115)

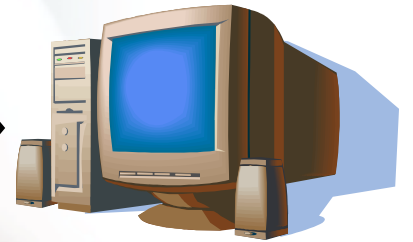
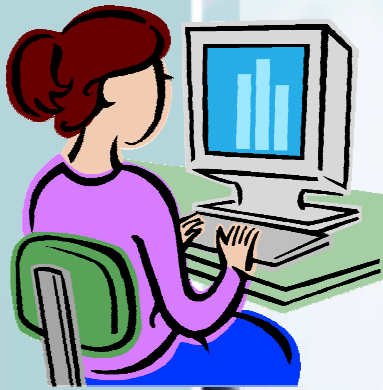
# Adopsi standar informatika kesehatan oleh Depkes AS

- March 21, 2003 **Messaging Formats**
  - HL7, NCPDP, IEEE 1073, DICOM, LOINC (results)
- May 6, 2004 **Terminologies**
  - HL7 vocabularies, SNOMED-CT, LOINC (orders), HIPAA code sets, FDA drug names and codes, RxNORM, NDF-RT, EPA substance registry system, HUGN



# Standar pertukaran data

- Standar format pesan
  - Data administratif - X12
  - Data klinis - HL7
  - Gambar medis - DICOM
  - Data peresepan obat - NCPDP
  - Data alat medik - IEEE 1073
- Arsitektur dokumen
- Template medis
- User Interface
- Patient Data Linkage



# HL7

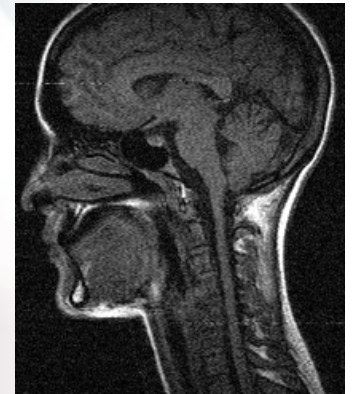
- HL7 = Health Level 7
- ANSI Standards Development Organization (1994)
- Menentukan transaksi pertukaran data kesehatan
  - Meliputi: Registrasi pasien, ADT (Admission Discharge Transfer), asuransi, biaya, order, hasil pemeriksaan lab, observasi, penjadwalan
- Not-for-profit, volunteer
  - Provider, vendor, asuransi, kelompok pemerintah, konsultan, dll
- Komite teknis, Special Interest Group

# Contoh pesan hasil laboratorium menggunakan HL7

- MSH Segment - Message Header
- PID Segment - Patient ID
- OBR Segment - Observations Report ID
- OBX Segment - Observation/Result

```
MSH|^~\&||CDB|||ORU^R01|K172|P<cr>
PID|1|0123456-1||ROBERTSON^JOHN^H|||||9821111<cr>
OBR|5|2740X^OE|BC402^MIC|87186^Antibiotic MIC|R|198703281230 |19870329080<cr>
OBX|1|ST|28-1^AMIPICILLIN:SUSC:PT:ISLT:QN:MIC^LN||<2|ug/ml||S||F<cr>
OBX|2|ST|60-4^CARBENICILLIN:SUSC:PT:ISLT:QN:MIC^LN||<16|ug/ml||S||F<cr>
OBX|3|ST|267-5^GENTAMICIN:SUSC:PT:ISLT:QN:MIC^LN||<2|ug/ml||S||F<cr>
```





# DICOM

- Digital Imaging and Communications in Medicine
- Standards Committee
  - Vendors: Philips, Siemens, GE Medical Systems, IDX, Heartlab, Eastman Kodak ...
  - Users
  - General Interest

NDC

HCPCS

ICF

ICD-10

NOC

ICD-10-PCS

Omaha

CPT-4

NANDA

ICD-9-CM

MEDCIN

# Terminologi Kesehatan

NHS  
CTV3

LOINC

NIC

NDF-RT

DSM

Gabrieli

MedDRA

Read Codes

SNOMED  
-RT

SNOMED  
-CT

ICD-9

HIPAA

health insurance portability  
accountability act



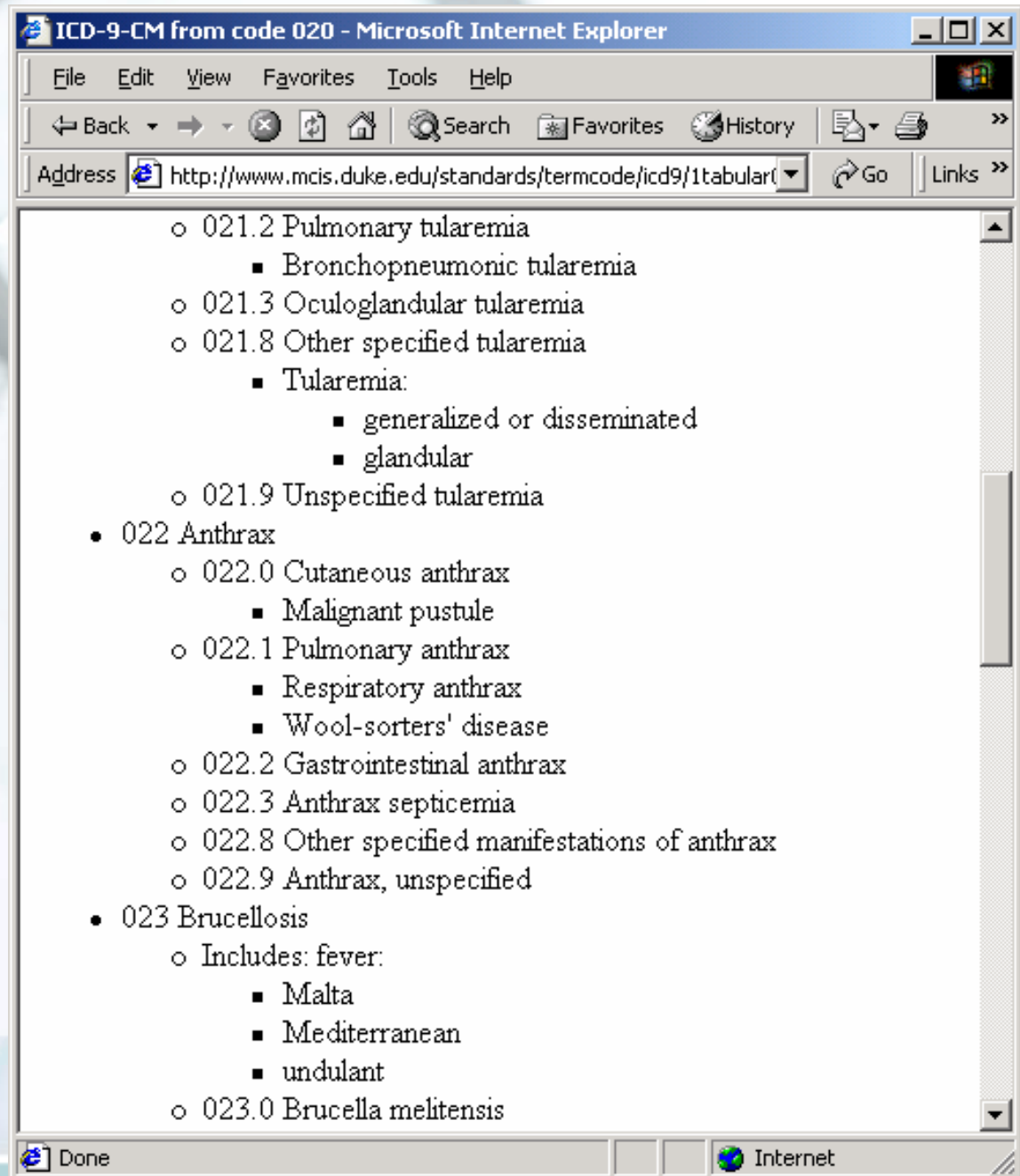
# Standar yang dianut oleh HIPAA

ICD-9-CM	International Classification of Diseases, 9 <sup>th</sup> Edition, Clinical Modification
CPT-4	Current Procedural Terminology, 4 <sup>th</sup> Edition
HCPCS	Healthcare Common Procedure Coding System
CDT-2	Code on Dental Procedures and Nomenclature, 2 <sup>nd</sup> Edition
NDC	National Drug Codes

# ICD-9-CM

- ICD-9-CM berbasis pada ICD-9
- ICD: International Classification of Diseases
  - World Health Organization (WHO)
  - Tujuan:
    - kode dan klasifikasi mortalitas berdasarkan sertifikat kematian
    - Promosi komparabilitas internasional
  - ICD-10 (since Jan. 1, 1999), WHO copyright
- ICD-9-CM: International Classification of Diseases, Clinical Modification
  - National Center for Health Statistics (NCHS)
  - Tujuan:
    - Kode dan klasifikasi morbiditas pasien rawat jalan (outpatient)
  - Dapat didownload, diupdate setiap tahun

# ICD-9-CM



ICD-9-CM from code 020 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print Links

Address <http://www.mcis.duke.edu/standards/termcode/icd9/1tabular/> Go Links

- 021.2 Pulmonary tularemia
  - Bronchopneumonic tularemia
- 021.3 Oculoglandular tularemia
- 021.8 Other specified tularemia
  - Tularemia:
    - generalized or disseminated
    - glandular
- 021.9 Unspecified tularemia
- 022 Anthrax
  - 022.0 Cutaneous anthrax
    - Malignant pustule
  - 022.1 Pulmonary anthrax
    - Respiratory anthrax
    - Wool-sorters' disease
  - 022.2 Gastrointestinal anthrax
  - 022.3 Anthrax septicemia
  - 022.8 Other specified manifestations of anthrax
  - 022.9 Anthrax, unspecified
- 023 Brucellosis
  - Includes: fever:
    - Malta
    - Mediterranean
    - undulant
  - 023.0 Brucella melitensis

Done Internet

# NDC

- NDC = National Drug Code
- Drug Listing Act of 1972
  - Dimandatkan oleh FDA (Badan POM AS)
  - Untuk peresepan dan sebagian obat bebas yang tersedia di AS
- Memuat formulasi, route, packaging, perusahaan
- Contoh kelas NDC

ADRENAL CORTICOSTEROIDS  
TOPICAL STEROIDS  
CEPHALOSPORINS  
QUINOLONES / DERIVATIVES  
DISORDERS, ACID/PEPTIC  
ANTIDEPRESSANTS

ANTIDIARRHEALS  
SEDATIVES / HYPNOTICS  
DERMATOLOGICS  
ANTIVIRALS  
CNS, MISCELLANEOUS  
AMINOGLYSIDES



# NDC Search Page

The screenshot shows a Microsoft Internet Explorer browser window titled "Electronic NDC Home Page - Microsoft Internet Explorer". The address bar displays "http://www.fda.gov/cder/ndc/database/". The main content area has a yellow background and features the following text:

## National Drug Code Directory

Current through December 2001

[Preface](#)

[FAQs](#)

[Search by Proprietary Name](#)   [Search by NDC Number](#)

[Search by Active Ingredient](#)   [Search by Firm Name](#)

Drug questions email: [DRUGINFO@CDER.FDA.GOV](mailto:DRUGINFO@CDER.FDA.GOV)

See also: [Drug Registration and Listing Instructions](#)  
[National Drug Code Directory Data Files](#)

U.S. Department of Health and Human Services  
Public Health Service  
Food and Drug Administration  
Center for Drug Evaluation and Research  
Office of Information Technology  
Division of Data Management and Services

The browser's status bar at the bottom shows "Internet".

# NDC Query

National Drug Code Query-Active Ingredient - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print Links

Address <http://www.fda.gov/cder/ndc/database/docs/queryndcai.htm> Go Links

## National Drug Code Query

---

**Search by Active Ingredient Name:**

(Type in part or all of active ingredient)

---

[Return to the National Drug Code Directory Home Page](#)

Done Internet

# NDC Results

**National Drug Code Directory Search Results - Microsoft Internet Explorer**

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print Copy Paste Links

Address <http://www.accessdata.fda.gov/scripts/cder/ndc/getaidet.cfm?prodcode=689&blcode=51660> Go Links

Trade Name	Strength	Complete NDC	Packsize	Packtype	Dosage Form	Rx/OTC
DOXYCYCLINE CAPSULES	100MG	51660-689-04	250	BOT	CAP	R
DOXYCYCLINE CAPSULES	100MG	51660-689-50	50	BOT	CAP	R

[Return to National Drug Code Directory Home Page](#)

Internet

**NCVHS**

**National Committee on Vital  
and Health Statistics**

# NCVHS

## Terminologi Utama

<b>SNOMED-CT</b>	Systematized Nomenclature of Human and Veterinary Medicine, Clinical Terms
<b>LOINC</b>	Logical Observations Identifiers, Names, and Codes
<b>RxNORM</b>	("normalized" notations for clinical drugs)
<b>UMDNS</b>	Universal Medical Device Nomenclature System



# NCVHS

## Terminologi tambahan

UNII	Unique Ingredient Identifier
MedDRA	Medical Dictionary for Drug Regulatory Affairs
MEDCIN	Medicomp Systems Inc.
ISBT	International Society for Blood Transfusion
DSM-IV	Diagnostic and Statistical Manual for Mental Disorders
Pharmacy knowledge bases	FirstDataBank, MediSpan, Multum

# SNOMED-CT

- Systematized Nomenclature of Medicine - Clinical Terms
  - Rilis pertama Feb. 2002
- Kolaborasi AS dan Inggris
  - AS: College of American Pathology (CAP)
    - SNOP, SNOMED 2, SNOMED International, SNOMED-RT
  - Inggris: National Health Service (NHS)
    - Read 4-byte set, 5-byte set, Read 2, Clinical Terms Version 3
- Isi
  - 325.000 konsep, 800.000 descriptions, 950.000 relas

# SNOMED - Axes

- D - Diseases
- C - Drugs
- F - Function
- L - Living Organisms
- X - Manufacturers
- G - Modifiers
- M - Morphology
- J - Occupations
- A - Physical Agents
- P - Procedures
- S - Social Context
- T - Topography

# SNOMED - contoh

"D3-15000"	"01"	"Myocardial infarction, NOS"	"(T-32020) (M-54700)"
"D3-15000"	"02"	"Infarction of heart, NOS"	"(T-32020) (M-54700)"
"D3-15000"	"02"	"Cardiac infarction, NOS"	"(T-32020) (M-54700)"
"D3-15000"	"02"	"Heart attack, NOS"	"(T-32020) (M-54700)"
"D3-15010"	"01"	"Microinfarct of heart"	"(T-32000) (M-54701)"
"C-C137A"	"01"	"Bufferin Analgesic Tablets"	
"C-C137B"	"01"	"Bufferin Analgesic Caplets"	
"M-54700"	"01"	"Infarct, NOS"	
"M-54700"	"02"	"Infarction, NOS"	
"M-54700"	"05"	"Infarcted"	
"M-54701"	"01"	"Focal infarct"	
"M-54701"	"02"	"Microscopic infarct"	
"S-10120"	"01"	"Mother, NOS"	

# LOINC

- Logical Observation Identifier Names and Codes
- Tujuan
  - Membuat identifier universal (nama dan kode) yang nantinya akan digunakan dalam pesan HL 7 dan DICOM
- Tanpa lisensi dan fee
- Besar
  - 32,000 observasi



# Struktur dasar LOINC

Field	Contoh
Komponen	Potassium, hepatitis C antigen
Properti	Substance concentration, volume rate
Waktu	Point in time, 24 hr
Sampel	Urine, serum, plasma
Skala	Quantitative, ordinal, nominal, narrative
Metode	MOLGEN

2951-2

SODIUM:SCNC:PT:SER/PLAS:QN

# UMLS

- Unified Medical Language System
- National Library of Medicine (NLM)
- Purpose
  - Mempermudah kemampuan program komputer untuk memahami makna istilah biomedis dan menggunakannya untuk mengintegrasikan berbagai informasi kepada pengguna (1993)
  - Mempermudah pengembangan sistem komputer yang dapat memahami/ “understanding” bahasa biomedis dan kesehatan (2004)
- UMLS Knowledge Sources
  - Metathesaurus, Semantic Network, Specialist Lexicon

# UMLS

- Cakupan
  - Kombinasi berbagai vocabulary
- Ukuran
  - 1 juta konsep, 2.8 juta nama, 100+ sumber
- Nama dan hubungan
- Organisasi berdasarkan konsep
- Makna



# UMLS Knowledge Source Server (UMLSKS)

*National Library of Medicine*

## About the UMLSKS

- ▶ [Log in](#)
- ▶ [Overview](#)
- ▶ [Frequently Asked Questions](#)
- ▶ [UMLS Metathesaurus®](#)
- ▶ [Semantic Network](#)
- ▶ [SPECIALIST Lexicon](#)

## Documentation

- ▶ [User's Guide](#)
- ▶ [Developer's API](#)
- ▶ [UMLS Documentation Set](#)

## UMLSKS Registered Users

Login ID:   
Password:

**Login**

[Forgotten your password?](#)

## What's New

- ▶ **2004AA Metathesaurus - including SNOMED CT® - now available to download for those that have signed the new license agreement!**
- ▶ Existing users may click on the Forgotten your password link (above) and enter the new license number. You may use your previous Login ID and Password. After a brief grace period, old license numbers will

## New UMLSKS Users

The UMLSKS is restricted to registered users. If you are not a registered user and would like to use the resources of the UMLS, please read the [UMLS license agreement](#), obtain a UMLS license number, and fill in the form below to request a UMLSKS user account.

Login ID:   
Password:   
Confirm Password:   
First Name:   
Last Name:   
Email:   
UMLS License #:

**Request Account**



# Referensi tentang standar

- National Library of Medicine
  - <http://www.nlm.nih.gov/index.html>
- Unified Medical Language System
  - <http://www.nlm.nih.gov/research/umls/umlsmain.html>
- NCVHS
  - <http://ncvhs.hhs.gov>
- LOINC
  - <http://www.regenstrief.org/loinc>
- SNOMED-CT
  - <http://snomed.org/snomedct/index.html>
- National Health Information Infrastructure; Standards and Standards Organizations
  - <http://aspe.os.dhhs.gov/sp/nhii/standards.html>
- NDF-RT; VA Drug Demonstration Project
  - [http://mmr.afs.apelon.com/va/about/ndfirt\\_files/frame.htm](http://mmr.afs.apelon.com/va/about/ndfirt_files/frame.htm)





# Manfaat

Integrasi

Interoperabilitas

Konsisten

Duplikasi

Sesuai dengan karakteristik perkembangan SIMRS

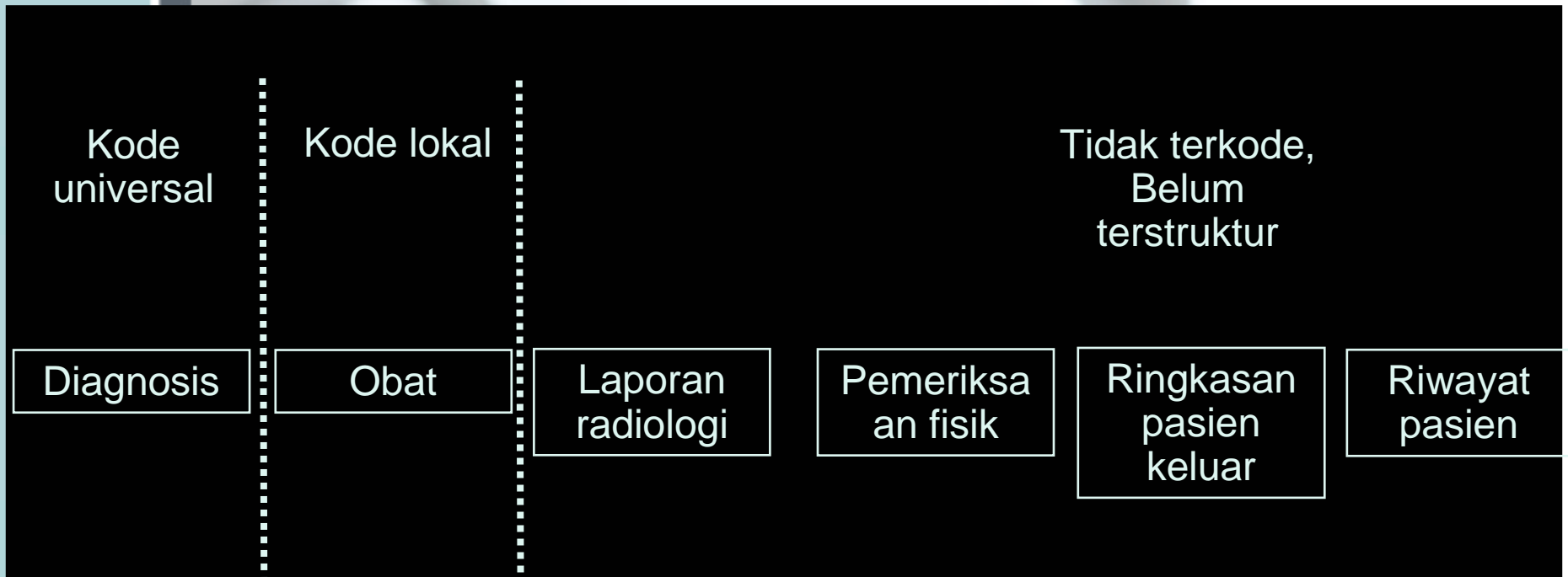
# Implikasi bagi pengembangan SIMRS

- Persyaratan standar informatika kesehatan harus dipenuhi oleh **aplikasi sistem informasi**
  - Standar nasional
  - standar internasional
- Dituangkan dalam master plan pengembangan SIM RS
- Dimasukkan ke dalam kerangka acuan kerja (proposal) pengembangan SIM RS → ditawarkan ke vendor
- Aplikasi vendor harus dinilai kepatuhannya terhadap standar

# Kapan memilih standar?

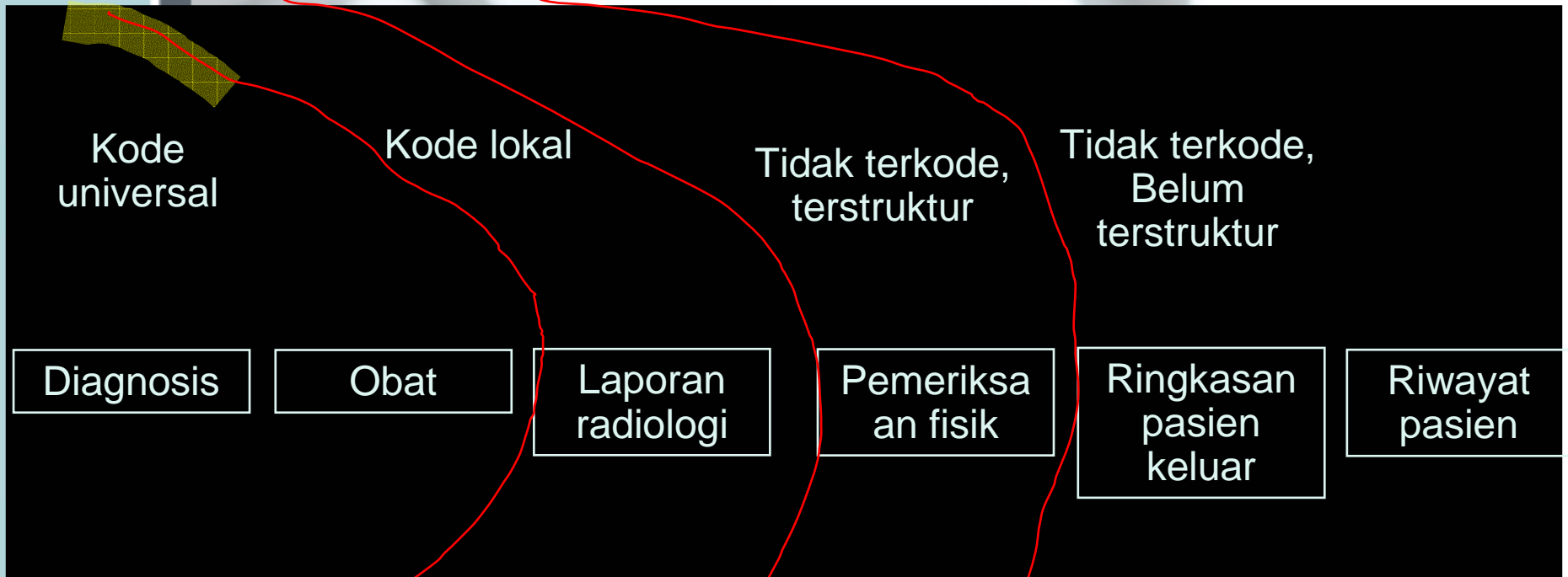
- Memiliki rencana jangka panjang pengembangan sistem informasi rumah sakit
- Telanjur memiliki sistem yang tidak interoperabel satu sama lain
- Regulasi sistem informasi rumah sakit

# Gambaran umum penggunaan kode/klasifikasi



Then (1993)

# Harapan perkembangan berikutnya..



Then (1993)



# Memilih standar

## 1. Adopsi

- Membayar lincense fee – beberapa
- Tanpa lisensi – ICD-10, WHO ATC, LOINC

## 2. Mengembangkan sendiri

- Membutuhkan tim peneliti yang kuat
- Sharing data antar lembaga lokal

# Thailand health coding center

1. Menyusun kesepakatan standar
  2. Pemeliharaan standar kode
  3. Training coders
  4. User support
  5. Penelitian dan pengembangan kode baru
- berdiri 2006 di bawah Depkes Thailand

# Upaya bersama

- **Pemerintah**
  - Regulasi
  - Sumber dana
- **Rumah sakit**
  - Think Big, start small
- **Industri**
  - Adopsi standar dalam pengembangan dan inovasi software
- **Akademik**
  - Adaptasi standar internasional ke lokal (translasi)
  - Apa yang bisa dan yang tidak bisa (*lesson learnt*)

# Kesimpulan

- Tidak ada monopoli sistem informasi
- Diperlukan standar informatika kesehatan
- Memasukkan persyaratan standar informatika kesehatan dalam master plan SIM RS
- Regulasi tentang standar informatika kesehatan

A close-up, slightly blurred photograph of a person's hand holding a silver pen and writing on a white document. The document is part of a binder, with metal rings visible on the left side. The background is a soft, out-of-focus light blue and white. The text 'Terima kasih' is overlaid in the lower-left quadrant of the image.

**Terima kasih**