Introduction
Course structure

- Lectures
- Display wall
- Visualization projects
- Mid-term
- Final project
- Office hours
- Communication
Why this course?

- Your goals
- My goals
- Opportunities
Figure 8.1. Some of the actors involved in healthcare delivery, administration, policy-making, and regulation, each of whom may have a stake in an evaluation study. (Source: Friedman & Wyatt, 1997a.)
The Process of Patient Care

Patient presents with a problem
ID, CC, HPI
Ask questions

Initial hypotheses

More questions
HPI, PMH, FH, Social, ROS

Refine hypotheses

Select most likely diagnosis

EKG, etc.

Laboratory Tests

Radiologic Studies

Examine patient
PE
The Process of Patient Care

- Patient presents with a problem
  - ID, CC, HPI
  - Ask questions

- Initial hypotheses
  - More questions
    - HPI, PMH, FH, Social, ROS

- Refine hypotheses
  - EKG, etc.
  - Laboratory Tests
  - Radiologic Studies
  - Examine patient

- Patient is better; no further care required
  - Observe Results
  - Patient dies
    - Chronic Disease
    - Treat patient accordingly

- Select most likely diagnosis
Functions of computers in medicine

- Data acquisition and presentation
- Record keeping and access
- Communication and integration of information
- Surveillance
- Information storage and retrieval
- Data analysis
- Decision support
- Education
### Physicians' Acceptance of Medical Computing Applications

<table>
<thead>
<tr>
<th>Application</th>
<th>% Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer-Based Patient Records</td>
<td>83</td>
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Types of doctors

• Primary care provider
  – Internist, family practitioner, pediatrician
• Specialist
  – Medical
  – Surgical
• Hospital based provider
  – Anesthesiologist
  – Pathologist
  – Radiologist
Types of health interaction

• Healthy visit
• Chronic visit
• Diagnostic visit
• Acute care
Locations of health care and documentation

- Office
- Hospital
- Home
- Chronic care
- Other hospitals
- Abroad
- Etc.
Types of information

- Textual
- Trend
- Lab data
- 2/3D images
- Administrative
- Billing
Admission Note

10/17/1949

History:

A Mexican-American man was admitted to the hospital for a tonsillectomy.

Physical Exam:

Slight tonsillar enlargement noted. No other significant findings.

Diagnosis:

Tonsillitis

Plan:

Surgical procedure scheduled for tomorrow.

Discharge Date:

10/21/1949

Assessment:

The patient tolerated the procedure well and is expected to make a full recovery.

Signature:

[Signature]

June 3, 1949

CLINIC HISTORY

STANFORD UNIVERSITY HOSPITAL
STANFORD UNIVERSITY MEDICAL CENTER
STANFORD, CALIFORNIA 94305

Head:

47 R. pa weak
Testes - NI size and cons, tachy; no masses
Rectal - 2 masses; R
Prostate nodule ~ 1.5 cm

Figure 2.2. A physician's hand-drawn sketch of a prostate nodule. A drawing may convey precise information more easily and compactly than a textual description.
Figure 2.3. An ophthalmologist’s report of an eye examination. Most physicians trained in other specialties would have difficulty deciphering the symbols that the ophthalmologist has used.
<table>
<thead>
<tr>
<th>Date</th>
<th>Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/1/96</td>
<td>P.T. 1/2: struggled to walk</td>
</tr>
<tr>
<td></td>
<td>able to sit up in chair</td>
</tr>
<tr>
<td></td>
<td>complained of pain in plant ankle</td>
</tr>
<tr>
<td></td>
<td>pil. i rect. muscle. i visual</td>
</tr>
<tr>
<td></td>
<td>normal gait</td>
</tr>
<tr>
<td></td>
<td>red in plant ankle</td>
</tr>
<tr>
<td></td>
<td>p.m. 2: drank 20 oz water</td>
</tr>
<tr>
<td></td>
<td>pil. of rect. muscle</td>
</tr>
<tr>
<td></td>
<td>visual normal</td>
</tr>
<tr>
<td></td>
<td>red in plant ankle</td>
</tr>
<tr>
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</tr>
</tbody>
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Figure 2.8. Written entries are standard in paper records, yet handwritten notes may be illegible. Notes that cannot be interpreted by other people may cause delays in treatment or inappropriate care.
• 2 and 3-d data sets
  – Echocardiography
Data storage

- Current approaches
- Computerized approaches
- Visualization of data
NUMERO ASSOLUTO dei NATI VIVI
MASCHI e
loro superstiti classificati per età
secondo i risultati dei Censimenti
in
SVEZIA
1750-1875

Linee di età    Linee dei censiti
    isodemiche    " superstiti

SCALE
25° per 100 anni di età e per 100 di osservazione
75° per 10 000 individui

Le ordinate verticali rappresentano il numero dei morti, le ordinate orizzontali indicano il tempo di osservazione e gli anni di età.

SISTEMA D’ASSI

100 000 Individui

50 000