



# Interoperable Clinical Practice Guidelines

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“Knowing is not enough; we must  
apply. Willing is not enough; we  
must do”

-Goethe

# **Other Guidelines Implemented**

- **Uncomplicated Urinary Tract Infection in Women**
- **Otitis Media**
- **Pharyngitis**
- **Sinusitis/Upper Respirator Infection**
- **Asthma**
- **Depression**
- **Lipid Management**

# Patient Summary

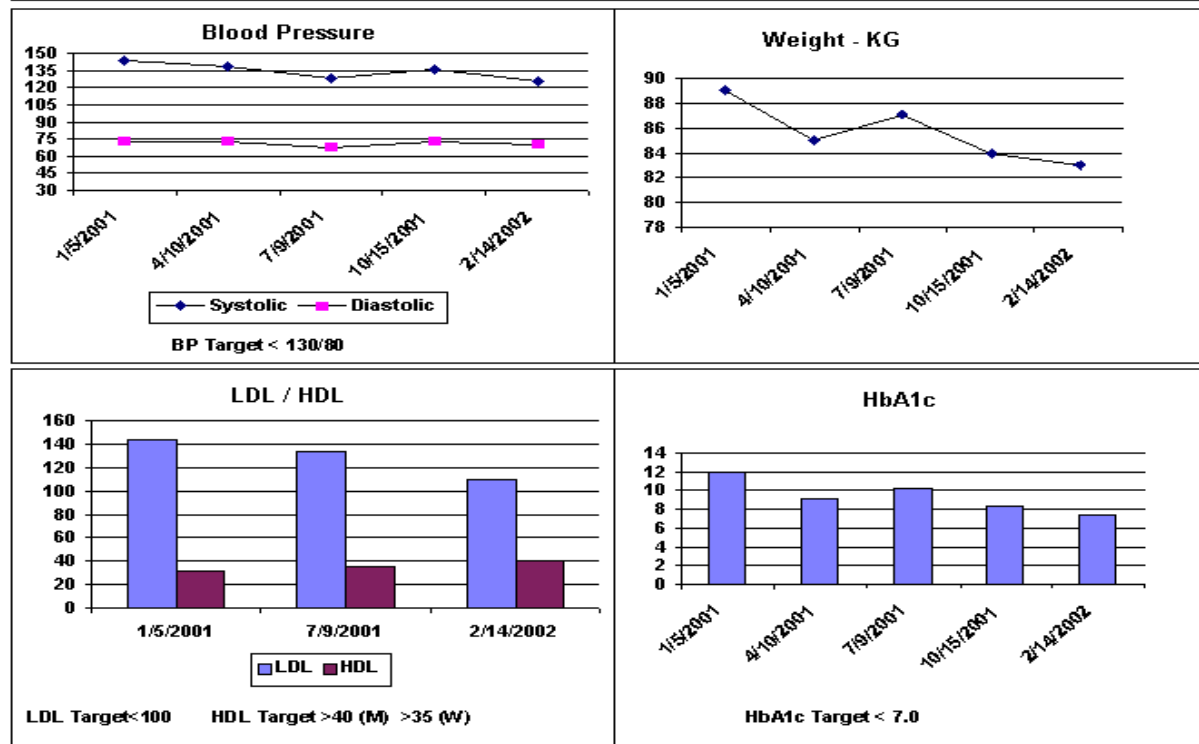
Springfield Medical Center  
Mayo Health System

**Name:** MAKEBELIEVE SANDMANN  
**Address:** 1234 DITCH LANE  
SPRINGFIELD MN 56087  
**Phone:** 5077230000

**MR#:** SP0000027  
**DOB:** 5/22/1975  
**Age:** 27  
**Gender:** F

**Date:** 12/5/2002  
**Physician:** Annette Schmit-Cline, MD

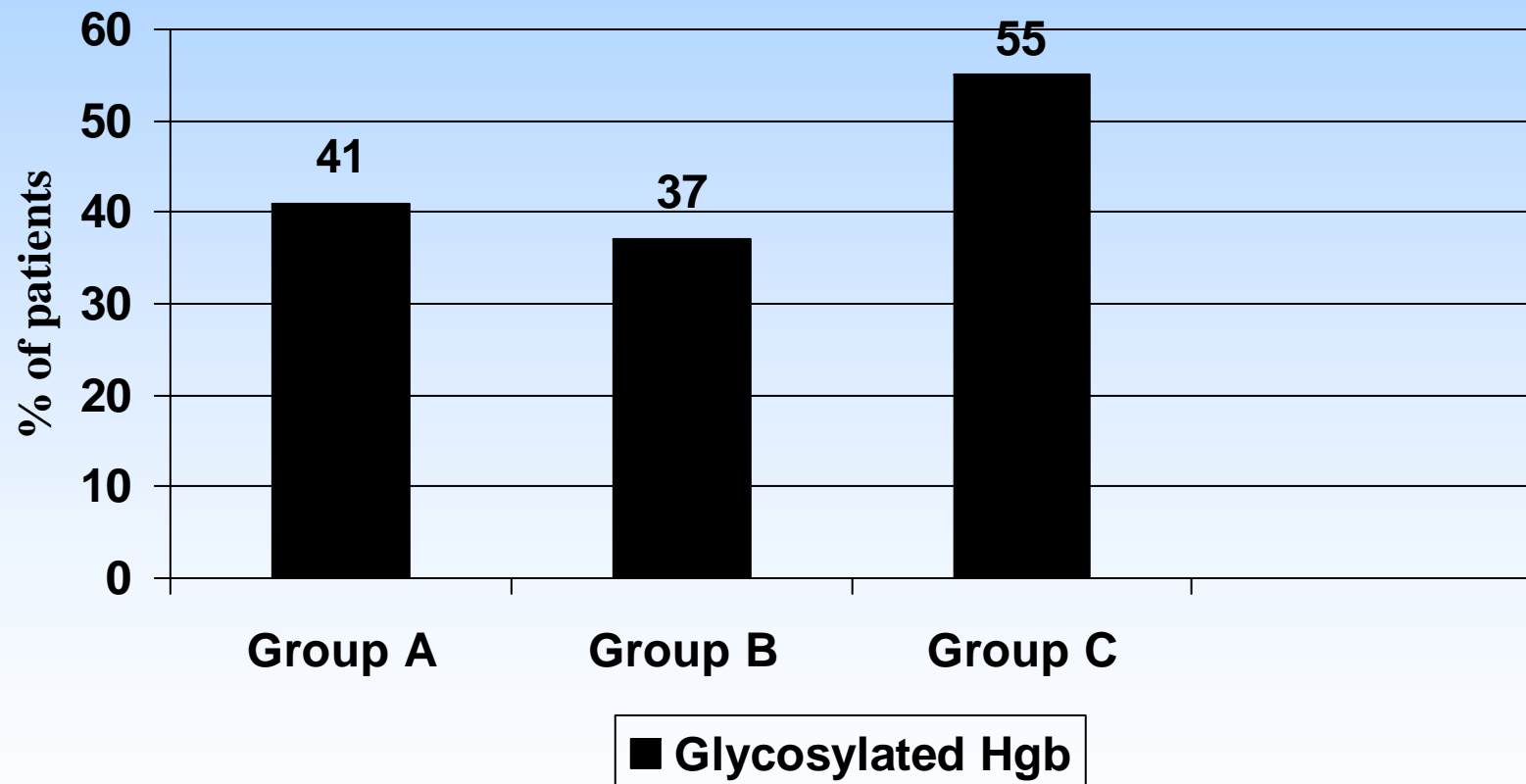
**Dilated Eye Exam** Yearly current 2/7/2002 **Diabetic Education** Yearly OVERDUE 4/24/2001  
**Foot Exam** 6 months OVERDUE 2/7/2002



Self Management Goals:

Test Name	Frequency	Status	Target	2/14/2002	10/15/2001	7/9/2001	4/10/2001	1/5/2001
CHOLESTEROL	yearly	current	<200	196		265		298
CREATININE	yearly	current	<1.3	1.1				0.8
GLUCOSE	6 months	OVERDUE	70-126	112	118	152	129	204
HbA1c	6 months	OVERDUE	<7.0	7.4	8.4	10.2	9.2	11.9
HDL	yearly	current	>40	40		35		32
LDL	yearly	current	<100	110		133		143
MICROALBUMIN	yearly	OVERDUE	<30					10
TRIGLYCERIDES	yearly	current	<200	186		254		316

## Percent of Patients within Target at Study End Who Exceeded Target at Baseline



Graph 4

## Study Interventions

<i><b>Interventions</b></i>	<b>Group A (N=396)</b>	<b>Group B (N=331)</b>	<b>Group C (N=356)</b>
Academic Detailing	<b>X</b>	<b>X</b>	<b>X</b>
Risk Lists	<b>X</b>	<b>X</b>	<b>X</b>
Team Time		<b>X</b>	<b>X</b>
Automatic Letters			<b>X</b>

**Table 1**



## Risk Report: TANGALOS, ERIC G.

GlyHgb Result >= 9.3

LDL Result >= 130

Blood Pressure (Sys) >= 130

GlyHgb Date > 6 months

LDL Date > 12 months

Blood Pressure (Dia) >= 85

3-519-612

~~ALDEN~~, Robert

(507) 288-5745

GlyHgb Result

9.7

GlyHgb Date

4/12/2001

LDL Result

145

LDL Date

5/28/2001

Blood Pressure

90 \ 60

### Appointment Information

<u>Date</u>	<u>Time</u>	<u>Physician</u>	<u>Appt. Note</u>
12/01/01	750	Dr. E. G. Tangalos	GE40 PER DR/WAS NOV
1/05/02	745	Dr. E. G. Tangalos	GE40 PER DR/WAS NOV
1/21/02	800	Dr. E. G. Tangalos	RP20 1/28
1/28/02	1020	Dr. E. G. Tangalos	GEN 1/21

1-604-567

~~GARDNER~~, Lyle

(507) 282-1016

GlyHgb Result

7.5

GlyHgb Date

4/6/2001

LDL Result

68

LDL Date

6/8/2000

Blood Pressure

130 \ 68

### Appointment Information

<u>Date</u>	<u>Time</u>	<u>Physician</u>	<u>Appt. Note</u>
3/11/02	400	heidi dyk	KUPP AFT
3/11/02	400	Hygiene	KUPP AFT
3/11/02	445	Dr. L. I. Kupp	CK AFT HYG
5/04/02	800	Dr. E. G. Tangalos	GME/MAY OR JUNE

2-556-264

~~HAMEISTER~~, Curtis

(507) 289-0112

GlyHgb Result

8.2

GlyHgb Date

12/14/2000

LDL Result

115

LDL Date

10/31/2000

Blood Pressure

160 \ 84

### Appointment Information

<u>Date</u>	<u>Time</u>	<u>Physician</u>	<u>Appt. Note</u>
12/01/01	810	Dr. E. G. Tangalos	GME/SITE
1/05/02	810	Dr. E. G. Tangalos	GME/SITE/WAS DEC
3/02/02	810	Dr. E. G. Tangalos	GME/SITE/WAS DEC



# Diabetes

- **Population Management**
  - **Patient reminders**
  - **Physician reminders**
- **Proactive Care**
- **Integrated Management Guidelines**
- **Utilize a Team Approach**




# Real-Time Reporting for Physician



Diabetes Provider Specific and Site Report		
Diabetes Provider Specific and Site Comparison		
April 19, 2000		
	Resident, NW Clinic	Family Clinic Northwest
Total number of patients:	5	213
Patients with GlyHgb in last 6 months	4 80%	131 62%
Patients with GlyHgb < 9.3 (HbA1C < 8.0)	4 80%	160 75%
Patients with LDL in last 12 months	5 100%	159 75%
Patients with LDL <= 130	4 80%	150 70%
Patients with BP < 130/85	1 20%	74 35%
Patients with Microalbumin in last 12 months	1 20%	107 50%
Patients with Eye Exam in last 12 months	2 40%	122 57%
<div>Print this Form</div> <div>Cancel</div>		

# Provides a 'Snapshot' for Visit Planning


**Chronic Disease Registry \*\*\*DIABETES TEST VERSION\*\*\***


File View Show Maintenance Reports Sort Appointments

  Find Patient


Patient List (N=2987) View Patient  

**Patient Information**

Name: 

Clinic Number: 

Gender: F

Age: 69 Phone: 

**Primary Provider / Area**

Resident, AGIM

Area Medicine

**Last Recorded Vital Signs**

Blood Pressure: 104 / 56

Blood Pressure Date: 09/17/1999

Weight: 162.0 Kg. on: 09/17/1999

**Last Lab Results**

Glucose(P)	05/25/1999	172
Hb,Glycosyl(RBC)	05/25/1999	9.7
HbA1c	Calculated	8.3
Ratio of Alb/Creat	04/27/1998	5
Cholesterol(S)	07/26/1999	187
Triglycerides(S)	07/26/1999	425
HDL Chol(S)	07/26/1999	33
LDL, Calculated	07/26/1999	NAC
Creatinine	05/25/1999	1.5

**Miscellaneous**


Last Eye Exam: 11/21/1995

Note: Eye exam date is filled from billing data and due to lag times may not always be current.

# Sorting and Filtering Capabilities Identify Patients

**Chronic Disease Registry \*\*\*DIABETES TEST VERSION\*\*\***

File View Show Maintenance Reports Sort Appointments

  Find Patient

**Patient List (N=42)** View Patient

Patients for Provider: Scheitel, Sidna M. - Sorted by Last GlyHgb Test

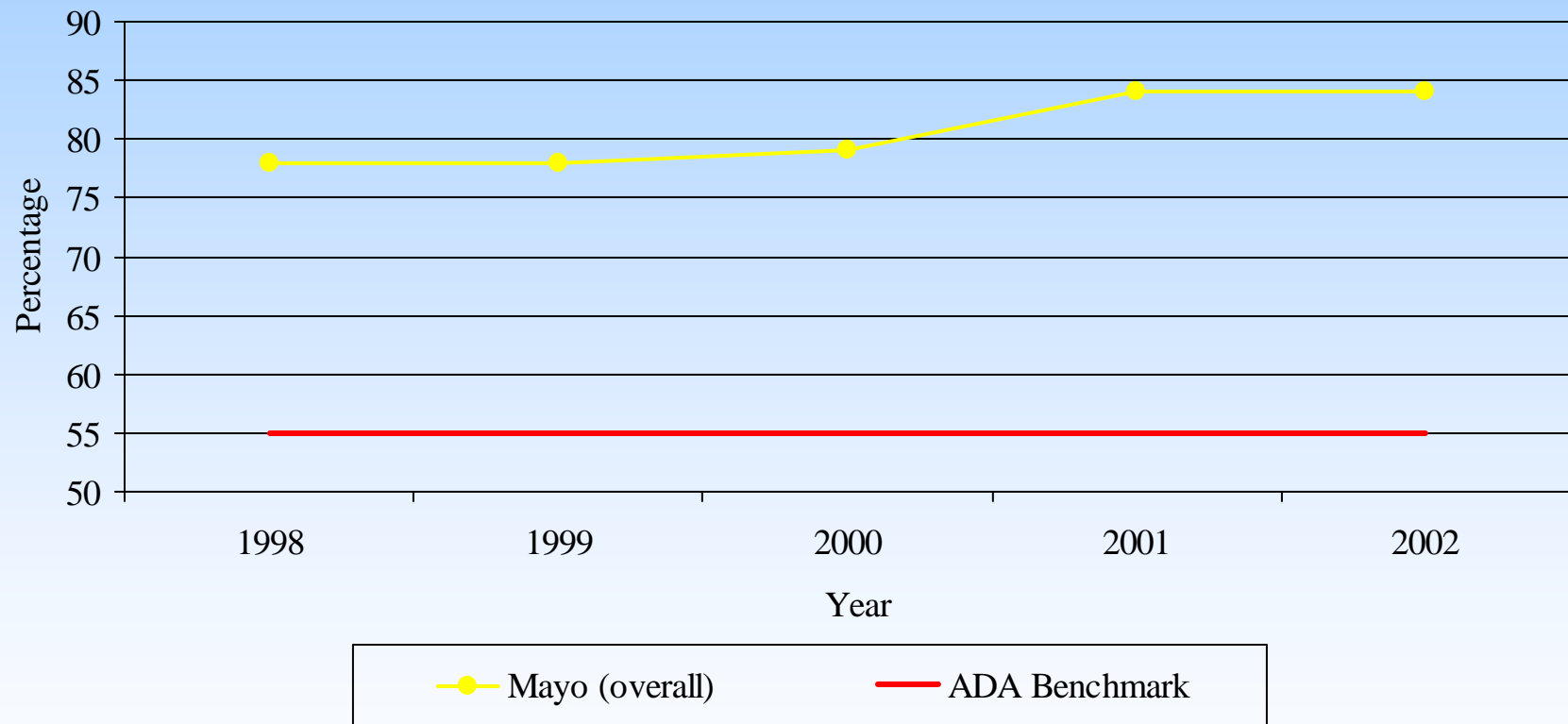
Clinic Number	Last Name	Last GlyHgb	GlyHgb Result	Last Microalbumin	Microalbumin Result	Last C
		08/12/1997	8.2			
		11/12/1998	8.0			03/24
		01/08/1999	8.1			03/31
		06/21/1999	6.5	06/09/1997	1877	06/21
		07/18/1999	11.7	06/29/1999	9	07/24
		07/21/1999	8.8	11/08/1996	14	04/19
		09/08/1999	8.1	06/04/1999	19	04/30
		09/10/1999	15.4	01/07/1998	11	01/06
		10/07/1999	6.7	10/08/1999	3	04/01
		10/19/1999	8.3	10/20/1999	57	10/19
		11/11/1999	7.6	06/21/1999	32	06/21
		11/11/1999	6.3	11/11/1999	6	11/11
		11/16/1999	6.5	11/16/1999	7	03/27

# **Chronic Disease Registry**

- **PC Based Tool to assist providers in:**
  - **Proactive Disease Management**
  - **Visit Planning**
  - **Real-time data feedback**

# Diabetes

HbA1c < 8.0 % or Gly Hgb < 9.7 mg/dl  
Goal 90%.



## Sample

1998-99 n = random sample of 60 patients per quarter  
2000-02 n = Registry; all patients in population

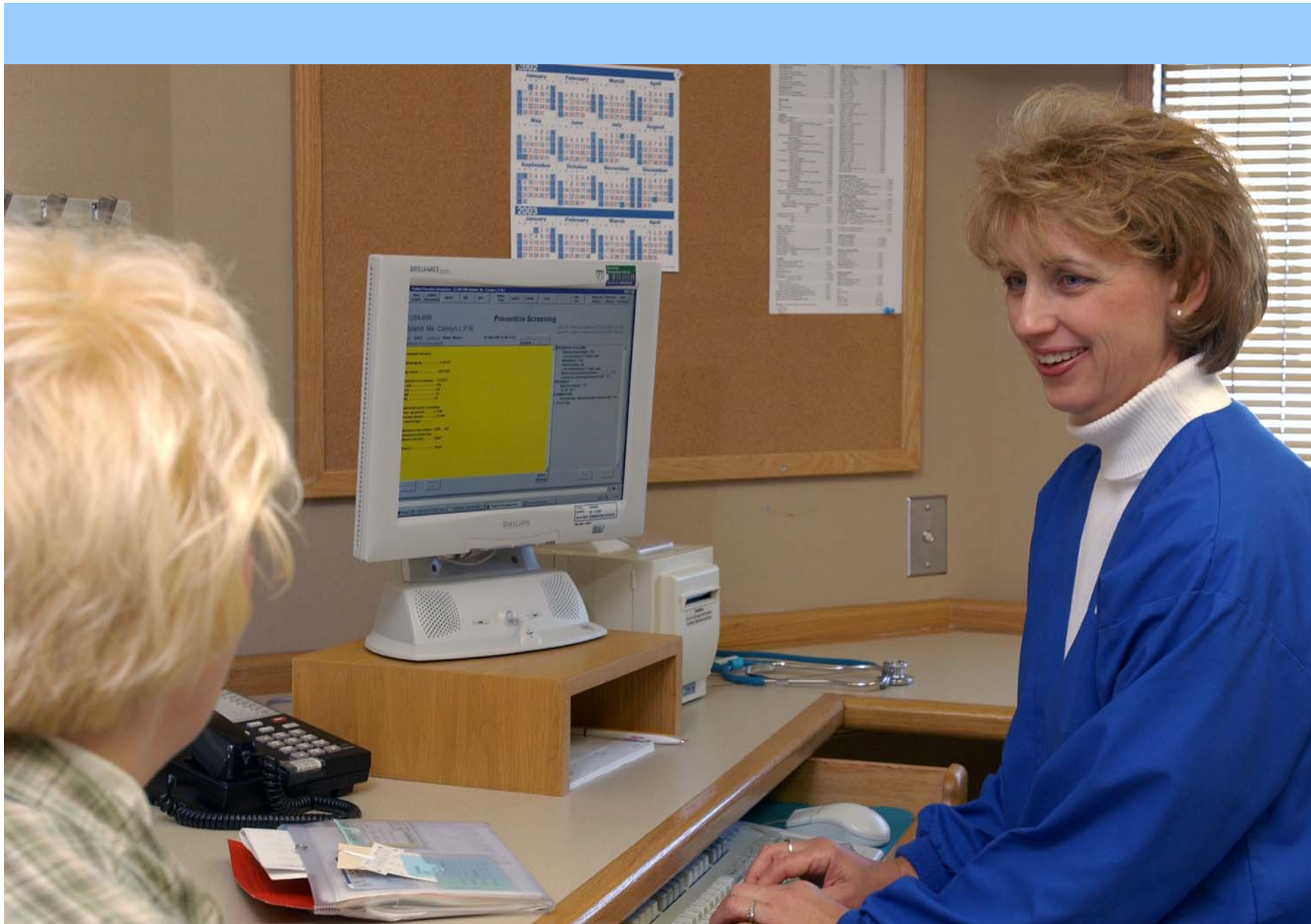
Confidential-Review  
Organization Data.

Chronic Care

Acute Care

Preventive Care

End of Life Care



**Preventive Services** (Adult)
**Sheet  
Number**

Number (Above) and Name

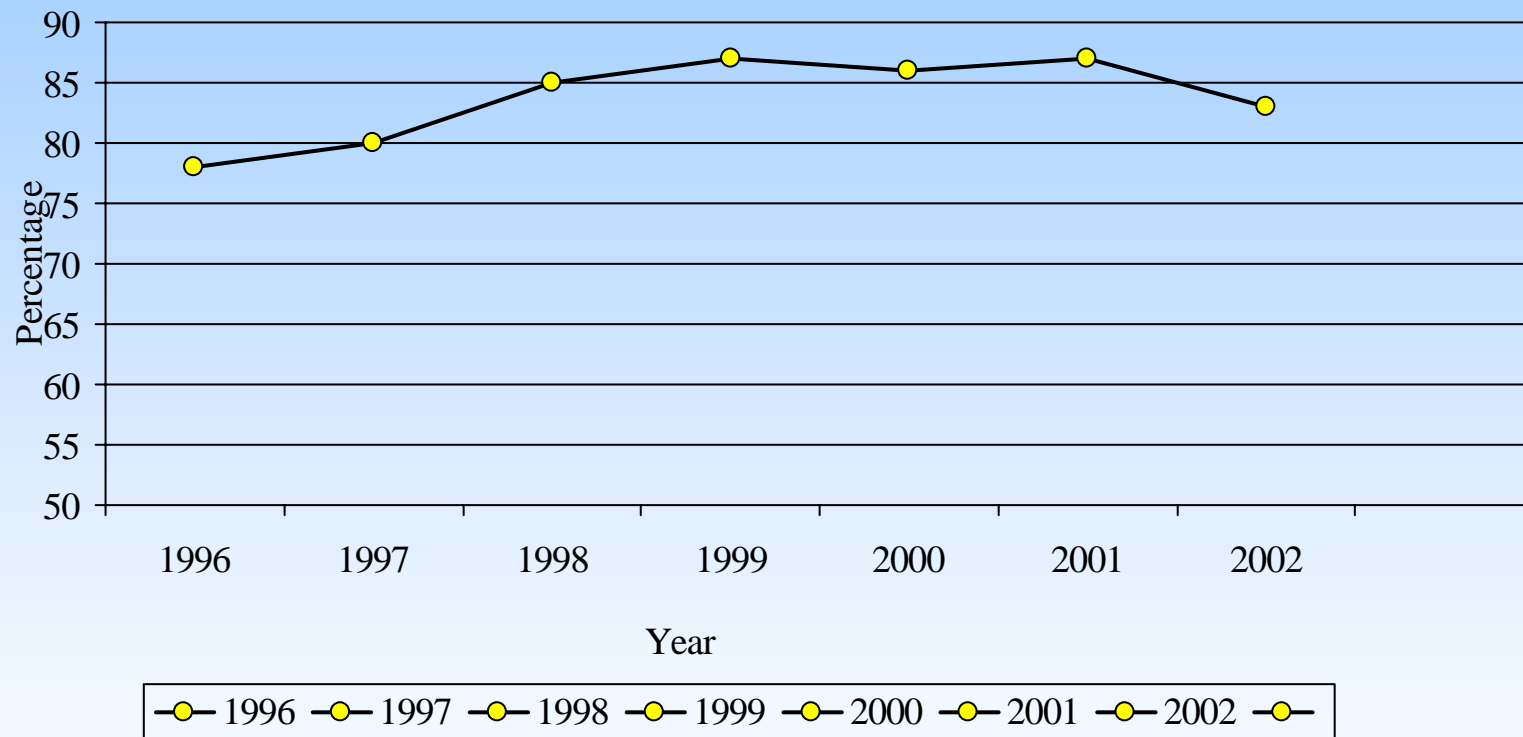
Indicate in the boxes below the last date (mo./yr.) each test was completed (or refused), and if applicable, use the following codes to indicate status: N=neg/ normal; AB= abnormal; R= refused and E = completed elsewhere and results (N/AB)

Date		1995	1996	1997	1998	1999	2000	2001	2002
Mammogram									
Pap smear									
Cholesterol screening									
Colorectal cancer screening									
Flexible sigmoidoscopy/procto									
Barium enema									
Colonoscopy									
Td (tetanus) vaccination									
Influenza vaccination									
Pneumococcal vacc.									



## Preventive Services Services Complete

Goal 90%



**Note:** Percentage of appropriate (age and sex defined) services for the population which were completed.

Confidential-Review

Organization Data.

# Preventive Services

- **Lipid Screening**
- **Immunizations**
- **Cancer Screening**
  - **Breast**
  - **Cervical**
  - **Colon**
- **Tobacco Cessation**
- **Blood Pressure Evaluation**

The diagram consists of four ovals arranged in a 2x2 grid. The top-right oval is yellow and labeled 'Preventive Care'. The top-left oval is light blue and labeled 'Acute Care'. The bottom-left oval is light blue and labeled 'Chronic Care'. The bottom-right oval is light blue and labeled 'End of Life Care'. A small, faint white circle is located at the bottom of the 'Chronic Care' oval.

**Preventive Care**

**Acute Care**

**Chronic Care**

**End of Life Care**

Acute Care

Preventive Care

Chronic Care

End of Life Care

# Planned Care Model

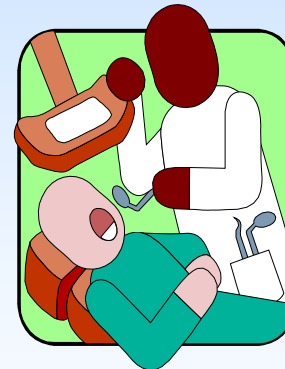


# Generations of Activities



- **First Generation**
  - Based on patient coming to the office, any reason.

- **Second Generation**
  - Population Based
  - Dentistry Model



## Disease Management Strategy Coordinating Committee

Sidna Scheitel, MD

### Physician Liaison Mayo Rochester

Rob Stroebe, MD

### Physician Liaison MHS

Mark Nyman, MD

Healthcare  
Policy &  
Research

### Focus Group Leaders

#### Planned Care Model

Robert Stroebe, MD

#### Acute Illness

Greg Bartel, MD

Healthcare  
Policy &  
Research

Healthcare  
Policy &  
Research

### Mayo Clinic Rochester - Primary Care

Area General Internal Medicine  
Community Internal Medicine  
Community Pediatrics and  
Adolescent Medicine  
Family Medicine Baldwin  
Kasson Family Practice  
Kenyon Family Practice  
Urgent Care Center  
Mayo Family Clinic Northwest

### Mayo Clinic Rochester- Specialty Care

Allergy and Outpatient  
Infectious Diseases  
Emergency Medical Services  
Endocrinology  
General Internal Medicine  
Hypertension  
Pulmonary  
Peds Allergy

### Mayo Health System

Albert Lea	Owatonna
Austin	New Hampton
Cannon Valley	Red Cedar
Decorah	Springfield
Fairmont	Wabasha
Franciscan Skemp	Waseca
ISJ - Mankato, Northridge, Madelia	
Lake City	
Luther Midelfort (Eau Claire)	

# ICSI Guideline Program

- ◆ **Over 50 guidelines developed**
- ◆ **Evidence-based development & maintenance**
- ◆ **Each site chooses 4 guidelines to implement**
- ◆ **Results and approaches shared yearly**
- ◆ **New member programs, change management, consensus building, QI**
- ◆ **Web and pocket-guide access**



# Institute for Clinical Systems Improvement (ICSI)

- Not for profit organization
- 39 participating medical groups
- 5 sponsoring health plans
- Coordinates guideline & technology assessment
  - Development
  - Maintenance
- Forum implementation ideas

# Critical Elements of Mayo's Program

- Leadership support
- Collaboration
  - External
  - Internal
- Clinical Site Guideline Implementation Teams
- Continuous Quality Improvement Methods
- Physician/Patient specific measures
- Healthcare Policy & Research

# What is Disease Management?

## Carve-Out Model:

Care for patients with chronic illness is provided by contracts with disease-management companies.

## Primary Care-Based Disease Management:

Teams work to assist primary care MD in treating patients with chronic illness.

Bodenheimer T. Disease Management-Promises and Pitfalls.  
NEJM. 1999.340(15) 1202-1205

# What is Disease Management?

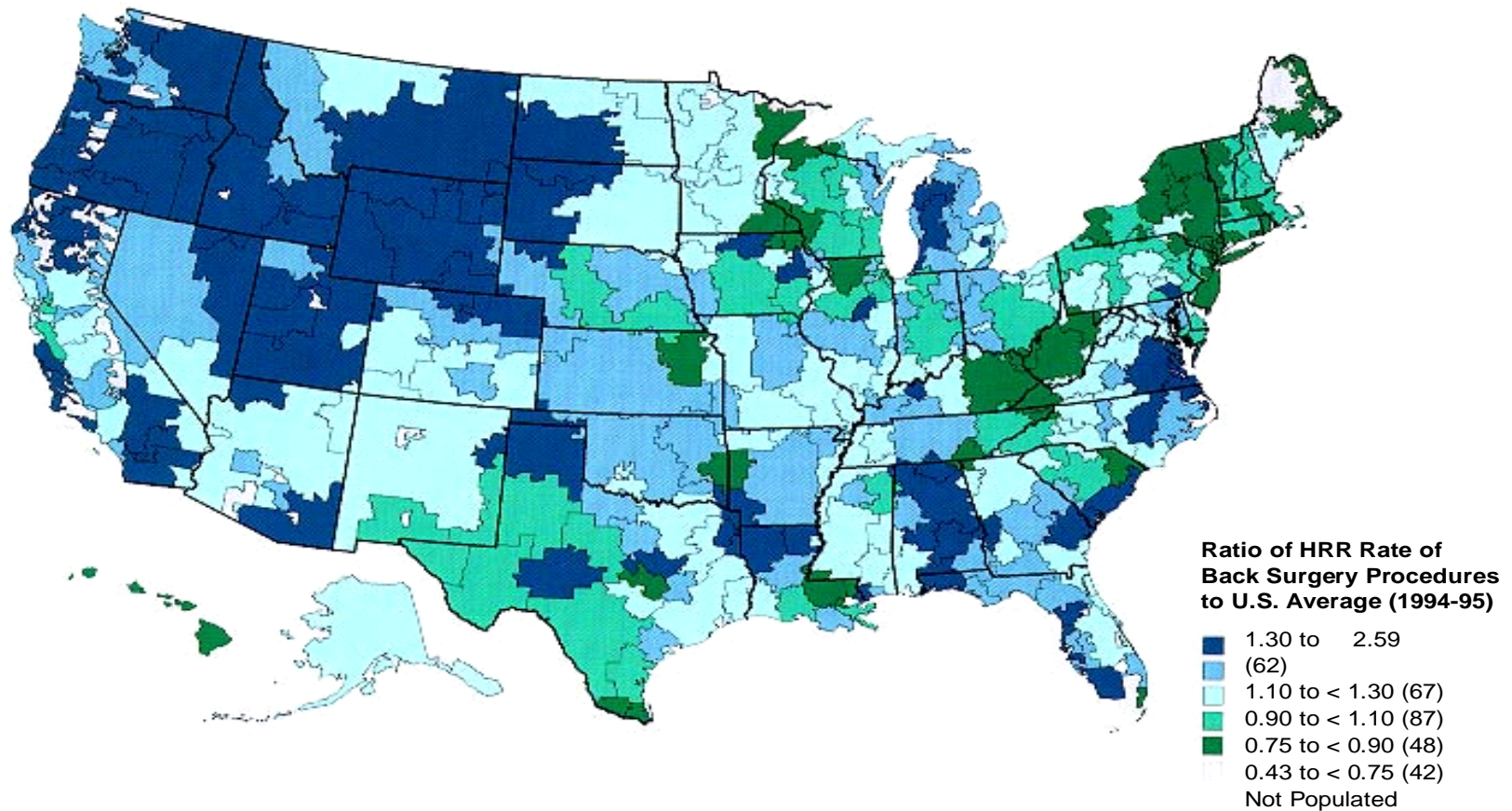
“...a systematic, population-based approach to identify persons at risk, intervene with specific programs of care, and measure clinical and other outcomes.”

Epstein RS et al: Ann Intern Med 124:832-37, 1996

# **Mayo Clinic's Disease Management Strategies Program**

# Ramifications

## Back Surgery



# Ramifications

- **Blind Spots in Knowledge in the 1980s**
  - **Examples:**
  - **Only 27% of Family Practitioners were aware of the need to monitor hemoglobin A1C for diabetic control.**
  - **Only 39% of Obstetricians used a trial of labor in certain women who had previous C-section.**

Williamson, JW; Annals of Internal Medicine. 1989;110:151-160

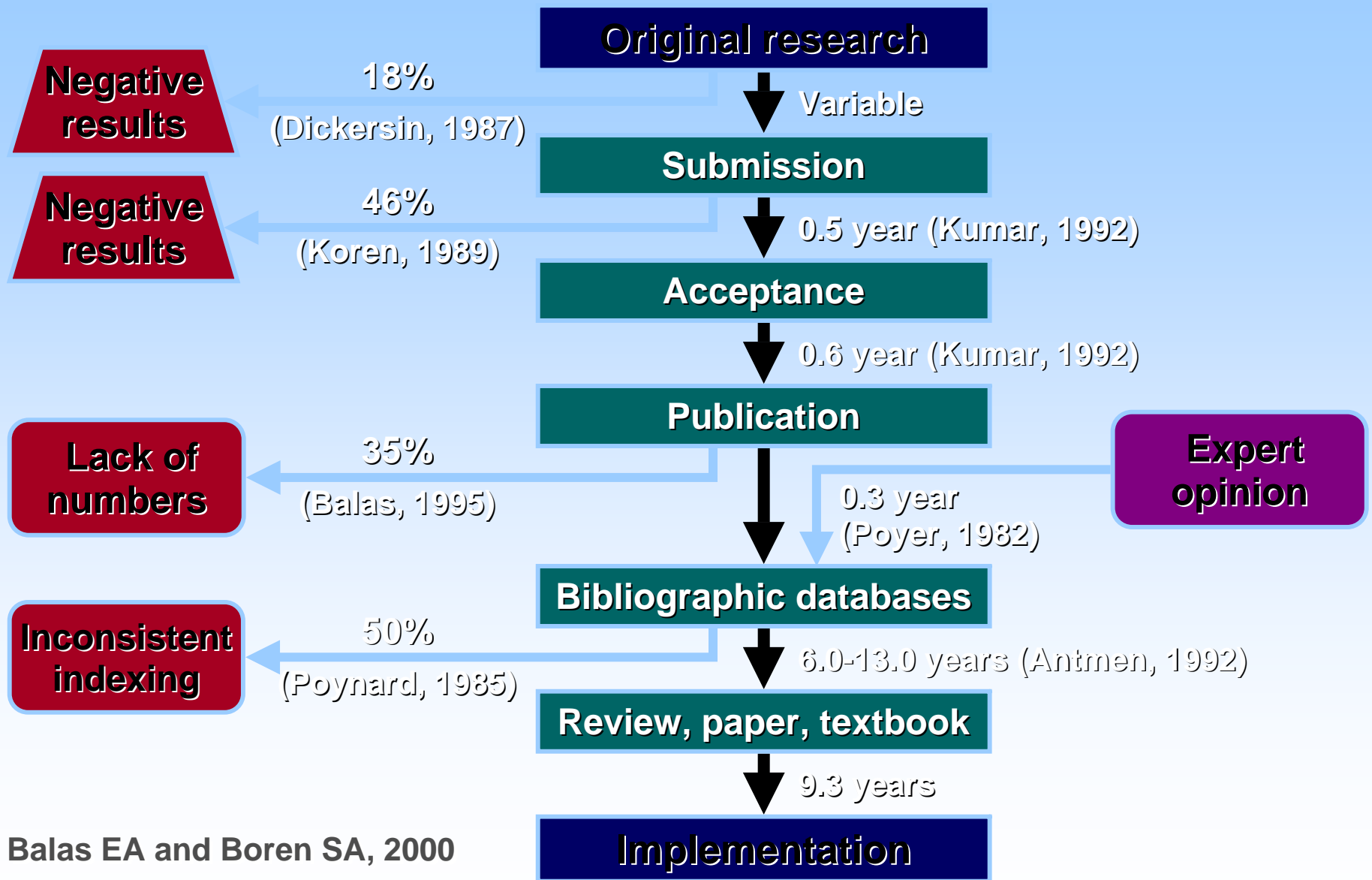
**Miller, GA**

**The magic number seven, plus or minus two: some limits on our capacity for processing information.**

**Psychological Review 1956; 63(2):81-97.**



# Transfer of Research to Practice



Balas EA and Boren SA, 2000

# Literature Impossible to Review

- **Problems with Passive Diffusion of Knowledge**
  - **To read everything of potential biomedical importance, physicians would need to read 6000 articles per day.**

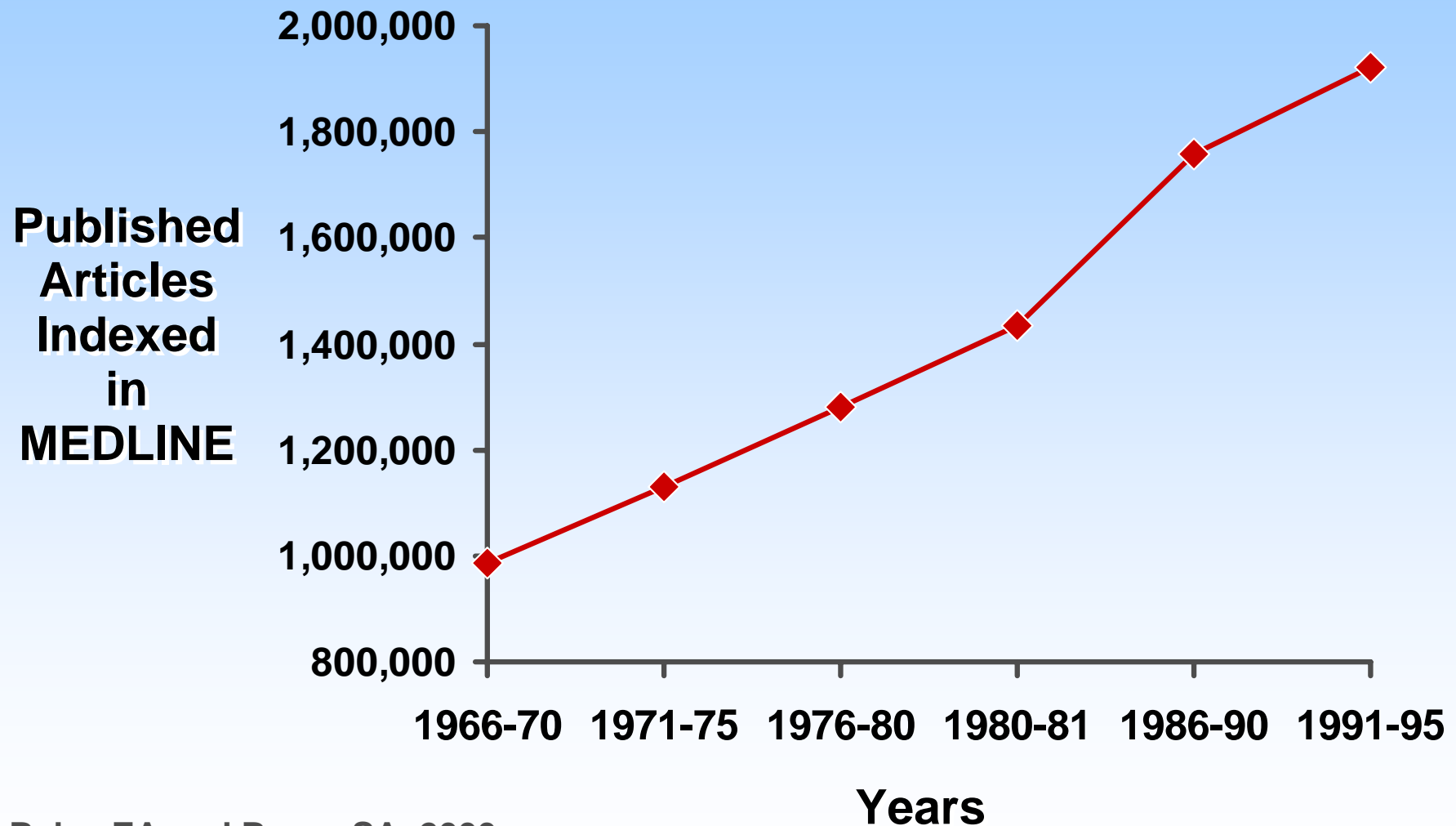
Lundberg, JAMA, 1992;80:110-4.

**General physicians would need to read 19 articles a day 365 days a year.**

Davidoff, BMJ, 1995;310:1085-6.

# Why Electronically Supported Guidelines ?

# Surge in Biomedical Research Production



Balas EA and Boren SA, 2000



"A collaborative project to  
develop a universal framework for  
encoding and disseminating electronic clinical guidelines"

# The SAGE Project

Standards-Based Sharable Active Guideline Environment

"A collaborative project to develop a universal  
framework for encoding and disseminating  
electronic clinical guidelines"

Robert M. Abarbanel, MD, PhD



## Project Overview

- An R&D consortium to develop the technology infrastructure to enable computable clinical guidelines, that will be shareable and interoperable across multiple clinical information system platforms
- Scope: 3 year, \$18 M, multi-site, collaborative project
- Funded in part by: NIST Advanced Technology Program

## Partners

Apelon



IDX



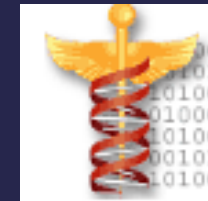
Intermountain Healthcare



Mayo Clinic



Stanford Medical Informatics



University of Nebraska  
Medical Center



## Project Approach

Standards-based Sharable Active Guideline Environment

- Ultimate goal: An infrastructure that will allow execution of standards-based clinical practice guidelines across heterogeneous CIS platforms.
- Focus is on the goal of **active deployment** of guideline knowledge within the workflow of clinical information systems.
- Employ (and extend where necessary), best available informatics standards and controlled terminologies.
- Build on an invaluable foundation of earlier research and effort.
- Close collaboration with leading Standard Development Organizations: HL7, SNOMED, LOINC, others.



# Goal of Interoperable Guidelines

Standards  
-based

Standard information models, medical terminologies, controlled resources, data formats

Sharable

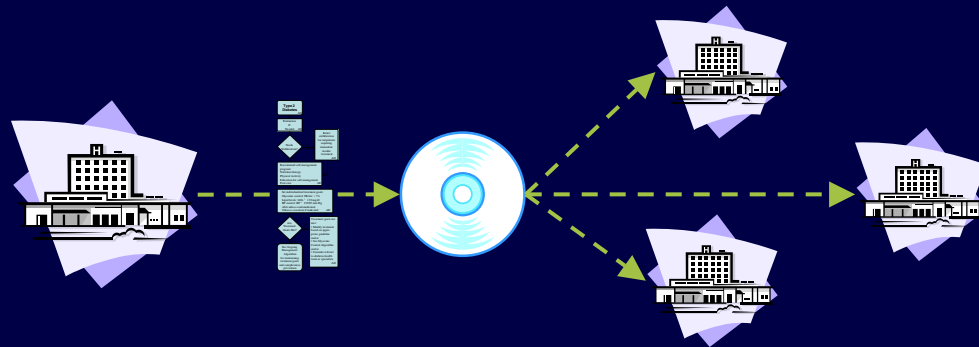
Encoded guidelines can be disseminated to, and executed in, heterogeneous clinical systems

Active

Guideline logic and contents are instantiated within the workflow of the clinical information system

Guideline

Environment



## "A word from our sponsors"



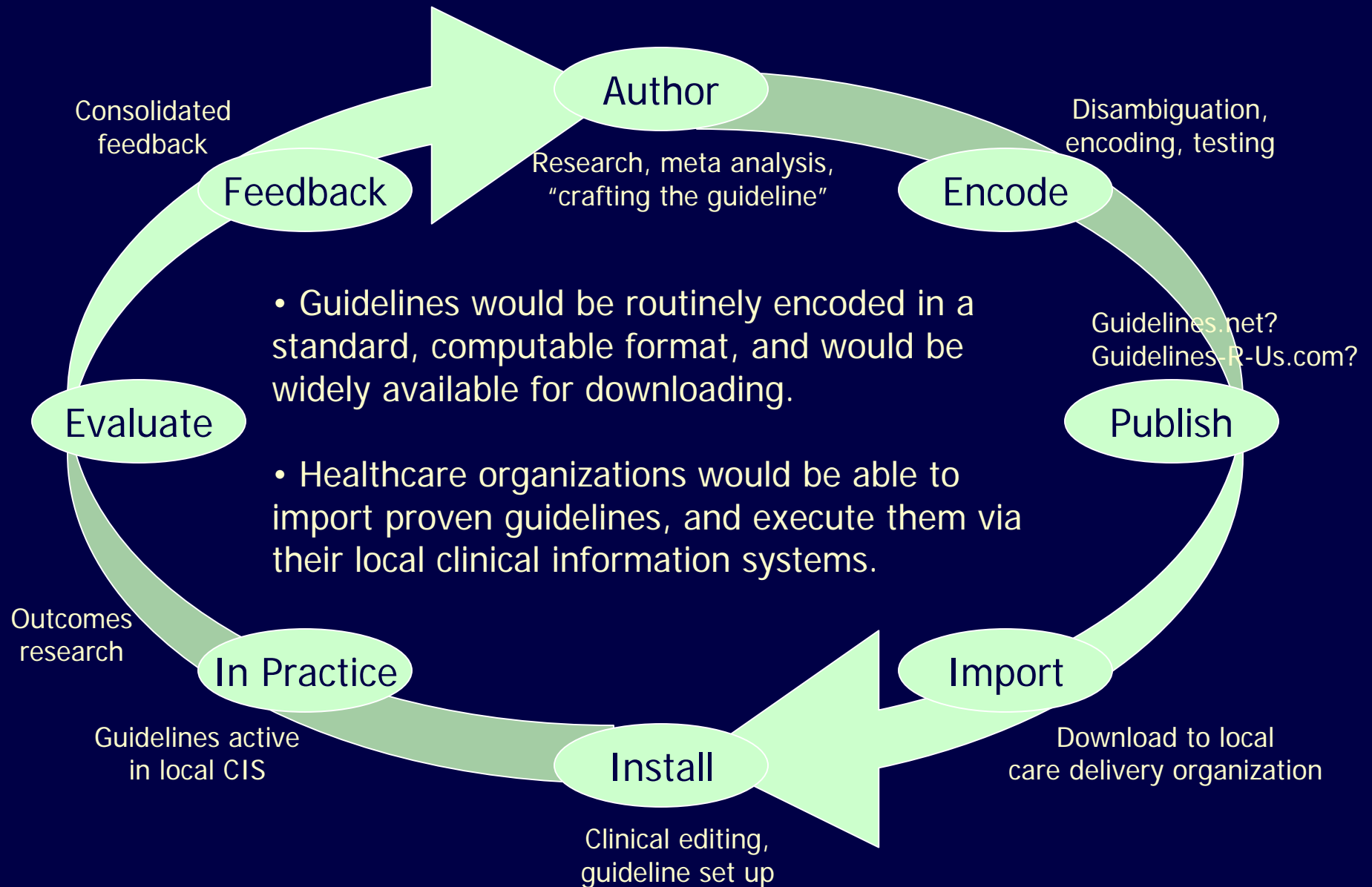
- The National Institute of Standards and Technology (NIST), an arm of the U.S. Department of Commerce, funds "high risk" research through its Advanced Technology Program (ATP).
- The mission of the NIST/ATP program is *"To accelerate the development of innovative technologies for broad national benefit through partnerships with the private sector"*.
- NIST/ATP projects must entail research that 'leads to significant national benefits.'

The SAGE project is partially funded by NIST/ATP Cooperative Agreement Number 70NANB1H3049

## SAGE Main deliverables

- An interoperable guideline model – A computable knowledge representation “format” for encoding the content and logic of executable clinical practice guidelines.
- A guideline workbench – A software tool for authoring, encoding, and maintaining guidelines in the format of the SAGE guideline model.
- A guideline deployment system – Software that “decodes” the content of electronic guidelines and surfaces that content via functions of the local clinical information system.
- Controlled resources – Specification of a common layer of information models and terminologies to mediate guideline content.

# Imagine if SAGE technology were in place today . . .



# Project Approach

## Taxonomy of Guidelines

- Level 1: Original text guideline
  - Level 2: Structured markup
  - Level 3: Scrubbed “markup” (disambiguated)
  - Level 4: Codified “markup” (vocabulary standards)
  - Level 5: Knowledge “markup” (structured knowledge)
  - Level 6: Context “markup” (specify clinical setting)
  - Level 7: Executable form (deployable knowledge)
-

# Project Approach

## Taxonomy of Guidelines

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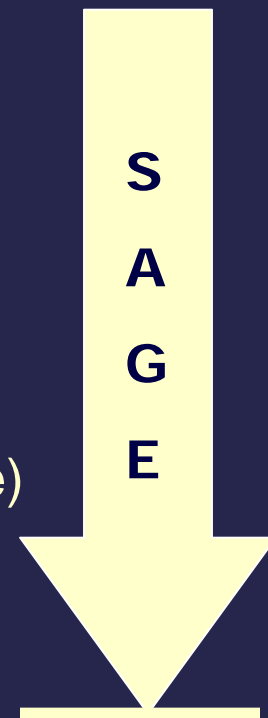
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Level 5: Knowledge “markup” (structured knowledge)

Level 6: Context “markup” (specify clinical setting)

Level 7: Executable form (deployable knowledge)

S  
A  
G  
E



## Some challenges

- An interoperable model
- Deployment concepts – including architecture
- Can a provider USE the guidelines?
- Guideline “file” format

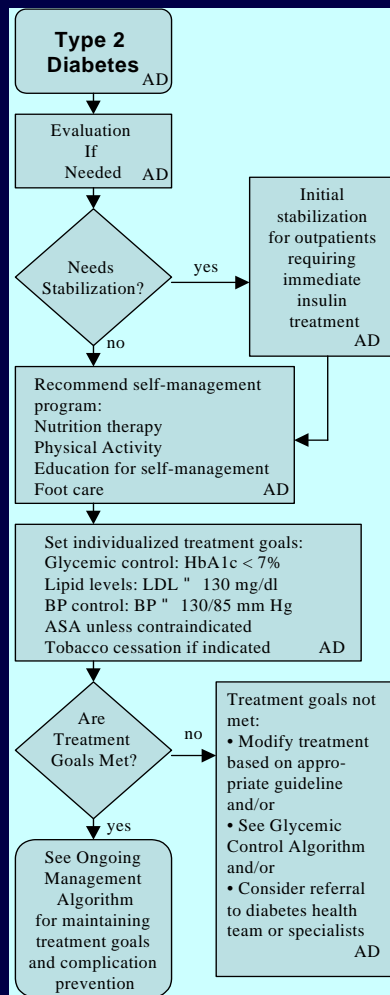
# Interoperable Guideline Model

A standard computable "specification" for representing and encoding the content and logic of clinical practice guidelines



# Interoperable Guideline Model

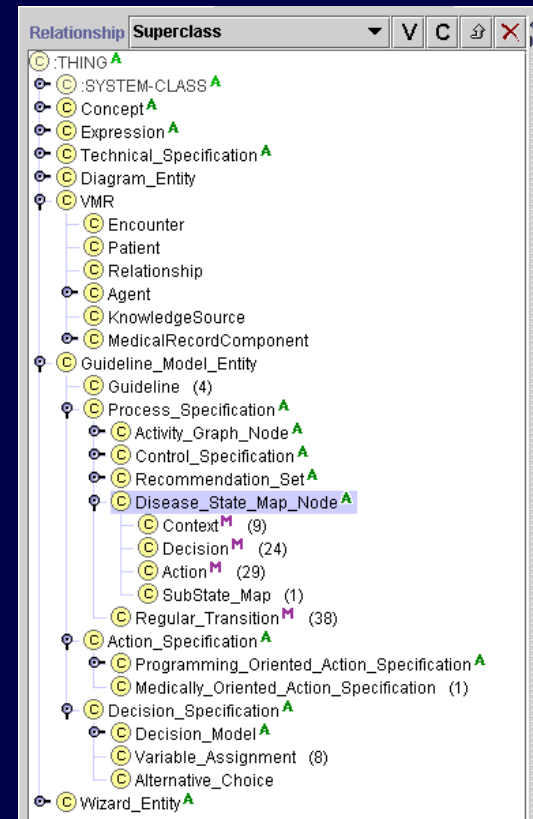
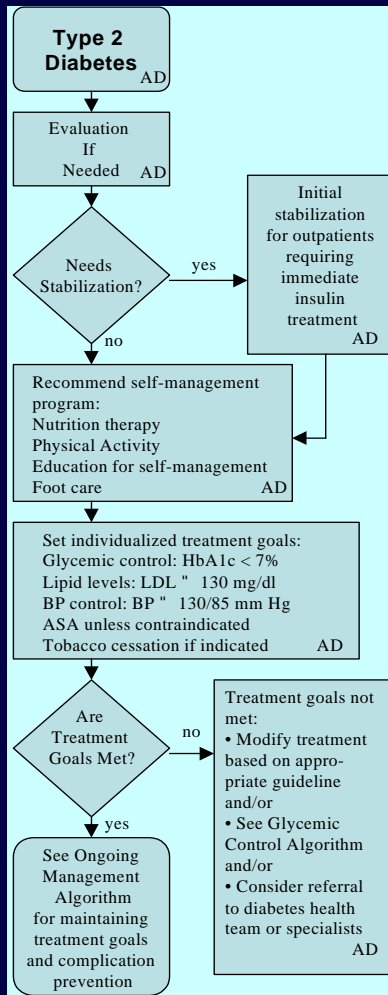
A standard computable "specification" for representing and encoding the content and logic of clinical practice guidelines



Type 2 Diabetes Guideline Flow Diagram, courtesy of Institute for Clinical Systems Improvement (ICSI)

# Interoperable Guideline Model

A standard computable "specification" for representing and encoding the content and logic of clinical practice guidelines

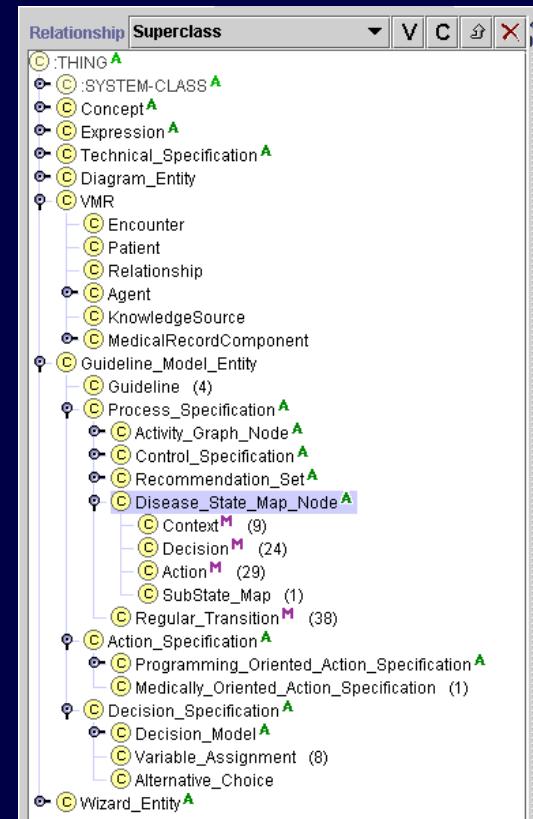
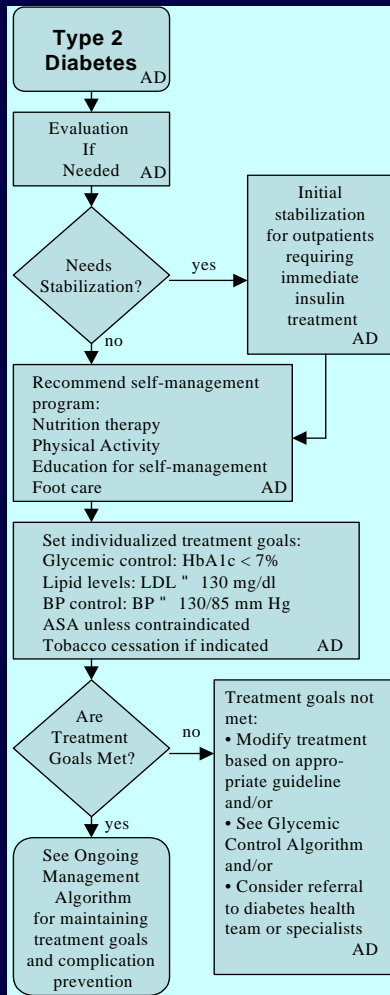


Protégé Guideline Model Knowledge Base,  
Courtesy Stanford Medical Informatics

Type 2 Diabetes Guideline Flow Diagram, courtesy of Institute for Clinical Systems Improvement (ICSI)

# Interoperable Guideline Model

A standard computable “specification” for representing and encoding the content and logic of clinical practice guidelines

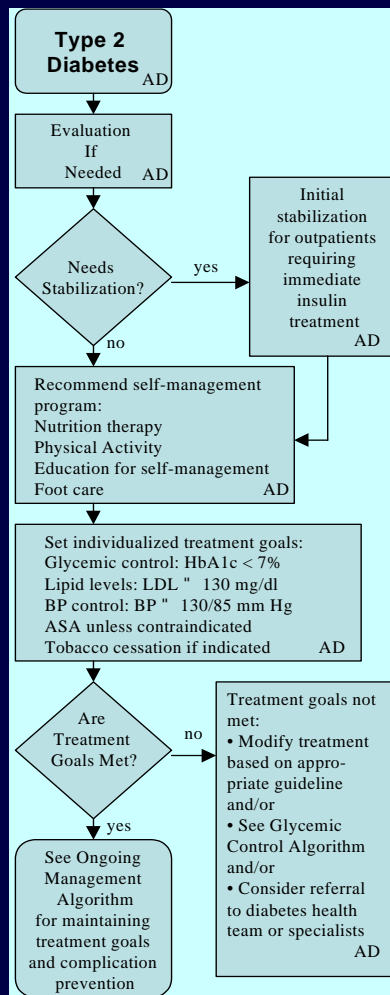


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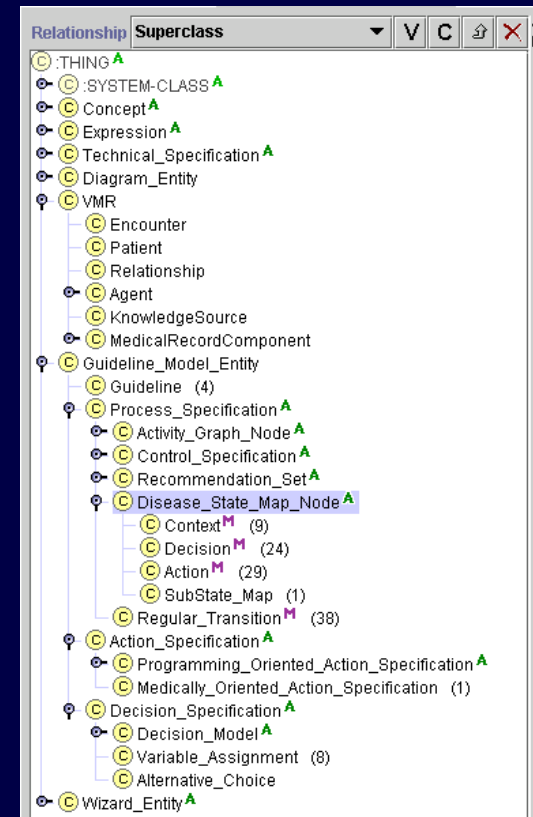
Type 2 Diabetes Guideline Flow Diagram, courtesy of Institute for Clinical Systems Improvement (ICSI)

# Interoperable Guideline Model

A standard computable "specification" for representing and encoding the content and logic of clinical practice guidelines



- ✓ Clinical content (criteria, actions)
- ✓ Patient status and eligibility
- ✓ Decision logic
- ✓ Clinical sequencing and workflow
- ✓ Guideline goals and intentions
- ✓ Guideline evidence and references
- ✓ Associated controlled terminologies
- ✓ Query and expression languages

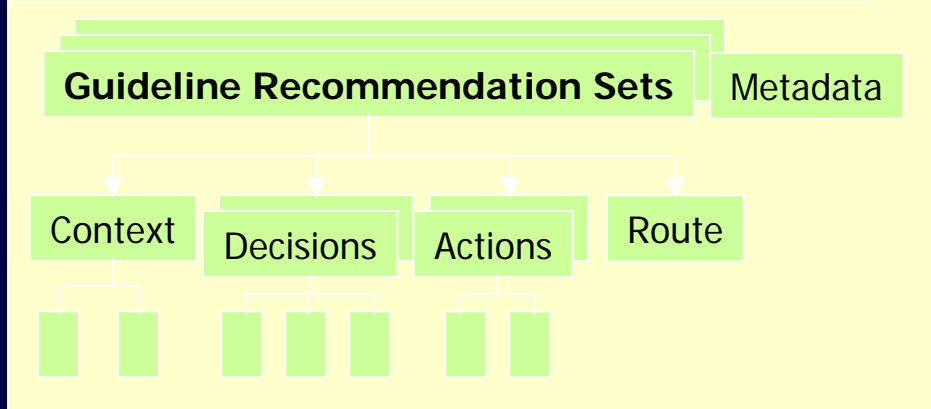


Protégé Guideline Model Knowledge Base, Courtesy Stanford Medical Informatics

Type 2 Diabetes Guideline Flow Diagram, courtesy of Institute for Clinical Systems Improvement (ICSI)

# Conceptual Overview of SAGE Architecture

## SAGE Guideline Model Concepts



Data queries and decision logic represented using standard expression language

Expression Language

Guideline content encoded using standard terminologies and information models

Patient Data Model  
(Virtual Medical Record)

Care Workflow Model

Medical Ontologies

Health Care Organization Model

Common Layer of Terminologies and Information Models

Local EMR concepts mapped to standard models for execution

SAGE  
Guideline  
Execution  
Engine

Standards-based API

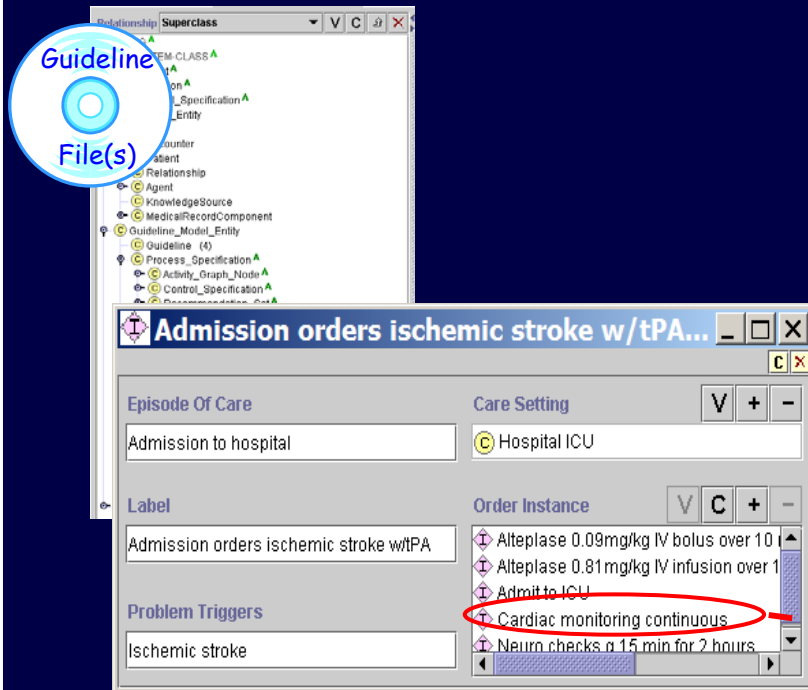
Clinical Information System

Applications

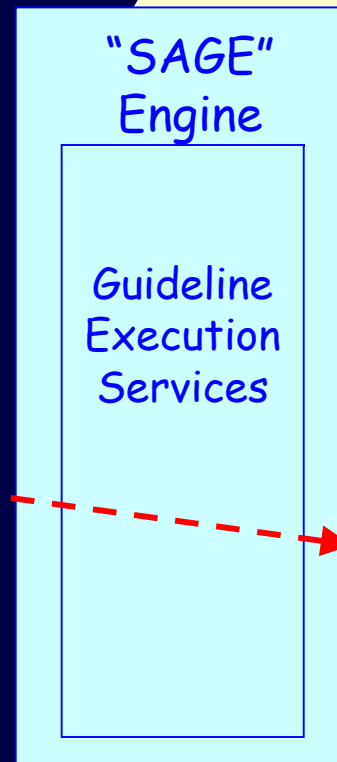
EMR

Binding

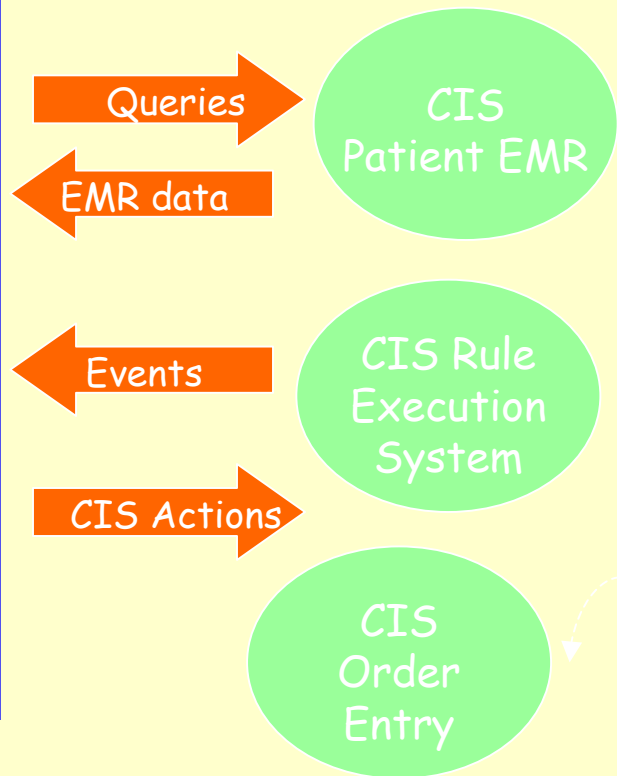
# Guideline Deployment Concepts



- ✓ Guideline goals
- ✓ Guideline context
- ✓ Guideline actions
- ✓ Guideline decisions



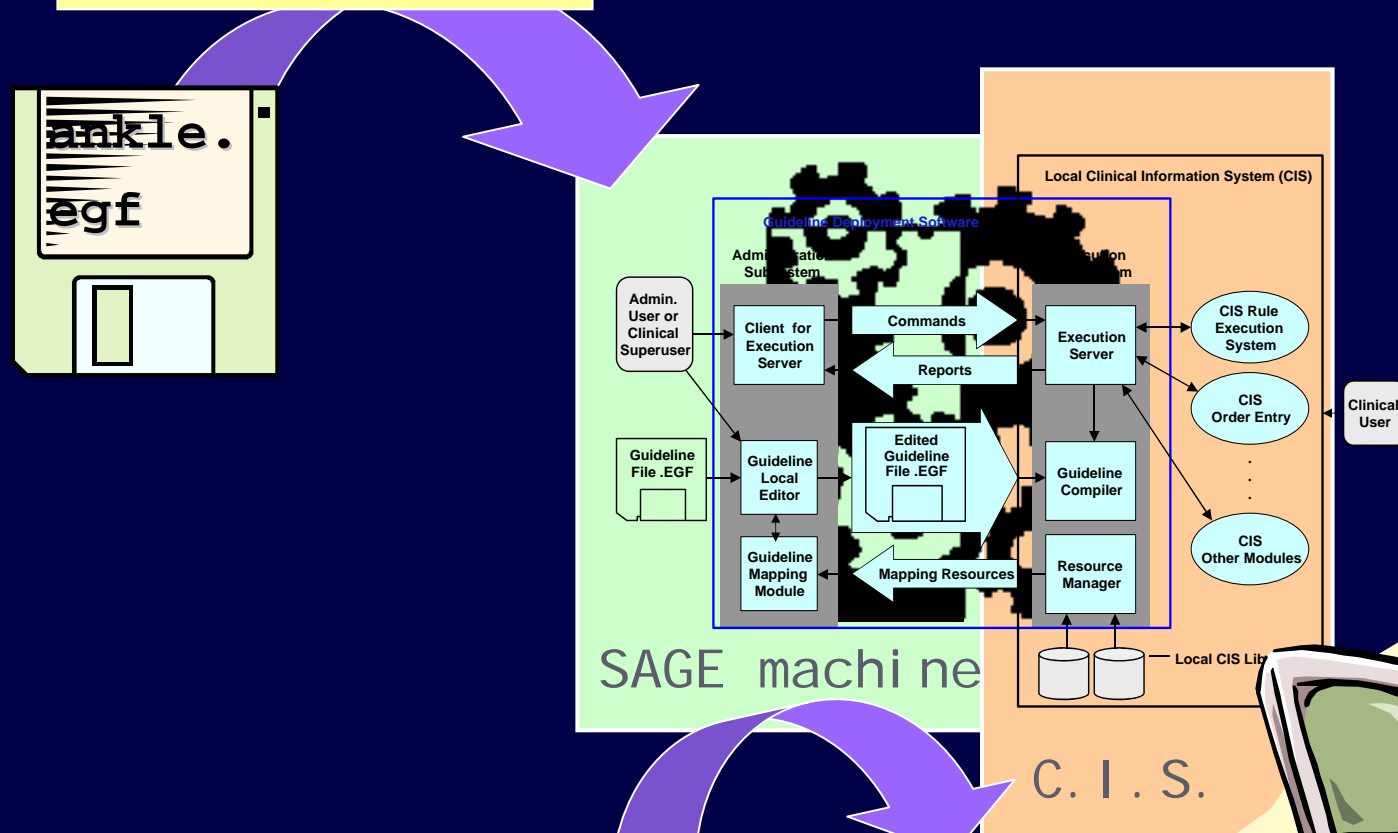
Local Clinical Information System



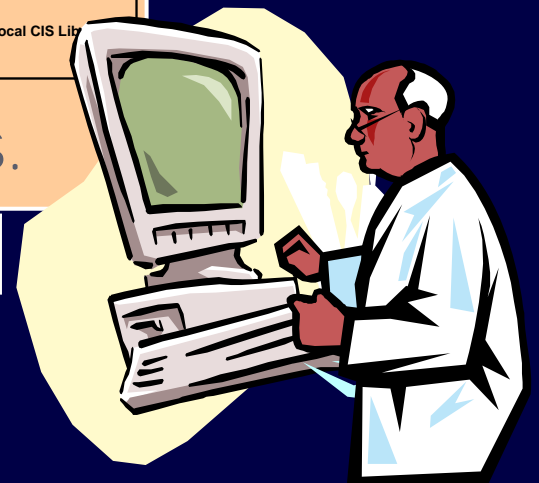
Local CIS Resources

# Guideline Deployment

## Step 1: Guideline setup



## Step 2: Guideline-based care



cervicalcancerstroke Protégé-2000 (C:\Documents and Settings\gmansfield.CASINO\Desktop\SAGE\Protege Projects\cervicalca...)

Project Window Help

Knowledge Acquisition Classes & Instances Classes Slots Forms Instances Queries

Relationship Superclas... V C X

Class

Order\_Set

Direct Instances

- Admission order set ischemic stroke no tPA
- Admission orders ischemic stroke w/TPA
- ED evaluation of suspected stroke
- Ischemic stroke admit skilled rehab
- Ischemic stroke discharge from hospital
- Ischemic stroke rehab discharge orders

Cardiac monitoring continuous (Order)

Label: Cardiac monitoring continuous

Order Start Date/time

Department Responsible For Order

Order Stop Date/time

Nurse Or Lab Draw

Service Code

Order Frequency: Continuous

Service Code Terminology

Order Priority: Routine

Condition

Order Repetitions

Admission order set ischemic stroke no tPA (Order\_Set)

Episode Of Care: Admission to hospital

Condition

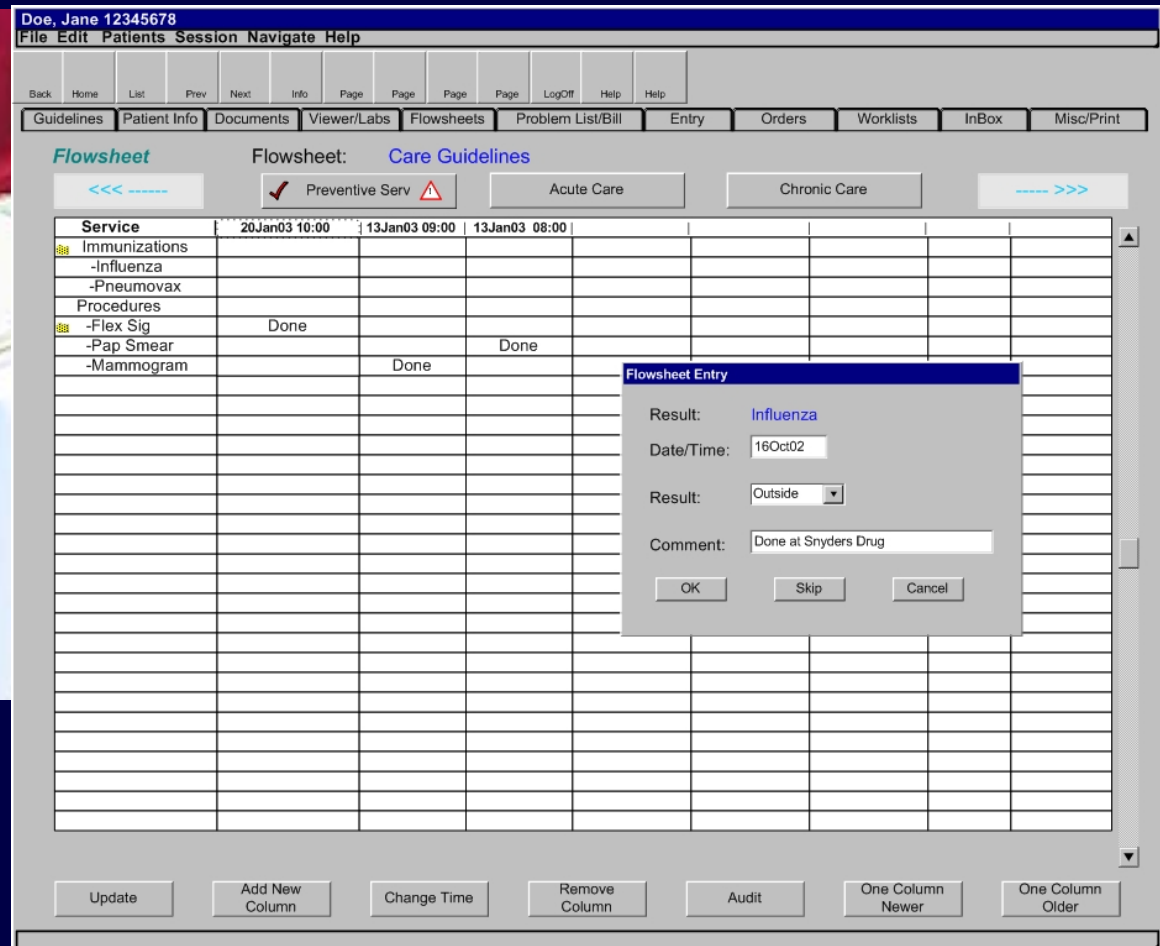
Order Instance

- Admission diagnosis: CVA
- Admit to hospital
- Vital signs q4hours
- Cardiac monitoring continuous
- Intake and output q shift
- Oxygen by nasal prongs to keep
- Pulse oximetry continuous
- Seizure precautions
- Skin assessment daily
- Suction as needed
- Foley catheter continuous drain
- Neuro checks q 4hours
- PT and OT consult
- Social work consult
- Speech consult

Superclasses




- ❖ Done using scenarios and prototypes
- ❖ Performed at Mayo Usability Laboratory



# Usability Lab Evaluation

- ❖ Done using scenarios and prototypes
- ❖ Performed at Mayo Usability Laboratory



IDX Web Framework - Microsoft Internet Explorer

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Address [\\chsrv01\mem\Public\SAGE\Test Screens\UntitledFrameset-5.htm](#) Go Links

powered by **IDX**

**Carlos O'KELLY** MRN: 3 303 999 Sex: M  
DOB: 11/06/2002 Age: 6 Months  
SSN: 123-45-6789

Nursing HB

Organizer  
Patient  
Reports

Help  
Settings  
Pause  
Exit

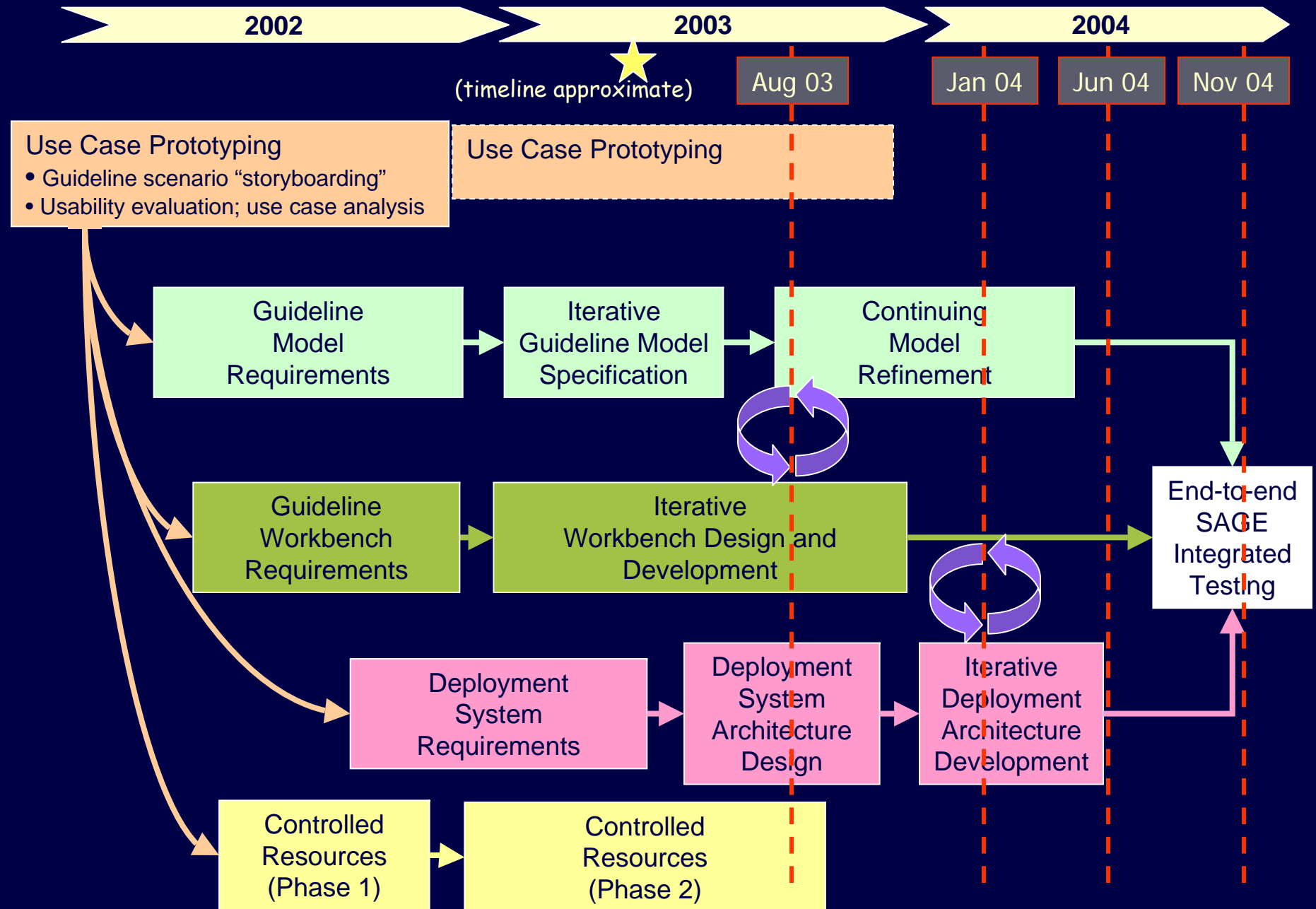
**Immunization Flowsheet**

Order	Item	Info	Due	11-06-2002
<input checked="" type="checkbox"/>	DTaP	i	Today	
<input checked="" type="checkbox"/>	IPV	i	Today	
<input type="checkbox"/>	MMR	i	10-06-2003	
<input checked="" type="checkbox"/>	PCV7	i	Today	
<input type="checkbox"/>	Varicella	i	10-06-2003	
<input checked="" type="checkbox"/>	Hib	i	Today	
<input checked="" type="checkbox"/>	Hep B	i	Today	Given

Submit Order View Guideline Update Information

Done Local intranet

# SAGE Project Plan Overview



## Requirements Analysis Work Cycle

1. Select initial "generic" guidelines
2. Define/storyboard specific scenarios
3. Model and evaluate user interactions (Mayo Usability Laboratory)
4. Document use cases
5. Perform UML Modeling

## Selected Exemplar Guidelines

Exemplar Guideline	Clinical Domain
<b>Diabetes Management</b> (DBM)	Chronic disease monitoring and treatment. Acute exacerbation of chronic disease. Chronic disease as a comorbidity.
<b>Immunizations</b> (IMM)	Routine health maintenance, in both outpatient and inpatient settings.
<b>Community Acquired Pneumonia</b> (CAP)	Emergency room evaluation and diagnosis. Outpatient treatment of acute disease. Inpatient and ICU treatment of acute disease. Follow-up of acute disease.
<b>Total Joint Replacement</b> (TJR)	Surgical guideline. Comprehensive pre-op workup, inpatient plan of care, and post-op outpatient management.

## Markets for SAGE technologies

- Guidelines.com
- Guideline technology company
- Clinical trials management
- Other markets?

## SAGE is about

- Solving technological problems
- Creating infrastructure
- Influencing Standards
- Making a market

## Frequently Asked Questions

### Is the SAGE project developing guideline content ?

No. While we are fully characterizing and encoding a small set of guidelines to be used in our R&D work, the main objective of the SAGE project is to enable a technology infrastructure for encoding and wide-spread dissemination of active guideline content.

### Is the project developing an IDX-specific solution ?

No. We are using IDX *Carecast* as our prototyping CIS environment during the project; however, our goal is a universal infrastructure that will allow activation of guideline content in multiple HIS vendor systems.

### Where is more information on the SAGE project ?

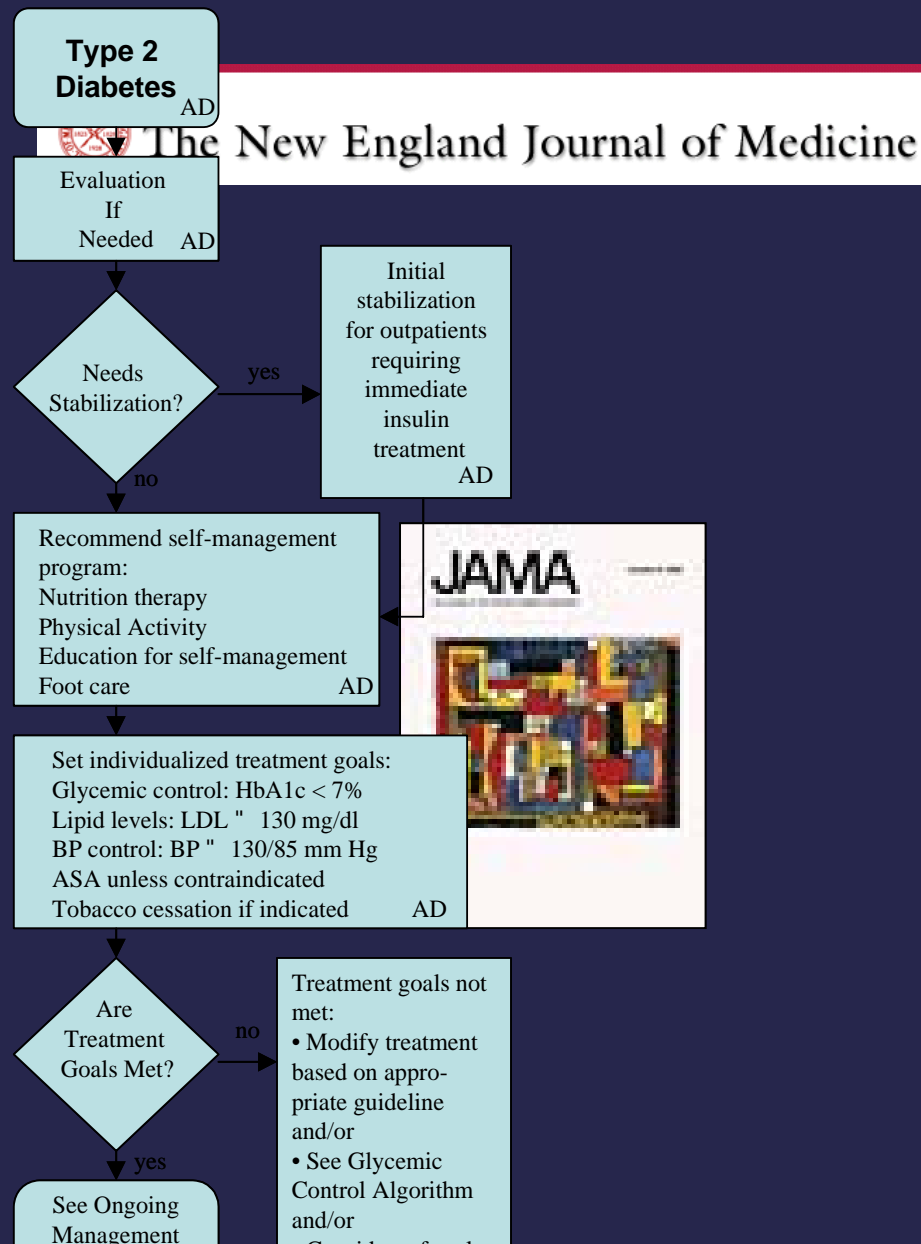
Our project web site [www.sageproject.net/](http://www.sageproject.net/) is just coming online and will provide increasing detailed project updates in the near future.



# Step 1:

## *Collect the Evidence*

Guideline author collects source material required for the guideline. This may include textbooks, research papers, textual guidelines, paper-based flowcharts.



## Step 2: *Build the Guideline*

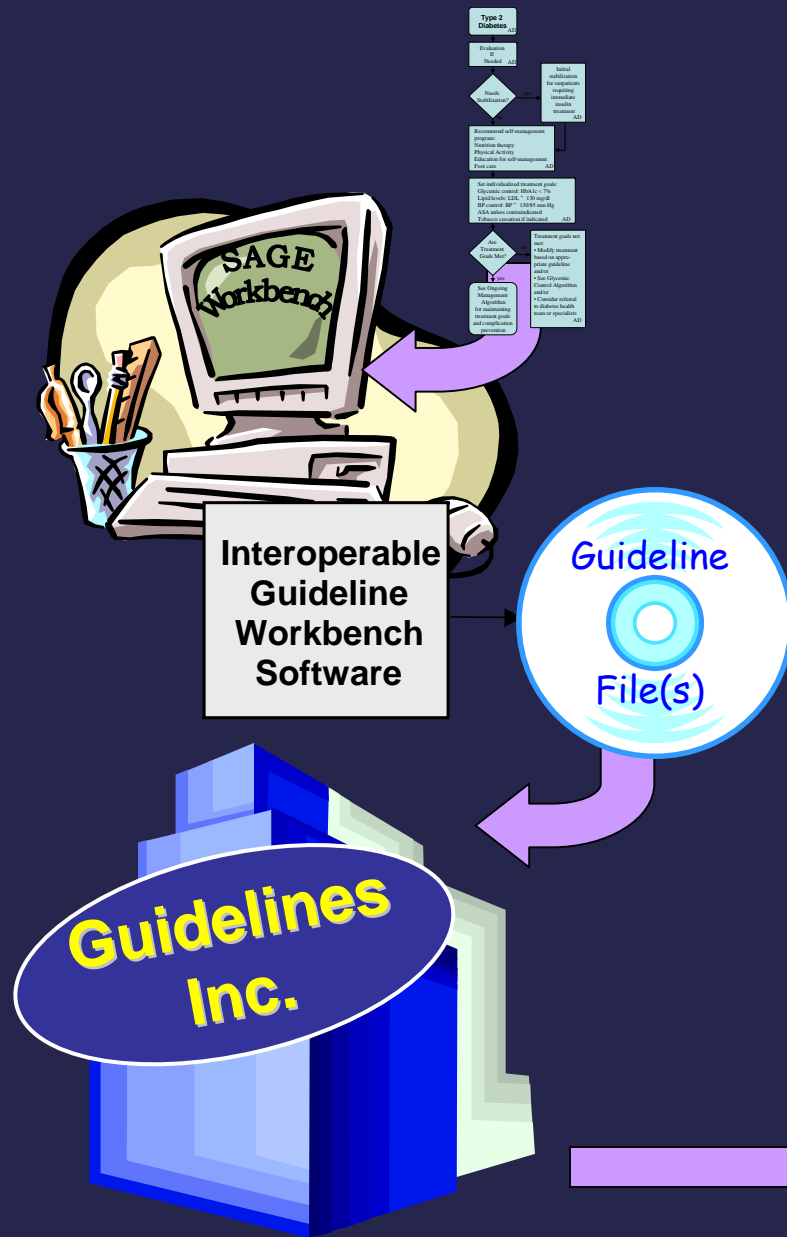
Use a  
“guideline workbench”  
to encode electronic  
versions of guidelines.

The workbench  
provides assistance,  
such as highlighting  
logical inconsistencies  
or workflow ‘dead  
ends.’ It also provides  
access to standard  
vocabularies.



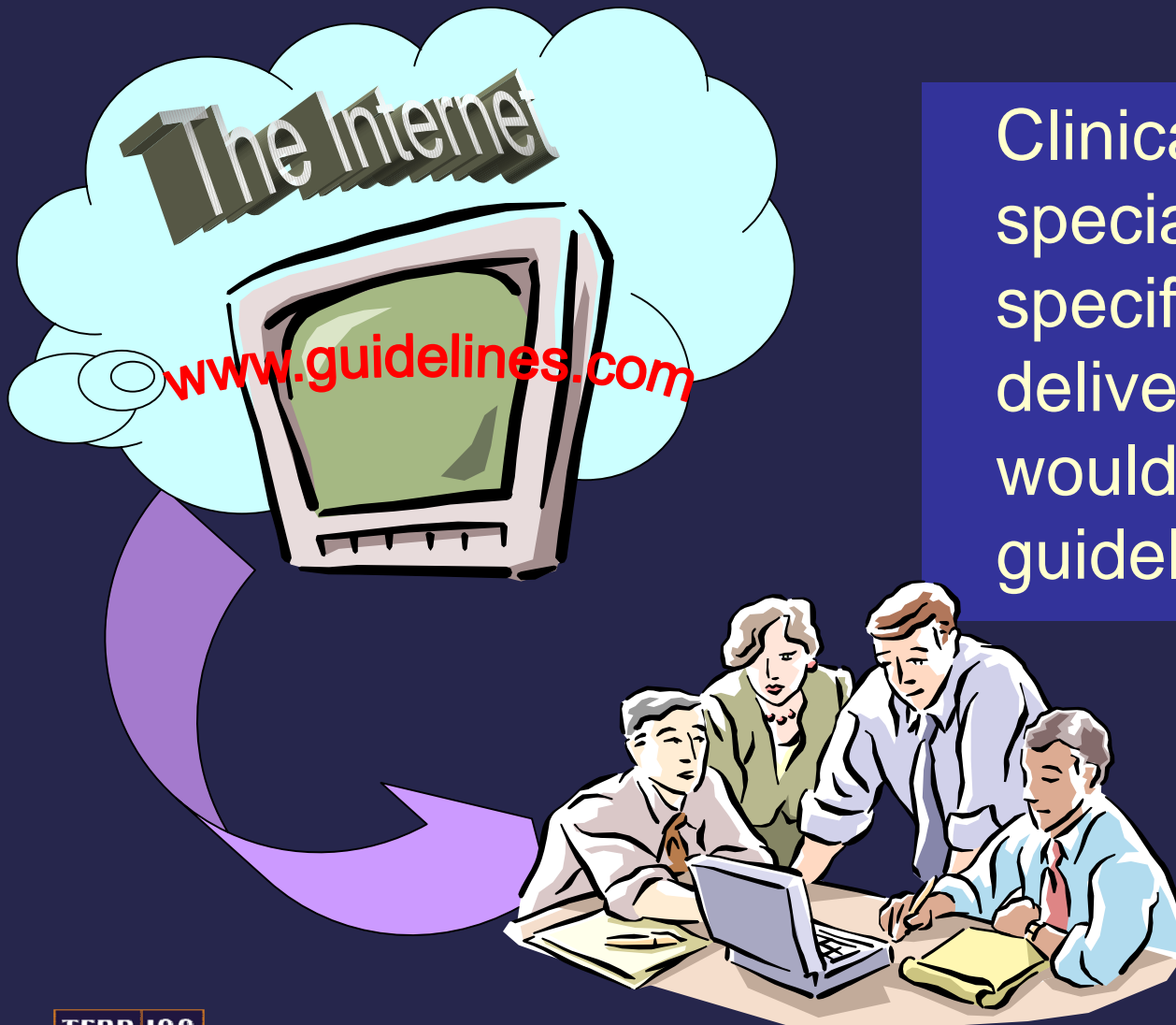
# Step 3: *Publish the Guideline*

The encoded guideline will be stored on a website and managed by a not-for-profit, or a commercial organization



## Step 4: *Download the Guideline*

Clinical practice specialists in a specific healthcare delivery organization would 'download' the guidelines.



# Step 5: *Develop Local Consensus*

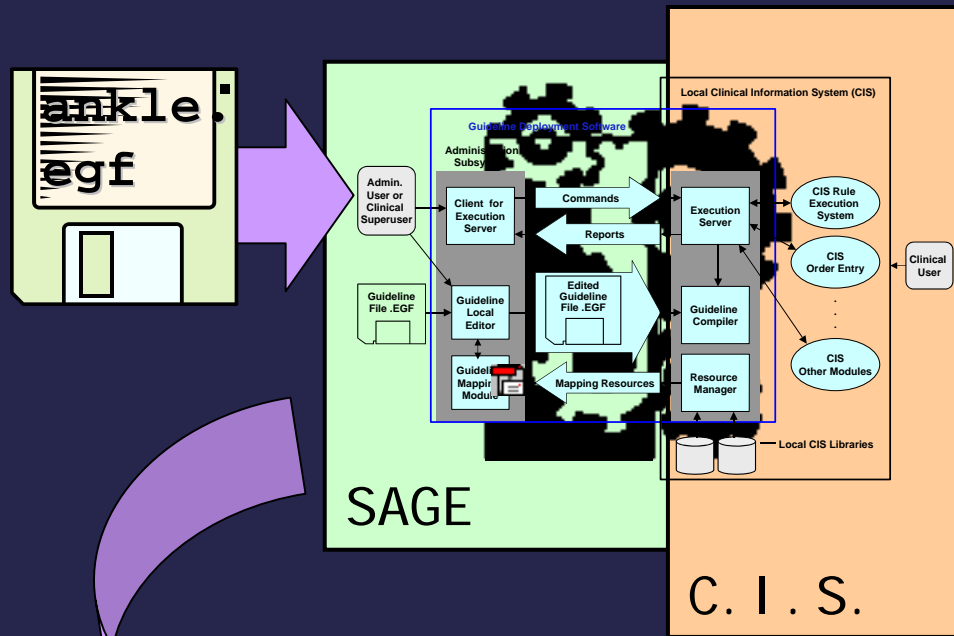
Upon local approval of the guideline, it may need to be adapted prior to deployment.

This may entail substantive changes to clinical content.

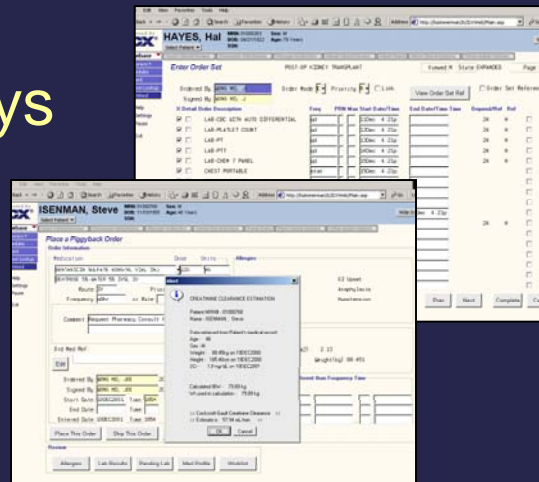


# Step 6: *Import the Guideline*

The guideline will be imported into the local C.I.S.



- Clinical pathways
- Problem-linked order sets
- Expert systems
- Flowcharts



**START:**  
*Guideline deployed...*

**Surveillance:**  
*Is this patient a candidate?*

**Selection by Clinician**

**Activation**  
*Guideline instantiated for patient*

**Recommendations for tests**

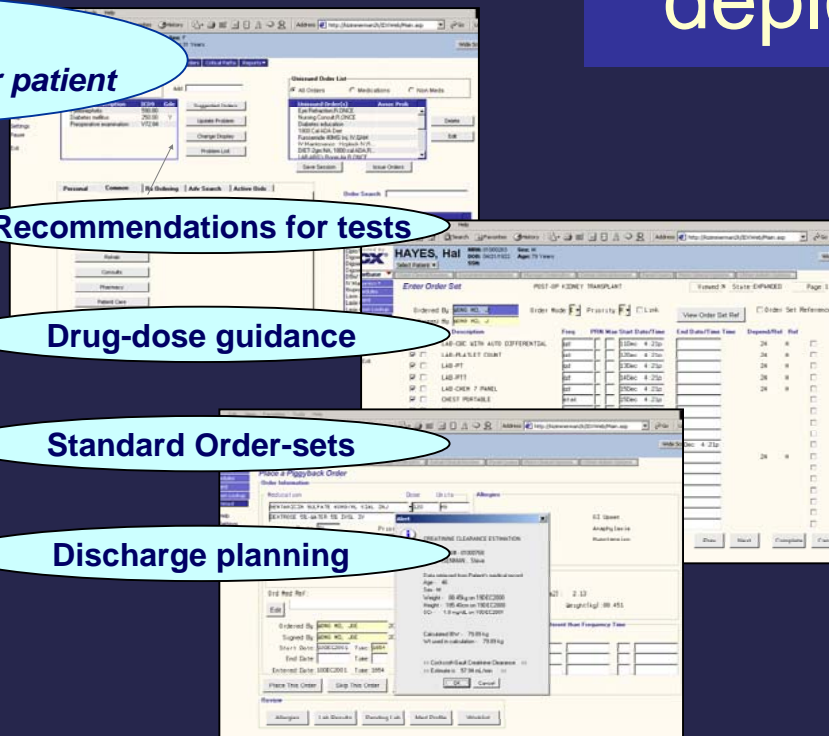
**Drug-dose guidance**

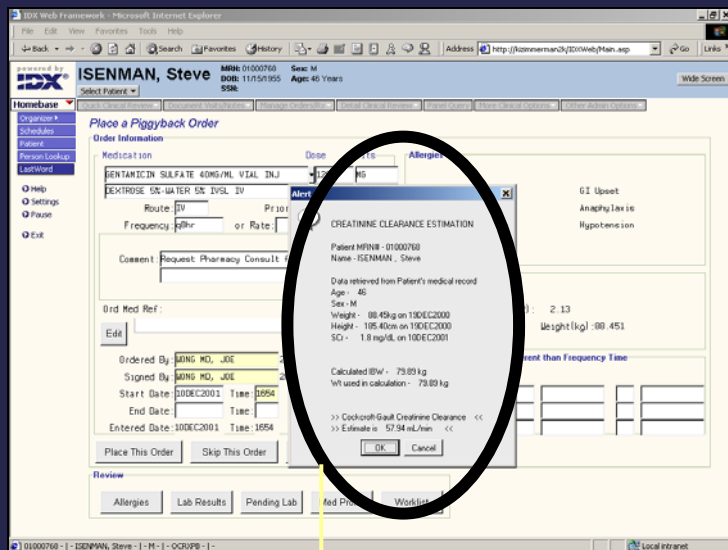
**Standard Order-sets**

**Discharge planning**

# Step 7: *Guidelines in Practice*

After upload,  
guideline(s) are  
deployed.

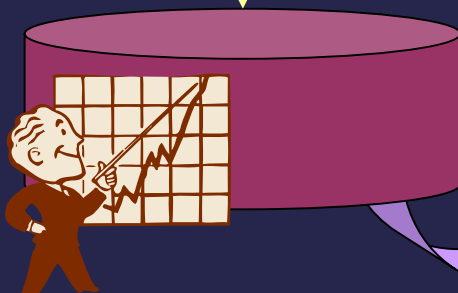




## Step 8: *Evaluating the Guidelines*

Guideline  
impact  
must be  
evaluated.

Guideline	Activation date	Accept?	Result?
CCF – 403 – ICSI#B2	3-Jul-03	Y	Y
AMI – 229 – ngch#J7	7-Aug-03	N	Y
ARF – 844 – ACC#L3	16-Aug-03	Y	N





# Step 9:

## *Consolidated feedback to central library*

Guideline evaluations  
will be reported to the  
'central' organization.



**Guidelines  
Inc.**

Thank You

~

*[www.sageproject.net](http://www.sageproject.net)*