

Two words:
improve workflow

Workflow Management Systems in Healthcare: Focus on Quality and Throughput

June 23, 2005

Harm Scherpbier MD
Product Manager, Clinical Decision Support
Siemens Health Services

harm.scherpbier@siemens.com

Topics

- What is a Workflow Management System?
- How to apply Workflow Management to Disease Management processes?
- Drivers: Safety, Quality and Throughput
- The parallel objectives of Disease Management and Workflow Management: “More health for less \$\$\$”, or “Do more with Less”

What is a Workflow Management System?

- Process Management Tool
 - Industry: BPM, Business Process Management
- Consisting of:
 - Predefined steps, sequential and parallel,
 - Spanning a period of time,
 - Involving all players on the team.
- “Orchestration”

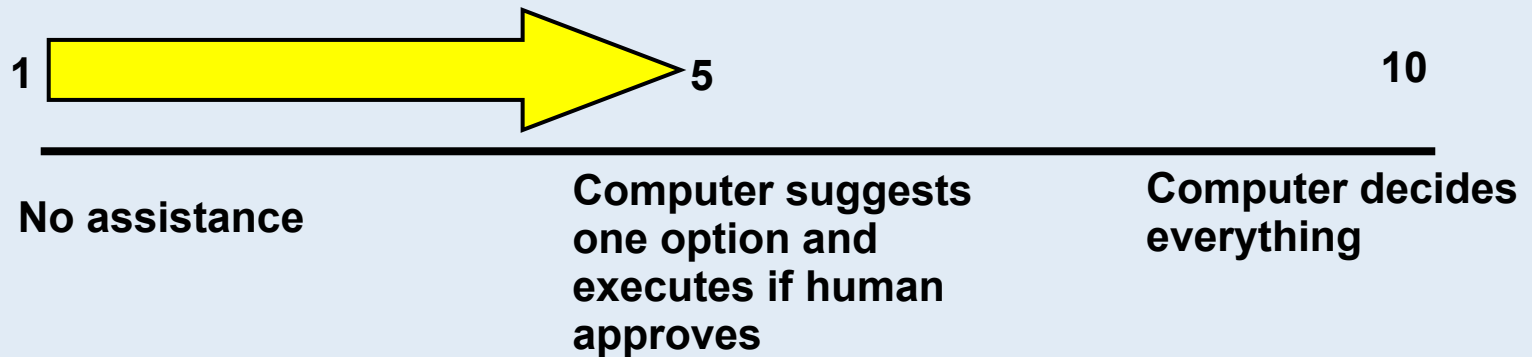
```

graph TD
    HDO[Hospital Discharge Order] --> PD[Patient Discharge]
    PD --> N2[Nurse notified]
    PD --> P6[Pharm fills d/c Rx's]
    N2 --> F5[Family notified]
    P6 --> N3[Nurse review orders]
    F5 --> F10[Family arrives]
    N3 --> N4[Nurse d/c process]
    N4 --> P11[Patient education]
    N4 --> P7[Pharm notified]
    N4 --> P8[Dietary notified]
    N4 --> P9[Resp notified]
    F10 --> P12[Transport notified]
    P12 --> P13[Pt out of room]
    P13 --> H15[House-keeping notified]
    H15 --> R16[Room cleaned]
    R16 --> R17[Room queued]
    R17 --> NS18[Nursing supervisor notified]
    NS18 --> NA19[Nurse assigned]
    NA19 --> N20[Notify admitting]
    NA19 --> N21[Notify ER]
  
```

Handoffs

Bed turnaround

Sheridan's "Degrees of Computerization"

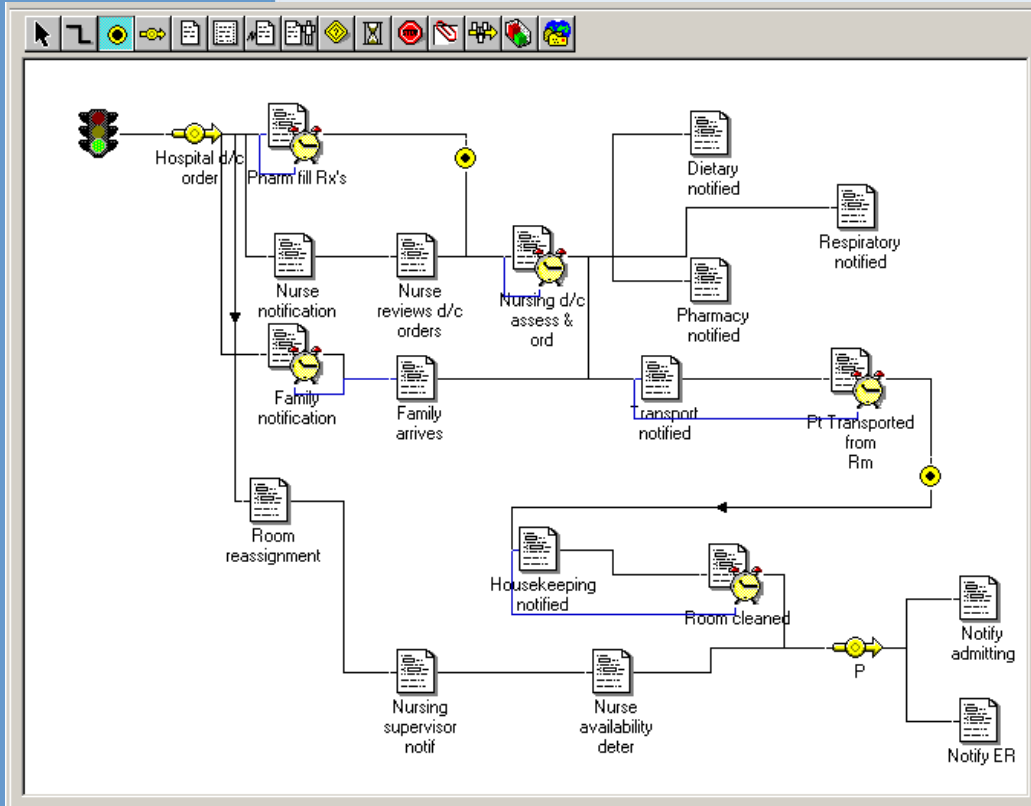


- U.S. Medicine today mostly at level 1
- Clinical Decision Support most effective at approx level 5

Bates DW et al, Ten Commandments for Effective Decision Support, JAMIA 2003;10:523-530

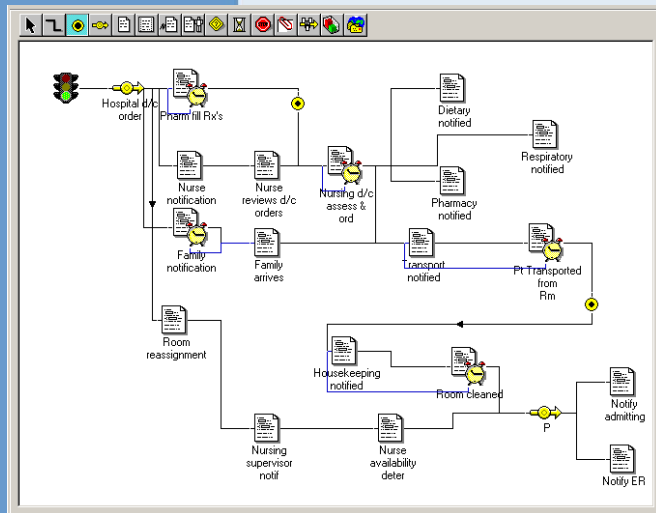
Sheridan TB, Thompson JM, People versus Computers in Medicine, Human Error in Medicine, 1994, 141-59

Workflow Management System



- Optimize Workflow
- Manage Tasks
- Prioritize
- Coordinate
- Delegate
- Escalate

Workflow Management Strategy



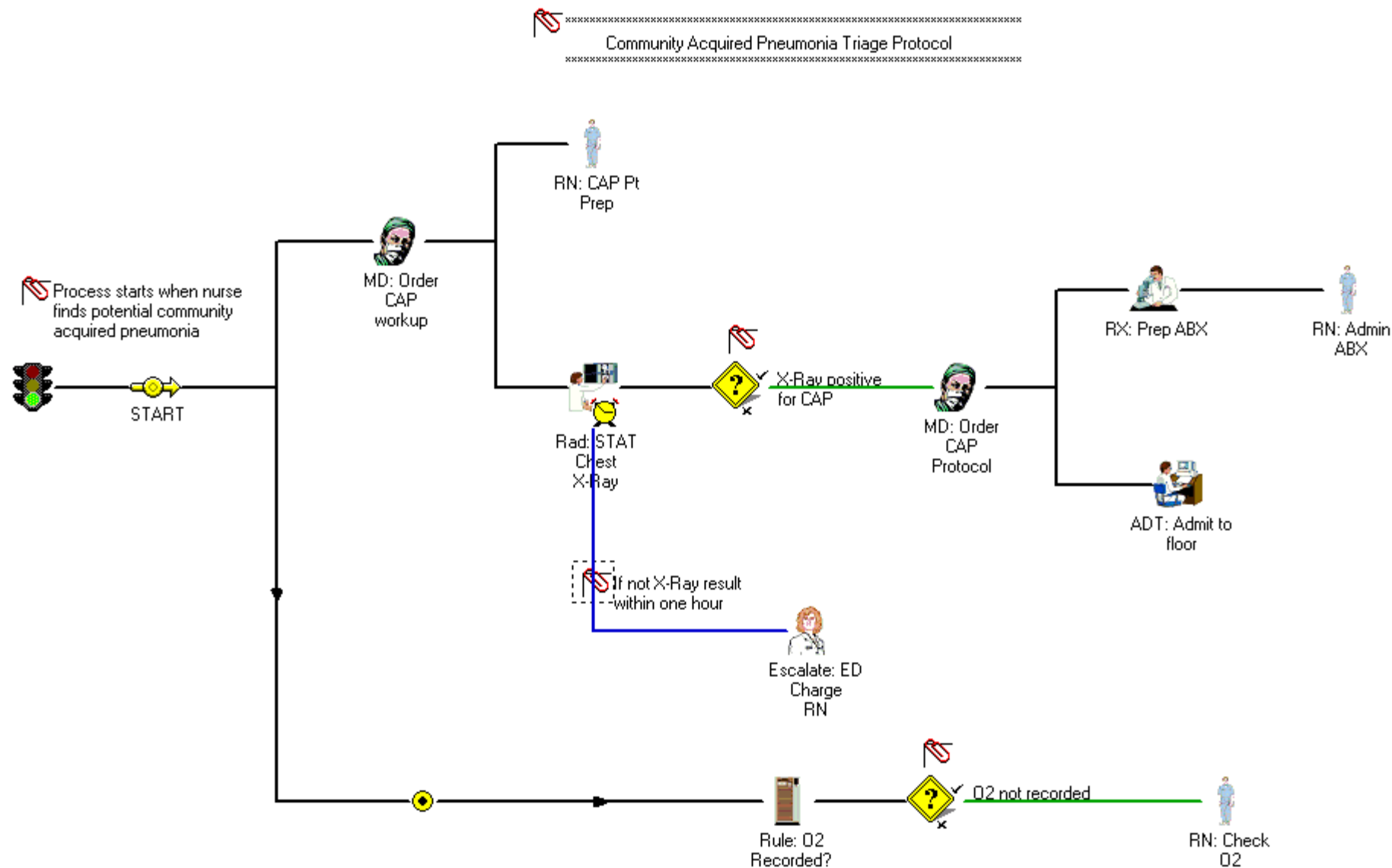
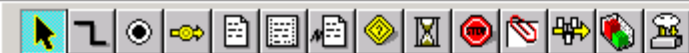
■ Workflow-enable all processes

B Intra

B Inter

B Extra

■ Focus on: Team, Time, and Configurability



SIEMENS

Dom Aporongao, MD [SMH](#)



ALERTS



My Patients Only



3EST Elwood, Torey D

☐ **Consider Pneumonia - Suggested Actions**

[CXR 10/21/2004 12:41](#)

- ☐ Disagree with DX
- ☐ Will select different regimen
- ☐ [Review recommendations for the mgmt of community-acquired pneumonia](#)
- ☐ D5 1/2 NSS IV @ 125 cc/hr
- ☐ Pulse Oximetry
- ☐ Oxygen 2 l/min per nc if O2 Sat < 95%
- ☐ CBC with differential
- ☐ Serum Electrolytes
- ☐ Pneumococcal urinary antigen test
- ☐ Blood Culture - 2 - 28 minutes report

DOCUMENTS TO BE SIGNED

CLINICAL NOTES

ORDERS TO BE SIGNED

ORDERS APPROACHING EXPIRATION

CONSULTATIONS

3EST 315-A • **Elwood, Torey D** 67 m

PT# 10020177

MR# 547177

MPI#

69 days

[Allergies](#)[Physicians](#) / [Nurses](#)

Glucose, Bedside (70 - 105) mg/dl

10/21/04 10:16

185 ↑ HH

Glucose, Bedside (70 - 105) mg/dl

10/21/04 09:30

188 HH

WBC (3.5 to 10.0) K/ul

10/21/04 06:01

10.2 ↑ H

RBC (4.10 to 5.90) M/ul

5.46 ↑

HGB (13.0 to 17.3) g/dL

16.1 ↑

HCT (38 to 52) %

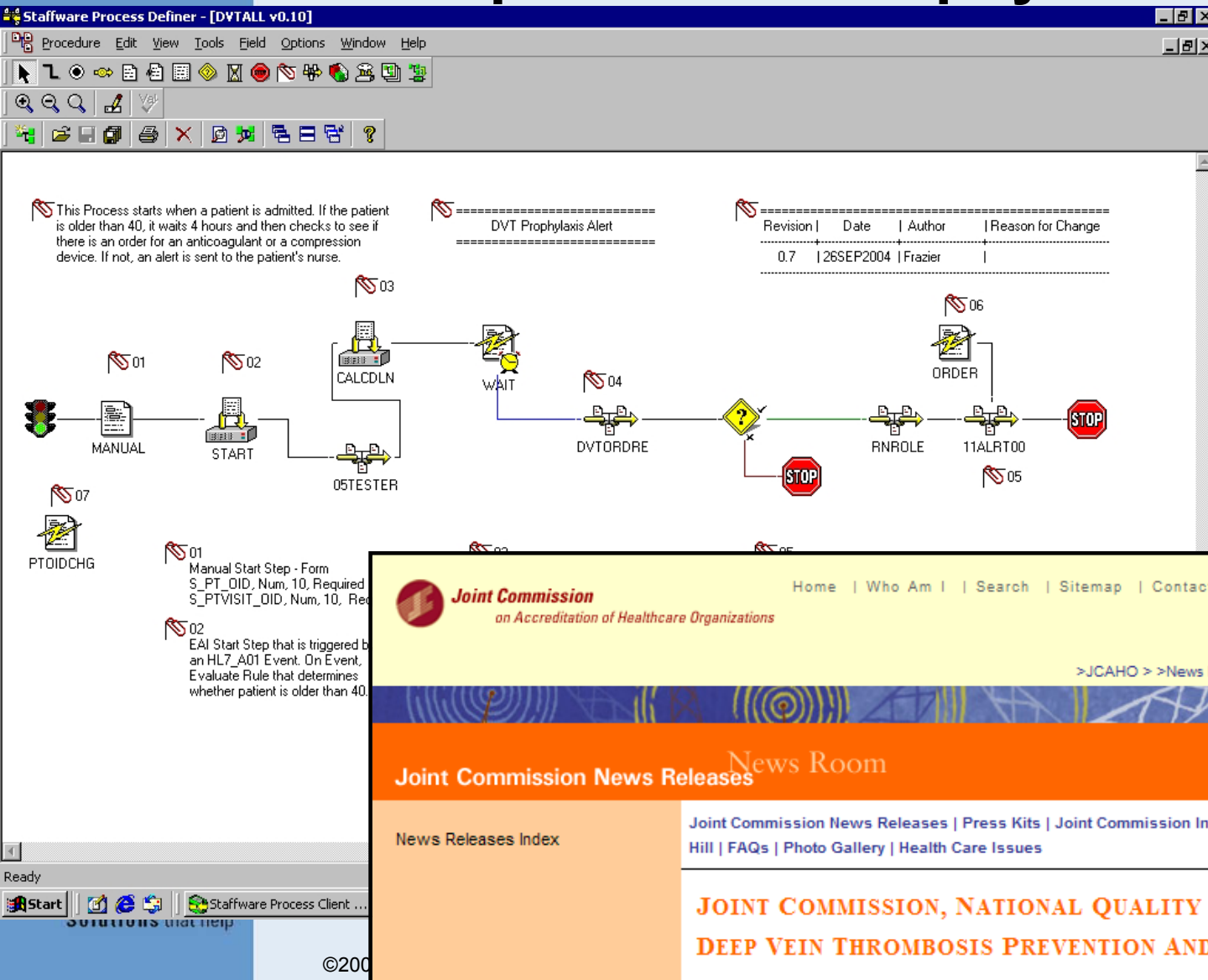
43 ↑

MCV (84 to 100) fL

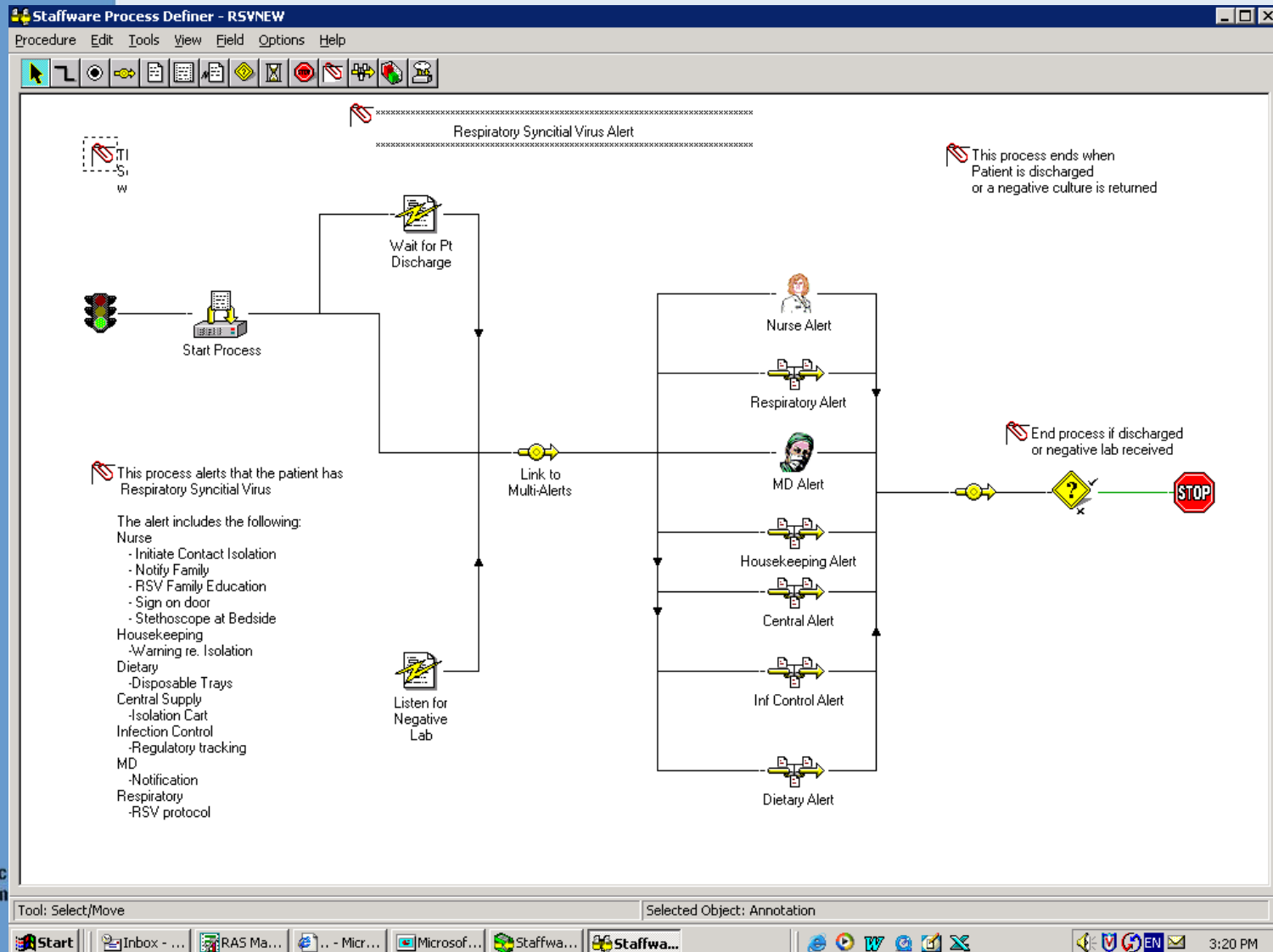
88.8 ↑

SMH 4EST 411-A **Osburn, Virgil K** 68 mSMH 5EST 533-B **Tratar, Katherine J** 37 fSMH PEDI 125 **Carew, Blase L** 7 m

Example 1: DVT Prophylaxis



Example 2: Infection Control



Example 3: Bed Management

- Objective: Reduce Turn Around Time from Discharge to Bed Availability
- Notification via beeper, telephone, worklist



Next Workflow Management Scenarios

- Discharge Management
 - Case Management
 - JCAHO / CMS Metrics
 - Clinical Practice Guidelines
-
- Progressively more complex, involving more members of the healthcare team

Extend into DM Processes

- DM processes are ideally suited for...
 - Challenges:
 - Span longer periods of time
 - Span organizations – payor, provider
 - Includes patient as participant in the process
 - Partly predictable, partly unpredictable
 - Target: both individual patient as well as population
 - Opportunities:
 - Increase candidate identification
 - Improve process definition, yet easier to change
 - Reduce manual transactions
 - Goal: deliver more DM within same team
- Key challenge – particularly in management of chronic diseases in primary care!

Challenges of clinical guidelines for chronic diseases in primary care

- Targets: Hypertension, Angina, Asthma
- Challenges:
 - Timing of triggers
 - Ease of use
 - Helpfulness of content
- Bates: “biggest challenge is identifying accurately where the patient is in their care, so that helpful suggestions can be made.”

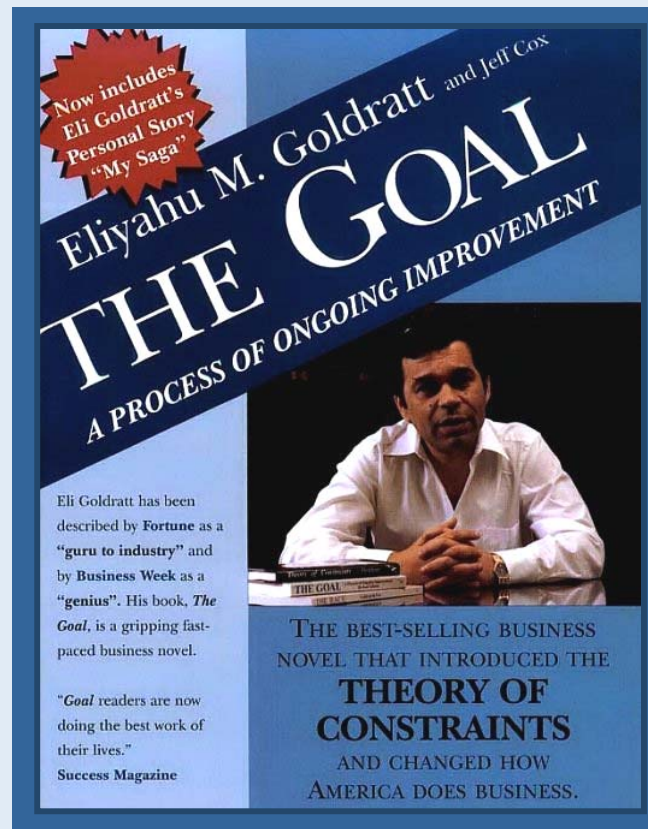
Montgomery AA et al, BMJ 2000; 320:686-90

Eccles M et al, BMJ 2002; 325:941

Roussau N et al, BMJ 2003; 326:314-8

Bates DW et al, JAMIA 2003;10:523-530

Eliyahu M. Goldratt: “The Goal”



North River Press 1984

The Process Improvement Dilemma

- What to Change?
- What to Change it to?
- How to Change it?



What is Your Organizational Goal?

- Improve quality
- Increase efficiency
- Increase profits
- Reduce cost of care
- Improve market share
- Improve patient satisfaction
- Improve health of the community
- Provide efficient, high-quality care
- Improve workflow
- Improve performance
- Other suggestions?



Goldratt's Goal

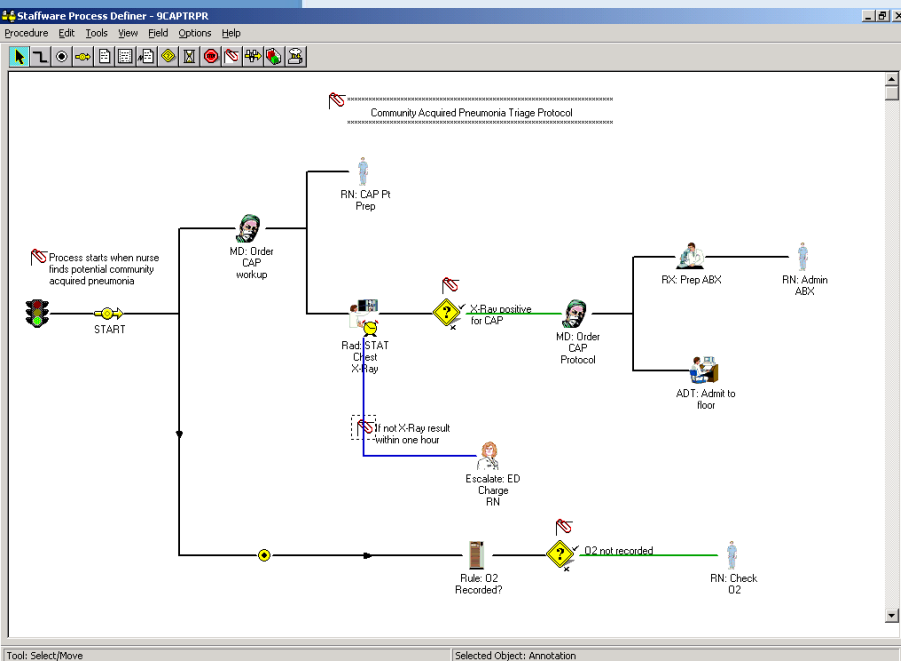
- Manufacturing: “Make Money”
- But: how does that apply to healthcare organizations???
- Increase Throughput
- Decrease Inventory
- Decrease Operational Expenses

In other words: Do More With Less....

Drivers of Workflow Management Technology in Healthcare

■ Today:

- B Patient Safety
- B Quality Improvement



■ Tomorrow:

B Throughput

B...realizing that quality and safety are necessary preconditions to high throughput

Do More With Less....

Conclusions

- Workflow Management Systems as emerging technology in healthcare
 - B Starting in inpatient settings, expanding from there into continuum of care
 - B Clinical and operational
- Parallel Goals of DM and WFM
 - B Optimize health (patient and population) at minimal expense
 - B Do more with less – increase throughput for the healthcare system as a whole
- Seeking application areas