The Use of Advanced Technology in Patient Flow Design

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The Future Business Challenges

~ Reimbursements will decrease.
~ Workload – EMR – MU2, ICD-10 Volume must increase.
~ Provider Pay tied to Patient Experience [CCHAPS]
~ In short — “Do more with less while delighting your patients, staff and physicians.”

Is this Mickey Mouse Stuff?

- Disney $1 Billion Bet on Technology in Tracking Visitors
- Radically Expected Change: Customer & Company
- Using BIG DATA Analytics
- KEY: Meaningful Information
- Financial Performance Improvements
Patient Flow

- Is very complex
- Changes constantly
- Is a constant challenge

But . . . . it can be optimized, improved, & refined with analytics

Lean Six Sigma Options

- Visual Clinic
- Manual Scheduling
- Both require data analysis

APPLYING LEAN SIX SIGMA PRINCIPLES TO HEALTHCARE

- Acknowledgement of participatory approach to healthcare
  - Traditional method is Authority of management

- Systems must be implemented so all have same guidelines
  - i.e. Clinical protocols for work ups, injections, procedures

- Revisit processes after implementation
  - Feedback from staff, doctors, patients

- Benefits:
  - Reduction of errors
  - Consistency
  - Individual accountability
  - Increased productivity
STEPS TO SIX SIGMA PROCESS IMPROVEMENT

1. DEFINE
   1. Identify the problem; define current facts and objectives; set a goal

2. MEASURE
   2. Measure to validate the problem; collect data

3. ANALYZE
   3. Analyze data for potential problems by developing hypotheses; identify root cause, validate hypothesis

4. IMPROVE
   4. Improve by testing solutions and measuring results

5. CONTROL
   5. Initiate control by establishing measures to maintain performance; continuous improvement

CASE STUDY

- The waiting room is standing room only at 2:45 every Tuesday afternoon. Patients appear angry that they have been kept waiting for 45 minutes; occasionally one or two leave without being seen. Patient satisfaction surveys are usually excellent but fall consistently on Tuesdays. The doctors say it’s the techs; the techs say it’s the doctors. Management notices techs stand around more than usual on Tuesday afternoons.

QUESTIONS PRIOR TO STARTING

- Do we have the necessary resources?
  - Staff, time, money (if applicable)

- Are doctors and management on board?

- Are the team and management willing to accept the risk (and benefits) of the final outcome?

- What is the final vision?

STEP 1: IDENTIFY THE PROBLEM

- The waiting room is at capacity on Tuesday afternoons.
- The benchmark for waiting after check-in is 15 minutes.
- Our goal is to meet the benchmark on Tuesday afternoons.
STEP 2: MEASURE

- If schedules are maintained review the past 4 Tuesday afternoons. EMR reporting.
- Determine the average amount of time that patients wait

STEP 2 (cont): MEASURE

- How many physicians are in?
- How many rooms do each use? Leaving how many for work ups?
- Look at patient schedules
  - Long appointments back to back?
  - Extra testing?
  - Add ins mid-session?
- Look at staffing schedules
  - Is a part-timer off Tuesday afternoons?

STEP 3: ANALYZE

- Hypotheses:
  - The subcontracted retinal doctor sees patients Tuesday afternoons
  - The practice has not met the additional diagnostic testing needs
  - Mary is off on Tuesdays
  - Consults are told to “come right in”

STEP 4: IMPROVE

- Try different solutions from easiest to most complex
  - Have Mary change her day off from Thursday to Tuesdays
    - There is some improvement, but patients wait 25 minutes
  - Consults are moved to end of sessions
    - This reduces the number of wait times that exceed 25 minutes
STEP 4 (cont): IMPROVE

- The retinal doctor brings his OCT tech to your practice x2 when his partner is on vacation
- Patient wait times are decreased to under 10 minutes both weeks

STEP 5: CONTROL

- A part time position is created with training opportunity for an OCT technician
  - Provide education
  - Growth opportunity
  - Control costs
- Patient satisfaction surveys indicate marked improvement
- Other sessions are evaluated similarly.

Visual Clinic Provides At-a-Glance Status Reporting

Data Analysis: Doctor Exam Times
**Data Analysis: Technician Workup Times**

**CREATING A MASTER SCHEDULE**
...THE OLD FASHIONED WAY

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**Time Study**

<table>
<thead>
<tr>
<th>Dr. ABC</th>
<th>Main St. office</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>MRN</td>
<td>Appt Type</td>
</tr>
<tr>
<td>Appt Time</td>
<td>Arrival</td>
<td></td>
</tr>
<tr>
<td>Ck In Done</td>
<td>Tech Call</td>
<td></td>
</tr>
<tr>
<td>WU Begin</td>
<td>WU Done</td>
<td>Dilate</td>
</tr>
<tr>
<td>Seated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD In</td>
<td>MD Out</td>
<td>Duration</td>
</tr>
</tbody>
</table>

**Averages**

- Time per appointment type
- Time for:
  - Check in
  - Work up
  - Wait time
  - Provider time
  - Testing
  - Check out
- Work up time per tech (if included in data capture)
- These will help you staff appropriately.
Data Gathering

- Number of lanes
  - Work up – one for each tech
    - Decreases time looking for available room
    - If more staff than rooms, reallocate them to testing, scribing, flow, triage, eRx, etc.
- Diagnostic tests
  - Average time for each
- Clinical staffing
  - Stagger work schedules to cover early, lunch and lates
  - Stagger doctors’ start and end times
- Time study
  - All aspects of clinical flow

Execute the plan

- Use a scheduling template to put it all together.
- It will not be easy, perhaps lots of iterations of the same to get the best
- Most important, let your staff know what you are doing and the planned result.
- Knowing that technician time really matters is helpful, and can add much to understanding strengths and weaknesses to lead to improvement!
- Maximizing efficiency means maximizing revenue, time and resources!

THANK YOU FOR YOUR ATTENTION

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CASE STUDY #2

Operational Targets

1) Assess the new scheduling template capacity versus the current schedule
2) Increase clinic capacity to meet challenges of rising costs and declining reimbursements
3) Required 10-20% increase in the number/mix of long appointment types for the following reasons:
   I. Increase and satisfy the new patient demand
   II. Provide larger pool of patients who need or desire to qualify for SX options
4) Adjust a percentage of short or post-operative appointments as necessary based on demand
5) Reduce wait times through better operational efficiencies and awareness
RESOURCES…

Resource Targets
1) Assess the new scheduling template capacity with just "7 work-up exam rooms" and 7 techs (not scribes);
2) Using 2 Doctors in the Clinic with 4 "Doctor Rooms"
3) Maximize clinic capacity and Physician utilization 
Making it Practical & Achievable

First: What is a Real-Time Locating System?
RTLS is a method for locating people or objects, and a useful tool for monitoring and improving processes

Second: What is Modeling and Simulations
- Decision Support Tool for managers and executives
- Powerful tool for designing and analyzing complex and dynamic systems to predict their behavior under different conditions.
- Simulations are a highly cost-effective method of testing new processes or ideas without having to affect current operations.

Simulation Example – Static Baseline Model
Methodology

- Operational Data Analysis & Objectives
- Modeling & Simulation
- Assessment

Key Whitman Case Study Plano

- Summary bar chart - Comparison of scenarios
Summary…starting with 92 Patients/Day…

- 110 patients is feasible given the current resources and constrains
  - There are optimized scheduling scenarios that offer small gains in efficiency

- Maximum throughput, given current constraints and resources, is limited by the number of technicians and their overall utilization rate to 119 patients/day
  - The value add of the system generated schedule is 27 additional long-type of appointments
  - The proposed changes could result in additional clinical revenues of $20,250 per week or about $1 million annually

(*3 days a week adjustment / avg of $250 reimbursement rate / 50 weeks a year / assumes demand is met)

Integrating Tools and Technology

- Make better decisions faster
- Facility layout and design
- Resource evaluation – Staff, Doctors, Rooms, Equipment, etc.
- Modeling as a tool
  - Complexity
  - Uncertainty
  - Variability
  - Limited Resources
  - Capacity planning
  - Management Planning

Re-Engineering

<table>
<thead>
<tr>
<th>RTLS</th>
<th>Patients, Staff, Doctors</th>
<th>Times, Data Reporting</th>
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Simulations and Process Modeling

| Process Flow & Resource evaluation | Real & accurate Data & Modification analysis or "what-if" scenario development. |

Implement New Productivity Improvements

| Help optimize templates, Schedules, and resource scheduling | Understand and control wait times, patient flow, Utilization, and reduce guesswork |

Modeling and simulations coupled with historical data provides us with the opportunity to deliver the “try before you buy” concept allowing graphical representation and outcomes of real potential decisions. Without the accurate data delivery of Simulations is only someone’s “best guess”.

Key learnings -

- The power of the technology is realized when you combine these processes: RTLS, modeling and simulations, and data analysis

- Guessing produces unwanted or undesired opportunity cost in complex situations

- Although there is an art to running the organization it is difficult to accomplish without careful analysis and accurate data

**Validation brings peace of mind and more informed decision making**
THANK YOU FOR YOUR ATTENTION

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