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Case Study

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INSIGHTS AND INNOVATION FOR RURAL HOSPITALS AND PROVIDERS

Do Better *is Not a PI Methodology*

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The Adverse Consequences of Misusing Performance Improvement Methodology (PIM)

INTRODUCTION

The term "process" is used often in healthcare. For example, when a patient arrives at the emergency department (ED), we refer to each of the five steps—triage, registration, patient in room, initial nurse assessment, and the physician's initial medical assessment—as individual "processes".

What is "process?" It is ***"a systematic series of progressive, continuous, and interdependent actions or steps taken in a specific manner by which an end is attained that can be acted on alone."***

Individually, these five ED steps do not have an individual outcome that is substantive enough to be acted on alone. But, each is important. Together, they contribute to a physician's initial (differential) diagnosis decision that ***collectively*** can be acted on alone even if the patient goes to another place of service for further patient care (as in the case of transfer to another facility).

In contrast to referring to each of these five steps as a single process, we often refer to the entire span of time from arrival to disposition (discharge) as a single process. Thus, it appears that everything we do, great or small, is a process.

So, how do we intelligently communicate in order to understand, discuss, and act to improve outcomes? For a more complete education and instruction, I've put together a document called ***Catalyst™ - A Performance Improvement Methodology (PIM),*** available for free on our website at:

HospitalMD.com/resources/insight

In this case study, however, and until one understands process more fully, we will define the overall patient stay in the ED broadly as the four

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functions of:

- Initial physician assessment process
- Diagnostic process
- Re-assessment/treatment process
- Disposition process

Each of these four functions include several intermediate supporting steps that make up the "process" and collectively have a single outcome with an end point that can be acted on alone. The individual elemental actions or steps within each of these four processes are defined as "procedures" (loosely "sub-processes").

DATA – THE BUILDING BLOCKS

The term "data" will be used to reflect the outcomes or results of both processes and procedures where the outcomes of procedures have a much lesser significance. Data are the building blocks of understanding process. Initial data in a natural "raw" state such as 800 ED patient visits, 6 LWOTs (left without treatment), and 30 admissions that we see reported in monthly reports usually have not been organized in any particular fashion and are generally random and scattered and of little use.

The incremental net revenue lost from acute admissions that are misclassified as OBS in most small community hospitals is from $1.8 million to $2.3 million.

Such data points will appear to be entirely independent of each other, have little or no relationship one to the other, and each will seem to be as equally important as all other data elements. For example, what is the meaning and use of 800 patient visits as a stand-alone datum? Are there really 30 "acute" admissions? Hospitals are paid by CMS for true acute admissions at about 8 times more per discharge than the amount they are paid for OBS. And the out-of-pocket cost to patient for OBS is typically much more than for a true acute admission. Do we think we are getting paid for 30 acute admission at 8 times the OBS rate? And what is the relationship of these individual measures to each other? What can we know and what can we do with these sterile data? The annual incremental net revenue lost from acute admissions that are misclassified as OBS in most small community hospitals is in the range of $1.8 million to $2.3 million.

This case study that follows illustrates the unintended, adverse consequences that can result from misuse of performance improvement methodology (PIM) when we do not fully understand process design nor use of the associated analytic tools. It also illustrates how misuse leads to frustration and the belief that PIM lacks credibility.

WHAT DOES ALL OF THIS MEAN?

Why is it so perplexing that we have such difficulty judging and improving performance of emergency medicine (EM) services? Even though some process improvements start well, they often regress and do not "stick", making way for Plan B (i.e., "we've just got to 'do better'"). What does "do better" mean? If anything, it means work **smarter**. It doesn't mean work faster and harder. High performance has little to do with working harder and faster.

CONSIDER THIS SCENARIO

I think we all would agree that reducing the overall **Average Length of Stay (ALOS)** of 90 minutes for all dispositions by 33% to 60 minutes is working **smarter**. But, what smarter steps lead to smarter results? And, are all "smart" steps equally smart?

Many studies have been published that indicate that the tools and techniques of Six Sigma and Lean (performance improvement methodologies) do not lead to improvement in performance in healthcare and therefore PIM is not applicable to healthcare. On the contrary, HMD's research in the application of ***critical path theory*** and ***statistical process control*** methodologies to the complexity and uniqueness of Emergency Medicine (EM) has led us to a set of tested **process decision rules** that have resulted in reductions in the overall ALOS of 25% to 50% in actual implementation.

The key is that the decision rules must be followed completely and consistently.

In light of our success with our decision rules, let's look at the steps taken by a hospital that achieved a dramatic 33% decline in ALOS. We will see how use of parts of these decision rules led to this level of improvement and how misuse of parts of the decision rules had unintentional, adverse outcomes.

This hospital followed **most** of the steps of the decision rules and achieved the 33% reduction in ALOS, but took short-cuts described later. As a result, the 33% reduction in ALOS overshadowed an unintended loss of $2.4 million in annual net revenue and might have been overlooked completely. This scenario illustrates that following these decision rules simply means **following all the rules consistently**. And it does not mean that following these rules is difficult, nor is performing them perfectly necessary.

UNDERSTANDING THE PROBLEM – A STARTING PLACE

Dimensions of Medicine

In the vocabulary of PIM, there are two dimensions of medicine:

- **Process** (workflow) of medicine
- **Science** of medicine.

Making decisions about the process (workflow) of medicine using appropriate analytic tools is analogous (or parallel) to making medical decisions based on diagnostic lab exams and x-rays (clinical decision tools). And by extension, a greater and deeper understanding of process analysis yields a picture (image) with better visual clarity for "treating" processes in a similar way as does a CT compared to a plain film x-ray.

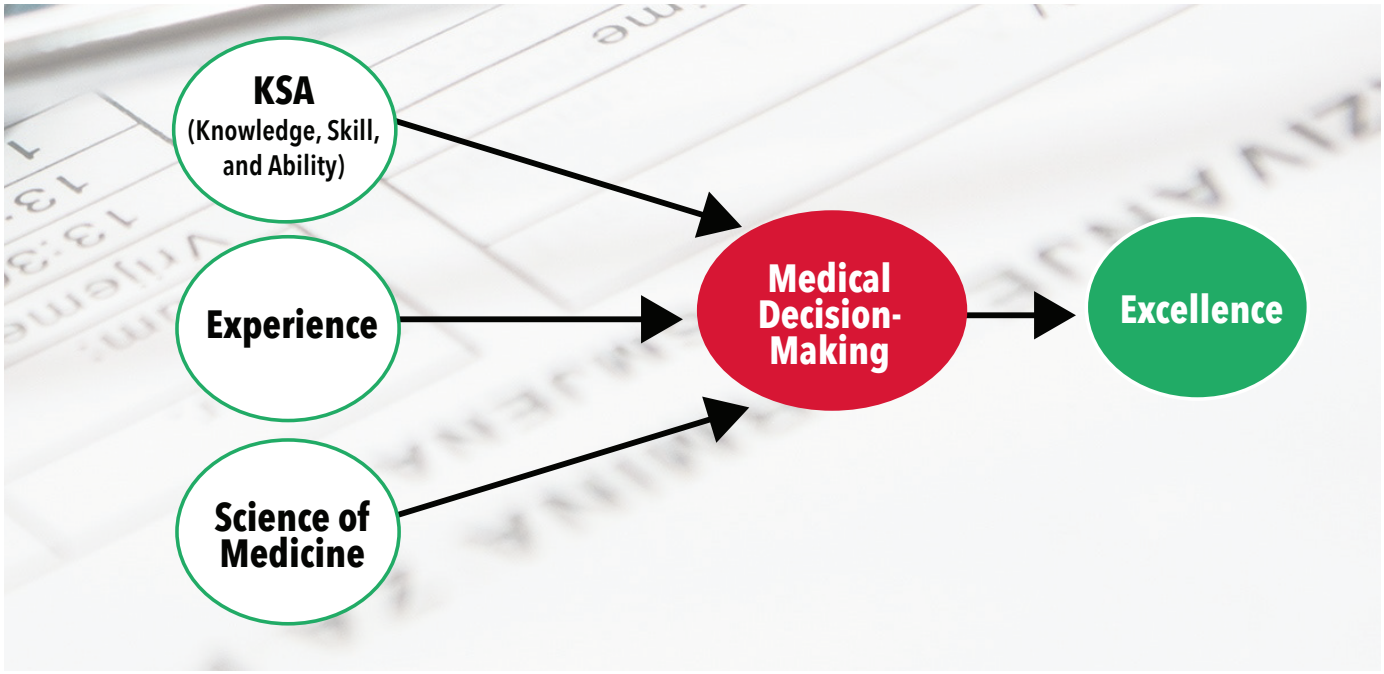
Complexity

We can all agree that the science of medicine is complex. I am sure most of you who have worked in any hospital patient care unit, and especially EM, have an appreciation of the complexity of patient care. And my guess is that part, if not much, of your perception of the complexity is influenced by the chaos and dysfunction that exists delivering patient care.

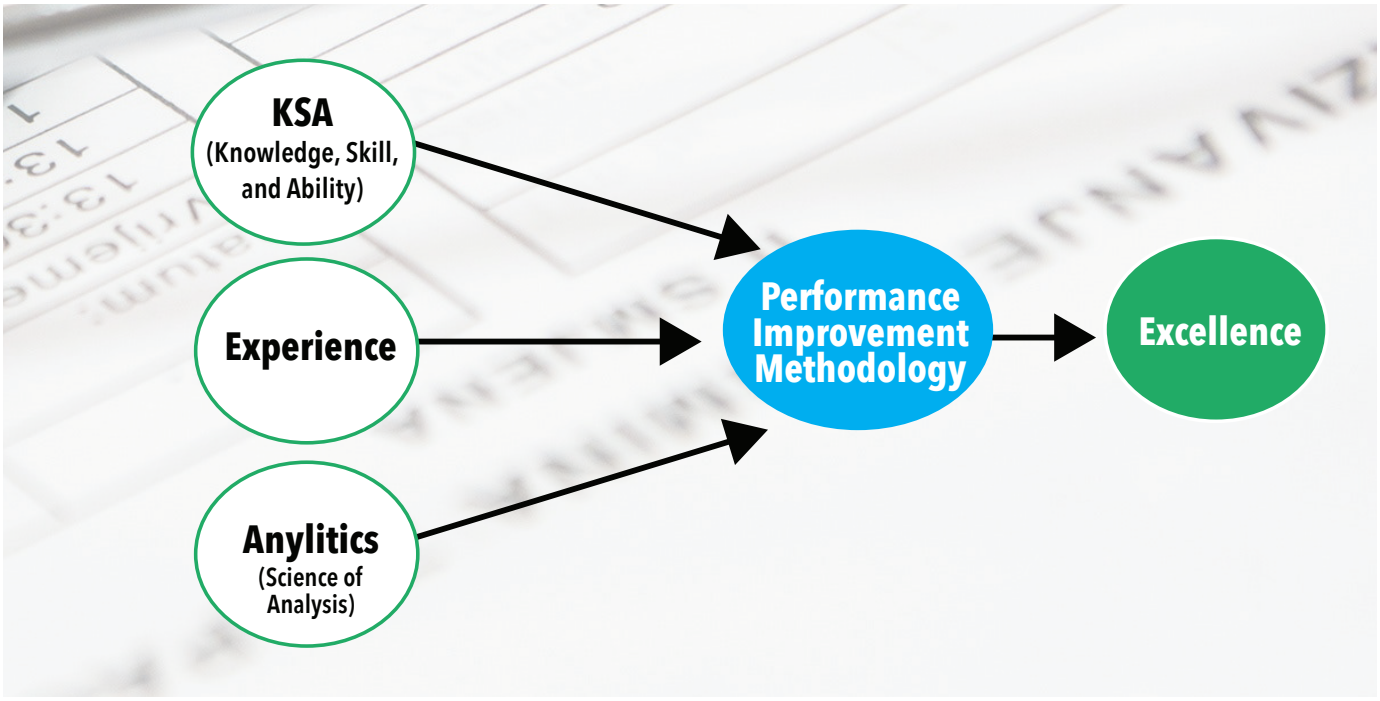
We understand that treatments of medical conditions employ methods of diagnosis that involve a systematic analysis using the science of medicine. The purpose of diagnosis to establish differential (two possible) diagnoses. The doctor tests the suspicion that generally there are two possible (or likely) causes of the illness. Diagnosis is a process of "ruling out" one of the two. It is about breaking problems down into their fundamental parts.

In practical language, clinical research isolates the presumed and most basic and fundamental cause, holds all other variables constant, and experiments with eliminating the presumed cause.

This concept is illustrated below.



Likewise, treating process "disease" follows much the same decision process and is only as good as the correct diagnosis, and understanding how to use the appropriate tools. This concept is illustrated below.



Productive and Non-Productive Activity

Let's look at ED patient care complexity from the perspective of workflow. All patient care activity from patient arrival to final disposition is either **productive** or **non-productive**. **Productive activity** (or productive time–PT) is all activity that directly or indirectly *contributes* to diagnosis, treatment, and patient comfort. Examples include: triage, initial assessment, initiating orders, performing exams, re-assessment, and disposition.

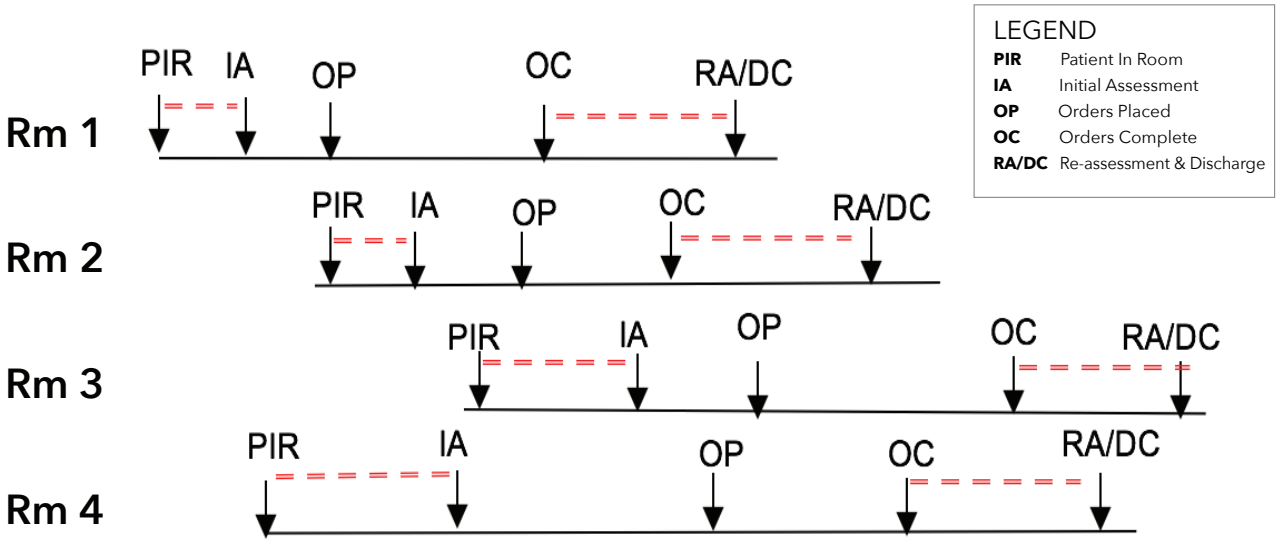
Non-productive activity (or non- productive time–NPT) is all activity (wait time) that occurs between completion of one productive activity and start of the next productive activity. An example is the idle time represented by the red dashed line (**-----**) that occurs with respect to the patient between completion of a lab exam when the results are known and re-assessment. From a practical and value point of view, this time is wasted regardless of whether it is avoidable or not. NPT is non-essential. Therefore, LOS can be reduced only to the extent that any or all of this time can be eliminated.

If you see the magnitude of time represented by the red dashed lines, you will accept the magnitude of reduction in LOS and ALOS. Next, you need to implement the decision rules and apply them to achieve the reduced LOS.

Most Time Dependent Events

The initial medical assessment and medical re-assessment are two *most critical productive* events and dictate how quickly the patient can be discharged or admitted. The initial medical assessment is critical because no significant diagnostic work can be done until the assessment is complete. And the medical re-assessment is critical because no additional diagnostic, treatment, or disposition work can be done until this final assessment. The illustration below and decision rule on the next page represent the first and simplest improvement opportunity.

Potential Impact of Reducing Non-Productive Activity



Decision Rules (The Magic)

The "decision rules" that must be followed by the physican to reduce the overall ALOS, and minimize individual patient LOS are defined as follows:

At the conclusion of any initial or re-assessment event, immediately move to the next patient that requires either an initial assessment or re-assessment, and has been waiting the longest since the last patient event.

Reduction in individual LOS occurs in significant amount ONLY if assessment and/or re-assessment can be accelerated or performed sooner in time than normally occurs with the random sequence in the absence of decision rule.

This decision rule and the "potential impact" illustration on the previous page represent the first and simples iteration (application) of process improvement steps (decision rules) to take. The same general steps (decision rules) can be taken for successive, deeper levels of process detail after improvement. From this step, is complete but all subsequent decision rules are stated in this same form.

THE PLAN

After discussing the problem of length of stay (LOS), the doctors at this hospital felt that these ideas and changes made sense; but insisted that they would focus more of their effort on the intuitive but suboptimal steps of (1) getting patients into the treatment room quickly (reduce door-to-doc time), and (2) allowing the doctor to decide the sequence of patients to attend rather than follow decision rules.

Naturally, a doctor would look at patient care process from the perspective of medicine. Their argument for their preference (2) above was that lower acuity patients can be discharged quickly; and higher acuity patients naturally have long stays so why rush? Sadly, the view here is that improvement in service cannot be achieved for high acuity patients, and directly violates the fundamental principles of PIM that effective PIM improves multiple procedures concurrently. And this view further violates our desire to improve all aspects of patient satisfaction, and not only one at the expense of the others.

The science of medicine impacts the timing and sequence of an episode of care for individual patients based on acuity; but has only limited impact on the processing of all patients collectively being treated by limited physicians and other clinical resources.

Initial ALOS Results

The project launched on a Monday at 7 AM and ran for a month. The ED clinicians worked together following the altered decision rules.

At the end of the first month, the project team was eager to hear that the new ALOS was 81 minutes (down from 90). This seemed to be enough evidence that their efforts had gotten results. After a short discussion and congratulations around the room, the group adjourned with the feeling that they were on the right track and to continue the project.

The team was excited the second month about a new ALOS of 70 minutes, and even more excited about 63 minutes the third month; both improvements from 90 minutes. They began to believe that they had figured this thing out and that they might even reach 60 minutes.

Didn't Plan on This

However, they began to notice that the monthly patient visits had declined even as LOS was declining. This was strange and unexpected. The volume should increase if satisfaction has increased. But

when we don't understand something, we have a tendency to rationalize. And in this case, the explanation was that this is "probably" good because these were "probably" uninsured; or resulted from these new ACA narrow-network plans.

The Danger is Almost Always Below the Surface

The altered decision rules accomplished a significant decline in the overall ALOS. But the altered rules that favored improved performance for low acuity patients and forced their averages downward also artificially forced the averages and ranges around the averages for high acuity patients upward. These movements created two separate clusters.

Our retrospective analysis revealed that the decision rules followed did achieve the decline in the ALOS and that the short-cuts resulted in a wide range of variation of individual LOS that produced essentially two independent clusters of individual LOS around patients with low acuity, and a separate cluster of LOS around patients with high acuity. These data for overall average (A), low acuity (B), and high acuity (C) both before and after new decision rules were implemented are illustrated below:

	(B) Low Acuity	(A) Average	(C) High Acuity
Prior to new procedure	75	90	146
Following new procedure	46	60	180
Change over old procedure	(29)	(30)	+34
Improvement	39%	33%	(23%)

This problem was very familiar to us. HMD had warned against the short-cuts. We continued, however, to assist this hospital to determine if this *new* procedure was the cause of the decline of ALOS. We found that the new procedure did significantly decrease the overall ALOS by 33%.

However, the altered rules did have an adverse impact of a decline in ED patient visits of 20%. It is likely that no one would have looked for further improvement or consequences of this project after having achieved an Olympic-level reduction in the ALOS. But a close examination of this 20% decline in ED patient visits by the CFO revealed that the decline had occurred largely with high acuity patients. If this were true, the hospital would have lost its most productive source of acute inpatient admissions. And this magnitude of lost inpatient admissions would represent a decline in net revenue (cash) of as much as $2.4 million annually in fewer acute inpatients. Talk about good news, bad news!

The reduction of 29 minutes (39% shorter) obviously pleased patients with low acuity. But the increase of 34 minutes (23% longer) was very frustrating to higher acuity patients.

We found that this cluster of patients in the higher acuity cluster was primarily older patients that presented to the ED with generally higher acuity illnesses, higher inpatient admission rates, and thus higher revenue per visit. These older patients tended to critical of longer waits than they had experienced on previous visits. And, in addition to their longer wait time, they observed low acuity patients leaving quicker than them which added to their frustration and their future hospital choice. There was some decline in revenue. But fortunately, the decline in visits was detected early, the CFO analyzed the data to determine the effect, and evidence of the effectiveness of the correct use of the decision rules and the team got back on tract.

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DISASTROUS UNITENDED CONSEQUENCES

Unintended, adverse consequences do not always occur, and are not a normal byproduct of performance improvement. When PI steps are understood and applied correctly the benefits can be extraordinary.

This PIM has proven to always achieve dramatic benefits. If you don't quite get it after review this cases study, or become discouraged or risk-averse, don't give up. It is worth talking to us to assist you to begin the improvement projects. We can train you and your organization to become independent in the long run and establish a continuous, integrated, ongoing PI culture.

We look forward to hearing from you!
877.881.8783 or **insight@hospitalmd.com.**

Jim Burnette is the Founder and CEO of **HospitalMD**. Jim has worked in healthcare for more than 20 years. His mission is to strengthen small community hospitals across the nation and help them thrive in today's rapidly changing healthcare climate. Jim is a graduate of Georgia Tech and resides in Peachtree City, a small community right outside Atlanta.

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