TRANSACTIONS FROM

INTERNATIONAL SYMPOSIUM ON QFD 2010-PORTLAND

THE TWENTY-SECOND SYMPOSIUM ON QUALITY FUNCTION DEPLOYMENT

September 24-25, 2010
Portland, OR

DREAM/QFD to Re-Design Staff Service Excellence at Rutland Regional Medical Center

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Abstract

As a rural community hospital in the northeast U.S. state of Vermont, one of our corporate goals for this year at Rutland Regional Medical Center (RRMC) is to develop standardized processes and clear expectations ("service standards") for how we serve and interact with our patient customers. Based on analysis of our voice-of-the-customer (VOC) data, we have identified inconsistencies and a lack of clearly defined requirements for how we communicate with and serve our patients which have resulted in lower levels of their satisfaction. While these inconsistencies and lack of service requirements are not reflective of the quality of our clinical care, they are reflective of our behaviors, words, body language, and the interactions we have with our patients. This project describes our efforts to change the way we work in delivering better and more consistent service to our patients based on their perceptions of what is important to them when they receive care and treatment in our hospital.

Key words

Quality Function Deployment (QFD), Analytic Hierarchy Process (AHP), service excellence, healthcare, Voice of the Customer (VOC), Design/Redesign Effectiveness Assurance Method (DREAM)

The quality journey at Rutland Regional Medical Center

In the 2008-2009 Annual and Community Report, Domenic M. Serino, CFRE, Executive Director of the Rutland Health Foundation, writes:

> "Rutland Regional Medical is more than just a building: it is a community of highly skilled caregivers who all play a vital role in ensuring the best possible care to the greater Rutland community."

Under the guidance of our president/CEO, Thomas W. Huebner, we have established a vision: *To be the Best Community Hospital and Health System in New England.* This vision requires that we recognize our key customers – health care providers, and especially our patients - as

the very reason for our service to the Rutland community for over 100 years. In order to transform and move the organization towards this vision, we have been using the Malcolm Baldrige National Quality Program as the framework on our "Journey to Excellence." RRMC's culture is shaped by our organization direction, including our mission, vision, values and goals. Our five strategic goals include quality, growth, information excellence, financial strength, and employee engagement. The quality and information excellence goals include elements of providing superior services which meet customer needs through effective processes and competent and caring staff, which is the topic of this paper.

To help with the transformation of the organization, RRMC employed the services of Douglas A. Horne and the Institute for Quality Advancement located in Toronto, Ontario. Doug, with roots in Bell Canada and GOAL/QPC (author of the Memory Jogger[1] series), worked with the RRMC senior leaders and key staff members to develop a multi-year transformation plan. Integral to the transformation plan was to develop an approach for process improvement. A process improvement transformation team was formed to develop this approach. The first order of business was to endorse a consistent methodology and to apply this to a number of our key processes. Our process improvement team comprised of senior leaders, leaders and staff led the way. Up through 2005, we had exposure to and used of a wide variety of improvement methodologies across the organization: PDCA, PDSA, FOCUS-PDCA, Lean, Six Sigma, and the Institute for Healthcare Improvement's (IHI) Model. Our process improvement transformation team studied, learned, and evaluated these various improvement methodologies to determine the approach that would best meet organization's direction. The team recommended the development of MEDIC, a "home grown" methodology, which marries together best practice tools and techniques from the disciplines of process improvement, project management and change/transition management. MEDIC was aptly named for its purpose and our organization -- Method for Effective Diagnosis & Improvement of Causes. With similar roots to six sigma's DMAIC, Toyota's A3 Storyboard, and other problem solving algorithms, an experienced training organization was selected to develop the curriculum and deliver the education program and coaching to our initial MEDIC project teams.

Initially, this methodology was highly successful in some situations, but not in others. In line with our overall PDCA philosophy, our process improvement approach includes a step for improvement of the methodology itself through cycles of evaluation and refinement. The evaluation of our initial experiences with MEDIC revealed the need for some improvements to the methodology, project structure, and supporting education. Furthermore, this evaluation also made us realize that we needed another, quite different, methodology; one that would enable us to completely redesign or design key processes.

This realization triggered the establishment of another transformation effort; the creation of our DREAM approach. A transformation team was established to research and develop this. Similarly to our development of MEDIC, we found numerous approaches from which to learn about this topic. Recognizing the organizational benefit of maintaining consistency, where appropriate with MEDIC, as well as other established aspects of our management system, we determined that it was best to develop a 'home grown' methodology which married together best practices in design/redesign including the appropriate use of the 7 Management & Planning tools, project management, and change/transition manage-

ment. DREAM was likewise named for its purpose – <u>D</u>esign <u>R</u>edesign <u>E</u>ffectiveness <u>As</u>-surance <u>M</u>ethod. With similar roots to Design for Six Sigma (DFSS), Stage-Gate®, and QFD, we selected an organization to develop the curriculum and deliver the education program in conjunction with our education staff. This includes coaching to our DREAM teams.

RRMC delineates these two approaches as follows:

Table 1. Institute for Quality Advancement – MEDIC vs. DREAM approaches

	MEDIC **Process Improvement Model**	**DREAM** **Design/Re-design Model**
Purpose	Continuous Improvement	Innovation
Degree of change	Incremental, small steps	Radical, extreme
Starting point	Existing processes with data	Clean slate, starting from new
Frequency of change	Continuous (may be one-time)	One-time
Participation	Bottom up	Top down
Typical scope	Narrow, within functions	Broad, cross-functional

The DREAM method more closely aligns with QFD and was selected as the approach to use for this Service Excellence project. As a quality management process, DREAM follows Walter Shewhart's PDCA[2] (Plan-Do-Check-Act) process with seven major process steps as follows:

Plan
    Step 1.   Define Requirements
    Step 2.   Feasibility Check
    Step 3.   Initial Design Proposal
Do
    Step 4.   Final Design
    Step 5.   Plan & Test the Design
Check
    Step 6.   Check the Results
Act
    Step 7.   Fully Deploy
                   Plan for Continuous Improvement

Within the DREAM method, each step has identified tasks and deliverables. Tools for management & planning, change/transition management, and project management have been identified to help teams accomplish the necessary work. Gate reviews are conducted at the conclusion of the team's work at each step along the way by the steering committee members (typically comprised of RRMC senior leaders) assigned to provide guidance and direction to the project leader and team. DREAM is a very rich and powerful method. The first DREAM training began in 2008 and revealed some concerns for how to obtain an accurate voice of customer and from it more clearly define customer requirements. RRMC recommended QFD be added to Step 1 and Glenn Mazur of Japan Business Consultants, Ltd. and the QFD Institute was asked to custom tailor a QFD approach that would integrate with DREAM, with particular attention paid to Step 1 – Defining Requirements.

Traditional QFD approaches

Since its beginning in Japan in the 1960s, QFD applications have been custom tailored to the needs of each organization and project.[3] In Dr. Yoji Akao's (co-founder of QFD) case study book,[4] several advanced deployments are introduced, including technology deployment, reliability deployment, and cost deployment. In the 1990s, QFD Institute directors began to address QFD efficiency concerns because modern lean organizations were finding the time these traditional deployments required exceeded the resources available. This was due to several factors such as "right-sizing" organizations in difficult economic times, global competition forcing faster time to market, and lean six sigma promotion to prioritize high value projects. While most organizations agreed that listening to the voice of the customer was important, the effort to complete large, complex matrices such as the House of Quality was significant enough that QFD risked abandonment in the middle of the project, or in some cases could not be completed until after the product had launched!

Concerned that QFD would fade from use and customer satisfaction would lose focus, Dr. Akao tasked Mazur and Richard Zultner (another QFD Institute director) to modernize QFD based on the methods fashioned by Zultner for software developers and Mazur for consumer products and services. The resulting Blitz QFD® provided a faster, more efficient approach than the methods most companies were using. In the U.S. and elsewhere, the most common approach was the 4-Phase Model which had been tailored for reliability improvement in the automotive components industry. Each phase called for a matrix to juxtapose and interrelate customer requirements to product quality characteristics, these to part characteristics, these to manufacturing steps, and these to process parameters. Customers of the tier one parts makers were the automotive engineers at the OEM car companies, and the so the first matrix or House of Quality typically represented an engineer-to-engineer requirements documentation. It was assumed that the OEM automotive engineer understood their customer, the drivers and passengers, and so there was little additional effort for parts makers to do a detailed market analysis. This assumption proved fatal as the U.S. auto makers steadily gave up market share in the 1980s and 90s.

Of course, Dr. Akao never intended QFD to be a one-size-fits-all approach. Virtually every Japanese case study that Mazur translated began by discussing the business issues facing the company and how QFD was tailored to address weaknesses in their product development process. Thus, one of the fundamentals of modernizing QFD became adapting the QFD process to the organization, rather than the other way around.

Custom tailoring QFD to the organizational needs of RRMC

The QFD Institute has formalized the tailoring process to include a series of interviews with key product development managers, a report on findings (without attributing to any individual), an executive briefing on the benefits QFD can bring to their organization and what their roles and responsibilities are to obtain those, custom tailoring a QFD flow and the tools to be used, and finally customized training materials to be used in subsequent QFD Green Belt® and QFD Black Belt® in-company courses.

Mazur conducted interviews in July 2009 with representatives from the following functional areas of RRMC: quality, supply chain management, planning, organizational excellence, support services, patient relations, performance improvement, human resources, education, clinical services, outpatient clinics, professional support services, cardiac services, regulatory ac-

creditation and patient safety, diagnostic imaging, senior leadership, as well as the external consultant, Doug Horne. Key findings from the interviews included:

- A need to be able to identify unspoken customer needs;

- Capturing the magnitude of the gap between current service performance and desired levels;

- How customers measure the quality of their care;

- Operationalizing the improvements;

- Appropriate use of tools.

From these opportunities, Mazur worked with RRMC to extract a set of QFD tools and integrate them into the DREAM process, which is shown in **Figure 1**. The DREAM process is shown on top and the QFD tools are shown on the bottom, relative to the DREAM tasks that they support. Detailed excerpts will be shown throughout the paper. Training commenced in October 2009.
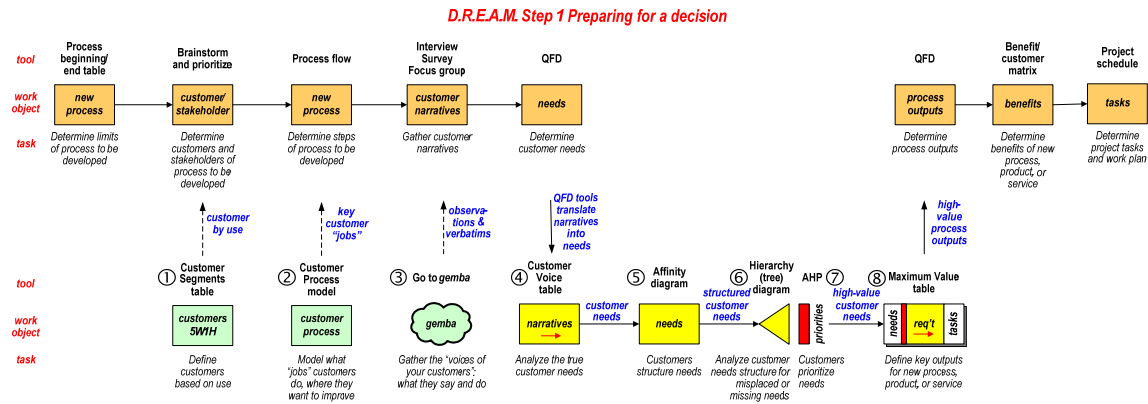

Figure 1. DREAM and QFD flow chart

Service Excellence project background and purpose

Rutland Regional Medical Center has been on a "journey to excellence" since 2002, with a strong customer-focus as a compass to help guide our improvement efforts. Over that time, we have been using a combination of process and satisfaction data to improve a variety of the processes, products and services that we provide to our patients. Despite these various efforts, current data indicates that our patients still do not receive their services in a consistently excellent way.

Through our review of the data, which includes our patient satisfaction priority indices, patient complaints, service recovery data, results from prior patient focus groups and recent market studies, we have identified an emerging theme around inconsistent and unprofessional practices within the way we deliver care to our patients. These practices are not reflective of the quality of clinical care that we deliver; but are reflective of our behaviors, words, body language, and inconsistencies among different care team members as we serve our patients. These inconsistencies mean that we sometimes provide "excellent" service, sometimes "average" service, and sometimes "poor" service. These inconsistencies are one reason that patients are

dissatisfied with this aspect of our organization which in some cases is leading them to choose other health care providers in the region to receive their services. It is clearly in the best interests of the organization, our employees, physicians and the patients that we serve to address these issues through a Service Excellence project.

The service excellence project's primary goal is develop standardized processes and clear expectations (service standards) for how we are to serve our patients based on their needs and expectations. These service standards, along with supporting education, training and coaching/feedback will equip our employees to consistently deliver excellent service. Through this project, we recognize that we are not trying to change people (we are who we are), but we are trying to change the way we work in proving caring, more customer-directed service to our patients. It's about how this is perceived by, and what's important to, our patients during their experiences with our employees. Part of being a customer focused organization means not being satisfied with the status quo; so while the data shows we are good now, we want to become even better – consistently excellent. In addition, our physician customers also expect improved consistency of service delivery to their patients from the employees and volunteers who regularly interact with those patients and their family members.

The patients in focus for the first phase of the Service Excellence project will be the organization's key customers: invasive procedures outpatients, oncology outpatients, and diagnostic services outpatients. It is expected that service standards will be transferable to other outpatient and inpatient units after deployment is finished in the key customer areas.

Based on the priority indices and complaint data, four potential areas have been identified:

- Response to concerns and complaints
- Sensitivity to individual patient needs
- Keeping the patient and family informed
- Attitudes and behaviors of staff.

Other related processes such as the hiring, performance appraisal, and education & training are also being aligned with the service excellent project to ensure consistency of purpose. Finally, the team is also expected to be able to provide input into the implementation of RRMC's new electronic medical record (EMR) for functions such as the ability to capture unique patient needs or preferences, special patient or family information, patient information-related processes, and similar data.

Measures of success for the project will include patient satisfaction survey results from questions that reflect the key components of the service excellence project such as "Staff's sensitivity to your needs" and "Degree to which staff cared for you as a person." Additional measures of success are being evaluated by the team.

DREAM Step 1, Task 1: Determine limits of process to be developed

A common concern of all process, service, and product planners is scope drift and creep. Once a project has been chartered with a budget, resources, deliverables, and time schedule, any change in scope can be significant. Thus, it was important at the project start to clarify what part of the process is to be redesigned – where does the process start and where does it end. The DREAM process included a tool for defining these points, known as the Process Beginning/End table. (**Table 2**) The scope was set to focus on the experience that patients have from

the time they enter the department where they are to receive service, beginning with the first encounter between the patient and hospital staff. The process ends when the patient departs from the area. It was also noted that it might be possible that later in the QFD analysis of the service process from the customer's perspective, the process beginning and end points might need to be revised, should additional needs be exposed. This could, of course, require that the project scope be reviewed again by the leadership team.

Table 2. Process Beginning/End table

Begin	Process	End	Customers & Stakeholders	Special Rq'ments
Patient enters department reception area	Consistently make patients feel like individuals	Patient leaves depart-ment after service	Lab, Oncology, and Diagnostic Imaging patients Staff & their Leaders	HIPAA (patient confidentiality)

By spending time defining the boundaries (beginning and end) of the process from the customer's perspective, the team was able to agree that the greatest leverage for improving the patient's experience begins at the moment they arrive at the department and ends, not when the service is over, but when the leave the department. While we recognize that other opportunities exists to improve the patient experience well before they ever enter the hospital and days or weeks after their service, these were considered out of scope for the project team. This focus helped the team to stay on track and not drift into other areas.

DREAM Step 1, Task 2: Determine key customers and stakeholders

A hospital is a complex organization with many constituents who may have different and sometimes conflicting needs. In order for the team to focus its work, it is useful to identify who are the key stakeholders and customers of the process to be developed. Criteria were developed to determine what would make a customer or stakeholder key, such that satisfying their needs would lead to project success. The Customer Segments table **(Table 2)** was then used to identify the customers and stakeholders. In this excerpt from the completed table, we see that oncology, laboratory, and magnetic resonance imaging (MRI) patients are important to growth plans for RRMC, during both day and evening when different employee shifts are on duty. The service experience should be consistently excellent regardless of the time of day, day of week, etc. We also identified how we would capture the customer needs, such as using observation of body language as well as spoken comments.

Table 3. Customer Segments table

#	Criteria	Customer Segment	Who Benefits From	Cust/ Stake?	Key?	What	Where	When	Why	How
CS1	Revenue	Oncology Radiation	Patient			Emotional Comfort	DI	Day shift	BuildTrust	Verbal
CS2	ease of identification	MRI Outpatient	PCP	Stake		inform	Oncology	Evening shift	Consistency	body language
CS3	growth	Laboratory	Physician specialist	Stake		Individualized Care	Lab	Weekday	Preferred choice/Reputation	best practice

In completing the customer segments table, the team learned that each patient segment had a combination of both shared as well as unique needs. By discussing the "who, where, why, etc." for each patient segment, the team members were able to gain a much more valuable understanding of the specifics around each patient's experience.

DREAM Step 1, Task 3: Determine major steps for process (high level flow-chart)

Complex human processes involve many small steps. It is hard for any one team member to know them all, or even for the customer to articulate them all. In DREAM and QFD, it is helpful for the team to hypothesize the customer's process and then validate or revise it with the customer. By first creating a hypothesis, the team members can each contribute their knowledge of what might take place, thus improving team dynamics. Further, the effort demonstrates to the customer through this forethought that they are serious about satisfying the customer. The team first observed a few patients and from that developed several Customer Process models according to the different medical procedures. These models were then tested with additional patients, and used to capture customer voices. A portion of one MRI patient model is shown in **Figure 2.**
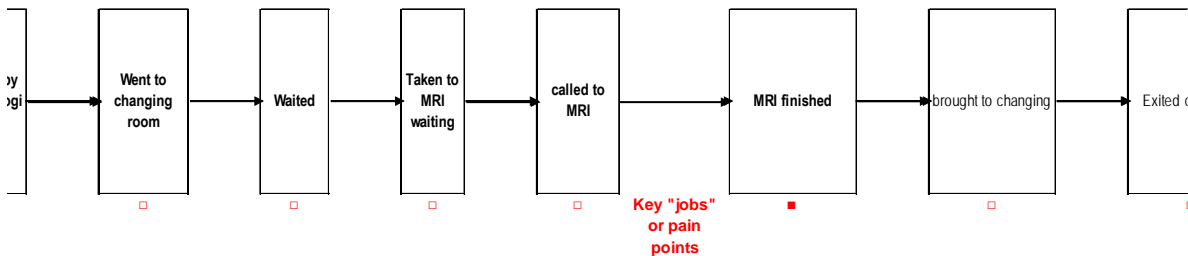

Figure 2. Customer Process model

By completing the Customer Process Models, the team learned that even for short procedures (those that are quick or involve a small number of process steps) there were multiple opportunities to standardize the staff interactions with patients. The team also began to understand the complexities of the patient flows in areas that the team was less familiar with.

DREAM Step 1, Task 4: Determine needs and requirements of customers

DREAM employs several techniques for capturing the voice of the customer, such as interviews, questionnaires, and focus groups. Since these survey instruments are typically scripted by the team, they tend to focus on things we know and want to validate and things we know we don't know and want to find out. One of the unique QFD tools is called *gemba* which is a Japanese term indicating the "crime scene" or the place where first hand evidence is gathered. In the quality movement, this usually refers to the plant floor where a problem has occurred and needs to be investigated by the experts. In new product, service, and process development, however, there is no plant floor or problem to investigate yet, so the *gemba* shifts to the customer's "plant" and his problems that need to be investigated. In the *gemba*, we can observe the customer *in situ* as they go about their life and work and we can identify issues through behavior and language that the customer themselves might not even be aware of or think to mention in an interview or focus group. Thus, *gemba* gives access to what we don't even know

we don't know. By adding *gemba* to the DREAM VOC acquisition tool set, we now have multiple avenues to capture customer "narratives," surveys and questionnaires, interviews, focus groups, and *gemba* visits.

Voice of Customer data was collected at each of the process steps with extra attention paid to key "jobs" or patient "pain points." **Table 4** shows some of the *gemba* lessons learned.

Table 4. Gemba Visit table

Project:	Service Excellence Dream Team					
Key Project Goal:	Individualized Patient care					
Key Customer Segment: Outpatient November 10, 2009						
GV	Customer	Contact info	Location	Date Duration	Gemba team	Lessons Learned
GV1	Diagnostic Imaging		DI Waiting Room	12:20 - 1:50pm	Jim Greenough	A lot of traffic and patient comes in flows. Staff, constructions, volunteers, engineering. Room one appears to be a pass through
GV2	Diagnostic Imaging		DI Waiting Room	12:20 - 1:50pm	Jim Greenough	Patient came out of waiting room. Key in purse sticking out. Pt brought back 15 minutes later with key around wrist.
GV3	Diagnostic Imaging		DI Waiting Room	12:20 - 1:50pm	Jim Greenough	One patient came out with nothing except key.
GV4	Diagnostic Imaging		DI Waiting Room	12:20 - 1:50pm	Jim Greenough	Took staff about one minute to give instructions and within one to two minutes came back to get them for test.

By conducting the *gemba* visits, the inconsistencies of the various activities became obvious to the team members. This led them to understand that there was no well-defined process in place. These inconsistencies were not being identified by the patients because each of them was only focused on their individual experience. But this understanding was crucial to the team's goal of providing consistently excellent service across multiple units and shifts.

Since patients are almost always interested in helping providers help them, it is common to receive suggestions on how we could improve our services. Depending on the business, customer suggestions can often get technical, typically referencing existing solutions, but also pointing to new functions and features the customers believe would benefit them. QFD teams frequently report that when customers suggest adding features to a product, they are usually out-of-date, and in some cases misleading; and fulfilling the requirement can still lead to dissatisfaction. This suggests that customers can believe a feature will benefit them, even if it won't. One of the skills required to do QFD well is to translate the "voice" of the customer (narratives) into true customer needs, independent of the product features. These narratives address many customer issues, including needs, requirements, improvement suggestions, complaints, etc. Then, later in the realization and operationalization phases of QFD, we can better define and design those features based on emerging technology. In modern QFD, the Customer Voice table is used to translate customer narratives into customer needs. **(Table 5.)**

Using the customer voice table allowed the team to differentiate between patient-mentioned solutions and true patient needs – the benefit the patient imagined the requested solution would deliver. By understanding the true needs, the team could later identify other possibly better solutions that would meet this broader patient need. Further, the team was better able to put

themselves into the patient's shoes rather than the position of a healthcare worker making assumptions about what patients need.

Table 5. Customer Voice table

narrative or observation (from CRM, interviews, questionnaires, focus groups, gemba)	customer "job" or task	product/service/ process attributes	customer need
Before tech administered bone density test I HAD to look at pictures of her dog. VERY inappropriate.	Having exam	No personal pictures	Need to have time valued; Need personal attention; need professionalism, Need focus to be on me, Need to reduce anxiety
Groggy after MRI - No time to 'wake up' - ushered right out. Offer headphones w/music or news.	Having exam; MRI finished - changing	Headphone w/music or news	Need time to be fully alert; need technologist to be sympathetic to condition; Need alternative calming during procedure, Need to not be rushed, Need to be treated as individual, Need distraction, Need staff to be sensitive to individuals

Once the customer needs are identified, the next step is to determine which need to address first. It is not uncommon that the time, budget, or staff assigned to a project will change (usually reduced) during the course of a project. Thus, the most important customer needs should be addressed first. Prioritizing customer needs was not sufficiently defined in the DREAM process and so QFD was used to perform this. Prioritization in multi-criteria decision making was advanced by the research of Dr. Thomas Saaty in the 1970s at the U.S. Department of Defense and later at the Wharton School of Business at the University of Pennsylvania. Saaty found that decision makers facing a multitude of elements in a complex situation innately organized them into group sharing common properties, and then organized those groups into higher level groups, and so on until a top element or goal was identified. This is called a hierarchy and when making informed judgments to estimate importance, preference, or likelihood, both tangible and intangible factors must be included and measured. Modern QFD, uses Saaty's Analytic Hierarchy Process (AHP)[5] technique to prioritize.

Correctly applied, AHP must be done by the data "owners" i.e. those with the most knowledge. For customer needs, this would be the customer. Further, AHP is applied to a hierarchy of data, and the Affinity diagram[6] has been found a useful way for customers to build the hierarchy. The Affinity diagram is similar to the output of the KJ™ Method developed by Dr. Jiro Kawakita[7], a Japanese cultural anthropologist who developed several data grouping techniques for his research. The affinity diagram is not shown here.

We had reservations about how to teach the affinity diagram method to people that may never have done it before. However, in all four focus groups, we were easily able to teach the participants the technique and get them to create their affinity diagrams quickly and effectively. In some cases, the headings that the patients developed had a different meaning than we initially thought. For example, when patients expressed a need for "professionalism," our initial thought was of clinical competence. Through the focus groups we were able to realize that what they really meant was more about how staff treated them as a person (e.g. bedside manner) than the effectiveness of the clinical care that they received.

The Hierarchy diagram[8] is built from the Affinity diagram in order to set up the AHP for prioritization. It serves as a quality assurance technique for AHP accuracy by correcting problems in the Affinity diagram. One problem occurs when hierarchical levels are improperly aligned. In a fruit example, customers could easily express a preference for an apple or an orange, but

would find it difficult to choose between an apple or a piece of fruit, since an apple is a kind of fruit. This violation of the hierarchical levels affects accuracy of the prioritization. The hierarchy is also a good way to find missing, unspoken customer needs. For example, if we know that the category of fruit contains the elements of apple and orange, we can look to see if there are missing elements in the category such as pears, bananas, etc. **Figure 3** shows an excerpt from the study. The team's experience was that even though the words in the header statements might be a little different from focus group to focus group, the needs were similar. No new needs were identified in the focus groups, which helped validate the thoroughness of the earlier work done by the team.
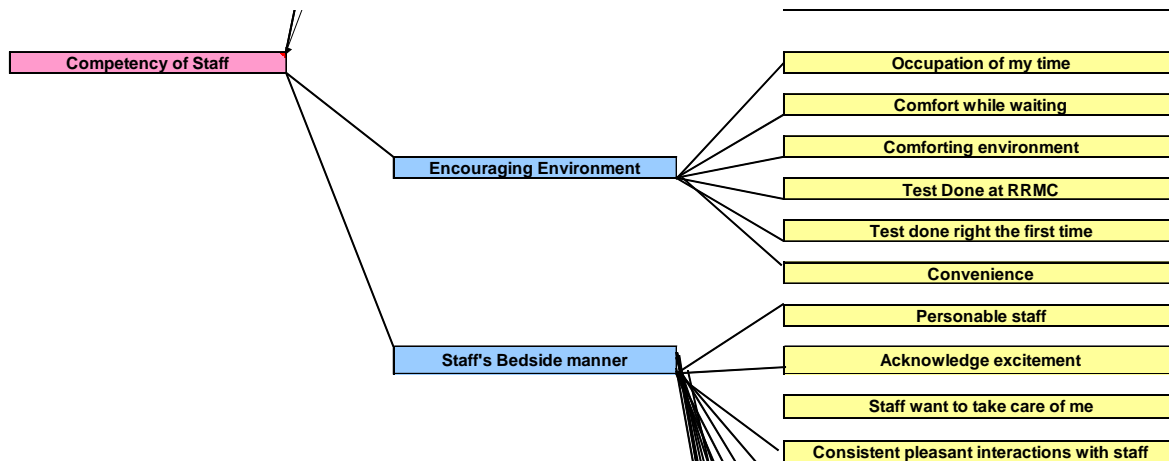

Figure 3. Hierarchy diagram

Once the hierarchy is in place, AHP provides an accurate and efficient methodology to find the relative importance of each of the needs in the hierarchy. The word "relative" is the key point of distinction. The importance percentages delivered by the AHP methodology are mathematically sound. The percentages can be added, subtracted, multiplied or divided with accuracy. If Need A is 20% of the goal, and Need B is 10% of the goal, we can say with great confidence that Need A is twice as important as Need B. This precision allows focus on the most important needs of the customer. The precision in the ratio scale that AHP delivers is preferred over ordinal scales produced by traditional QFD. Before AHP, QFD used ordinal rating methodologies that ask the user to rate needs on a scale of 1-5 or 1-10. This methodology is easy for the user to understand, but it does not require the user to make any tradeoffs. In other words, the user can rate all of the needs with the same level of importance. For example, each need can be rated a 4. The result is that the overall importance ratings for the needs end up with a few needs at the top, a few needs at the bottom, and most of the needs bunched in the middle. Traditional QFD then tried to average the needs yielding values like 4.2 or 4.3. These averages are not mathematically sound either because we cannot calculate an average or mean with ordinal scale numbers. So, while you can make some inferences about the top needs, we are unable to specify the amount of importance the customer places on the attribute or the amount of importance difference between the attributes.

Another reason that the ratings are bunched in the middle is because survey participants will suffer from survey fatigue from trying to accurately gauge the amount of importance for each need in a large list. AHP solves the survey fatigue problem by only asking participants to com-

pare the importance of two needs at a time. These comparisons are called judgments. A judgment of only two items is much easier for participants to complete than comparing a list of 20 items. Pairwise comparisons generate more information and so improve judgment consistency when attributes may be close in value[9] which is one reason why optometrists use this approach when prescribing corrective lenses. Plus, when the items are arranged in a hierarchy, we can start at the most general level, and only pursue with the participants, those branches that have high importance. An excerpt from the AHP is shown in **Table 6.**

Table 6. Customer Needs AHP

Tertiary CNs	Occupation of my time	Comfort while waiting	Comforting environment	Test Done at RRMC	Test done right the first time	normalized columns					sum	row avg
Occupation of my time	1	3	1/4	3	3	0.167	0.305	0.135	0.200	0.265	1.072	**0.214**
Comfort while waiting	1/3	1	1/5	3	2	0.056	0.102	0.108	0.200	0.176	0.642	**0.128**
Comforting environment	4	5	1	5	5	0.667	0.508	0.541	0.333	0.441	2.490	**0.498**
Test Done at RRMC	1/3	1/3	1/5	1	1/3	0.056	0.034	0.108	0.067	0.029	0.294	**0.059**
Test done right the first time	1/3	1/2	1/5	3	1	0.056	0.051	0.108	0.200	0.088	0.503	**0.101**
	6.000	9.833	1.850	15.000	11.333	1.000	1.000	1.000	1.000	1.000	5.000	1.000
										Inconsistency Ratio		**0.08**

With AHP, every participant can have an equal vote because the geometric mean of the participant responses allows for accurate averaging. As typical with focus groups, some participants were more verbal than others and the tool helped compensate for this disparity. This also put many of the participants at ease because they did not have to reach an overall consensus on each need and significantly sped up the process.

DREAM Step 1, Task 5: Determine process outputs (products, services)

The next step is to define what the new product or process should do, but not necessarily how it will do it (this comes in DREAM Steps 2 and 3). This aligns neatly with another modern QFD tool, the Maximum Value table (MVT). This tool helps define for the key customer needs only, what product or process attributes (characteristics, capabilities, key quality characteristics) a solution must address. The MVT diagrams the effect-to-cause relationships between the customer need and what the team must consider in order to realize a solution. **Table 7** shows what one of the key customer needs should address.

Table 7. Maximum Value table

		D.R.E.A.M Step 1 Maximum Value table												D.R.E.A.M Step 2	
customer				process/product/service outputs										feasibility check	
segment	"jobs" or tasks	narratives	needs	characteristics & capabilities	key quality characteristics	Solution Specifications (potential ideas)			KEY PROJECT TASKS	process begin/end	resources (start)	resources (ongoing)			
						functions (product)	activity (service)	information (software)							
Oncology Outpatient Key Customer	Interactions with staff	Breast cancer to call next day and results never called. I had to call my doctor nine days later. Way too much waiting and worrying.	staff to do what they say	Staff familiarity with protocols and procedures in their area

Authority to communicate

Messaging communication protocol

Staff accountability for commitments they give to patient | Accurate, current, complete, consistent

consistent, confidential

consistent, complete accountability, timely, on-time | ensure accurate, current, complete, and consistent protocols are in place | ensure training component for familiarity | readable, up-to-date, accessible

limitations of an individual's authority over each situation | what to include in communication to patient

general recommendations to dep't on what to communicate to patient

Problem solving process for failed commitments | at greeting thru at discharge | current staff (no new staff needed)

to get up and running, we need best practice training materials

trainers

champions

training conference rooms | software? | HIS |

Through the MVT, the team was able to connect the patient's verbatim narrative and the associated needs (from the customer voice table) at all times during later process steps. This helped prevent the team from forgetting or drifting from what the patients actually said. By staying focused on the patients' verbatims, the team was able to more effectively identify potential solutions to meet the patients' needs. Through the use of the MVT, the team was also able to identify the key project tasks that may not have been obvious initially but were identified as necessary to continue to make progress towards implementing solutions.

Next steps: Integrating QFD output into the New Kano Model

Based on the work done through the maximum value table, the team was able to identify the solutions (service standards) that best addressed high priority patient needs. These service standards included elements of patient greeting, hospital staff introduction, promoting (talking up) the next department, response to patient concerns & complaints, explanations of tests, treatments and next steps after discharge, etc. These service standards were then used to develop a Kano survey to understand which of these features were expected, desired, or would excite the patients. The results suggested that the majority of the service standards were exciting. This was somewhat surprising to the team as most thought these service standards would be either

Figure 4. Blitz QFD® and New Kano Model integration

expected or desired. By implementing these service standards we believe we will be able to have a positive impact on future patient satisfaction. **Figure 4** shows how the two methods can be properly integrated to test the degree of satisfaction with proposed features.
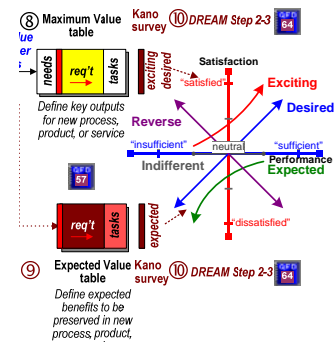
Conclusion

Through the use of the DREAM and QFD methods, RRMC has gained a much greater and clearer understanding of the service experience needs of our patient customers than we ever have been able to in the past. The experiences and the lessons learned from this project will also be shared to the benefit of future RRMC projects. The steering committee members, project leaders, and core team members continue to be excited about the opportunities that the project offers to finally make measurable and lasting gains in our patient satisfaction levels. The additional effort and time required to apply the methodologies to this project are sure to pay off handsomely as the project progresses and the team prepares for implementation. As with any organization's customers, ours deserve our very best efforts and our use of DREAM/QFD have provided us with a high degree of confidence that we have listened to and incorporated the voice of our organization's customers into what will be a consistently excellent patient service experience. Further use of and experience with the DREAM and QFD methods will help RRMC be even more customer-focused with our products, services & processes and better able to continue on our 'journey to excellence' to become the best community hospital and health system in New England.

―――― **About the Authors** ――――

Darren M. Childs began work at Rutland Regional Medical Center (RRMC) in 1994. During this time, he has held a variety of positions with increasing responsibility; he is currently the Vice President of Quality Improvement and a member of the senior leadership team at RRMC. In this role, he is responsible for the organization's Performance Improvement System and Quality Regulatory Readiness programs among others. His background includes a Bachelor's Degree from Castleton State College in Castleton, Vermont and a Master's Degree in Administration from Saint Michael's College in Colchester, Vermont. Darren has been previously certified as a Quality Manager from the American Society for Quality (ASQ), is a Lean Six Sigma Greenbelt, and a certified QFD Green Belt®.

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Notes

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