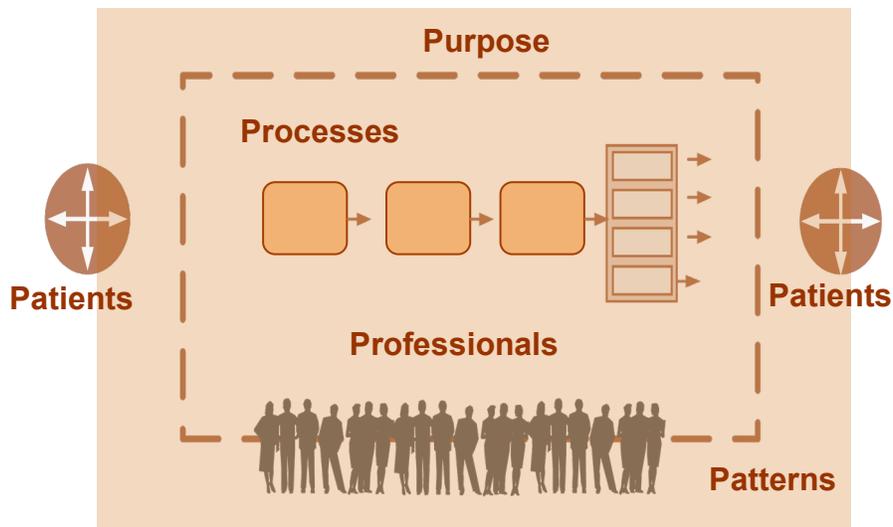


# Microsystems At A Glance

A Quick-Look Guide  
Developed *by* Microsystem Members  
*for* Microsystem Members



[clinicalmicrosystem.org](http://clinicalmicrosystem.org)

"Microsystems at a Glance" was developed with colleagues from Lucile Packard Children's Hospital at Stanford University Medical Center in Palo Alto, California in an effort to provide the "big picture" and an overview of microsystem development to new members beginning the developmental journey.

The original document has been circulated in the USA and the world to those who are using the microsystem development curriculum, processes, and tools to support their journey to become a high performing microsystem. Feedback and revisions have been incorporated as the booklet has traveled. This booklet is a revised and updated version that offers an overview and quick summary of the various methods, tools and processes to provide a "big picture" and road map of the improvement journey.

The website, [www.clinicalmicrosystem.org](http://www.clinicalmicrosystem.org) provides the foundation to the "Microsystems at a Glance" including an electronic version to download and print. You will find additional materials and resources to complement this booklet, including videos, worksheets, publications, stories, contacts, and the electronic version.

Special acknowledgement to Coua Early, for the original design and formatting and her continued commitment to sharing the applied research findings with other microsystems around the world.

As always, we look forward to your stories and feedback about this resource.

Marjorie M. Godfrey, PhD, MS, BSN, FAAN, Editor  
Founding Executive Director  
Institute for Excellence in Health and Social Systems (IEHSS)  
Research Professor, Department of Nursing  
College of Health and Human Services  
University of New Hampshire  
Durham, New Hampshire

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## Introduction and Welcome

The aim of “Microsystems at a Glance” is to introduce and attract new colleagues to the developmental journey to become a high performing microsystem based on the Robert Wood Johnson research. “Microsystems at a Glance” can help activate microsystem transformation by providing an overview and quick introduction to the body of knowledge, various tools, and processes to make it easier to begin improving care in the workplace and “activate the front-line team”. Through activation of the front-line team, members can “provide exceptional care AND continuously improve your care delivery system” while realizing the sense of “ownership” of the microsystem. (Lipmanowicz)

It is with great enthusiasm that we welcome you to the microsystem journey. Your input and participation in the process of making good things happen in your practice are invaluable. We all know that quick fixes don’t tend to last. Through microsystem development and learning about the scientific approach to change, the “fix,” when it happens, tends to “stick” long term. We want to work smarter, not harder. To make this happen, we need to apply methods and tools of the microsystem approach to quality improvement in health care including enhancing team communication, relationships and dynamics.

We can all think of things we do every day that seem like they could be done more efficiently. We create “work arounds.” By looking at how we do things, and always keeping focus on our goal of exceptional, safe patient care, we can find ways to work more effectively and efficiently. In the pages ahead you will get a brief outline of the methods and tools used to create positive change in your microsystem.

Visit [www.clinicalmicrosystem.org](http://www.clinicalmicrosystem.org) to find additional materials and resources. We have created Electronic Quality Improvement Modules that are short videos with attached worksheets to help you determine the pace of improvement that works for you and your team. Contact us at [iehss.admin@unh.edu](mailto:iehss.admin@unh.edu).

## Quality is Personal

One of the best ways to apply the methods and tools that we learn in microsystem development is to **practice on a personal project**. Attempting to “improve” something in our lives on a personal level allows us to practice the tools and therefore gain a better personal understanding. **Several individual “quality is personal” examples follow:**

*“I used “quality is personal” to improve my email “habits”. I used the tools to look at how I could better stay ahead of my emails and be organized. I tracked data, keeping a log for 3 weeks of my inbox at home and at work. Then I looked at possible solutions and asked other people how they managed their email. Finally, I came up with a plan to improve my email and implemented it. I then tracked data for several days to see if my steps to improvement were working. The changes I made became habit and I was able to improve my emailing habits. The same is true with everything we do personally and at work. If we track the data, see trends, search how others do the work and then brainstorm to improve a process, we can make positive things happen. Remember if you can’t measure something, you really can’t improve it. We **can** improve our quality. Using the quality improvement methods and tools on a personal quest will help improve our confidence with the methods and tools for other areas of life, like work.”*

(Roberts Harry V, Sergesketter, Bernard F, *Quality is Personal*, The Free Press, NY, NY, 1993.)

"The more I do improvement the more I realize that this is the essence of much of what we try to do."

(Kerrigan, C. (2010) Walk the Talk. In PB Batalden (ed.), *Lessons Learned in Changing Healthcare... and How We Learned from Them* (p. 13-23). Toronto, Canada: Longwoods Publishing.)

### **Effective Meeting Skills**

For meetings to be productive, following a standard format that includes the Seven Step meeting process: ground rules of working together, meeting roles, and a timed agenda prepared in advance of the meeting to ensure time is spent more efficiently and everyone who attends has a similar expectation of the meeting. Meeting roles should be rotated amongst the team to provide an experience of each of the roles and to practice working together differently.

#### **Meeting Ground Rules Example**

1. Be present and ready to begin on time (Arrive early to start on time).
2. No side conversations.
3. Cut off lengthy discussions and assign offline actions as necessary.
4. Assign a leader, facilitator, recorder, and timekeeper at the beginning of each meeting.
5. Have and follow an agenda - add times for each agenda item.
6. If you oppose, you must propose.
7. Assign action items only to people present at the meeting.
8. Choose action item due dates with 80% confidence.
9. Strive for 100% on time but provide advance warning if an action item will not be completed on time.
10. Use process check, *"Is this what we want to be discussing right now: Should the subject be taken offline from here?"*
11. If things get heated, focus on the situation or issue, not the person.
12. Respect for each other no matter how contentious the topic.
13. Agree to the mental model of being "unconditionally constructive" while we are working together.

## **Meeting Roles**

- **Leader of the meeting:** Prepares agenda, moves agenda, elicits participation
- **Recorder:** Visual record for the group, next action list
- **Timekeeper:** Verbally announces amount of time remaining and when time is up
- **Facilitator:** Helps to manage group process, balances participation, keeps group focused on objectives
- **Participant:** Follows the ground rules, keeps an open mind to new ideas, arrives early to start on time

## **Timed Agenda**

The agenda is an important part of your productive meeting and will help set the agenda for the next meeting through action planning. By setting the agenda, participants can prepare for the work that is expected to be accomplished during the meeting. Specific tasks are listed, and responsible persons noted. This way there is no question who to follow up with for action items. With the agenda, the first part of the meeting is to assign the roles listed for meetings. This helps you to stay on task before you get started. If a topic arises during the meeting that is not on the agenda, the agenda can be re-evaluated by the group or the topic can be added to a “parking lot” list for future agendas.

Jobs or participation are never assigned to absent team members because it doesn't allow for discussion or true ownership of the task. If someone is unable to attend meetings, but is willing to take on a task, that should be announced to the team only if a firm commitment is made by the absent team member. Finally, every meeting should be evaluated for its effectiveness. This should happen in the last few minutes of the meeting. Team members who score the meeting process and participation should be prepared to express why they scored the meeting in the way they did. Using a scale of 0-10 with 10 being the best meeting ever and describing what went well and what could be improved helps develop open communication amongst the team and to also provide feedback on your meeting process.

(Scholtes Peter R, Joiner Brian L, Streibel Barabara J. *The TEAM Handbook*, 3<sup>rd</sup> Edition, Oriel Incorporated, Madison, WI, 2003)

## **Microsystem Improvement Process (MIP) Spiral**

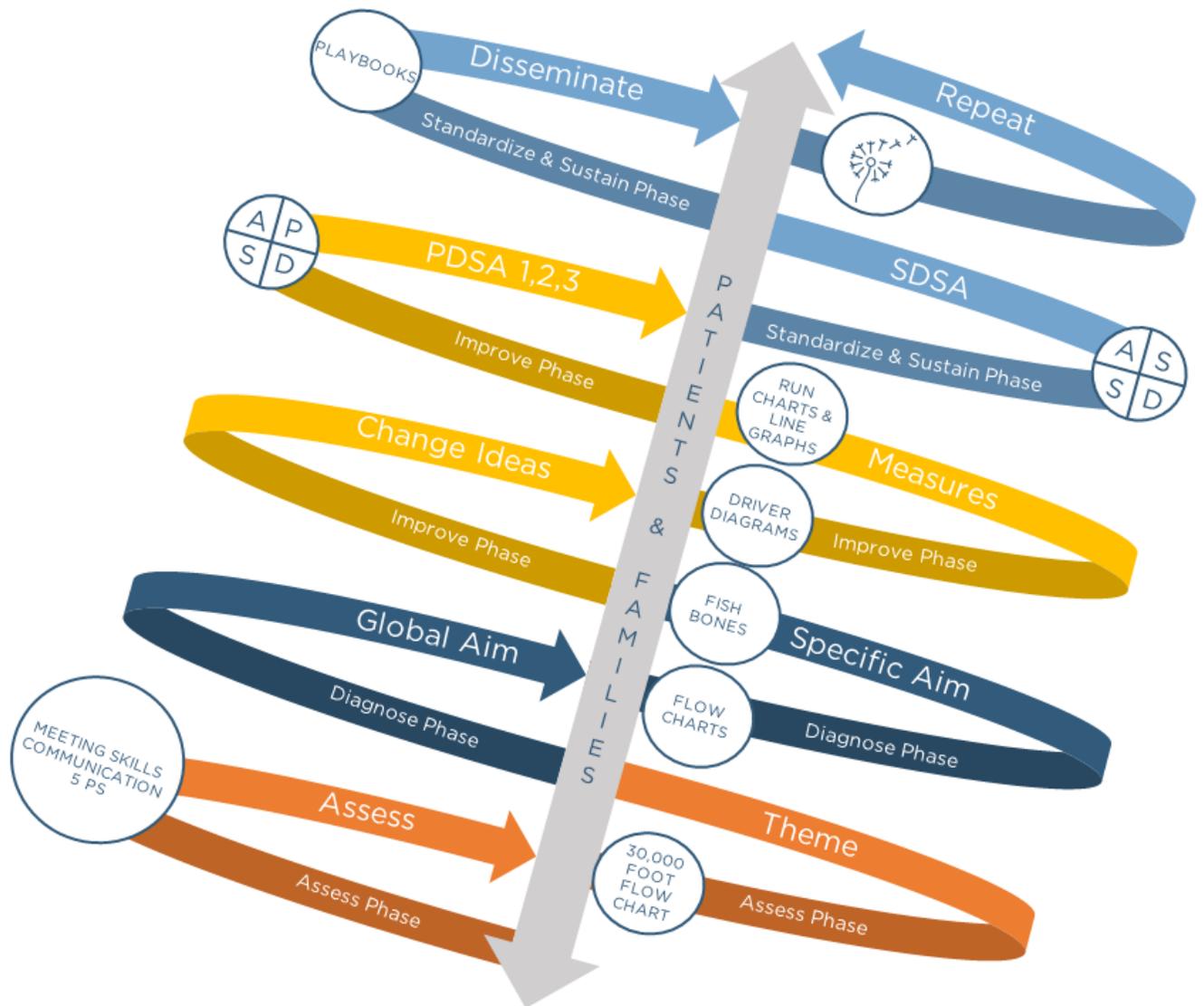
The Microsystem Improvement Process Spiral depicts the model of the organized and disciplined steps of any quality improvement initiative you decide to take on. Prior to the updated MIP Spiral (2020), the Dartmouth Microsystem Improvement Curriculum (DMIC) and “ramp” provided a helpful framework for improvement (Quality by Design, 2009, Part 2).

Before beginning any improvement, the following phases (designated in specific ribbon colors) should be reviewed to take action; The **ASSESS phase** includes review of performance data, the 5Ps and other databases specific to the microsystem. Using the data, a theme and a 30,000-foot flowchart of the overall process are included. The **DIAGNOSE phase** includes a global aim, flowchart of the global aim, specific aim(s), and a fishbone. The **IMPROVE phase** includes change ideas based on benchmarking, review of the literature and evidence-based practice with brainstorming and multi-voting, driver diagrams, PDSA cycles with measures. The **STANDARDIZE, SUSTAIN AND DISSEMINATE phase** includes specific actions

such as playbooks, dashboards, attention to the changing context to sustain improvement to then move to the next improvement focus. Progressing from assessment through each phase to Disseminate improvements and start again helps to take a scientific and systematic approach toward quality improvement goals.

Of special note about the spiral is the arrow in the center which emphasizes patients and families provide the “spine” for guiding, informing and coproducing care. Patients and families should be engaged as equal partners in quality improvement.

### Microsystem Improvement Process Spiral



## ASSESS: Assessment

In the assessment phase of the MIP, with your multidisciplinary team you will review the strengths of your unit/microsystem and identify what the improvement opportunities are. Between organizational/professional data bases and “sampling” data using the core and supporting processes assessment worksheet in the microsystem workbook, staff are asked to vote on microsystem processes that worked well and processes that were “broken” (5P assessment - Core and Supporting Processes Assessment Tool). This is part of the initial assessment of your microsystem. In this phase of the MIP, we are “diagnosing” our microsystem challenges and opportunities to create a “plan of care” that will provide good outcomes for our patients and our staff.

(Godfrey MM, Nelson EC, Batalden PB, “*Assessing, Diagnosing and Treating*” Workbooks, [www.clinicalmicrosystem.org](http://www.clinicalmicrosystem.org), click “**Knowledge Center**” and then “**Workbooks**”)

## ASSESS: The 5Ps Framework

The 5Ps can be viewed as a systematic, structured and organized process to learn about and assess the anatomy of a clinical microsystem to understand current state and processes from a system perspective.

### ***What is the benefit of the 5Ps framework?***

It is a useful tool to assist staff to visually review, assess and understand their own microsystem in a new way—a system way and not just see “assignments, shifts or sessions” of care.

### **What are the 5Ps?**

The 5Ps are the structure, process and outcomes that give life to a clinical microsystem.

**Purpose:** “Why does this microsystem exist?” An example: To achieve the best possible outcomes for patients using evidence based practice, ideal processes and creating a great workplace.

### **Patients/Population**

Subgroup of patients such as post-partum patients, newborns, and antepartum patients—ages, top diagnoses, type of insurances, ages, patient experiences. Patients partner with the improvement team through engaging in conversations about how to engage, when and how and setting expectations (See checklist).

**Professionals:** Nurses, Nursing Assistants, Secretaries, Respiratory or Physical Therapists, Physicians, Social Workers, Translators, Lab Technicians, etc. What are their FTEs, what is their resilience and wellbeing? Do professionals work together to meet patients’ needs by engaging in direct patient care processes?

**Processes:** Identification of Core and Supporting processes of care and services in the microsystem help develop a common understanding and focus for improvement, such as accessing

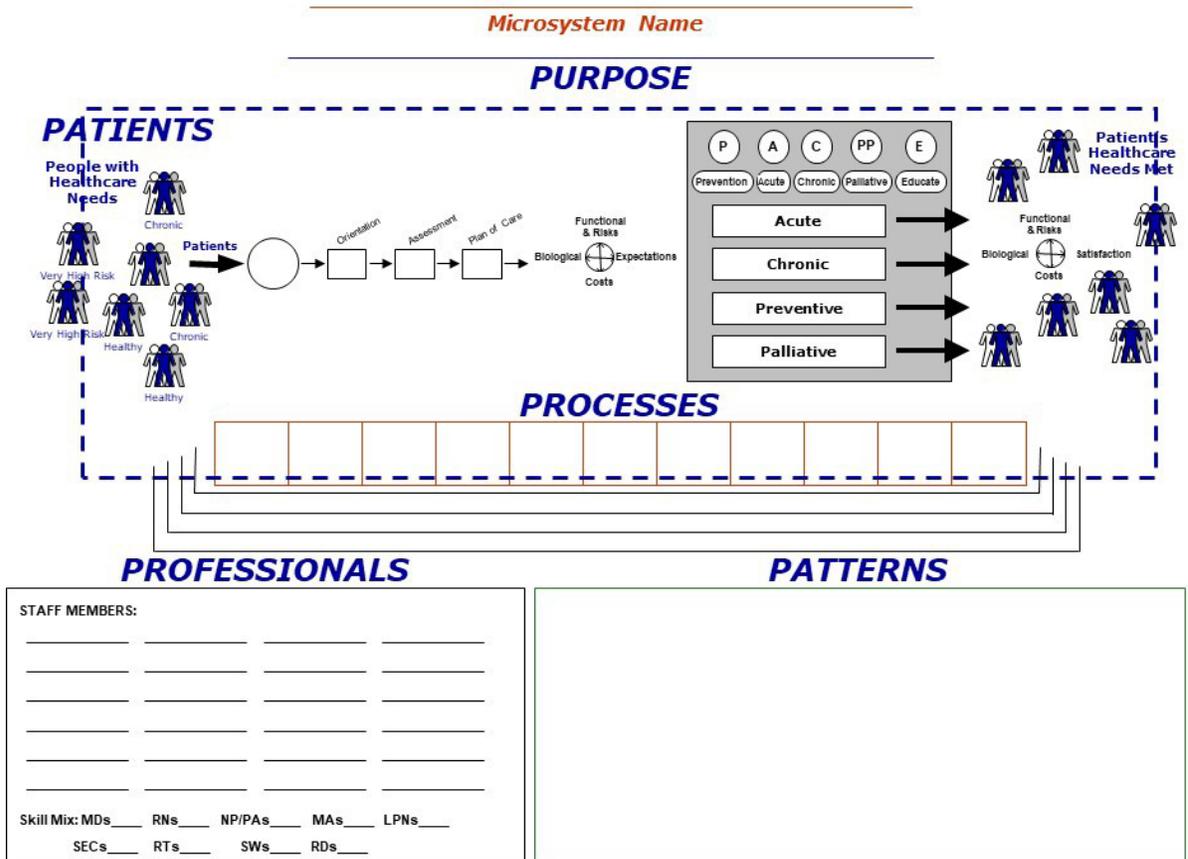
systems and needs, diagnosing problems, creating treatment plans, and following up.

**Patterns:** Patterns identify safety, functional status, risk, patient satisfaction, and balanced outcomes including financial performance. Patterns of leadership, meetings to discuss care delivery, cultural and traditional patterns and symbols, values of the microsystem, communications, and relationships (relational coordination).

The Assess, Diagnose and Treat Workbooks can be found at [www.clinicalmicrosystem.org](http://www.clinicalmicrosystem.org) "Knowledge Center" click "Workbooks" to gain guidance to the 5P assessment.

(Batalden P., Nelson E., Godfrey, M. Chapter 6 Planning Patient-Centered Services. *Quality by Design: A Clinical Microsystems Approach*, San Francisco, CA: Jossey-Bass, 2007.

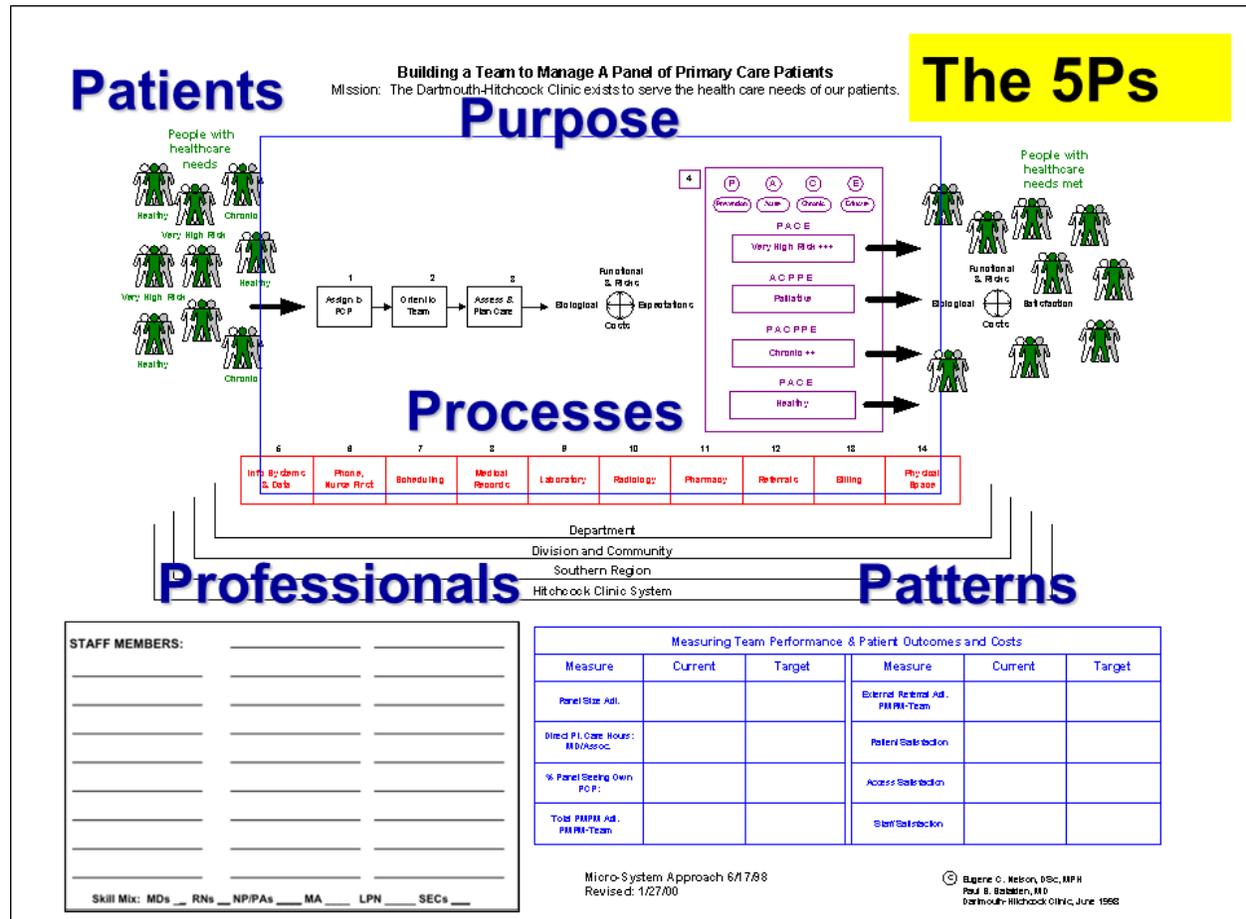
Nelson, E., Batalden, P., Godfrey, M., Lazar, J. *Value by Design: Developing Clinical Microsystems to Achieve Organizational Excellence*, San Francisco, CA: Jossey-Bass, 2011.)



Microsystem Approach 6/17/98; Revised 03/04

© Eugene Nelson, DSc, MPH, Paul B. Batalden, MD, Dartmouth-Hitchcock Clinic, June 1998

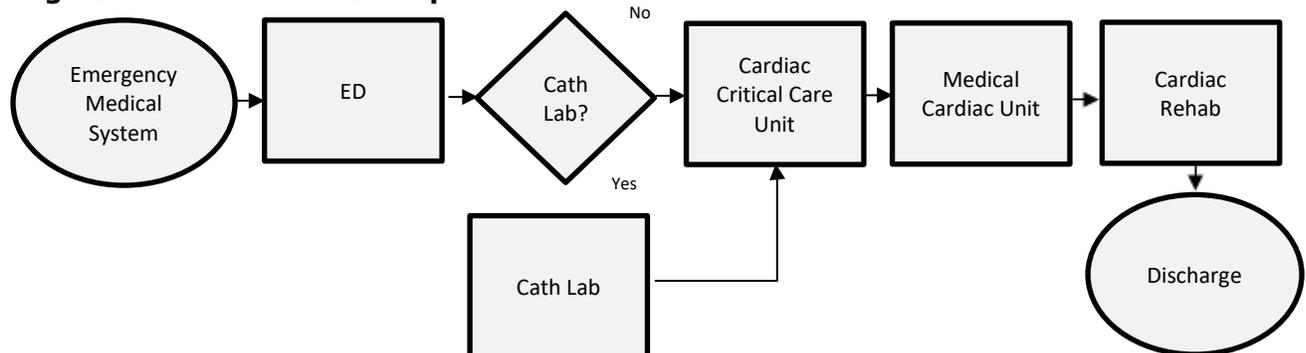
## Background – An Example of a Simple 5Ps



### ASSESS: 30,000 Foot View

Create a high-level flow chart of your microsystem with your interprofessional team. Start with creating just one 30,000 foot view flowchart. In future you can dive deeper into each step and create additional flowcharts. Review the flowchart to identify rework, delays, items that need clarification and opportunities to improve. Read further in this document to learn more about creating a flowchart.

### High Level Flow Chart Example



### ASSESS: Theme

When choosing a theme, review what you learned during the assessment phase. From the data and information, you want to build on what makes patients and staff identify as strengths and look at what patients and staff find impossible to live with. By looking at these items, you should be able to identify a theme to focus improvement based on data, information and patient/staff experience. You will usually find many themes to improve but pick one theme that will make the biggest difference in the shortest amount of time at the lowest cost to begin with. The improvement journey is continuous - there will be future time for all the themes!

### **DIAGNOSE: Global Aim**

The global aim is based on the selected theme for Microsystem improvements. The global aim is the big picture of where you want to go. You may find after working with a global aim a complete change of direction may be necessary. Use the Global Aim Template, to formulate your global aim.

*We aim to (insert the name of the process) in (insert the clinical location in which the process is embedded). The process begins with (give a starting point) and ends with (give an ending point). By working on this process, we expect to (list expected benefits). It is important to work on this now because (list the imperatives).*

An example of a global aim is below:

#### **Global Aim Statement**

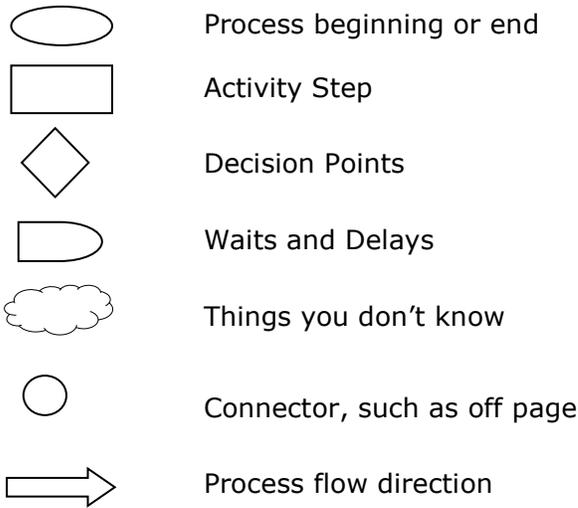
We aim to improve the communication process in maternity. The process begins with specific patient care needs and those who provide services. The process ends when the patient needs are met. By working on the process, we expect to see our patients' and staff satisfaction scores increase, interdepartmental relationships improve and an efficient use of time. It is important to work on this now because we are tired of being broken.

### **DIAGNOSE: Process Mapping**

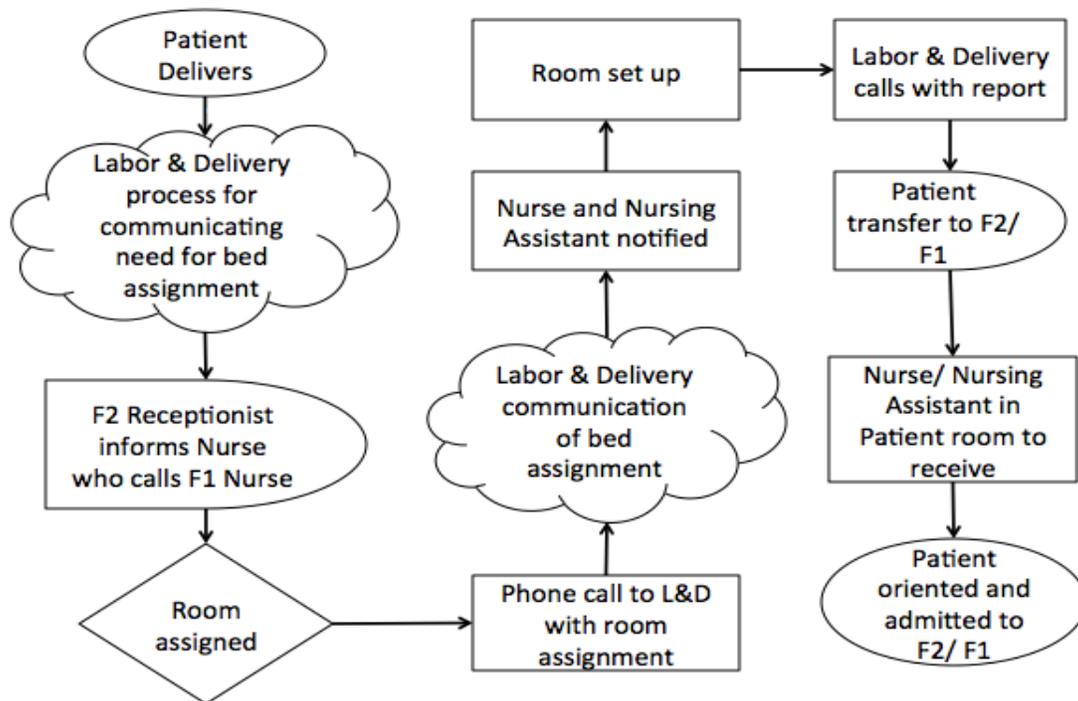
With the global aim now written, mapping the process is the next step. Process mapping, simply stated, is a diagram of the current process you wish to improve. Gathering the information to create the process map will give your improvement a better chance to succeed.

In coming up with a global aim and process mapping, it is often helpful to use one of the improvement tools called a flowchart. A flowchart is basically a picture of the steps in a process in the order they occur. Using different symbols, a visual diagram of the process can be created. These same diagrams can be used to plan a project, describe a process, or document a standardized way of doing things. The flowchart is meant to show the process as it *CURRENTLY* exists. When the process improvement is completed, the flowchart may be used in the playbook to show the process. See the symbol key to identify the meaning of each symbol in the chart.

### Flow Chart Key



### Flow Chart Example



### DIAGNOSE: Specific Aim

The specific aim statement is essentially the meat and potatoes of where you want to go with your improvement and includes specific numeric goals after you create the process map. The specific aim is focused and to the point. It is where you want to get with your improvement, the finish line so to speak. It includes measurable outcomes that are clear. These outcomes *help* maintain the intention and focus. Also included in a specific aim is the target date for completion.

We will (improve/increase/decrease) the (quality/number/amount/percentage/other) (by/from percentage/baseline state amount) to (change in quality or number/amount percentage) by (date).

An example of a specific aim:

**Specific Aim Statement**

We will increase the number of daily huddles at the beginning of shift from zero to 15 per week by November 1, 2021.

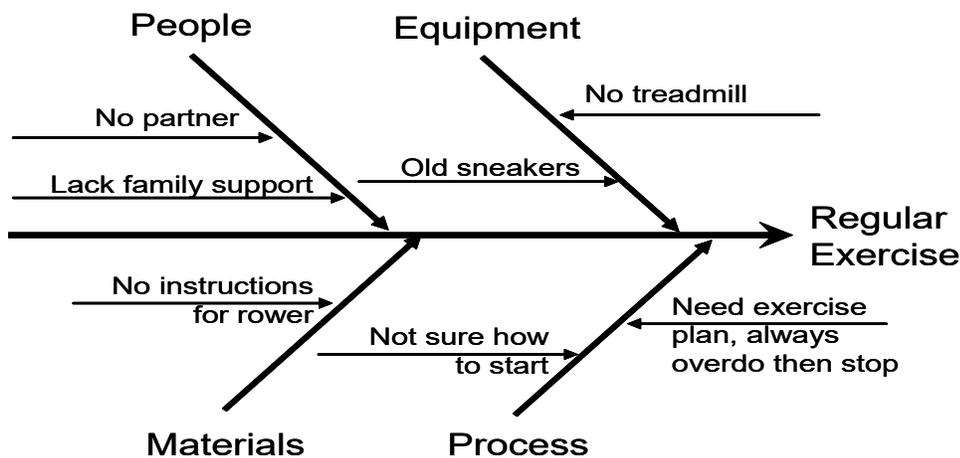
**DIAGNOSE: Cause and Effect – Fishbone Diagrams**

In moving through the Microsystem Improvement Process Spiral, you want to next look at cause and effect. This cause and effect are part of the science of making a change. You want to see if you can influence the cause and effect relationship(s). We realize not one thing can “cause” something to happen, there may be multiple things that “cause” an effect which is why the fishbone helps to identify all the causes.

The fishbone is a way of diagramming the cause and effect relationship(s). The fishbone can stimulate the formation of impressions that would be worth doing a PDSA cycle on (PDSA - **P**lan, **D**o, **S**tudy, and **A**ct). The fishbone, by its design, encourages looking at problems on a deeper multi-causal level. By narrowing things down and looking deeper, more potential solutions may become apparent. From the main bones of the fish, you look at categories of causes, for example, equipment, people, materials, and process. From the smaller bones of the fish, you gather the contributing factors.

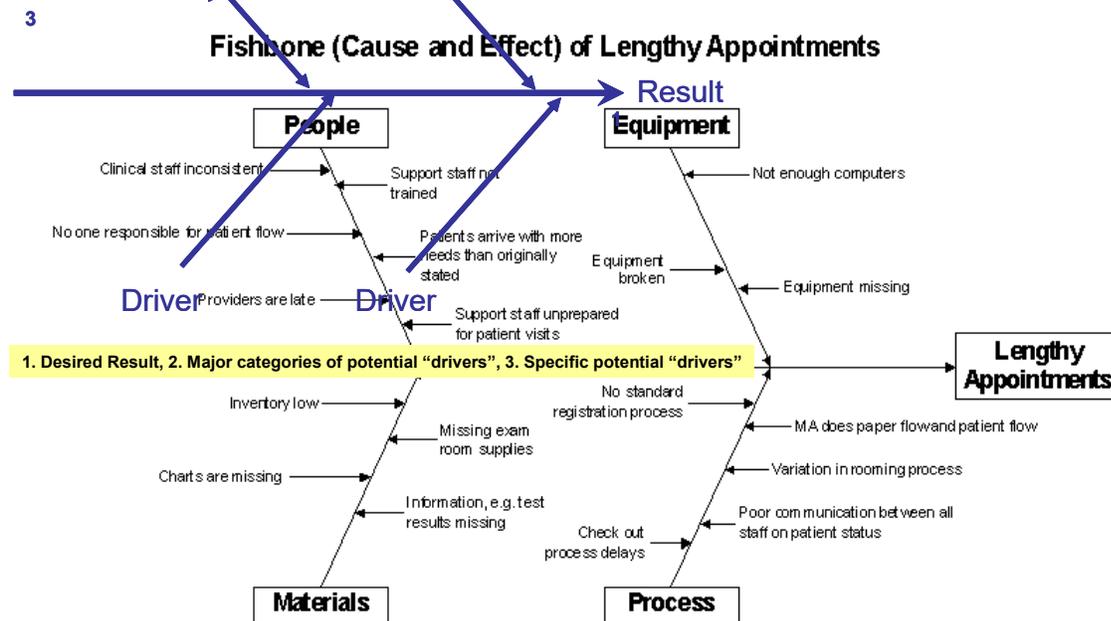
So, for example, let’s say you are looking at the process of exercising. The things that might prevent you from exercising could be lack of equipment, no partner to exercise with, or you may not have proper materials or instruction. By using a fishbone, you could visually identify where the problems were and start addressing them in the PDSA cycles.

**Fishbone Diagram Example**



## Fishbone Diagram

Example of a Fishbone of causes for lengthy appointments in an ambulatory practice.



## IMPROVE: Change Ideas

Change ideas provide a list which can help you generate your actual changes. By using benchmarking, review of best practices, evidence-based practice, driver diagrams and networks with brainstorming you can formulate your actual change for a PDSA cycle. By formulating change ideas, you can identify what tests you will need to do for your PDSA cycles.

**Benchmarking** looks at how other places do the same or similar process. It's a way of looking for the best of the best or best practice. Why re-invent a process when another hospital or company is already successful with a similar process? By drawing on their experience, time and money can be saved. The company or hospital you choose to do benchmarking with now also becomes a resource for questions and problems with process when you bring it to your unit or hospital. Sometimes when benchmarking a process, new ideas of change around that process can be generated and adapted to your own unique setting. It can truly be a win/win endeavor.

**Brainstorming** is meant to generate lots of ideas for change within the framework of your specific aim. Brainstorming helps you to build knowledge of potential change ideas. All members of the team are invited to add ideas to the list. In a brainstorming session, you want to first review the topic you are discussing. Make sure everyone understands the topic and its relationship to the specific aim. Allow a couple of minutes of silent thinking before proceeding with the actual brainstorming. Encourage everyone in the group, regardless of their role in the group, to throw out ideas no matter how crazy. During the brainstorming period, there is to be no discussion and

no criticism of any idea submitted. The ideas should be written on a flipchart or board so all members of the team can see and read them. Now that you have this big list, discuss the ideas and make sure they are clear to the team. Have team members prioritize, in their heads or on paper the top 1/3 of the total ideas from the list. It is useful to use "selection criteria" to help choose the top ideas. Selection criteria is usually that the idea is easy to do, doesn't cost any money, could be started on Monday, and will have the biggest impact on improving patient care and staff workplace.

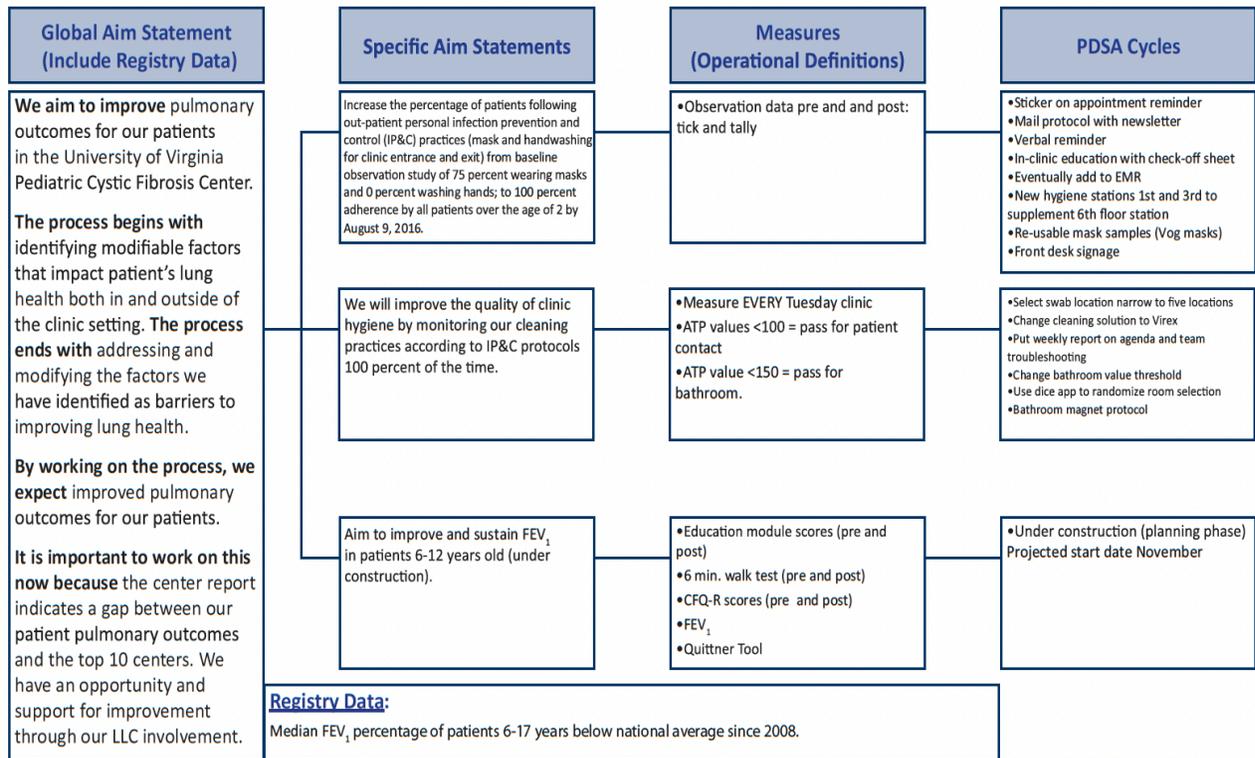
You now need to begin to narrow the list of ideas. This can be done by using the technique of multi-voting. This process allows members of the team to vote for their top 1/3 of the total choices, then, a second voting is done by selecting the ideas that had the most votes. This then shortens the list further by a second round of voting so that you come up with one or two ideas to work on to test as a group.

### **IMPROVE: Driver Diagrams**

The driver diagram is a tool to organize and track multiple improvements to achieve the "Global Aim" of the "Theme" of improvement. The driver diagram also shows the relationships among the theme, global aim, specific aims, measures, and PDSA cycles in a quick, visual way. Creating a "Gantt chart" to add pace to the improvement is often helpful. The driver diagram can be used in two ways for improvement teams:

1. Use at the beginning of improvement to list and organize the evidence-based, best-known practices and other improvement PDSA cycles to conduct to reach the goals of improvement. The PDSA cycles can be conducted one-by-one (especially when you are learning improvement skills).
2. Use as a road map when multiple staff know the discipline of improvement and multiple PDSA cycles can be conducted simultaneously to move in a more timely fashion toward the desired aim.

**Pulmonary Outcomes Driver Diagram**



Source: University of Virginia, Pediatric Program (used with permission)

**IMPROVE: Measures**

“Improvement measurement begins with one data point.” – R. Messier

Measurement starts at the beginning of the improvement journey when you assess your 5Ps. If you review the Assess, Diagnose and Treat Workbooks, you can see where you can start measurement with Tick and Tally measures leading to Run Charts. Measurement is important to measure or evaluate the changes implemented. You will see in the PDSA cycle that measures or evaluation is included in the process. You can’t improve something you can’t measure. It is the oldest principle of scientific experimentation. You must be able to measure your outcome. Numeric measures are the easiest to post on a chart or graph. Good measures have several important components. They should answer important questions. They should be reliable and valid, not based on opinion, and they should be based on fact and data. It takes good measures to determine whether your global aim and specific aims are being met. You need to remember to keep your aim in mind: What are we trying to accomplish? Measurement answers the question, “How do we know if change is improvement?” Run and control charts are often used to measure outcomes. You will learn more about the run chart below.

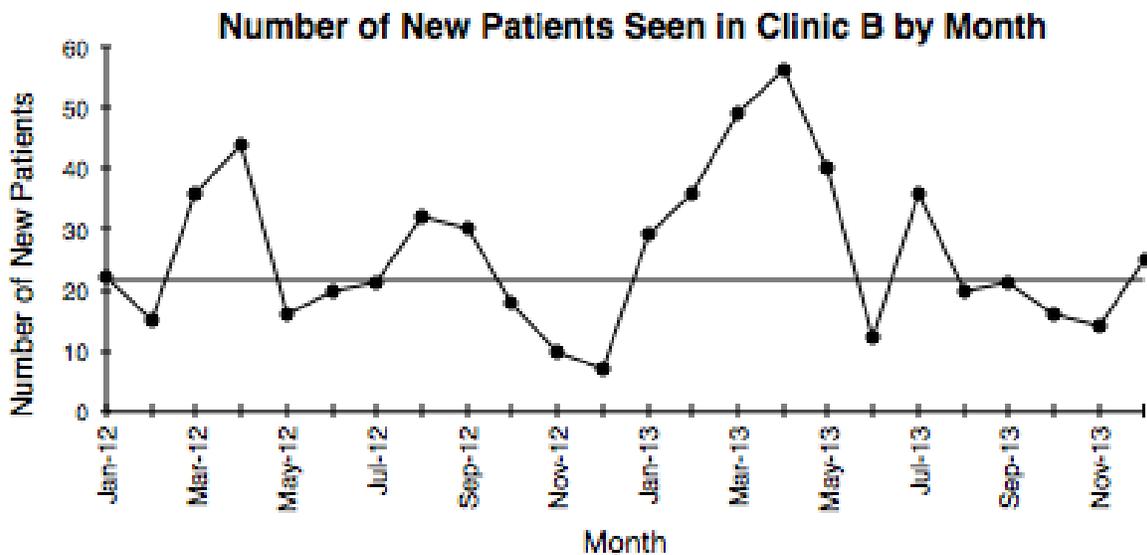
## IMPROVE: Run Charts

A run chart is a graphic display that allows a team to measure a process trends or patterns over a specified period of time.

### Reasons Why Run Charts Are Used

- 1) They are easy to make and interpret.
- 2) They provide a picture of how a process is performing.
- 3) They can be used to detect problems, to determine if microsystems are performing at the targeted level, to determine if changes are being made, and to unveil causes influencing the process.

### Run Chart Example



## IMPROVE AND SUSTAIN: PDSA ↔ SDSA

PDSA is known as the model for improvement. The focus of the PDSA is experimentation. This model has four steps to test changes, provides a way for testing ideas, learning from the testing and moving ahead with better-informed actions to make improvements. 50% of the PDSA cycle should be spent planning the change, 10% spent "doing", 15% Studying and 25% designing next steps or acting.

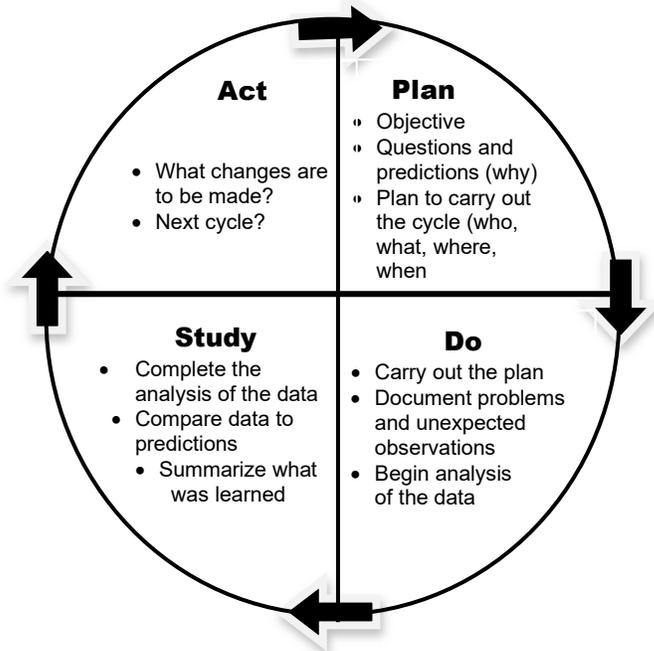
**P-PLAN** you describe and plan the objective and the specific change to be tested along with design great detail to the improvement to be made.

**D-DO** the pilot test is carried out based on the preparations in the planning step.

**S-STUDY** is the study period of time used to analyze the data and how the pilot test went.

**A-ACT** team decides whether or not idea being tested should be modified or abandoned based on the results attained.

## The PDSA Cycle



What are we trying to accomplish?  
 How will we know that a change is an improvement?  
 What changes can we make that will result in an improvement?

Once the desired specific aim is achieved, SDSA (**S**tandardize-**D**o-**S**tudy-**A**ct) is used to standardize the process until the time comes to make new improvements.

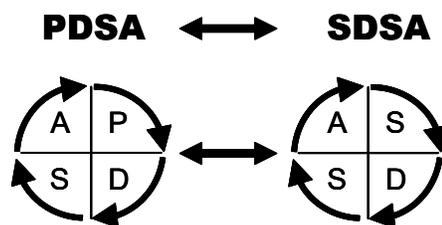
SDSA is the other half of making improvement that has staying power.

**S-STANDARDIZE** the process is integrated into daily work.

**D-DO** is what is being done to ensure the new standardize process is being maintained.

**S-STUDY** with measures that tell you that the process is being done consistently.

**A-ACT** to ask, "are the standardized processes occurring all the time?" Reflect on what changes need to occur and be tested.



The PDSA and SDSA have a back-and-forth relationship. Continuous review and evaluation will tell you if the best practice is in place and if you need to move back to PDSA. Once you have finalized the SDSA for standard practice, a “play” in the PLAYBOOK should be created to ensure the best practice is carried out at the right time, by the right person, every time.

**STANDARDIZE AND SUSTAIN: The Microsystem Playbook**

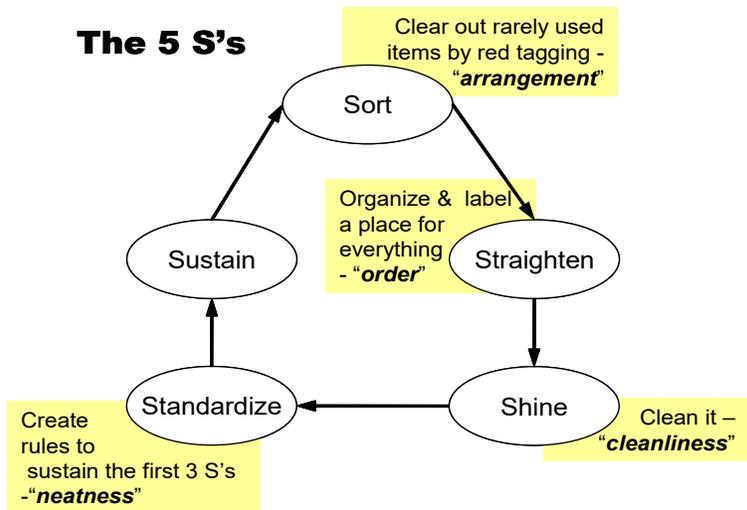
The Playbook provides a collection of tested “best practices” or “plays” to be used by the members of the microsystem to help sustain all the improvement efforts and results in the microsystem. The Playbook consists of finalized FLOWCHARTS, tools to audit and measure the frequency of the “play” being completed and a regular schedule to review the plays to ensure they are current. The Playbook is often used to; interview potential new employees of the microsystem, orient new members of the microsystem, and hold members accountable during performance evaluations to ensure “best practice” is being executed in the microsystem every time by everyone to get the best results.

**STANDARDIZE AND SUSTAIN: Waste and 5S**

Waste is anything other than the minimum amount of equipment, materials, space, and worker’s time which are essential to add value to the product of service. Waste is a symptom, not a cause, of a problem.

**STANDARDIZE AND SUSTAIN: The 5S**

- SORT** Sort through items, keep only what is needed, and dispose of what is not.
- STRAIGHTEN** Orderliness.
- SHINE** Cleanliness. The cleaning process allows us to inspect and expose abnormal or failure conditions that affect quality.
- STANDARDIZE** Create rules to monitor first 3 Ss.
- SUSTAIN** Self-discipline. Maintaining a stabilized workplace is an ongoing process.



## STANDARDIZE AND SUSTAIN: Benefits of the 5Ss

- An organized efficient workplace for improved productivity.
- A cleaner workplace for improved safety.
- Reduction in costs and inventory.
- Gaining valuable floor space.
- Contributes to how we feel about our institute and work environment.
- Provides an inviting and pleasing environment at all times.

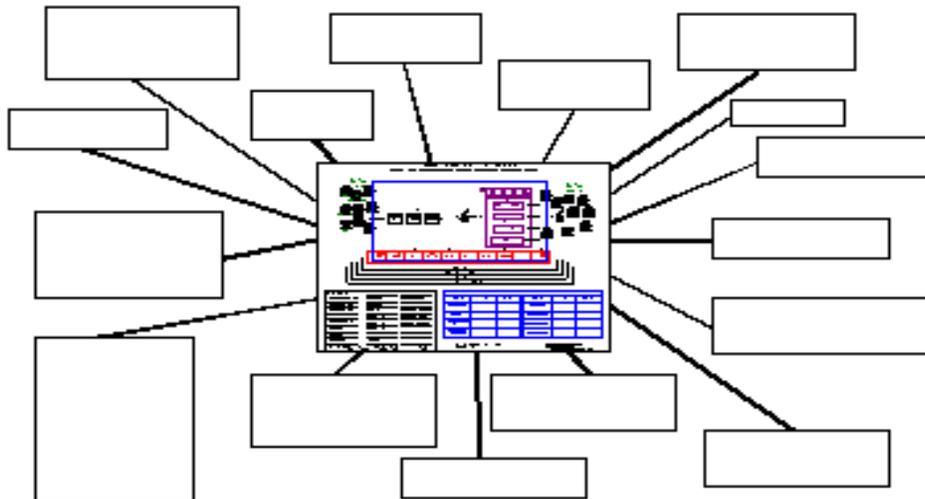
The 5Ss come together to create a continuous process for improving the work environment and eliminating waste or “muda”.

MUDA means activity without value. Found in personal and organizational work.

## External Mapping

External mapping is a visual diagram of the systems (microsystems) that affect your patient population. The map provides a tool to look at which systems within your department and outside of your department impact patients. They may include L&D, pharmacy, NICU, dietary, and others. They may have big or small impacts on the patient.

Exploring the external context of the clinical microsystem for improving the health of a given subpopulation of patients...



Place a bold line around the rectangle of the “most important contributors” to the improved health of the subpopulation. Illustrate the relationships with a blue line. Add an arrow head if the direction of the relationship is clear. If the relationship can be significantly improved, use red for the line.

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## Relational Coordination

**Jody Hoffer Gittel, Professor of Management, The Heller School for Social Policy and Management, Brandeis University, Waltham, MA**

Relational Coordination

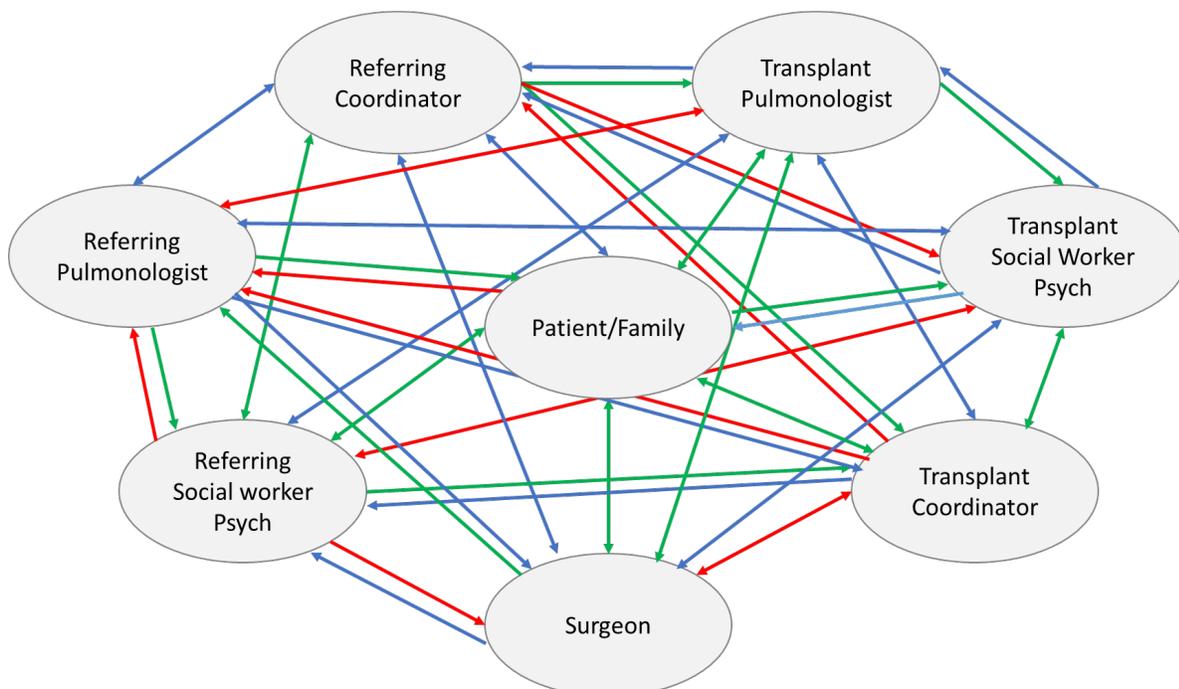
- Measures the quality of relationships and communication involved in the coordination of work
- Matters most for work that is complex, uncertain and time constrained.
- Drives quality, efficiency, satisfaction, and engagement outcomes.
- Is supported and reinforced by relational, structural, and process improvements.

Relational Coordination consists of 7 dimensions in two categories of communication and relationships based on research by Jody Hoffer Gittel. The 7 dimensions are: frequent, timely, accurate, and problem-solving communication, shared goals, shared knowledge and mutual respect. These dimensions are measured within and between units for workgroups (providers, administrators, nurses, secretaries, technologists, residents, etc.)

Relational Mapping can explore communications and relationships and stimulate important conversations.

Relational Coordination can be discussed within unit workgroups and between unit workgroups by creating a relational map. Using three colored markers, (red-low; blue-medium; green-high) the perceived collective "RC" assessment between workgroups and units can be discussed and stimulate new understanding and perspectives to enhance communication and relationships which improve processes and systems.

An example of Relational mapping is here - Red (Low), Blue (Medium) and Green (High):



## Relational Coordination Surveys

In some situations, organizations, researchers, and leaders desire more detailed measures. Workgroups (example displayed in relational map) of units can complete a survey that rates the 7 relational coordination dimensions to rate from low, medium and high the individual dimensions of RC at baseline before implementing changes to then re-measure the RC for workgroups in unit and with other units.

The survey questions for each dimension:

Dimension	Question
Frequent Communication	How <b>frequently</b> do people in each of the following workgroups communicate with you about [focal work process]?
Timely Communication	How <b>timely</b> is their communication with you about [focal work process]?
Accurate Communication	How <b>accurate</b> is their communication with you about [focal work process]?
Problem-solving Communication	When a problem comes up in [focal work process] do people in each of these groups blame others or work with you to <b>solve</b> the problem?
Shared Goals	How much do people in these groups <b>share your goals</b> for work in [focal work process]?
Shared Knowledge	How much do people in these groups <b>know about</b> the work you do in [focal work process]?
Mutual Respect	How much do people in these groups <b>respect</b> the work you do in [focal work process]?

(References: <https://relationalcoordination.org/>

*Transforming Relationships for High Performance: The Power of Relational Coordination*, Jody Hoffer Gittel, 2016.)

## **Generative Relationship STAR Model (An alternative way to explore relationships)**

**Brenda Zimmerman Schulich School of Business, Toronto, Canada**

[Brenda](#) was a professor of Strategic Management at the Schulich School of Business at York University in Toronto, Canada and the founder and Director of the Health Industry Management Program. Her primary research applied complexity science to management and leadership issues in organizations. She co-authored two books and was the thinker and designer of the STAR MODEL in the early 2000s.

The STAR model is a visual diagram of the generative relationship between people and/or unit services. There are two parts to the generative relationship. One is that the relationship produces something that the individual members could not have produced alone. The second is that the value of the new procedure or service is created by the interaction between the parties. Relationships can be contentious, distant, routine, competitive or generative. The generative relationship is what we strive for in complex systems as they create the greatest potential for creativity and innovation. In the STAR map, we look at separateness, tuning (which translates to the talking and listening), action, and reason to work together. As you read through the parts of the STAR, try selecting a group or different unit that you might apply the idea of the four arms of the STAR.

For example, what is the STAR model as it relates to you or your unit's relationship with another unit or service, L&D and F1/F2, or F1/F2 and pharmacy?

Separateness also refers to differences. All parties involved in the relationship need to have skills, backgrounds, and perspectives that are different. If these components are similar, you may be able to have heated conversations and debates, but you will unlikely be challenged and changed. The differences allow for different perspectives and therefore new solutions. Often including patients or family members in the group will help increase the separateness and increase the generative outcomes.

Tuning is related to the need to not only talk, but also to listen to one another. There needs to be opportunity for the two parties or groups to challenge things that don't appear to be working. There can't be a "sacred cow" as it may be the very thing that changing could promote a better relationship. We need to be open to all input.

Action is essential to the STAR. Let's face it, talk is cheap. If you don't put any action behind the discussion, you haven't accomplished anything. The parties need to be able to get together to create something.

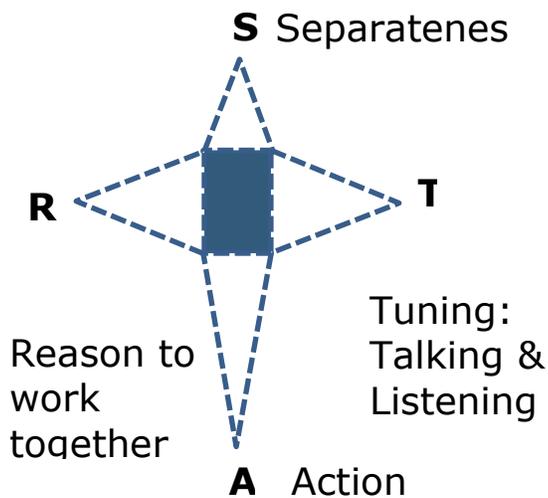
Reason to work together relates to whether the two units or parties have a reason to work together. There has to be some benefit for both parties aligned with the improvement. If the two parties or groups don't see value in working together, or if they view one another as adversaries, then it is highly unlikely that the two sides will co-create something of value. They may learn from one another but won't create something new and different.

This assessment of relationship helps to see the current state of the relationship to engage in constructive conversation to improve communication and insights between the two parties.

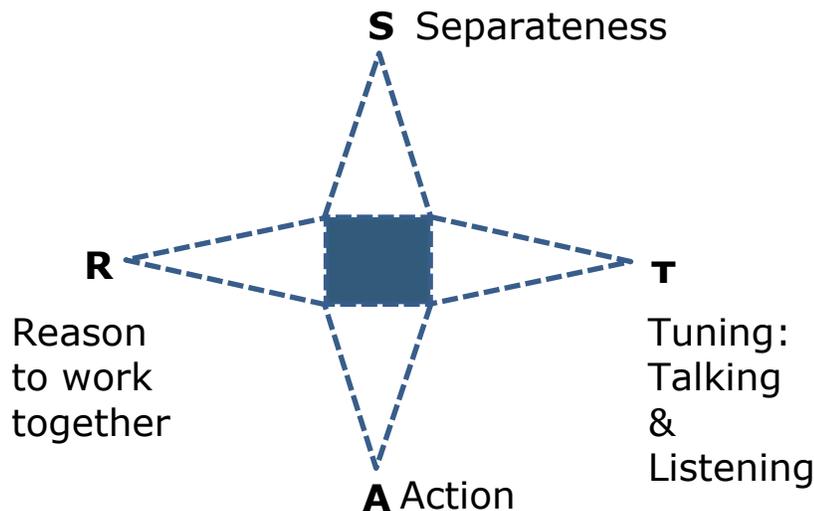
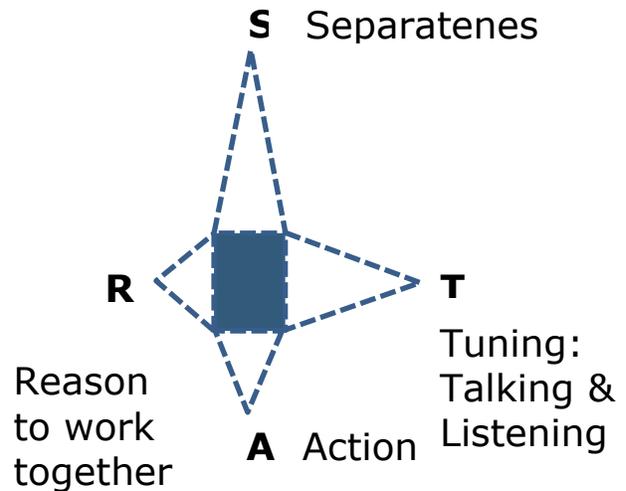
## Generative Relationship STAR

### Generative Relationship STAR Examples

#### *Missing Separateness*



#### *Missing Action/Reason*



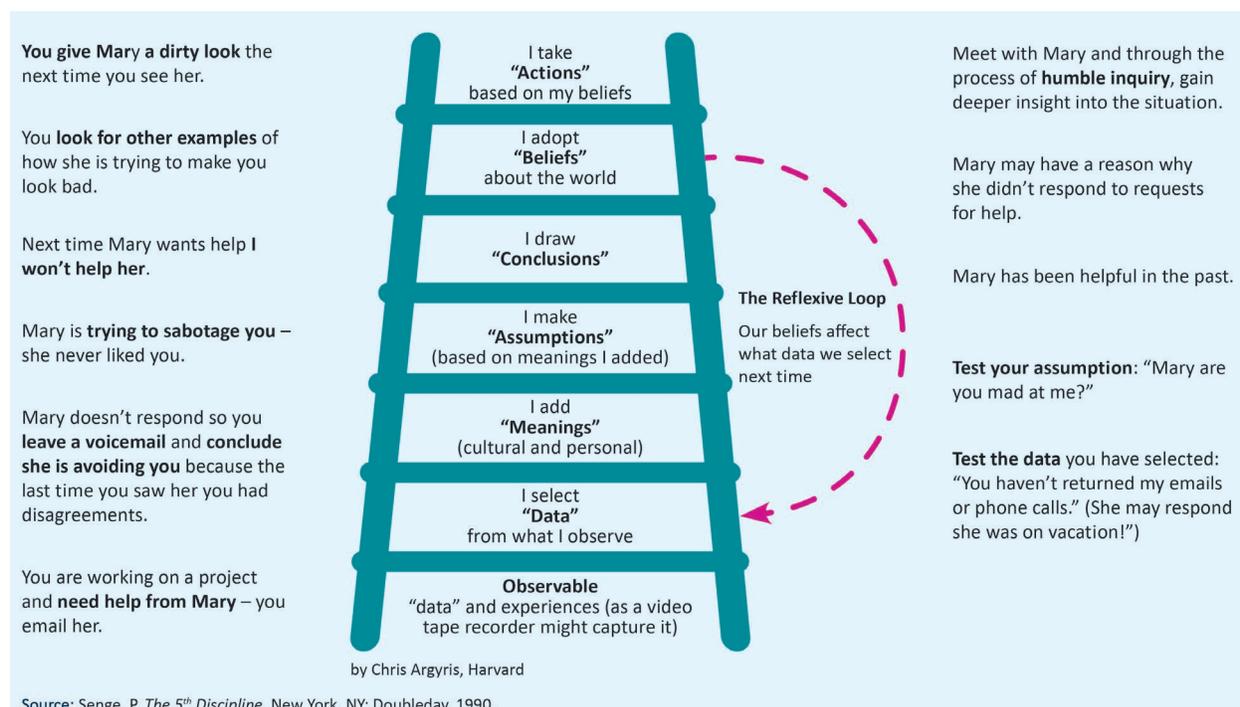
### **Mental Models**

Mental Models are images, assumptions, and stories we create and carry in our minds about ourselves, others, institutions, and every aspect of the world. Mental models explain why two people can observe the same event and describe it differently - they observe different details. They are below the level of our awareness and are often untested. Mental models must be brought to the surface of awareness to explore and discuss them openly. Thus, new mental models can be created that better serve us and our patients and families.

## Ladder of Inference

The Ladder of Inference is a mental pathway of increasing abstraction, often leading to misguided beliefs. It demonstrates how quickly we make assumptions and come to conclusions without a rational thought process. It is like rapidly climbing up a ladder in our minds. Some individuals have difficulty hearing what others are saying. Instead, they hear what they expect others to say, have little tolerance for multiple interpretations and can only see their own interpretation. Such individuals spend hours arguing their ideas.

(Scholtes Peter R, Joiner Brian L, Streibel Barabara J. *The TEAM Handbook*, 3<sup>rd</sup> Edition, Oriel Incorporated, Madison, WI, 2003. Argyris, C. *Reasoning, Learning and Action*. Jossey-Bass, San Francisco, CA, 1982.)



Using the ladder of inference (LOI) improves communication through thinking and reasoning. **(REFLECTION)**

The LOI makes your thinking and reasoning more visible to others. **(ADVOCACY)**

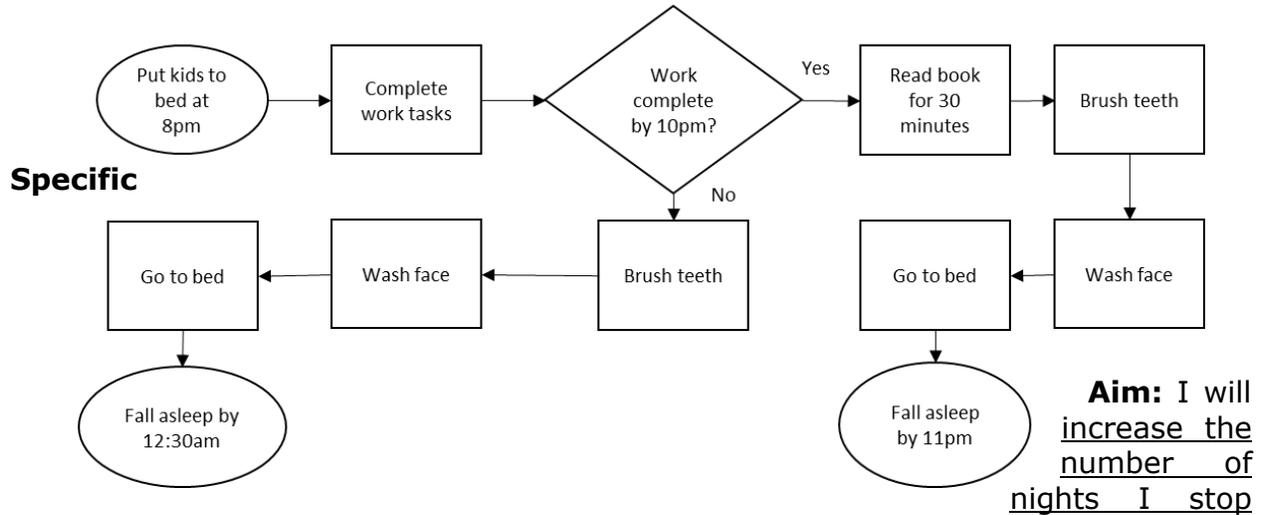
The LOI inquires into others' thinking and reasoning. **(INQUIRY)**

**Example 1: Quality is Personal**

**Theme:** Sleep

**Global Aim:** I aim to improve my ability to fall asleep at night. The process begins with putting kids to bed and ends with falling asleep. By working on this process, I expect to feel less tired during the day. It is important to work on this now because my lack of energy is impacting my productivity.

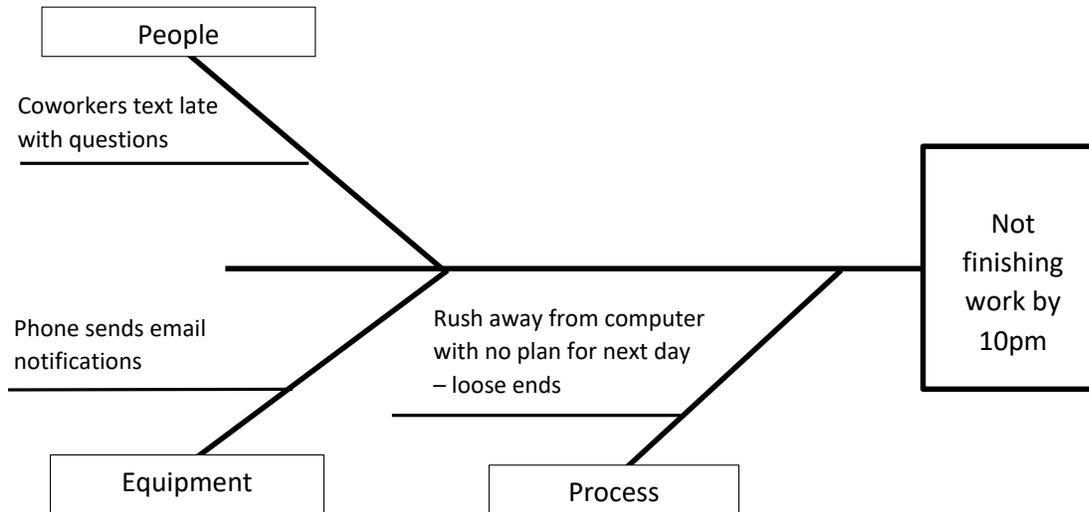
**Flow Chart:**



working by 10pm from 3 to 6 per week by May 1, 2023.

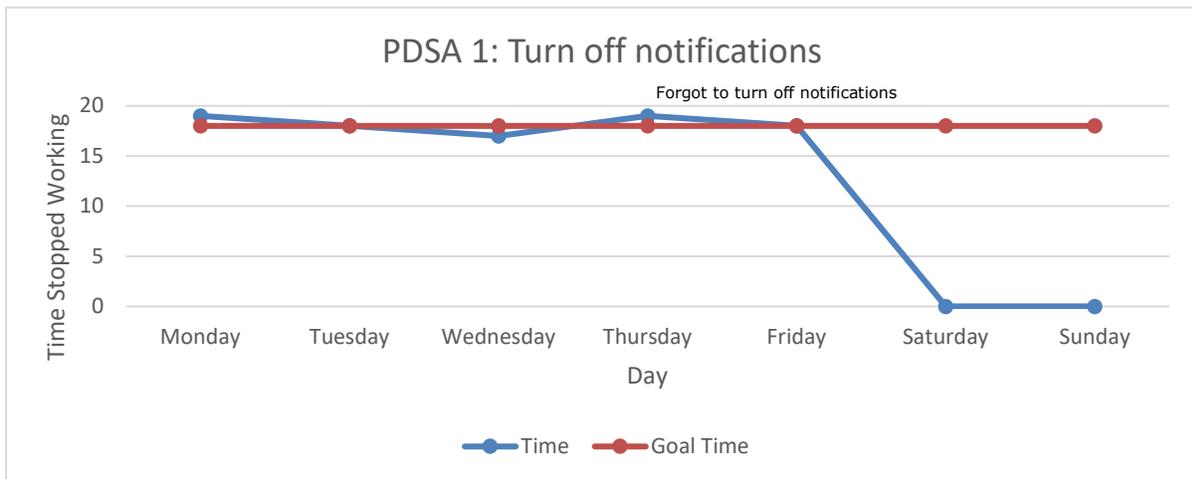
## Fishbone

### Fishbone: Finishing work by 10pm



**Change Idea:** Turn off notifications on phone after 9pm

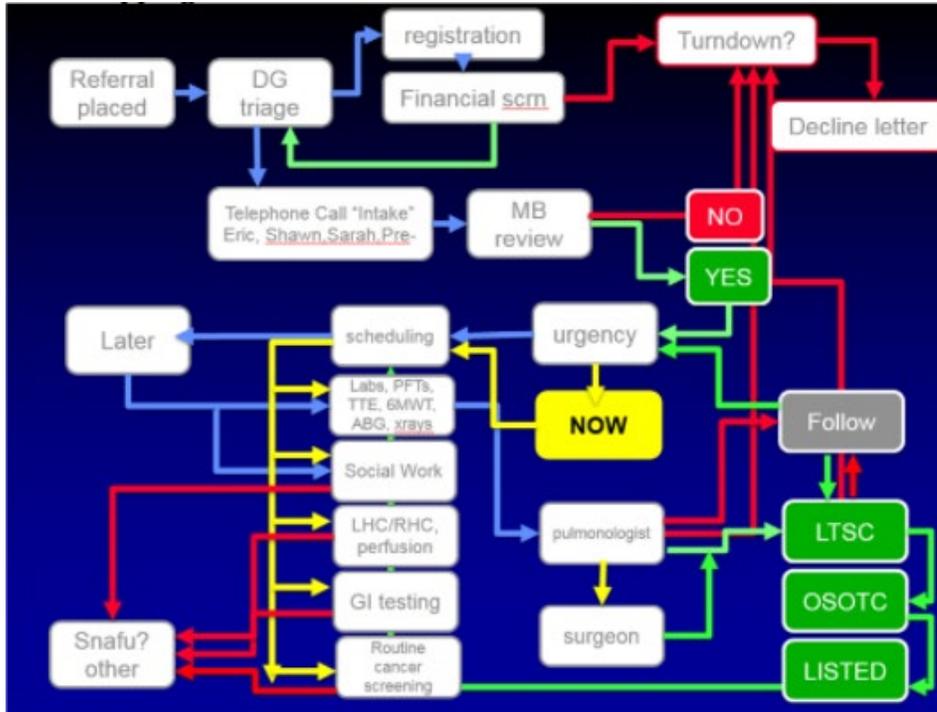
## PDSA:



I will adopt this change as it helped me to make an improvement toward reaching my goal.

**Example 2: Used with Permission from Cleveland Clinic Lung Transplant**

**High Level Flow Chart**

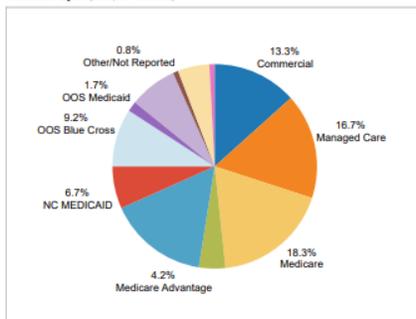


**5Ps**

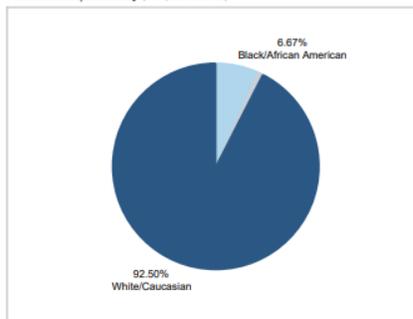
**Purpose:** Building relationships with patients and families to help them live healthy and meaningful lives by providing compassionate, evidence-based, quality care.

**Patients**

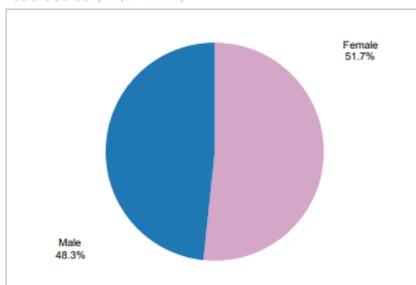
Patient Payor (Unique Patients)



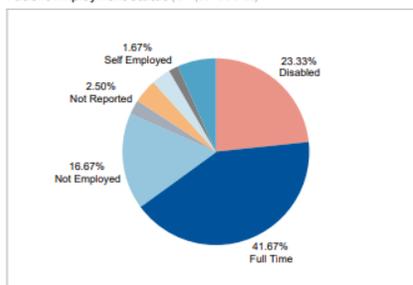
Patient Race/Ethnicity (Unique Patients)



Patient Gender (Unique Patients)



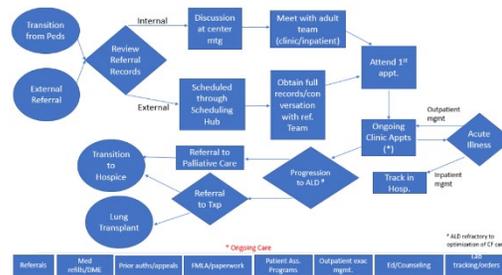
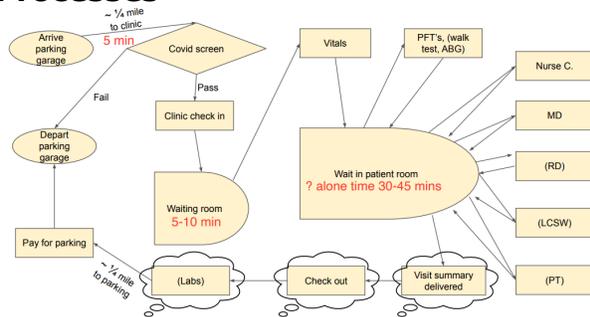
Patient Employment Status (Unique Patients)



## Professionals

- Direct CF Team Members:
- Physician – Director 0.15 FTE / Physician 0.3 FTE
- Physician – Assoc Director 0.1 FTE / Physician 0.3 FTE
- RN – Program Coord 0.95 FTE / Nurse 0.05 FTE
- SW – SW 0.1 FTE / Mental Health Coord 0.5 FTE
- Dietician – 0.8 FTE
- RT – 0.1 FTE
- PT – 0.1 FTE
- CRC—Research 0.9 FTE
- Pharm – 0.2 FT

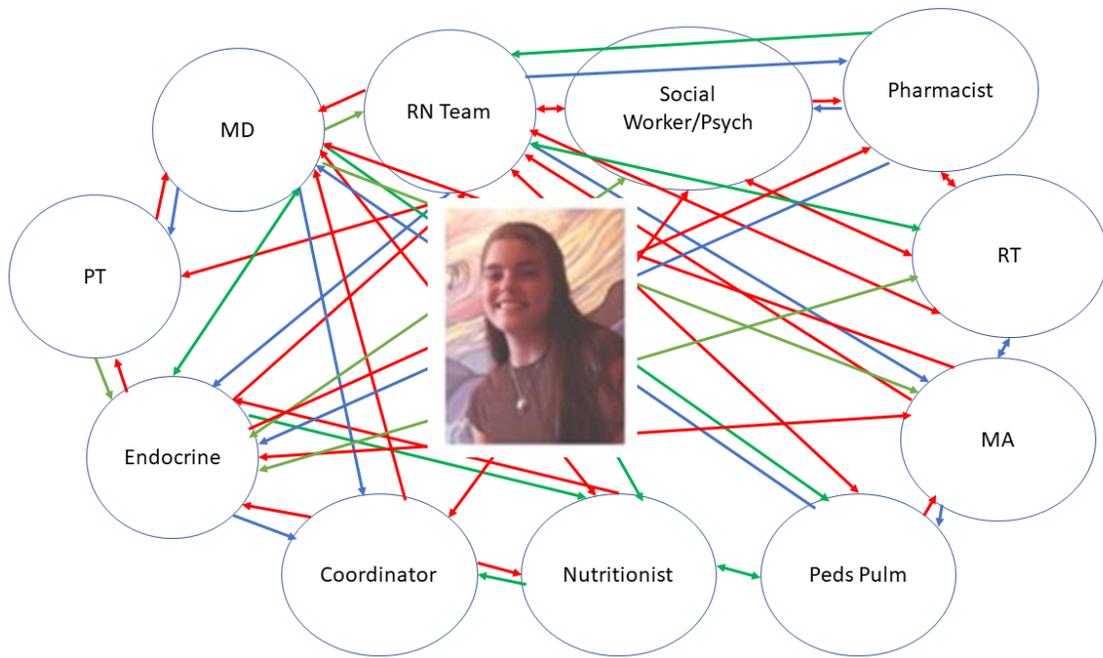
## Processes



## Patterns



Team Huddle	<ul style="list-style-type: none"> <li>• Mon. Wed. Fri- 7:45 to 8:00 AM</li> </ul>
Full Clinic Meeting	<ul style="list-style-type: none"> <li>• Quarterly</li> </ul>
Birthdays	<ul style="list-style-type: none"> <li>• Celebrated the first Friday of the month for all birthdays in that month.</li> </ul>



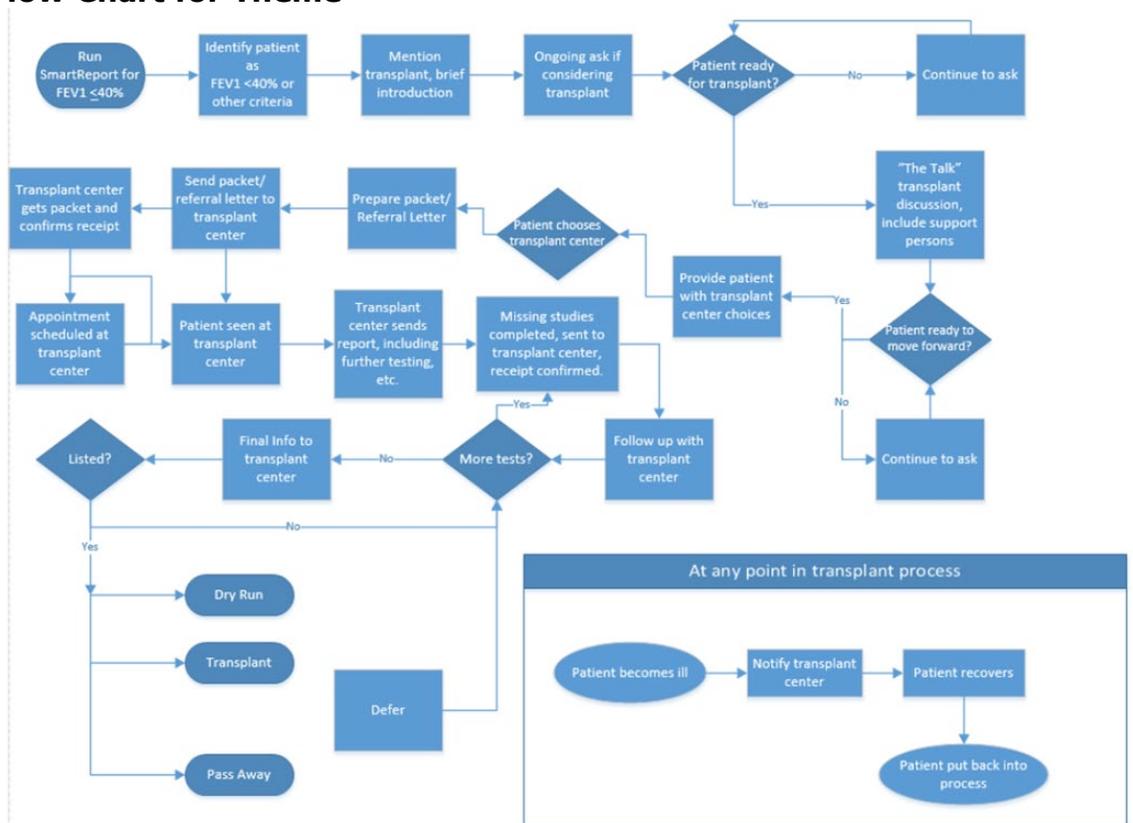
5

This RC Map has been adapted from the original teams' RC map due to template updates.

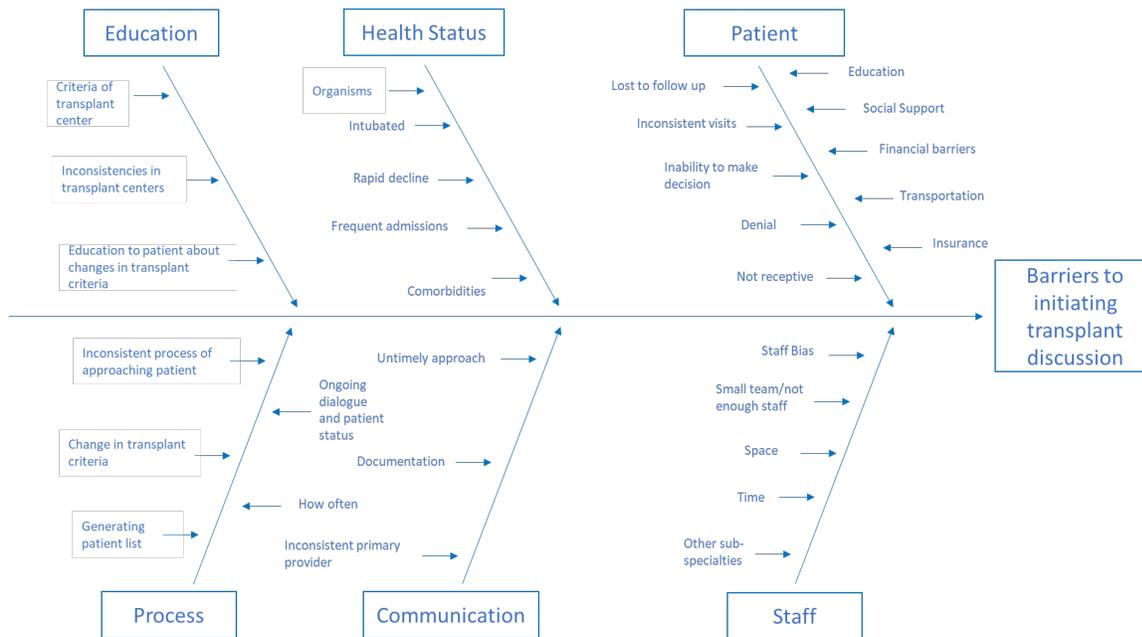
## Driver Diagram

Theme & Global Aim	Specific Aim	Measures	Change ideas	PDSA cycles
<p><b>Communication:</b> We aim to improve the lung transplant referral process in UC Adult CF Program. The process begins with identifying ACFLD patients who meet the referral criteria and ends with patients transferring to the Cleveland Transplant Program.</p> <p>By working on this process, we expect to improve communication, co-management and outcomes between people with ACFLD, families and transplant centers.</p> <p>It is important to work on this now, because timely, efficient referrals and ongoing collaborative care will improve patient satisfaction and outcomes while saving time and money.</p>	<p>We will increase the percentage of eligible people with ACFLD (FEV1 &lt; 40) that have begun a transplant dialogue from 70% to 95% (by 25%) by April 1, 2018</p>	<p>% of patients with preliminary Tx discussion</p>	<ul style="list-style-type: none"> <li>Review all eligible patients per guidelines</li> <li>Regular reminders of who is eligible</li> <li>Patient notification of transplant eligibility</li> <li>Document conversations in Advanced Care Plan</li> </ul>	<ul style="list-style-type: none"> <li>Review CFF Guidelines</li> <li>Identify people with ACFLD</li> <li>Determine when ACFLD patients will be in clinic</li> <li>Identify on whiteboard when ACFLD patient is in clinic as "eligible" for transplant discussion</li> <li>Document on whiteboard and EMR when transplant discussion is held.</li> </ul>
	<p>We will improve communication with the Cleveland Transplant center during the referral process through transplant and after transplant by 30% by December 31, 2018.</p>	<p>-Track dates of meetings and communication between the CF LTT partner teams.</p> <p>-Communication survey results</p> <p>-Chart review for Tx status updated</p>	<ul style="list-style-type: none"> <li>Document referral plan as part of Advanced Care Plan</li> <li>Include ACP in referral documentation</li> <li>Shared updated team contact lists</li> <li>Use encrypted email to communicate updates quickly</li> </ul>	<p>PDSA cycles added here</p>
	<p>We will improve patient satisfaction with our communication with them about their transplant status during their assessment and referral process by 40% from base line by December 31, 2018.</p>	<p>-Patient satisfaction with communication transplant status; survey results.</p> <p>-Chart review for documented transplant status updated</p>	<ul style="list-style-type: none"> <li>Notify eligible people with ACFLD of referral status</li> </ul>	<p>PDSA cycles added here</p>

## Flow Chart for Theme



## Fishbone



## Playbook

1	Patient Out-Patient Action Discharge Plan -General -Multidisciplinary	2009 *** 2019 *****#
2	Patient & Family Advisory Board	2010 ***
3	Improving Inpatient and Outpatient Communication -General -Respiratory (On-going PDSA)	2010 ***** 2013 ***** 2014 *&
4	ImPOWER Education Flipchart -Respiratory (On-going, 4 <sup>th</sup> edition) -Respiratory (On-going, 8 <sup>th</sup> edition)	2011 *&~ 2019 #~
5	5 S's -Pulmonary Education Tool Cart -Nutrition Supplement Sample Cabinet	2011 * 2018 *
6	Advance Care Planning	2011 **
7	Utilizing a visual Resource and Demonstration in Education on Pancreatic Insufficiency	2011 **#~
8	Improving Patient and Family Satisfaction and Care-Respiratory	2014 ***~
9	Patient Perceptions of use of Home Spirometry	2015 **
10	Choosing a Respiratory Equipment that Satisfies Patients' Need and Hospital Budget -Nebulizers -Vibrating/Oscillating Positive Expiratory Pressure (PEP) Device	2015 **& 2017 **
11	Fostering Change in the Midst of Chaos and Budget Cuts	2015 *
12	Patient, Families, and Providers advocating for Inhaled Antibiotics to be put on TX Medicaid Preferred Drug List	2016 *
13	Stream-lining CF Clinic Culture Result Report Out	2017 *#
14	Improving the Number of Adult Patients who have CF Clinic Appointment at Least 4 Times per Year to Improve Patient Outcomes	2017 *#
15	Improving the Number of Quantity Not Sufficient (QNS)	2017 *#

### Example 3: Primary Care

#### 5Ps:

- **Purpose:** To promise and deliver reliable, patient-centered, evidence-based care for every patient, every time.
- **Professionals**

Current Staff	FTEs	Comment/Function	3 <sup>rd</sup> Next available		Cycle Time
Titles			PE	Follow Up	Range
MD	6.2	3 vacant	25	5	2-45 days
NP/PA	3.5	1.5 vacant			
RNs	3	1 vacant			
LPNs	2	Full staff			
LNA's/MAs	3				
Front Desk	8	Phones/Desk			

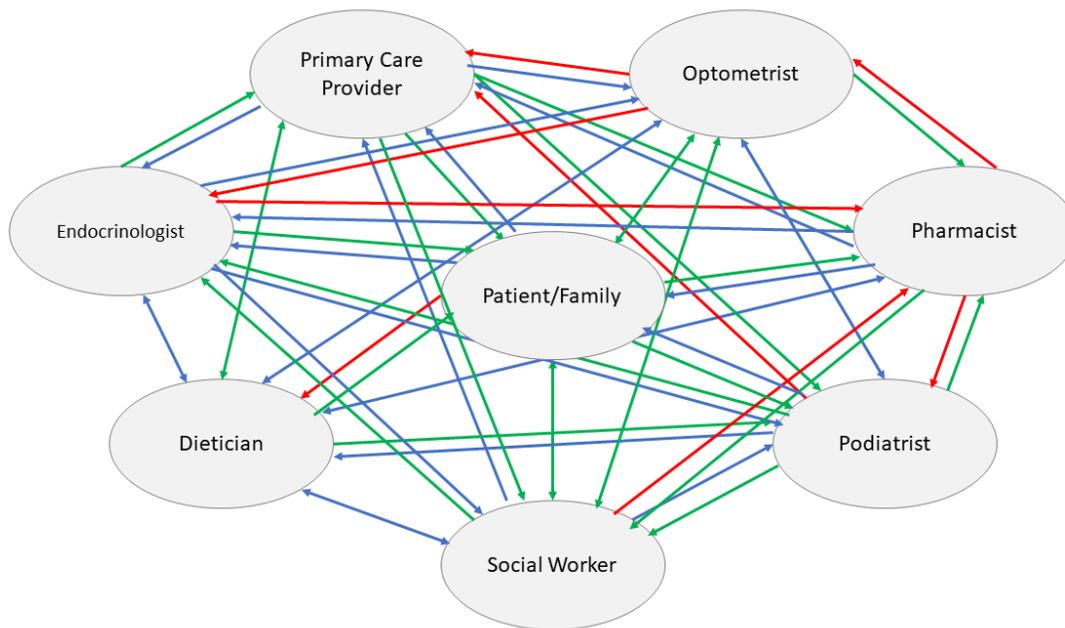
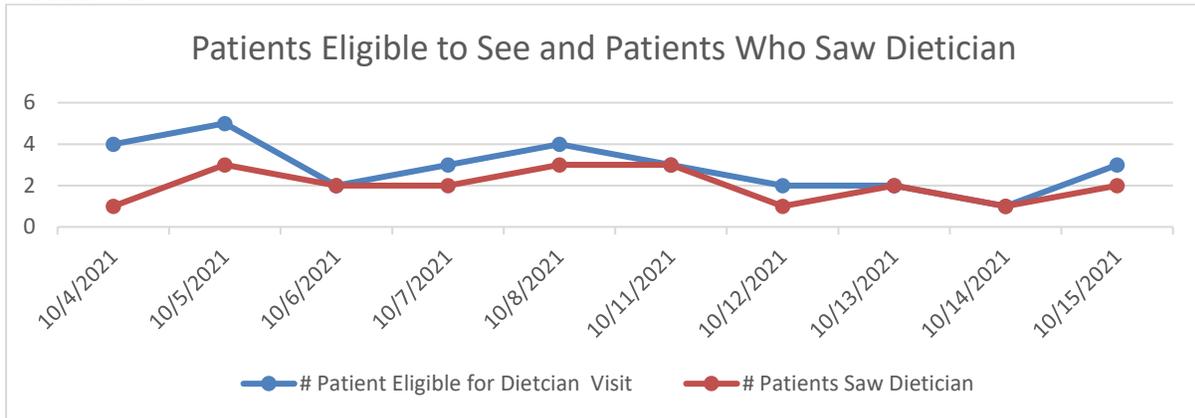
#### Processes: Cycle times

Provider	Average Visit time	Average Cycle Time
1. Glowa	35-45 min	1 hr 30 min
2. Adams	15-30 min	40 min to 1 hr 10 min
3. Morrow	20-40 min	45 min to 1 hr 10 min
4. Nelson	30-45 min	60 min
5. Murphy (NP)	15-25 min	35-45 min
6. Lazar	40 min	1 hr 10 min
7. Luttinger	35 min	55 min
8. Morden	35 min	50 min
9. Cornell (NP)	20 min	45 min

#### Processes: Now standardized, following past pilots

- 1. Use of EMR to document all patient visits (exception prenatal care)**
  - Proportion of clinical notes in electronic record: ~100%
  - Proportion of notes direct entry: 85%
  - Proportion of seen patients with verified electronic problem list
- 2. EMR Medication/allergy list verified with patient at intake of every visit**
  - Proportion of appointments with verified lists in EMR: 95%
- 3. Use of EMR to communicate clinical tasks**
  - Referrals, prescriptions, tasks routinely communicated electronically
  - New initiative to order on-site immunizations electronically

## Patterns



*This RC Map has been adapted from the original teams' RC map due to template updates.*

Team Huddle	Daily 7:45 to 8:00 AM
Full Clinic Meeting	Monthly
Birthdays	Celebrated the first Wednesday of the month for all birthdays

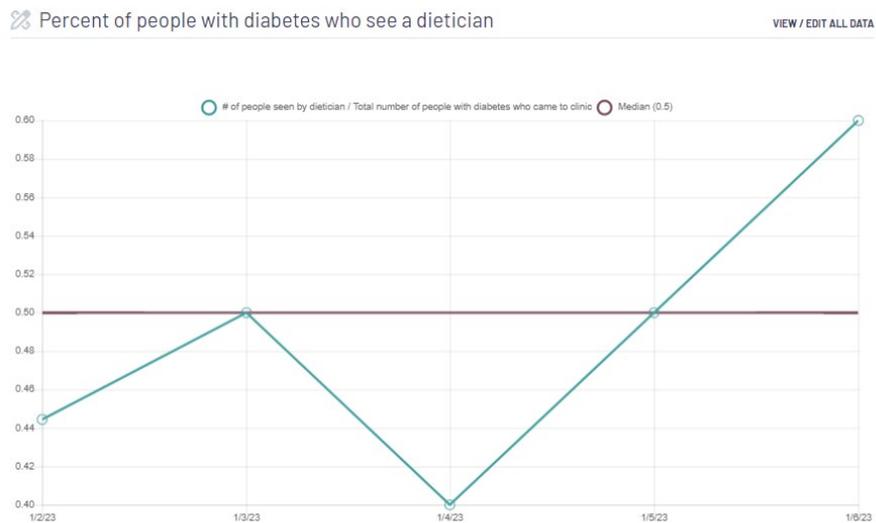
**Theme:** Improving care for people with diabetes

**Global Aim:** We aim to improve A1C of our diabetic population in the White Mountains Primary care Clinic. The process begins with identifying the people in our practice with diabetes. The process ends with a standardized approach to monitor and support this population. By working on this process, we expect to improve the average A1C, BMI, patient satisfaction and overall nutritional health of our patients. It is important to work on this now because our last accountable care report showed that we were in the bottom 20% of practices caring for people with diabetes.

**Specific Aim:** Increase the percentage of patients who see a dietician from 30% to 70% by July 1, 2023.

**Change Ideas:** Morning huddle, after visit summary information.

**PDSA:** Morning huddle to discuss people with diabetes coming to clinic. Front desk clerk will print daily schedule and highlight each patient with a diagnosis of diabetes in the nurses circulating area at 7:30am each day. We will review the last and identify those patients that the nutritionist will plan to see that day. We will test the cycle for 3 days and reassess.



**A note:** The examples above use ImproveApp™ to track the team’s improvement journey, share information with one another, complete the Quality Improvement Assessment (QIA) and resilience and wellbeing assessment (RēsWell) and measure and display data. To access ImproveApp for your team, contact us at [admin@improve.app](mailto:admin@improve.app)

## Reference Guide

The following sources maybe helpful to you.

The Microsystem website has many resources and ideas and is constantly being updated. [www.clinicalmicrosystem.org](http://www.clinicalmicrosystem.org)

Our friends and colleagues at the Institute for Healthcare Improvement have incredible resources and experiences from colleagues around the world to help support your improvement journey. [www.ihl.org](http://www.ihl.org)

## Books

Batalden, P., Nelson, E., Godfrey, M. (2007). *Quality by Design: A Clinical Microsystems Approach*, San Francisco, CA: Jossey-Bass.

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Nelson EC, Batalden PB, Godfrey MM, Lazar JS. *Value by Design: Developing Clinical Microsystems to Achieve Organizational Excellence.* San Francisco, CA: Jossey-Bass, 2011.

## Publications

### **The Joint Commission Journal of Quality Improvement Microsystems in Healthcare original 9 Part Series**

**Part 1:** Nelson, E. C., Batalden, P. B., Huber, T. P., Mohr, J. J., Godfrey, M. M., Headrick, L. A., & Wasson, J. H. (2002). Microsystems in health care: Part 1. Learning from high-performing front-line clinical units. *The Joint Commission Journal on Quality Improvement*, 28(9), 472–493.

**Part 2:** Nelson, E. C., Batalden, P. B., Homa, K., Godfrey, M. M., Campbell, C., Headrick, L. A., Huber, T. P., Mohr, J. J., & Wasson, J. H. (2003). Microsystems in health care: Part 2. Creating a rich information environment. *The Joint Commission Journal on Quality Improvement*, 29(1), 5–15.

**Part 3:** Godfrey, M. M., Nelson, E. C., Wasson, J. H., Mohr, J. J., & Batalden, P. B. (2003). Microsystems in Health Care: Part 3. Planning patient-centered services. *The Joint Commission Journal on Quality Improvement*, 29(4), 159–170.

**Part 4:** Wasson, J. H., Godfrey, M. M., Nelson, E. C., Mohr, J. J., & Batalden, P. B. (2003). Microsystems in health care: Part 4. Planning patient-centered care. *The Joint Commission Journal on Quality Improvement*, 29(5), 227–237.

**Part 5:** Batalden, P. B., Nelson, E. C., Mohr, J. J., Godfrey, M. M., Huber, T. P., Kosnik, L., & Ashling, K. (2003). Microsystems in health care: Part 5. How leaders are leading. *The Joint Commission Journal on Quality Improvement*, 29(6), 297–308.

**Part 6:** Mohr, J. J., Barach, P., Cravero, J. P., Blike, G. T., Godfrey, M. M., Batalden, P. B., & Nelson, E. C. (2003). Microsystems in health care: Part 6. Designing patient safety into the microsystem. *The Joint Commission Journal on Quality Improvement*, 29(8), 401–408.

**Part 7:** Kosnik, L. K., & Espinosa, J. A. (2003). Microsystems in health care: Part 7. The microsystem as a platform for merging strategic planning and operations. *The Joint Commission Journal on Quality Improvement*, 29(9), 452–459.

**Part 8:** Huber, T. P., Godfrey, M. M., Nelson, E. C., Mohr, J. J., Campbell, C., & Batalden, P. B. (2003). Microsystems in health care: Part 8. Developing people and improving work life: what front-line staff told us. *The Joint Commission Journal on Quality Improvement*, 29(10), 512–522.

**Part 9:** Batalden, P. B., Nelson, E. C., Edwards, W. H., Godfrey, M. M., & Mohr, J. J. (2003). Microsystems in health care: Part 9. Developing small clinical units to attain peak performance. *The Joint Commission Journal on Quality Improvement*, 29(11), 575–585.

#### **The Joint Commission Journal of Quality and Patient Safety 4-Part Series, 2008.**

**Part 1:** Nelson, E.C., Godfrey, M.M, Batalden, P.B., Berry, S.A., Both, S.E., McKinley, K.E., Melin, C.N., Muething, S.E., Moore, L.G., Wasson, J.H., & Nolan, T.W. (2008). Clinical Microsystems, part 1. The Building Blocks of Health Systems. *Joint Commission Journal on Quality and Patient Safety*, 34 (7), 367-378.

**Part 2:** Wasson, J. H., Anders, S. G., Moore, L. G., Ho, L., Nelson, E. C., Godfrey, M. M., & Batalden, P. B. (2008). Clinical microsystems, part 2. Learning from micro practices about providing patients with the care they want and need. *Joint Commission Journal on Quality and Patient Safety*, 34(8), 445–452.

**Part 3:** Godfrey, M. M., Melin, C. N., Muething, S. E., Batalden, P. B., & Nelson, E. C. (2008). Clinical microsystems, Part 3. Transformation of two hospitals using microsystem, mesosystem, and macrosystem strategies. *Joint Commission Journal on Quality and Patient Safety*, 34(10), 591–603.

**Part 4:** McKinley, K. E., Berry, S. A., Laam, L. A., Doll, M. C., Brin, K. P., Bothe, A., Jr, Godfrey, M. M., Nelson, E. C., & Batalden, P. B. (2008). Clinical microsystems, Part 4. Building innovative population-specific mesosystems. *Joint Commission Journal on Quality and Patient Safety*, 34(11), 655–663.

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Fishman, C. (2007). No Satisfaction. *Fast Company*, 82-92.

Joint Commission Resources. (2005). *From Front Office to Front Line, Essentials for Health Care Leaders*. Joint Commission Resources.

Lipmanowicz. "BUY-IN" versus "OWNERSHIP."

### **Clinical Microsystem Publications**

1. Batalden, P., & Splaine, M. (2002). What will it take to lead the continual improvement and innovation of health care in the twenty-first century?. *Quality management in health care*, 11(1), 45–54.
2. Mohr, J. J., & Batalden, P. B. (2002). Improving safety on the front lines: the role of clinical microsystems. *Quality & safety in health care*, 11(1), 45–50.
3. Weinstein, J. N., Brown, P. W., Hanscom, B., Walsh, T., & Nelson, E. C. (2000). Designing an ambulatory clinical practice for outcomes improvement: from vision to reality--the Spine Center at Dartmouth-Hitchcock, year one. *Quality management in health care*, 8(2), 1–20.
4. Nelson, E. C., Batalden, P. B., Mohr, J. J., & Plume, S. K. (1998). Building a quality future. *Frontiers of health services management*, 15(1), 3–32.

## Glossary

**5Ps:** An assessment process that evaluates the anatomy and current performance of your clinical microsystem e.g. CF referring or Lung transplant program. Donabedian's\* structure, process and outcome framework provides the foundation to the microsystem purpose, patients, professionals, processes, patterns evaluation. Donabedian A. (2005). \*Evaluating the quality of medical care. 1966. *The Milbank quarterly*, 83(4), 691–729. <https://doi.org/10.1111/j.1468-0009.2005.00397.x>

**5S:** A LEAN process to evaluate and organize the workplace with a goal of eliminating waste. The 5S include sort, straighten, shine, standardize and sustain.

**ACFLD:** Advanced Cystic Fibrosis Lung Disease

**Action Plan:** Activities to be achieved in the immediate time period of 1-3 weeks including action items, accountable person and date to be completed to maintain rhythm of improvement. Detailed "next steps" and "to do" with clearly identified and accountable people and timeline.

**Agenda:** Meeting process that includes meeting roles to result in productive meetings with timed segments and clear objectives.

**Benchmarking:** To search for best practices that consistently produce best in-the-world results by exploring other microsystems. A systematic process of continuously looking for the best practices to compare a microsystem performance and identify new ideas and processes to improve toward high performing systems.

**Best Practices:** A process that is rigorously tested and consistently provides best results to be replicated and adapted in other settings.

**Brainstorming:** A team process designed to generate a large number of change ideas to then narrow down with multi-voting. Can be vocal or silent brainstorming.

**CF LTT LLC:** Cystic Fibrosis Lung Transplant Transition Learning and Leadership Collaborative typically occurring over 18 months. The aim of the LLC is to convene multiple multidisciplinary improvement teams from CF referring and Lung Transplant programs including patient and family partners to learn improvement science, communication and relational skills within and between programs to improve collaboration for lung transplant referral and transition from CF to lung transplant processes including a shared care model.

**Change Concepts:** Stimulants to develop and design detailed and specific tests of change. Combining change concepts with deep knowledge of the processes can jump start new thinking and improvement ideas. (*The Improvement Action Guide: A Practical Approach to Enhancing Organizational Performance*; Langley, Nolan et al, 1996 and *Clinical Improvement Action Guide*; Nelson, Batalden & Ryer, 1998)

**Change Ideas:** Generated from literature review, best practices, benchmarking, and change concepts to select a change idea to test.

**Control Charts:** A data display over time that detects the amount of variation in a process. Shows data points in the order in which they occurred with statistically calculated upper and lower natural process limits.

**Core and Supporting Processes:** Core processes are the routine activities that are essential to functioning within a system of care. Supporting processes intermittently provide care and services to support the process of care.

**Deployment Charts:** A type of process mapping tool that documents the process across roles or departments. This is helpful when redesigning processes to optimize roles.

**Driver Diagram:** A tool to organize and track multiple improvements to achieve the "Global Aim" of the "Theme" of improvement. It also shows the relationships among the theme, global aim, specific aims, measures, and PDSA cycles in a quick, visual way.

**EMR:** Electronic medical records.

**EPIC:** A common electronic medical record system.

**External Mapping:** A map or visual diagram of all the systems and units that impact your own unit.

**FEV:** Forced expiratory volume. How much air a person can exhale during a force breath.

**FEV1:** Forced expiratory volume. How much air a person can exhale during a force breath in 1 second.

**FVC:** Forced vital capacity. The amount of air that can be forcibly exhaled from lungs when taking the deepest breath possible.

**Fishbone:** An analysis tool that depicts the possible causes that contribute to a single effect. Also called a "cause-and-effect" or Ishikawa diagram.

**Flowchart (process map):** Graphic representation of steps in a process using standard symbols and arrows.

**Gantt Chart:** Type of bar chart that visualizes various categories into time series. Gantt charts illustrate the start and finish time in a time period block. Can be used to track improvement over time.

**Global Aim:** The overall goal of quality improvement based on the selected theme of improvement determined by assessment of current performance and systems. Places improvement themes into context and is a great place from which to start your improvement work. Use global aim template.

**ILD:** Interstitial lung disease.

**Huddle:** Mini staff meeting used to keep all staff aware of current happenings. May include current PDSA, expected admissions, anticipating needs, reviewing any improvement progress or unusual situations on the unit. Does not last more than 7 minutes and is usually conducted while standing.

**Ladder of Inference:** Mental pathway of increasing abstraction, often leading to misguided beliefs and assumptions. (Chris Argyris)

**Measurement and Monitoring (Ticks and Tallies):** Observational data tracking through documenting frequency with a "Tick" or hash mark and then a total "Tally" of the individual hash marks.

**Mental Models:** Images, assumptions, and stories we create and carry in our minds about ourselves, others, institutions, and every aspect of the world.

**Macrosystem:** The larger organization that multiple meso and microsystems are nested in.

**Mesosystem:** Two or more microsystems: e.g. A patient pathway.

**Metasystem:** The highest level of the system consisting of multiple macrosystems in a larger health system. e.g. Kaiser Permanente, Dartmouth Health and CFF are metasystems.

**Microsystem:** The place where patients, families, and care teams meet. A front-line unit that provides day-to-day health care. A small group of people who work together on a regular basis to provide care to discrete subpopulations of patients. Frontline clinical units including patients, families, professionals, data, and information with common purpose with shared business and clinical aims. It produces performance outcomes. It has clinical and business aims, linked processes, and a shared information environment and it produces performance outcomes.

**Microsystem Improvement Process (MIP):** The MIP is a visual model depicting the organized step-by-step improvement process based on clinical microsystem theory and improvement sciences. The stages are assess, diagnose, improve, standardize, sustain and disseminate.

**Muda:** Any activity without value.

**Outcomes:** Short- and long-term changes that occur as a direct result of "processes" on inputs. Process outcomes measure cycle times, delays, etc. Clinical outcomes measure patient outcomes such as vital signs, infection rates, weight, FEV2, etc.

**Owner:** Person with the responsibility and authority to lead the improvement of a process. Also, the person with responsibility for a given process.

**Pace of Improvement:** Consideration of operational and seasonal impacts that affect the pace of improvement like vacations, snowstorms, etc. The PACE documents what activities, meetings, accreditations, etc. that are scheduled and then add improvement meetings and activities to ensure there is clarity in the PACE of improvement related to the prior commitments of the microsystem.

**Pareto Chart:** A Pareto chart is a special example of a bar chart. The bars are ordered by frequency counts from highest to lowest. These charts are often used to identify areas to focus on first in process improvement. Pareto charts show the ordered frequency counts of values for the different levels of a categorical or nominal variable. The charts are based on the "80/20" rule. This rule says that about 80% of the problems are the result of 20% of causes. This rule is also called the "vital few and trivial many." Again, the idea is that you can focus on a vital few root causes of the problem and ignore the trivial many.

**Patients:** The second of the 5Ps, patients are at the core of quality improvement work in a microsystem. Their top diagnoses, age distribution, experience of care, and satisfaction with current care, social determinants of health are a few measures.

**Patterns:** The fifth of the 5Ps, patterns are repeating predictable cycles and behaviors that can be observed and articulated (e.g., meeting frequency, communication and relationships, social activities, financial performance). Typically called "culture" of the micro-meso-macro-metasystem, the "artifacts" including dimensions of relational coordination and inclusion of patient and family partners.

**PDSA (Plan-Do-Study-Act Cycle):** A model of continuous quality improvement that uses scientific approach, plan-do-study-act. Originally developed by Walter Shewhart and made popular by W. Edwards Deming, who ascribed inherent variation in processes to chance and intermittent variation to assignable causes. The PDSA cycle is a four-part method for discovering and correcting assignable causes to improve the quality of processes.

**Pilot Test:** Small-scale test of a proposed solution to determine what gaps, errors or incomplete processes might exist before tested in a larger sample.

**Playbook:** The "how we do things" book. Written directions or "plays" for how different activities (usually standardized best practices) are completed on the unit. Consists of primarily a collection of best practice process maps to standardize care and processes that all staff are aware of and accountable for.

**Process Maps:** Chronological graphical displays of steps in a process. Different types of process maps include flowcharts, swim lanes, deployment charts, and value stream mapping.

**Processes:** The fourth of the 5Ps, a process is any activity that is a series of steps with a beginning and end resulting in products or outcomes. Identify and assess the processes through flowcharting core and supporting processes with the team. Core

processes, eg admission, scheduling appointments, routine visits, urgent visits, pulmonary exacerbation visits, discharge processes. Supporting processes include diagnostic studies, laboratory tests, pulmonary testing, cleaning rooms between visits.

**Professionals:** The third of the 5Ps, multidisciplinary professionals are members of the frontline team including anyone who has the privilege to provide care and services; administrative staff, lead MDs, nurses, therapists, social workers, dietitians, etc. What is the microsystem resilience score? What is it like to work in the microsystem? What is the match or mismatch between current staffing patterns and functions and what would be the ideal related to the patient information and need?

**Purpose:** The first of the 5Ps, purpose is intended to engage all multidisciplinary team members to discuss and come to consensus “why” the microsystem exists. Not the organization vision or mission, the microsystem purpose is a reflection of the reason why the members are in the microsystem.

**RēsWell:** A web-based app to assess individual and team resilience consisting of the Oldenburg Burnout Inventory and Professional Quality of Life (ProQOL) assessment and chargers and drainers.

- Oldenburg Burnout Inventory - Demerouti, A.B. Bakker, I. Vardakou, A. Kantas. The convergent validity of two burnout instruments. *European Journal of Psychological Assessment*, 19 (1) (2003), pp. 12-23, 10.1027//1015-5759.19.1.12
- ProQOL - Hudnall Stamm, B. Professional Quality of Life: Compassion Satisfaction and Fatigue Version 5 (ProQOL) [proqol.org](http://proqol.org). *Center for Victims of Torture*. [cvt.org](http://cvt.org). (2009)
- Short ProQOL - Galiana, L, et al. Development and Validation of the Short Professional Quality of Life Scale based on versions IV and V of the Professional Quality of Life Scale. *Health and Quality of Life Outcomes*. (2020)
- Special thanks to the U.S. Department of Defense.

**Run Charts:** A graphical display that displays observed data in a time sequence.

**Rhythm of Improving:** Disciplined improvement supported by regular meetings, monthly all-staff meetings, and annual retreats to plan and execute improvement.

**SDSA (Standardize-Do-Study-Act Cycle):** A model for standardizing improvement, standardize-do-study-act. The steps taken when PDSA Cycle has been successfully done to achieve the original aim consistently-“ best it can be” now. The purpose is to hold the gains that were made using PDSA cycles and standardize the process in daily work.

**Selection Criteria:** A set of criteria to help individuals select/multi-vote with a team an improvement idea to test after a session of brainstorming. Usually

includes: don't need permission to work on, can start right away, doesn't cost money, and will have the biggest impact on needed improvement.

**Small Pilots:** Small-scale preliminary study conducted in order to evaluate feasibility, time, cost, adverse events, and impact to improve upon the study design prior to performance of a full-scale research project.

**Specific Aim:** The focused aim of quality improvement including clear measurable goals and target dates. Use the specific aim template.

**Spirometry:** Breathing test to assess the amount and/or speed of air that can be inhaled and exhaled.

**Staff Satisfaction Survey:** Employee affective and cognitive satisfaction with the workplace.

**Stop the Line:** A process by which we take immediate action to stop a process that is broken. Commonly used by the Toyota car manufacturing, but useful in the health care setting as well. An example would be a pattern of a missing instrument for a surgical procedure. The pre-surgical set up process would be "stopped," evaluated to understand how the instrument was not included, then improved.

**Subpopulations of Patients:** A specific group of individuals with common patient characteristics (e.g., race/ethnicity, age, risk factors, diagnoses).

**Sustaining Improvement:** Utilizing SDSA and playbooks to sustain improvement gains and best practices while creating conditions in the microsystem to support improvement.

**Tests of Change:** See PDSA.

**Theme:** Focus of improvement after review of information and data of a microsystem.

**Trend Charts (Run Charts):** Used to show trends in data over time.

**Unplanned Activity:** Interruptions, waits, and delays in the processes of providing smooth and uninterrupted patient care.

**Value Compass:** A measurement framework designed to measure patient outcomes which can be tracked during improvements. The four domains using a compass framework include North: functional status, South: cost, East: satisfaction and perceived benefits, and West: clinical outcomes.

**Value Stream Maps:** A visual tool to show workflow, including information, data, communication, handoffs and value added versus non-value-added activities from the patient and family perspective.

