How to Run Your Own Clinical Quality Improvement Training Program

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DRAFT – a work still in progress

Course aims
Physical space and course infrastructure
Curriculum (including storyboards)
Projects and consultants
Project presentations and graduation certificates
Evaluation
Other things to think about
Resources for sister training programs

Chapter 1 – Aim Defines the (Training) System

(purpose and instructional philosophy used within the course)

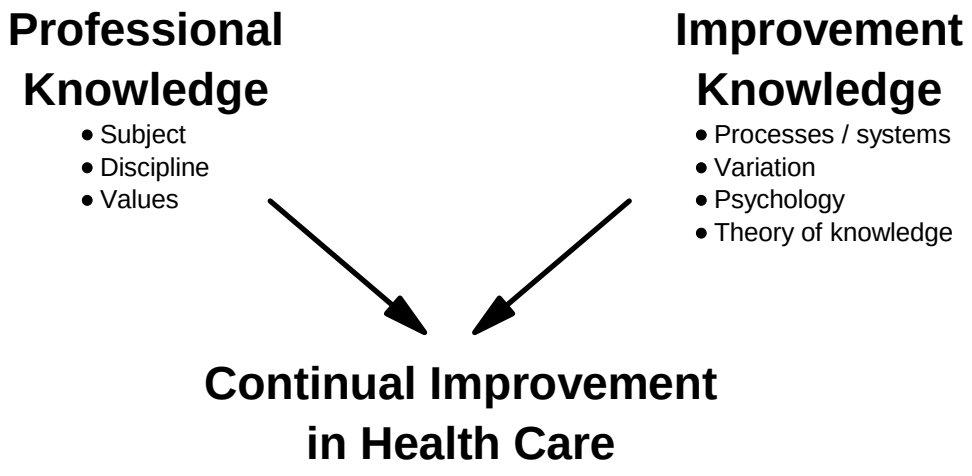
In 1986, I left the Harvard School of Public Health to set up a health services research program within Intermountain Healthcare. The foundational idea was simple: Most non-health care businesses invest heavily in pragmatic operations research, as they try to survive and thrive in competitive markets. Intermountain's managers recognized that in health care delivery, operations research is health services research. We established in Intermountain Institute for Health Care Delivery Research (IHCDR). The IHCDR was entirely internally funded (it did not rely on external grants for its core work); it had sufficient organizational independence that it could truly follow the data to scientifically reliable answers, despite internal organizational politics; and it took its research agenda from the needs of Intermountain's clinical and facility line managers. In other words, we found answers to important questions that directly affected our ability to deliver very high quality, inexpensive health care to the communities we served.

The IHCDR's initial studies looked at variation in clinical practice after hospitalization. We showed massive variation in how different physicians, nurses, pharmacists, technicians, and administrators approached and managed patients, even when those patients had the same underlying primary medical conditions and complexity and severity of illness. In 1987, I presented some of our initial findings at a national invitational meeting. Dr. Paul Bataldan (then the Vice President for Quality at the Hospital Corporation of America, now a professor at Dartmouth College) commented our variation research reminded him of similar work performed Dr. W. Edwards Deming, in manufacturing industries. Shortly after, Dr. Bataldan introduced me to Dr. Deming.

This was directly contradictory to the widely held wisdom of health care delivery at the time. In 1987, health professionals defined quality as "spare no expense." Human lives outweighed any financial consideration, often to the point where many thought it was unethical to even consider costs when discussing medical treatment. At the same time, health care delivery organizations were coming under increasingly difficult cost controls. Within that context, Dr. Deming made a fascinating argument: He could show broad circumstances where better quality should reduce an organization's costs of operations. I brought Deming's ideas home to the IHCDR. We started to add cost outcomes to existing clinical trials, in parallel with the clinical outcomes that such studies traditionally tracked. Within a few months, we demonstrated that Deming was right. We found areas where, as we improved clinical outcomes, our costs fell.

This led Intermountain to become one of the first health care delivery organizations to actively pursue clinical quality improvement. Today, of course, Deming's arguments about quality and cost are well proven within health care delivery. Everyone understands that the best way to cost effective operations is a tight focus on better patient care. However, that viewpoint represents a radical break with traditional thinking in clinical professions, and in health care delivery operations (hospital and clinic administration).

Bataldan and Stolz noted that health professionals – administrators as well as clinicians – received extensive training within a professional specialty area. If an organization is to take advantage of Deming's insight, though, those same professionals require a parallel body of knowledge, methods, and experience about improvement (Figure 1).

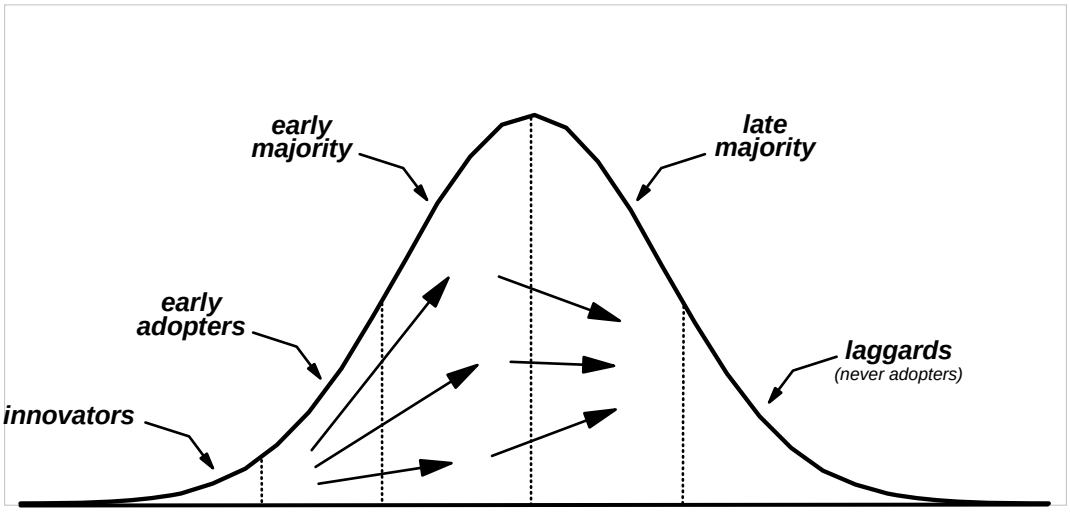


Bataldan PB and Stolz PK — A framework for the continual improvement of health care: building and applying professional and improvement knowledge to test changes in daily work. *Joint Comm Journ on Qual Improvement* 1993; 19(10):424-52 (Oct).

Figure 1. A clinical QI training program "retreads" clinical and administrative health professionals. It adds improvement knowledge to the knowledge gained during initial professional training.

Within Intermountain, we decided to address our need for this expanded practical knowledge head on. We created a training program designed to fill the gap. We called our new offering the Advanced Training Program in Clinical Practice Improvement. We designed it with 3 specific factors in mind:

Aim 1: Change the clinical and administrative culture – target who should attend
We recognized that our new training program's first objective would necessarily involve a fundamentally new culture for health care delivery and its organization. Dr. Deming commented on culture change in terms of "the square root of n." If you want to change the culture of an organization that contains "n" individuals, he said, you don't need to convert everybody; you need about the "square root of n" key leaders on board. If Dr. Deming had lived long enough to study Roger's *Diffusion of Innovation* (a classic in the field), I'm certain that he would have modified his advice to say, "Target the early adopters" (which roughly corresponds in numbers to "the square root of n" – see Figure 2).



Rogers, E. *Diffusion of Innovation.* New York, NY: Free Press, 1995.

Figure 2. Roger's Diffusion of Innovation describes a mechanism to move new approaches across an organization over time. Start with innovators and early adopters. They represent a relatively small subgroup (typically less than 15%, at most, of a total organization) that is willing to invest in change. Experiment to find what works. As they achieve success, showcase their results. Their personal word of mouth will be as effective as your parallel objective measurement in moving the change to the early majority and, finally, to the late majority (this is sometimes called an "onion patch" or "pilot and deploy" diffusion strategy for culture change).

At Intermountain, we drew up an initial "hit list" of influential physician leaders, nursing leaders, pharmacists, therapists, technicians, and administrators. We actively pursued people on that list, inviting them to attend the course and facilitating their participation by whatever means we could. Over time, we added support staff, such as medical informaticists, statisticians, and data managers. Since 1991, more than 2,000 health care professionals have completed the ATP. They break out along the following lines:

Senior physician leaders:	42%
Senior nursing leaders:	25%
Support staff:	17%
CEOs, CFOs, and senior administrators:	8%
Academics (pursing outcomes research):	3%
Other:	5%

Deming was right. Within Intermountain, as we approached "the square root of n" within any category the change was palpable. It was not that everyone agreed. Even today, we still have people within our system who viscerally oppose our ongoing shift to clinical process management and improvement. That shift represents a huge change, and a major

break with tradition. Change is hard. However, we have enough people who "get it" – and are deeply convinced of and committed to it – that we can move vigorously ahead.

The key idea is this: The main purpose of a training program is culture change within an organization. To achieve that culture change, you will need to target specific, key, individuals; and you will need to build a sufficient cadre of leadership partners, over time, that together can carry the change through the entire organization.

Aim 2: Build on the foundation of the healing professions

When introducing major change within an organization, it is not enough to stand on the peak and call to those in the valleys below to climb up to you. The key to success is to join them in the valley, then climb up together. The values of the healing profession offer a very strong foundation upon which to build. Rather than asking your students to abandon key life commitments that they hold to be true and value highly, you show them that a quality-based approach is a much better way to reach and sustain those key life commitments.

Winston Churchill said it best: People like to change; they just don't like to be changed. When you build on the foundation of the healing professions, you trigger the mechanism contained within Churchill's insight. Your course does not change people. It shows them how to change themselves, while honoring the values and deep commitments that have sustained and maintained the healing professions for more than 6,000 years of recorded human history..

Since Deming laid out his core theory (quality improvement, the science of process management) a number of strong consulting efforts have attempted to package his approach into recipes that management teams could apply. For example, during my time in process management I have lived through Total Quality Management (TQM); Re-engineering; 6 Sigma (Motorola version); PICOS (General Motors); Toyota Production System (TPS)-Lean (Alcoa Aluminum version); and a return to 6 Sigma (GE version, derived from Motorola's original experience). Today, we are seeing a resurgence of TPS-Lean.

The problem with consulting efforts is that they have inherently limited life spans. Consultants must constantly re-invent their offerings, to maintain a marketable product. Each new approach repackages Deming's core theory. Most add some clever new presentations and approaches. Some have added one or two new tools (e.g., 6 sigma as a measure of process capability; the idea of "mass customization" introduced by TPS-Lean). Our task, though, is to translate the theory, tools, and experience into the framework of clinical care delivery.

The key idea is this: You should build your course using the values and language of the healing professions. Don't ask your students to abandon their roots, replacing it with what, to them, will be the cheap substitute of the language of industrial quality control.

Instead, adapt the methods to fit the values and language of the healing professions. To the extent that you do that effectively, your students will change themselves.

In fact, it is quite common for graduates of the ATP to say that it has "given them a new lease on professional life;" that it has "restored and intensified their commitment to the core values of the healing professions, which is what brought them into medicine (or nursing, or health administration) in the first place." Most often, they simply say that the course has changed their lives.

Aim 3: Demonstrate organizational accountability - show a return on investment
Running a clinical quality improvement program will take a very large amount of organizational resources. It will take planning, lesson preparation, space, food, paper, and faculty. The most expensive part of your course, though, will be the time your students spend away from their regular day jobs. A course that involves adult workers inherently reduces their work productivity.

At Intermountain, we tried to show value through intense customer focus – where our primary customers are the managers who send their people to the course. Today, any internal person who attends one of our clinical QI training courses must be sponsored by their line manager.

We make specific commitments to management sponsors. Specifically, any person whom they send to the course will be able to, upon graduation:

1. Facilitate an effective process improvement team;
2. Act as an internal consultant, helping their colleagues solve problems and improve working conditions in day-to-day, "over the back fence," conversations with their co-workers; and
3. teach – we cannot train a sufficient number of individuals through out central program to supply all of the needs of Intermountain's 30,000+ employees. Therefore, many subunits run their own internal training programs. The ATP is Intermountain's "train the trainers" for that purpose.

To us, "customer focus" means that if we fail to provide significant value to the line managers who send people to our courses, they will simply stop sending people.

A second major principle applies. As is outlined below, graduation for our training programs requires that students complete a process improvement project. Given the artificially short time frame of the course, not all projects are immediately successful. Despite the fact that only about 1 in 4 projects "go golden," the financial gains from those projects that do succeed are far more than enough to completely justify the entire course, including the time of course participants away from their productive daily work.

The key ideas are these: First, focus strongly on the line managers who send people to your course as your primary customers. Your students are also very important customers,

but their role is defined by their managers. Second, find a mechanism to actively track financial results, side by side with quality results, in your student projects. Play the winners. It is your job to package the successes, financial as well as quality, and vigorously share them with the leadership of your system. A solid demonstration of ROI will guarantee that your funding does not dry up during the lean times that cyclicly hit any organization.

Summary aims:

Change culture (leadership and front line, clinical and administrative)
Create partners (rocks in the stream; internal consultants)
Build on the foundation of the healing professions (the core business of health care delivery is patient care; facilities management is an important secondary aim)
Supply teachers
Build concrete examples that can help convince others (projects)
Document and vigorously disseminate improved outcomes (projects)
Produce direct return on investment (through successful projects)

Teaching methods

In contrast to traditional high school and college education settings, adult learners bring a wealth of experience to a class. Effective instruction links to that experience. Master teachers tell carefully selected stories then extract core principles from the stories. Good stories link to students' real life experience. They "hook" adult learners, grounding theory in experiential reality, and lead more directly to real change. A practical focus causes most adult learners to greatly value immediate, hands-on application of theory and tools taught in a didactic session. In other words, your ability as a teacher depends on the quality of your stories, and how well you can tell them.

In general, human beings learn through 3 parallel mechanisms:

- visual (learn by seeing)
- auditory (learn by hearing)
- kinesthetic (learn by movement, such as taking note or participatory learning)
- experiential (learn by doing)

Any individual will subconsciously emphasize and rely upon one primary method, but nearly all individuals use all of them to some degree. Good instructional approaches combine all three. One particularly potent combination starts with didactic presentation (major emphasis on visual and auditory) then moves to kinesthetic (hands-on participation). Under this method the instructor teaches a concept, then breaks the class into small groups and assigns a practical problem to extend the just-discussed theory to practical application. This instruct-practice approach (see one – do one) is particularly useful for adult learners. It teaches practical skills, as well as theory. It gives the students

to try out the skills, ask questions, and more deeply understand their application before leaving the instructional setting.

However, such an approach suffers from 2 limitations: First, the hands-on sessions consume time. If a course must cover a large number of tools and concepts, while facing a limited amount of class time, then the routine use of hands-on case applications competes directly with total class content. Second, the problems assigned for hands-on practice are almost always artificial. They represent simple applications that can fit into a classroom setting. One size must fit all. Very often, good hands-on problems for classroom instruction, do not match the each student's local needs after leaving the class.

The ATP attempts to find a balance. Hands-on application comes through a project, rather than artificial in-class practice sessions. The course is therefore divided into 4 sessions, at roughly 1 month intervals (sometimes the final interval can extend to as much as 2 months). Classroom time is devoted mostly to instruction, out of respect for the students' time away from home and work. After leaving the course, each student works on a real project between class sessions, based on homework assignments that are part of the course. They bring back their real experiences and debrief with an expert (a consultant) at the next session. This minimizes time spent in the classroom (always an issue for experienced health professionals being pulled from full-time work). Hands-on experience comes from real work, not from artificial teaching constructs.

Fast methods for hands-on experience

While the ATP format attempts to direct most hands-on practice with the tools it teaches to real projects between classes, there are some methods that give structured experience without major time commitments. Dr. Eugene Nelson (Dartmouth College) recommends dividing a class into small groups of 4 to 8 individuals. Each group selects a "reporter." Then, at the end of each major section, the course instructor asks the class to break into its small groups, then identify and discuss

- the thing in the lecture just finished that was most murky, unclear, or difficult
- any items or details that were missing
- any special applications of theory, method, or tools just covered

Discussion time is limited, typically to something on the order of 3-5 minutes. At the end of that time, the instructor has two or three groups briefly report, building on and expanding each "reporter's" comments. The instructor then asks the groups at large if there are any other critical elements.

At least some sort of structured interaction, within the content of the course, if quite important with adult learners. Many such students expect embedded hands-on practice time. Skipping over some sort of practice interaction will generate complaints and negative evaluations. The only reason the aforementioned method works, though, is that they have a fixed structure. This means they start and stop quickly, without a lot of set up time around any specific question.

Teaching in small blocks

Some research on teaching methods suggest that all learners, including adults, lose focus within relatively short periods of time. In response, some instructors break there presentations into small, modular, blocks of about 8 – 12 minutes duration. They tell the students they are setting up the session that way. At the end of each block, they do quick review and interaction, including fast skill practice if applicable. At the end of their lecture, they pull all the pieces together into a comprehensive whole.

Class discussion and class size

In adult learning settings, interactive discussion is essential. Students need to be able to clarify issues, extend the discussion to new questions, resolve conceptual concepts, and share experiences. There are two main ways to handle class discussion: Some instructors ask students to hold all questions to the end of a section, writing their questions down to be certain that they don't get lost. This approach tends to be more efficient. Very often, the instructor's prepared material will answer a question a few minutes down the path. Most instructors actively encourage interaction. Real-time interaction tends to hold students' attention more actively, perhaps even breaking the instruction into the 8-12 minute segments mentioned above. It also allows an instructor to much more accurately gauge the tone and tenor of a class, and adjust on the fly. Some instructors create interaction by routinely building questions into their presentations. (One idea: If you use questions, carefully observe the class then direct your question to those quiet students who otherwise don't directly interact.)

Full interaction offers another very significant advantage: To the extent that the members of a class come from diverse backgrounds and locations, they can supply differing viewpoints that can greatly improve the insights gained during a session. For example, the ATP often brings together health professionals from around the United States, and often incudes a few individuals working in care delivery in other countries. Any issue discussed will be slightly different across those different settings. The resulting discussion gives levels of insight far beyond what any instructor can hope to convey working alone. In other words, classes of experienced adult learners are as much about shared learning among the participants, as they are about didactic instruction from faculty alone.

Full interaction also presents a very significant challenge: Some individuals may tend to dominate the discussion, while others' personal mannerisms will lead them to sit quietly in the background. If one of two students interact too aggressively, other students may find little value in the discussion. This, too, will lead to complaints. It is important to set initial expectations with the course participants, including mechanisms to put off some discussions because the topic comes later in the prepared flow of the course; "parking lots" to hold secondary topics to the end of the discussion; or off-line discussions with some individuals.

Experience with the physicians, nurses, support staff, and senior administrative executives that make up the bulk of a typical ATP indicates that the ideal class size for interactive discussion is about 25 – 30 individuals. We try to cap classes at 40

individuals, because more than 40 people seems to result in a significant decline in discussion. However, other programs successfully operate with significantly larger classes. For example, the Sutter Health MC&E program routinely brings 60+ students into a single course. The main point: You will need to adjust your teaching and interaction methods, based upon the number of people you allow into a single session.

<Note: Be certain that individual students attend all sessions, so that you are not repeating previous material and discussions>

Chapter 2 – Physical Space and Course Infrastructure

Physical layout

- Large room with good acoustics
- Bank of windows along one side (visual alternatives turn out to be very effective)
- Working space (tables) for students, with comfortable chairs
- Large open space at the back, with a full sit of refreshments (drinks, food), etc. The idea is that students can get up and move around the room even as the course proceeds, without unduly inconveniencing their table mates. For example, a student can go to the back of the room to get a drink, stand and stretch, while still participating fully in a lecture.
- Separate "Ready Room" with computer terminals (for web access), several phones, a fax machine, a printer, a comfortable couch, and a conference table and chairs for small group meetings. This is a primary space where students can take phone calls, for the inevitable consultations and teleconferences that will arise. It gives them privacy in an alternative space, so that such calls do not disrupt the class.
- Full wireless web access in the room, along with power outlets and hardwired Ethernet connections in the floor

Display equipment

- Computer projector of sufficient strength to display a large image, easily viewable from all part of the room, with full room lighting and with unblinded windows (typically XGA 1024x768 resolution, minimum 4,000 lumens)
- Sound system for presenters and for computers, videos, etc.
- Cart with DVD and VCR players, overhead projector, etc.

Materials

- Handouts, binders, books, book bags, etc.
- References and additional resources

Faculty

Other factors and issues

- Food / candy jars, etc.
- Local entertainment book
- Managing supplies (with TPS tools)
- Location of course (in-house vs. off-site; interruption prevention)
- Doodlers
- <actual Intermountain process flows for course operation, etc. – in appendix>

Chapter 3 – The Curriculum

The Intermountain miniATP is divided into 4 sessions. Instruction starts at 8:00 a.m. each day, with 15 – 30 minute breaks mid-morning and mid-afternoon. Class ends by 5:00p each day, except for the last day of each session. On each concluding day, the course ends by noon to give participants travel time.

Consultants meet with project teams over lunch during each of the first 3 sessions (see below). We also use lunch times for special video presentations, such as the John Nance patient safety video in Session 3. We arrange special hands-on training sessions for Microsoft Excel, Microsoft PowerPoint, Pen and Pencil Statistics, and other topics of special interest outside of the regular work day (e.g., at 7:00 a.m. or at 5:30 p.m.). Interested students sign up based on their own interest and perceived needs.

Figure 3 shows a general layout of the curriculum of Intermountain's miniATP. Some parts of the course are coordinated blocks, that must come in a specific order:

- the Introduction and 3 Methods are a block. They must come before any other section in the course, and should follow each other immediately.

- Modeling Processes and Pragmatic Science are an ordered block that should follow each other immediately.

- Quality Controls Costs and Tracking Healthcare Costs are an ordered block, but work well when broken up across 2 sessions.

- Understanding Variation, Data Types: Which SPC Chart Should I Use, and Severity of Illness Adjustment are an ordered block that spans sessions. This particular block addresses statistical concepts, which are some of the most difficult concepts in the course. They work best in separate sessions, at the first of day when the students are fresh and rested.

- Clinical Integration, Designing Data Systems, and Tracking Healthcare Costs are a sequential block, best presented in a single session. Note that Tracking Healthcare Costs also blocks together with Quality Controls Costs.

The other lectures in the course are flexible. They can be put in wherever convenient, with a few exceptions:

- Features of Effective Teams needs to come in the first week of the course. It is essential as students start up their project
- Curing versus Caring (service quality) can float, but generally works better somewhere in the first 2 sessions. Most course participants find it very interesting, while the content doesn't present the same degree of conceptual challenge as some other topics (i.e., statistics). It fits very well as an "after lunch" topic, when students energy levels tend to lag.

Day	Lecture	QI theory	Process and team tools	Patient safety	Variation tools	Financial tools
Session 1						
1	Introduction	**XXX**				
	3 Methods	**XXX**				
2	Modeling Processes		**XXX**	**XXX**		
	Pragmatic Science	**XXX**	**XXX**			
(float w/in session)	Features of Effective Teams		**XXX**			
(float w/in session 1 or 2)	Quality Controls Cost	**XXX**				**XXX**
3	Understanding Variation	**XXX**			**XXX**	
	Storyboard presentation					
	Homework assignment #1					
Session 2						
1	Data Types: Which SPC Chart Should I Use?				**XXX**	
	Deployment: Clinical Integration	**XXX**				
	Designing Data Systems		**XXX**			
	Tracking Healthcare Costs					**XXX**
2	Quality Planning Tools		**XXX**			
	Curing vs Caring					
	Storyboard presentation					
	Homework assignment #2					
3	Putting Quality Into (Primary Care) Practice		**XXX**		**XXX**	
Session 3						
1	Quality Improvement Leadership	**XXX**				
	Patient Safety			**XXX**		
(over lunch)	John Nance video			**XXX**		
	Shared Baseline Protocols and Medical Malpractice	**XXX**				
	Clinical Information Systems	**XXX**				
2	Severity of Illness Adjustment				**XXX**	
	Storyboard presentation					
Session 4						
1	Project presentations					
	Graduation dinner					
2	Curriculum review					

Figure 3. Curriculum layout for the Intermountain miniATP. Special note: Change management theory and tools are integrated into the entire course, rather than being treated as a separate lecture.

- Protocols and Medical Malpractice, and Clinical Information Systems tie up loose ends around topics that class participants often raise. If we fall behind on the total 4 session schedule with group, these are primary candidates to drop. Doing so will not damage the overall structure of the course, from a pure process management and improvement viewpoint.

- Patient Safety and Quality Improvement Leadership are summary lectures that depend very heavily on a well-informed class group. They therefore fit far better at the end of the course.

The overall course is structured into 4 sessions to facilitate participants' projects. Course content is coordinated to the projects, and to the homework that is assigned at each of the first 3 sessions. Students learn about the concepts. They return to work, where they get hands-on experience as the apply the theory, skills, and tools they just learned as they conduct their project. Then they return to the next session, where their experience is shared, debriefed, and discussed, both through the content of the course itself, through peer-to-peer conversations within the class, and with their consultants. A 3 to 4 week space between sessions seems to work quite well relative to the homework assigned. A longer period works better between the third and fourth sessions, however. At that point, the project teams are running PDSA cycles to test changes, and more time means more chances to run cycles. However, when we extended the break beyond about 6 to 8 weeks, we began to see teams that lost track of their projects entirely and were not prepared to present in the Session 4.

Notes on the specific lectures (with objectives)

Managing Clinical Process: An Introduction to Clinical QI

- Definition of processes
- Quality improvement as the science of process management
- Classes of outcomes: physical, service, cost
- Process management

3 Methods

- Feedback of comparative data (QUE studies)
- Practice guidelines/protocols (ARDS study)
- Computerized decision support (Antibiotic Assistant study)

Modeling Processes

- Use of conceptual and detailed flow diagrams
- Use of cause and effect diagrams, tally sheets and pareto charts in organizing and displaying information
- Formal team tools: brainstorming, multi-voting, nominal group technique (NGT Dephi methods)

Pragmatic Science

- Accelerated improvement efforts
- Goal: improvement vs. research

- Fundamental improvement questions
- Graphical display of data
- Adjusting for differences in inputs (severity, cohort formation)
- Extracting medical evidence; synthesis / meta-analysis of data

Features of Effective Teams

- Explain the differences between committees and team structures
- Describe the features of a "good" team: safe, inclusive, open, consensus seeking
- Define team roles; team leader, facilitator, team member
- Understand the value and use of ground rules
- Create and utilize storybooks and storyboards

Understanding Variation

- Specification limits
- Process capability
- Frequency distributions; central limit theorem
- Methods for separating random from assignable variation (introduction to Statistical Process Control)
- Methods to manage assignable variation: tracking to root causes
- Methods to manage random variation: Shewhart's PDCA cycle (the scientific method)
- Tampering

Data Types: Which SPC Chart Should I Use?

- Four types of data: nominal, ordinal, interval, ratio
- Correlation between SPC graphical analysis and data type
- Role of underlying distributions when constructing control charts
- Rules for collecting data

Severity of Illness Adjustment

- Understand the conceptual implications of different severity measures
- Understand the impact of data on severity measurement
- Explore the impact of different severity measures on perceptions of outcomes

Deployment: Clinical Integration

- Understand the structural considerations for replicating improvement across systems of care
- Describe Intermountain's management structure designed to accomplish implementation
- Understand drill-down versus outcomes tracking approaches

Designing Data Systems

- Concepts important when designing a data system
- Relationship between aim statement and data system design
- Components of self-coding data forms

Quality Controls Costs

- Causal links between quality and cost
- Quality waste -- cost of poor quality

- Productivity / efficiency -- limited resource utilization
- Optimalist-maximalist argument -- implications of cost pressures for the health care system

Tracking Healthcare Costs

- Reductionism and sub-optimization
- Fixed vs. variable costs
- Direct vs. indirect costs
- Activity based cost accounting
- Strategies to harvest quality savings
- The business case for quality

Quality Planning Tools

- Understand Quality Planning Tools
- Understand the relationship between quality planning tools and other quality planning processes
- Establish a framework for the prioritization of resources

Curing versus Caring

- Definition of "customer"
- Definition of "expectations"
- Methods of managing customer expectations
- A generic, functional definition of quality

Quality Improvement Leadership

- Understand the components of reward and recognition systems
- Identify the principles regarding diffusion of change
- Define major factors of a quality leader

Patient Safety

- Recognize how system failures create errors
- Determine patient safety clinical focus areas for their organizations
- Identify and make recommendations for local and national collaborations

Protocols and Medical Malpractice

- Principles that can help a health care provider avoid medical malpractice claims or assist in defending against litigation
- Legal pitfalls and promises of protocol usage
- Suggestions for minimizing liability

Clinical Information Systems

- Core principles of clinical information systems
- Requirements of clinical information systems: central patient record, expert system, encoded data
- Issues of clinical information systems implementation

<add in reading lists and Excel homework lists>

Chapter 4 – Projects and Consultants

The ATP is structured around improvement projects. Every course participant must complete a project to graduate. Projects serve at least 3 major roles:

1. Projects give adult learners the hands-on experience that makes the learning real, translating theory into applied practice.

2. Projects produce real results for the sponsoring organization. They are the main method of showing direct return on investment. They justify the substantial expense that the organization must allocate to conduct the training.

3. Projects provide a very potent means to evaluate what works (or doesn't work) within the course. As documented elsewhere, they are the primary metric for continuously improving the course itself.

Many people attend improvement courses as work teams. (In fact, at Intermountain we actively encourage workgroups to come learn together, so that students can share and cross-support each other both in the classroom and back at work between sessions.) When people come to the course as a team from a shared work unit, we strongly suggest that they work together on a single shared project for the course.

Selecting projects

The final responsibility for any hands-on project always rests with the student. While training program staff, consultants, and faculty can advise, encourage, and support, the student must actually do the work that drives the learning. Within the Intermountain ATP, we have therefore always insisted that the students choose their own projects.

We do give students advice about project choices: Small scope processes with obvious failure points are relatively simple. They thus fit the artificial time constraints of a course. Given that the student will be doing the improvement work as part of their regular work day, the best projects are processes that the student works within on a daily basis. We therefore suggest that students look for process failures within their own daily work. The biggest hassles and most frustrating problems within routine daily work almost certainly represent process failures, and are very good targets for a project. (That is exactly how we advise the students: "Look for your biggest hassles and frustrations in your daily work.")

Some participants in your course may not have a work environment that offers a good opportunity for learning by doing. I usually direct such individuals to Roberts' *Quality Is Personal*. That text describes application of process management and improvement principles to the hassles of daily living – things like processing your mail in a timely, organized fashion, or exercising regularly. Obviously, any person will have experience and opportunities in that realm.

Finally, some senior executives will see organization and planning as their primary work responsibilities. As the course director, I usually serve as the consultant for those projects personally. They don't fit the standard Juran Diagnostic Journey, Remedial Journey model. The truth is, many of them are not actual process improvement at all, but the high level planning and organization to systematically introduce process improvement into an organization. While happily quite rare – they don't illustrate data-based problem solving as clearly as process-based improvement – those kinds of projects count too.

The very best projects come when a team attending the course comes with the full sponsorship and support of their management team. For example, at MD Anderson Comprehensive Cancer Center, the chief operating officer (Dr. Tom Burke) uses their CS&E course to routinely solve real problems that the organization faces. When someone raises a major problem that needs solution, he helps them form an improvement team then sends the team to CS&E with that particular project. This aligns the organization's needs: The course automatically hits the best people for culture change, while helping front-line teams solve real problems that make a difference, with senior management fully engaged.

Dr. Patricia Martinez is the chief quality officer for Asante Health Care in Medford, Oregon. She identified a series of Core Teams around Asante's clinical strategic mission. She met with her CEO to identify key leaders, assigned them to the Core Teams, then sent them to the Asante clinical quality improvement training program to help Asante's leaders learn while they solved strategic issues for their system. When a course is structured in this way, the organization's investment in the course takes on the appearance of being staff support for strategic change initiatives. Project assignment through senior management acting upon a strategic plan is essential.

Project-based homework assignments

At Intermountain, the entire clinical quality training curriculum is structured around hands-on learning. The "hands-on" part comes through the projects that form the core of the course. We therefore structure the course curriculum according to the tools that students/teams will need as they work on their project, step by step, and assign specific homework at each session that represent the application of key concepts taught during the session. More pragmatically, the homework walks each student/team experientially through the sequential elements of data based problem solving, using Juran's model of the Diagnostic Journey, the Remedial Journey, and Holding the Gains (see Figure 4). If students/teams complete the homework in a timely way, they will have solid projects to present in the final session.

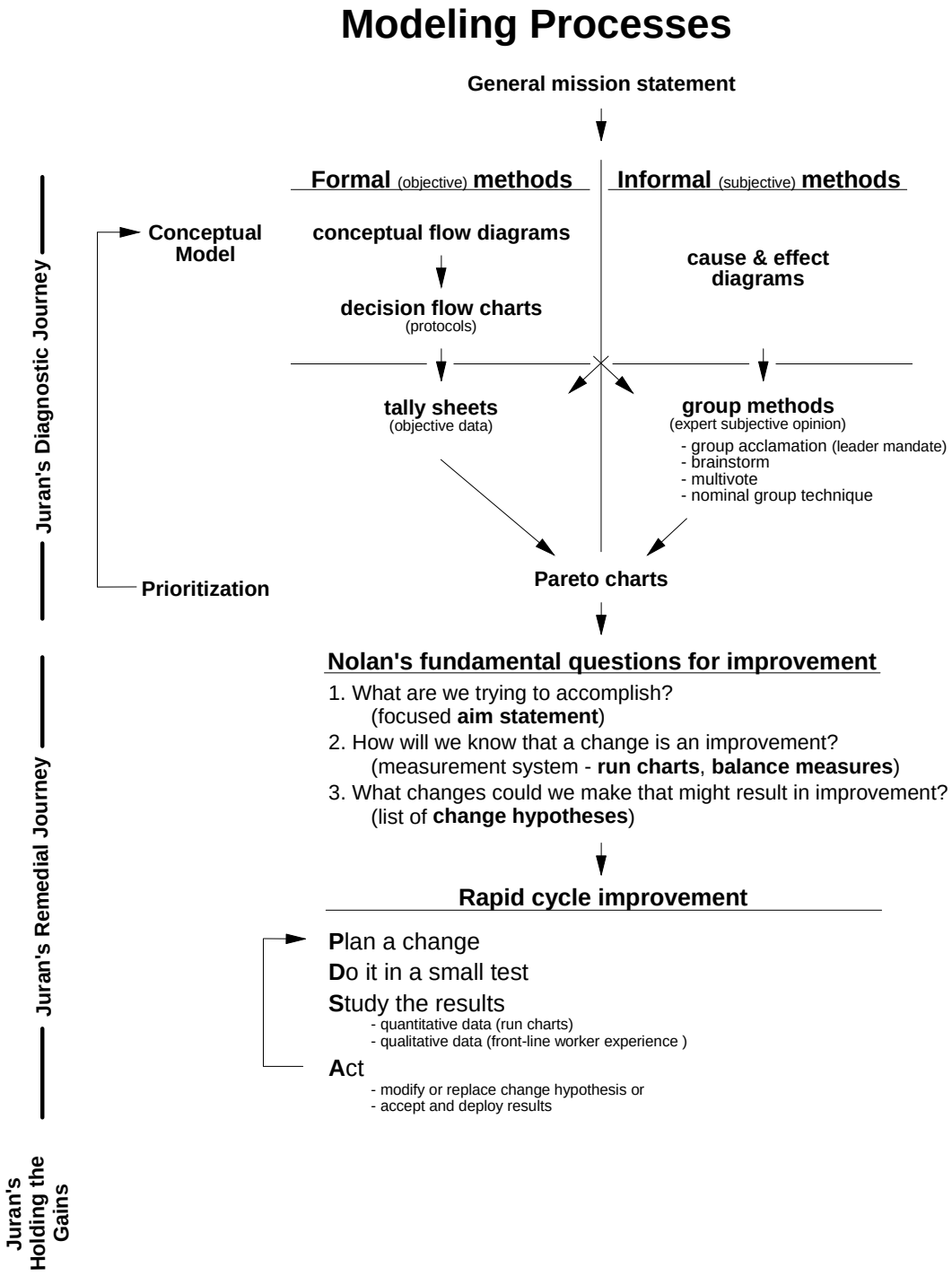


Figure 4. A general model for typical data-based problem solving in a process management and improvement environment. This model is the basis for homework assignments and consultant meetings in the Intermountain clinical QI training program.

Here are the actual homework assignments from the Intermountain course, directly linked to the content of each associated session:

Session 1 assignment
By our next meeting (Session 2), you should be prepared to submit in written form, describe, and discuss with your consultant:

1. A **general mission statement** for the problem you are attempting to address (or the opportunity you to hope to develop and exploit)

2. A **conceptual diagram** of your process (e.g., conceptual flow diagram, decision flow diagram, cause & effect diagram)

3. A **list of team members** that reflects
   - the two-way street of "fundamental knowledge up, ownership and participation down"
   - similar two-way linkages to a management champion group

   You should be prepared to discuss how you selected your team members based on these principles, how you trained them in their interactive role, and how you have followed up to insure that they are filling that role.

4. A high-priority **leverage point** (or points) within your process (drill down for action), that represent your best opportunity for improvement

   You should be prepared to describe how you identified your leverage point(s), using objective data (e.g., tally sheets), expert opinion (e.g., brainstorming, multivotes), and prioritization (Pareto charts); and to defend that they objectively represent your best points of attack.

5. A properly structured, tight and terse, **aim statement**:
   - that represents an important topic (that can engender enthusiastic team support)
   - outcomes focused (directly implies measurement)
   - specific, stretch goals
   - timeline
   - target population
   - terse, succinct

Session 2 assignment
By our next meeting (Session 3), you should be prepared to submit in written form to your consultant, then describe and defend:

6. What you plan to measure to "tell if a change was an improvement"
   - laid out as an **annotated run chart**;

- that links directly to the measurement implied in your primary aim statement;
- using actual baseline measurement if possible, but "dry lab" (made up) example data if necessary (to show exactly what the run chart will look like, including axis labels, etc.);
- including balance measures, if necessary (to track potential negative effects; pick up parallel changes important to the project; etc.);
- with a description of your intended data collection mechanisms (e.g., how you will blend tally sheet methods into the flow of front-line work, with support and help of your front-line team)

7. A prioritized **list of change hypotheses** (minimum of four) – what you plan to change, in order to move toward the goals laid out in your aim statement

Session 3 assignment

At our next meeting (Session 4), you will present your project (storyboard of process management and improvement) to the class, using the format described in course. I will evaluate your project (in order to grade the success of the course), based on:

- Whether you introduced at least one change into your process, with an intent to improve performance as specified in your aim statement;

- whether you tracked sufficient data following the change, to be able to tell whether "the change was an improvement" (Fitzpatrick Level 3); and

- whether you showed statistically-significant movement toward your stated goal (measured improvement – Fitzpatrick Level 4).

To help students better understand the structure and content of a final project presentation, we:

- Describe the layout of a PowerPoint storyboard for the final project presentation, as a part of the course.

- Include "storyboard presentations" in every session, where experienced clinicians who have "been there, done that" present their own ATP projects, then respond to questions. This is also very useful to demonstrate the use of data-based problem solving tools, and how they string together within a process management setting (plus, we try to pick clinical improvements that are impressive and just plain fun – see Chapter 2, on Curriculum, above).

- Provide a special section of especially outstanding presentations from earlier courses on the IHCDR website, and encourage current students to review several cases. We direct their attention to the format of the presentations, as well as their content.

- Conduct break-out session to teach Microsoft PowerPoint (part of curriculum).

At Intermountain, we present the entire homework list starting in Session 1, then review it during class in each subsequent session. Some teams will make very rapid progress, and be able to start on the Session 2 homework assignment even before they return for Session 2.

Project consultation

A key factor in successful projects is embedded consultation. Each session, time is set aside for project teams to meet with an expert consultant. Times for consultation are blocked out in the printed class schedule. Very often, the same consultant works with the team between sessions, through face-to-face meetings (if possible), e-mail, two-way interactive video, or by telephone. Beyond facilitation and support, the primary aim of consultation is accountability: The consultant sets intermediate and final deadlines and tracks student/team progress on those deadlines. This is the key factor to insure that students will have solid projects to report at the final session.

Good consultants are:

- People working within your organization, who take time from their other assignments to help new teams learn and succeed (in other words, management assigns part of their time to help support improvement teams in a learning environment). Consultants enjoy small-group teaching and facilitating. They are skilled at it.

- Most often, a consultant is not expert in the problem the team is addressing. Topic expertise arises from within the improvement team itself. However, a good consultant is expert in data-based problem solving through process management (improvement). They know, from personal experience and application, the underlying theory of improvement (methods and tools) and the practical, hands-on reality of running a successful team and driving real change.

- In selecting consultants, it may be useful to think about specialized improvement skills. For example, at Intermountain nearly all IHCDR technical staff (e.g., statisticians) routinely consult, helping 2 or 3 (and sometimes more) teams in each class group – it's part of their job. Of course, all such IHCDR staff are trained facilitators, at or close to a black belt level. In addition to knowledge of improvement, they also bring very strong skills in data collection, storage, organization, and analysis – all areas where many clinical teams need added support. Leaders at MD Anderson Comprehensive Cancer Center assign management engineers to serve as project consultants within their courses. Anderson's management engineers are all Lean or Six Sigma black belts. They bring special expertise around automation, measurement, human factors – a very broad blend of specialized skills, that the course leadership match to specific team needs. Other organizations rely upon interested clinical leadership and technical staff, who are themselves trained QI facilitators

(often through the same training program where they are now consulting) and who bring other specialized measurement and improvement skills.

Several successful organizations have built a cadre of consultants drawn from among their high- or mid-level managers. In addition to helping an improvement team learn by doing, management-level consultants also facilitate organizational resources and address organizational barriers. This approach provides a strong back channel: Those same managers get a very good sense of how the training program is functioning, and direct experience of the sorts of problems that front line teams are facing.

- Think about "secondary consultants." Many of your students will come from organizations (or parts of your own organization) where your prior graduates currently work. In addition to the consultants that you provide as a key part of the course, consider explicitly connecting your current students with your former local graduates, who sometimes can serve as a very effective secondary source of advice and support.

The bottom line: Your successful clinical quality improvement training program will need to build and maintain a group of effective consultants based within your home organization. Building and maintaining project consultation resoucre will require careful up-front planning and competent ongoing management. It is something that a training program can "grow into" over time, by carefully selecting among its own interested graduates.

Within Intermountain, we directly link consultation to project-based homework assignments (outlined above):

0. **Before the course starts**

- In initial communications sent before the course starts, we ask each student to send us a brief outline of the course project that they plan to undertake (this ties to our Introduction DVD, mentioned elsewhere). We raise and recommend the idea of student teams, and ask that they outline possible teams that might evolve if their group is sending several people to attend the course together.

- In a pre-course planning session, we match student's project plans to skill sets and interests of our internal consultants. We make initial assignments, matching a consultant to each project (student or student team), fully understanding that we can adjust consultant-student match-ups "on the fly" as the course progresses.

- We schedule Consultation Reviews following each course session (see below).

1. **Week 1 consultation session – Get ready for the Diagnostic Journey**

Aim: Introductions and expectations; discussion of a general problem area (mission statement) for the project; distribution and discussion of the written deliverables that the student/team should bring to the Week 2 consultation.

Typical time: < 15 minutes – should happen after the first day of the course is complete

Step 1 – Introductions and expectations. Get to know each other – names, backgrounds, etc. Establish means of between-session communication, such as e-mail addresses and telephone numbers. Reinforce a major expectation that is covered in the first session lectures: Specifically, the consultant knows the tools and methods of data-based problem solving, but (usually) has little or no background regarding the specific problem the student/team is attacking. The role of the consultant is to help the student/team understand and use the tools and methods, not to do the project. The actual work at each step belongs entirely to the student/team.

Step 2 – Discussion of a general problem area. The Introduction to the ATP DVD recommends that students consult with their home-system management (who are, presumably, sponsoring them to the ATP) to select an appropriate project before attending the class. Those who follow this recommendation should be able to present a outline of the problem they wish to attack – a general "mission statement." The mission statement lays the foundation for the student's Diagnostic Journey.

Step 3 – Before the second course session, the student/team should complete the steps of the Diagnostic Journey. Explain that the student/team should bring the finished work, in written form, to the consultation meeting at the next session, with a copy to be left with consultant.

Common problems – Despite the advice contained in the Introduction DVD, some students will not have selected a project problem area by the time of the first consultation. In such circumstances, the main purpose of the first consultation session is to help the student/team understand how to choose a good project, and to establish a clear expectation that the student/team will need to complete the project selection step, as well as the regular homework assignment (Juran's Diagnostic Journey), before the next session.

In rare other cases, the selected problem area will not fit the general problem-solving approach contained in Juran's Diagnostic Journey / Remedial Journey format. At Intermountain, we usually ask the course director to act as the consultant for such students/teams, generating a unique design that will result in a successful final project presentation during Session 4.

2. **Week 2 consultation session – Report results from the Diagnostic Journey; get ready for the Remedial Journey**

Aim: Validate that the student/team has completed the Diagnostic Journey (or, at least, is making solid progress in that direction with a clear plan of action); distribute and discuss the written deliverables that the student/team should bring to the Week 3 consultation.

Typical time: ~ 30 minutes

Step 1 – Review written deliverables assigned at Session 1:

- a (written) general mission statement
- (written) conceptual model(s) for the process being improved (e.g., conceptual flow diagrams, decision flow diagrams, and cause & effect diagrams)
- a (written) list of team members who bring fundamental knowledge of the process
- data generated by measurement or expert opinion, showing high priority failure points or areas of opportunity within the process (tally sheets, multivotes, Pareto charts)
- a (written) aim statement (demonstrating the Features of a Good Aim Statement, contained within the course in the Pragmatic Science lecture)

As the student/team presents their results, the consultant should use those materials to reinforce concepts covered within the course. For example, the consultant should ask how the mission statement represents an important area of improvement for the home organization, and expect a reasonably detailed, thoughtful reply. The consultant should discuss the list of team members in terms of fundamental knowledge (does the team include front-line, hands-on people who understand each step in the real work process), in terms of linkages to upper management, and linkages to front line workers (how did team members share results with their coworkers, gathering good ideas and letting their colleagues at the front line know, contribute to, and gain ownership for the change cycles that will soon be coming). The consultant should carefully review the initial Aim Statement, being certain that it implies measurement (outcomes focused), that it sets specific stretch goal targets, that it contains target dates (which hopefully relate to the project presentation in Session 4), and that it identifies target populations.

Step 2 – Assign and review the written deliverables that the student/team will present to the consultant at Session 3 (the set-up for Juran's Remedial Journey, outlined above). Explain that the student/team should bring the finished work, in written form, to the consultation meeting at the next session, with a copy to be left with consultant.

Step 3 – Arrange and schedule initial between-session telephone and e-mail follow-up, if necessary, especially if the student/team has fallen behind on deliverables and so needs to catch up.

Common problems – Confusion about the actual problem/process that the student/team will address; problems and barriers, usually related to time and team function, that have stopped the student/team from completing all of the deliverables due at this time.

At this stage, the consultants role is (1) to provide technical support and good ideas with regard to the challenges the student/team is facing; (2) to be very clear about course leaders' expectations regarding project deadlines and a successful final presentation, while being equally clear that the student/team is ultimately responsible, not the consultant; and (3) to provide enthusiasm and encouragement ("yes, all teams face problems like this, but they are surmountable – look at how these other teams overcame the challenges!").

3. **Week 3 consultation session – Report results from the Remedial Journey set-up; discuss rapid cycle change testing and preparation of a final project presentation**

Aim: Validate that the student/team is ready for the Remedial Journey (rapid cycle PDSA change testing); review resources for preparing and formatting a final presentation; set expectations regarding the structure and operation of the final presentation.

Typical time: 30-45 minutes

Step 1 – Review written deliverables assigned at Session 2, as well as any updated materials from earlier assignments:

- a (written) annotated run chart that tracks the key outcome contained within the project's aim statement
- a (written) list containing a least 4 prioritized hypotheses for change

Following the format laid out in the Session 2 consultations, as the student/team presents their results, the consultant should use those materials to reinforce concepts covered within the course. For example, the consultant might review cycle times for data production, linking back to tally-style data that embed into daily work processes. The consultant should investigate availability and collection of baseline data (it is very good if a team already has baseline data at this point). The discussion should address balance measures – whether they are necessary, and what they might look like.

Usually, the list of possible change hypotheses is the simplest part of the review. Most of the change ideas devised before the first PDSA cycles won't survive initial testing. The key element is to be certain that the student/team is not stuck on a single idea – that they haven't "jumped to solutions," and will try to force fit a preconceived solution whether or not it works. The purpose of demanding a list of 4 change hypotheses is to help students/teams avoid that trap; the purpose of the review is to check whether the team has avoided the trap. The content of the list is secondary.

Step 2 – Review the structure of a final project presentation (insert diagram of storyboard layout here), remind the student/team of the resources for final projects included with the course, and (if asked) talk about how the presentations themselves are structured (e.g., 15 minute presentation time followed by 5 minute Q&A; certificates presented at

the end of the presentation; every student/team member has to actively participate in the presentation in order to receive a graduation certificate).

Step 3 – As before, arrange and schedule initial between-session telephone and e-mail follow-up, if necessary, especially if the student/team has fallen behind on deliverables and so needs to catch up.

Common problems – At this stage, the team usually has a very clear idea of where they are headed. They often are feeling intense pressure, and express concerns about personal challenges among team members, data collection problems, and a general angst imposed by a looming presentation schedule. The consultants role remains technical advice and encouragement.

Consultation review sessions

Within Intermountain's ATP, at the end of the first three training sessions we schedule a Consultant Review. All of the IHCDR staff consultants meet for an hour with the course director. We review each team and project in the course, and record the results in a structured document (copy attached) build around the homework assignments as described above – Mission, Conceptual Model, Team, Focused leverage points, Aim Statement, Data (annotated run chart for primary and balance measures, data sources, baseline data, etc.), and Change Hypotheses. If a team is not making its deadlines, we discuss ways to help. Those often take the form of e-mails or calls at regular intervals from the consultant to the team leader, contact with the course instructor, or even (rarely) contact to the organization's leadership.

The Consultant Review Session provide a second major advantage. The course director can use them to evaluate and improve the consultation itself. Very often, a consultant will describe a problem with a team. Other consultants offer suggestions. The course director might review background theory. In short, these sessions are the primary way in which the course director insures that the consultation works effectively, trains the consultants, and systematically improves consultation over time.

Chapter 5 – Project presentations and graduation certificates

Completing the Advanced Training Program represents a significant accomplishment. The required improvement project requires real dedication – concentrated time, effort, and plain hard work. It often achieves real improvements in care delivery. Many participants describe the course, and the ideas it contains, as life changing. It brings clinical professionals back to the ideals that first brought us into the caring professions. Project presentation and graduation represents the culminating step in an intense educational experience. Properly organized and executed, graduation consolidates and locks down the concepts contained in the entire course. It therefore deserves very careful planning and execution.

Graduation is best regarded as a classic example of reward and recognition, as outlined in the course itself. It delivers a message that, from this point forward, the graduate has the concepts, tools and personal commitment to bring the healing professions, and their own organization, to a new level of quality performance. The project presentation represents a clear demonstration of that knowledge, skills, and dedication. It therefore usually works best to execute the 4 steps of reward and recognition immediately upon completion of a team's presentation: Holding diploma presentation to another time – say, a group presentation at the end of all of the project presentations, or at a graduation dinner – can significantly reduce total impact.

1. **Thank you** – At the end of a team's presentation, the course leader leads the full class in questions and suggestions. This is an opportunity to directly recognize elements in the presentation that worked particularly well, perhaps with some carefully crafted suggestions for next steps or improvements. Remember, though, that the primary purpose is to demonstrate a new set of skills, and to consolidate the new team members in them (see below for suggestions on how to handle sub-standard projects).

   It is important that the course leader hand each participant their graduation diploma, shake hands, congratulate them, and say "thank you." You may also want to involve other senior leaders, both to make the "thank you" more meaningful, and to consolidate the leader(s) in the quality effort.

2. **Something physical to make the "thank you" real** – we prepare graduation certificates (diplomas) specifically designed to have the look and feel of a Masters degree certificate. Ours use a vellum paper, with a gold foil Intermountain logo at the bottom. They are individually signed by the course instructor and the CEO of Intermountain Healthcare. For internal courses, each certificate is also signed by each graduate's line manager, and the senior executive over their division within Intermountain (yes, this does take a fair bit of coordination to get all of the signatures). We print them using an old English font, to parallel the look of many upper-level university graduation certificates. Several examples of the layout and fonts used in Intermountain graduation certificates are attached (@@@).

We always mat and frame the graduation certificates for presentation (see attached examples). Our purpose is that our graduates will hang them with pride in their office, where they will see them often, so that the "thank you" – and the ideas and accomplishments that it represents – resounds again and again in the future. When our graduates face air travel to return home, we glaze them with plexiglas, to reduce weight and chances of breakage. Framing, matting, and glazing can be easier than it seems. For example, the Alaska Native Medical Center training program and the Asante Healthcare training programs both order very nice wood frames, with included matting and glazing, through Costco at a very reasonable price (ref:@@@)

In the Intermountain program, we also present graduates with a small gift from the staff and faculty of the course, to say "thank you" for their friendship and participation. For example, in the past we have used small leaded glass jewelry boxes, clocks, and flash drives, all embossed with an Intermountain logo and, occasionally, the name of the Institute and of the course.

3. **A symbol, that the graduate can wear or display –** technically, the graduation certificate itself is a displayable symbol of a quality accomplishment, that sets the graduate apart. However, other programs have designed some very nice wearable jewelry – stick pins – to further serve the same purpose (see attached examples from the MD Anderson CS&E program, and the Asante Health System training program - @@@). Remember, though, that they need to be nice – something unique, obtainable through no other source, that clearly sets the graduate apart and marks them as a quality leader within your organization.

4. **Recognition** – "name and face in a public place" – the project presentation is based on a project storyboard, and serves this purpose admirably. We also post projects on our website (a continuing storyboard presentation), and we encourage our graduates to display real storyboards within the halls, central offices, lobbies, or lunchrooms of their home institutions. We offer particularly good project teams the opportunity to present storyboards at future iterations of the course, and at Storyboard Evenings conducted with some conferences.

At the Institute's training programs, the specific sequential process for project presentation / graduation lays out as follows:

1. **Set expectations**

During Session 1, and at each subsequent session, remind participants that:

- Projects are the essential element of the course.
- Presentation of a project is required for graduation. Each participant must stand in front of their (quality expert) peers and say something (even if it is so simple as, "My

nursing colleague will now present our actual work and results"). Otherwise, they will not receive a graduation certificate.

- Given the artificially short timeline of the course, not all projects will have time to travel the full distance to measured positive results. In fact, some of the best learning within the course will come from project teams that faced significant barriers, as they describe how they addressed these challenges. Make this reality clear to the participants, while still encouraging that they get all the way to a complete project if possible.

2. **Get ready**

- Session 2: Circulate a list of all participants, to all participants. Ask them each to clearly write out their names and titles, as they wish them to appear on their graduation certificate.

- Session 3. Before the session, type up a "final draft" list of names and titles. During the session, circulate the list so that each participant can review their entry, and make any desired corrections.

Between Session 3 and Session 4 (the project presentations),

- Prepare a presentation agenda (see attached example)
  A properly structured presentation agenda is a key tool to help the person coordinating the presentations to keep the presentations on schedule and to assess (grade) each presentation, as part of your course evaluation. The agenda should include a block for each presentation, containing the scheduled time, a project name, and the names of all presenters. It should leave enough room for the coordinator to keep some simple notes (see below). To help with assessment, it may include an ordered list of boxes, containing letters that represent the following steps in a typical project (see attached example; note that some legitimate projects will fall outside the standard format, so that the list will not be useful – in those rare circumstances, you will need to rely on some simple notes to score the project):

  M – process conceptual Model (flow charts, conceptual flow diagrams, cause & effect diagrams, etc.)
  T – Team members, reflecting fundamental knowledge plus a clear links to front-line participation and to management sponsors
  L – (an organized approach to identify high priority) Leverage points within the process
  A – Aim statement
  D – integrated measurement (Data)
  H – prioritized change Hypotheses (more than one), generated before testing begins
  C – the project team implemented at least one Change
  E – the team showed measured results of at least one change, whether or not they were positive (Evaluation)

R – significant measured progress toward goal (Results)
G – (clear plan for) holding the Gains

The factors which will play the most important part of your course evaluation are those for Evaluation (E) and Results (R), so you may want to visually emphasize these elements by making them larger. (They correspond to two key elements in Fitzpatrick's hierarchy for training program assessement.) You will need to count how many "hits" (positives) you have for these two elements after all of the presentations are completed. A well-formatted agenda will make that process easier and more accurate.

- Print, obtain signatures on, and frame the graduation certificates

There should be a one-to-one correspondence between your presentation agenda and the finished, framed, graduation certificates.

- Prepare other graduation handout materials

These may include such items as CME/CEU certificates and class photos. At Intermountain, we put these materials in a separate large envelope (so that they can lie flat, without folding), with the participant's name on the outside. That makes them easy to distribute as part of the diploma presentation at the end of each project presentation.

- Obtain a sufficient number of pins or other gifts, if you plan to use them (see section on the project presentation / certificate presentation as an application of reward and recognition, above)

- Obtain PowerPoint files from each team that will present

You should insist that these are submitted at least a week in advance. The fact is, some people will be late. Others will have fixes and changes (new versions) at the last minute. Your only hope of staying on top of the last minute changes is to have the bulk of the presentations loaded and ready to go.

As the presentations come in, review them for completeness, errors, and to be certain that inappropriate patient-identifiable or other sensitive information is not included; obtain corrections from the team, if necessary.

At this point – well before the project presentation / graduation session – screen any presentations that are not of sufficient quality to graduate, and deal with those students privately (this is a very rare event – most often, the students will know and will approach you in advance. Best strategy: postpone their presentation to your next group, so that they have time to finish up).

As mentioned above, a significant proportion of the presentations will not have had sufficient time to fully complete, achieving measured progress toward the goal expressed in the aim statement. That's OK – what you are judging is whether the students understand the principles and methods of improvement, are on track, and are well along toward their final goal. On the other hand, a deadline is a wonderful thing. Don't let them off the hook. You might consider a scheduled follow-up formal presentation for those projects that don't produce significant results by the time the course ends. Give these teams their graduation certificate on the initial presentation day, but give them a follow-up deadline to help them invest the necessary effort to achieve final completion. For example, Dr. Patricia Martinez at Asante Healthcare in Medford, Oregon, routinely schedules follow-up presentations one year after the initial graduation, and requires all students to present a second time. This gives time for some projects to finish up and show results; for all projects, it gives a chance to see whether teams are holding their initial gains.

You will need to set student/teams expectations both in regards to challenges, and in terms of whether the project had achieved its final goals by the time of the session 4 project presentation: Again, some of the best learning in this final session of the course is the perils associated with real projects and how they were overcome; but finishing the class doesn't mean, necessarily, that all teams have completely finished their projects.

- Print the PowerPoint presentations and prepare a handout binder, so that each member of the class / audience has a copy during the presentations. (It really helps to have hardcopy, to be able to track along with the presentations.) Note that some presenters may want to include expanded materials in their handouts, beyond what they include in their formal presentation. You should inform them of this option well in advance, and encourage them to use it if they desire. You will, of course, include the agenda, handouts for any formal course instruction presentations, and any other necessary handout materials in the same binder.

3. **Set up the presentation room** (day before or morning of presentations)

- Organize a table from which the coordinator can observe the presentations. Make certain that the coordinator has a manual containing hardcopies of all the presentations, and a (standard) agenda to use for coordinating the presentations, and for scoring each presentation as it is given.

- Prepare "timing cards" that show the numbers "5" (perhaps on one side), and "10" (usually on the other side of the sheet). The numbers should be large enough to be easily seen by the presenter in the front of the room, when held up by the coordinator in the back of the room.

- Cover a second table, convenient to the coordinator, with a nice tablecloth (or the like). Arrange the framed graduation certificates on the table, in order of presentation (so

the coordinator can quickly find the appropriate framed certificates, when it is time to present them). Stack any additional presenter-specific material (anything with an individual's name on it, such as CME certificates) on the table with its matching framed certificate. Stack gifts, pins, or other non-individual-specific materials to the side in appropriate numbers (see Figure 5 for one example).

Figure 5. Graduation certificates ready for distribution. The certificates are stacked in the order of presentation. Corner protectors prevent damage to the wooden frames within the stack. Personalized continuing education certificates and a personalized class photo are tucked into each graduation certificate. A stack of boxed flash drives, containing all materials from the course in electronic form, are stacked along the left edge of the table. These are a gift given by the training staff to each student who completes the course.

- Prepare the screen, computer projector, and sound system for use.

- Preload all of the PowerPoint presentations on a single computer, with the aim that all presenters will use that single machine (which means that it needs a loaded copy of a late version of PowerPoint (e.g., Office 2007), and any other presentation software likely to be used, or that you know some presenter will attempt to use). At

Intermountain, we have found it very convenient to create a folder on the computer's Windows desktop that contains all presentations (very easy to find when you are in a hurry). Consider opening a full sub-session's presentations in PowerPoint, in order of presentation, which will greatly ease bringing up the next PowerPoint between presentations (A "sub-session" is a continuous interval between opportunities to preload another set. For example, at the start of the day load all presentations up through the first break; during the first break, load all presentations up through the lunch break; over the lunch break, load all presentations up through the afternoon break; etc.).

Test open all presentations, using the display PC. Solve any resulting problems or incompatibilities (well before the actual session).

Develop and consistently use a standard naming convention for the PowerPoint slide sets. For example, we name them using their presentation order, followed by the last names of the presenting team members (e.g., 1 – James, Soria, and Fredricksen – Designing and implementing a clinical improvement training program.ppt).

You will always have a few presenters who bring updated versions of their presentations at the last minute, usually on a flash drive or CD-ROM. It usually works best to copy them onto the presentation computer's hard drive, in the standard desktop folder, using your standard naming conventions. Even though it may take an extra minute to load them to the hard drive, you will avoid technical problems using secondary data sources during the presentation, that more than make up for the extra minute or so it takes to load them. You will also probably find yourself distributing hardcopies of new, replacement handouts. Make certain that the coordinator always gets a copy, as they are essential for the evaluation step.

On rare occasion, you will have a class member who needs to present from their own notebook computer. It is very wise to test the machine with your computer projector before the session starts, to avoid delays during the actual presentation time.

4. **Do the presentations**

- Call the class to order, and <u>lay out the ground rules</u>:

1. every team member must say something, if they are to receive a graduation certificate
2. each team will have 15 (or 20, depending on how you have set it up) minutes to present
3. you (the coordinator) will hold up the "10" sign, when the team has 10 minutes left in their presentation; you will hold the "5" sign when there is 5 minutes left; and you will bring the graduation certificates to the front of the room when time has expired and it is time to wrap it up

4. there will be a time for questions and comments at the end of the presentation; class members should hold them until that point
5. please hold applause for each team to the point at which graduation certificates are awarded

- Announce the project name and team member / presenters for the first (next) project;

  as the team comes to the front of the room, pull their PowerPoint slides up on the presentation PC;

  quietly make certain that the team members have microphones (if you are using them), and that they know how to advance their slides.

- As you return to your seat at the back of the room, note the precise time that the presentation started (e.g., consistently use your wristwatch, or a single wall clock within the room). Write it down on the left margin of your schedule / scoring sheet, next to the team's name. This is your primary tool to determine how much time the team has left in their presentation.

- Listen to the presentation while you rview the hardcopy presentation:

  ◦ Grade the project, as described above. In particular, mark whether each project tested at least one change hypothesis, with measured results (e.g., "Eval: +/-"). Also mark whether the project achieved convincing (statistically significant) progress toward its aim, as reflected in measured results (e.g., "Result: +/-"). You may also want to jot down notes regarding special attributes of the project, or to score it more fully as shown above.

    Watch out – it is not at all uncommon for presenters to include updated results that did not make it into the handouts. It is also quite common for teams to display charts in their handouts showing what they hope will happen, even though they don't have results yet.

  ◦ As the presentation proceeds, display time cards at appropriate intervals. You may need to hold them high and wave them back and forth, until you can see that a member of the presentation team has noticed them (it is not uncommon for presenters to look down at the presentation PC, or up at their own slides, to avoid eye contact with people in the audience – presenting can be a little stressful!).

- Toward the end of the presentation, pick up the graduation certificates, CME certificates, gifts, etc., for the team. Quickly check each to be certain it is correct in every way. If necessary, quickly review class participant photo lists, name tags, check with your staff – to be certain that you know exactly who is everyone is (so you don't embarrass yourself, and the team, when you present the graduation certificates). Quickly review the agenda to see who (or what) is up next, as the first step in preparing for the next presentation.

- As the time expires or the team comes to the end of their presentation, gather up the certificates and gifts and move up to the front of the room. Stand quietly to the side. Your presence should alert the team that it is time to wrap it up. If necessary, after an appropriate wait, move to stand beside the presenter to help them know that the end of their presentation has arrived.

- As the team finishes up, ask the class for questions and comments. You conduct the Q&A session, keeping order and making certain that things move expeditiously on to the next presentation.

  I usually have prepared some questions to clarify murky areas (if necessary), comments about what I thought the team did particularly well, and suggestions for things that might make the presentation even better, before I come up to the front.

- During the Q&A, quietly move the display PC to the next presentation. Our computer projector has a "shutter" function, which I invoke so that the class won't be distracted from the Q&A as I shift things over. You can achieve the same thing with a thick piece of paper, if the projector is within physical reach – just put something in the path of the projection beam.

- When the questions and comments dry up, or when the available time has expired, wrap up the Q&A session. Then present the graduation certificates (that you brought up to the front at the end of the team's formal presentation), one at a time, to the graduating team members.

  ◦ Look each person in the eye; shake their hand;
  ◦ Present their personal graduation certificate, held so that the whole class can see it;
  ◦ Personally congratulate them (usually quietly – this is for the graduate, not the class);
  ◦ Give them any additional pictures, CME certificates, and the like;
  ◦ Present them with any pins or gifts you may have chosen to use.

  If someone else is helping you present the graduation certificates, you may need to coordinate beforehand. For example, your CEO might hand graduating team members their graduation certificates, while you hand them CME certificates, pins, and gifts. In such circumstances, make certain that whoever is actually handing out the graduation certificate (the part that really counts) knows how to do it correctly (as outlined above); and be clear that you are running the session (handling the Q&A, signaling when it is time to applaud, by starting to applaud yourself, calling the next team up, etc.)

- When every member of the team has received a graduation certificate, lead the class in applause (you will be the marker for the class) – even if there was spontaneous applause for individuals earlier.

- Announce the next team, call them to the front, un-shutter the projector (if you are using that approach), and kick off the next presentation.

5. **Summarize and record project scoring for the session** – one part of evaluating the effectiveness of your training program, and evaluating changes that you may have introduced (see the section on Course Evaluation, below).

In many instances, managers who sponsored a team, project consultants, or your general organization management will want to watch specific presentations. Such participation greatly increases the value of the presentations and thus, indirectly, the value of the course for both the students and for your management team. You should actively promote such participation in the final presentation session. You may need to coordinate participation, notifying specific consultants or managers when a team is about to present, so that they can break free and attend (examples: program staff at Intermountain use a web-based messaging system to alert interested individuals at an appropriate advance before a particular presentation; program staff at MD Anderson Comprehensive Cancer Center call interested department leaders and clinical colleagues by telephone).

Chapter 6 – Evaluating Your Training Program's Success

It is important to measure the performance of your training program for 3 reasons:

First, you need to certify that your graduates leave the course with the knowledge and practical skills necessary to manage and improve health care processes. Second, you should practice what you preach. Training is itself a process. Course evaluation is the method by which you track that process. It enables you to systematically improve the course itself. Through evaluation, you can "tell if a change was an improvement." Finally, you need to show solid self-generated accountability to those who sponsored you (and paid the bills, including your salary) within the organization.

When dealing with adult learners in a work setting, the first 2 evaluation aims overlap. For example, when Dr. Deming taught courses, he assumed that his students came to him fully motivated and wanting to learn. He prepared a list of 100 questions, the correct answers to which summarized a complete knowledge of course content. At the first class, he distributed the entire list to every member of the class. For each class session, he would randomly select 10 of the questions from the list. Those 10 questions would become a short quiz at the end of the session.

Obviously, the early quizzes in the course would produce very low scores. It would contain randomly-selected questions that the class had not yet addressed. Dr. Deming expected that the scores would climb as the course went on. If he found a student that could correctly complete all questions on each quiz in the early sessions in the course, he would draw that student aside and offer a quiz of the full list. If the student could complete that comprehensive quiz, Dr. Deming would immediately give the student full credit for the course. That student could still attend future sessions, of course, and might even help with the instruction itself or with special projects, but attendance was not mandatory. If, on the other hand, a student failed to show progress over time, Dr. Deming would draw that student aside to discuss their needs and their continuing participation within the course.

Dr. Deming would give any student who showed steady progress of knowledge within the course, as assessed by his weekly quizzes of random elements from the final comprehensive list, an "A" for the course. That was his goal – to give everyone an "A," representing the fact that each student had mastered the materials. Dr. Deming's quizzes were designed mainly to assess his effectiveness as an instructor, not to rank the students.

Kirkpatrick's classic text on training program evaluation (Kirkpatrick, Donald L. *Evaluating Training Programs: The Four Levels, 3rd Edition*. San Francisco, CA: Berrett-Kohler Publishers, Inc. 2006) identifies 4 levels of evaluation for training programs. Based on experience within a health care setting, I have added 2 more levels (levels 0 and 5):

Level 0 (added) **– Attendance**

Rational: The health professionals who attend your training sessions are very highly educated, intelligent people. They would not spend their time if there was not real value in doing so.

This is the primary level of evaluation used by most university administrations. They are interested primarily in the business of teaching. They want enough students to pay enough tuition to financially sustain the institution.

I added this level to Kirkpatrick's core system after an interesting teleconference with U.S. programs teaching patient safety concepts. A surprising number of universities turned out to have certificate or full degree programs with that emphasis. They also emphasized attendance as a primary measure of program success.

Level 1 – Student course evaluations

Rational: The health professionals who attend your training sessions are very highly educated, intelligent people. They can directly assess both the course content and the effectiveness of presentation through a structured questionnaire.

Attached please find an example of the questionnaire we use for each lecture and session of the Intermountain miniATP (@@@). We summarize results from this survey quickly following each session. We combine them with the Curriculum Review held during Session 4 of each course, then meet together as program faculty and staff to plan changes in the next offering.

Often, the most useful part of a student evaluation are the open-ended questions that ask "What worked best" and "What worked worst" in a lecture or session.

Level 2 – Knowledge testing

Rational: Instruction centers around the transmission of knowledge and skills. A training program can directly test its students, to see whether they can correctly reflect back the knowledge and skills contained in the course.

This is the primary form of learning assessment usually employed within universities, including most clinical training. The story of Dr. Deming's method of course evaluation, related above, provides an excellent example. Qualifying examinations (board certification) for physician specialties falls into the same category. Some programs start with a pre-assessment, that can show changes in knowledge and skill levels. Others jump directly to written or oral tests administered to students during and at the close of the training.

Level 3 – Knowledge application

Rational: Quality improvement training programs teach theory and tools to adult learners. Effective training should lead to graduates using the theory and tools in real work.

The projects that lie at the center of a quality training program represent a direct application of Kirkpatrick's Level 2. Within Intermountain, we directly record whether a project introduced at least one change, then summarize and track the results (see below). Other programs (MD Anderson CS&E, Sutter Health MCE) survey graduate at a fixed time point after the course ends. They ask their graduates to report how many times they have applied teaching contained in the course, specifically counting additional projects, the teaching of training sessions, or significant uses in other parts of daily work.

Level 4 – Results

Rational: The best demonstration of effective training moves a step beyond application, to demonstrated changes in operations and outcomes.

In addition to tracking whether students' project introduce at least one process change, we also record whether each project showed data demonstrating statistically significant progress toward the project's stated aim.

Figures 6 and 7 show SPC run charts used within the Intermountain training programs to track Kirkpatrick Level 3 and Level 4 results, relative to course changes that we introduced.

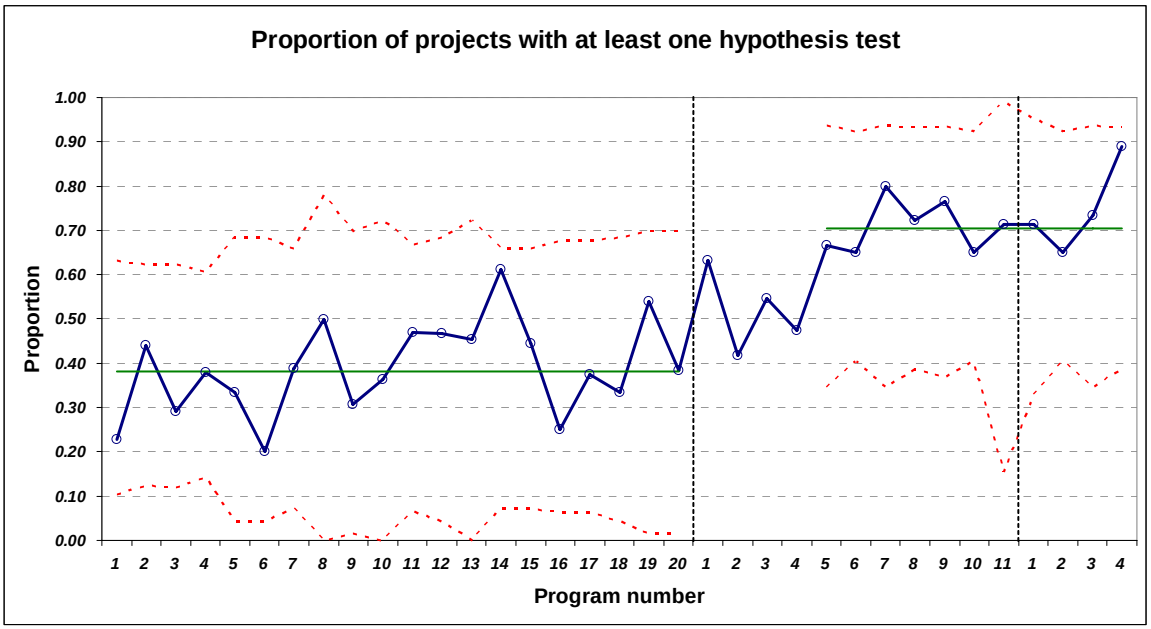


Figure 6. (Kirkpatrick Level 3) P-chart showing the proportion of Intermountain ATP and miniATP project presentations that introduced and measured at least one process change. At time point 1, consultant support was added to the course. At time point 2, an introductory DVD was sent to students at least one month before each course started. Within the DVD, the fact that a project would be required for graduation was clearly

stated, criteria for project selection shared, and a strong recommendation made that the student begin to plan their project before coming to the first session.

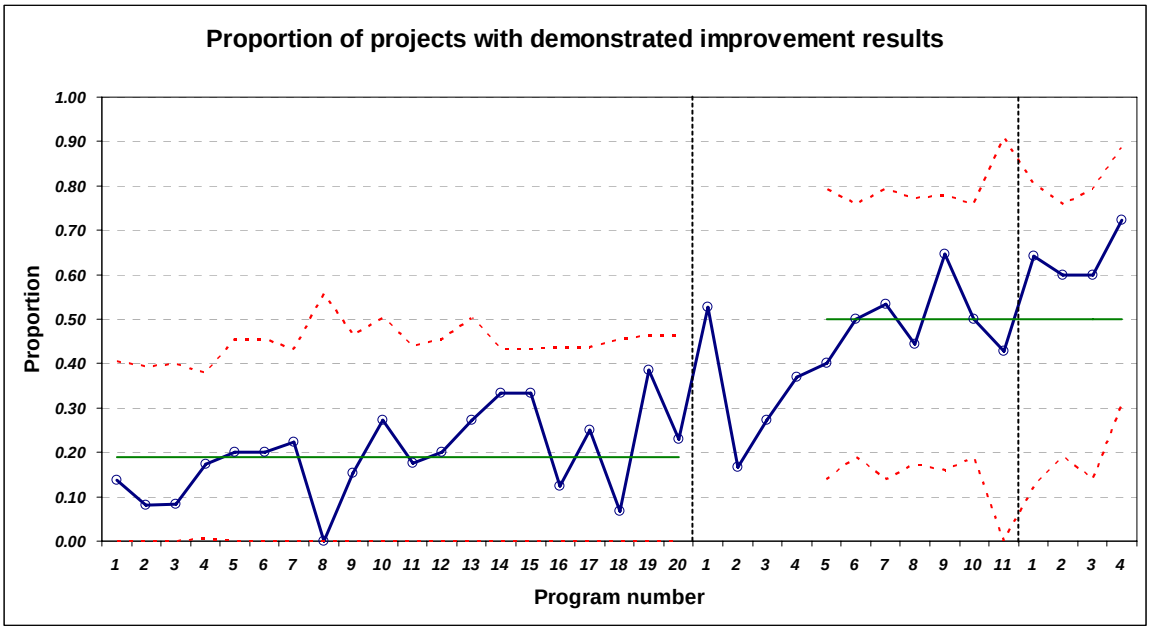


Figure 7. (Kirkpatrick Level 4) P-chart showing the proportion of Intermountain ATP and miniATP project presentations that demonstrated statistically significant movement toward project aims. The annotation lines correspond to changes introduced into the course, as described in Figure 6.

Level 5 (added) **– Return on investment**

Rational: A quality improvement course represents a significant allocation of resources for a health care organization. Beyond individual students and projects, administrative leaders need to see whether the course is succeeding at an organizational level.

On one occasion in the past, IHCDR staff carefully calculated the full costs of running a clinical QI training course, including the time of those health professional attending the course being away from their work. We then compiled a list of projects that showed significant improvements, and estimated the cost savings that those projects produced. While our analysis lacked the rigor necessary for publication in peer-reviewed professional journals, it did reach the level of routine internal financial analysis. The result: Successful projects within the course were saving Intermountain somewhere between 4 and 6 times the cost of operating the course, including student salaries.

Sutter Health's MCE course uses an even more effective approach. At the end of each course, they forward summary project results to their Vice President for Finance. That person estimates the financial impact of the projects on the

organization. (The Vice President for Finance is a graduate of the course.) This approach provides an added advantage: While analysis performed by the course's leaders might be suspect in other parts of the organization, independent assessment performed by a senior finance officer is automatically credible.

The main point is this: You should heavily emphasize measuring cost outcomes as well as quality outcomes within every project conducted for the course. Beyond giving your students a key tool that can contribute greatly to their own success back in their home place of work, you will also lay a foundation for showing your own administrative leadership that they acted wisely when they allocated resources for quality improvement training. In addition to changing culture and building a cadre of leaders for the future, your course paid its own way.

<Note: need to add MD Anderson CS&E method of evaluation, based on a Baldridge-like 1,000 point score, feeding into recognition of outstanding graduates as quality fellows in an academic setting>

Curriculum Review

On the last day of each course, we hold a 2 hour review session with the students. We go through the entire course, including preparation, materials, logistics, food, and content. This review serves 3 purposes:

1. It gives the students a summary review of what they learned during all 4 sessions, tying it all together as a whole package.
2. Many of the students may later participate in their own training programs. The Curriculum Review provides a very good review of a complete program, its structure and operations.
3. At this point in the course, students are able to evaluate and criticize the whole experience. Comments at this final point are often much more useful than the interim evaluations that the students complete for each lecture and at the end of each individual session.

Chapter 7 – Other Things to Think About

Additional things to think about:

1. Accreditation of course
   - State and/or national level
   - CME (physicians), CEU (nurses), pharmacists, etc.

2. Infrastructure
   - support staff for the course itself
   - where it fits in the organization (stand alone internval vs community resource, QIO level, etc.)

3. Scheduling/timeline of course
   - divide into sessions
   - ideal length of time between sessions

4. Holding the gains
   - alumni support, refresher courses, etc.

4. Integrating with research – oversight of ethical QI

Checklist for starting a training program:

Budget
Personnel
- Director (MD or nurse)
- Course coordinator
- Other support staff

Plan structure and layout of course, including class sizes and make-up
Establish curriculum, including methods for delivery
- Local faculty
- DVD learning modules
- Web casts
- e-Learning

Identify faculty
Program accreditation
Facility
Teaching resources and materials
- Obtain copyrights

Consultants and coaches
Plan for communication with students
Registration system

Chapter 8 – Resources for Sister Training Programs

1. **This book - The "certified" miniATP –** How To Run Your Own Clinical QI Training Program

2. **DVD training modules, with parallel written materials**

3. **Live (or "tape delayed") webcasts** of ATP faculty

4. **The ATP/miniATP, to "train the trainers"**

5. **miniATP curriculum, all slide sets, etc.**

6. **Collaborative learning network –**
   - listserve
   - web site
   - sessions at Natl Forum on QI in Health Care
   - annual face-to-face meetings
   - sharing of faculty and resources between organizations

7. **A list of possible external faculty**