

## CLINICAL SUPPORT SYSTEMS PROGRAM

# What is clinical practice improvement?

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### BACKGROUND

One of the outstanding characteristics of our current health-delivery systems is the chasm between what should be done and what is actually delivered.<sup>1</sup> This applies to the treatments chosen and to the way they are delivered. We have health bureaucracies replete with policies and plans, many of which are not fully implemented. One of the key problems for ‘evidence-based medicine’ is the failure to implement what we know, while we explore what we don’t know. Evidence for the need to improve the care we deliver comes from a multitude of sources. The preventable adverse event rate from the Quality in Australian Health Care Study indicates that up to 8% of hospitalizations in Australia are associated with a preventable adverse event.<sup>2</sup> In the US study, fewer than 50% of patients hospitalized for ischaemic heart disease were discharged on treatment that current evidence would support.<sup>3</sup> It is difficult to explain why procedure rates geographically vary so drastically. For example, there can be a more than threefold difference in the rate of hysterectomy, for women in one Australian state.<sup>4</sup>

These observations have led to descriptions of system operations as ‘failing in implementation’.<sup>5,6</sup> This point provides the launching pad for thinking about clinical practice improvement (CPI) as a tool for helping to manage the improvement of health care. The complexity of the environment in which this improvement needs to occur is immense and increasing, and with this comes the difficulty of achieving improvement. The need for improvement is unarguable, which begs the question, Why has it not happened already? The answer to this question lies in the difficulty of the task. The skills required have not

been appreciated, let alone broadly disseminated in the health-care environment. The scientific community involved in health-care delivery has ‘valued’ the generation of new knowledge or research and developed a framework for the conduct and funding of this vital work. This same community has not valued the management of health-care improvement in the same way. In fact, there has been a sense that unearthing and disseminating the ‘right thing to do’ will spontaneously lead to a change in practice or care. This spontaneous change in practice is uncommon and, at best, often slow and incomplete.<sup>7</sup> Hence the need for formal methods for improving practice with a scientific underpinning for those methods. CPI satisfies those requirements. Its knowledge base has evolved from Deming’s system of profound knowledge of four interrelated elements:<sup>8</sup>

- 1 Appreciation for a system
- 2 Knowledge about variation
- 3 Theory of knowledge
- 4 Psychology

### RESEARCH OR IMPROVEMENT

The relationship and differences between research and improvement work can cause considerable intellectual and practical difficulty for clinicians who are well trained in ‘scientific method’. Some of these notions have been explored under the banner of ‘pragmatic science’<sup>9</sup> and commence with the clear difference between a research study and an improvement project. The objective of research is to create new knowledge by testing an hypothesis, usually of the presence or absence of a causal relationship between a particular action and a specific effect. The objective of clinical improvement is simply to spread innovation in order to improve a particular outcome or process, through changing the processes within the current system for that care. Proof of a causal

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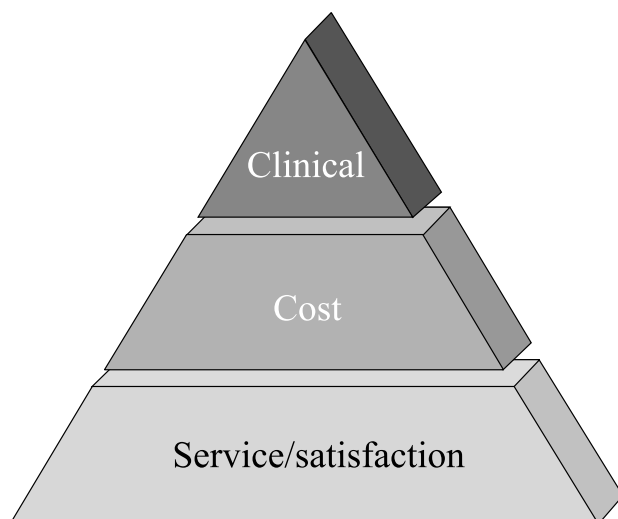
*Received 11 June 2002; accepted 12 June 2002.*

relationship between a particular intervention and improvement is not essential and should not be allowed to 'divert' the project. Demonstration of measured improvement is essential, often with multiple, and even simultaneous, interventions to that system of care.

## OUTCOMES MEASUREMENT

The ideas behind improvement were assembled and popularized by Deming and were tested in many industries before widespread application in health care occurred in the USA.<sup>10</sup> Deming's initial successes were in the Japanese manufacturing industry, where the goal was to build a product that customers wanted – at a higher quality and lower cost than competitors. That efficiency is an inextricable component of quality was not argued in that environment. However, in health care there is sometimes a sense that making a system more efficient is a 'lower order' task, or that improved efficiency is antithetical to improving health outcomes. There are three outcomes from any improvement activity, and measurement of all three is essential to being able to decide whether improvement has actually occurred. These three outcomes are: (i) clinical benefit or harm, (ii) cost and (iii) service, or satisfaction, from the patients' perspective (Fig. 1).

The history of managing health-care improvement is marked by patchy participation or support by clinicians, who have been dismissive of a perceived lack of methodological rigour and an overabundance of bureaucratic process. The emphasis on resource



**Figure 1** Three essential and interrelated outcomes of an improvement project.

consumption and the linking of efficiency and clinical outcomes was unfamiliar and sometimes unwelcome. In this environment, a systematic attempt to teach the methods of CPI to health-care professionals in New South Wales commenced in 1999. This process was inestimably assisted by the generosity of Dr Brent James and illustrated by the success achieved at Inter-Mountain Health Care in Utah. By approaching quality improvement of health services in a systematic, statewide manner, the NSW Council for Quality in Health Care realized that using top-down policies to guide actions at the workplace needed to be matched with local implementation tools. CPI provided the tools for that local implementation, whether it is for policy or evidence.

## CPI METHODOLOGY

The following summary is a generic approach to quality improvement using CPI methods. The basic CPI principles share common ground with other management approaches, but it is important to note that there is a scientific basis for this knowledge and that the chronological order of actions is logical. First, the following two questions should be answered in the affirmative:

1 Is the problem worth solving? The problem should be important enough in terms of clinical and/or resource outcomes to justify attention.

2 Is improvement achievable? There should be a sufficient gap between your present practice/performance and the practice/performance of the best performing centre or facility that you know. Analysis of the incentives or barriers for success should suggest that improvement is possible locally.

If the answers are positive, then Figure 2 outlines the suggested process. The sequence of steps is logical and needs to be maintained in that order. A very common occurrence when clinicians begin with this process is that they assume that they know what the solution to the problem is and, hence, the diagnostic phase is redundant. The 'solution' is often the hypothesis that they would wish to test if they were performing research. It is illuminating when an appropriate diagnostic phase is undertaken with a team that has fundamental knowledge of the clinical processes involved, because it often reveals more than one 'solution'. Also, it can reveal that there are some solutions that could be implemented today, within currently available resources, as well as some that will take many months and need money, equipment or personnel that are not currently available.

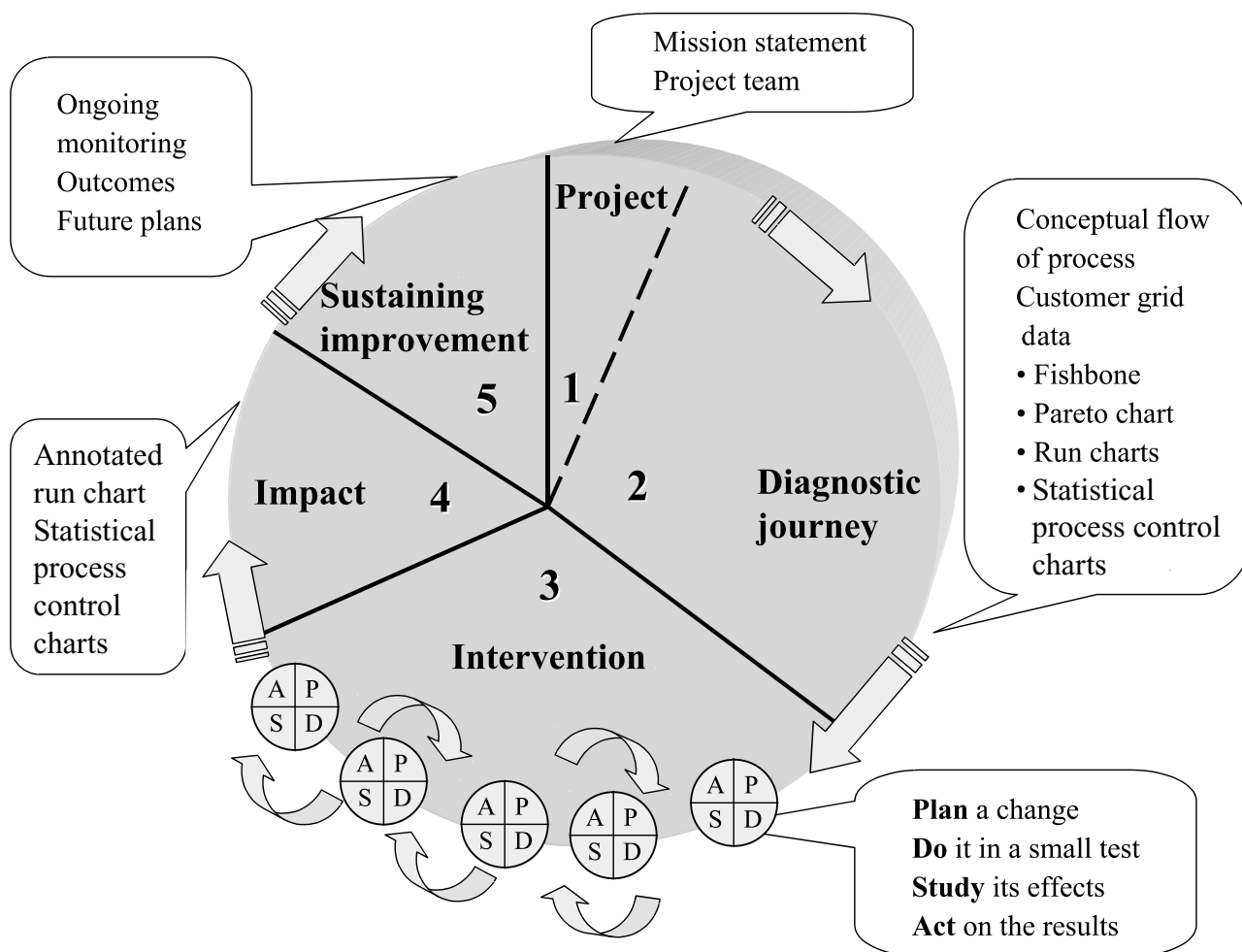


Figure 2 Cycle of sequential steps involved in clinical practice improvement.

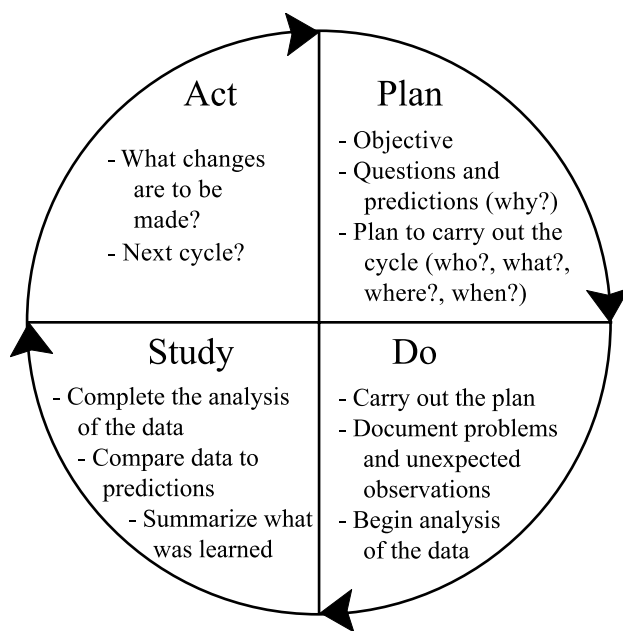
The underlying premise is that each aspect of clinical care is made up of multiple processes. Combining these processes develops the system of care for that particular task. Berwick indicates that every system is perfectly designed to achieve the results that it achieves.<sup>11</sup> This important so-called ‘central law of improvement’ leads to important next steps. First, unless you change and improve the system there will not be an improvement in results. Second, improvement in performance is not a matter of effort – of trying harder – but rather requires a change to the system of care. This helps reduce the historical focus on individual performance and increases the attention on the system of care. Hence, improvement methods based on process improvement are more likely to be successful than exhortation of individuals to try harder or to avoid error.

### SHEWART–NOLAN MODEL

The basis for improvement is the Nolan or Shewart improvement model, which is encapsulated in Figure 3. The three key questions are: (i) What are we trying to accomplish? (ii) What changes can we make? and (iii) How will we know that a change is an improvement? This can be summarized in the Plan-Do-Study-Act (PDSA) cycle: (i) *plan* is planning for a change, (ii) *do* is making a small test change, (iii) *study* is measuring the effect of that change and (iv) *act* broadly means to implement that change if the small scale trial has been effective.

### TEAM OPERATIONS

The work is based on a team, made up of members with ‘fundamental knowledge’ of the processes under



**Figure 3** Elements of the Plan-Do-Study-Act cycle.

review. This team has a leader from an organizational management perspective and a facilitator with skills in CPI, in order to keep the team functioning successfully and on the right track. This team will develop a flow chart of the processes involved, identify the parts of the process that can be improved and then be encouraged to innovate. This development of new improvement ideas is a key step, and guidance can come from a generic list of improvement ideas.<sup>12</sup> Without these ideas or innovations, progress cannot be made. 'Borrowing' ideas from other sites or units is to be actively encouraged. Rapidly testing these ideas on a small scale will quickly inform the team with measurable outcomes – the *study* phase. If the study results are favourable, then the team should be in a position to broadly implement the locally tested change. Using the measurement tools used in the planning phase, the effectiveness of this implementation can be monitored and responded to. This implementation can be continuously improved, based on the experiences gained and on the guidance of the team. Not all the interventions tested in the *do* phase will be successful, however these provide some of the richest lessons in how to get it right and should not be viewed as failures.

Sustaining the change is usually driven by routine measurement of the outcome and its publication or dissemination. The use of statistical process control charts for this task is essential for following effects over

time and being able to assess whether a change is an improvement. Careful analysis of these charts should prevent tampering with the normal variation of a process, while facilitating timely attention to special cause variation. An example of such a chart is shown in Appendix I. This chart summarizes a project to reduce atrial fibrillation after cardiac surgery and is annotated with the interventions undertaken by the team.

## FUTURE

It should be apparent that the work involved for a project team to initiate and sustain improvement in health care is complex and significant. The need for such work is unargued, but the agreement about change management methods and the investment they require is far from universal. Equally, although the leadership from the top of an organization for such work is essential, it is not always forthcoming. From these two statements come two key directions for the future. The first is the ongoing development for organizational leadership for quality improvement, and the second is the broad training and investment in change management in care delivery. These two directions need substantial support, with CPI providing the basis for that work.

The need to manage rapid change over multiple sites simultaneously is apparent, with the breakthrough collaborative model from the Institute for Health Care Improvement providing the international lead. This model is based on the principles of CPI.

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## APPENDIX I

### Reducing atrial fibrillation after cardiac surgery

#### *Aims*

To decrease new incidence of atrial fibrillation (AF) by 50% for coronary artery bypass grafting (CABG) patients.

To limit the impact of new incidence of AF on length of stay (LOS) to  $\leq 1$  extra hospital day for same patient group (DRG 106 & 107).

#### *Measures*

Weekly rate of the new incidence of postoperative AF.

LOS for all patients (with and without postoperative AF).

New incidence of postoperative AF rate for different interventions.

#### *Sampling methods*

Data were collected on all CABG patients.

One year later, data were collected on all heart surgery patients (i.e. valve repair or replacement, combination procedures, myxoma removal).

Chronic AF patients were excluded.

AF was defined as: (i) lasting 4 h or (ii) patient required treatment.

#### *Key changes*

Beta-blocker medication was administered to medically appropriate patients:

if the patients were on a beta-blocker preoperatively, their normal dose was administered the morning of surgery.

assured that preoperative beta-blocker was resumed postoperatively.

postoperatively, prophylactic beta-blockers were administered to patients who were not previously on beta-blockers.

trial of first dose was given intravenously or by mouth.

trial of first dose was given 8 h postoperatively (if stable or on postoperative day (POD) 1).

simplified the beta-blocking process by: (i) giving the lowest effective dose orally, (ii) giving metoprolol 25 mg b.i.d. or (iii) restarting patient's preoperative medicine on POD 1.

expanded beta-blocker protocol to all heart surgery patients (not just CABG).

implemented timeline for treatment of AF for entire care team.