

Model for Improvement as a Predictive Tool

Bruce Harries

Quality Healthcare Network

Toronto, Ontario

September 26 - 27, 2005



Every system is perfectly designed to produce the results it gets. Performance is not simply a matter of effort; it is a matter of design.

*Donald Berwick, MD
Institute for Healthcare Improvement*

All improvements require change but not all changes are improvements.

Associates in Process Improvement



Management is prediction.

W. Edwards Deming



Purpose of Session

- Better understand the Improvement Model
- Learn how it can be applied

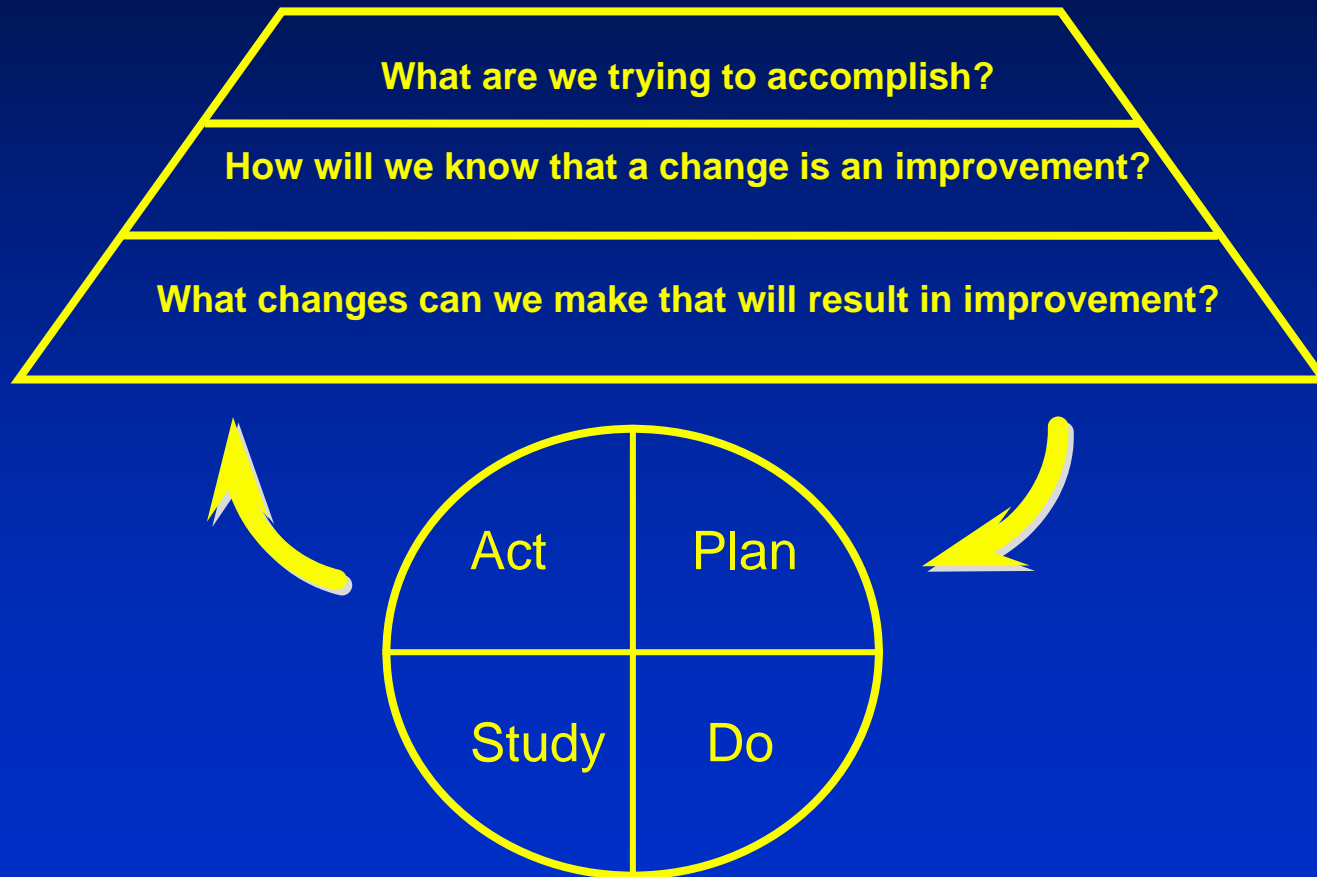


The Improvement Model (Part One)

Three Questions for Improvement
Aim, Measures and Ideas



Improvement Model



What Are We Trying to Accomplish?

- Alignment
- Clear and concise
- Bold and unambiguous
- Deadline
- Focus



Example of Aim Statement for VAP

- Reduce ventilator-associated pneumonia (VAP) rate by 50% within 12 months.



How Will We Know a Change Is an Improvement?

- 2-6 measures
- Add balancing
- Useful
- Learning not judgment



How Will We Know a Change Is an Improvement?

- Outcome measures to see progress towards aim, e.g. VAP rate
- Process measures to determine if a specific change is having the intended effect, e.g. bundle compliance
- Balancing measures to understand the impact of changes on the broader system, e.g. patient satisfaction



Operational Definitions

An **operational definition** is a procedure agreed upon for the translation of a concept into measurement of some kind.

W. Edwards Deming

There is no true value of any characteristic, state, or condition that is defined in terms of measurement or observation.



Example of Measures for Rapid Response Teams

- Codes per 1,000 discharges
- Bundle compliance
- Codes outside the ICU
- Utilization of RRT (# of calls)
- Staff satisfaction

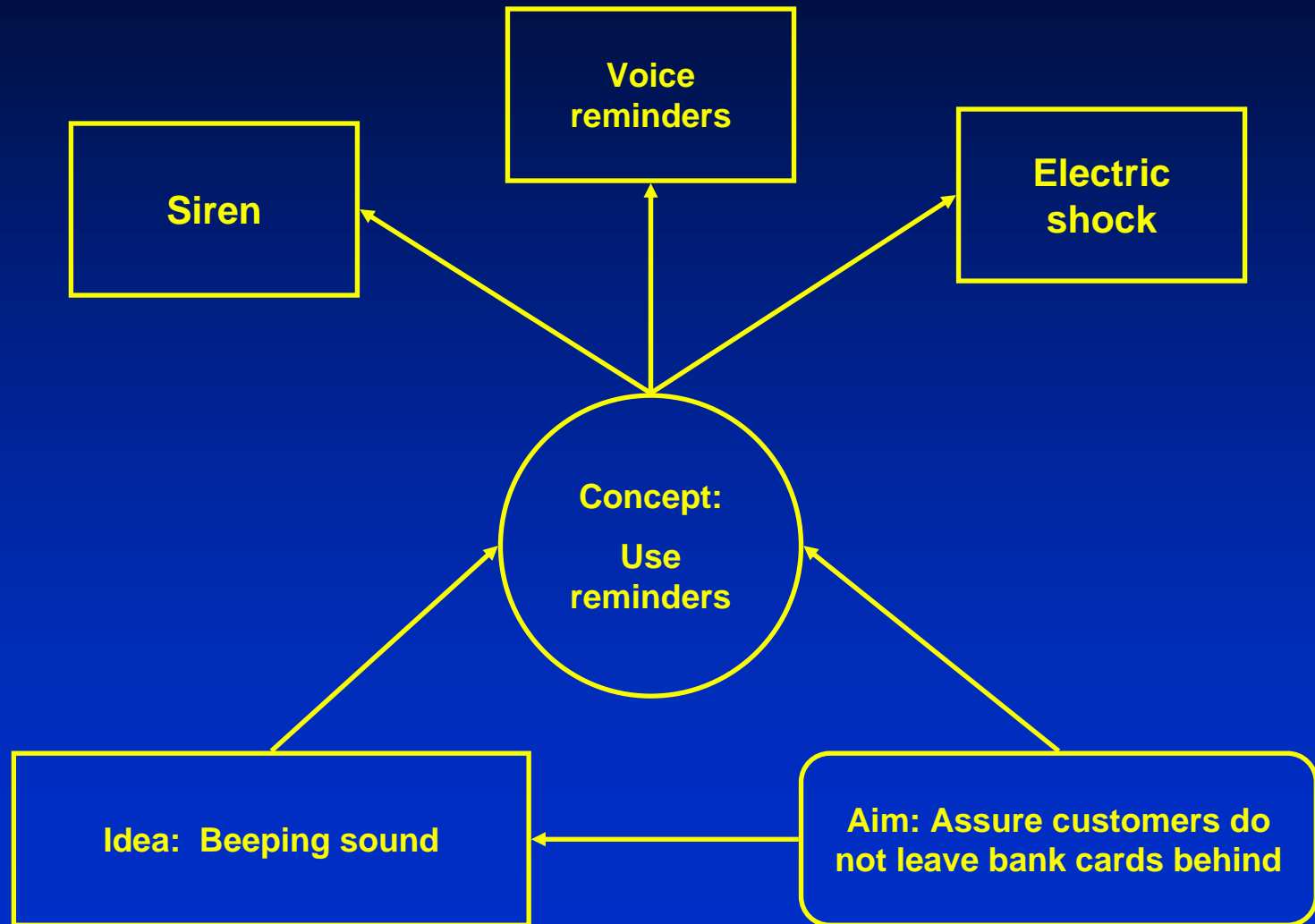


What Changes Can We Make That Will Result in Improvement?

- Change packages
- Hunches
- Best practices
- Process users
- Subject matter experts
- Research and benchmarking



Change Concepts



Example of Changes

- Care “Bundles” and Components
 - VAP bundle, Central Line Insertion bundle, 7 aspects of care for instituting Rapid Response Teams
- Safety huddles
- Checklists
- Daily goal sheets
- Multidisciplinary rounds



The Improvement Model (Part Two)

PDSA Cycles &
Principles for Testing a Change

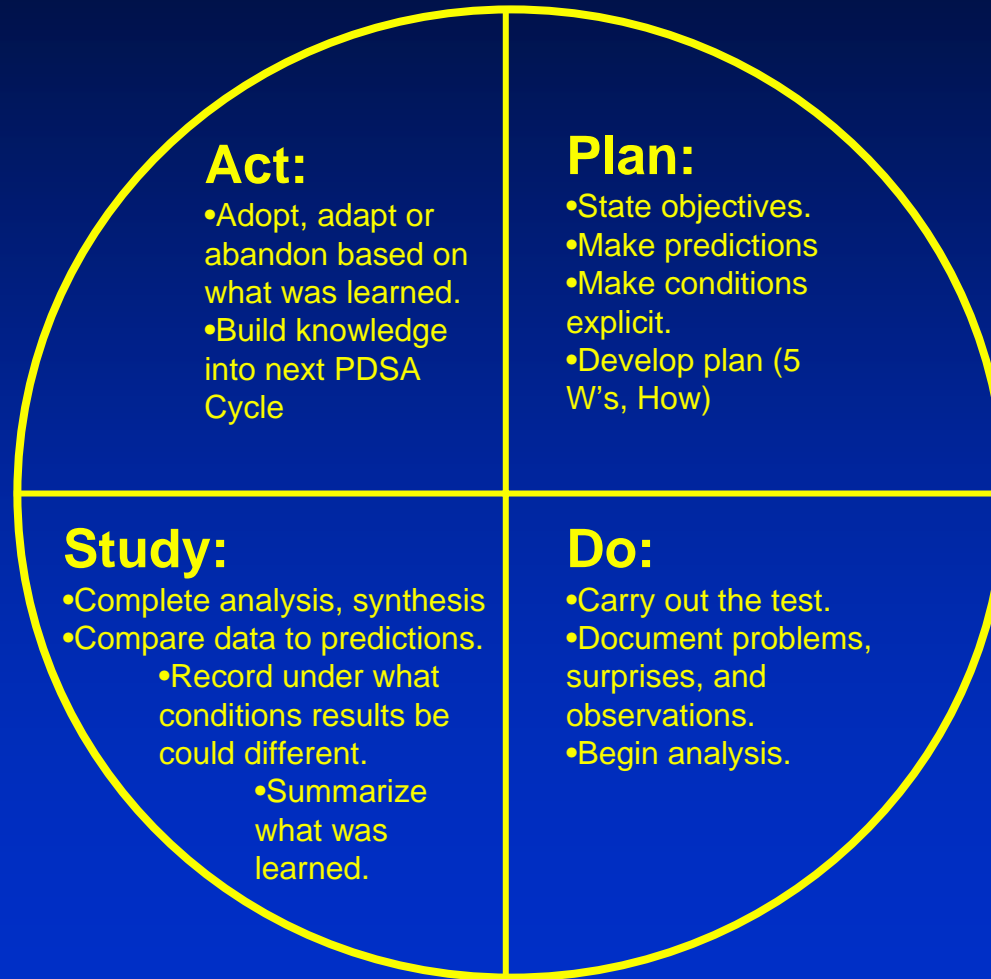


Prediction Exercise

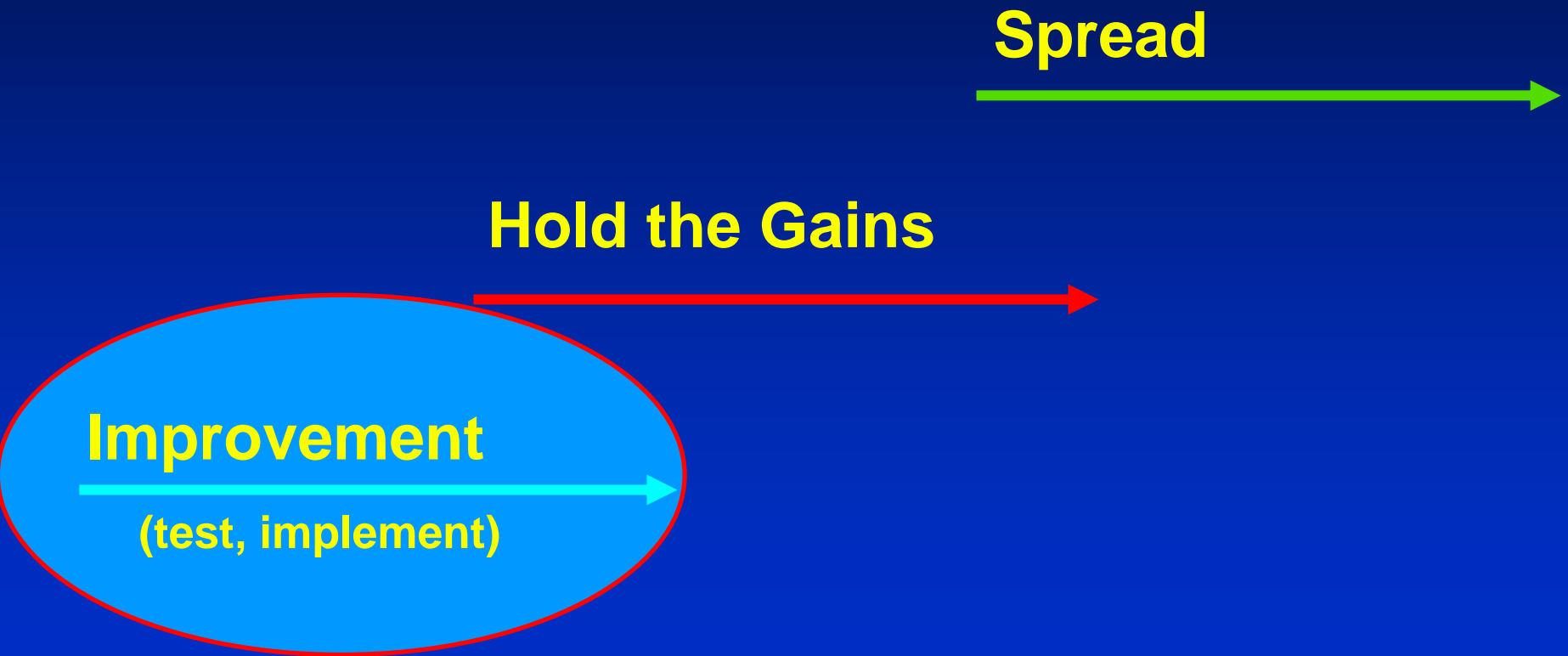
- First to market wins
- Predict the number sequence
- Choices:
 1. Get more information
 2. Predict the next number
 3. Predict the sequence
- You are bankrupt if your losses exceed \$50,000



Elements of the PDSA Cycle



Creating a New System



3 Principles for Testing a Change

1. Test on a small scale
2. Collect data over time
3. Build knowledge sequentially and include a wide range of conditions in the sequence of tests



Principle 1: Test On a Small Scale

	DEGREE OF BELIEF IN SUCCESS OF THE CHANGE	
CONSEQUENCE OF FAILED TEST	LOW	HIGH
MINOR	Medium-scale tests	One cycle to implementation
MAJOR	Very small-scale tests	Small-to-medium scale test



Designing a Small Scale Test

- Simulate
- Experts
- Volunteers
- 1:1:1 rule
- Pencil and paper data
- Sampling



Designing a Small Scale Test

- Test changes separately
- Redundancy
- Time -what COULD we do by next Tuesday?

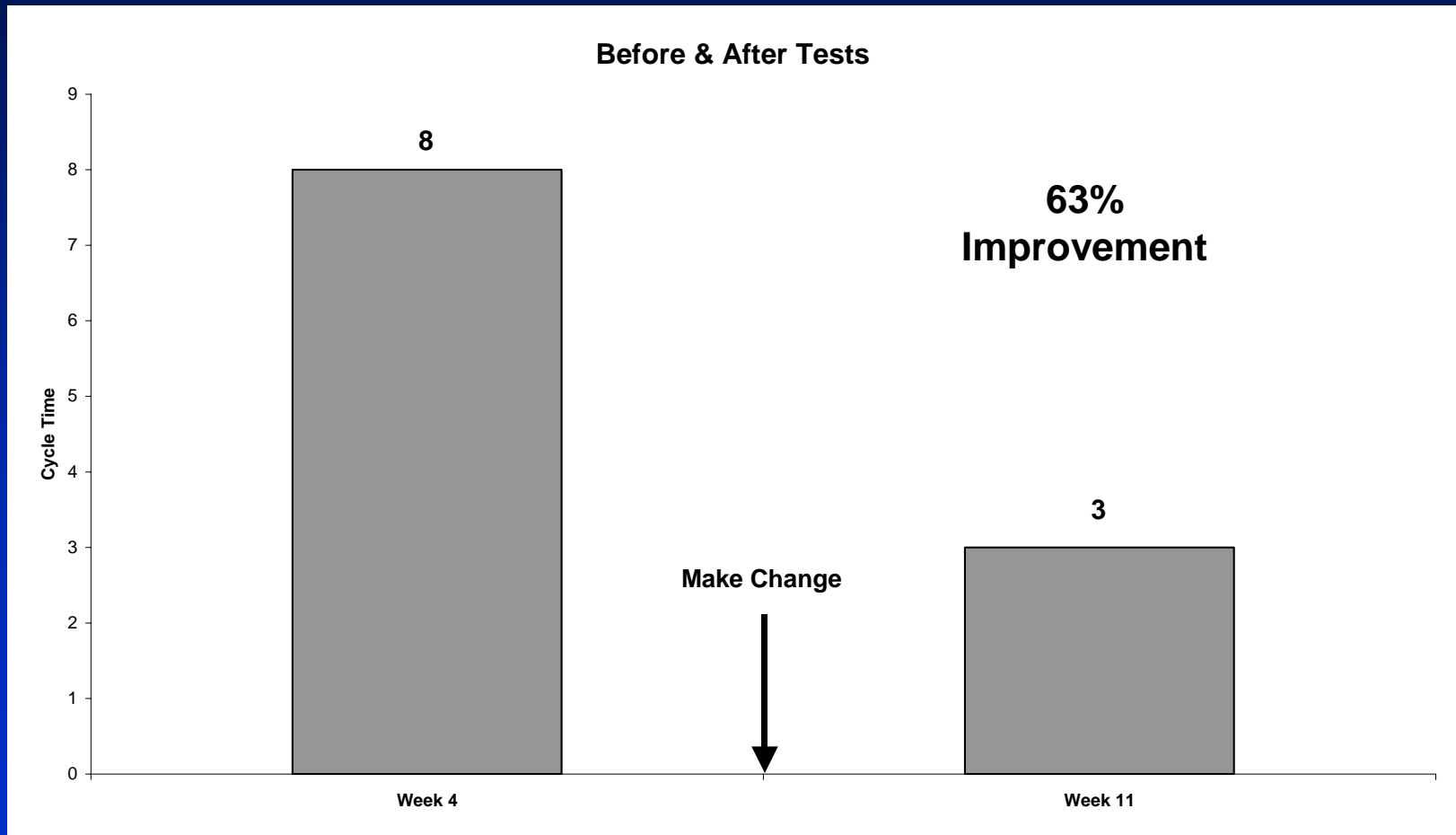


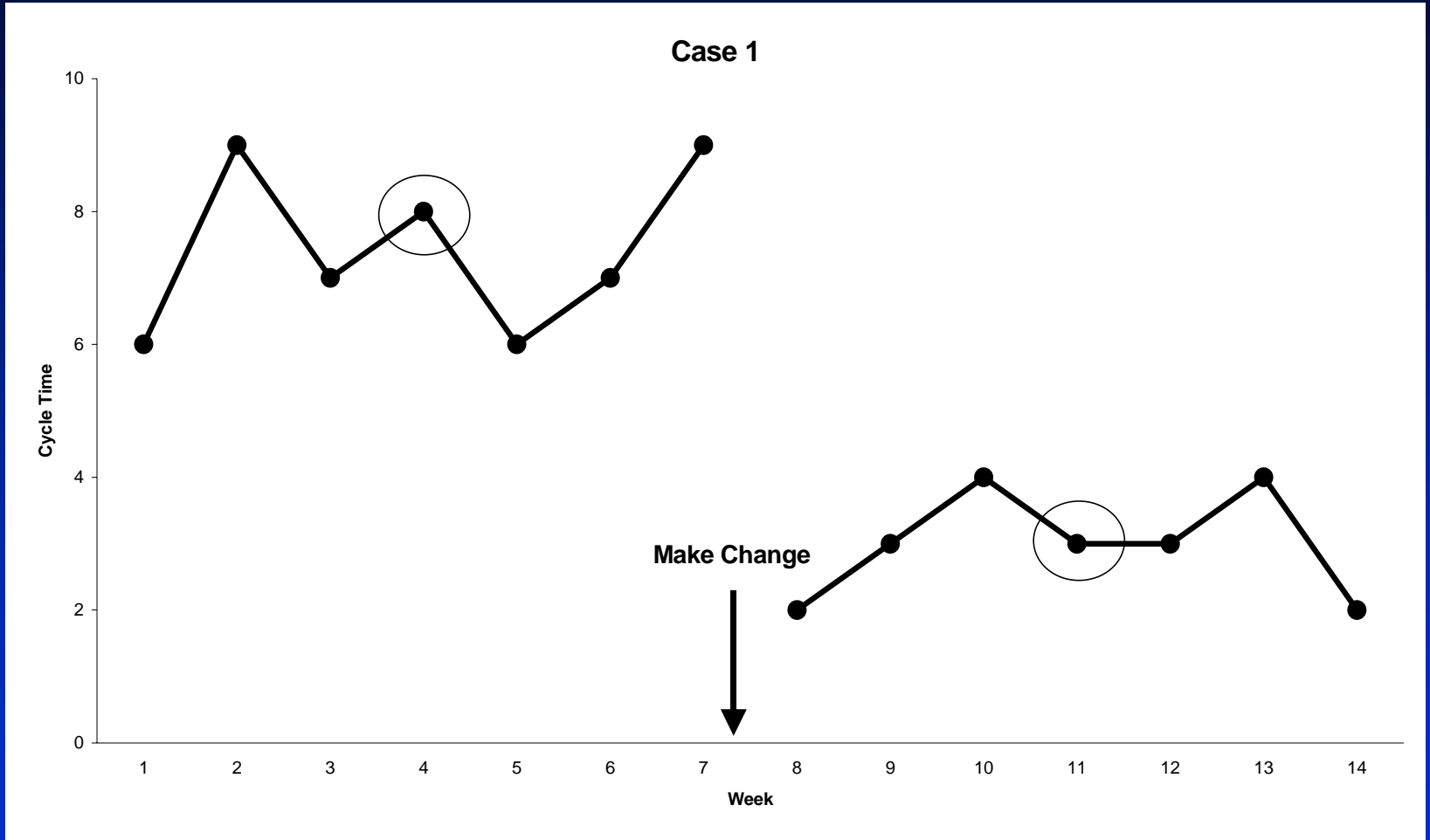
Examples

- Educate next 5 patients on importance of “medication cards”
- Incorporate safety huddle with volunteers on Monday morning at 9:00
- Ask for feedback from 1 daytime nurse and 1 nighttime nurse on head of bed education materials

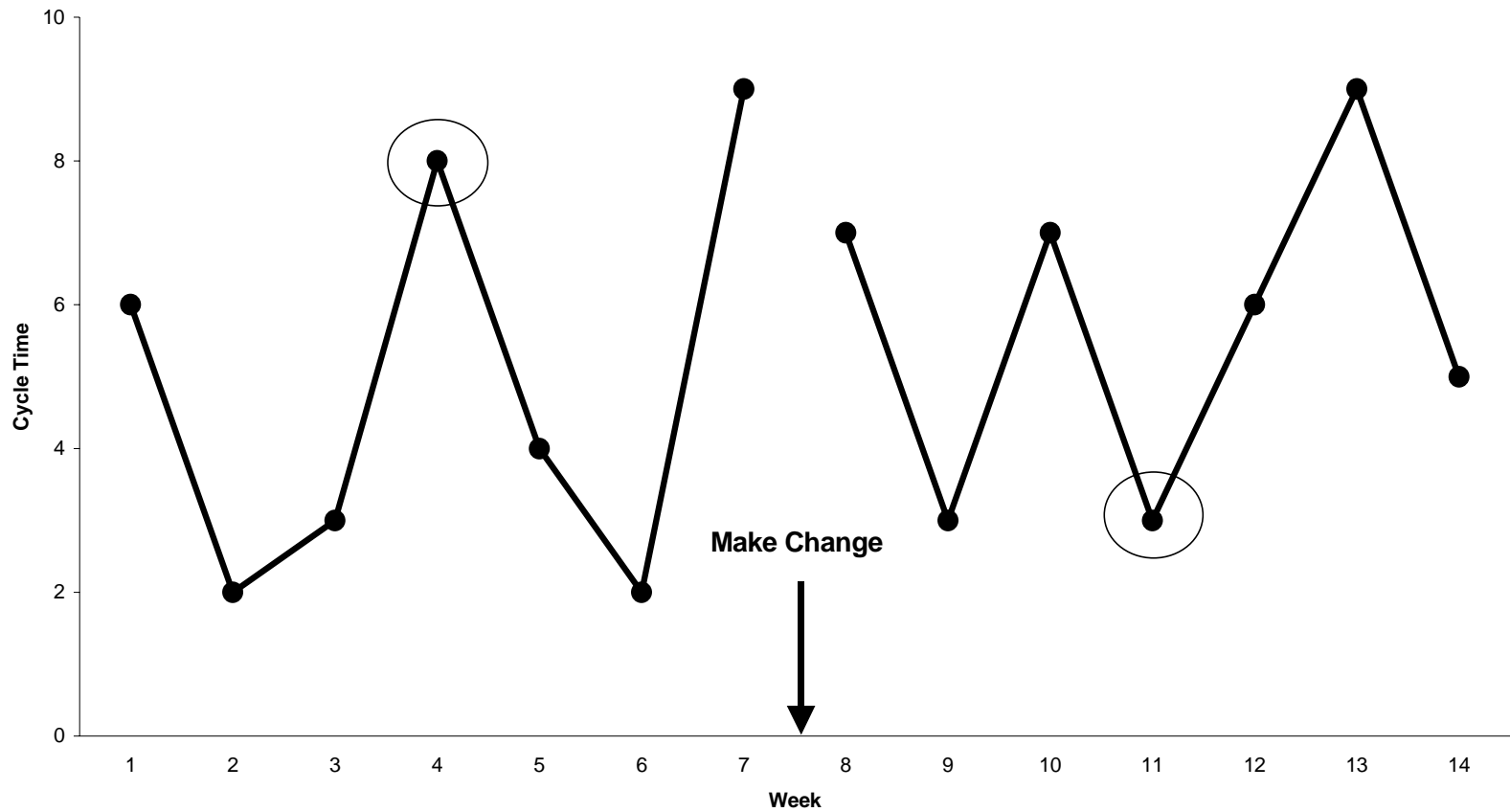


Principle 2: Collect Data Over Time

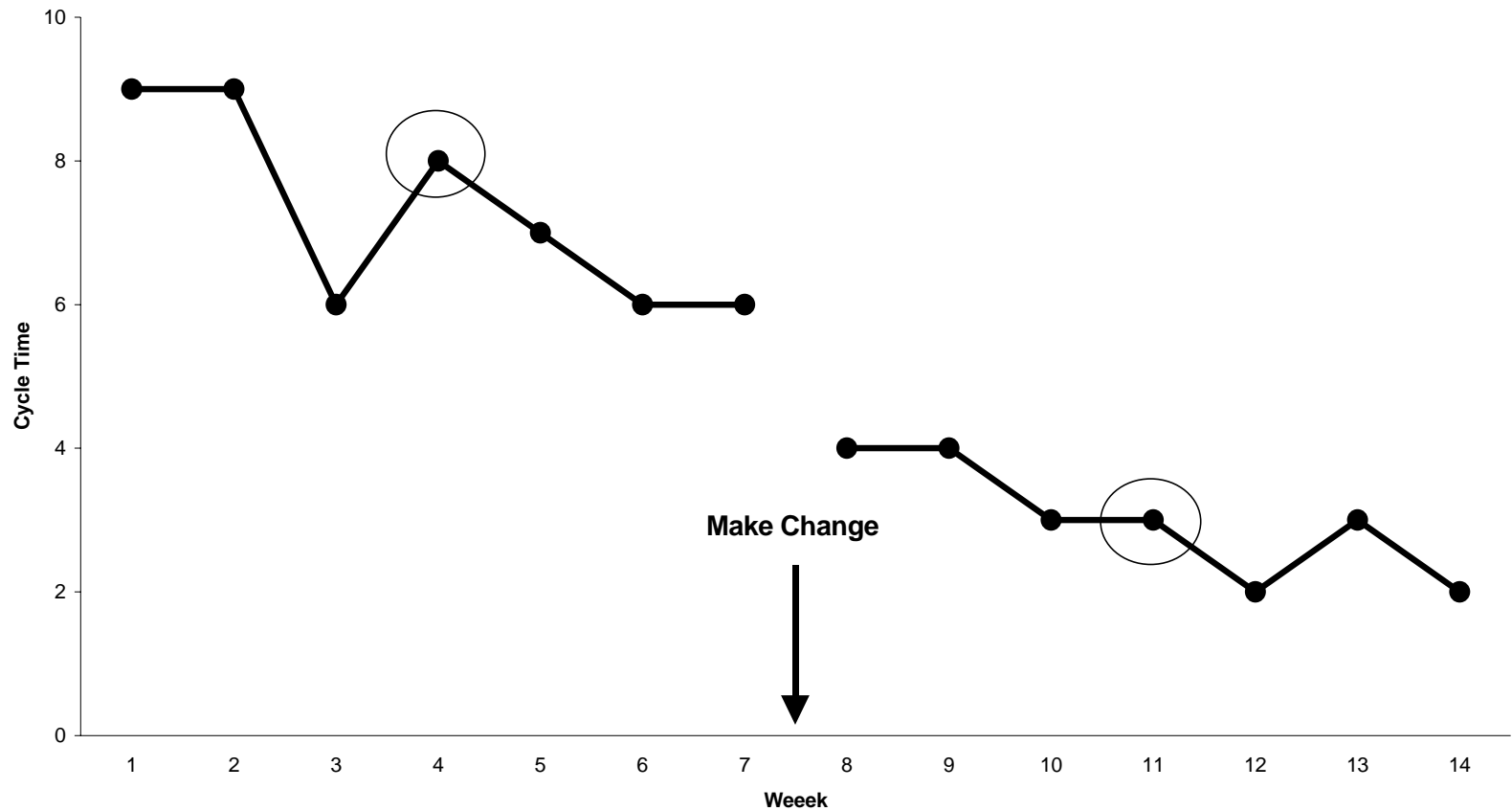




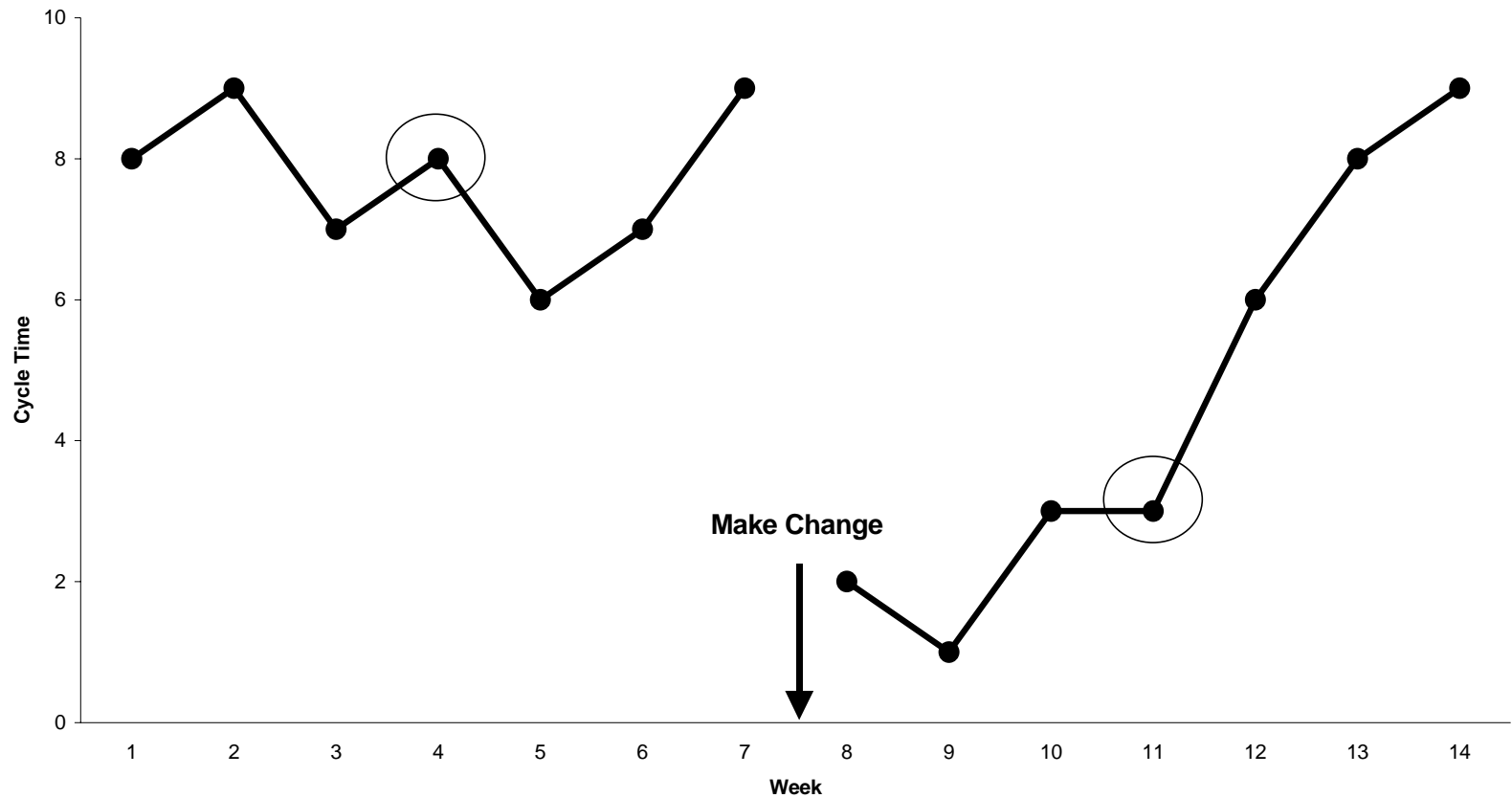
Case 2



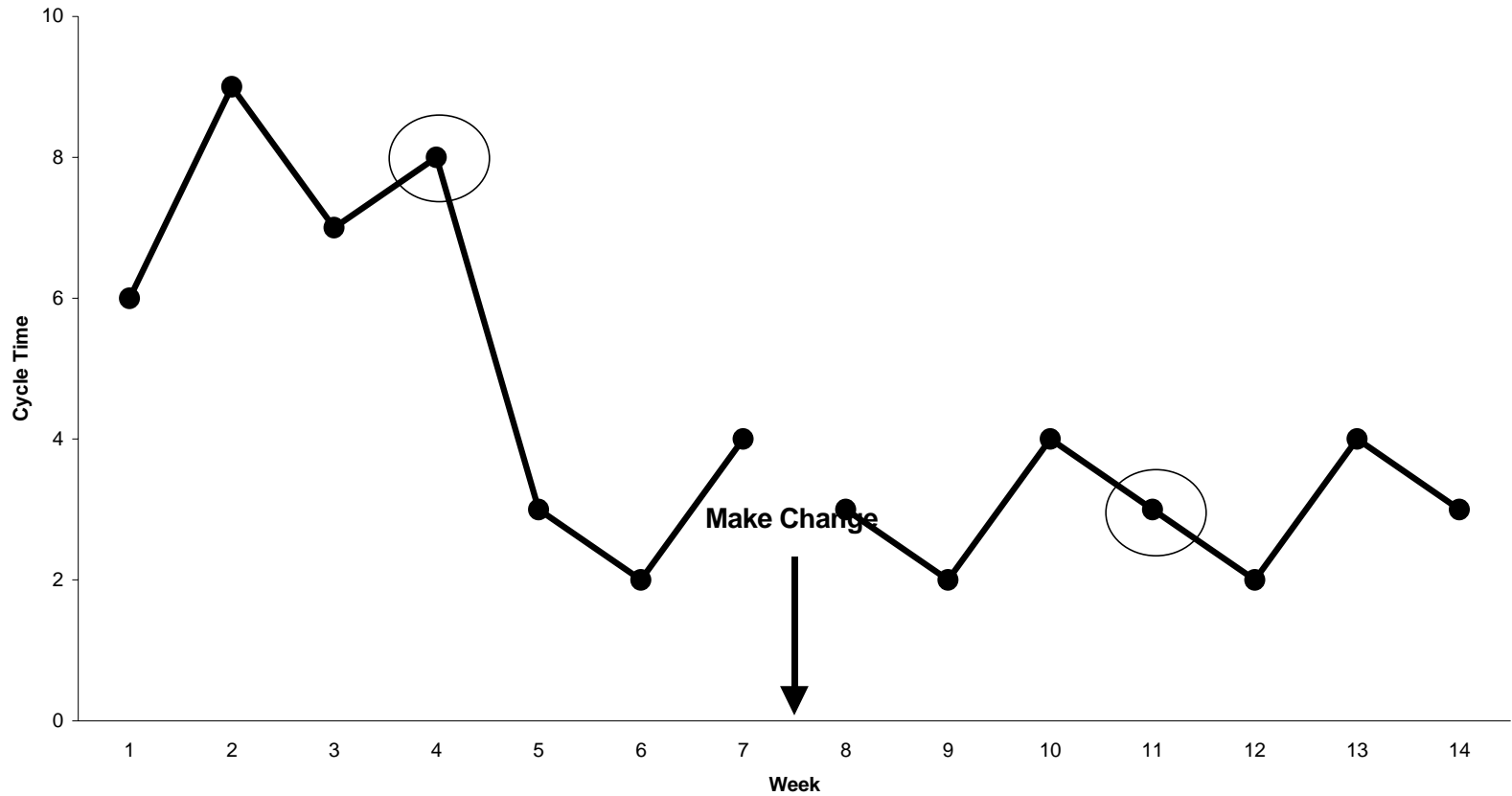
Case 3



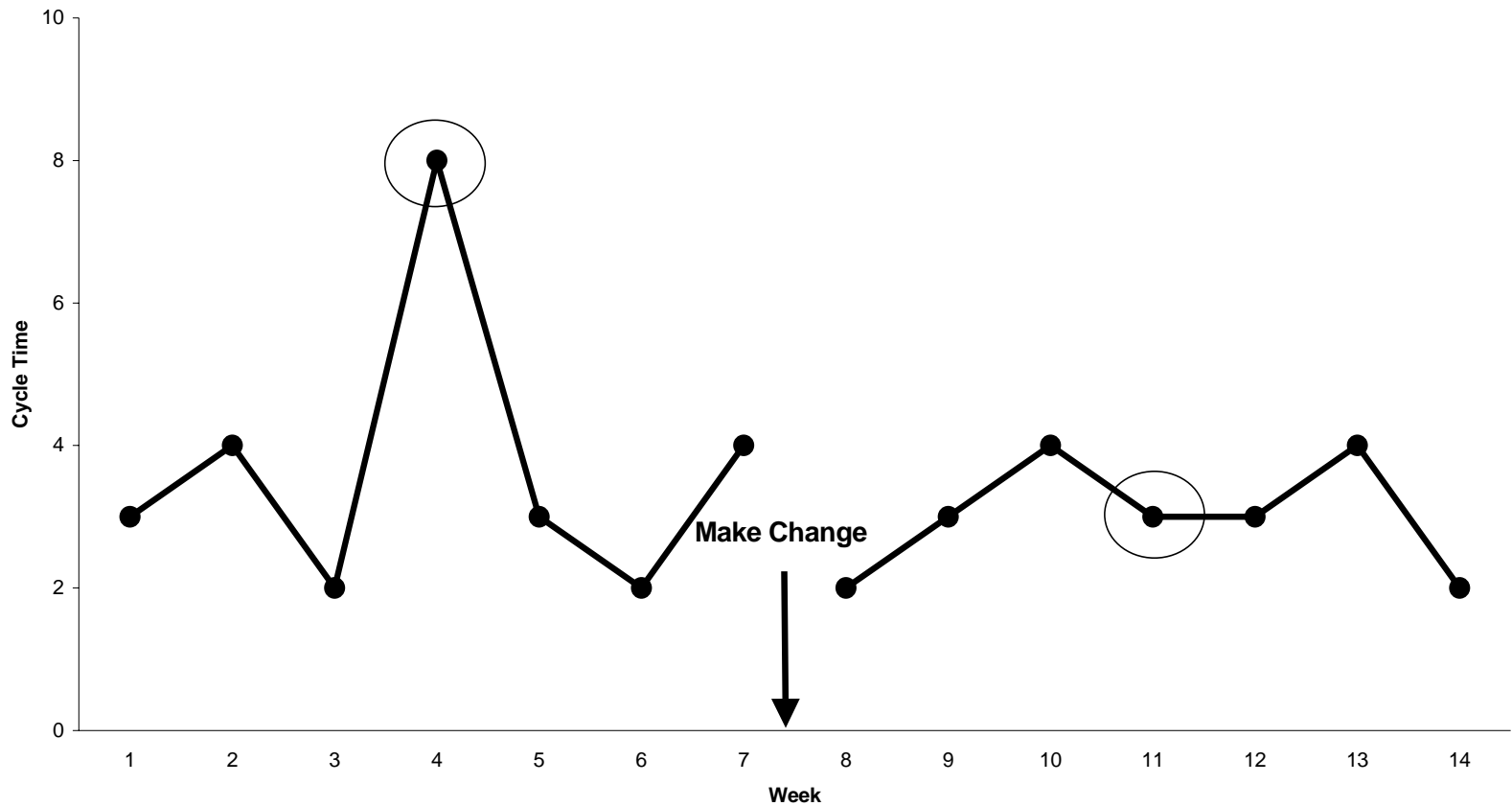
Case 4



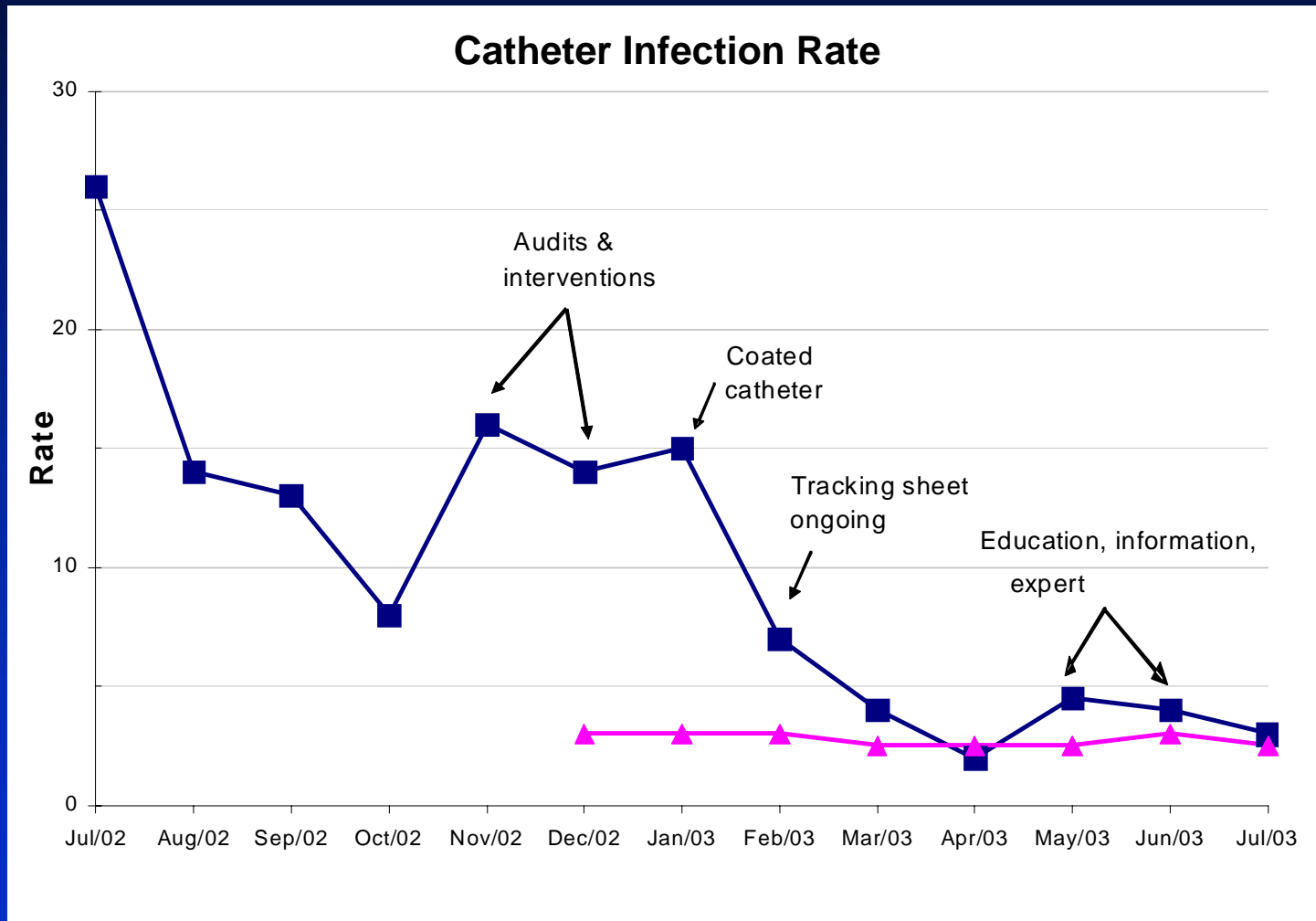
Case 5



Case 6



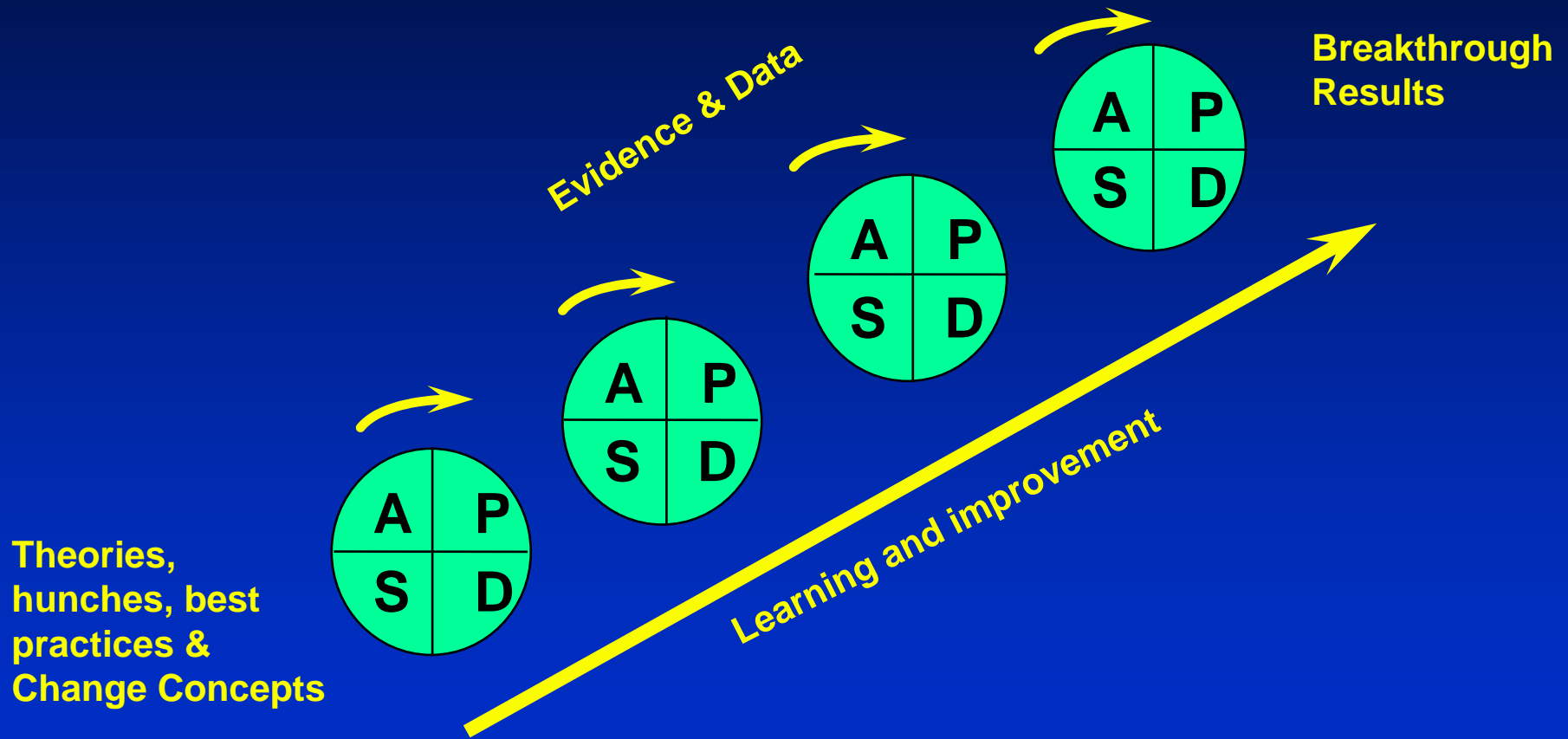
Example of Annotated Run Chart



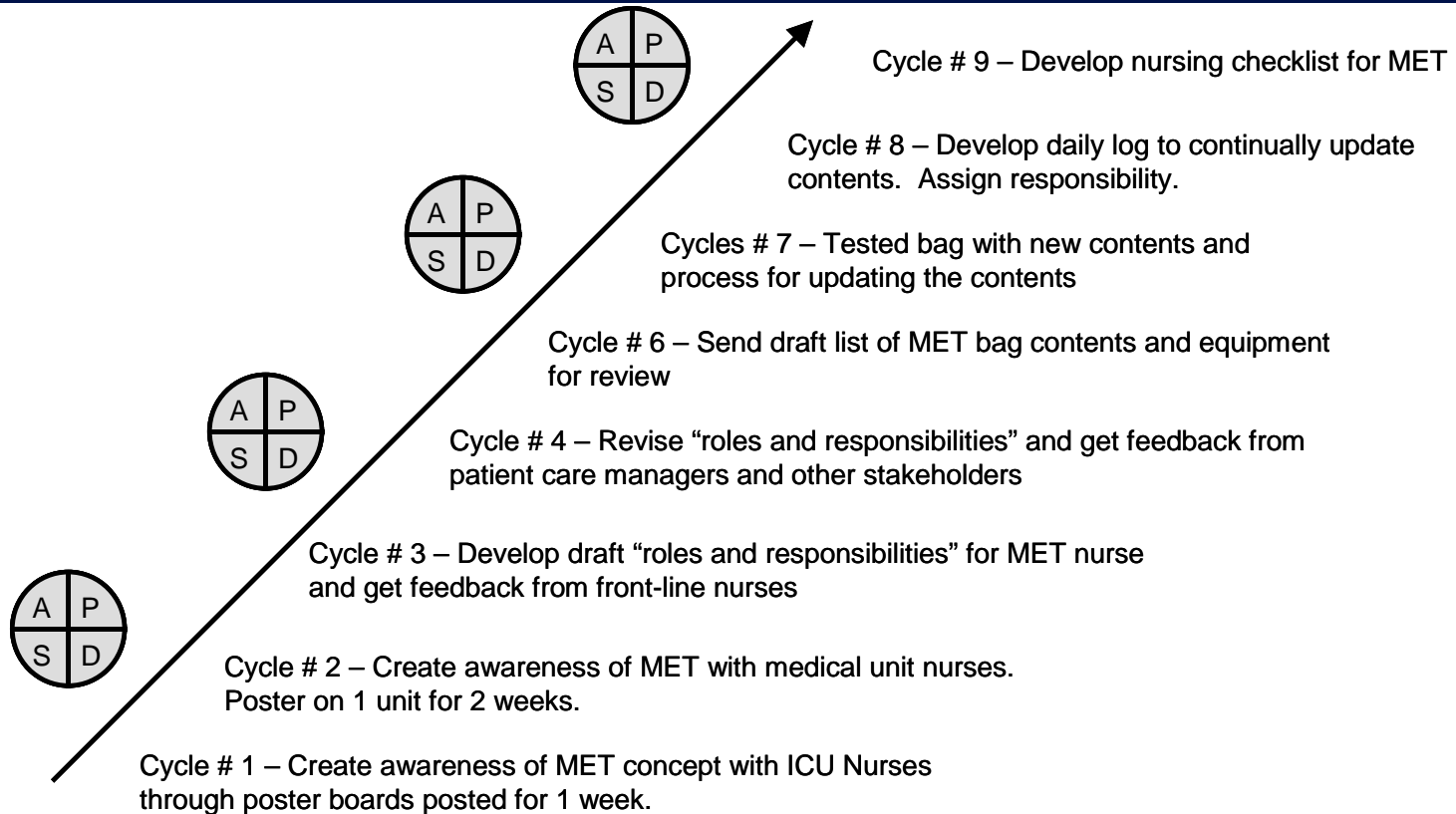
**Principle 3:
Build Knowledge Sequentially
and Include a Wide Range
of Conditions in the Sequence
of Tests**



Sequential Building of Knowledge



Example of “Ramping PDSAs”



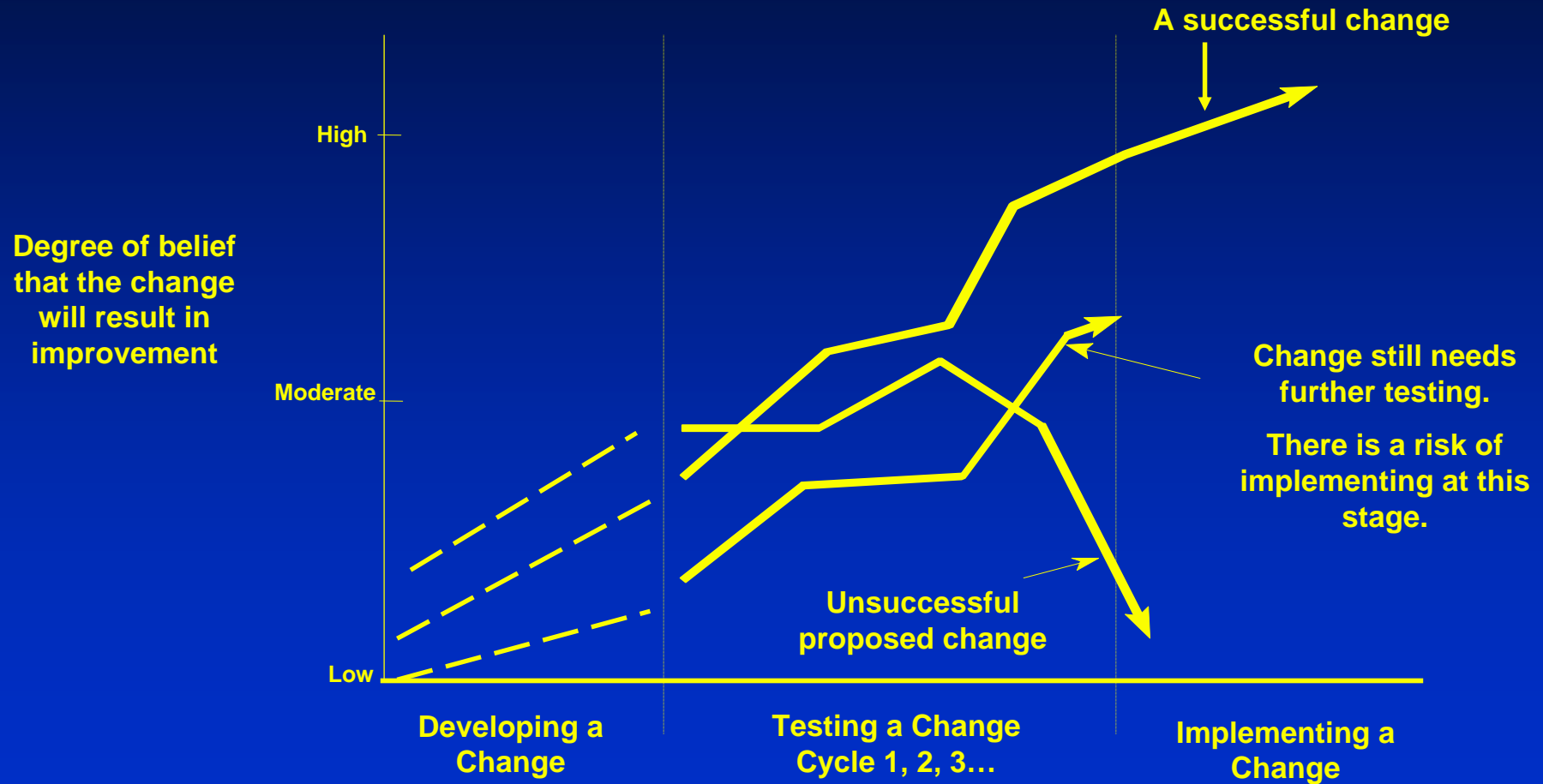
Change Concepts:
Institute a Medical
Emergency Team

PDSA Form

PDSA Cycles	
Project Name: _____	Cycle #: _____
Objective of this Cycle: _____	
PLAN	What change are we testing? What is our prediction and theory? Details of the plan (who, what, where, when and how).
DO	Carry out the plan. Record data and observations.
STUDY	Complete analysis and synthesis. Do the results agree with the predictions? Under what conditions could the results be different? Summarize new knowledge.
ACT	What action are we going to take as a result of this cycle (Adopt, Adapt or Abandon)? Are we ready to implement? What other processes or systems might be affected by this change?
	Objective of Next Cycle
<small>Improvement Associates Ltd. Page 1</small>	



Develop, Test and Implement



Degree of Belief Depends On:

- The extent to which the reasoning or theory that is the basis of the prediction can be supported by evidence
- The similarity between the conditions under which the evidence was obtained and the conditions to which the predictions apply



Predictions

“It is not enough to determine that a change resulted in improvement during a particular test...you will need to predict whether a change will be an improvement under different conditions in the future”

Langley, et al. *The Improvement Guide*



Contact

Bruce Harries

Director, Canadian ICU Collaborative
Improvement Associates Ltd

780.437.5861

bharries@telus.net



Acknowledgements

The Improvement Model was developed by **Associates in Process Improvement (API)** and has been used by thousands of healthcare and industry teams.



