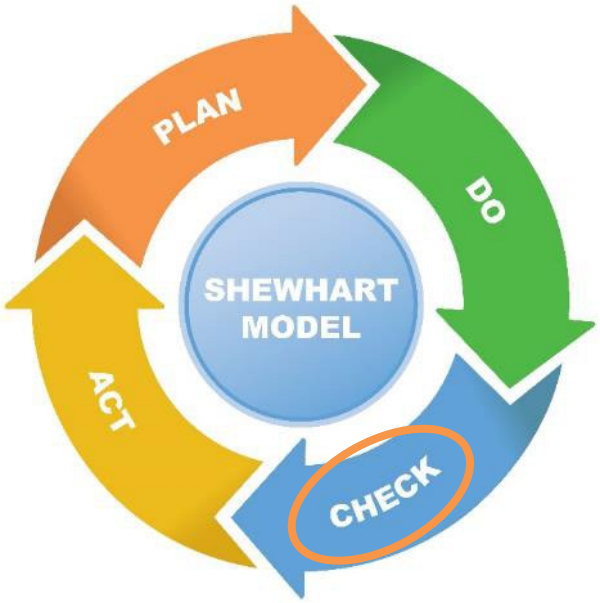
Quality and Safety Series

Variation, Monitoring, and Course Correction

OBJECTIVES

- Review key definitions for data monitoring.
- Identify types of variation.
- Define the “3 A’s” of the “Act” phase.
- Discuss approaches to course correction.
- Recognize the importance of scale, spread, and sustainability.

Measuring the Results



Measuring, monitoring, and course correction are critical steps in all quality improvement models.

See ***Quality Improvement Models*** and ***Rapid Cycle Improvement*** Quickinars: www.hsag.com/hqic/quality-series

Measuring Results

- Quantifies the relationship between inputs and outputs.
- Provides a visual representation of processes, compliance, and outcomes.
- Identifies what is working and what is not.

"What gets measured gets managed." —*P. Drucker*

Drucker P. (n.d.). Peter Drucker quotes. https://www.azquotes.com/author/4147-Peter_Drucker

Review: Types of Measures

Process Measures	**Assess a step in the care of a patient.** Percentage of patients prescribed opioids at discharge through e-prescribing.
Outcome Measures	**Assess the effectiveness of care or the result of care.** Rate of opioid-related adverse drug events.
Balance Measures	**Assess for unintentional outcome(s).** Decreased opioid prescribing results in an increase in patient pain rates.

See ***Data Plan*** Quickinar: www.hsag.com/hqic/quality-series

Review: Process Reliability

Process Reliability → **The *consistency* of a process to produce a specific output.**

Goal **≥ 95%**

Process Capability → **The *ability* of a process to produce a specific output.**

See ***Reliable Processes*** Quickinar: www.hsag.com/hqic/quality-series

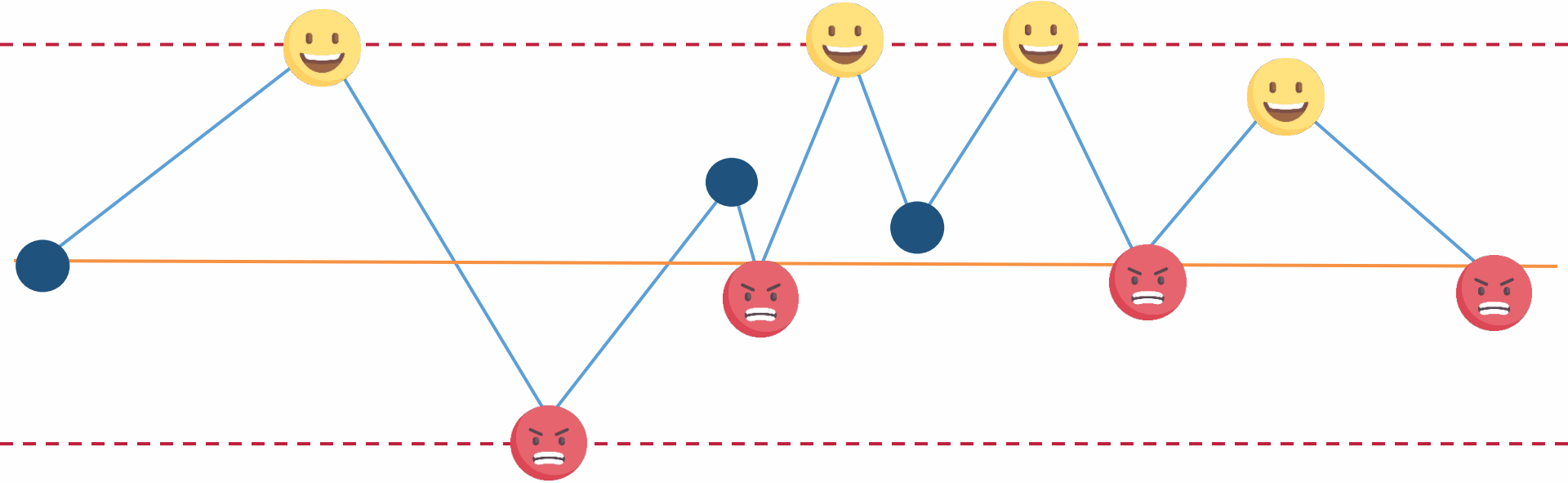
Review: Data Visualization

- Displaying the data
  - Run charts
  - Control charts or SPC* charts
- Analyzing the data
  - Are these the predicted results?
  - Look for impact of the intervention
- Change or variation
  - 5 to 8 points above or below the mean

SPC = statistical process control

See ***Data Visualization*** Quickinar: www.hsag.com/hqic/quality-series

The Variation Story



Data Pitfalls

"Every system is perfectly designed to get the results it gets." —W.E. Deming[1]

WARNING

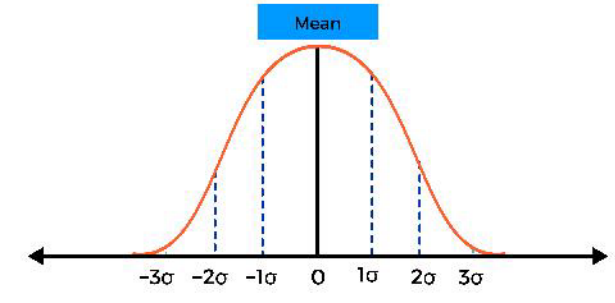
Do not fall into the trap of reacting to common cause variation.
Data do not change without process change.

"The definition of insanity is repeating the same behaviors and expecting different results." —A. Einstein[2]

1. W. Edwards Deming Institute. *Quotes by W. Edwards Deming*. 2020. https://deming.org/quotes
2. O'Brien J. (n.d.). Einstein's parable of quantum insanity. *Quantum Magazine*. Sep. 2015. https://www.quantamagazine.org/einsteins-parable-of-quantum-insanity-20150910/

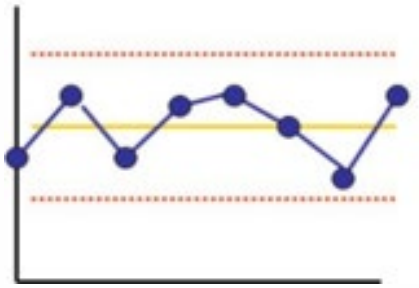
Definition Pause

Standard Deviation: Measures of the amount of variation in a set of values.

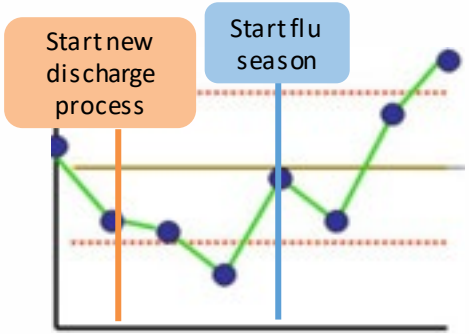


Control Limits: Typically set at 3 standard deviations above and below the mean.

- Upper control limit
- Lower control limit



Annotated Run Chart: Includes explanations of key events.



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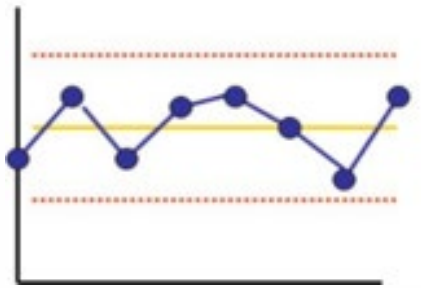
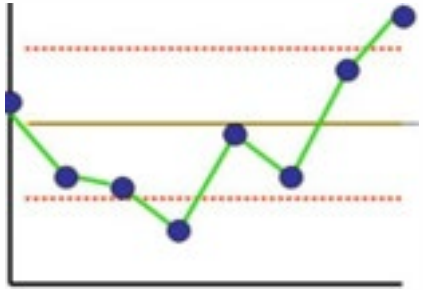
Identifying Variation

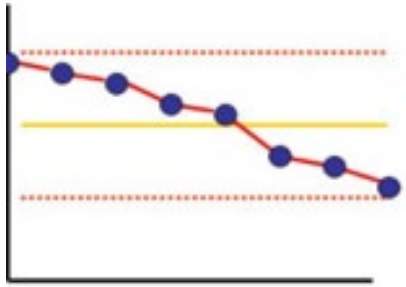
Common Cause



Special Cause

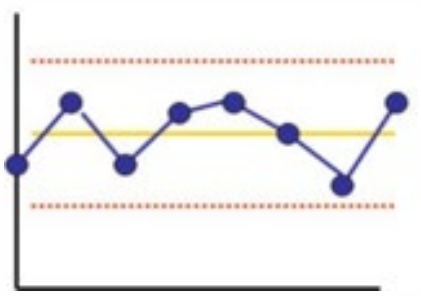


Change Trend



Common Cause Variation

Common Cause
No data points outside controls



Common Cause Variation
(natural cause, random cause, noise)

- Inherent part of a process
- Caused by unknown factors
- Steady but random distribution
- Typically, within 3 standard deviations
- Remains within the control limits
- No trend

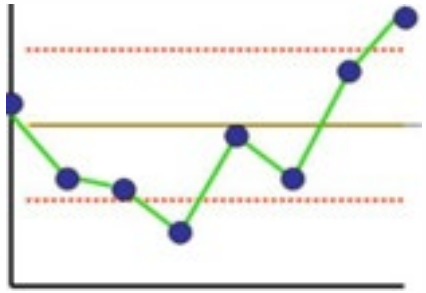
Do not react to these points as a success or failure

You can have common cause variation, but still have an "unstable" process. A "tight" process has less variation and/or less deviation.

https://www.isixsigma.com/dictionary/common-cause-variation/

Special Cause Variation

Special Cause
Few data points outside controls



Special Cause Variation
(assignable cause)

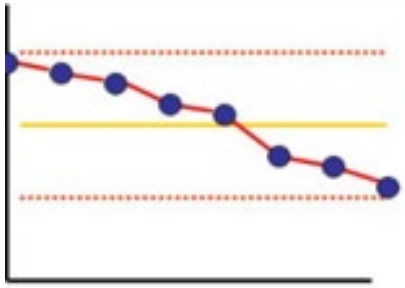
- New and unanticipated change in process
- Shift in output caused by a specific factor
- Data point(s) outside the control limits
- Unpredictable and problematic
- Can be cyclic (think flu season and readmissions)
- May require course correction/process change

You can use an annotated run chart to denote significant variables/changes that can be linked back to the special cause variation.

https://www.isixsigma.com/dictionary/special-cause-variation/

Change Trend

Change Trend
5 to 8 data points above or below the mean

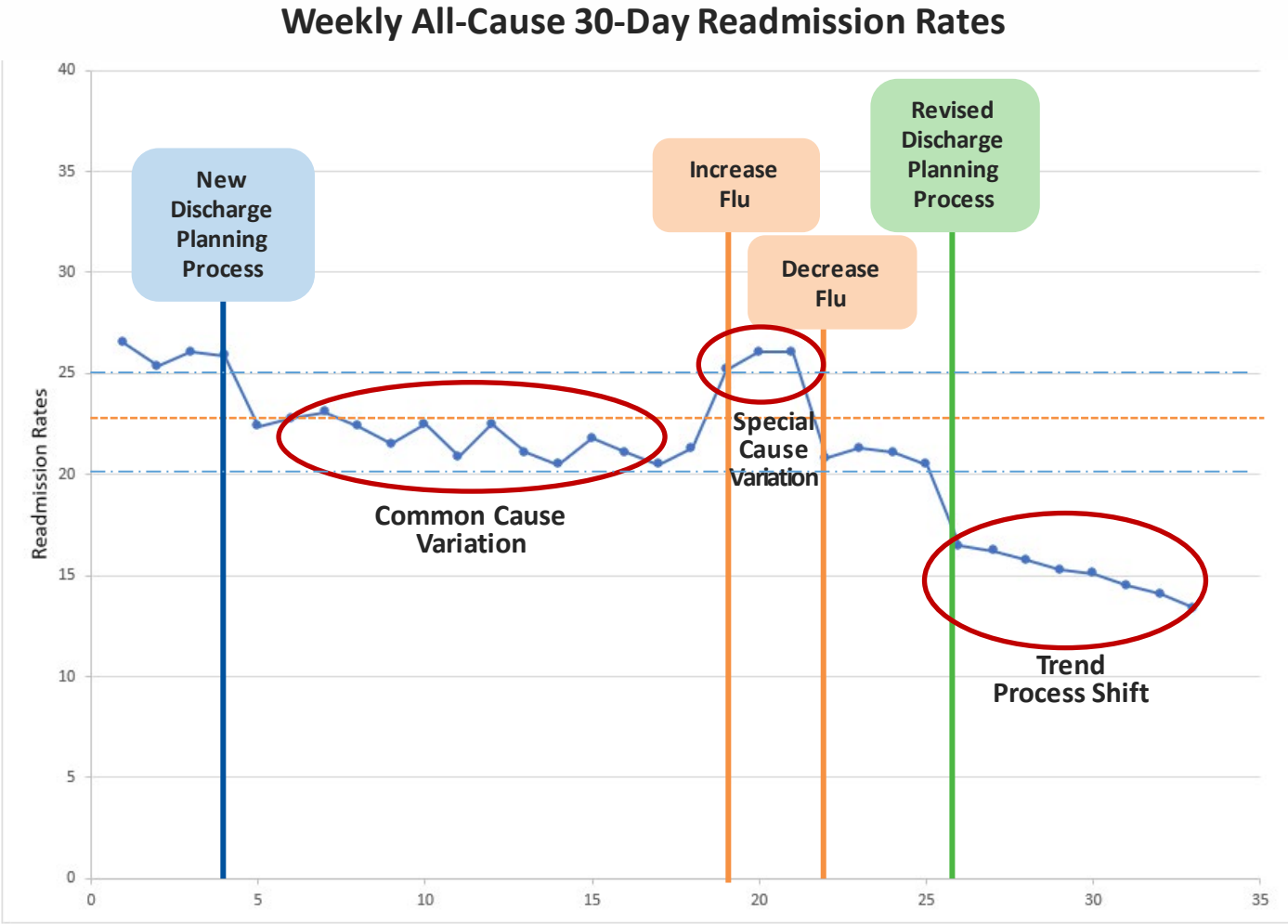


Change Trend

- A pattern that moves in a direction over time
- A developing change in data
- 5–8 data points above or below the mean is common
- A trend can be positive or negative

If the trend is positive, it may be an indication that your project changes/process changes are working.

Example: Annotated Run Chart



The 3 A's of Act

Adapt

- Some change realized
- Modify process

Adopt

- Realized, expected change
- Continue process

Abandon

- No change realized
- Failure of process

Action

Adapt

- The process is loose
- Some positive changes achieved, but not yielding results
- Undergone at least 1 full PDCA/PDSA* cycle
- Requires process improvements/changes
- Addresses identified barriers
- Improves buy-in/compliance

PDCA = plan, do, check, act
PDSA = plan, do, study, act

Action

Adopt

- Achieved results
- Met goal
- Established as a reliable process
- Is a stable process
- Undergone several PDCA/PDSA cycles
- “Hardwired” process/standard work
- Buy-in/compliance is improved
- Ready to move to sustainability

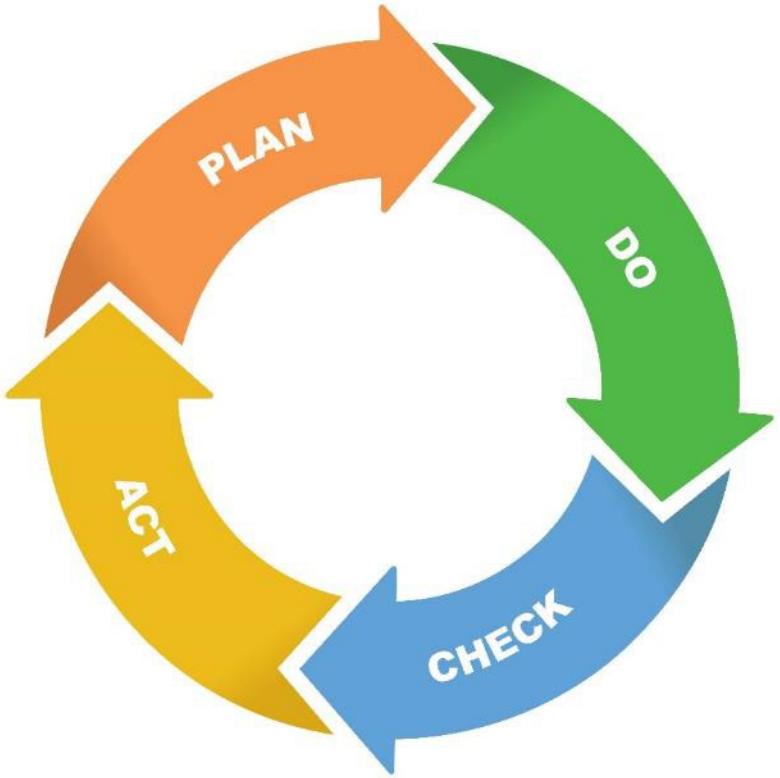
Action

Abandon

- After adapting/changing, the process is still not yielding results
- Undergone multiple tests of change
- Undergone multiple PDCA/PDSA cycles
- Too many barriers to overcome
- Not enough resources
- Too complex
- Time to take a different approach
- Can be emotional or seen as “failure”
- Part of the quality improvement process

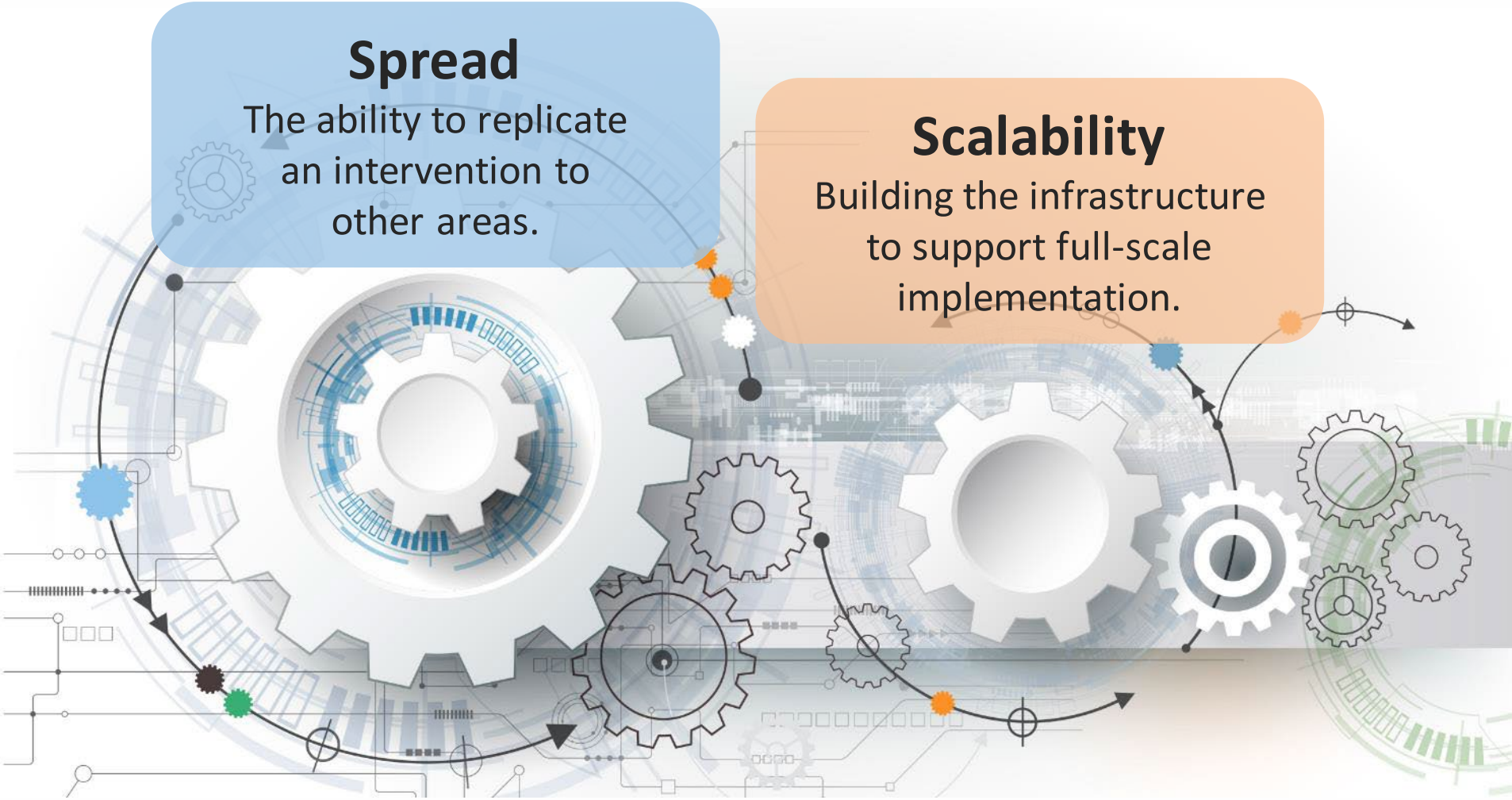
Adapt: Quick Test of Change

- Employ rapid cycle improvement
- Conduct quick tests of change
- Adapt or make changes in the process
- Create an accelerated process
  - Make and test changes during a short timeframe
- May need more frequent data
  - Daily or weekly instead of monthly
- Monitor concurrent data



 See ***Rapid Cycle Improvement*** Quickinar: www.hsag.com/hqic/quality-series

Expanding the Process



Greenhalgh T, Papoutsi C. Spreading and scaling up innovation and improvement. *British Medical Journal*. 2019. https://www.bmj.com/content/365/bmj.l2068

Sustainability and Control Plans

"Sustainability occurs when processes or improved outcomes last within an organization after implementation has occurred…it has become part of the organizational culture and has been maintained regardless of workforce turnover." —*AHRQ*

The most difficult part of quality improvement is sustaining the gains!

- Planning for sustainability starts at the beginning of the quality improvement project.
- Develop a formalized sustainability or control plan.
- Ensure ongoing measuring and monitoring of compliance.
- Establish a feedback loop.
- Anticipate course correction for drift.
- Empower frontline staff.

See ***Control Plan*** Quickinar: www.hsag.com/hqic/quality-series

https://www.ahrq.gov/hai/quality/tools/cauti-ltc/modules/implementation/long-term-modules/module6/mod6-facguide.html

Key Take-Aways

- Ensure you are using appropriate measures.
- Data are key to identifying project progress.
- Use data rules to identify types of variation.
- React to the data—the 3 A's.
- Use rapid cycle improvement when adapting.
- Remember, abandoning is not a failure, but part of the quality improvement process.
- Once you achieve success, plan for spread and scalability.
- Plan for sustainability and develop a comprehensive plan.

Thank you!

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