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STRATEGIC RELEVANT FOCUSED

Quality Improvement Seminar

INTERACTIVE TEAMWORK

INFORMATIVE

FUN SKILL BUILDING

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Nurse Practitioner & Physician Assistant Training Programs

Continuing Education Credits

In support of improving patient care, Moses/Weitzman Health System is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

This series is intended for Postgraduate Nurse Practitioners - Family, Psychiatric Mental Health, Adult-Gerontology, and Pediatric.

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Please complete the survey and claim your post-session certificate on the WeP after today's session.

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Disclosures

- With respect to the following presentation, there has been no relevant (direct or indirect) financial relationship between the faculty listed above or other activity planners and any ineligible company in the past 24 months which would be considered a relevant financial relationship.

- The views expressed in this presentation are those of the faculty and may not reflect official policy of Moses Weitzman Health System.

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Session Goals

- Demonstrate the value of displaying data over time
- Introduce the distinction between random (common cause) and non-random (special cause) variation
- Review a temporal display and analysis method -- the run chart
- Offer examples in practice of using time plots and run charts

Roles

- Theory burst presenter
  - Mark
- Facilitator, timekeeper & technical genius
  - Emma
- Take-home thoughts
  - Emma

Agenda

- Welcome (5 minutes)
- Four theory bursts
  - Data collection tips (5 minutes)
  - Displaying data over time & example (10 minutes)
  - Types of variation (5 minutes)
  - Overview of run charts (10 minutes)
- Application exercises
  - Interpreting a run chart example (15 minutes)
  - Case study and discussion (15 minutes)
  - Using the templates (10 minutes)
- Summary and take-home points (5 mins)

Curriculum Plan

- *An overview of Quality Improvement (10/9/25)*
- *Care Observations & Stakeholder Considerations (10/23/25)*
- *Organizing your Improvement Project (11/13/25)*
- *Global Aim and Fishbone Diagram (12/11/25)*
- *Process Mapping (Flowcharts) (1/8/26)*
- **Measurement to Inform Change (1/22/26 & 1/29/26)**
- An Approach to Testing a Change (2/12/26)
- Communication about your Improvement Effort (2/26/26)
- Stakeholder Analysis & Conflict Management (3/12/26)
- Managing Up and Gaining Leadership Buy-In (3/26/26)
- Negotiation (4/9/26)
- Negotiation and More About Cycles of Change (4/23/26)
- Sustaining your Improvement Effort (5/14/26)
- Resident Presentations (5/28/26, 6/11/26, 6/25/26)

Model for Improvement

- What are we trying to accomplish? (Aim)
- How will we know that a change is an improvement? (Measures)
- What change can we make that will result in improvement? (Change)

Three questions...

...coupled with an approach for testing change.

Langley GJ, et. al. The Improvement Guide (2nd Edition), 2009.

Developing a data collection plan

- Be clear about who does what when
- Consider what is needed to collect the data
- Try to build the data collection into the process of work
- Pilot the data collection and then revise it as needed

Data Collection Plan Questions

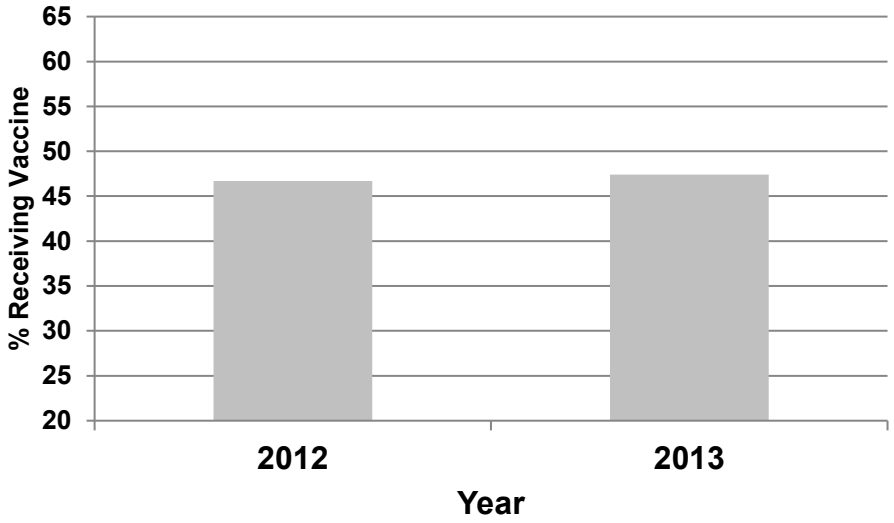
- What data will you collect?
- How will the data be analyzed?
- Will the data be stratified? If so, what will be the strata?
- How much data will be collected?
- When will data collection start and stop?
- Who will collect the data and where?
- Who needs what training to collect these data?
- When will the data collection be piloted?

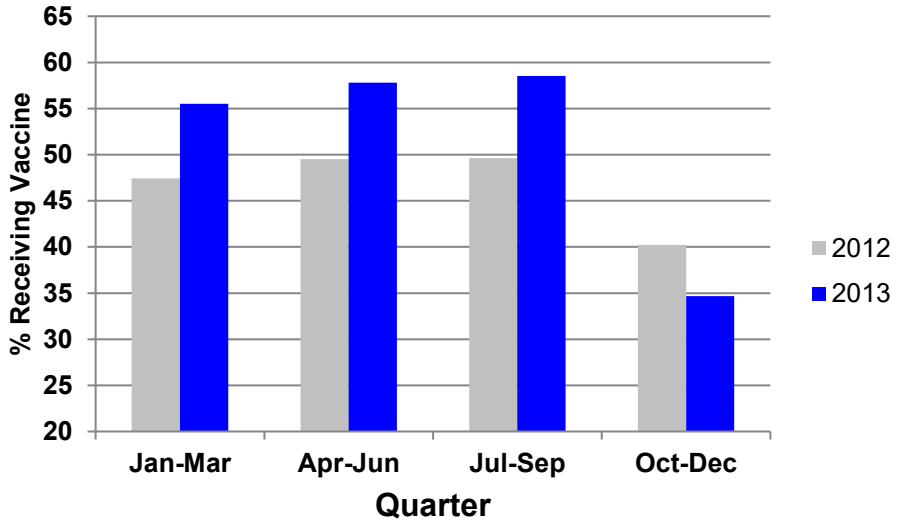
Issues that often come up…

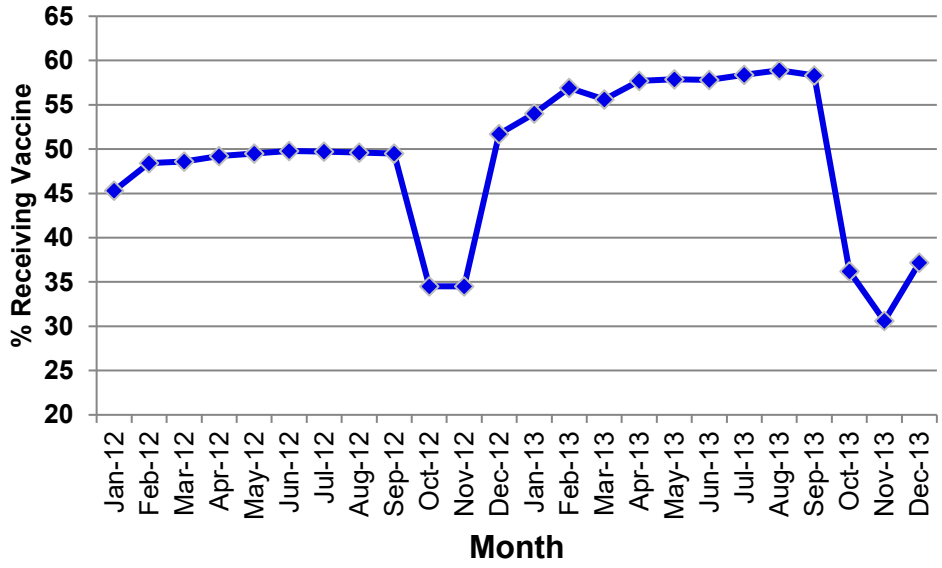
- Deciding how much data you need
- Understanding who might need training to collect the data
- How to display the measure
- Doing a pilot test

Displaying Data Over Time

Diabetics & Flu Shots

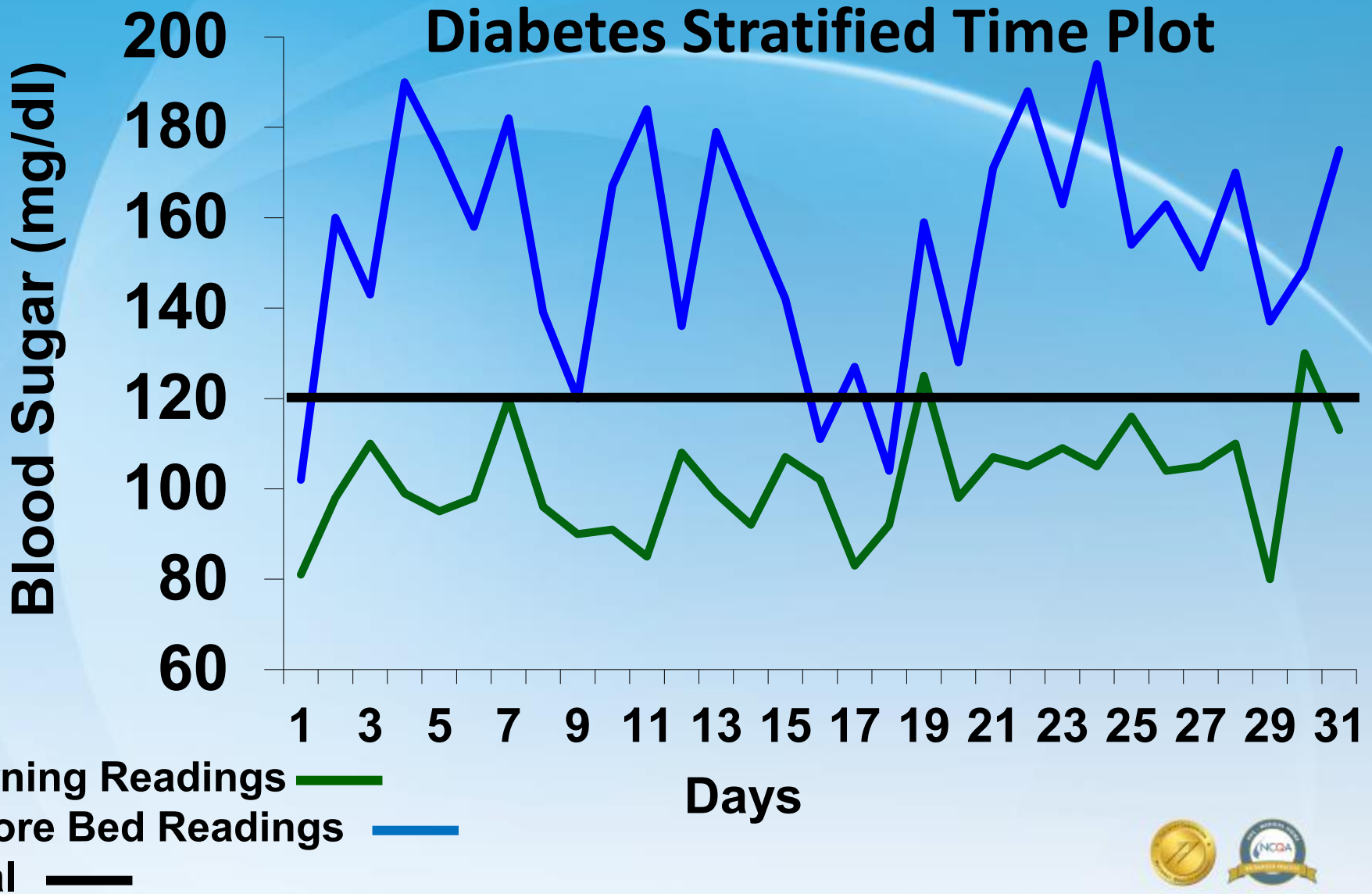




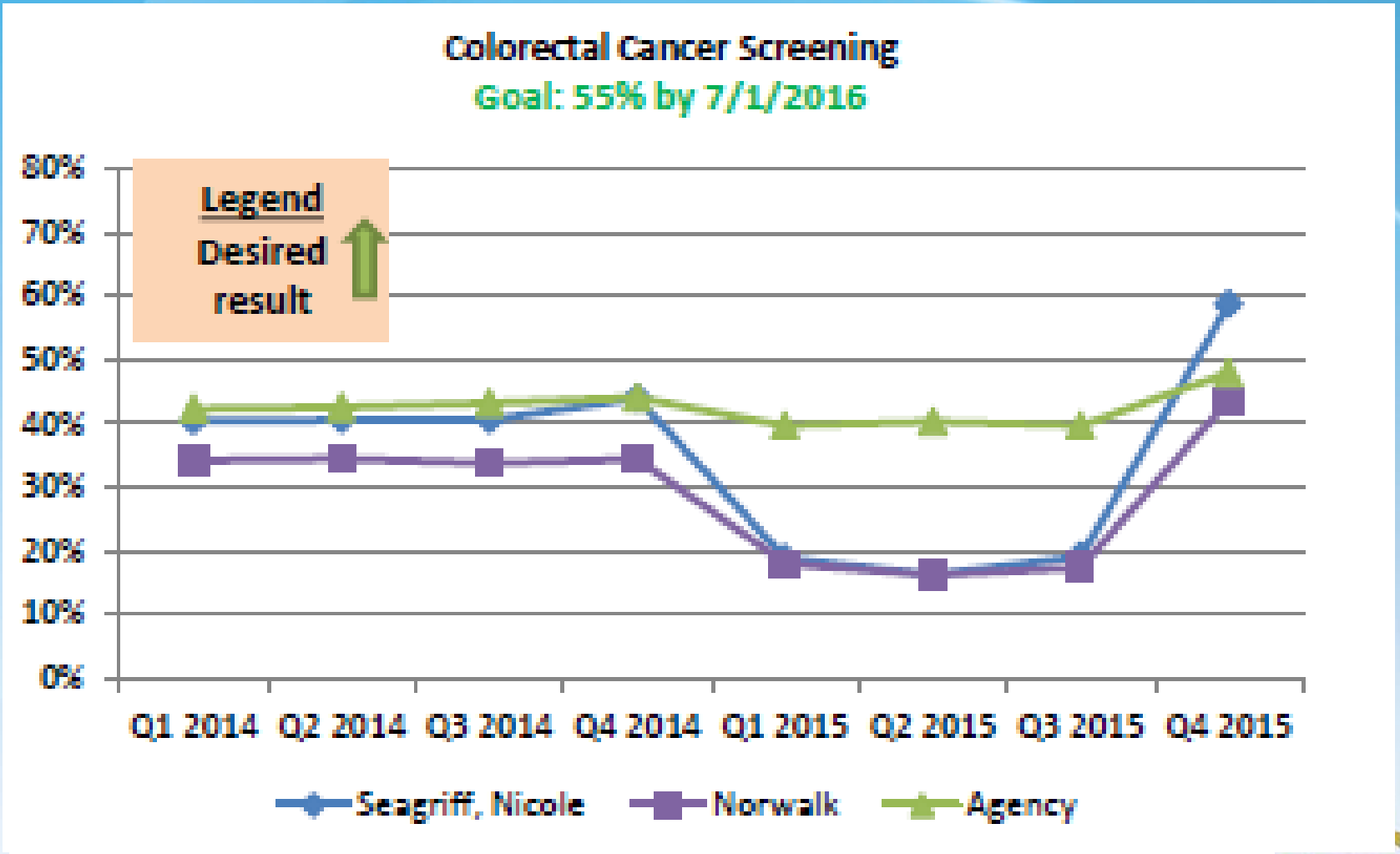


Time Plot

- A graph of data in time order
- Often kept to identify if and when problems appear (proactive)
- Also used to see trends over time (reflection)
- Especially helpful when you implement a change to follow the result


Diabetes Stratified Time Plot
Blood Sugar (mg/dl)
200
180
160
140
120
100
80
60
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Days
Morning Readings
Before Bed Readings
Goal

Example from Nicole Seagriff, DNP



Two Types of Variation

- Random (common cause) variation
- Non-random (special cause) variation

Random Variation

- Typically due to a large number of small sources of variation
  - Example: Variation in arrival time of a patient might include: weather, vehicle problems, parking issues
- Usually requires a deep understanding of the process to change

Non-Random Variation

- Are not part of the process all the time. Arise from special circumstances
  - Example: Patients arrive late for appointments due to a bus strike

- Usually best uncovered when monitoring data in real time (or close to that)

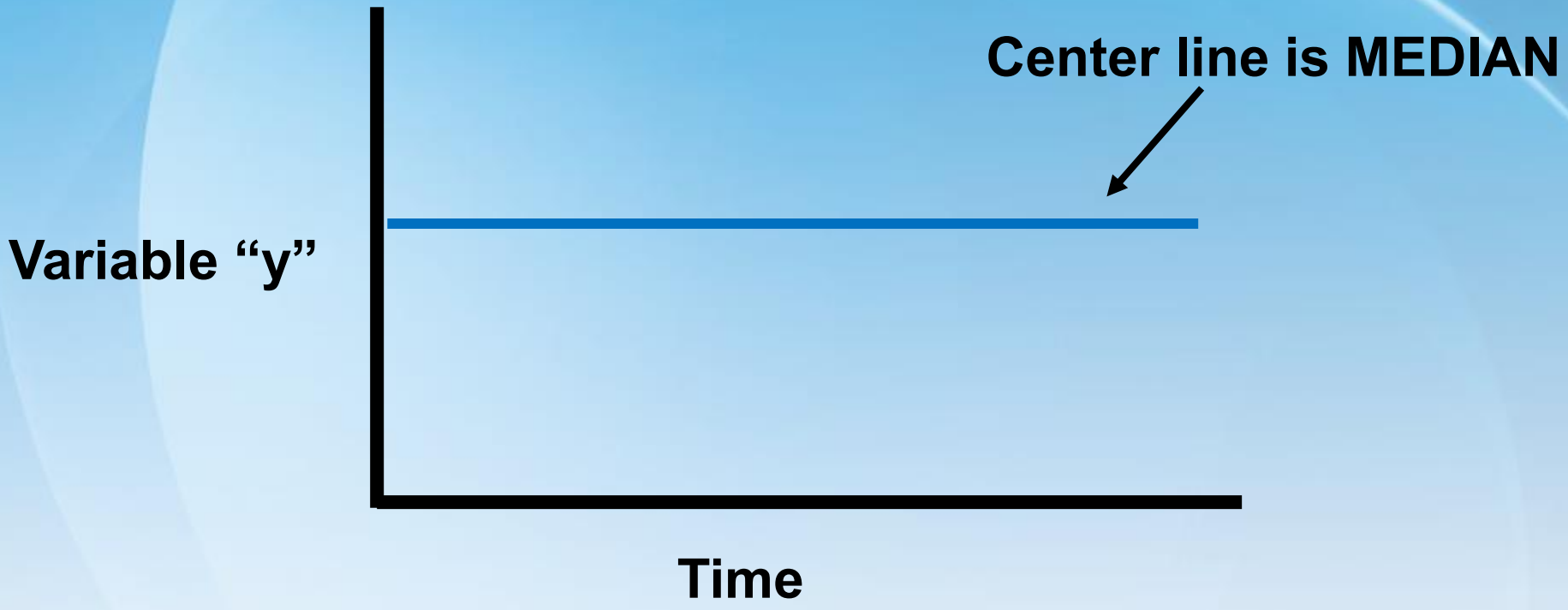
How to React to Variation

Process result	Action
Process with non-random variation	**Identify the cause:** If positive, then can it be replicated or standardized. If negative, then cause needs to be eliminated Target the special causes - to get the process predictable
Process with only random variation	**Not satisfied with result**: redesign process to get a better result **Reduce variation**: make the process even more predictable or reliable

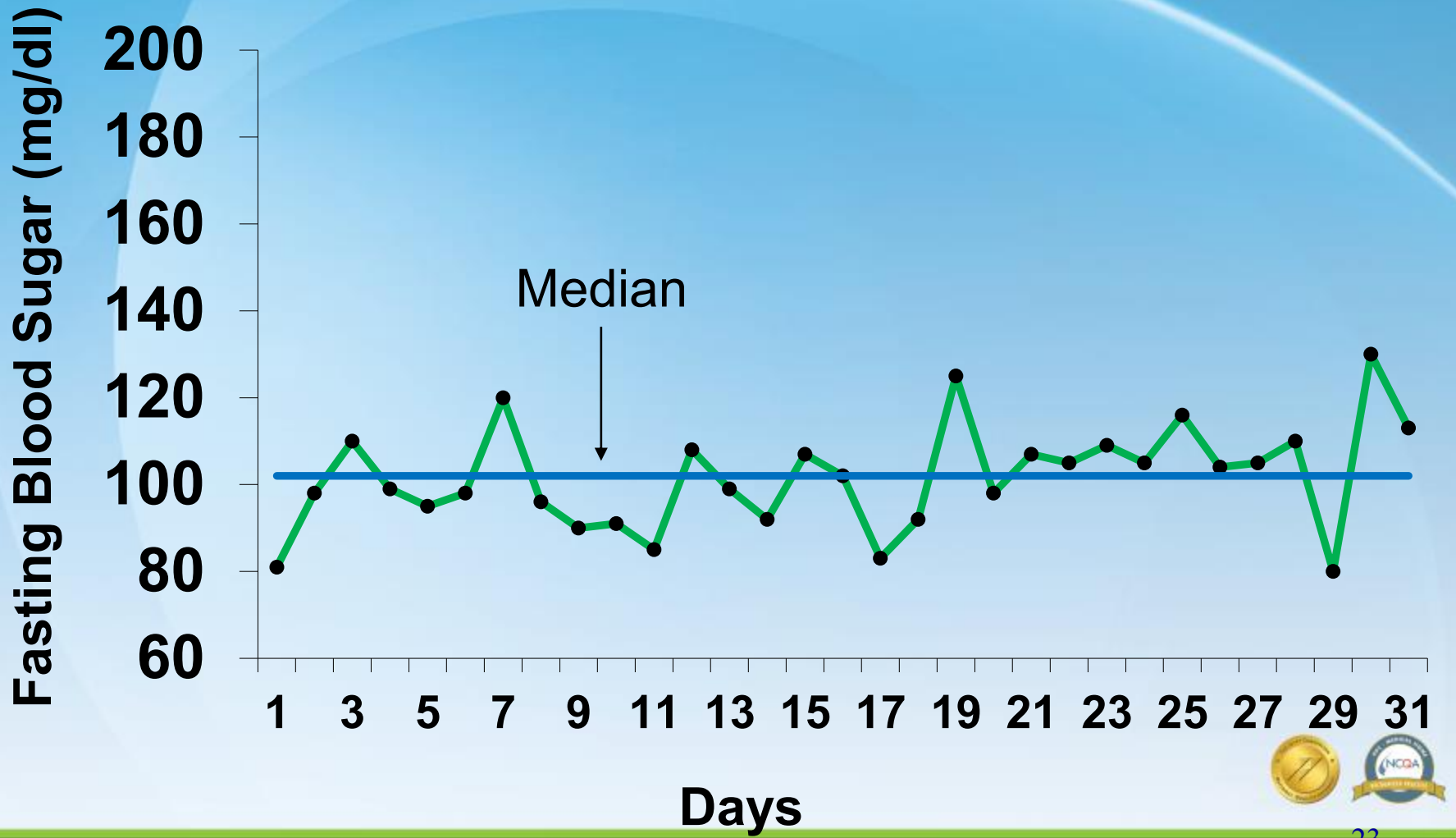
Run Charts

Detecting non-random (special cause) variation

Anatomy of a Run Chart



Run Chart Example



What is a Run?

- A “run” is one or more consecutive points on the same side of the median
- The presence of runs is where the chart gets it name

Perla, Provost, and Murray. BMJ Qual Saf. 2011;20:46-51

How to Count Runs

A Run is a point or group of consecutive points that fall on one side of the median

Non-Random Patterns on Run Charts

- The presence of a shift in the process
  - A run that is too long (6 or more consecutive points on one side of the median)
- The presence of a trend
  - A run with consecutive increases or decreases in data (5 or more consecutive points)
- The presence of too much or too little variability
  - Too few or too many runs (depends on number of points on the chart)

Perla, Provost, and Murray. BMJ Qual Saf. 2011;20:46-51

Table. Runs Rule Guidance

Number of observations excluding points on the median	Lower limit for the number of runs	Upper limit for the number of runs
13	4	11
14	4	12
15	5	12
16	5	13
17	5	13
18	6	14
19	6	15
20	6	16
21	7	16
22	7	17
23	7	17
24	8	18
25	8	18
26	9	19
27	10	19
28	10	20
29	10	20
30	11	21
31	11	22

Source: *Perla, Provost, and Murray. BMJ Qual Saf. 2011;20:46-51*

Run Chart Interpretation Exercise

- Work with your site colleagues or alone if needed
- Use the slide handouts (slides #23, #26, #27)
- Answer the questions on the next slide
- Be prepared to discuss your answers in a couple of minutes

Questions

1. What does the blue line on the graph represent?
2. How many runs are there?
3. How many shifts do you see?
4. How many trends are in the data?
5. How many non-random patterns (special cause signals) are met in this run chart?
6. What is your interpretation of the chart?

Discussion of Answers to Questions

What did you decide?

Break!

Take five minutes to recharge and refresh.

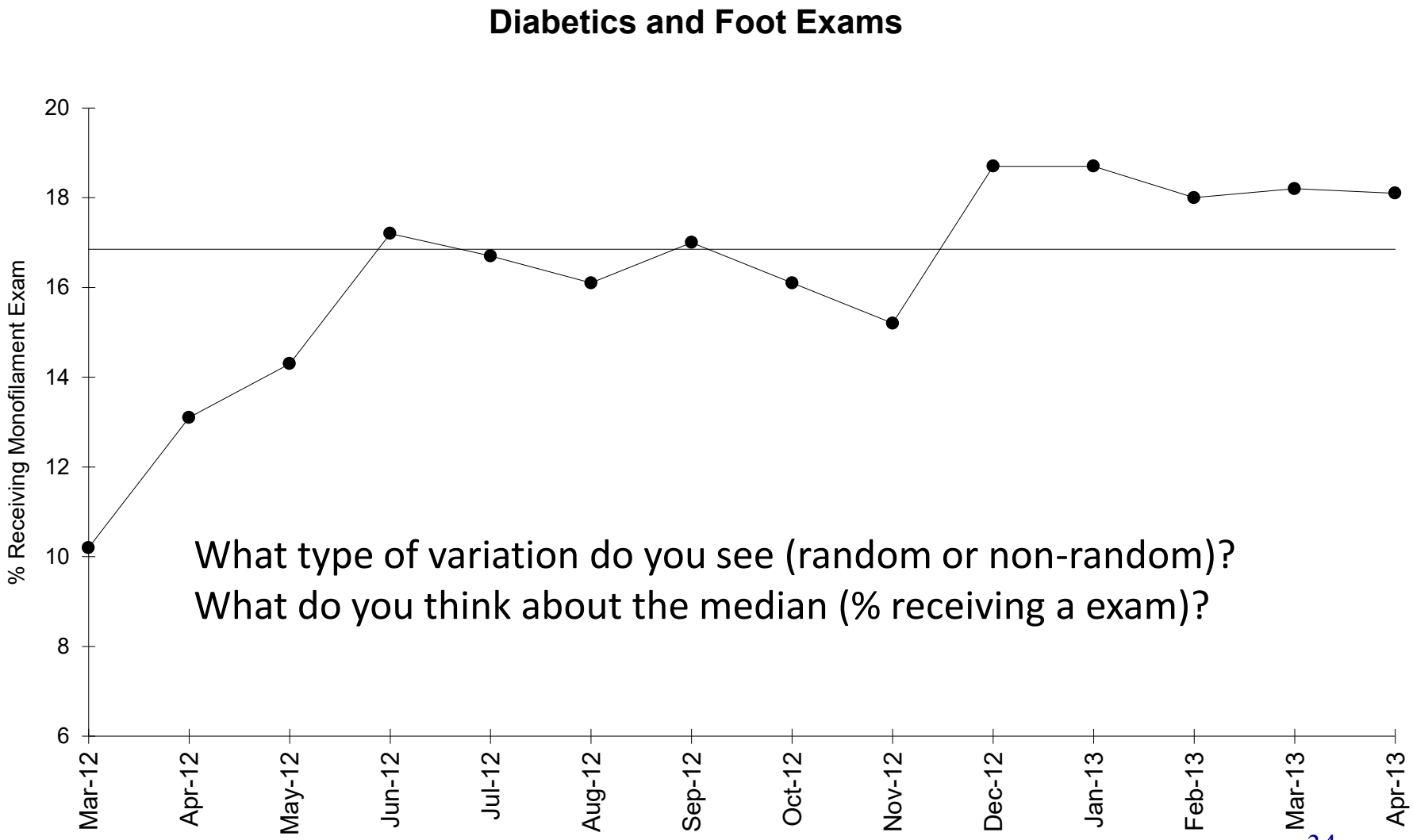
Interpreting of Run Charts

Diabetes Foot Care Case

Diabetes Case Introduction

- Already made improvements (hemoglobin A1c and cholesterol blood tests)
- Focusing now on diabetic foot care
- Providers checking feet, but documentation of a complete foot exam is not often present
- Challenges – lack of monofilaments, lack of knowledge about where to check, lack of time
- Made a couple of changes
  - Reviewed how to do the foot exam properly
  - All exam rooms are stocked with monofilaments

Initial Run Chart

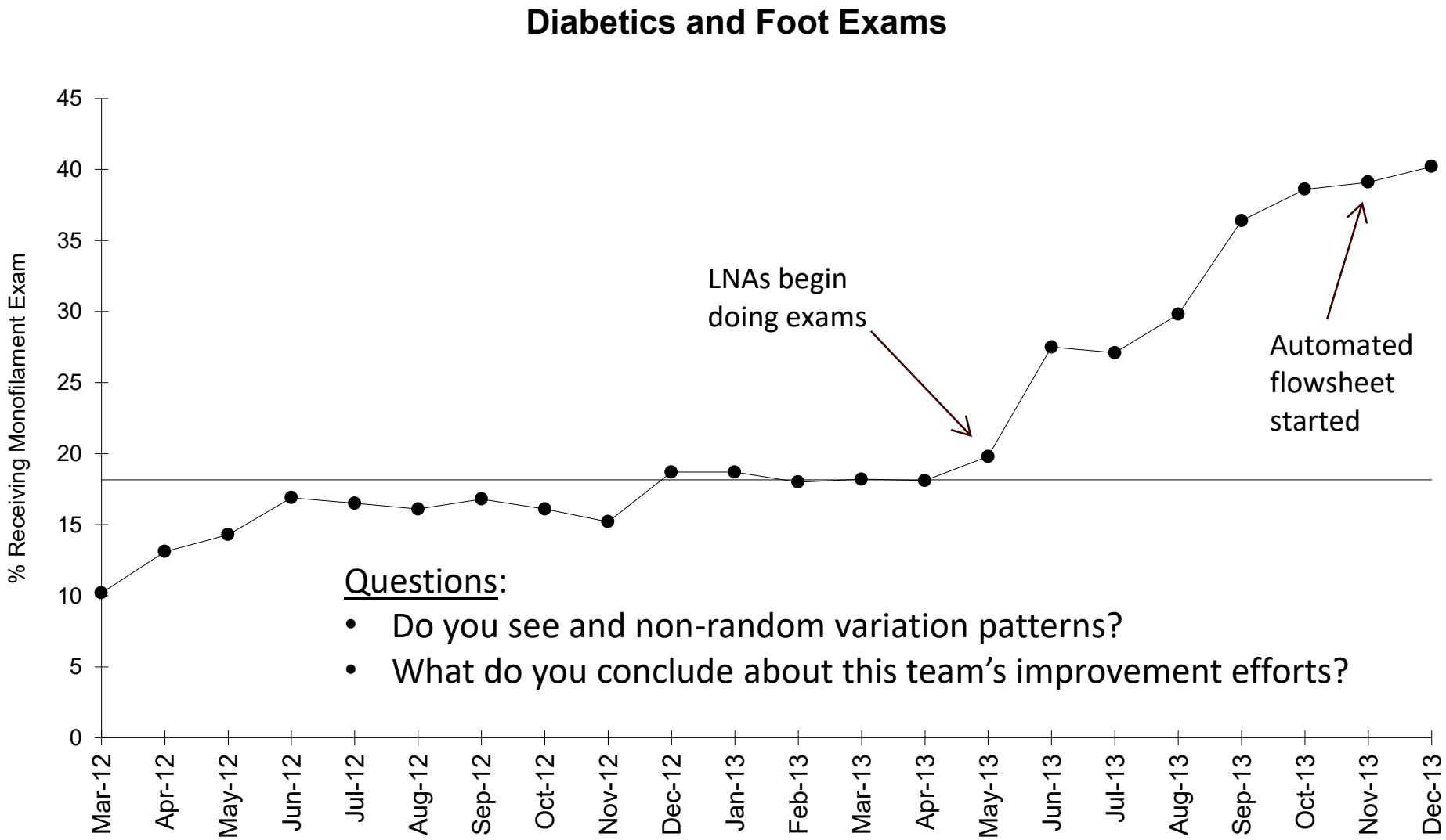


What type of variation do you see (random or non-random)?
What do you think about the median (% receiving a exam)?

Case Part 2 (Group Activity)

- New Information
  - The LNAs on the team received training to perform the monofilament exam
  - They take on responsibility for doing these exams beginning in May 2013.
  - In addition, some members of the team developed a flowsheet for diabetic patients which began use in November 2013.
- Review the updated data on the next slide

Case Part 2 Run Chart



Prospective Monitoring of Data Using a Run Chart

Pneumonia Vaccine for Outpatient Diabetes Care

(Optional Review – view video of this demonstration using the link: https://us02web.zoom.us/rec/play/p4CzoW_25ZN3l3BWddwGsHqmQ5cJTfSwhu9teIzVBYfiWEU7sOPYPqPkgj-A_bo4f1phlk2hiinnfZUe.1ajuhtOHQ5e88uT0)

Using the Templates

Time Plot & Run Chart

What haven't we figured out yet?

Questions or issues that remain unclear?

Take-home Thoughts

Emma – share 1 or 2 ideas you will take away from our small group discussion

Summary

- Variation over time is intrinsic to all health care & other work processes.
- Displaying data over time can help visualize the variation present.
- Understanding that variation can help monitor, adjust and improve processes.
- Studying variation with run charts can offer insights about possible cause of that variation and offer clues to the design of change.

Session VIII Assignment

- You have learned about a tools for displaying data over time (time plot & run chart)
- Now it is your turn to use the tool(s)
  - Templates sent by email previously
- Assignment for next time
  - Pick a measure for your project and display it on a time plot or run chart (the data can be real or what you hope to collect), then interpret the results
  - A second option is to display de-identified clinical data on a run chart or time plot and interpret the results
  - Send your display and interpretation to Mark and Emma by Wednesday (2/11/26) before the next session

Help With Data

- We know this is hard, and we want to assist you with this part of your project
- If you would like some assistance with data, please reach out to us or come to Office Hours (next is Feb 19th from 11:30am-12:30pm ET)

References

- Langley GJ, Moen R, Nolan KM, Nolan, TW, Norman CL, and Provost LP. The Improvement Guide: A Practical Approach to Enhancing Organizational Performance (2nd Edition). San Francisco, CA: Jossey-Bass, 2009. Chapter 1, pp 23-25.

- Perla RJ, Provost LP, and Murray SK. The run chart: a simple analytical tool for learning from variation in healthcare processes. BMJ Qual Saf. 2011;20:46-51.