A Quality Improvement Project to Improve the Management of Type 2 Diabetes Mellitus at the Three Rivers Rural Health Clinic

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Objectives

1. Identify strategies for implementing an office-redesign to provide more systematic chronic care management.
2. Cite reasons why primary care providers struggle with chronic care management and how these can be better addressed.
3. Indicate methods that can be used to capture and analyze quality improvement project data.

Introduction

- Primary care providers provide more than 80% of diabetes care (Peterson, 2008)
- Leading cause of new blindness, end stage renal disease, and lower limb amputation (ADA, 2008)
- Better outcomes with better glycemic control and screening
- 2003 National Healthcare Quality Report showed that preventative diabetic care was being performed less than 65% of the time by primary care providers (Leininger, et al, 1996)
- Main reason= lack of systematic approach

Background

- Important to set up a specific process for managing and reviewing information for optimal chronic disease management (CDC, 2011).
- A systematic approach to tracking diabetes (Adeleman & Harris, 1998).
- Clinic design issues- Diabetic registry, flow charts, self-management support, reminder system (Wagner et al., 2001, Renders et al, 2001b, & Nutting et al. ,2007).
- Pt. education & foot inspection reduce foot complications (Litzelman et al., 2009)
- Developing clear and concise practice guidelines & review of dashboards improve outcomes (Wagner et. al, 1998)

Comprehensive Diabetes Evaluation

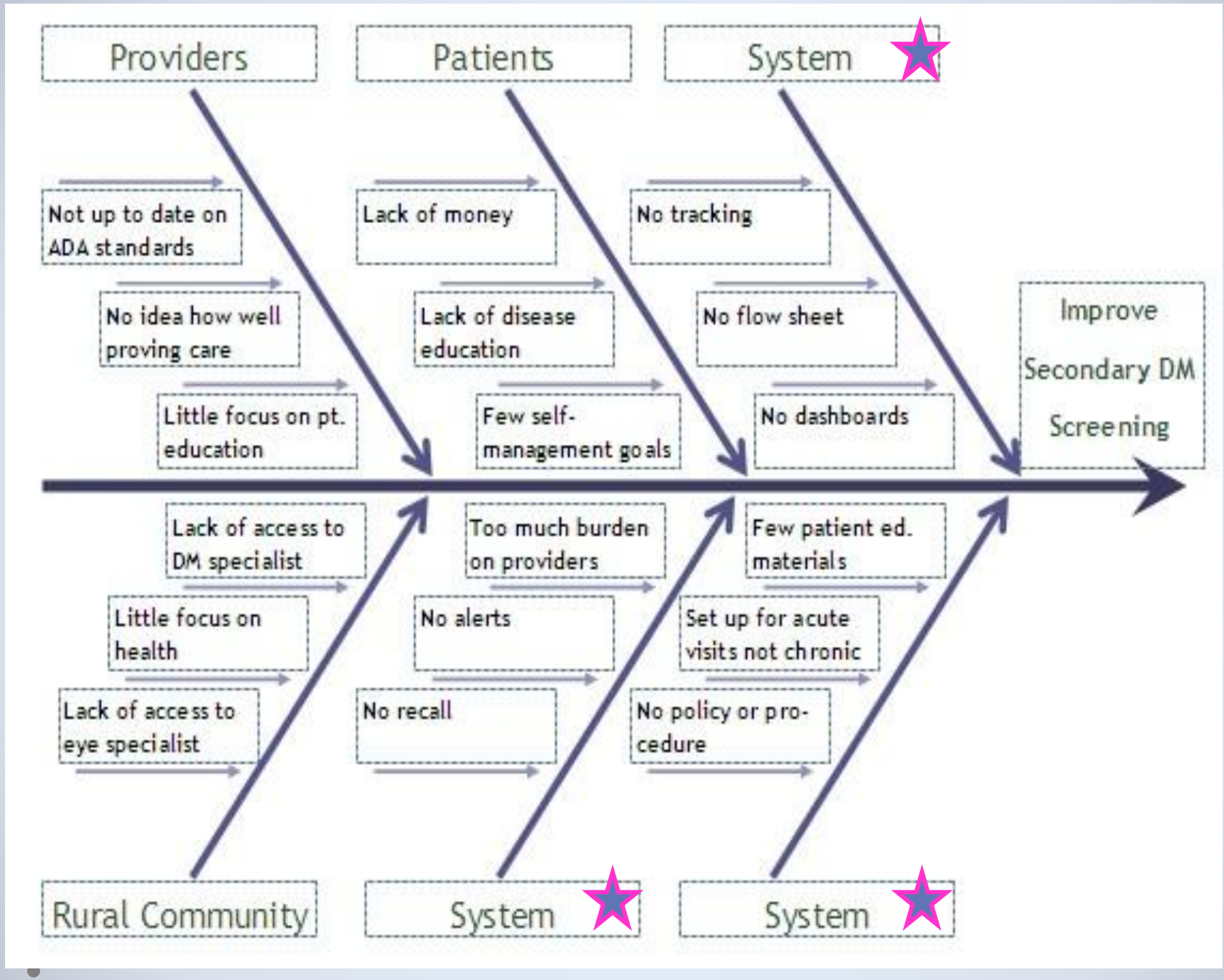
- Medical History
- Physical Exam
  - BP, thyroid, skin, foot exam
- Labs
  - A1C- q 2-3 months
  - Annual
    - LFTs
    - Lipids
    - Creat/GFR
    - Urine microalbumin
    - TSH

ADA (2013)

Comprehensive Diabetes Evaluation

- Referrals
  - Annual dilated eye exam
  - Family planning for women of reproductive age
  - Dental exam every 6-12 months
  - DSME
  - Mental Health, if needed

ADA (2013)


Providers
Patients
System
Not up to date on ADA standards
Lack of money
No tracking
No idea how well proving care
Lack of disease education
No flow sheet
Improve Secondary DM Screening
Little focus on pt. education
Few self-management goals
No dashboards
Lack of access to DM specialist
Too much burden on providers
Few patient ed. materials
Little focus on health
No alerts
Set up for acute visits not chronic
Lack of access to eye specialist
No recall
No policy or pro-cedure
Rural Community
System
System

Aim Statement

- To improve the management of diabetes in accordance with ADA guidelines in adult patients age 18+ with type 2 diabetes at the Three Rivers Rural Health Clinic by March 31, 2013.
  - ↑ Hemoglobin A1C ≤7.0 from 50% to 75%
  - ↑ annual foot exams from 6% to 75%
  - ↑ referral for a dilated eye exam from 5% to 100%
  - ↑ completed an annual dilated eye exam from 12% to 50%
  - ↑ annual urine Microalbumin lab screen from 9% to 75%
  - ↑ use of ACE-I in those with a Microalbumin >30 µg/ml from 1.5% to 75%

Methods

- Oversight and approval through the College of Nursing DNP Capstone Bridge Committee
- Charts and paper tickler were stored in a locked file cabinet in the record room.
- Excel spreadsheet used for data analysis contained no personal identifying data
- Minimal risks
- Sample-
  - All patients age 18+ with type 2 diabetes
  - None excluded
  - Varied monthly

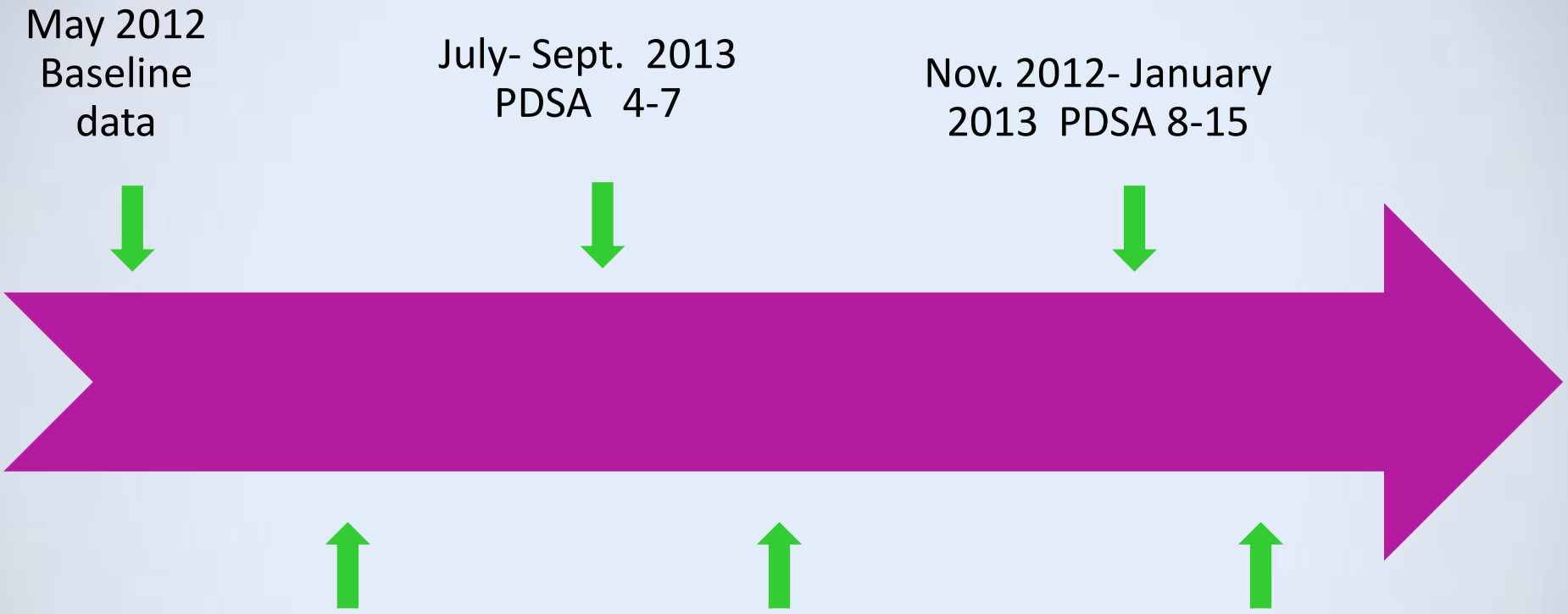
Methods (Cont.)

- Setting
  - Rural health clinic in Montana
  - Owned and operated by Nurse Practitioners
  - Team included secretary, med tech, office manager, and 2 NP providers
- Reliability & Validity of Methods Used
  - Methods based upon review of the literature….meta-analysis, systematic reviews, RCT
  - Data obtained by the lead QI
  - Interventions were adjusted based upon team feedback and monthly dashboard review

Methods (Cont.)

- Reliability & Validity of Methods Cont.
  - Data capture and interventions using ADA standards of practice
    - A1C to track blood sugars
    - tuning fork and monofilament for foot exam
    - urine Microalbumin screen for renal function
    - Annual dilated eye exam to screen for retinopathy
    - Ace Inhibitor use for urine Microalbumin >30 µg/ml
  - Dorothea Orem's Self-Care Theory
  - Chronic Care Model

Run Chart


May 2012
Baseline
data
July- Sept. 2013
PDSA 4-7
Nov. 2012- January
2013 PDSA 8-15
June 2012
PDSA 1-3
Oct. 2012 Post
intervention
Data Review
March 2013
Data Analysis

Interventions

Phase	Date Complete	QI Team	Lead QI
1	Spring 2012	•Identify problem •Est. benchmarks •Analyze tasks •Assign tasks	•Form QI team, identify problem, develop plan •Est. benchmarks •Obtain baseline data •Literature review

Phase	Date Complete	Providers	Reception	QI Team	Lead QI
2	Summer 2012	•Test flow sheet •Test updated flow sheet •Implement flow sheet •Staff training of ADA guidelines and microvascular complications	•Test tickler •Re-design tickler •Implement tickler •Phone calls/mailers to patients	•Review monthly dashboards •Brainstorm ideas	•Implement existing flow sheet •Redesign flow sheet •Worked with providers to implement standardized ADA care •Design Excel tickler •Design paper tickler •Redesign paper ticklers •Finalize tickler •Research and obtain patient education materials •Implement chart identifier (neon dot) •Design & Implement Excel tracking •Design referral log

Diabetes Care Patient Flow Sheet Designed for the Three Rivers Clinic

DIABETES CARE FLOW SHEET			Date & Results				
History and Physical	**Frequency**	**Goal**					
Blood Pressure	Every Visit	<130/80					
Weight	Every Visit	Individualize					
BMI	Every Visit	Individualize					
Dilated Retinal Exam Referral	Annually	Retinopathy Prevention					
Dilated Retinal Exam Complete	Annually	Retinopathy Prevention					
Monofilament and peripheral pulses foot	Annually	Lower extremitiy amputation prevent					
Laboratory Analysis	**Frequency**	**Goal**					
AIC	Every 3-6 months	<7.0%					
Fasting Lipid profile	Annually						
LDL		<100mg/dL					
Triglycerides		<150mg/dL					
HDL		>40mg/dL in men: >50mg/dL in women					
Total		<200mg/dL					
Urine albumin-to-creatinine ratio (spot	Annually	<30 mg/dL					
Vaccinations	Frequency						
Influenza	Annually						
Pneumococcus	Once. Revacinate patients > 65 who received the vaccine 5 years previously & were <65 years old.						
Counseling and Risk Reducation							
Smoking/Tobacco status: _____Never _____Former Current Quit Date: _____							
Aspirin Therapy (81-325mg/day)							
ACE Inhibition/ARB: Treatment for HTN or microalbuminuria							
Dental care (every 6-12 months referral)							
Depression Screeing							
Sexual functioning							

Phase	Date Complete	Providers	Reception	QI Team	Lead QI
3	Fall 2012	•Continue implementing flow sheet •Standardize lab notations •Disseminate patient education materials	•Develop and implement patient reminder postcards •Continue with tickler implementation	•Review monthly dashboards •Brain storm ideas •Attend community ed.	•Provider /clinic education •Attempt to find eye provider willing to travel •Develop & give community education seminar •Develop referral log
	Spring 2013		4	• Review of QI project, determine sustainability	•Data Analysis •Share results •Write up results

Outcomes Reviewed

- Microalbumin screening up to date?
- + Microalbumin (>30) treated with ACE-I?
- Foot exam up to date?
- Eye exam up to date?
- Eye referral made?
- Hemoglobin A1C > or < 6.9

- Fisher's Exact Test

Screening for Secondary Microvascular Complications

Outcome	Timing	n/total	%	OR	CI*	p value	z score
Urine micro. up to date	Pre	6/65	9				
	Mid	36/61	59	14.16	5.30-37.83	<.0001	5.85
	Post	41/61	67	20.16	7.45-54.56	<.0001	6.79
Foot screen up to date	Pre	4/65	6				
	Mid	24/61	39	9.89	3.18-30.76	<.0001	3.09
	Post	34/61	56	19.20	6.20-59.49	<.0001	6.14
Eye referral completed	Pre	5/57	5				
	Mid	13/44	30	7.55	1.99-28.56	<.0001	3.09
	Post	14/40	35	9.69	2.56-36.71	<.0001	2.88
Eye exam completed	Pre	8/65	12				
	Mid	17/61	28	2.75	1.09-6.96	0.02	2.81
	Post	21/61	34	3.74	1.51-9.29	0.002	2.75

Key: Pre-May 2012, Mid-Oct 2012, Post-Feb 2013, OR- Odds Ratio,
CI-Confidence Interval , *CI at 95% level of confidence using Fishers Exact test

Hemoglobin A1C Values

Outcome	Timing	n/total	%	OR	CI*	p value	z score
HbA1C ≤ 6.9	Pre	33/65	51				
	Mid	40/61	66	1.85	0.90-3.97	0.07	1.50
	Post	40/61	66	1.85	0.90-3.79	0.07	1.50
HbA1C ≥ 7.0	Pre	32/65	49				
	Mid	21/64	34	1.85	0.90-3.97	0.07	1.50
	Post	21/61	34	1.85	0.90-3.79	0.07	1.50

Key: Pre-May 2012, Mid-Oct 2012, Post-Feb 2013, OR- Odds Ratio,
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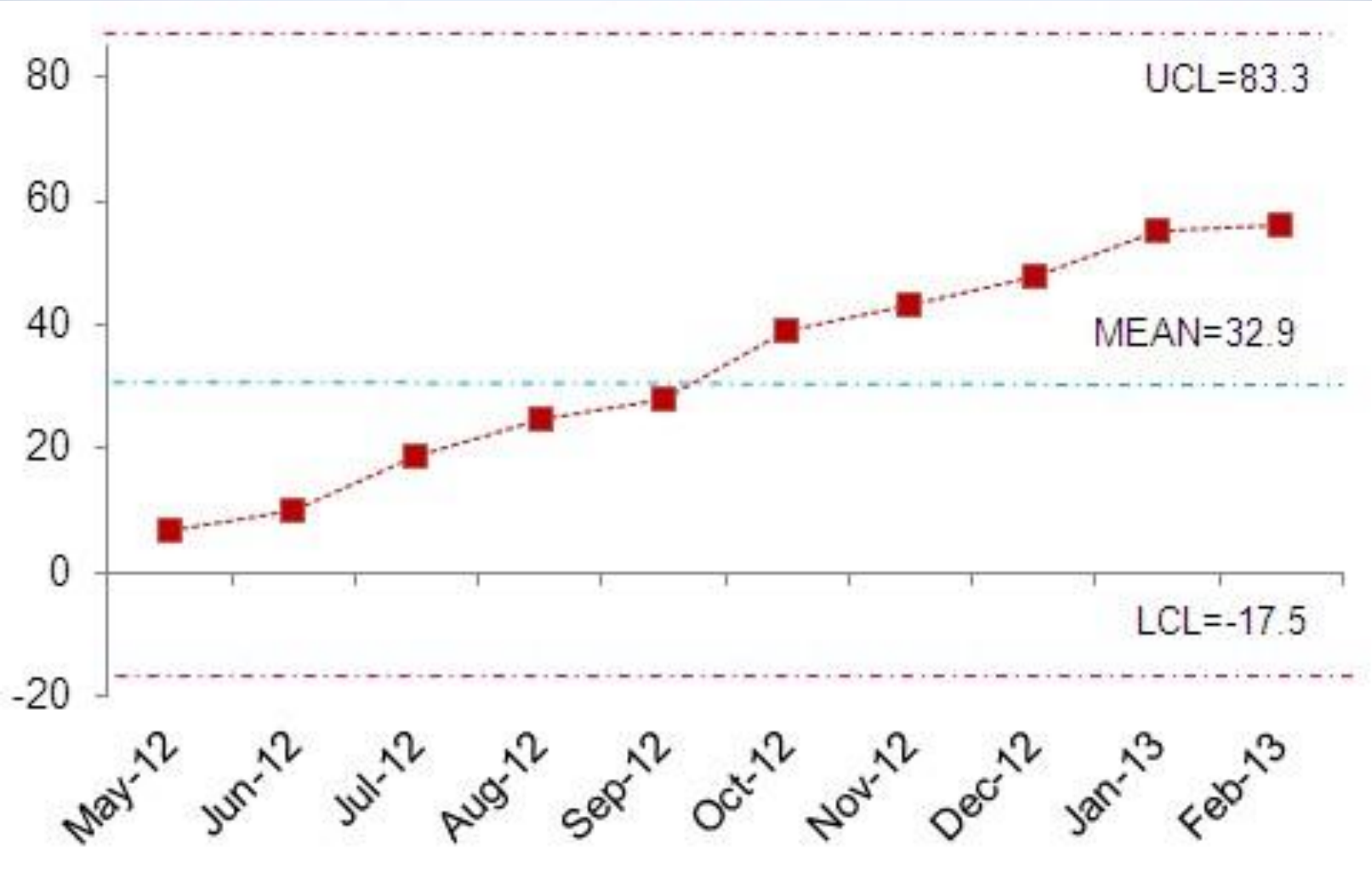
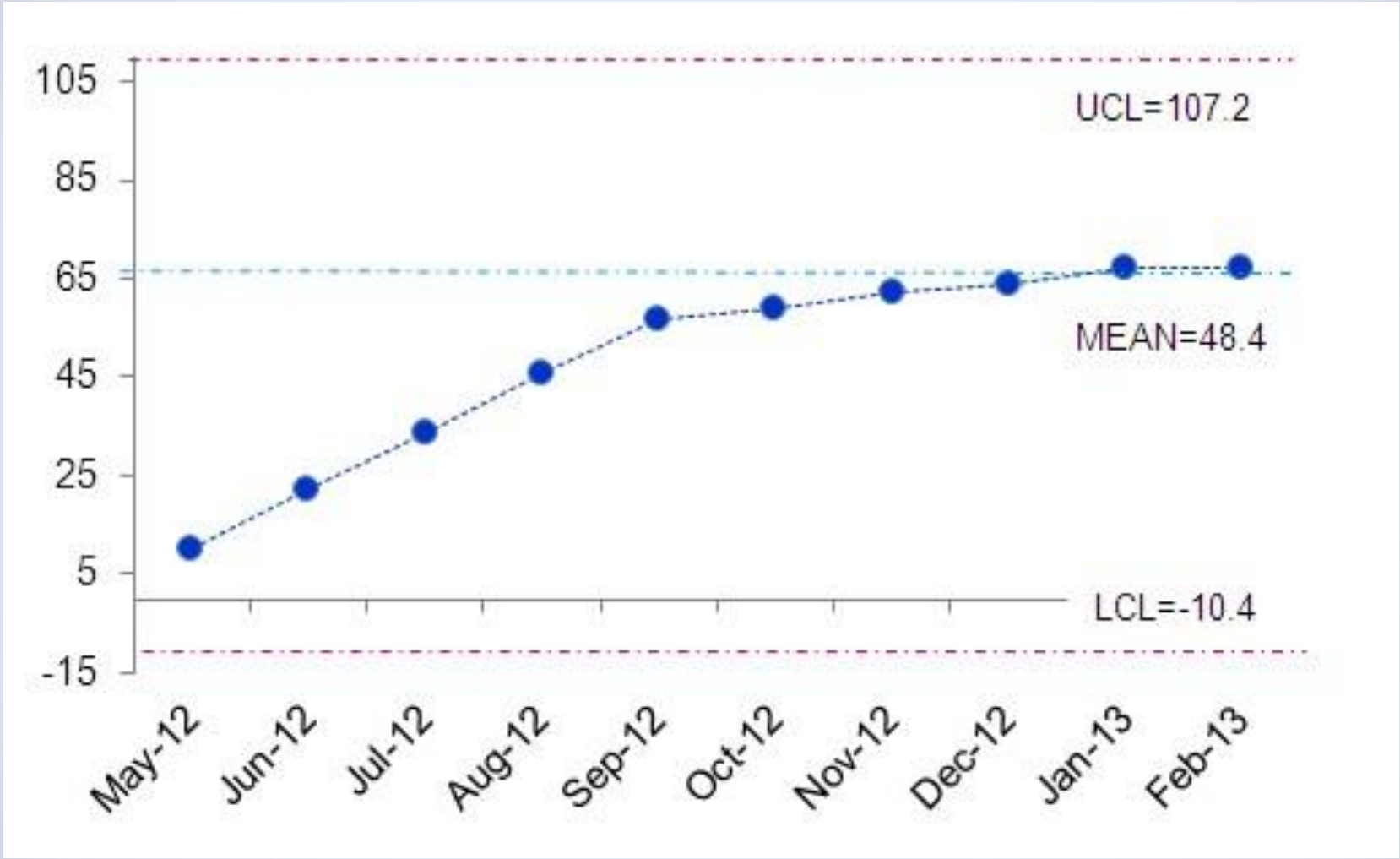
Foot Exams Up to Date



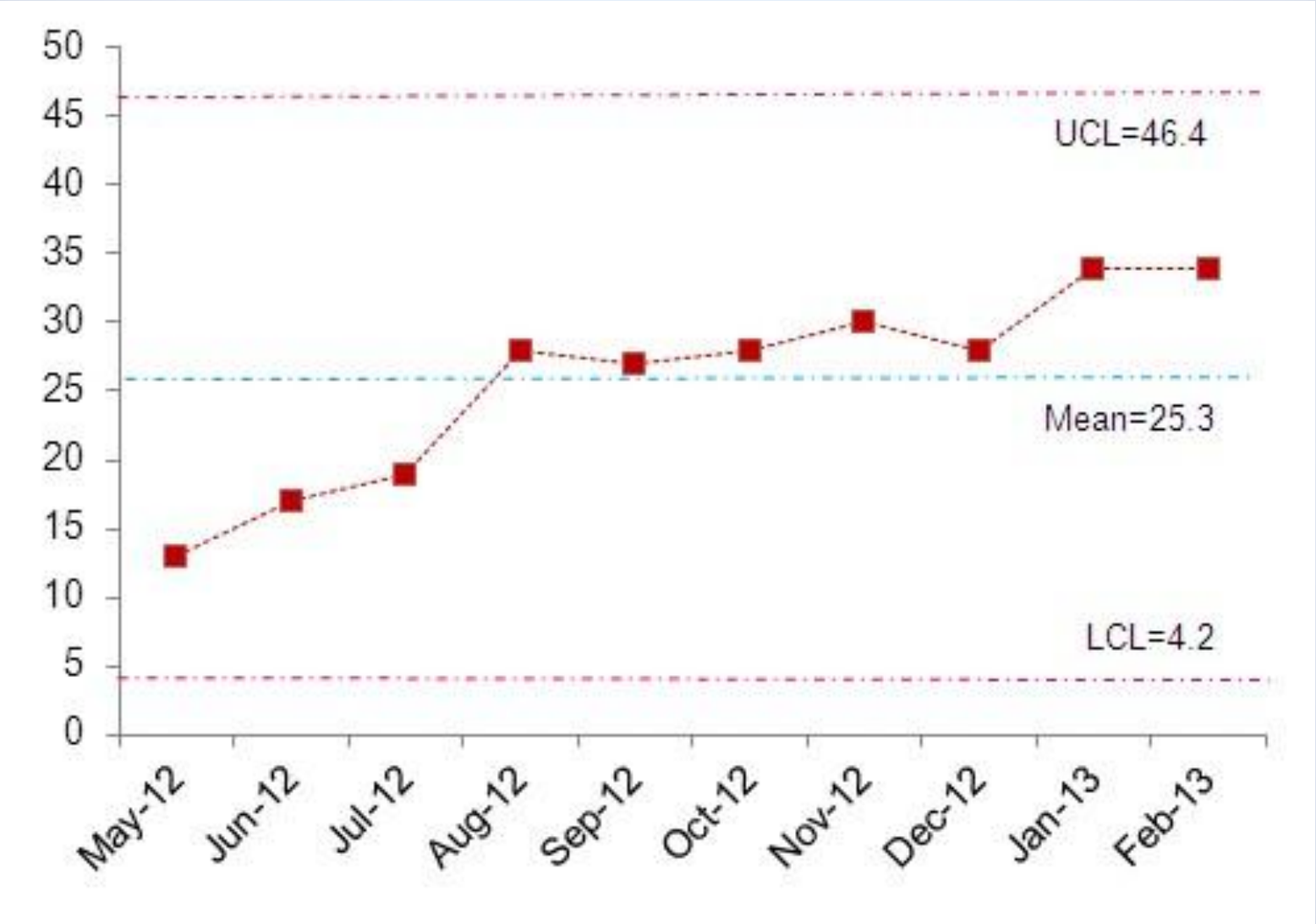
Pre-Intervention **Post-Intervention**

Microalbumin Screen Up to Date



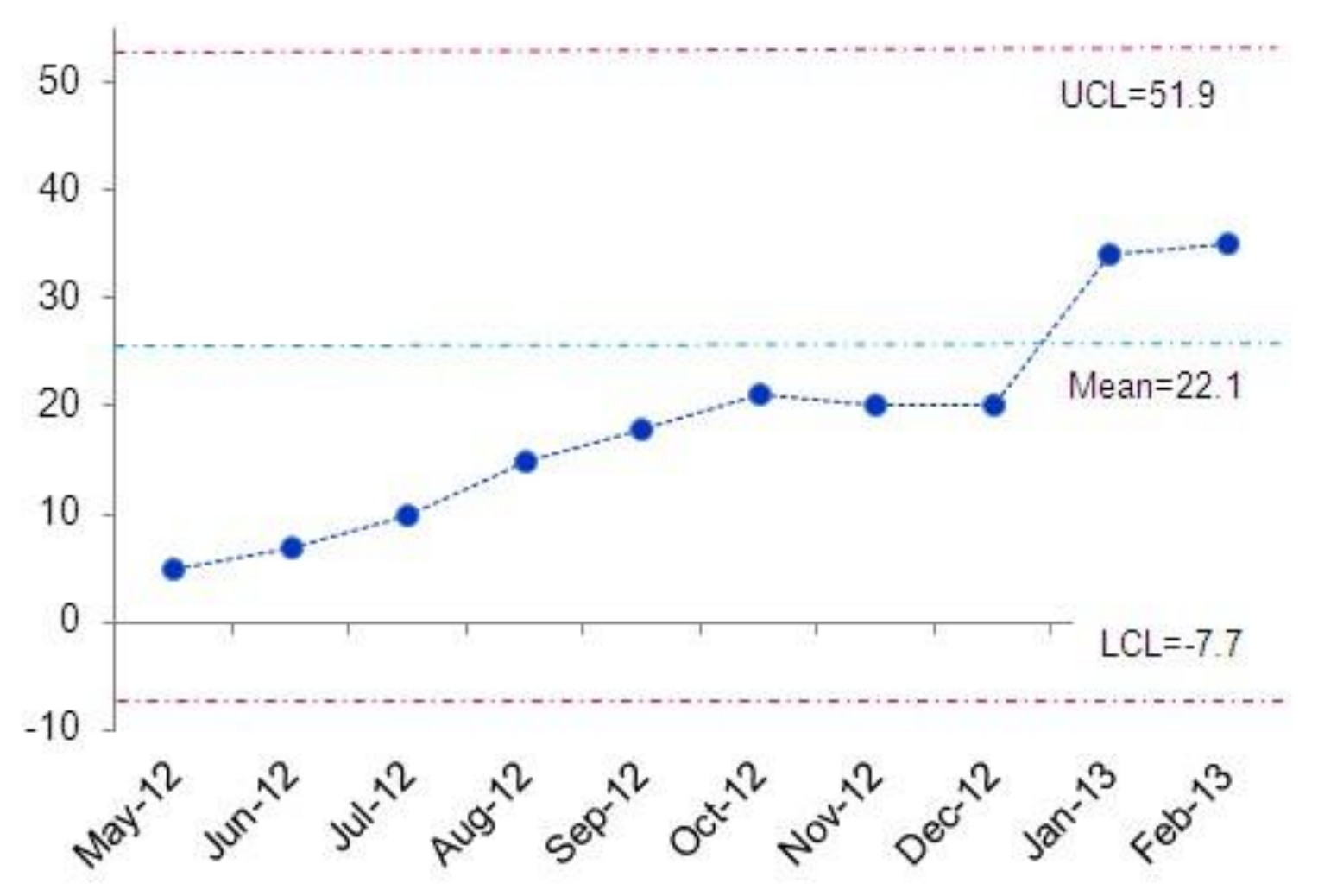
Pre-Intervention **Post-Intervention**

Annual Eye Exam Up To Date



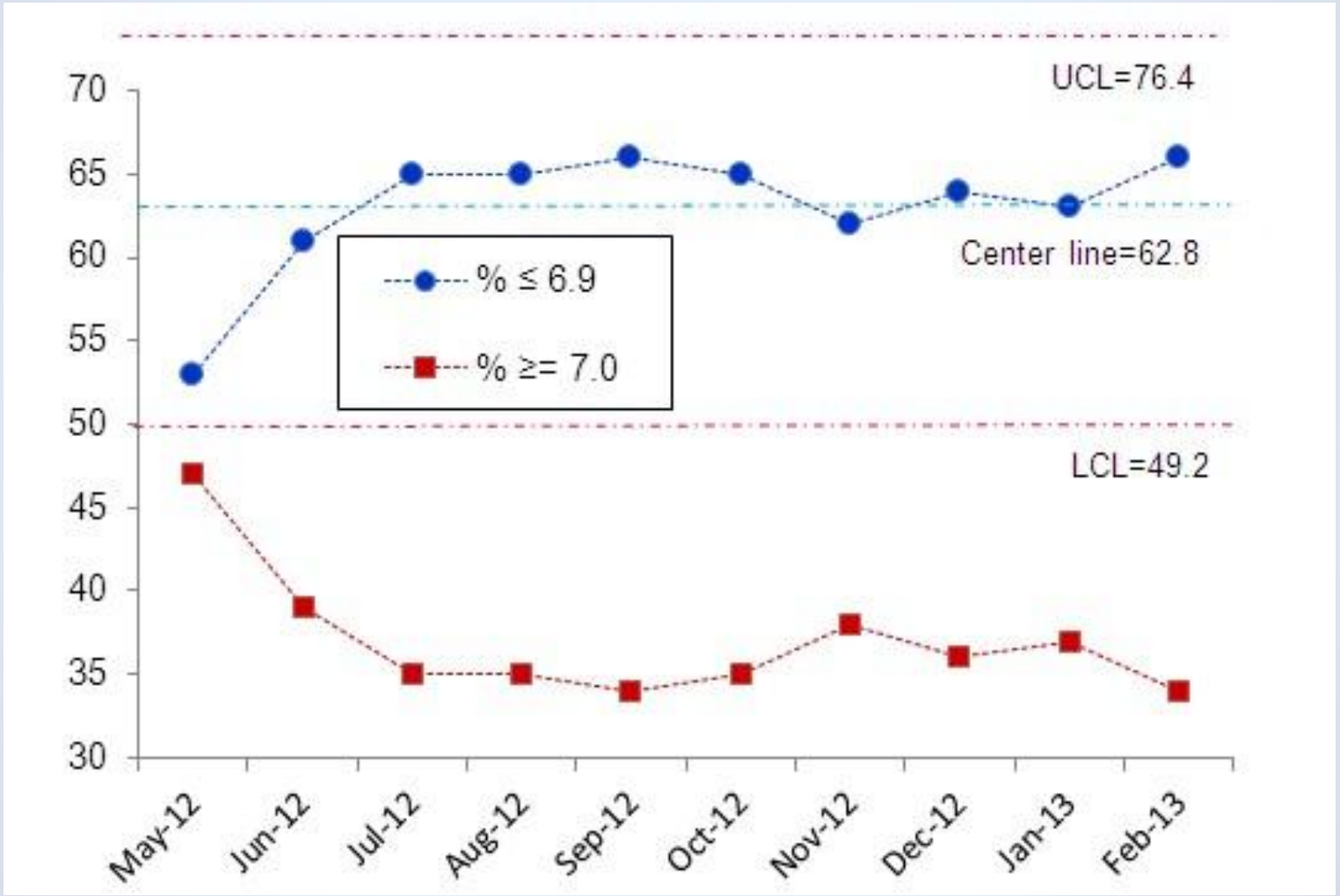
Pre-Intervention **Post-Intervention**

Eye Exam Referral Made



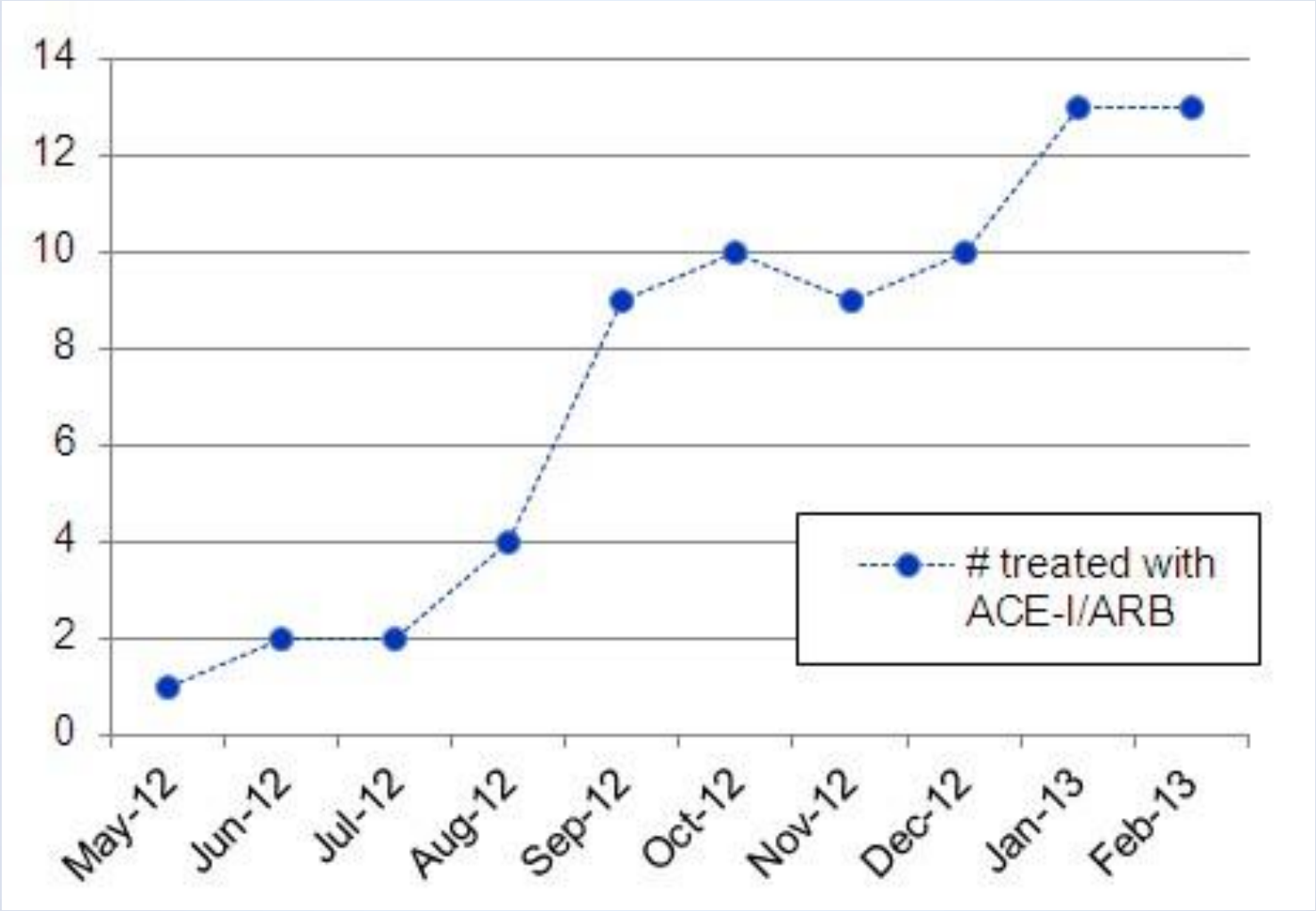
Pre-Intervention **Post-Intervention**

A1C Percentage, Goal 75% < 7.0



Pre-Intervention **Post-Intervention**

Urine Microalbumin >30 µg/ml



Pre-Intervention **Post-Intervention**

Discussion

- Positive impact:
  - Flow sheets and provider education (Litzelman et al., 2009)
  - Chart identifier (neon dot), flow sheets, tickler, and pt. education (Wagner et al. 1998)
  - Reminder system and tickler file (Renders et al, 2001b)

Limitations

- Generalizability
  - Rural Setting QIP
- No comparison group
- Small sample size
- Benchmarks were initially set too high

Implications for Practice

- Advanced Practice Registered Nurses can successfully design and lead quality improvement projects in the management of chronic care conditions
- Closer to meeting ADA practice guidelines
  - Increased prevention of secondary microvascular complications
- New staff will be trained to maintain the tickler, reminder system, and flow sheet.
- Current staff will receive quarterly reminders and be encouraged to continue using flow sheets
- Tickler reviewed by secretary on a weekly basis and new patients with diabetes will be added

Future Plans

- Management of other chronic conditions
- Preventative screening
- End of life discussions, POLST implementation

Conclusion

- Chronic care can be addressed even during acute care visits
- Successful chronic care management requires a systematic practice design and approach
- ADA practice guidelines can be successfully addressed and implanted within the primary care setting
- Advanced Practice Family Nurse Practitioners can design, implement, and successfully complete quality improvement projects that have significant positive impact on patient care

Any Questions

- I have no funding to disclose

References

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