



Public Health Approach to Vision Health and Diabetes Surveillance, Education, Empowerment

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December 9, 2014

Community Advisory Council

University of Rochester School of Medicine and Dentistry



40 million in US: Vision Threatening Eye Problems

4 Million in US: Poor Vision = \$130 billion annually

Curable
Causes of
Vision Loss



Need for Glasses

1/3 need glasses
for distance &
almost everyone
needs glasses
for reading after
50 yrs.



Cataract

Most Common
Surgery in the US.
By 2020, Cataract
will increase from
20.5 million to
30.1 million cases.

By 2050:

Glaucoma Triples to
7.3 million

Macular Degeneration
Most Blindness in 65+ yrs.
Doubles to 17.8 million

Diabetic Retinopathy
Most Blindness in
Working Age (20-74 yrs.)
Triples to 16 million

Treatable
Causes of
Vision Loss



Vision Loss Risk & Prevention is Known



Risk for Glaucoma

African American, 40 yrs. +,
Family History, Eye Injury

Prevention of Vision Loss

Identify early with dilated
eye exam by eye doctor and
treat 'high' eye pressure



Risk for Age-Related Macular Degeneration

Northern European, 55 yrs. +,
Family History, Smoker, Low
intake of certain vegetables

Prevention of Vision Loss

No Smoking, eating healthy
for the eyes, regular eye
exams after age 50.



Risk for Diabetic Retinopathy

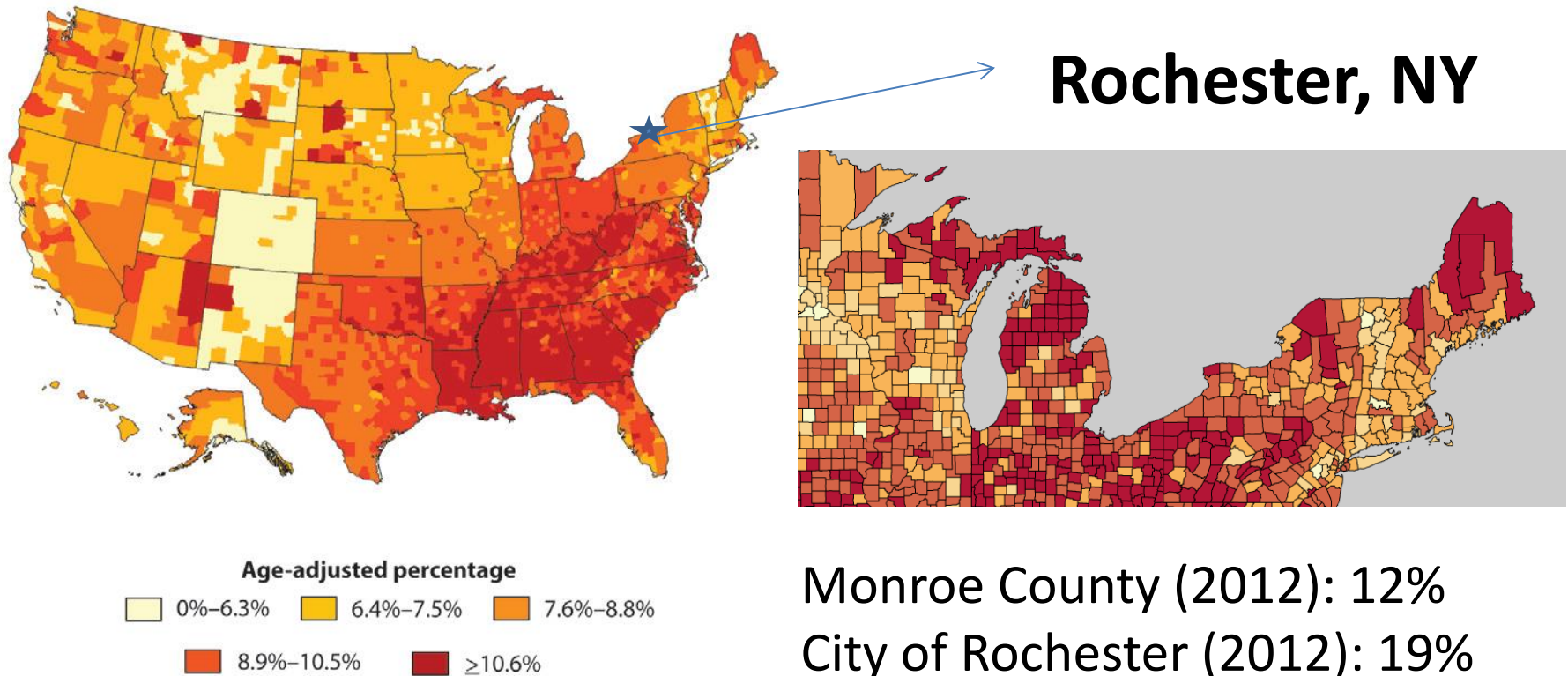
Diabetes with High Blood
Sugar, Blood Pressure, and
Cholesterol; More years
with Diabetes; Smoking;
Insulin use

Prevention of Vision Loss

- Control Blood Sugar, Blood
Pressure, and Cholesterol;
- **Annual dilated eye exams
& treating vision threatening
disease saves vision in 95%
of people**

Diabetes is the only Risk Factor Tracked Nationally

Figure 3. Percentage of U.S. Adults Aged ≥ 20 Years with Diagnosed Diabetes, by County, 2008



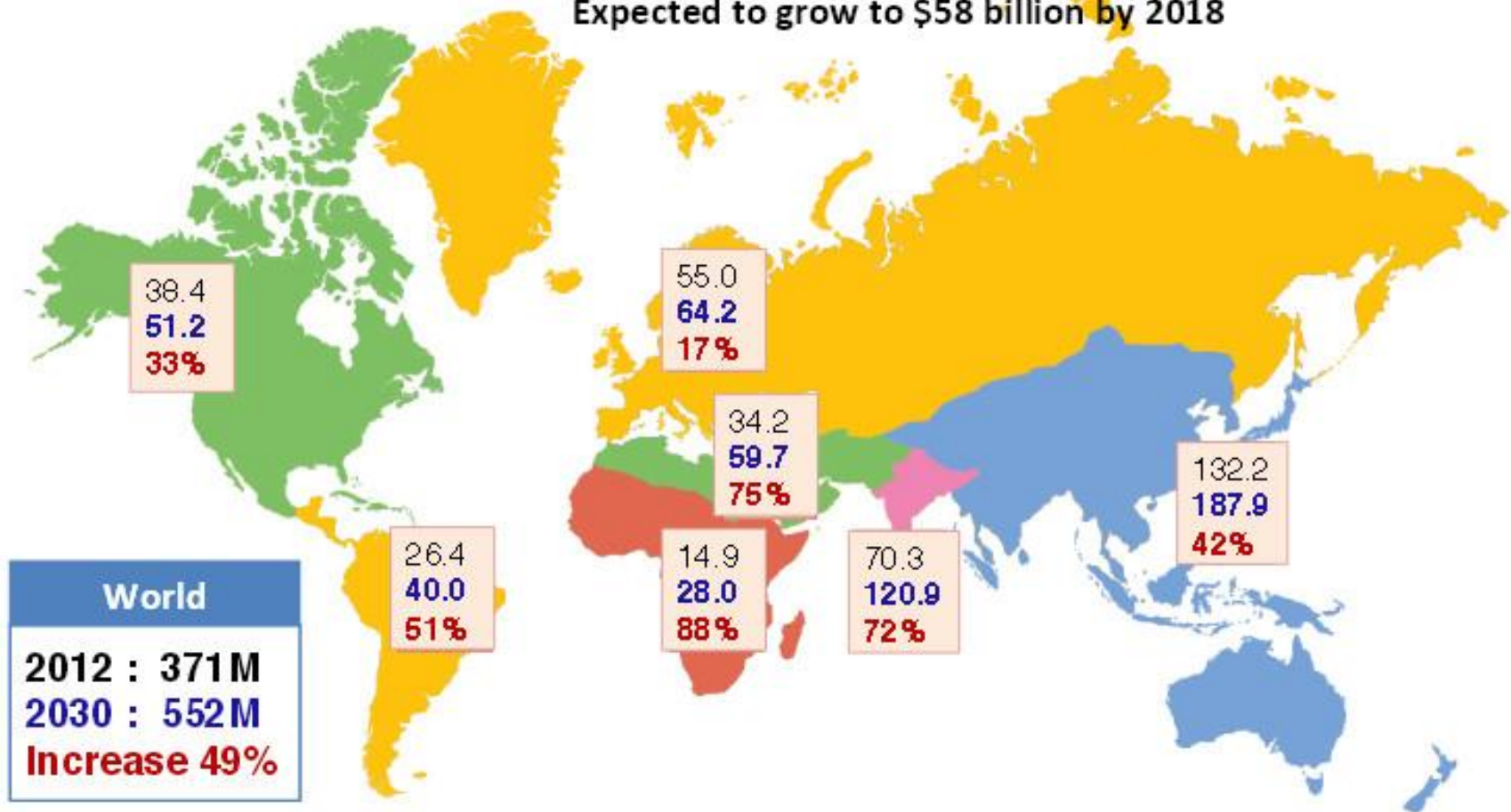
Data were age adjusted. See Technical Notes for more details.
Source: National Diabetes Surveillance System, Behavioral Risk Factor Surveillance System data and U.S. Census Bureau (Population Estimates Program) data.

Diabetes Pandemic, 50% Inc. by 2030



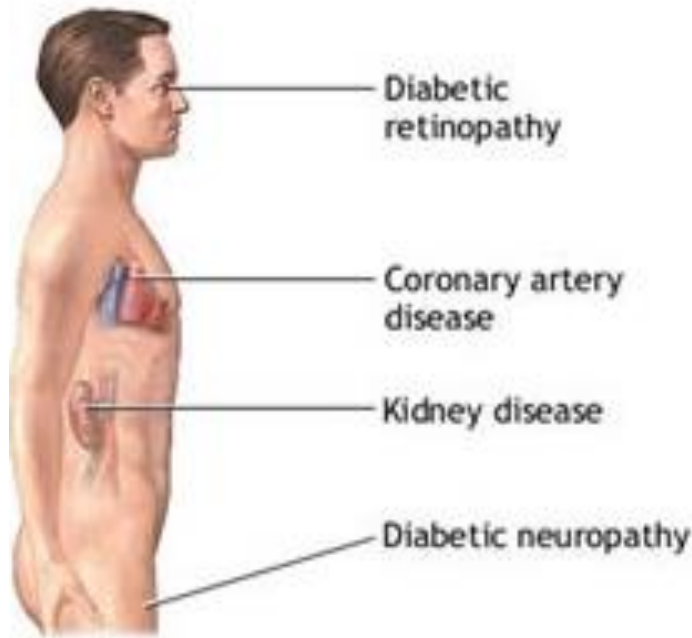
Diabetes Growth Projections 2012-2030

Diabetes worldwide drug market size \$35 billion
Expected to grow to \$58 billion by 2018

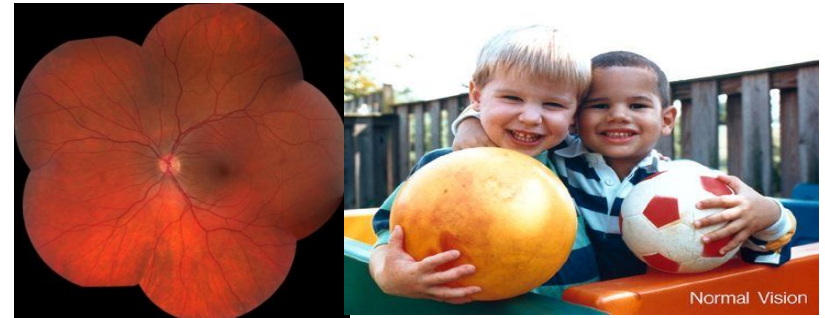


Source: International Diabetes Federation Diabetes Atlas 5th Edition: 2012 Update

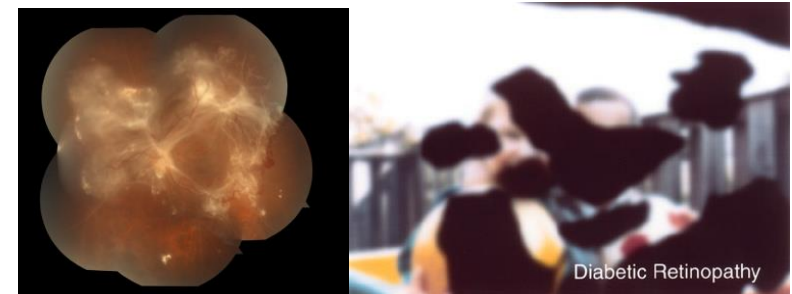
Diabetes Leads to Vascular Disease



Normal Retina



Diabetic Retinopathy

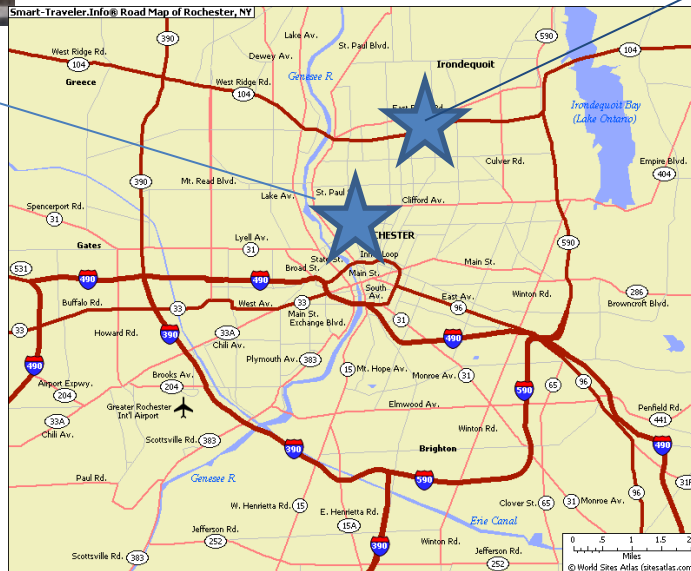


Vision Loss, due to Diabetic Retinopathy (DR) is The Most Feared Complication Among Patients.

State of Annual Dilated Eye Exams in Inner City Rochester



**Clinton Family Health Center
Neighborhood Clinic
2013 Diabetic Patient
Annual Eye Exam
Rate: 38%**



**RGH Hospital Clinics (2)
2012 Diabetic Patient
Annual Eye Exam Rate:
10-20%**

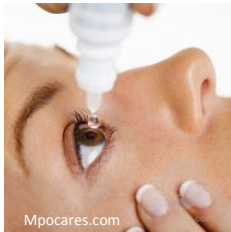
**Reported US Annual Eye Exam Rate for Diabetic Patients:
50-60% of the insured and 25% of the un- & underinsured**

Teleophthalmology Overcomes Barriers for Annual Retinopathy Screening

Barriers to Detecting Retinopathy



PCP not equipped to fully examine undilated eye



Patient Fear of Drops/Dilation
DR Asymptomatic Disease
Additional Cost of Exam and Time



US Eye Doctor (53K) Supply limited & not well distributed (29.1 M Diabetics – 2012)

Lack of Documentation Reaching PCP

Potential Solution – Remote Imaging

(Teleophthalmology)



FDA Approved Retinal Camera in **Primary Care Office**
Operated by Clinic Staff
No Dilation (Non Mydriatic) Required

Eye Specialists at Central Reading Center

Evaluate Images

Report Findings

- Images Used to Educate Patients
- **Screening Meets HEDIS Reporting**

Tele-I-CARE:

Institutional Review Board approved (2012-2015) telemedicine pilot to increase the annual surveillance rate for diabetic retinopathy in Rochester.

- Telemedicine is the use of medical information exchanged from one site to another via technology to help improve a patient's health status.

- 1. Build infrastructure & implement surveillance**
- 2. Increase annual retinal surveillance rate to 80% at 3 FQHCs in inner city Rochester**
- 3. Link eye care and primary care providers
(EYE CARE IS PRIMARY CARE)**

Tele-I-CARE: Regional Collaboration



**Established Need
& Receptive
Clinical
Atmosphere**



ACCOUNTABLE
— HEALTH PARTNERS —

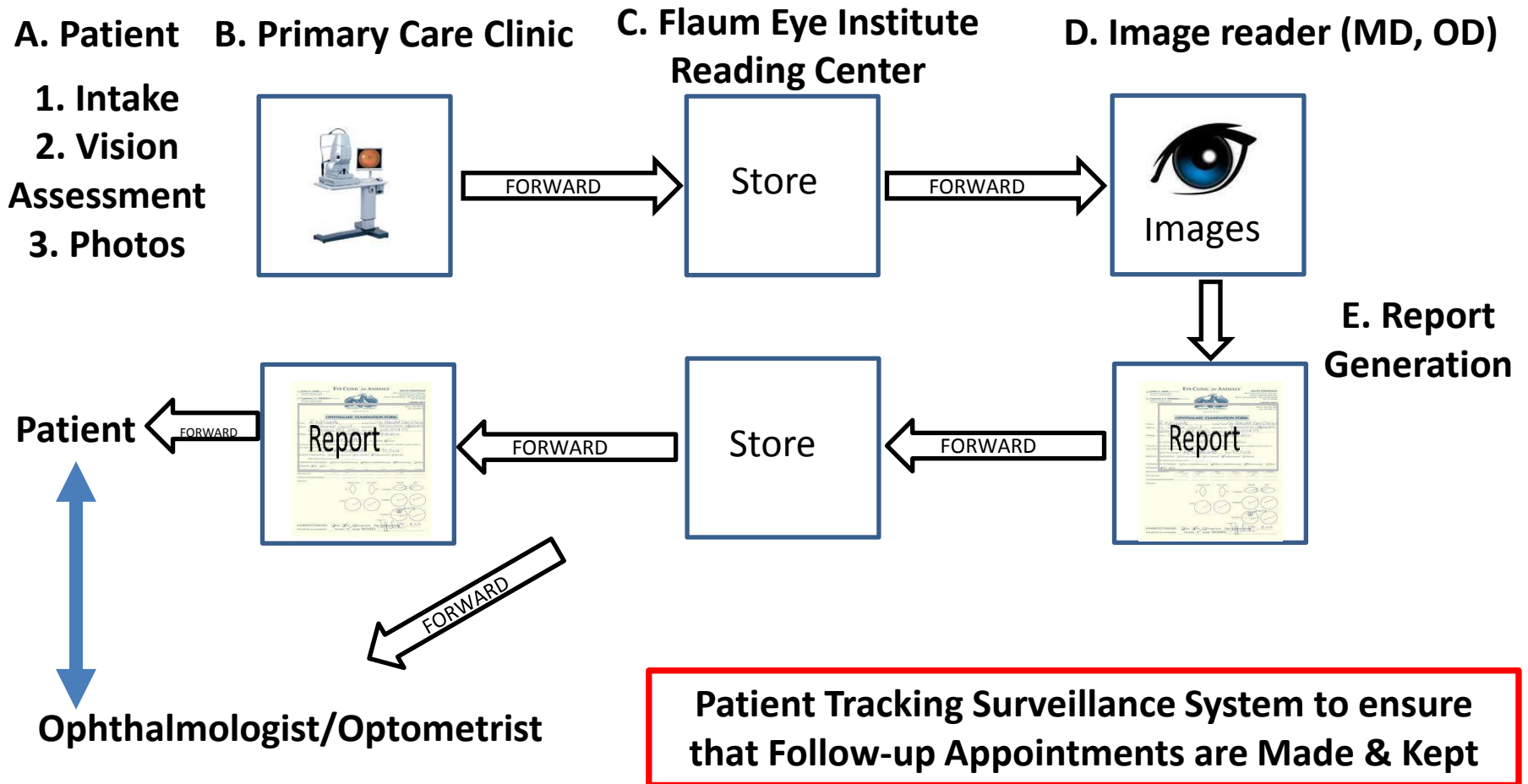
**Expertise &
Infrastructure in
Diabetic Eye care
& Population
Eye Health
Management**



**Biomedical Photographic
Communications Program
Only US Bachelor's Degree Program
teaching Ophthalmic Photography**

**Image Quality &
Technology
Development**

Tele-I-CARE: Store and Forward Teleophthalmology Process, Closes the Loop



Retinal Ophthalmic Camera



Reading Center Image Management



Flaum Eye Institute at the University of Rochester

Photography Reading Center Study Page



NORDIC - (L)IIHTT Study

SRS Study

ITED Study

TELE I CARE Study

TED01RV Study



HIPPA Compliant Tracking System



TELE - I - CARE



[Patient Status](#) [System Tools](#)

Rajeev Ramchandran ([Logout](#))

Patient Status

Date of Service (range): TO
 Date of Birth (range): TO
 Primary Care Provider:

Site Location:
 Pathology:
 Eye Care Provider:

First Name: Last Name:
 Eye Appt Made: Eye Appt Kept:
 Current Status:

Date of Service	Site Location	Patient Name	Medical Record #	Date of Birth	Primary Care Provider	Eye Care Provider	Current Status	Pathology	Recommended Follow-up By	Eye Appt Made	Eye Appt Kept	
09/25/2014	Twig						Ready to be Signed	R: None-DME, L: None-DME	4 Months: 03/12/2015			
10/09/2014	Twig						Ready to be Signed	R: Qui PDR-DME, L: Mild NPDR-DME	6 Months: 05/11/2015	05/07/2015		
10/01/2014	CFH							Ready to be Signed	R: None-DME, L: None-DME	4 Months: 03/12/2015		
10/07/2014	Twig							Ready to be Signed	R: None-DME, L: None-DME	12 Months: 11/12/2015	02/27/2015	
10/07/2014	CFH							Completed	R: Sev NPDR-DME, L: Qui PDR-DME	6 Months: 05/10/2015	05/14/2015	

Report on Eye Surveillance in PCP Office meets HEDIS Metric for Annual Eye Exam

Tele-I-Care Diabetic Retinopathy Surveillance Project

Patient Name: [Redacted]
Date of Birth: [Redacted]
Medical Record: [Redacted]
Date of Exam: [Redacted]
Clinic: [Redacted]
PCP: [Redacted]



Right Eye

No Apparent Diabetic Retinopathy
No Apparent Diabetic Macular Edema
Image Quality: Excellent



Left Eye

No Apparent Diabetic Retinopathy
No Apparent Diabetic Macular Edema
Image Quality: Excellent

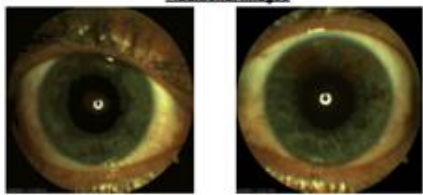
Other Findings:

[Redacted]

Follow up with ophthalmologist for complete dilated eye exam within 4m. Continue to work with primary care team for good blood glucose, pressure, and lipid control. Copy of recommendation sent to your Primary Care Provider. Copy of recommendation sent to your eye care provider and to Dr. Gwen Sterns, MD, Department Chief, RGH Ophthalmology.

Reviewed By:
Rajeev Ramchandran
Flaum Eye Institute, URM
Box 659, 601 Elmwood Ave
Rochester, NY 14642
Date: 11/12/2014

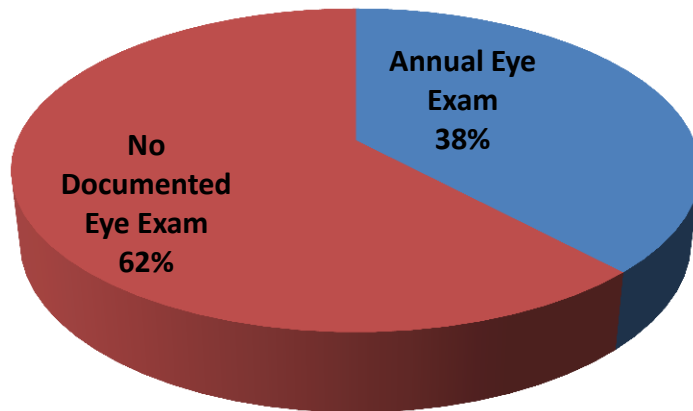
Additional Images



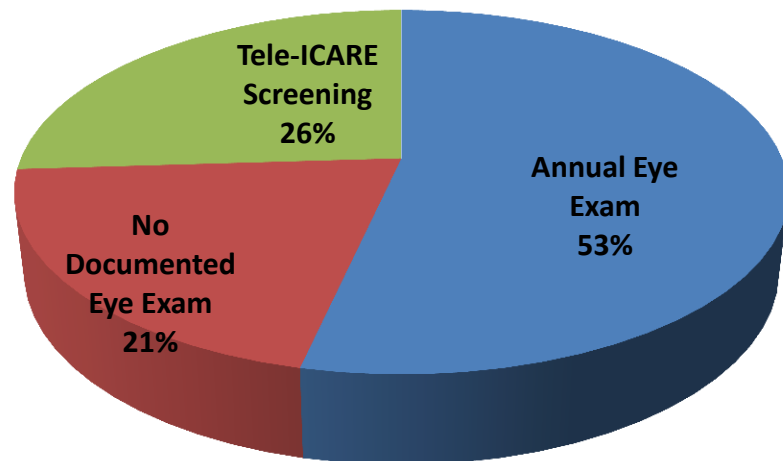
This report documents a limited screening for diabetic retinopathy performed with a retinal camera. All patients undergoing such screening are advised to see an eye care provider for a full eye exam. Tele-I-Care Project is supported by a grant from the Greater Rochester Health Foundation.

Increased Retinopathy Surveillance

Clinton Family Health 2013: 38%



Clinton Family Health 2014
79% of 828 Total Patients
Screened/Examined

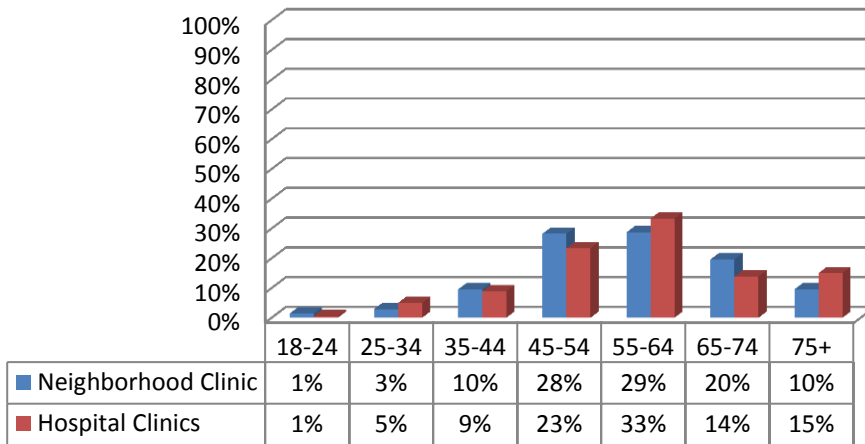


**Easier Data Access at
Neighborhood Clinic**

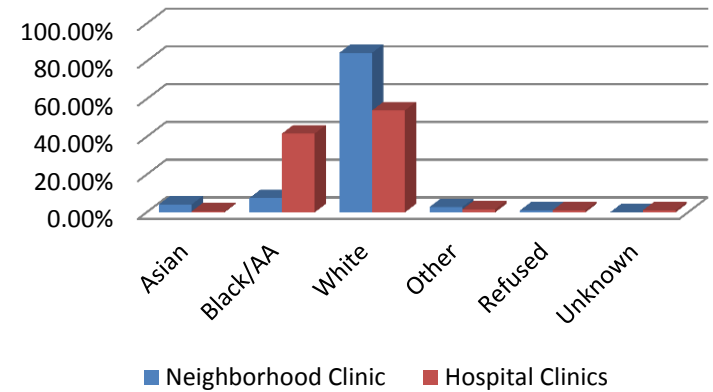
Screened Population: 1 Year

420 patients, 51% Female, 94% Insured

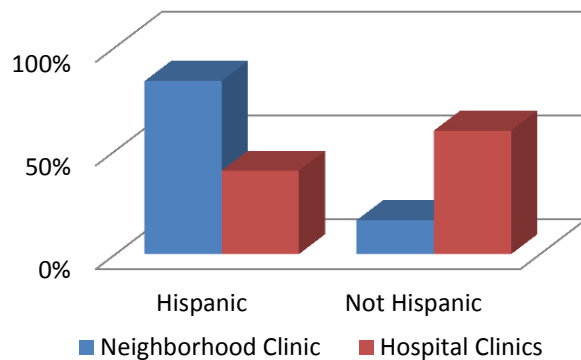
Age Distribution, Mean: 56, SD: 12 yrs.



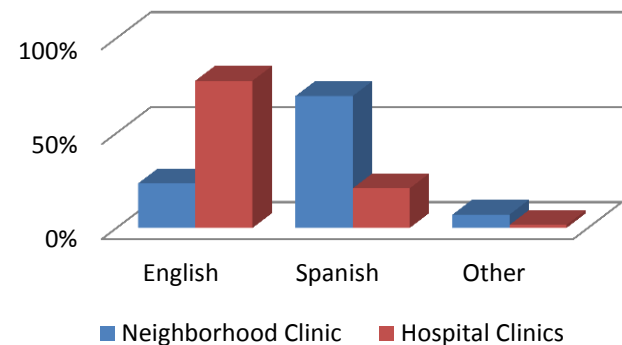
Race*



Hispanic Ethnicity*



Primary Language*



*p<0.05

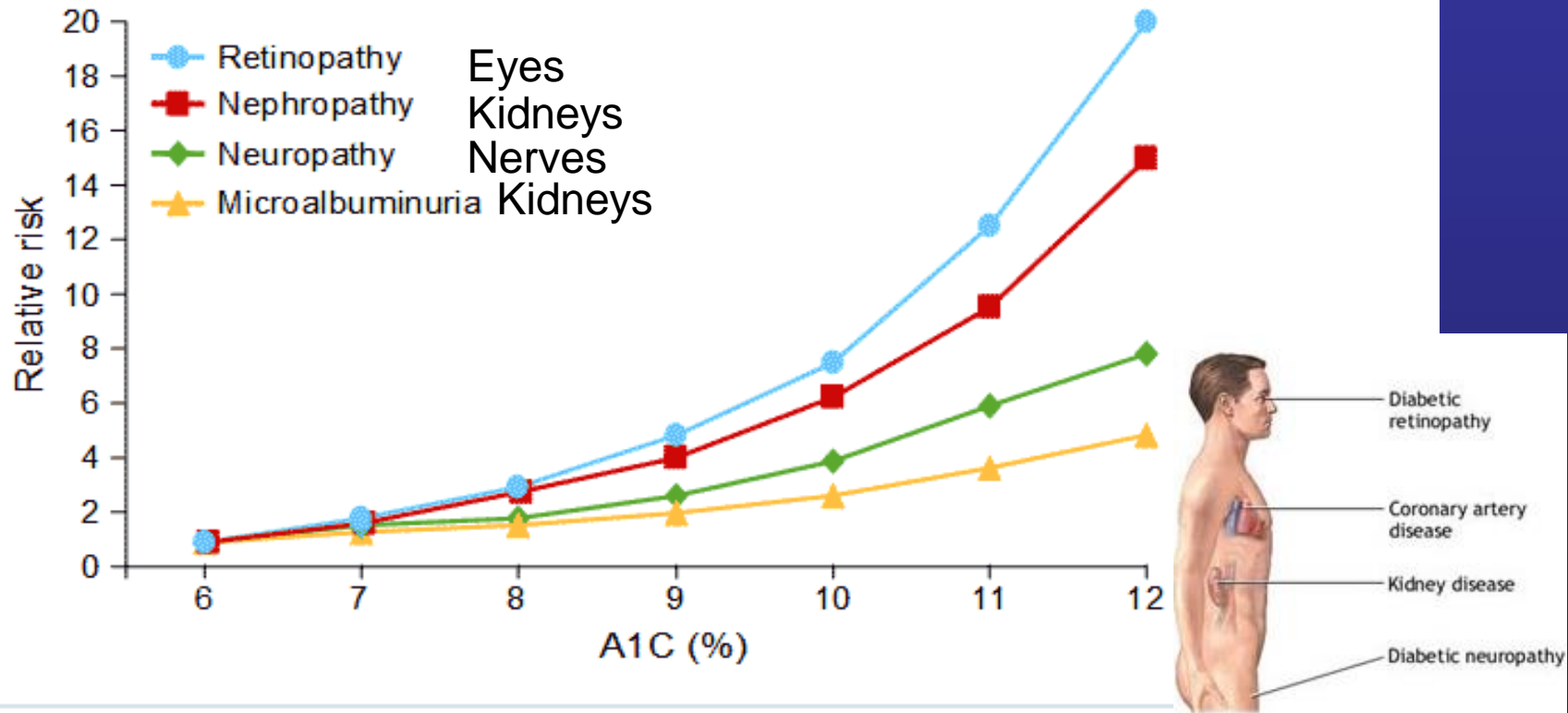
Project has led to Center for Community Healthy Supported Education Research

1. Develop Digital Diabetes Education that:
 - Incorporates Personal Retinal Photos
 - Presents Risk for Vision Loss
 - Reviews Diabetes Self Management and Monitoring
2. Small Randomized Trial to test feasibility and response to an education module using and not using personal eye photos and setting individualized goals for diet, exercise and monitoring blood sugar.
3. Goal is to increase motivation and improve diabetes self management.

January 2015 - Finalizing Protocol for IRB Submission



Sugar Control Prevents Body Damage



Every point decrease in HbA_{1c} (measure of sugar in blood)
(Ex: A drop from 9 to 8%) reduces your risk of Eye,
Kidney, and Nerve Disease by 35%

Name:
Date of Birth:
Medical Record Number:

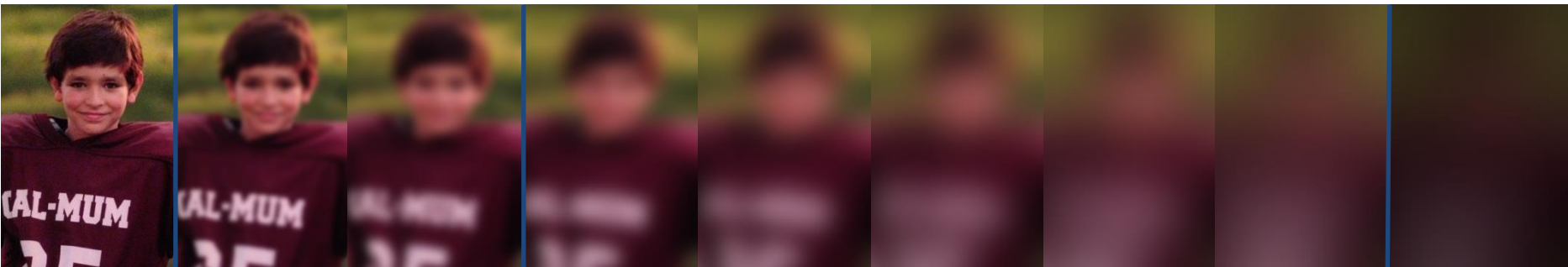
Date of Eye Screening:
Clinic Name:
Primary Care Provider:

Diabetic Retinopathy Screening Report

Recommendations for Follow-up:

Make an appointment to see your eye doctor **within the next 3 months**. If you do not have an eye doctor, tell your primary care doctor and he/she will help refer you.

VISION TEST RESULTS



20/20

20/40

20/200

Normal

Legal to Drive

Low Vision

Legally Blind

Right Eye



20/40

Left Eye



20/30

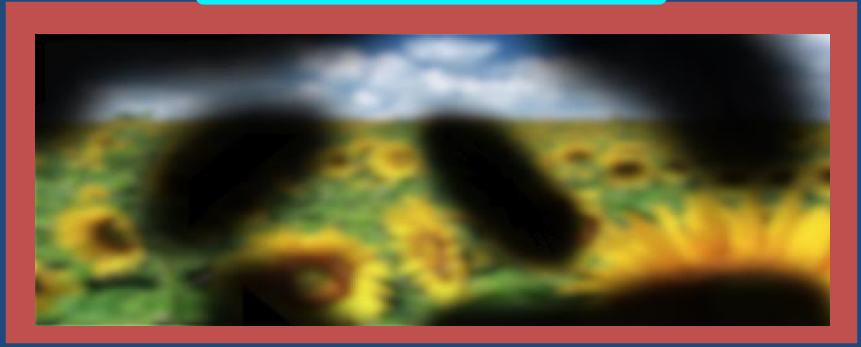
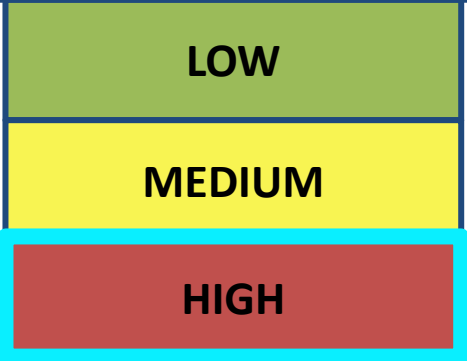
RIGHT EYE – RETINA PHOTO



Diabetic Retinopathy	YES	NO
Edema (Swelling)	YES	NO

RIGHT EYE – VISION LOSS

Your risk of vision loss based on the level of damage to your retina from Diabetes (retinopathy) is **HIGH**



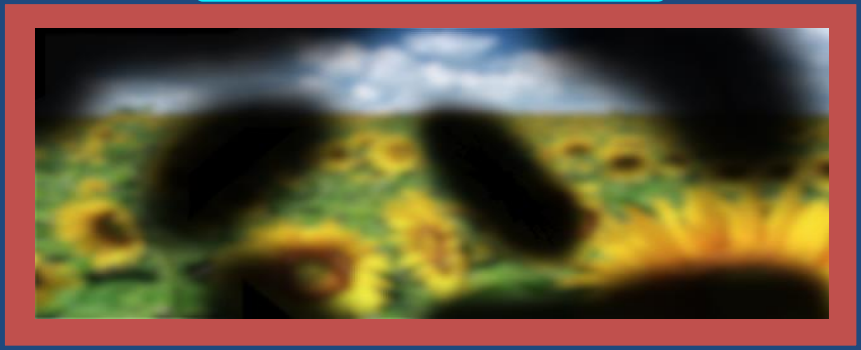
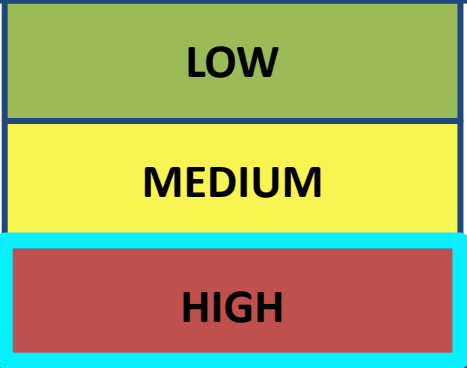
LEFT EYE – RETINA PHOTO



Diabetic Retinopathy	YES	NO
Edema (Swelling)	YES	NO

LEFT EYE – RISK OF VISION LOSS

Your risk of vision loss based on the level of damage to your retina from Diabetes (retinopathy) is **HIGH**



KNOW YOUR RISK FOR DR

Stop Diabetes from causing damage to your eyes. KEEP TRACK OF YOUR **ABCs**:

A1c (Blood Sugar Level)

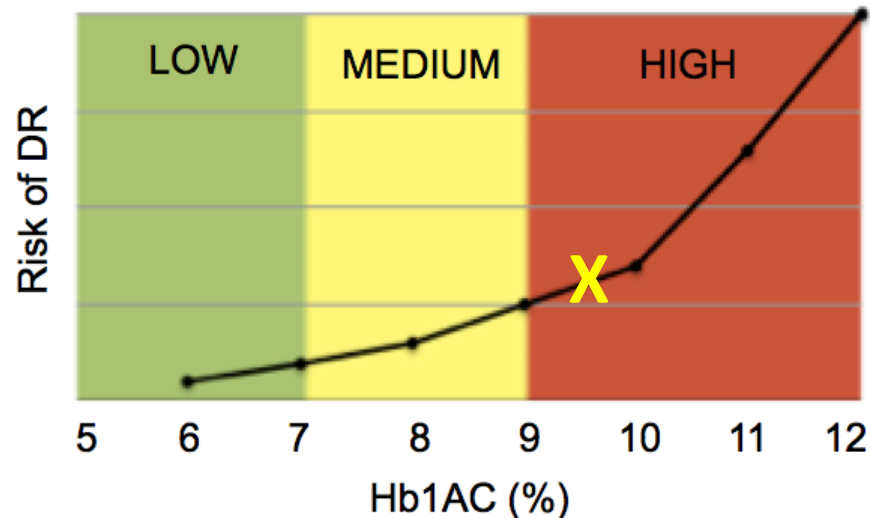
Blood Pressure

Cholesterol (LDL = Bad Cholesterol)

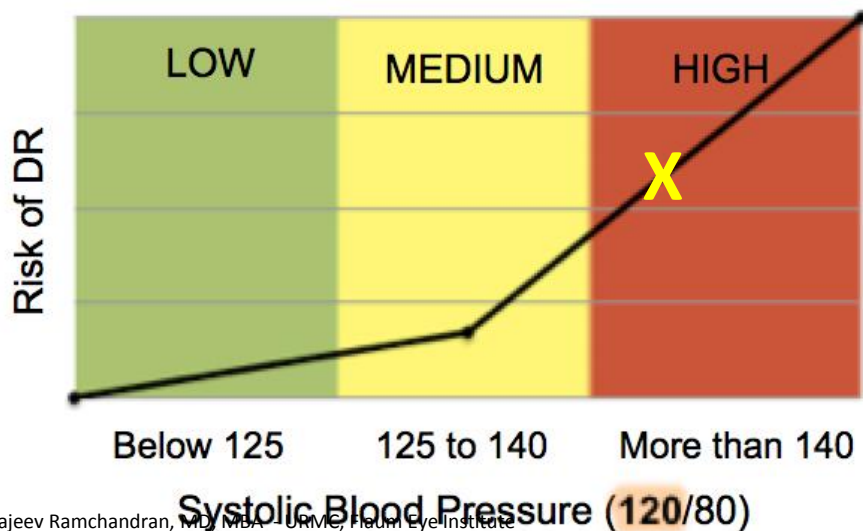
Use these charts to check your risk for DR.

Please ask your primary doctor what levels are right for you.

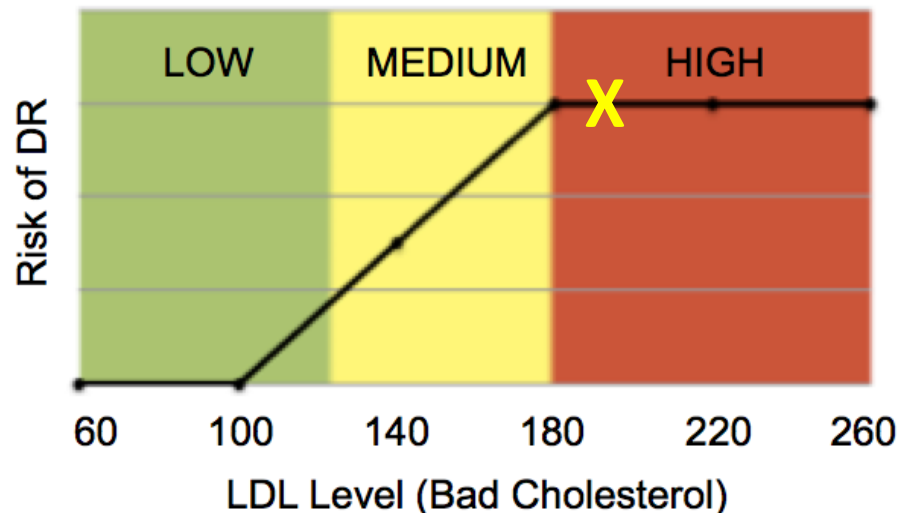
Diabetic Retinopathy Risk vs. HbA1C



Diabetic Retinopathy Risk vs. BP



Diabetic Retinopathy Risk vs. LDL



Next Step: Sustainability

Dependent on:

- Geographic Location – State Mandates, NYS Gov. recently signed Telehealth Coverage Law for January 1, 2016
- Mix of Payers responsible for Population
 - November 2014 – Discussion with Excellus to support program
- Priorities of Primary Care – Medical Homes – PCP practices show interest.
- *Business Model of Local Health System - ACOs
- *Accessing Data to Determine where the need is for increasing eye exam rates.
 - Sources: Insurers, FLHSA, ACOs
- *Making Vision and Eye Health a Public Health Priority

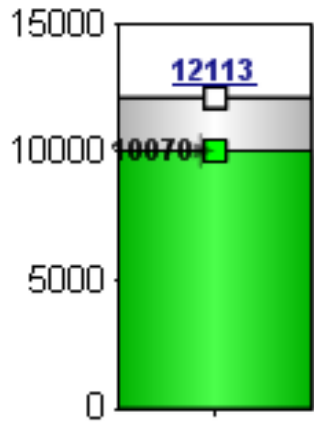
* Looking for partners to help with these objectives.

Current Fee For Service Codes

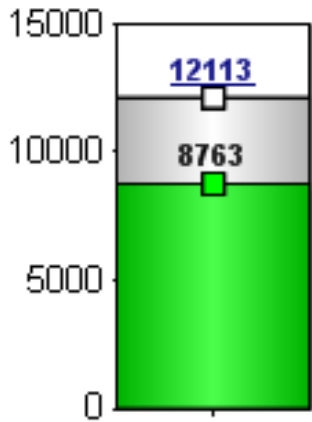
CPT	Description	Fee	Covered By	Notes
92250 Global (Technical + Professional)	Retinal Photography With Interpretation	\$40 - \$100	Most Major PPP Carriers	Coverage depends on DR level and region
92227	Remote imaging for detection of retinal disease	\$11 - \$19	Most plans	Applies to PCP interpretation of images
92228 Global (Technical + Professional)	Remote imaging of active retinal disease	\$31 - \$38	Most plans	Must have pre-existing DR
92014 SE	Ophthalmological service, established patient	\$60	Hawaii Med-Quest	Extra payment above FQHC PPS
HCPCS S0625 & S3000	Retinal exams for patients with diabetes	\$0	Not covered by Medicare as of 2014	May be used to document procedure

UR Affiliates PCP Dashboard

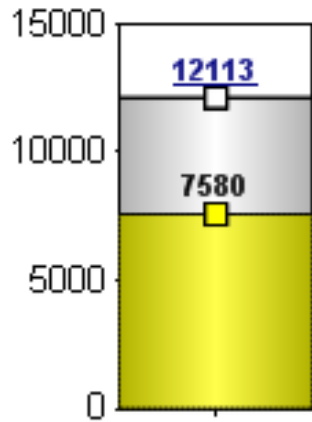
**DIABETES
HBA1C <=9 Goal
81% 11pts**



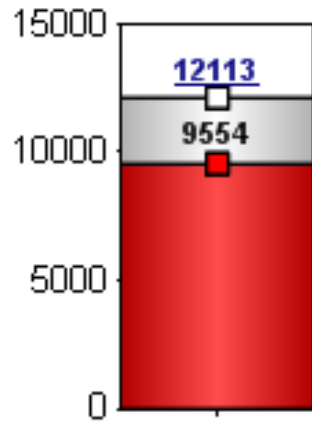
**DIABETES
HBA1C <8 Goal
70% 11pts**



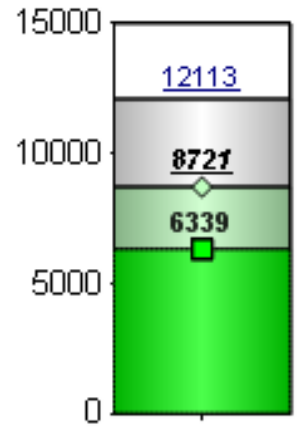
**DIABETES LDL
LT 100 GOAL 56%
5pts**



**DIABETES
BPLT140/90
GOAL 77% 10pts**



**EYE EXAMS
GOAL >72% 5pts**



Points: 11 83.13 %

11 72.34 %

5 62.58 %

10 78.87 %

0 52 %

**Need to identify clinics in need and tackle
Annual Eye Exam for our population
immediately!!!**

Translating Work For At Risk Seniors

Tele-ICARE for Seniors

- Extension of Diabetic Eye & Vision Health Surveillance for at risk older adult population.
- National Institute on Aging & American Geriatric Society supported feasibility study to assess vision and eye health in two Senior Living Communities





UR
MEDICINE

FLAUM
EYE INSTITUTE

A Preventive Problem Solving Intervention Older Adults with Macular Degeneration:

Silvia Sörensen, PhD

Departments of Ophthalmology and Psychiatry





Age-related Macular Degeneration



Depression and Low Vision



Rates of depression:
2 - 5 X greater in older adults with low
vision than in sighted older adults.



WHY?

- reduced ability to engage in valued and enjoyable activities (mediator)
- greater likelihood of social isolation
- Everyday tasks and mobility



Preventive Problem Solving



First 4 weeks: current problems

Last 4 weeks: future problems

1. Define a future problem you are concerned about
2. Set realistic goals to approach the problem
(including gathering information, making decisions)
3. Brainstorm various solutions
(where to get information, how to make a decision)
4. Pros and Cons of Solutions
5. Choose the most feasible solution(s)
6. Determine a plan of action: and assign as Homework.
7. Evaluate the Outcome at next visit

Testing the Intervention: RCT

Preventive Problem
Solving Intervention
(PREPSI)

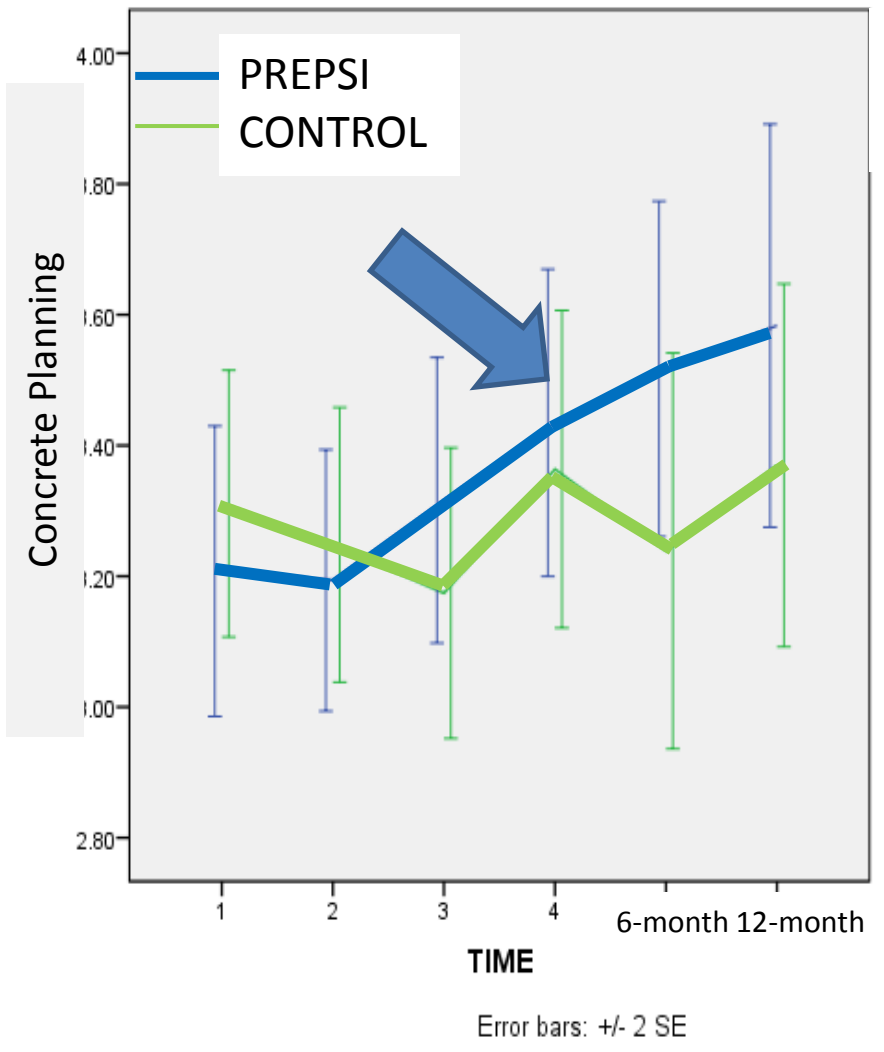
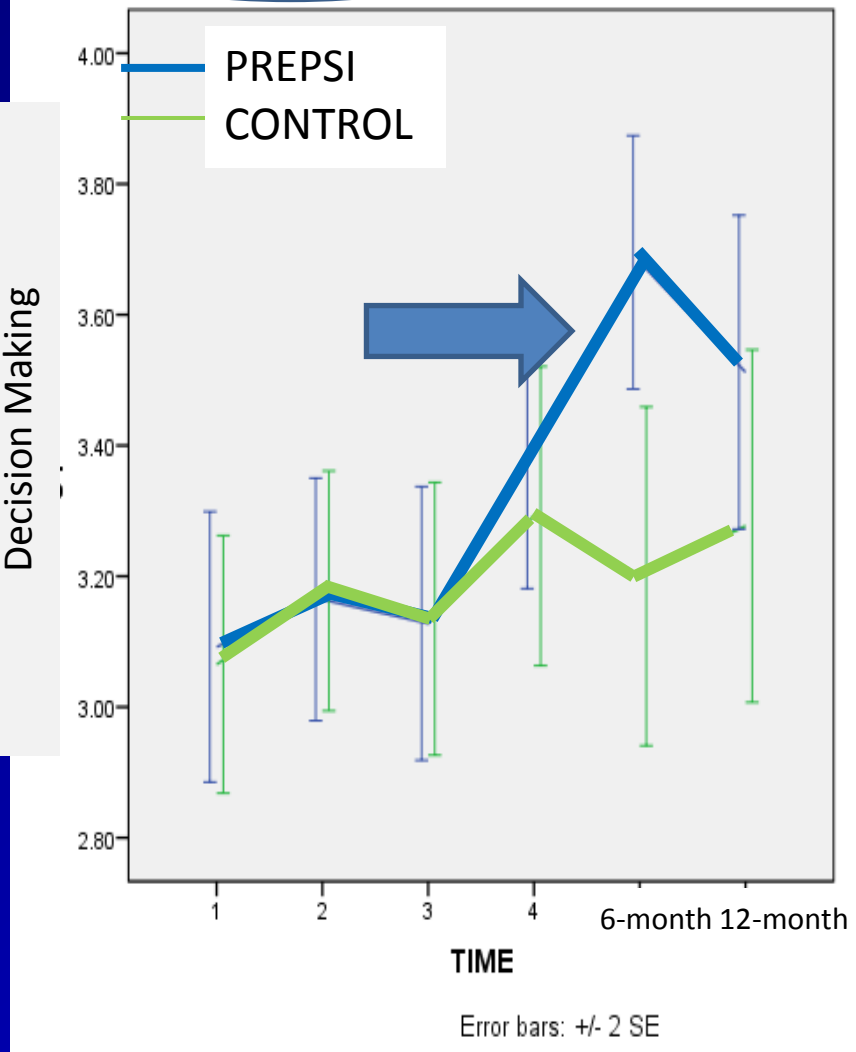
OR

Life Review and
Resource
Information

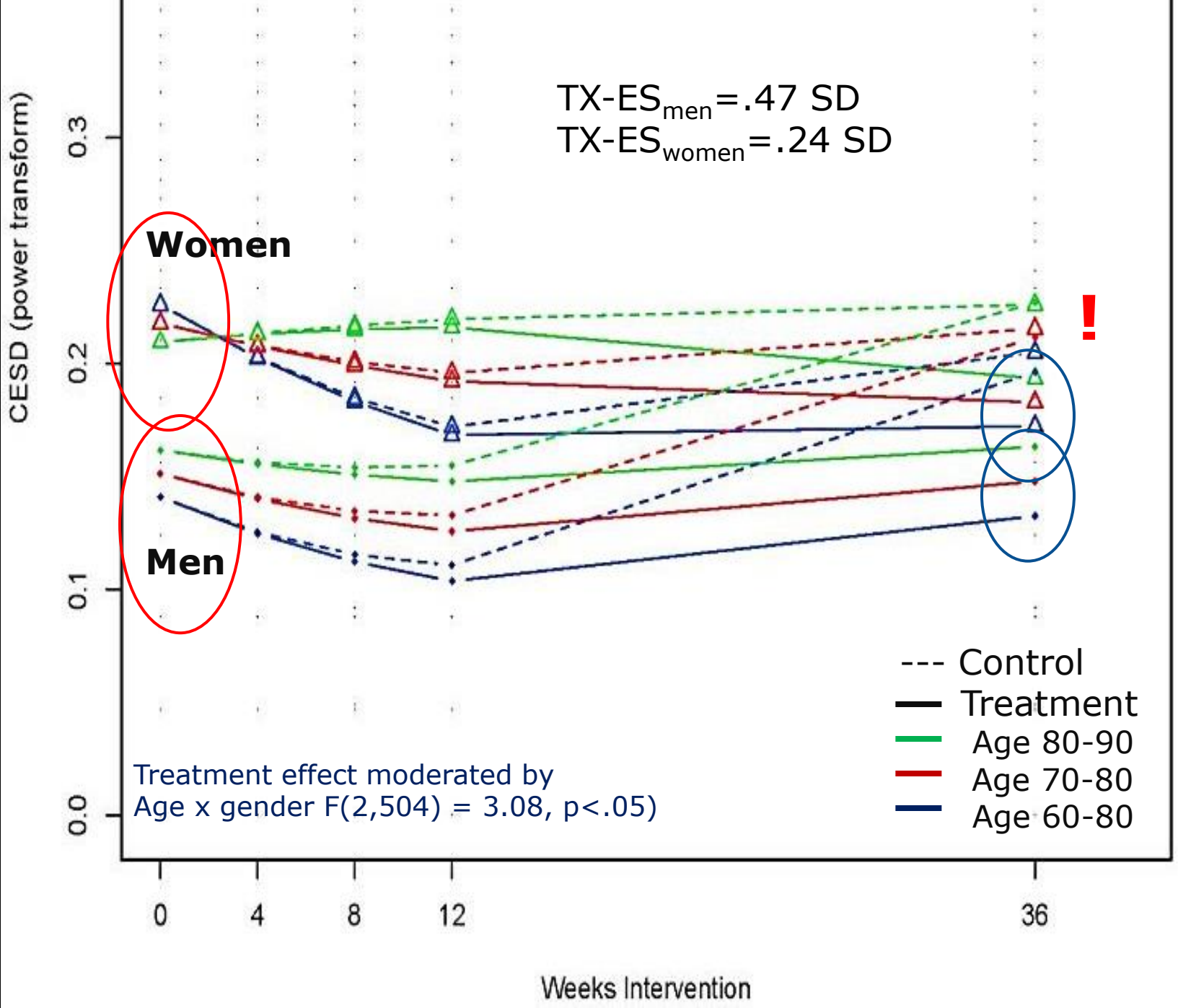


4-week Education
8-Week In-home Training

Decision Making and Concrete Planning: PREPSI vs Control



Note: T1=Pretest, T2, T3=during intervention, T4=post-intervention, T5=6-month follow-up, T6= 12-month follow-up



NEXT STEPS

- Adapt the intervention to Diabetic Retinopathy and other diseases
 - Implement this intervention in the context of eye care and low vision rehabilitation at ABVI and FEI
 - Make it sustainable
 - Greater Rochester Health Foundation
 - National Institute on Aging
 - Dialogue with Excellus and other Payers
-

Integrated Population Health Approach



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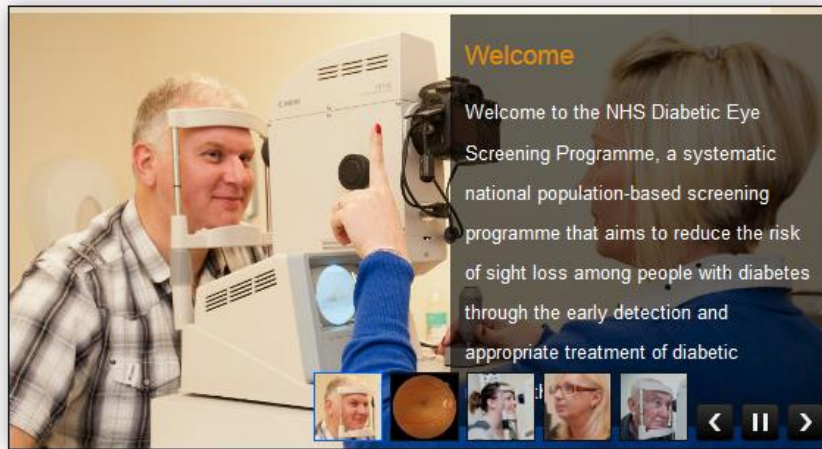
Global Teleophthalmology Diabetic Screening Programs: 100 million with DR of 300 million with DM



Vision and Eye Health is a Priority for UK Public Health



Welcome to the NHS Diabetic Eye Screening Programme

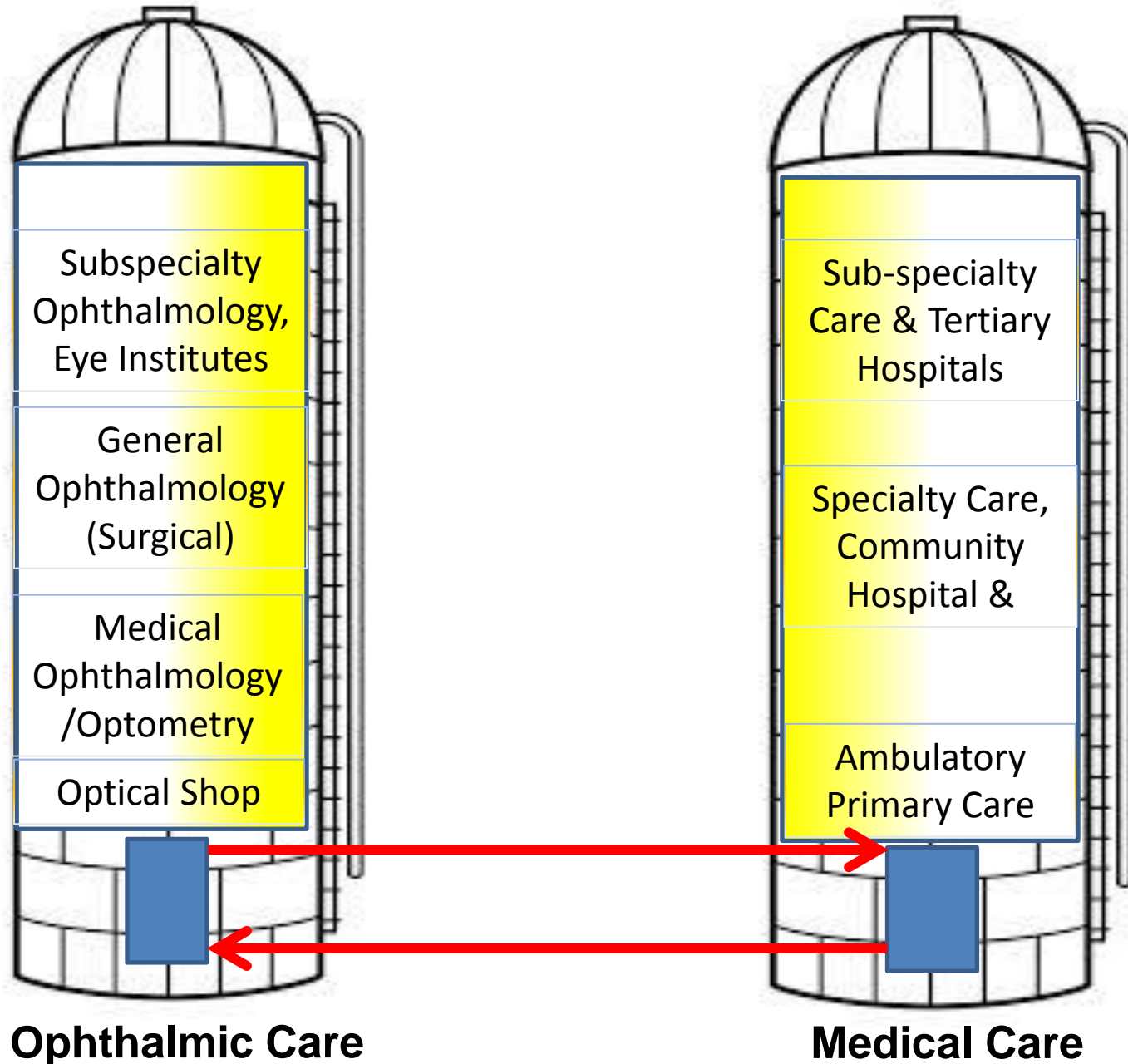


LATEST NEWS [More news](#) | [Press office](#)

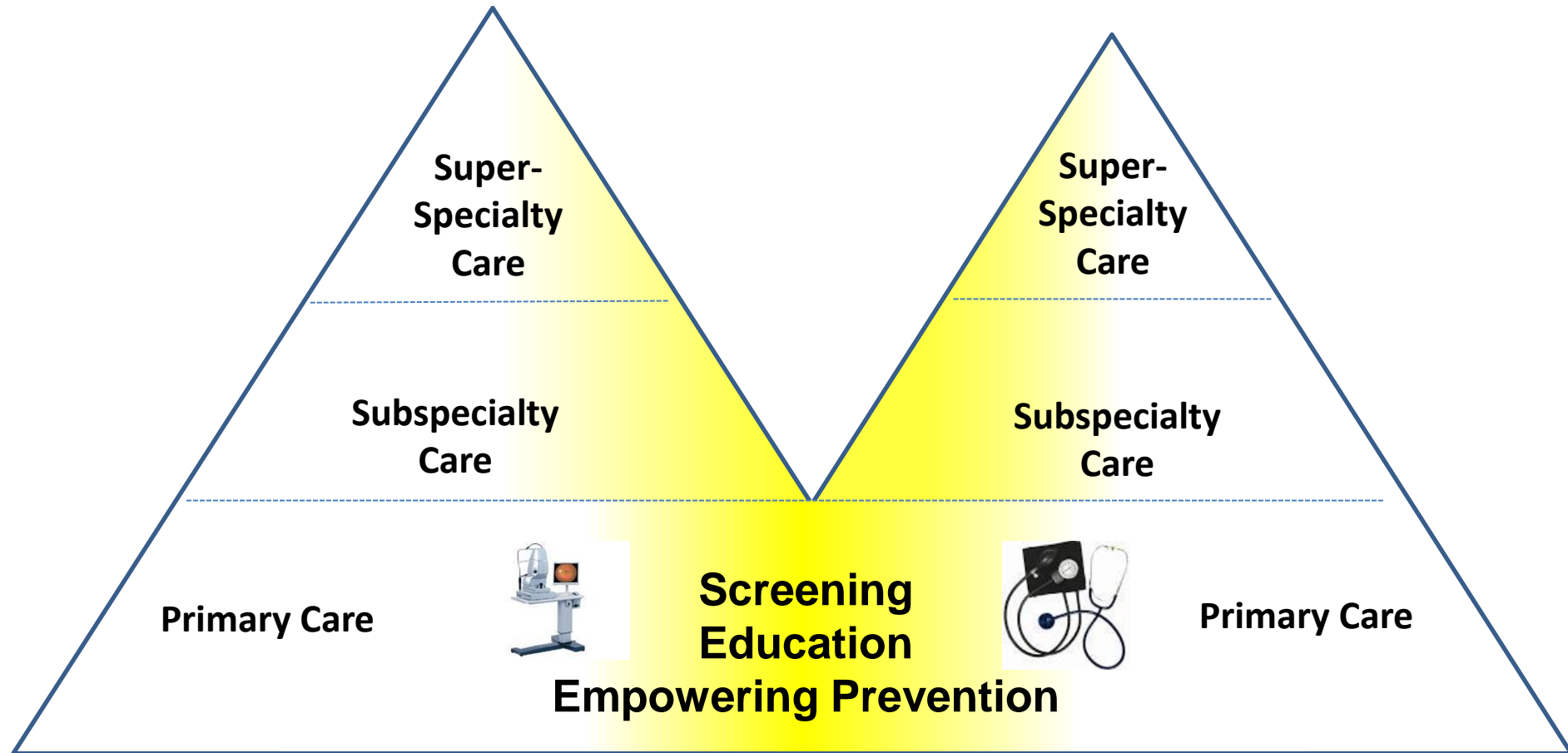
- 05/12/14 [Screening services near you - search function now available](#)
- 27/11/14 [Private screening - new information and blog from the UK NSC](#)
- 26/11/14 [Leaflet ordering: important information for Christmas period](#)
- 25/11/14 [Nearly 500 screened men had potentially](#)

- **Annual Eye screening rates are now 90%+**
- **Diabetic Retinopathy is no longer the leading cause of blindness in the UK.**

Traditional Siloed Care



Integrated Population Based Care Management to Achieve Synergistic Health Promotion



Ophthalmic Care

Improving Eye
Care in Primary
Care Settings

Medical Care

No Mention of Vision Health as Public Health Priority on Monroe County Department of Health Website



Services News Government

Department of Health
Information for a Healthy New York

You are Here: [Home Page](#) > [State and County Indicators For Tracking Public Health Priority Areas](#) > Monroe County Indicators For Tracking Public Health Priority Areas

Monroe County Indicators For Tracking Public Health Priority Areas

Indicator	Prevention Agenda 2013 Objective	US	NYS	Monroe County
ACCESS TO QUALITY HEALTH CARE				
% of adults with health care coverage ¹ Map of adults with health insurance	Health Insurance 100%†	82.1% ^a (2011)	85.3% (2011)	88.9% * (2009)
% of adults with regular health care providers ¹ Map of adults with regular health care providers	Primary Care 96%†	86% ^a (2008)	83.6% (2011)	90.9% * (2009)
% of adults who have seen a dentist in the past year ¹ Map of % of adults with a dental visit in the last year	Dental Care 83%†	69.9% ^a (2010)	72.5% (2010)	77.7% * (2009)
Early stage cancer diagnosis²				
Breast	Cancer Screening 80%	60% (2002-2008)	64.8%	68.3%
Cervical	65%	47% (2002-2008)	42.0%	41.6%
Colorectal	50%	38% (2002-2008)	43.6% (2009)	51.2% (2008-2010)
TOBACCO USE				
% cigarette smoking in adolescents ³ (past month)	10%	18.1% (2011)	12.5% (2011)	NA
% cigarette smoking in adults ¹ Map of Adults who are current smokers	Smoking 12%†	21.2% ^a (2011)	18.1% (2011)	19.6% (2009)

CDC Supporting National Vision Surveillance System



Centers for Disease Control and Prevention

National Center for Chronic Disease Prevention and Health Promotion Extramural Research Program Office

Establish a Vision and Eye Health Surveillance System for the Nation

RFA-DP-15-004

Application Due Date: 02/20/2015

Goal: Creating a Population Integrated System of Care Focused

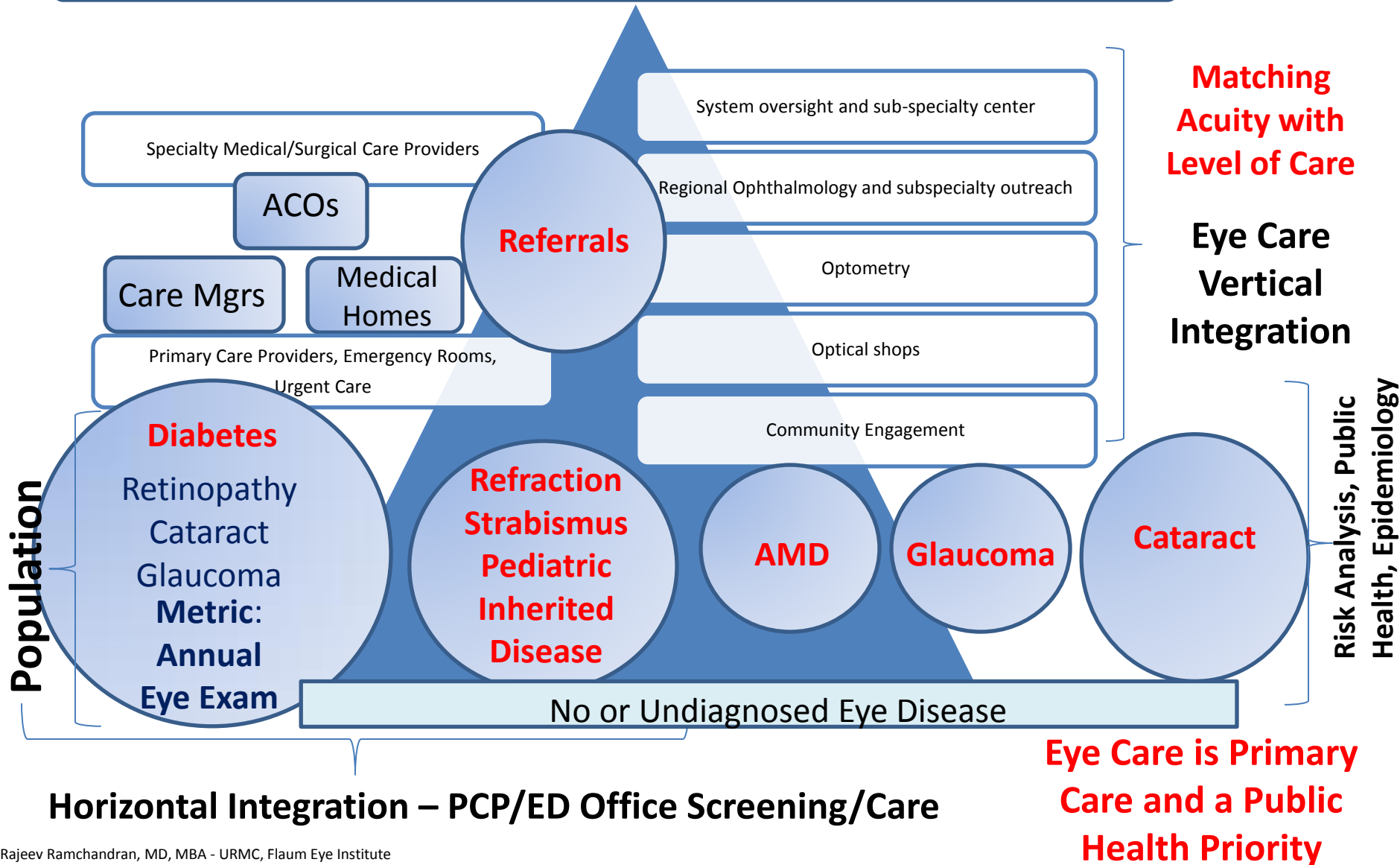
Where We Provide

- Surveillance
- Prevention
- Education
- Care
- Support

To Screen, Educate and Empower Populations
and Achieve and Maintain Health

Integrated Eye Care System for Upstate NY

Financial Models – Fee for Service and Risk Based Contracting





Thank You

<https://http://www.urmc.rochester.edu/health-connections.aspx>

Research Team

Rochester Area Tele-ICARE Team:

Vanessa M. Desmore, Health Project Coordinator

Elizabeth Czirr, MS, Data Manager and PhD Candidate

Jyothi Purushotham, BS – Health Project Coordinator

Silvia Sörensen, Ph.D., Dept. of Psychiatry

William S. Fischer, MS, Director of Flaum Reading Center

Christye Sisson, MS, Chair of Biomedical Photographic Com. Program, RIT

Gwen K. Sterns, Chief of Ophthalmology at RGHS

Physicians and Staff of Clinton Family Health, RGHS OPD and Twig Clinics

Residents and Medical Students:

Katherine Fallano, MD, Max Reber, Tatiana Deveney, Lauryn Chris



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Disclosure and Funding

- **No Financial Disclosures**
- **Volunteer (Unpaid) grader for EyePACS (UC Berkeley) teleophthalmology service**
- **Tele-ICARE (Rochester Area Teleophthalmology Program)**
Funded by the Greater Rochester Health Foundation
- **Improving population eye health: A pilot study on personalized health education for high-risk diabetic patients**
Funded by the Center for Community Health

