



Telemedicine System for Glaucoma Screening and Disease Management

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New Paradigm: Telemedicine and online patient care for cost-effective disease management

How to leverage new technology to:

- 1 Facilitate access to health care services
- 2 Streamline patient flow and increase through-put
- 3 Enable patient self-care, compliance and e-health
- 4 Reduce physician and clinic resources spent on routine care





New Paradigm: Telemedicine and online patient care for cost-effective disease management

Solution: Telemedicine + Disease Management

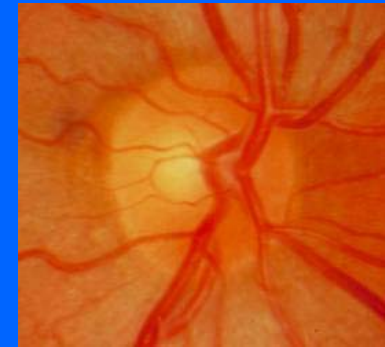
- 1** Reduce utilization
 - 2** Reduce unit cost of service
 - 3** Improve system-wide quality indicators (HEDIS metrics)
-



GLAUCOMA DZM: Case in point

Glaucoma :

1. Leading cause of blindness
2. Progressive, Irreversible Optic Nerve Atrophy
3. Largely undiagnosed (>50%)
 - 2 million have the disease
 - 2-3 million undiagnosed



HEDIS 2005 – Glaucoma Screening Cost Analysis

Cost to Society

Annual Cost of Treatment: \$2 Billion

Irreversible Blindness and High Treatment Costs from Late Detection

Direct and indirect expense to U.S. government
Per year, in billions

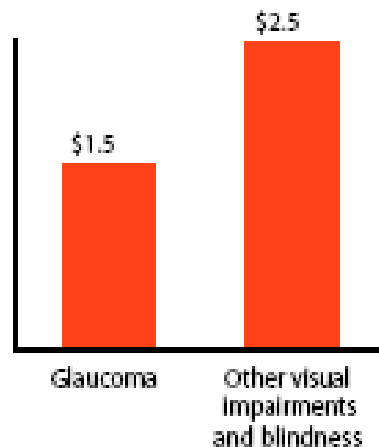


TABLE 1

Average annual costs per patient

Stage	Total costs	Medication costs
	mean (SD), $P=0.0156^*$	mean (SD), $P=0.0007^*$
0	\$200 (\$106)	\$36 (\$71)
1	\$374 (\$193)	\$60 (\$70)
2	\$483 (\$183)	\$186 (\$119)
3	\$605 (\$116)	\$72 (\$61)
4	\$836 (\$409)	\$195 (\$107)

*SD = Standard deviation. P -value based on analysis of variance (ANOVA).

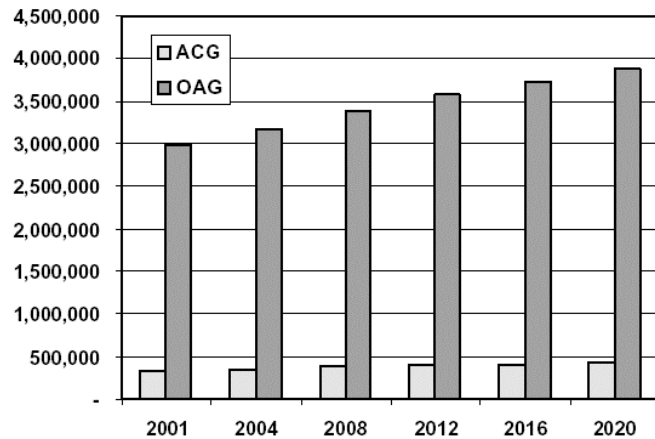
SOURCE: SIEBERT 1999



GLAUCOMA Disease Management

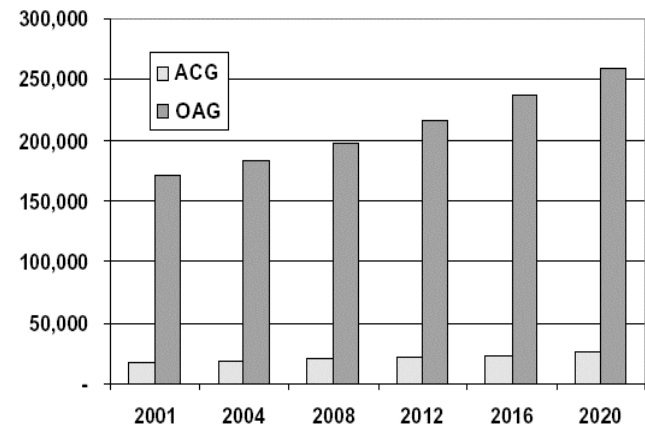
Glaucoma : Public health Impact

Exhibit 8 ♦ 20-Year Prevalence of ACG and OAG



Source: Quigley et al., and DRW estimates

Exhibit 9 ♦ 20-Year Incidence of ACG and OAG



Source: Quigley et al., and DRW estimates



GLAUCOMA: Improving Early Detection through screening.

Glaucoma HEDIS measure mandatory - January 2006

HEDIS glaucoma compliance and reporting

HEDIS score of each health plan based on the percentage of plan participants over 65 years of age who have have one of the following evaluations over a 2-year period:

- mid-level eye exam *by a physician* (level 2 - 4)

OR

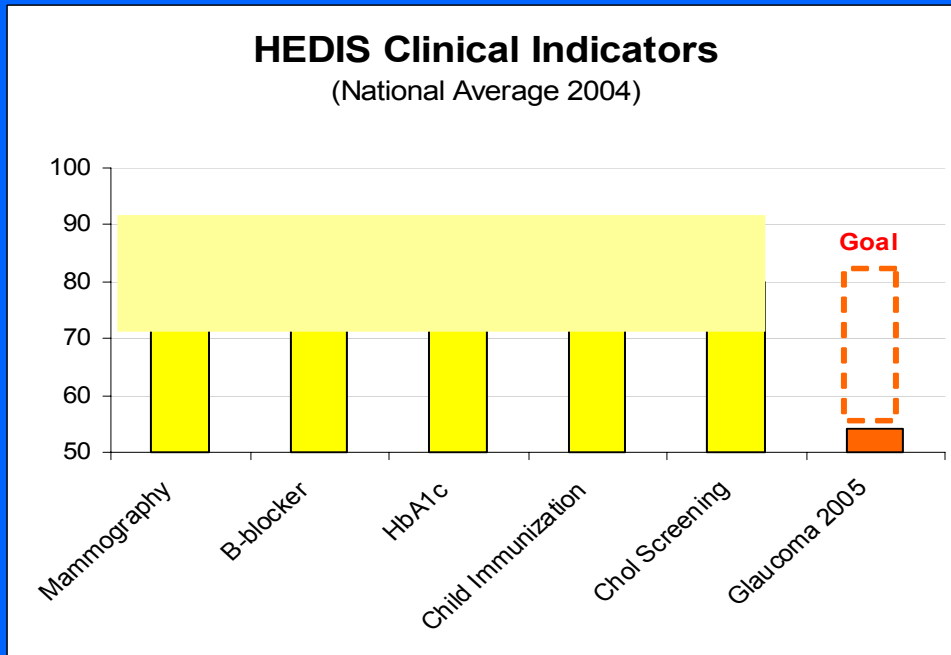
- glaucoma screening *by a physician* using the G code

OR

- **Visual field (perimetry) screening test**



Glaucoma metrics: Can we improve HEDIS score?



HEDIS score – Impact

- Improving HEDIS rates on average requires sustained, rational and often costly efforts – only 5% increase in breast cancer screening rates for the last 8 years (NCQA)
- Low glaucoma rates can adversely impact total HEDIS score – an important surrogate for overall quality of care.



Glaucoma screening rates vary widely

- Glaucoma screening rates vary from 22.8% to 93.3% among the managed care organizations¹
- Large differences between plans due to lack of standardized screening and disease management programs.
- Underperforming plans will need to create in-house programs to improve rates. No programs for outsourced glaucoma screening and disease management.

1. APHA Annual Meeting, Abstract #81563



GLAUCOMA Disease Management

Challenges: Can Disease Management Help?

1. Improve (early) detection?

- 50% undiagnosed
- 80% present with advanced visual field defects
- 75% skip annual exam because of doctor visit

2. Improve Compliance with Rx

- Compliance rate 30-50%
-



GLAUCOMA: Enabling Tools for screening and prevention.

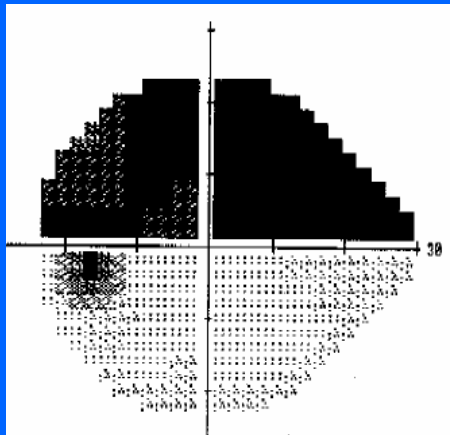


	Conventional Office Perimetry	Optic Disc Analyzer	Peristat® Virtual Perimetry
Sensitivity	>85%	>85%	>83%
Specificity	>95%	>90%	>90%
Screening	Eye MD Office-based	Eye MD Office-based	Self testing Home/Online



Peristat – The Clinical Results

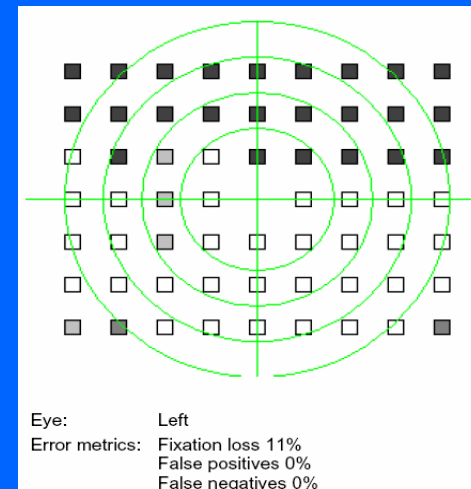
Peristat Reproduces HVF Results with High Accuracy



> 90% Sensitivity



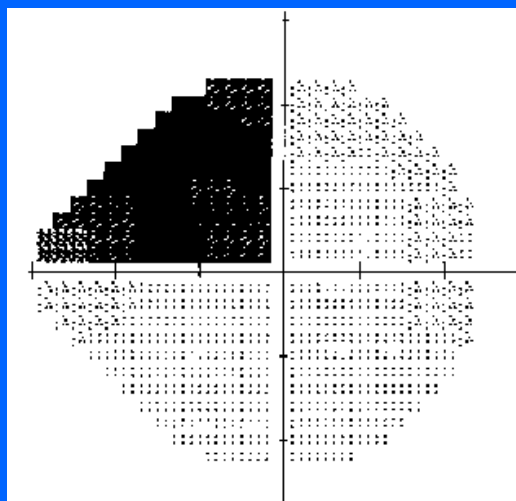
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Peristat – The Clinical Results

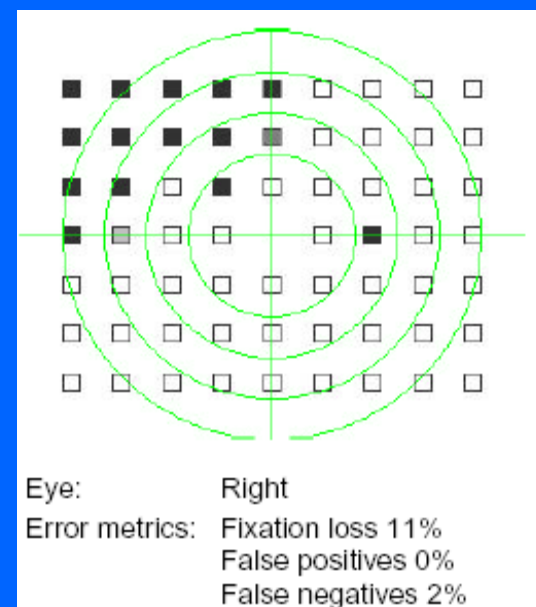
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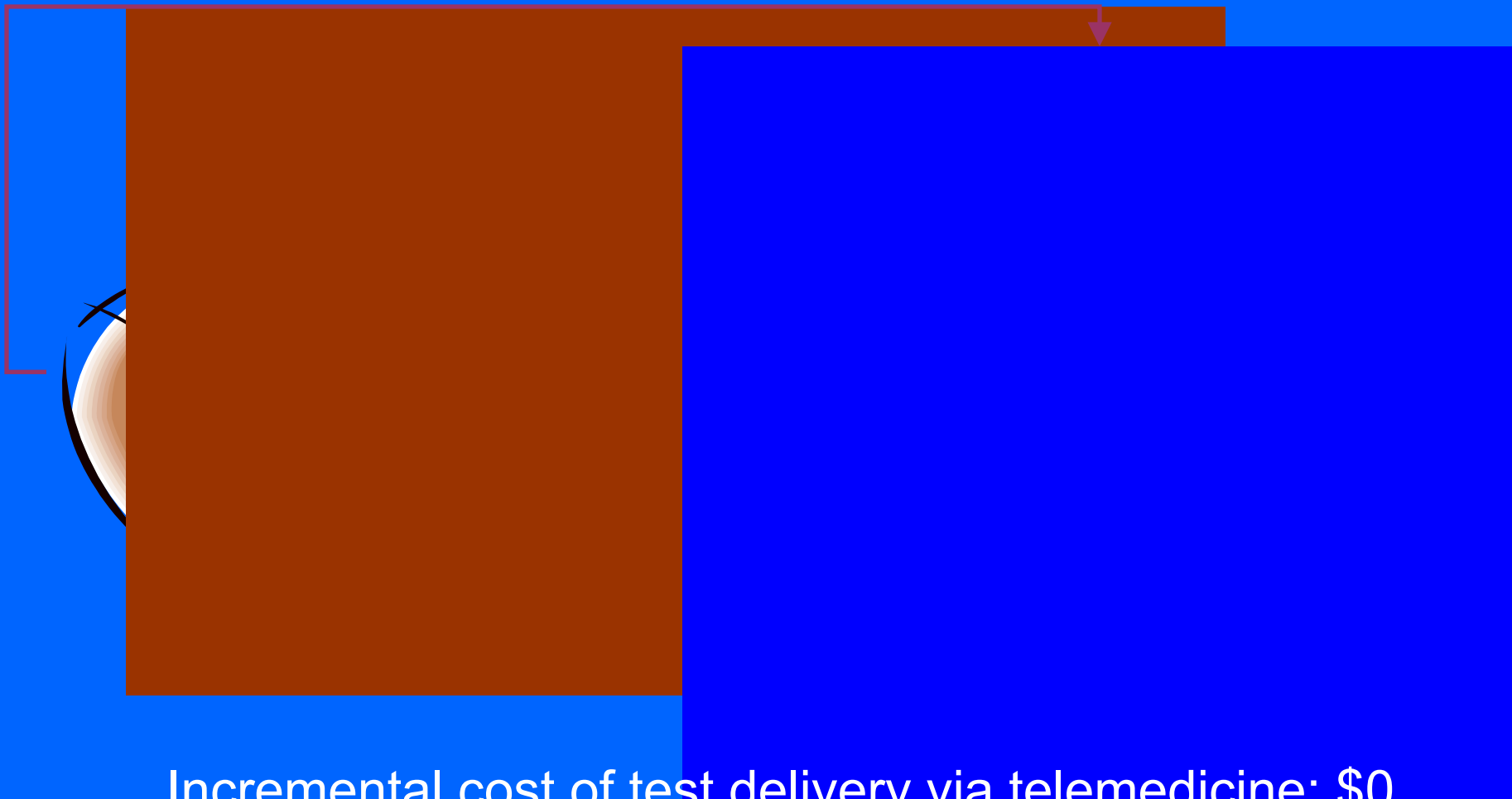
Online Perimetry vs Conventional Office Perimetry

KeepYourSight.com



	Peristat	Standard Office Perimetry
Clinical Validation	Yes	Yes
Sensitivity	85%-90%	85%-90%
Specificity	90%	90%-95%
Reliability parameters	False Positives False Negatives Fixation Losses	False Positives False Negatives Fixation Losses
Multiplex Testing	Yes	No
Technician-Free	Yes	No
Home Testing	Yes	No
Results Data-basing	Yes	No
Online Recording and Retrieval	Yes	No
FDA Clearance	Yes	Yes

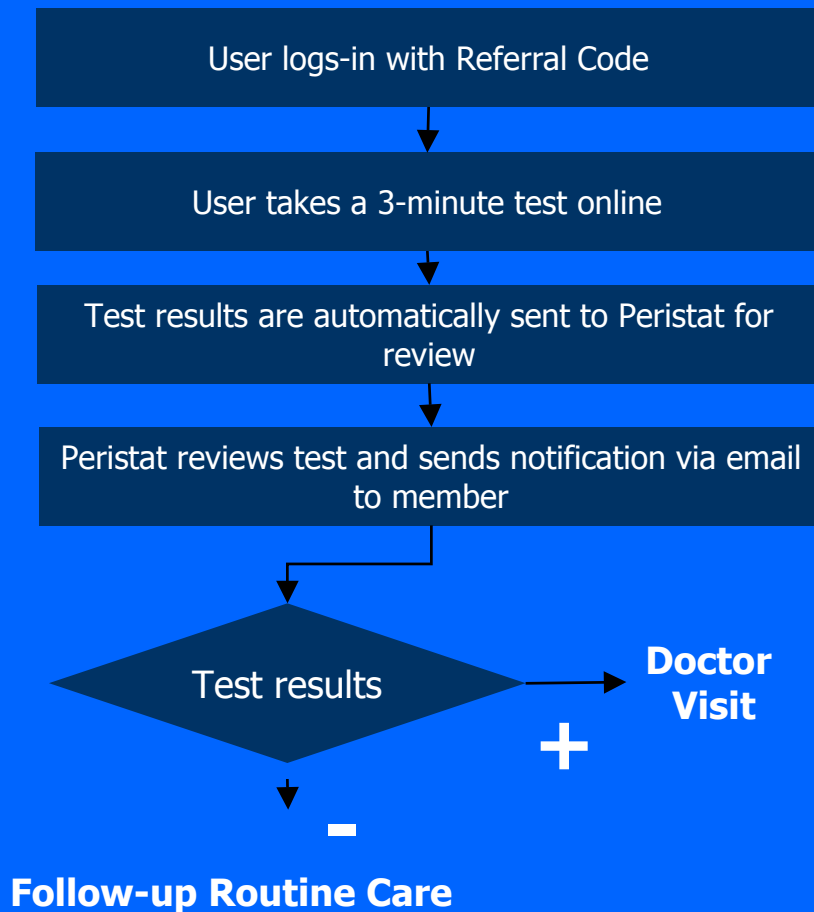
...High-throughput Self-screening via Telemedicine



Incremental cost of test delivery via telemedicine: \$0



Online Perimetry Service



- Online, fully automated process
- Test administration through self-testing
- Telemedicine system for screening and disease management
- Scalable System
- No equipment needed

Glaucoma – The Office Screening Paradigm

2-3 glaucoma cases for every 100 target screens

Repeat Testing 30-40%

\$70-100 per test

Office Visit

Registration

Preparation
&
Instructions

On-Site Testing

Analysis
&
Review



HEDIS 2005 – Glaucoma Screening Cost Analysis

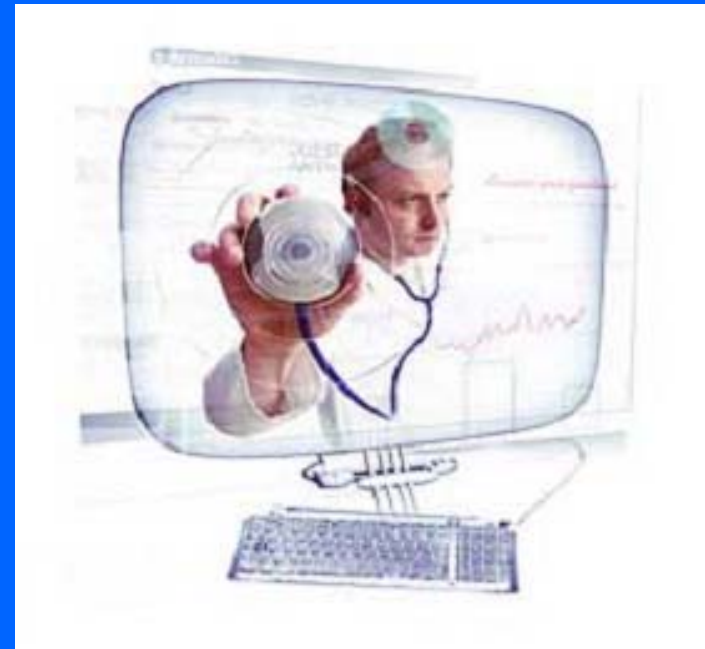
A More Cost-Effective Method?

Conventional Screening Options



Cost to administer test:
\$70-\$100

Online Visual Field Screening

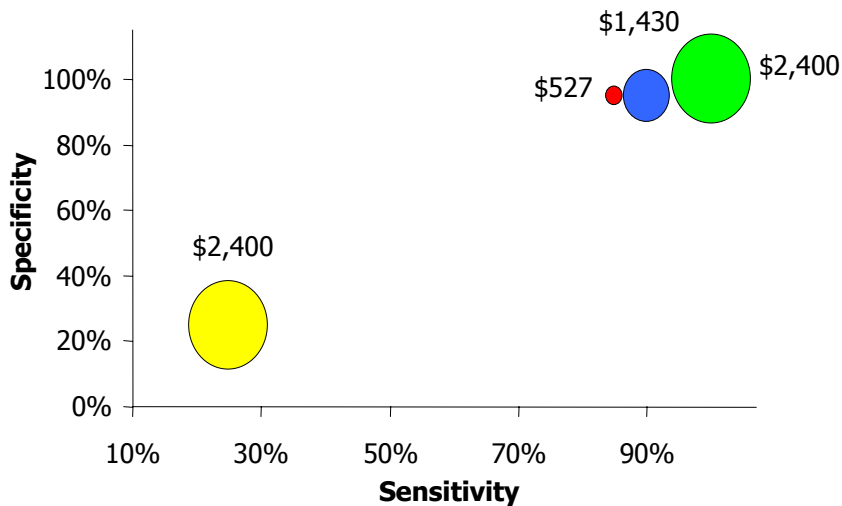


Cost to administer test:
\$10-15

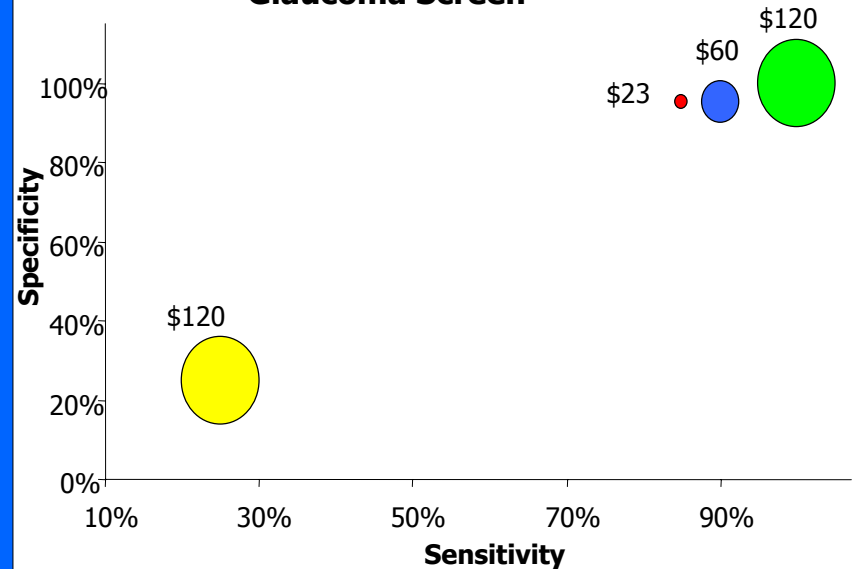


Online glaucoma screening: cost-optimized

Screening Efficacy and Total Cost Per Glaucoma Case Detected



Screening Efficacy and Cost Per Glaucoma Screen



○ = cost (\$)

- Survey
- Office Glaucoma Test
- Peristat
- Exam



Peristat Overview

WHY ONLINE PERIMETRY?

Benefits of Telemedicine Screening

- **SCALABILITY:** Can be taken and delivered any time, any place, and to unlimited simultaneous users.
- **SELF-ADMINISTERED AND AUTOMATED:** Online Perimetry is a SELF-test (unaided) – does not require a specialized technician to administer every test
- **COST SAVINGS:** Online Perimetry requires no equipment and maintenance (Average perimetry device costs \$15,000-20,000); Cost to administer a perimetry test - \$60-100 per office test vs <\$15 for Peristat

