12 Minute Agenda

- 30 seconds
- 3 minutes
- Telemedicine at UC Berkeley and EyePACS
- New technology for telemedicine and detection of disease
  - Cool new promising gadgets
  - Things that really work
- Can we actually help prevent blindness with screening? Where's the evidence?
  - The vicious cycle of "non-compliance"
  - Adherence-based program development
  - Primary care's role in preventing blindness
- 4 minutes
- 90 seconds
- Current projects for preventing vision impairment
- 3 minutes
- Policy wish list: what policies will help to sustain truly effective prevention programs?

EyePACS Staff Training Photographers at Yakima Family Health Clinic, Washington State
Telemedicine At U.C. Berkeley and EyePACS:

- 1994 – First telemedicine consult
- 1999 – Telemedicine Consults with China and India
- 2001 – EyePACS first version
- 2003 – Diabetic retinopathy detection
- 2005 – CHCF supports development ($2.7m)
- 2010 – UCB and EyePACS become self-sustaining programs
- 2015 – Active programs in 40 states and 5 countries; 8,000 exams per month
New technology for telemedicine and detection of disease

- Bigger
- Smaller
- Better
- Faster
- Cheaper

Optos Scanning Laser Camera

Centervue
DRS Robotic Camera

EyeGo Cellscope

U. Rochester Contact Camera

D·EYE

peek portable eye examination kit
New technology for telemedicine and detection of disease

- Bigger
- Smaller
- Better
- Faster
- Cheaper

Optical Coherence Tomography (OCT)

LKC Retrieval Electro-diagnostic device

Retinal Reading device
Bottom Line On Retinal Imaging For Blindness Prevention (Screening):

- Make it EASI:
  - **E**: Effective – Technology must be validated against the gold standard for retinal imaging
  - **A**: Accessible – It must be readily available for those patients who are most at risk
  - **S**: Sustainable – Capital and operating costs must be bearable
  - **I**: Integrated – Integrates easily into the information system and clinical work flow
Evidence That Teleretinal Programs Prevent Blindness

- Diabetic retinopathy no longer main cause of blindness in adults age 25-70 in UK
- Veteran’s Administration Program 10+ years going strong
- Teleretinal exams for diabetes now “approved” by Kaiser, “The Big 5” payers, HEDIS, ADA, AAO, AOA, CDC
- Growing number of international programs
Evidence That Teleretinal Programs Might Not Prevent Blindness

- 55% noncompliance with laser treatment in Beijing due to lack of awareness
  Hua et al, Can J Ophthalmol, 2013

- “Digital retinal imaging dramatically improves screening rates, but does not improve visit compliance for treatment”
  Newman et al, Family Medicine, 2012

- Low compliance with screening results in poor vitrectomy outcomes

- “Attendance for diabetic eye screening was inversely associated with HbA1c…”
  Scanlon et al, Diabetic Medicine, 2013

Dr. Rajeev Ramchandran with retinal patients in Guanajuato, Mexico
The Vicious Cycle of Blindness:

- Commonly known, but sparsely studied
- Could lack of engagement be the greatest cause of permanent blindness from diabetes?
- Often not addressed by “James Bond” (cool gadget) approach to project development

1. Poor compliance with eye exams and treatment
2. Symptoms arise
3. Too late for effective treatment
4. Treatment doesn’t work
5. Vision is permanently impaired
6. Instead of blaming uncontrolled diabetes
7. Treatment is blamed for blindness
8. No eye exams until then

Symptoms arise when it’s too late.
Integrating retinal image reading, assisted by algorithms, into primary care

- Three US county primary care and midlevel training programs have adopted retinal grading certification
- Factors determining compliance with treatment recommendations among diabetic patients study protocol designed
- Integrating chronic disease detection (and retinal screening) in urgent care clinics

Training Libyan physicians in Istanbul - 2014
Other Activities

- Clinical Trials Through An Internet-Based Research Environment
  - Device trials, data analysis
- Broader Blindness Prevention
  - Viewing change over time for detection and management of glaucoma and macular degeneration

Comparison of images over 20 months showed significant change in optic nerve appearance. Sequential images shows us how fast glaucoma is progressing.
IS THERE A PLACE IN OUR HEALTH SYSTEM FOR THIS TYPE OF ENCOUNTER?
Policy Wish List

- Recognize that blindness prevention is actually a primary care task:
  - Ensure sustainability of point of care eye disease detection
  - Allow pupil dilation by supervised medical assistants (with proper protocol)
  - Change HEDIS measures to be: screening by “validated process” rather than “dilated retinal exam by eye care provider”
  - Include retinal screening as a UDS measure for community clinics

- Adherence-based Program Development
  - Shift away from measuring rate of compliance with retinal exams and shift towards actual blindness prevention measures
  - Measure compliance with services for those most at risk, rather than the “worried well”
  - Tie incentives to primary care for “closing the loop”: measure referrals and treatments actually completed
...understanding the dynamics of communication between human beings improves the way we design information systems in health care.


Thank You!

Jorge Cuadros OD, PhD
jcudros@eye.pacs.com
510-219-8356