Overview

- Background & Significance
- Disease & Screening Overview
- DHS Teleretinal Screening Program Description
- Seize the "Teachable Moment"!

Diabetic Retinopathy: a safety net epidemic

- Diabetic retinopathy (DR) is damage to blood vessels of the retina caused by diabetes
- Leading cause of blindness in working-age Americans
- A large study of Latinos in Los Angeles showed a prevalence close to 50%

A Treatable Disease

- Early Treatment Diabetic Retinopathy Study (ETDRS): effective treatment can reduce severe vision loss by up to 94%
- At least 40-45% of diabetics who may benefit from earlier detection and treatment of retinopathy do not receive it
Screening for DR

- General US screening rates for diabetic retinopathy: ~60%
- US Inner city safety net clinic screening rates: < 25%
- Factors impacting disparity in inner-city vs. national screening rates:
  - Shortage of specialists for retinopathy screening
  - Large number of uninsured/underinsured patients
  - Patient misconceptions about utility of regular eye exams

Screening Process

Historical process for DR screening in LAC DHS

- Diabetic patient seen at primary care clinic
- Patient referred to county health facility for routine retinopathy screening
- Patient screened at county health facility, given follow-up as needed

A solution to the problem?

Teleretinal DR screening as a solution

- Digital nonmydriatic camera images are effective for DR screening
  - High sensitivity and specificity
  - Examples include VA, Joslin Vision Network, Indian Health Service
- With retinal image uploads & secure, web-based image viewing software, off-site specialists can assess risk asynchronously

Clinical Pathway for Teleretinal Imaging

- Diabetic patient identified at PCP visit
- Patient sent for teleretinal screening at end of PCP visit
- Images acquired
- Images transmitted to reading center
- Images reviewed, report generated back to PCP
- PCP clinic submits eConsult based on diagnostic/image recommendations
- Images reviewed, report generated back to PCP
- Patient referred to county health facility for routine retinopathy screening
- Patient screened at county health facility, given follow-up as needed

LAC DHS Teleretinal DR Screening Program Sites

- Active Sites:
  - Hudson CHC
  - El Monte CHC
  - Long Beach CHC
  - Humphrey CHC
  - Harbor UCLA
    - Family Medicine
    - Wilmington HC
    - High Desert Health System
    - Mid Valley CHC
    - Olive View UCLA
    - Clinic M
    - Clinic A
    - MLK-MACC
    - Rancho Los Amigos

- Upcoming Sites:
  - Harbor ULCA
  - Adult Medicine
  - Royal CHC
  - LAC-USC
Monthly Volume to Date

<table>
<thead>
<tr>
<th>Month</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 13</td>
<td>8</td>
</tr>
<tr>
<td>Jun 13</td>
<td>18</td>
</tr>
<tr>
<td>Jul 13</td>
<td>38</td>
</tr>
<tr>
<td>Aug 13</td>
<td>67</td>
</tr>
<tr>
<td>Sep 13</td>
<td>53</td>
</tr>
<tr>
<td>Oct 13</td>
<td>196</td>
</tr>
<tr>
<td>Nov 13</td>
<td>330</td>
</tr>
<tr>
<td>Dec 13</td>
<td>477</td>
</tr>
<tr>
<td>Jan 14</td>
<td>626</td>
</tr>
<tr>
<td>Feb 14</td>
<td>634</td>
</tr>
<tr>
<td>Mar 14</td>
<td>670</td>
</tr>
<tr>
<td>Apr 14</td>
<td>708</td>
</tr>
<tr>
<td>May 14</td>
<td>752</td>
</tr>
<tr>
<td>Jun 14</td>
<td>869</td>
</tr>
<tr>
<td>Jul 14</td>
<td>904</td>
</tr>
</tbody>
</table>

Current Case Statistics

- Total Encounters to Date – 6158
- Awaiting Review – 188
- Reviewed – 5970
- No Referral Needed – 3906
- Referred for Diabetic Retinopathy – 1250
- Referred for Other Eye Conditions – 814

Referable vs. Nonreferable Disease

<table>
<thead>
<tr>
<th>Disease</th>
<th>Referable</th>
<th>Nonreferable</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR</td>
<td>1250 (21%)</td>
<td>814 (13%)</td>
</tr>
<tr>
<td>Other</td>
<td>3906 (66%)</td>
<td></td>
</tr>
</tbody>
</table>

Policy Implications

- Example of successful implementation of Teleretinal DR Screening in a large urban safety net healthcare system
- Cameras placed
- CMA photographers trained
- 3% ungradable rate
- Reading center in place
- Triaging with use of eConsult
- Already screening many more people than before
- Goal is to improve access to and quality of care – treat those that need it in a timely manner

Clinical Pathway for Teleretinal Imaging

1. Diabetic patient identified at PCP visit
2. Patient sent for teleretinal screening at end of PCP visit
3. Photographer uploads images to software template and submits
4. Images transmitted to reading center
5. Images reviewed, report generated back to PCP
6. PCP clinic submits eConsult based on diagnosis/triage recommendations
7. Referral Guidelines

Referral Guidelines

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>No DR</td>
<td>Repeat photo in 1 year</td>
</tr>
<tr>
<td>Mild NPDR</td>
<td>Repeat photo in 1 year. Recommend tight BS/BP control.</td>
</tr>
<tr>
<td>Moderate NPDR</td>
<td>Optometry appointment in 6 months. Recommend referral to DM education class and tight BS/BP control.</td>
</tr>
<tr>
<td>Severe NPDR</td>
<td>Ophthalmology appointment within 3 months. Recommend tight BS/BP control.</td>
</tr>
<tr>
<td>Proliferative DR</td>
<td>Ophthalmology appointment within 4 weeks at a Medical Center, MLK-MACC, or Mid Valley CHC</td>
</tr>
<tr>
<td>Laser scars suggestive of panretinal photocoagulation, or in macula only</td>
<td>Ophthalmology appointment within 4 months</td>
</tr>
<tr>
<td>Suspected clinically significant macular edema</td>
<td>Ophthalmology appointment within 4 months or within 2 months at a Medical Center, MLK-MACC, or Mid Valley CHC</td>
</tr>
<tr>
<td>Ungradable photos/ Inadequate View</td>
<td>Optometry appointment within 3-4 months</td>
</tr>
</tbody>
</table>

Results Reported

Patients screened for
- Mild non-proliferative diabetic retinopathy (NPDR)
- Moderate NPDR
- Severe NPDR
- Proliferative diabetic retinopathy (PDR)
- Clinically significant macular edema
- Other conditions (glaucoma, cataracts, non-diabetic maculopathy, etc.)
Health behavior theories suggest that imagery can outperform words and numbers in terms of fostering learning, motivation, and behavior change. Influence motivation and subsequent behavior by increasing risk perception and countering feelings of invulnerability.

Small, pilot study out of Australia - 25 patients with NPDR and HgbA1C >7%

Showed significantly greater improvement in HbA1c in 3 months (−0.6% vs +0.3%, P<0.01) and enhanced motivation to improve blood glucose management (P<0.05)

Participants viewed their own retinal images and discussed:
- the healthy retina and how it works;
- how suboptimal blood glucose control can damage the retina;
- the asymptomatic nature of diabetic retinopathy and importance of eye checks and monitoring;
- the role of laser treatment in severe diabetic retinopathy;
- risk factors for diabetic retinopathy;
- what HgbA1c is and target levels;
- how to improve blood glucose control with diet, exercise, and medication;
- professional support options available for help in improving diabetes management.

Emphasized the important connection between self-care behavior and long-term eye health.

Questions

You've got their attention… use it!!

Thank You