The Potential For Teleophthalmology in the Patient-Centered Medical Home Model

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Devers Eye Institute
NRTRC Telemedicine Conference
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Disclosures

• **Practice Gap:**
  - Lack of awareness on how to provide specialty care services to under-served populations in the region.

• **Desired Outcomes for Conference:**
  - Providers will be able to apply knowledge acquired from the conference to better provide care using telemedicine to patients across the region.
  - Providers will be able to solve problems within their practice using telemedicine.
  - Providers will be able to identify the services available for their patients via telemedicine within their region.
  - Providers will be able to recognize the changes in telemedicine and how best to continue improving their practices during change.

• **Disclosure of relevant financial relationships in the past 12 months:**
  - I have not relevant financial relationships with commercial interests that may have a direct bearing on the subject matter of this CME activity.
Presentation Overview

• Background on teleophthalmology and diabetic retinopathy
• Our research program
• Dissemination efforts
• Characteristics of the patient-centered medical home model
• Teleophthalmology and medical homes
• Future directions
Teleophthalmology

- The application of telemedicine to the field of ophthalmology
  - teleophthalmology, ocular telehealth, ophthalmic telemedicine, teleretinal imaging
- Cameras used to capture images of the eye
- Store-and-forward method
- Image review and evaluation completed remotely
- Report with results and recommendation sent back to provider
Diabetic Retinopathy

• Diabetic retinopathy (DR) is the leading cause of blindness in U.S. adults aged 20-74.

• ~29% of those 40 years and older with diabetes have some level of DR

• DR is usually asymptomatic in the early stages

• Early diagnosis and treatment can reduce the likelihood of severe vision loss by 90%

• Approximately half of those diagnosed with diabetes obtain annual eye exams.
Teleophthalmology & Retinopathy Screening

• History

• Being used with increasing frequency

• More common in underserved communities, rural areas

• Screenings in primary care clinics are convenient for patients

• Cost Savings
Our Research

• The Tribal Vision Project
  • Original study designed to determine prevalence of various diseases
  • Diabetes disproportionately affects the American Indian/Alaska Native (AI/AN) population
  • Most recent grant focused on using teleretinal imaging to increase the proportion of those with diabetes that receive a yearly retinopathy screening
  • Expanded on previous research by using a randomized controlled trial (RCT) design and assessing long-term follow-up
Our Research (continued)

• METHODS

• RCT with a staged intervention
  • Provider Group (Traditional Surveillance)
    • Visited local eye care providers
    • Exam results sent to research team via postcard, fax, or online entry
  • Camera Group (Telemedicine)
    • Participants imaged at primary care clinic
    • Images evaluated and report generated at Devers
  • After 2 years, all participants were offered screening with telemedicine

• Participants recruited from two tribal health clinics
Our Research (continued)

- METHODS

- Teleretinal imaging with a nonmydriatic camera
Our Research  (continued)

• METHODS
  • Innovative Telemedicine System
  • Remote Client
Our Research (continued)

- METHODS
- Innovative Telemedicine System
- Remote Client
- Devers Database

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Our Research (continued)

- METHODS
  - Innovative Telemedicine System
  - Remote Client
  - Devers Database
  - Report Generation
Our Research (continued)

• RESULTS

• Participants
  • 567 patients with diabetes
    • 296 (52%) Camera Group
    • 271 (48%) Provider Group
  • Age:  $M = 51$ years (range 20-79)
  • Sex:  52% female; 48% male
  • Diabetes:  $M = 9.5$ years since diagnosis of diabetes
  • Blood Glucose:  $M = 8.3\%$ HbA1c
  • Race/Ethnicity
    • 50% reported AI/AN heritage
    • 72% reported a non-white race/ethnicity
Our Research (continued)

• RESULTS

Screening Proportion by Group (any type of screening)
Our Research (continued)

• RESULTS

Proportion Screened by Group and Exam Type

- Camera
- Baseline
- Provider Camera
- 1YR FU
- Provider Camera
- 2YR FU
- Provider Camera
- 3YR FU
- Provider Camera
- 4YR FU

Percentage of Participants Screened

Time Point

Provider ONLY

Both Exams

Camera ONLY
Our Research (continued)

RESULTS

- Referral Proportions (telemedicine exams only)

- The majority of patients (72%-81%) do not need to be referred for follow-up with an eye care provider

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<th>Stage of Retinopathy (%)</th>
<th>Baseline (n=271)</th>
<th>Year 1 (n=130)</th>
<th>Year 2 (n=149)</th>
<th>Year 3 (n=208)</th>
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<td>Absent</td>
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| Requiring Referral (%)   | 19.2             | 26.2           | 23.5           | 27.9           | 22.6           |
Our Research (continued)

• CADEES
  • While access to telemedicine increases screening proportions, there is still room for improvement
  
  • Why we created the Compliance with Annual Eye Exams Survey (CADEES).

  • How we developed the CADEES

  • The survey was completed by 316 participants in the telemedicine study
Our Research (continued)

• CADEES

Examples Items:

• Diabetes can result in a loss of visual function (e.g., difficulty reading or driving).
• I think I will lose some or all of my eyesight because of diabetes.
• I would benefit from having an eye exam every year.
• I do not like having my eyes dilated with eye drops that make my pupils large.
• My medical doctor talks to me about the importance of eye exams.
• I am confident in my ability to make an appointment for an eye exam.
• I am happy with the care I get from my eye doctor.
Our Research (continued)

• CADEES Results

  • Associations with adherence
    • self-reported, dilated eye exam in the past 12 months
  
  • Health belief items associated with adherence:
    • Belief about whether insurance covered most of exam cost
    • Whether there were general barriers to getting an exam
    • Whether obtaining the exam was a top priority
    • Whether eye disease can be seen with an exam

  • Demographic variables associated with adherence:
    • Longer duration of diabetes
    • Having insurance coverage
    • Lower blood glucose levels
Dissemination: From Research to Practice

- We partnered with LMGNW’s Internal Medicine Clinic to pilot the diabetic retinopathy screening telemedicine (DRST) program

  - Goal 1: Increase the proportion of patients with diabetes that are screened for retinopathy

  - Goal 2: Address common screening barriers with “one stop” diabetic care

  - Goal 3: Determine whether telemedicine program is feasible and sustainable
Dissemination (continued)

- Technician training
  - Clinic medical assistants
- Imaging manual
- Two training sessions
- Patient screening
  - Charts flagged
- Approaching Patients
  - Brochures
  - Physicians
Dissemination (continued)

- Pilot Program
  - 5 doctors referred patients
  - 5 month duration
  - 13 patients imaged

- Qualitative Study to determine
  - Perceived benefits of the program
  - Perceived barriers to implementation
  - Possible improvements
  - Sustainability potential for future efforts
Dissemination (continued)

- Qualitative Study
  - Methods
    - Semi-structured interviews with clinic manager, clinic physician, and medical assistants
  - Perceived Benefits
    - Capturing patients who would not likely be screened
    - Teleretinal imaging makes screening easy
    - New skill for medical assistants
  - Perceived Barriers
    - Program not presented to patients
    - Imaging difficulty
    - Time
Dissemination (continued)

• Qualitative Study

• Improvement Suggestions
  • Equipment
  • Additional staff for imaging
  • Contacting patients before appointment
  • Delivery of evaluation results

• Sustainability/Reimbursement
  • 80% of submitted claims were reimbursed
  • Amount billed by clinic: $102
  • Average reimbursement was $65.90 (65%)
    • Average Medicare = $54.75 (54%)
    • Average Private Insurance = $77.05 (76%)
Dissemination (continued)

- Qualitative Study

  - Lessons Learned
    - Program adoption is a process
    - The program was viewed as worthwhile
    - Identification of barriers will aid future implementation efforts
    - Program has the potential to be self-sustaining
Patient-Centered Medical Home Model

• “Medical Homes” at Legacy Health

• Change in the way health care is delivered

• Basic Elements
  • Care Coordination
  • Quality & Safety
  • Whole Person Orientation
  • Personal Physician
  • Physician Leadership
  • Enhanced Access
  • Payment

Image: http://thepcmh.org/
PCMH Model: Physician Leadership

Image: Penn State (http://news.psu.edu/photo/274952/2013/04/26/patient-centered-medical-homes)
Teleophthalmology & Medical Homes

- As primary care clinics become medical homes, diabetic care is expanding
- Quality of care measures
- Need for diabetic retinopathy screenings
- Benefits of incorporating teleophthalmology into primary care
Future Directions

- Implement program in primary care clinics
- Address barriers
  - Incorporate new technology
  - Have designated imaging staff
- Continue research
  - Increase screening proportions
  - Assess health beliefs (pre/post implementation)
  - Use teleretinal imaging as an educational tool for patients
Questions