Towards a Research Agenda for Management of Diabetic Eye Disease in Areas of Limited Resources

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Global research agenda for DR, as for most eye diseases, is not focused on needs of resource-limited contexts:

- Research goals of drug companies: develop patentable medications
- Research goals of developed world governments: find solutions applicable to their own context
- Research goals of journals: publish widely-cited papers (tends to reinforce above interests)
Global DR research agenda, as for most eye diseases, not responsive to needs of resources-limited contexts:

- Result: The global research conversation on future management of DR is largely silent on solutions best-suited for areas of limited resources
Research on DR: What do we need to know?

- **Training:** How do we build capacity to provide high quality service?

- **Uptake:** How do we build demand for life-long service?

- **Screening:** How do we connect providers and patients?
Research on DR: What do we need to know?

- **Treatment**: Are there better, more cost-effective ways?

- **System integration**: How does service for DR fit best into the overall healthcare context?
Question:

- What kind of investment in time/resources is needed to bring rural practitioners to high quality level in:
  - Recognizing DR?
  - Treating DR?
  - Referring DR?
• Question:

• How effective is training in changing clinical behavior in the long term (dilated fundus exam for all new patients, eye exam referral for new diabetics, etc.)?
Training for Caregivers

**Question:**

- What kind of training works best/is most cost effective?
  - Can computers and simulators be useful?
  - How necessary/safe is hands-on training in different contexts?
Research on improving uptake

• Diagnosis begins with accepting referral and a dilated exam

• Many asymptomatic patients may see no need

• Question: Can movies, counseling and other material improve acceptance of exams? What works best?
Years of follow-up without intervention may precede treatment

**Question:** What kind of interventions can keep patients in care?

- Automated SMS systems (where cellphones are common)
- P4P4P (Pay for performance for patient$: Lotteries, directed payments, etc.)
- Intensive case management: Nurses, medical students
Research on improving uptake

- Unlike cataract surgery, laser for DR does not improve vision, and often must be repeated

  - **Question:** How to “sell” treatment to patients?
    - DR equivalent of pseudophakic motivators
    - Video patient testimony
    - P4P4P
Research on screening

• **Several current options:**

  • Exams by trained local providers at different levels
  • Digital photo with remote human graders: telemedicine
  • Automated grading
Question: How do these options differ with regard to:

- Validity (Sensitivity, specificity, PPV, etc.)?
- Cost-effectiveness?
- Practicality?

Can they be combined?
• **Question:** What is the “best” camera?

• Holy Grail to identify the perfect camera for areas of limited resources:
  - Cheap
  - Robust for field use
  - Simple enough for nurses to utilize effectively
  - Good quality
  - Relatively small image size (Bandwidth concerns)
Diabetic macular edema (DME) is critical in reducing vision loss from DR: Biggest screening/treatment challenge, biggest cause of vision loss

Question: What is appropriate role of adjunct examinations (OCT, FFA, etc.) in screening and determining when to treat in area of limited resources? (Identify ischemia, response to treatment...)
Research on treatment

• **Modality:** Currently a revolution in therapy for DR with anti-VEGF treatments

• **Challenges of anti-VEGF:**
  • Repeated treatments
  • Risk of infection from injections
  • Cost
Research on treatment: VEGF

opportunities of anti-VEGF:

• Potentially eliminate cost of laser
• Risk of vision damage potentially less than from poorly administered focal treatment to the fovea
• Learning curve for intra vitreal injection less than for focal laser for DME...
Research on treatment: VEGF

**Question**…what (not if) will future role of anti-VEGF therapies be in areas of limited resources?
Question: How many lasers and laser surgeons are needed, and where? Based on:

- Prevalence of disease
- Severity of disease
- Assumptions about output
Health system research: EMR

• **Question:** How/whether to implement Electronic Medical Records in resource-limited areas?

• **Disadvantages:**
  - Cost
  - Acceptability to users

• **Advantages:**
  - Monitor physician compliance
  - Automated prompts for best practice
Health system research: Linkages

• **Horizontal:**

  • **Question:** How to connect and incentivize cooperation between internal medicine/endocrine and ophthalmology “worlds”?

  • **Question:** How to integrate glaucoma care into “DR programs”? (Natural overlap in training, equipment, record systems)
• **Vertical**

  • **Question:** How to manage referrals to regional centers and local follow-up?
DR Research: Resources

• **World Diabetes Foundation (WDF):**
  - Up to USD500K, 3 years:
    [http://www.worlddiabetesfoundation.org/apply-now](http://www.worlddiabetesfoundation.org/apply-now)
  - Focus on service delivery models

• **International Diabetes Federation (IDF):**
  - Will directly fund translational research (Bridges Program) [WWW.IDF.org/Bridges](http://WWW.IDF.org/Bridges)
Discussion

- What kind of DR research do you feel is most needed from the perspective of your organization?
- What DR research projects if any are you working on now?
- What DR programs are you involved in that might serve as platforms for research?
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