



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

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Research on DR in Resource-Limited Settings

- **Global research agenda for DR, as for most eye diseases, is not focused on needs of resources-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)**

Research on DR in Resource-Limited Settings

- **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?

Training for Caregivers

- 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?

Training for Caregivers

- 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?**

Research on improving uptake

- **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**

Research on screening

- **Question: How do these options differ with regard to:**
 - **Validity (Sensitivity, specificity, PPV, etc.)?**
 - **Cost-effectiveness?**
 - **Practicality?**

- **Can they be combined?**

Research on screening

- **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)

Research on screening

- 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?

Health system research: Capacity

- **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)**

Health system research: Linkages

- **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>
 - **Focus on service delivery models**

- **International Diabetes Federation (IDF):**
 - **Will directly fund translational research (Bridges Program) 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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