Chronic Disease and Medical Innovation in an Aging Nation

The Silver Book®: Diabetic Retinopathy
Diabetic retinopathy (DR) is a serious, irreversible eye disease that can occur in people with diabetes, and is a leading cause of blindness around the world. Because diabetes is becoming increasingly common in industrialized and even developing countries, DR could impact as many as 191 million people around the globe by 2030.

Vision loss from DR can be avoided with proper management and treatment, and risk is more common in people who have poorly controlled diabetes. The International Council of Ophthalmology (ICO) Diabetic Eye Care Guidelines outline best practices for screening and detection of DR, as well as assessment and management of DR patients.

Despite these clinical standards and the availability of effective treatments, as many as 50% of people with diabetes are not getting regular eye exams, or are diagnosed too late for treatment to be effective. Patients are often unaware of the seriousness of DR and the need for early detection and treatment, many countries lack the capacity to screen patients with diabetes, and treatment may be accessible to only a few. Countries and communities need to adopt policies that promote effective education, screening, detection, and management of DR.

Non-proliferative diabetic retinopathy (NPDR) is the early stage of DR, and proliferative diabetic retinopathy (PDR) is the late stage of the disease. PDR is sight-threatening and is characterized by the growth of abnormal blood vessels in the retina. These blood vessels can bleed and cause scarring and retinal detachment. Diabetic macular edema (DME) is an accumulation of fluid from leaking blood vessels in the macula — the part of the retina that controls detailed vision — and can occur at any stage of DR, but is more likely as the disease progresses and can lead to total blindness.

The Silver Book®: Chronic Disease and Medical Innovation in an Aging Nation is an almanac of thousands of facts, statistics, graphs, and data from hundreds of agencies, organizations, and experts. These statistics spotlight the mounting burden of chronic diseases that disproportionately impact older Americans, and the promise of innovation in mitigating that burden.

Launched in 2006, The Silver Book® has become a trusted resource for health policy practitioners and thought leaders and has featured volumes and factsheets on osteoporosis, thrombosis & AFib, heart disease, persistent pain, cancer, healthcare-associated infections, infectious diseases & prevention through vaccination, vision loss, diabetes, and neurological diseases. All data is available online at www.silverbook.org, where users can access more than 2,900 facts, statistics, graphs, and data from more than 800 references. All data is cited and when possible, linked to the original source online.
The Human Burden
In 2010, 37 MILLION PEOPLE WORLDWIDE AFFECTED

Patients with... of vision loss & SOCIAL WELLBEING

Quality of life decreases significantly among those with vision loss. Of those who have diabetes, Women... Vision loss is one of the LEADING CAUSES... (Brown 1999)

PROPORTION OF PEOPLE WITH DIABETES WITH ANY DIABETIC RETINOPATHY, BY COUNTRY*

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<tr>
<th>Country</th>
<th>4-7%</th>
<th>8-11%</th>
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The Economic Burden
DIET IF NOT OF DIABETES CAN COST US $105 MILLION

GLOBAL (Kilstad 2011) Nationwide burden of... of blindness or moderate... (Paudyal 2008)

The Future Burden
OF DIABETIC MACULAR EDEMA

TIGHT BLOOD PRESSURE CONTROL

Tight control of blood pressure is critical... (WHO 2005)

The Value of Innovation

DIABETIC MACULAR EDEMA

Appropriate treatment... (WHO 2005)

The Human Cost

- 37 million people worldwide affected by diabetic retinopathy (WHO 2005)
- 35.3% of people living with diabetes globally have some degree of DR

The Economic Cost

- Cost of blindness or moderate vision loss alone exceeds $1.6 billion annually (Lighthouse Int’l)
- DIET (Nzili 2011) estimates that if DR were prevented, it would result in $1.6 billion annually

The Future Burden

- Despite clinical standards for detection and treatment of DR, as many as 30% of high-risk patients in the United States never receive treatment for DR
- A 70% increase in number of people with vision loss due to DR

The Value of Innovation

- TIGHT BLOOD PRESSURE CONTROL
- Adequately trained general practitioners can... by 54%
- Appropriate management can... by 71%
- Laser treatment... by 90%
- Photodynamic therapy... by 50%
- Anti-VEGF therapy... by 65-74%
- Abnormal vision... by 50-64%
- Reduced cost to local... by 36-51%

Raising Awareness About Impact

- Programs to raise awareness about the impact of DR can cost-effectively increase... (WHO 2005)

Building Capacity

- New and existing programs must: Develop and strengthen existing... (WHO 2005)
- Improve infrastructure and equipment in secondary... (WHO 2005)
- Explore mobile health care services to supplement... (WHO 2005)

Measuring Success

- Successful programs should: Increase the proportion of known people... (WHO 2005)
- Raising awareness about impact
- Building capacity
- Measuring success
Raising Awareness About Impact

Patients with diabetes are often unaware of the seriousness of DR and the critical need for regular retinal exams, prevention, and timely treatment. Educational campaigns should:

- Discuss DR as a serious disease itself, not just as a complication of diabetes.
- Be patient-centered and emphasize the potential for vision loss and blindness.
- Involve primary care providers (PCPs) and allied health professionals in encouraging annual retinal exams to detect the often asymptomatic early stages of DR.
- Promote diabetes management and regular monitoring of eye health.
- Adapt messaging to be accessible for all cultures and groups within a society.

Building Capacity

Many countries still have only one ophthalmologist per 250,000 to 1 million people, located mostly in urban areas — often leaving rural areas underserved (Resnikoff 2012). New and existing programs must:

- Provide special and continuing education for PCPs on importance of diabetes management and screening.
- Build capacity of physicians who manage patients with diabetes at primary, secondary and tertiary levels.
- Offer training and incentives to increase the number of ophthalmologists available to treat DR.
- Improve infrastructure and equipment in secondary and tertiary level eye care treatment centers.
- Institute screening for DR using approaches adapted to the local setting, preferably using digital imaging.
- Make screening affordable and use low-cost interventions that target improved compliance.
- Ensure clear referral pathways to diagnosis and treatment for those who fail screening.
- Provide a clear path to reimbursement for healthcare professional time and services.
- Explore mobile health care services to supplement traditional medical offices, as a way to connect with available treatments.

Measuring Success

Quality DR care extends beyond self-reports of yearly retinal exams. Successful programs should:

- Promote compliance and self-management strategies for effective control of diabetes.
- Reduce the incidence of sight threatening DR through improved control of risk factors.
- Use sustainable, cost-effective approaches to the detection and treatment of DR.
- Increase the proportion of known people with diabetes who undergo annual retinal examination.
- Ensure that all identified with sight threatening DR undergo timely examination and treatment by a competent ophthalmologist.
- Promote collaboration between physicians and eye care providers at every level in the health system.
- Encourage collaboration amongst projects and countries using common indicators.
References


The Alliance for Aging Research is the leading non-profit organization dedicated to accelerating the pace of scientific discoveries and their application in order to vastly improve the universal human experience of aging and health.

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