A “Vision” for the Future: Integration as a Model to Promote Eye Health and Reduce Risk Factors for Vision Loss and Other Adverse Outcomes

The New York Experience

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Overview of presentation

- Provide background on common eye disorders.

- Discuss use of vision health module on NYS Behavioral Risk Factor Surveillance System (BRFSS), a CDC-sponsored telephone survey of noninstitutionalized, civilian adult population.

- Present data that show relationship between vision impairment and chronic conditions, risk factors, and quality of life.

- Introduce a model vision integration program currently active in New York State that uses data to promote collaboration with other chronic disease programs.
Common eye disorders

- **Cataract**
  - Clouding of eye’s lens, which can occur at any age but is more likely with advancing age.
  - The leading cause of blindness worldwide and the leading cause of vision loss in US.

- **Age-related macular degeneration**
  - Breakdown of central retinal tissue leading to leakage of blood or serum and subsequent loss of central vision.
  - The leading cause of permanent impairment of reading and fine or close-up vision among adults aged 65 years or older.

- **Glaucoma**
  - Major causative factor is elevated intraocular eye pressure, leading to degeneration of cells of optic nerve, which results in decreased peripheral vision or eventual vision loss.
  - A leading cause of blindness among African Americans in US.

- **Diabetic retinopathy**
  - Complication of diabetes that occurs when retinal blood vessels break, leak, or become blocked, thus impairing vision.
  - The leading cause of blindness among working-age adults in US ages 20-74 years.

[The Eye Diseases Prevalence Research Group, 2004]
Effect of eye disorders on vision

- Cataract
- Age-related macular degeneration
- Glaucoma
- Diabetic retinopathy
Eye disease and visual impairment are among ten most common causes of disability.

For adults, glaucoma, cataracts, age-related macular degeneration, and diabetic retinopathy are serious threats to vision, resulting in reduced quality of life and increased risk of premature death.

Annual cost of adult vision problems in US is more than $51 billion.  
[Rein, Zhang, Wirth, et al., 2006]

Rates of vision loss and blindness expected to increase dramatically in next three decades as population ages, chronic disease prevalence rises, and demographics change.  
[The Eye Disease Prevalence Research Group, 2004]
“Visual Impairment and Access to Eye Care”
BRFSS optional module

- Included on 2006-2008 (and 2010) NYS BRFSS survey.
- Funding support from National Association of Chronic Disease Directors and Prevent Blindness America.
- Nine questions asked to assess prevalence of self-reported visual impairment, eye diseases, vision insurance, and eye examinations among persons aged 40 years or older.
- Question about diabetic retinopathy asked in optional Diabetes module [NYS BRFSS 2006 & 2008].
Demographic characteristics of the 12,724 respondents aged 40 years and older, NYS BRFSS 2006-2008

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Weighted %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-64</td>
<td>8,203</td>
<td>71.7</td>
</tr>
<tr>
<td>≥65</td>
<td>4,521</td>
<td>28.3</td>
</tr>
<tr>
<td>Sex</td>
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<td></td>
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<tr>
<td>Male</td>
<td>4,813</td>
<td>46.3</td>
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<tr>
<td>Female</td>
<td>7,911</td>
<td>53.7</td>
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<tr>
<td>Race/Ethnicity</td>
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<td></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>10,358</td>
<td>70.4</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>911</td>
<td>11.0</td>
</tr>
<tr>
<td>Hispanic</td>
<td>753</td>
<td>11.2</td>
</tr>
<tr>
<td>Other, non-Hispanic</td>
<td>537</td>
<td>7.4</td>
</tr>
</tbody>
</table>
BRFSS questions about eye conditions

1. Have you been told by an eye doctor or other health care professional that you now have **cataracts**?

2. Have you ever been told by an eye doctor or other health care professional that you had **glaucoma**?

3. Have you ever been told by an eye doctor or other health care professional that you had **age-related macular degeneration**?

4. *[From Diabetes module]* Has a doctor ever told you that diabetes has affected your eyes or that you had **retinopathy**?

5. *[2006 & 2007]* Have you ever had an eye injury that occurred at your workplace while you were doing your work?
Prevalence of self-reported eye conditions among older adults by age, NYS BRFSS 2006-2008

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Macular Degeneration</th>
<th>Glaucoma</th>
<th>Current Cataract</th>
<th>Cataract Removed</th>
<th>Retinopathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-69 yrs</td>
<td>22.2</td>
<td>9.9</td>
<td>5.6</td>
<td>4.8</td>
<td>2.6</td>
</tr>
<tr>
<td>70-74 yrs</td>
<td>31.2</td>
<td>17.5</td>
<td>9.6</td>
<td>7.0</td>
<td>4.8</td>
</tr>
<tr>
<td>75-79 yrs</td>
<td>30.8</td>
<td>29.2</td>
<td>12.0</td>
<td>8.9</td>
<td>3.4</td>
</tr>
<tr>
<td>80-84 yrs</td>
<td>34.0</td>
<td>28.8</td>
<td>14.3</td>
<td>10.8</td>
<td>4.2</td>
</tr>
<tr>
<td>≥ 85 yrs</td>
<td>49.5</td>
<td>15.8</td>
<td>13.9</td>
<td>13.9</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Percent with eye condition
Now I would like to ask you questions about your vision. These questions are for all respondents regardless of whether or not you wear glasses or contact lenses. \textit{If you wear glasses or contact lenses, answer questions as if you are wearing them.}

1. How much difficulty, if any, do you have in recognizing a friend across the street?

2. How much difficulty, if any, do you have reading print in newspapers, magazines, recipes, menus, or numbers on the telephone?

\textit{Possible responses:}

\begin{itemize}
  \item No difficulty
  \item A little difficulty
  \item Moderate difficulty
  \item Extreme difficulty
  \item Unable to do because of eyesight
  \item Not applicable (blind)
\end{itemize}
Vision loss: Case definition

No vision loss
Reported **no difficulty** in recognizing a friend across the street (distance vision) AND **no difficulty** in reading print (near vision).

Little vision loss
Reported **a little difficulty** (but not moderate or extreme difficulty) in distance OR near vision tasks.

Moderate or extreme vision loss
Reported **moderate** OR **extreme difficulty**, OR **unable to do because of eyesight**, in distance or near vision tasks, OR reported being **blind**.
Prevalence of moderate or extreme vision loss among older adults by age and gender, NYS BRFSS 2006-2008
Prevalence of self-reported eye conditions by vision loss status among adults aged ≥65 years, NYS BRFSS 2006-2008

- Cataracts
- Macular degeneration
- Glaucoma
- Diabetic retinopathy

Moderate or extreme vision loss:
- Cataracts: 56.4%
- Macular degeneration: 19.6%
- Glaucoma: 14.3%
- Diabetic retinopathy: 7.0%

Little vision loss:
- Cataracts: 54.8%
- Macular degeneration: 10.2%
- Glaucoma: 10.3%
- Diabetic retinopathy: 3.1%

No vision loss:
- Cataracts: 45.4%
- Macular degeneration: 4.1%
- Glaucoma: 8.6%
- Diabetic retinopathy: 3.2%
BRFSS questions about eye care

1. When was the last time you had your eyes examined by any doctor or eye care provider?

2. [If 12 or more months] What is the main reason you have not visited an eye care professional in the past 12 months?

Possible responses:

- Cost/insurance
- Do not have/know an eye doctor
- Cannot get to the office/clinic (too far away, no transportation)
- Could not get an appointment
- No reason to go (no problem)
- Have not thought of it
- Other
### Main reason for not visiting an eye care professional in past 12 months, by vision loss status and age, 2006-2008 NYS BRFSS

<table>
<thead>
<tr>
<th>Reason</th>
<th>No vision loss (%)</th>
<th>Little vision loss (%)</th>
<th>Moderate / extreme vision loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No reason to go</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-64 yrs</td>
<td>56.4</td>
<td>37.7</td>
<td>27.4</td>
</tr>
<tr>
<td>≥ 65 yrs</td>
<td>67.2</td>
<td>48.1</td>
<td>31.5</td>
</tr>
<tr>
<td>Cost / insurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-64 yrs</td>
<td>15.9</td>
<td>21.5</td>
<td>31.5</td>
</tr>
<tr>
<td>≥ 65 yrs</td>
<td>7.4</td>
<td>10.3</td>
<td>20.5</td>
</tr>
<tr>
<td>Have not thought about it</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-64 yrs</td>
<td>6.3</td>
<td>9.8</td>
<td>8.8</td>
</tr>
<tr>
<td>≥ 65 yrs</td>
<td>5.5</td>
<td>6.9</td>
<td>11.3</td>
</tr>
<tr>
<td>Too far / no transportation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-64 yrs</td>
<td>1.0</td>
<td>0.8</td>
<td>2.2</td>
</tr>
<tr>
<td>≥ 65 yrs</td>
<td>0.8</td>
<td>2.0</td>
<td>5.2</td>
</tr>
</tbody>
</table>
Vision loss and health-related quality of life (HRQoL)

Visual impairment detrimentally affects HRQoL, resulting in:

- **Lower self-rated health.**
  
  [Wang, Mitchell, Smith, 2000]

- **Decreased physical functioning.**
  
  [Mangione, Guiterrez, Lowe, et al., 1999; Rubin, Munoz, Bandeen-Roche, West, 2000]

- **Decreased emotional functioning.**
  
  [Scott, Smiddy, Schiffman, et al., 1999; Rovner, Zisselman, Shmuely-Dulitzki, 1996]

- **Lower socialization.**
  

- **Depression.**
  
  [Brody, Gamst, Williams, et al., 2001; Rovner, Ganguli, 1998]
Vision loss and quality of life (BRFSS)

- Fair or poor self-rated health
- Frequent physical distress
  - 14 or more days of poor physical health in past 30 days
- Frequent mental distress
  - 14 or more days of poor mental health in past 30 days
- Frequent activity limitation
  - 14 or more days of limitation due to poor physical or mental health in past 30 days
- Lack of needed social and emotional support
  - sometimes, rarely, or never
- Low satisfaction with life
  - dissatisfied or very dissatisfied
- Current depression
  - Patient Health Questionnaire 8 [PHQ-8] cut point score of 10 or higher
Prevalence of fair or poor self-rated health by vision loss status and age, NYS BRFSS 2006-2008

<table>
<thead>
<tr>
<th>Vision Loss Status</th>
<th>40-64 yrs</th>
<th>≥65 yrs</th>
<th>All adults ≥40 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate or extreme vision loss</td>
<td>30.4</td>
<td>39.3</td>
<td>32.9</td>
</tr>
<tr>
<td>Little vision loss</td>
<td>17.4</td>
<td>29.9</td>
<td>21.0</td>
</tr>
<tr>
<td>No vision loss</td>
<td>10.7</td>
<td>23.1</td>
<td>14.2</td>
</tr>
</tbody>
</table>
Prevalence of frequent physical distress by vision loss status and age, NYS BRFSS 2006-2008
Prevalence of frequent mental distress by vision loss status and age, NYS BRFSS 2006-2008

<table>
<thead>
<tr>
<th>Vision Loss Status</th>
<th>40-64 yrs</th>
<th>≥65 yrs</th>
<th>All adults ≥40 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate or extreme vision loss</td>
<td>17.2</td>
<td>9.2</td>
<td>15.0</td>
</tr>
<tr>
<td>Little vision loss</td>
<td>11.2</td>
<td>6.5</td>
<td>9.8</td>
</tr>
<tr>
<td>No vision loss</td>
<td>6.5</td>
<td>4.0</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Percent with mental distress

[Graph showing the prevalence of mental distress for different vision loss statuses and age groups]
Prevalence of frequent activity limitation by vision loss status and age, NYS BRFSS 2006-2008

<table>
<thead>
<tr>
<th>Vision Loss Status</th>
<th>40-64 yrs</th>
<th>≥65 yrs</th>
<th>All adults ≥40 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate or extreme vision loss</td>
<td>16.9</td>
<td>13.2</td>
<td>15.9</td>
</tr>
<tr>
<td>Little vision loss</td>
<td>7.5</td>
<td>6.9</td>
<td>7.3</td>
</tr>
<tr>
<td>No vision loss</td>
<td>4.9</td>
<td>6.3</td>
<td>5.2</td>
</tr>
</tbody>
</table>
Prevalence of lack of needed social and emotional support by vision loss status and age, NYS BRFSS 2006-2008

Percent with lack of support

<table>
<thead>
<tr>
<th>Vision Loss Status</th>
<th>40-64 yrs</th>
<th>≥65 yrs</th>
<th>All adults ≥40 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate or extreme vision loss</td>
<td>34.0</td>
<td>34.9</td>
<td>34.2</td>
</tr>
<tr>
<td>Little vision loss</td>
<td>25.9</td>
<td>26.5</td>
<td>26.0</td>
</tr>
<tr>
<td>No vision loss</td>
<td>17.6</td>
<td>19.8</td>
<td>18.2</td>
</tr>
</tbody>
</table>
Prevalence of low satisfaction with life by vision loss status and age, NYS BRFSS 2006-2008

<table>
<thead>
<tr>
<th>Vision Loss Status</th>
<th>40-64 yrs</th>
<th>≥65 yrs</th>
<th>All adults ≥40 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate or extreme vision</td>
<td>13.0</td>
<td>6.2</td>
<td>5.8</td>
</tr>
<tr>
<td>loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little vision loss</td>
<td>6.2</td>
<td>4.7</td>
<td>5.8</td>
</tr>
<tr>
<td>No vision loss</td>
<td>3.9</td>
<td>2.6</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Percent not satisfied
Prevalence of current depression by vision loss status and age, NYS BRFSS 2008

- Moderate or extreme vision loss:
  - 40-64 yrs: 18.2%
  - ≥65 yrs: 12.3%
  - All adults ≥40 yrs: 16.7%

- Little vision loss:
  - 40-64 yrs: 8.1%
  - ≥65 yrs: 4.7%
  - All adults ≥40 yrs: 7.2%

- No vision loss:
  - 40-64 yrs: 5.6%
  - ≥65 yrs: 1.7%
  - All adults ≥40 yrs: 4.5%
Why integrate vision into public health?

- Prevention of vision loss.
- Prevention of secondary health issues among individuals with vision loss.
- Prevention of vision loss as a specific strategy to prevent chronic conditions and risky behaviors.
- Prevention of chronic conditions and risky behaviors where vision loss is a “side effect.”
Vision Health Integration and Preservation Program (VHIPP)

- CDC grant (2008-2011) awarded to Prevent Blindness America (PBA).
  - PBA founded in 1908.
  - Nation’s leading volunteer eye health and safety organization dedicated to fighting blindness and saving sight.

- Model collaboration between NYSDOH and Prevent Blindness Tri-State (PBTS).
  - PBTS a member of PBA family.
  - Works to provide eye health and safety programs and services for Tri-State (NY, NJ, CT) area children and adults.

- NYSDOH component situated in Diabetes Prevention and Control Program.
VHIPP Goals

Vision integration activities:

- Integrate appropriate and effective vision preservation strategies into existing programs and functions within a state health department.
- Promote public health strategies among community organizations and vision partners.

New York State Vision and Eye Health Collaborative activities:

- Develop strategic *Vision Integration Plan for the State of New York*. 
VHIPP Logic Model

**Inputs**
- Data sources
- Funds
- Program staff

**Earlier Activities**
- Assess the viability of existing data sources in monitoring vision health in New York
- Develop strategy for VHIPP integration effectiveness evaluation (value, reach, efficiency, and sustainability)
- Establish organization and infrastructure
- Conduct baseline programmatic assessments of internal (NYSDOH) programs and external (state and local) agencies and organizations
- Identify key stakeholders
- Form New York State Vision and Eye Health Collaborative (NYSVEHC)

**Later Activities**
- Maximize the impact of collected and analyzed data
- Conduct ongoing VHIPP integration effectiveness evaluation
- Conduct follow-up internal and external programmatic assessments
- Develop integration approaches to advance vision health
- Implement integration approaches via the VIP
- Evaluate effectiveness of collaborative process

**Outputs**
- Vision health fact sheets, surveillance reports, papers, and manuscripts
- Integration effectiveness evaluation analysis and presentation
- Effective evaluation instruments
- Comprehensive program assessments
- Activated constituency for vision integration
- NYSVEHC evaluation report

**Short-Term Outcomes**
- Assembly of data sets and use of existing data
- New data sources explored
- Data-supported integration strategies developed
- NYSDOH divisions, programs, and key leadership personnel
- Integration activities under NYS-specific objectives implemented by members
- Vision public health strategies promoted

**Intermediate Outcomes**
- Fact sheets and surveillance reports disseminated; manuscripts submitted; presentations made
- Health impact and effectiveness of program integration recognized by NYSDOH leadership
- Integration activities implemented by NYSDOH programs
- Integration adopted by state and local agencies and organizations
- Vision public health strategies promoted

**Long-Term Outcomes**
- Changes in burden and impact on disability and quality of life monitored
- Integration adopted by state and local agencies and organizations
- Improved understanding of collaborative process and effectiveness of integration activities

**Impact**
- Improved quality of life
- Vision loss prevention
- Eye health promotion and reduction of eye injuries

**INTERNAL AND EXTERNAL PROGRAMMATIC PRIORITIES / FUNDING PRIORITIES / POLITICAL AND SOCIAL ENVIRONMENT**
VISION HEALTH INTEGRATION AND PRESERVATION PROGRAM (VHIPP) GUIDANCE TEAM

Centers for Disease Control and Prevention (CDC) – primary funding source
Prevent Blindness America (PBA) – CDC funding awardee
Prevent Blindness Tri-State (PBTS) – PBA subcontractor, co-collaborator
New York State Department of Health (NYSDOH) Diabetes Prevention and Control Program – PBA subcontractor, co-collaborator

VISION HEALTH INTEGRATION AND PRESERVATION PROGRAM (VHIPP) CORE TEAM

Kim Kelly – NYSDOH
Sana Savadatti – PBTS
Larry Steele - NYSDOH

NEW YORK STATE VISION AND EYE HEALTH COLLABORATIVE (NYSVEHC)

New York State Department of Health programs
Community based organizations (vision prevention, vision rehabilitation, community health centers and other)
Professional eye care and medical societies/associations
New York State agencies/commissions
Academia
Health plans
Foundations

Prevention and Early Detection Work Group
Injury and Safety Work Group
Rehabilitation and Quality of Life Work Group
Education Subcommittee
VHIPP integration with NYSDOH programs

- **Diabetes Prevention and Control Program (DPCP)**
  
  *Vision Impairment and Diabetes: 5 Key Messages:* Two-page briefing document developed to be distributed as a fact sheet and posted to the NYSDOH Web site.

- Healthy Heart Program (HHP)

- Comprehensive Cancer Services Program (CCSP)

- Tobacco Control Program (TCP)
Diabetes and visual impairment

- Diabetic retinopathy, one of most common microvascular complications of diabetes, is one of major causes of blindness and low vision.
  
  [Fong, Aiello, Gardner, et al., 2004; Congdon, O’Colmain, Klaver, et al., 2004]

- Diabetic retinopathy can occur during pre-diabetes stage and up to 7 years before diagnosis of type 2 diabetes.
  
  [NACDD, Vision and Eye Health Council, Diabetes and Vision]

- Diabetes may also increase risk of vision impairment due to other ocular conditions such as:
  
  - Cataract
    
  
  - Glaucoma
    
Prevalence of diabetes by vision loss status and age, NYS BRFSS 2006-2008

- Moderate or extreme vision loss:
  - 40-64 yrs: 15.4%
  - ≥65 yrs: 21.9%
  - All adults ≥40 yrs: 17.2%

- Little vision loss:
  - 40-64 yrs: 10.2%
  - ≥65 yrs: 18.6%
  - All adults ≥40 yrs: 12.6%

- No vision loss:
  - 40-64 yrs: 7.4%
  - ≥65 yrs: 17.4%
  - All adults ≥40 yrs: 10.2%
Among adults aged 40 years and older with diabetes, prevalence of vision loss by race/ethnicity, NYS BRFSS 2006-2008

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Moderate or extreme vision loss</th>
<th>Little vision loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>White, non-Hispanic</td>
<td>22.9</td>
<td>24.4</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>34.1</td>
<td>25.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>39.8</td>
<td>21.9</td>
</tr>
<tr>
<td>Other, non-Hispanic</td>
<td>18.0</td>
<td>27.9</td>
</tr>
</tbody>
</table>
Prevalence of fair or poor self-rated health by diabetes/VL (any loss) status and age, NYS BRFSS 2006-2008

![Bar chart showing prevalence of fair or poor health by diabetes and vision loss status and age groups.](chart.png)
Prevalence of frequent physical distress by diabetes/VL (any loss) status and age, NYS BRFSS 2006-2008
Prevalence of frequent mental distress by diabetes/VL (any loss) status and age, NYS BRFSS 2006-2008

Percent with mental distress

Both diabetes and vision loss
- 40-64 yrs: 19.9%
- ≥65 yrs: 8.1%
- All adults ≥40 yrs: 15.3%

Diabetes only
- 40-64 yrs: 12.5%
- ≥65 yrs: 4.8%
- All adults ≥40 yrs: 8.8%

Vision loss only
- 40-64 yrs: 12.9%
- ≥65 yrs: 7.5%
- All adults ≥40 yrs: 11.5%

Neither diabetes nor vision loss
- 40-64 yrs: 6.0%
- ≥65 yrs: 3.9%
- All adults ≥40 yrs: 5.4%
Prevalence of frequent activity limitation by diabetes/VL (any loss) status and age, NYS BRFSS 2006-2008

- Both diabetes and vision loss
  - 40-64 yrs: 24.6%
  - ≥65 yrs: 16.2%
  - All adults ≥40 yrs: 21.4%

- Diabetes only
  - 40-64 yrs: 10.9%
  - ≥65 yrs: 13.0%
  - All adults ≥40 yrs: 11.9%

- Vision loss only
  - 40-64 yrs: 9.8%
  - ≥65 yrs: 7.9%
  - All adults ≥40 yrs: 9.3%

- Neither diabetes nor vision loss
  - 40-64 yrs: 4.3%
  - ≥65 yrs: 4.8%
  - All adults ≥40 yrs: 4.4%
Integration with Diabetes Prevention and Control Program: “Vision Impairment and Diabetes: 5 Key Messages”

**5 Key Messages**

1. **New Yorkers with diabetes and pre-diabetes are at high risk for diabetic eye diseases such as retinopathy, glaucoma, and cataracts.**
   - Diabetes is a growing epidemic. More than 1 million adults in New York State have diabetes and another 760,000 adults have prediabetes and don’t know it. Diabetes is the leading cause of new cases of blindness in adults 20-74 years of age.

   - **Diabetic retinopathy** (DR) can lead to blindness. DR is a complication of diabetes that damages the eye’s retina. DR is more likely to develop the longer a person has diabetes, particularly if the diabetes is poorly controlled. As there are often no symptoms in the early stages of DR, a dilated eye exam is critical to diagnosing retinopathy and preventing vision loss.

   - **Glaucoma** is a group of diseases that damage the eye’s optic nerve and can result in vision loss and blindness. A person with diabetes is 40% more likely to get glaucoma or other eye diseases.

   - **Cataract** is the clouding of the eye’s lens that causes vision problems. A person with diabetes is 60% more likely to develop cataracts. About 30% of New Yorkers aged 60 years and older with diabetes either currently have cataracts or have had them removed. Cataracts also develop at an earlier age in people with diabetes.

2. **An annual dilated eye exam is essential for all New Yorkers with diabetes to prevent or slow the progression of vision loss.**
   - Early diagnosis and timely treatment of diabetes has been shown to prevent vision loss. In more than 50% of people, good control of blood sugar, blood pressure, and cholesterol is very important to reduce vision loss in people with diabetes.

   - The American Diabetes Association Clinical Practice Recommendations include all people with diabetes should receive an annual dilated eye exam.

   - Approximately one in five people with type 2 diabetes have retinopathy when they are first diagnosed with diabetes and about half of patients are diagnosed with diabetic retinopathy too late for treatment to be effective.

3. **People with diabetes need more education about potential vision loss and the need for yearly dilated eye exams.**
   - In New York State, only 60% of residents with diabetes (in 2010) had received a dilated eye exam for the past two years.

   - Among New Yorkers aged 40 years and older, the most common reason given for not scheduling an eye care professional in the past 12 months was because “they had no reason to go.” This was true for both people with and without diabetes.

4. **Diabetic retinopathy is a growing public health concern for New York State.**
   - Diabetic retinopathy has been diagnosed in 11.4% of adult New Yorkers with diabetes. However, it is estimated that one in three persons with diabetes, and half of people with diabetes aged 45-64 years, have some stages of diabetic retinopathy.

   - Among adult New Yorkers with diabetes, diabetic retinopathy has been found to disproportionately affect the non-Hispanic black population (14%) and the Hispanic population (9%) as compared to the non-Hispanic white population (5%).

   - Diabetic retinopathy can occur during the pre-diabetes stage and up to seven years before diagnosis of type 2 diabetes. An estimated 1.7 million adult New Yorkers have pre-diabetes, a condition where blood glucose levels are higher than normal, but not high enough to be diagnosed as diabetes. As a result, eye exams can lead to an earlier diagnosis of diabetes for people who do not know they have the disease.

   - Over the next 30 years, the number of people in the U.S. diagnosed with diabetes is expected to triple. As a result, the number of individuals 40 years and older diagnosed with diabetic retinopathy or cataracts is expected to triple, and the number with glaucoma is expected to quadruple.

5. **Blindness and vision impairment are major public health problems causing a substantial human and economic toll on individuals and society.**
   - Vision impairment affects people’s ability to drive, read, learn and attend to household and personal tasks.

   - Without vision, individuals can result in social isolation, increased risk of falling, depression, familial stress and a greater tendency to experience disability or die prematurely.

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Prepared by the Vision Health Integration and Prevention Program, a collaboration of the New York State Department of Health and Prevent Blindness Tri-State.

State of New York Department of Health.
VHIPP integration with NYSDOH programs

- Diabetes Prevention and Control Program (DPCP)

- **Tobacco Control Program (TCP)**
  
  *Smoking Causes Blindness*: Print media campaign conducted in Buffalo, NY to complement smoking and eye health TV, radio, and internet campaign conducted by the TCP.

- Healthy Heart Program (HHP)

- Comprehensive Cancer Services Program (CCSP)
Smoking and eye health

- Smokers are 3 to 4 times more likely to develop age-related macular degeneration (AMD). Nonsmokers living with smokers almost double their risk of developing AMD.
  

- Heavy smokers (≥15 cigarettes/day) have up to 3 times the risk of cataracts as nonsmokers.
  
  [Edwards, 2004]

- Smoking is linked to high blood pressure, cataract, and diabetes, which are all risk factors for glaucoma.
  

- Smoking and having diabetes increases risk of diabetes complications such as diabetic retinopathy.
  
  [Ding, Hu, 2007; Sairenchi, Iso, Nishimura, et al., 2004]

- Dry Eye Syndrome is more than twice as likely to impact smokers as nonsmokers.
  
  [Moss, Klein, Klein, 2000]
Prevalence of current cigarette smoking by vision loss status and age, NYS BRFSS 2006-2008

Moderate or extreme vision loss
- 40-64 yrs: 24.4%
- ≥65 yrs: 9.5%
- All adults ≥40 yrs: 20.3%

Little vision loss
- 40-64 yrs: 18.3%
- ≥65 yrs: 6.5%
- All adults ≥40 yrs: 15.0%

No vision loss
- 40-64 yrs: 16.4%
- ≥65 yrs: 9.0%
- All adults ≥40 yrs: 14.3%
Prevalence of fair or poor self-rated health by current cigarette smoking/VL (any loss) status and age, NYS BRFSS 2006-2008

- Both smoking and vision loss
- Smoking only
- Vision loss only
- Neither smoking nor vision loss

<table>
<thead>
<tr>
<th>Category</th>
<th>40-64 yrs</th>
<th>≥65 yrs</th>
<th>All adults ≥40 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both smoking and vision loss</td>
<td>31.7</td>
<td>34.9</td>
<td>32.1</td>
</tr>
<tr>
<td>Smoking only</td>
<td>14.0</td>
<td>24.7</td>
<td>15.9</td>
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<tr>
<td>Vision loss only</td>
<td>20.9</td>
<td>33.7</td>
<td>24.9</td>
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<tr>
<td>Neither smoking nor vision loss</td>
<td>10.0</td>
<td>22.8</td>
<td>13.8</td>
</tr>
</tbody>
</table>

Percent with fair or poor health

Age groups: 40-64 yrs, ≥65 yrs, All adults ≥40 yrs
Prevalence of frequent mental distress by current cigarette smoking/VL (any loss) status and age, NYS BRFSS 2006-2008

- Both smoking and vision loss: 21.8% (40-64 yrs), 13.2% (≥65 yrs), 20.7% (All adults ≥40 yrs)
- Smoking only: 11.7% (40-64 yrs), 8.8% (≥65 yrs), 11.2% (All adults ≥40 yrs)
- Vision loss only: 11.6% (40-64 yrs), 6.9% (≥65 yrs), 10.1% (All adults ≥40 yrs)
- Neither smoking nor vision loss: 5.4% (40-64 yrs), 3.6% (≥65 yrs), 4.9% (All adults ≥40 yrs)
Prevalence of lack of needed social and emotional support by current cigarette smoking/VL (any loss) status and age, NYS BRFSS 2006-2008

Percent with lack of support

<table>
<thead>
<tr>
<th>Category</th>
<th>40-64 yrs</th>
<th>≥65 yrs</th>
<th>All adults ≥40 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both smoking and vision loss</td>
<td>38.9</td>
<td>32.7</td>
<td>38.2</td>
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<tr>
<td>Smoking only</td>
<td>20.5</td>
<td>21.4</td>
<td>20.6</td>
</tr>
<tr>
<td>Vision loss only</td>
<td>26.9</td>
<td>29.6</td>
<td>27.8</td>
</tr>
<tr>
<td>Neither smoking nor vision loss</td>
<td>17.1</td>
<td>19.7</td>
<td>17.9</td>
</tr>
</tbody>
</table>
Prevalence of low satisfaction with life by current cigarette smoking/VL (any loss) status and age, NYS BRFSS 2006-2008
“Smoking Causes Blindness” print media campaign

- Collaborative effort between NYSDOH VHIPP and Tobacco Control Program (TCP).

- **8-week print media campaign:** Billboards; bus sides and shelter posters; flyers; metro rail, airport, and store posters (in addition to statewide TV, radio, and Internet [TRI] campaign run by TCP).

- **Target:** Adult smokers in Buffalo, NY.

- **Control:** Adult smokers in Rochester, NY (not exposed to print media).

- **Call to action:** Contact TCP’s NYS Smokers’ Quitline (QL) for help.

- **Data:** “Prompt to call” (PTC) data in the Quitline database for Buffalo and Rochester residents aged <65 years.

- **Analysis:** Relationships between PTC type (print media-related [billboard/bus/bus shelter/flyer] vs. other) and study period.
Integration with TCP: “Smoking Causes Blindness” campaign

Airport

Store front
Integration with TCP: “Smoking Causes Blindness” campaign

Billboard
“Smoking Causes Blindness” print media campaign: Results

Quitline call frequency data suggested that print media campaign had impact on consumer awareness of smoking as a risk factor for vision loss and motivation to contact NY Smokers’ Quitline for help.

- Among Buffalo adults younger than 65 years, proportion of calls reported as prompted by print media increased from Pre-Campaign to Campaign period (3.9% vs. 9.0%), then decreased from Campaign to Post-Campaign period (9.0% vs. 4.5%).

- In Rochester, a demographically-similar city not targeted by the print media campaign, no association was found between type of PTC and study period.
"I Can See Clearly Now"

[Poster presentation, Tuesday 10 a.m.]

I CAN SEE CLEARLY NOW

State Tobacco Programs Can Serve as a Platform for Preventing Vision Loss

Larry Steele, PhD, New York State Department of Health (NYSDOH); Kim Kelly, NYSDOH; Sana Savadatti, MPH, Prevent Blindness Tri-State

BACKGROUND

- Nonsmokers see three times less, have more difficulty developing age-related macular degeneration, and have a higher risk of developing cataracts, glaucoma, and other vision problems.
- Smoking increases the risk of developing vision loss.
- Smoking is a major risk factor for age-related macular degeneration.
- Smoking is associated with other vision problems, including cataracts, glaucoma, and macular degeneration.
- Smoking is associated with an increased risk of other vision problems, including cataracts, glaucoma, and macular degeneration.

METHODS

- METHODS
  - Survey of 500 adults in New York State to assess the effectiveness of a targeted print media campaign.
  - Survey of 500 adults in New York State to assess the effectiveness of a targeted print media campaign.

RESULTS

- RESULTS
  - Table 1: Selected demographic characteristics of NY State adult smokers aged 15-74 years (n = 500) and non-smokers aged 15-74 years (n = 500)
  - Table 2: MI for the NY State's Tobacco Control Program
  - Table 3: MI for the NY State's Tobacco Control Program
  - Table 4: MI for the NY State's Tobacco Control Program

CONCLUSIONS

- CONCLUSIONS
  - Smoking is a major risk factor for age-related macular degeneration.
  - Smoking is associated with other vision problems, including cataracts, glaucoma, and macular degeneration.

SOURCES

- http://www.smokefree.gov/and/or http://www.tobaccofreekids.org/and/or http://www.quitnow.org/
- http://www.cdc.gov/tobacco/and/or http://www.nysdoh.gov/and/or http://www.preventblindness.org/
VHIPP integration with NYSDOH programs

- Diabetes Prevention and Control Program (DPCP)
- Tobacco Control Program (TCP)
- Healthy Heart Program (HHP)

**Healthy Heart Program (HHP)**

*See Better, Live Better, Work Better: A Focus on Eye and Vision Health in the Workplace:* Educational presentation made to the HHP contractors on eye health, eye safety, and vision information related to the worksite and the general adult population.

- Comprehensive Cancer Services Program (CCSP)
Workplace eye injuries

- Approximately 2,000 workers annually sustain job-related eye injuries that require medical treatment.
- About 1 in 10 eye injuries require one or more missed workdays for recovery.
- Of the total work-related injuries, 10%-20% will cause temporary or permanent vision loss.
- Nearly 3 of every 5 workers injured were not wearing eye protection at time of injury or were wearing wrong kind of eye protection.
- Estimated that 90% of eye injuries could be prevented through use of proper protective eyewear on the job.

[NIOSH, Bureau of Labor Statistics, Prevent Blindness America, National Eye Institute]
Prevalence of ever a workplace eye injury by gender and age, NYS BRFSS 2006-2007

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-64 yrs</td>
<td>13.8</td>
<td>3.2</td>
</tr>
<tr>
<td>≥65 yrs</td>
<td>9.2</td>
<td>1.0</td>
</tr>
<tr>
<td>All adults ≥40 yrs</td>
<td>12.6</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Prevalence of ever a workplace eye injury by educational attainment and age, NYS BRFSS 2006-2007

- **40-64 yrs**
  - Less than high school: 10.2%
  - High school graduate/GED: 11.6%
  - Some college/technical school: 10.6%
  - College graduate: 4.4%

- **≥65 yrs**
  - Less than high school: 4.7%
  - High school graduate/GED: 5.5%
  - Some college/technical school: 4.9%
  - College graduate: 2.4%

- **All adults ≥40 yrs**
  - Less than high school: 8.0%
  - High school graduate/GED: 9.4%
  - Some college/technical school: 9.3%
  - College graduate: 3.9%
Integration with Healthy Heart Program (Worksite Wellness): “See Better, Live Better, Work Better”
VHIPP integration with NYSDOH programs

- Diabetes Prevention and Control Program (DPCP)
- Tobacco Control Program (TCP)
- Healthy Heart Program (HHP)

**Comprehensive Cancer Services Program (CCSP)**

*Sun Safety for the Eyes:* Fact sheet on UV effects on vision and eye health incorporated within existing SUNWISE sun protection curriculum targeted towards students and school/camp personnel.
Ultraviolet (UV) light and eye health

- Long-term exposure to UV radiation can lead to cataracts, skin cancer around the eyelids, and other eye disorders.

- In short term, excessive exposure to UV radiation from daily activities, including reflections off of snow, pavement, and other surfaces, can burn front surface of eye.

- Greatest amount of UV protection is achieved with combination of: sunglasses that block 99%-100% of both UV-A and UV-B rays; wide-brimmed hat; and, for those who wear contact lenses, UV-blocking contacts.

[National Eye Institute, Prevent Blindness America]
Integration with Comprehensive Cancer Services Program (SunWise curriculum): “Sun Safety for the Eyes” [DRAFT]

Sun Safety for the Eyes

Be Wise! Protect Your Eyes!

- Protecting the eyes from the harmful rays of the sun is important throughout life. UV (ultraviolet) rays from sunlight and artificial UV rays from tanning beds can damage your eyes. There are two kinds of UV rays: UV-A rays and UV-B rays, and both are harmful to your eyes. People with all eyes and skin colors can be affected by UV eye damage.

What Kind Of Damage Can The Sun Do To Your Eyes?
- UV rays can lead to conditions (e.g. scarring of the eye which makes it hard to see things clearly).
- Thin scar tissue around the eyes can be caused by too much time in the sun or tanning beds.
- UV rays, including sunlight that bounce off of sand, snow, water, and other surfaces, can burn the front surface of the eye, similar to sunburn on the skin.

What Can You Do To Prevent UV Eye Damage?
- Never look at the sun directly.
- Always wear sunglasses or UV-blocking contact lenses to protect your eyes from direct rays from the sun and from the UV rays that bounce off of sand, water, and snow. Yes, you need to wear sunglasses in the winter too!
- When outside, always wear a hat with a wide brim to shade your eyes and to protect your face, ears and the back of your neck.
- Use an umbrella at the beach to rest and play under.
- Stay in the shade when the sun’s rays are the strongest (10 am - 4 pm). Wear sunglasses even in the shade. Remember, UV rays can’t be seen, so even when it’s cloudy or you are in the shade it’s important to protect your eyes.

Always choose sunglasses that:
- Are labeled with 99-100% for both UV-A and UV-B protection.
- Block blue.
- Are large enough, or a wrap-around style, to shade and protect your eyes from sunlight from most angles.
- Have lenses that are the same color and are not damaged.
- Fit your face well.
- Are "impact resistant" (do not shatter if they are hit) and should not pop out of the frames, especially if you play sports.
- It’s important to know that there are choices for UV-A and UV-B protection for all types of eyewear, including prescription and non-prescription glasses and contact lenses.

Just like when protecting your skin from the sun, doing as much as you can to protect your eyes from the sun works best!

Prepared by the Vision Health Integration and Preservation Program, a collaboration of the New York State Department of Health and Prevent Blindness Tri-State
Benefits of integration

- Integration enriches program materials and activities.
- Integration leads to better coordination.
  - Staff resources are used judiciously.
  - Materials can be created to satisfy a variety of needs.
  - Messages can be standardized and have a greater reach.
- Integration strengthens collaborations externally.
- Much can be accomplished with limited or no funding through integration.
Implications for data to inform policy or guidelines related to eye health promotion in New York State

[Examples from presentation]

- **People with VL generally not as healthy as those with no VL.**
  - Build policy around providing greater accessibility to public health information, and access to activities, programs, and services that promote healthy living.

- **Higher prevalence of moderate or extreme VL among non-Hispanic blacks and Hispanics with diabetes compared to non-Hispanic whites with diabetes.**
  - Support innovative vision screening methods in community health centers at the primary care level.
  - Improve reimbursement rate for eye care providers accepting Medicaid.

- **Depression more prevalent among adults with moderate or extreme VL compared to those with no VL.**
  - Work with state/national eye care provider associations to include depression screening as part of visits.
  - Build awareness/policy around referral to vision rehabilitation organizations/agencies.
  - [Note: American Diabetes Association added depression screening to their Clinical Practice Recommendations because of clear association between depression and diabetes.]
What can states do?

- Vision loss is not a failure of public health! Rather, it is an opportunity.
  - Population with vision loss or at risk for vision loss is large, older, dynamic, less likely to seek or access care, more likely to have comorbid chronic conditions and mental issues, and less likely to be able to improve their health.

- Encourage health promotion activities.

- Provide accessible health promotion information.

- Consider impact of environments and system changes.

- Develop and promote programs that encourage management and treatment compliance.
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