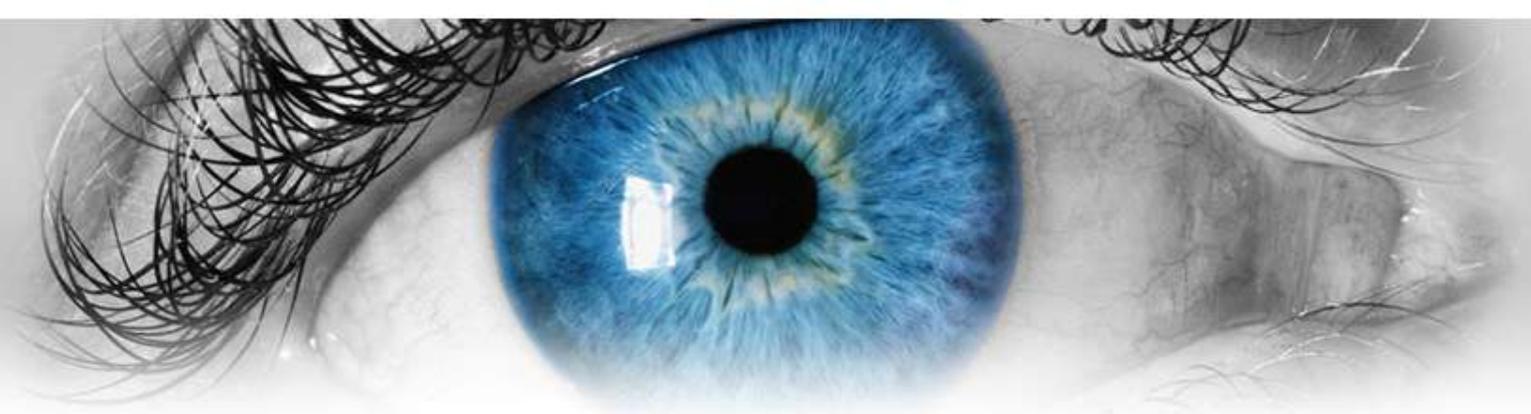


The Great Debate - How often is enough?

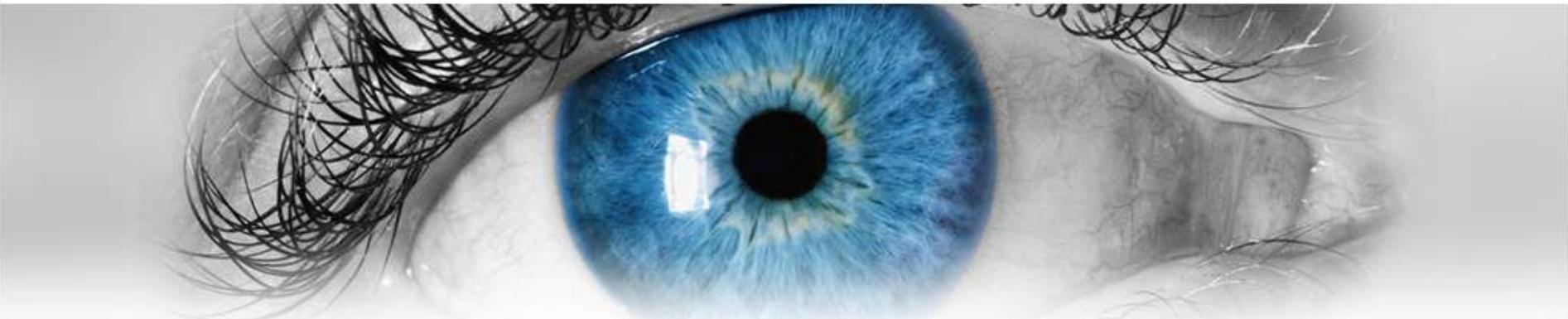


BARS Annual Conference, 23 September
2010

Dr Deborah M Broadbent

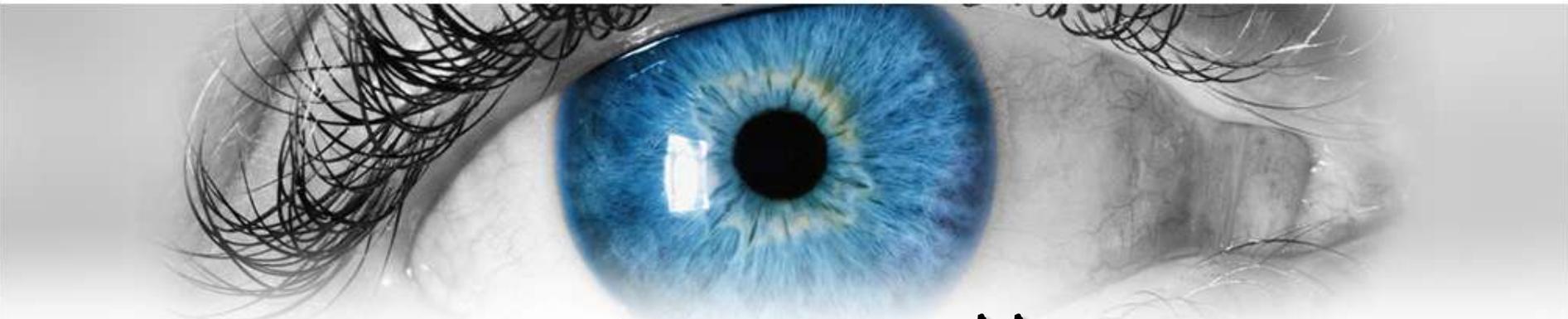


This house believes that patients should be screened annually for diabetic retinopathy

A close-up photograph of a human eye with a vibrant blue iris and a black pupil. The eye is looking slightly to the right. The eyelashes are dark and thick. The background is a soft, out-of-focus white.

Format

- Straw poll
- Present the pros and cons
- Expert panel discussion
- Open debate
- Repeat poll

A close-up photograph of a human eye with a vibrant blue iris and a black pupil. The eye is looking slightly to the right. The eyelashes are dark and thick. The background is a soft, out-of-focus white.

Straw poll

- Annually
- 2 yearly for R0
- Individualised
- Undecided



Recommended screen intervals

- The ENSPDR current recommendation is annual screening for all PWD aged ≥ 12 years*
- Recommendations for alternative screening intervals have been made by national & international groups based on expert opinion / consensus rather than direct evidence.

** Workbook version 4.3 www.retinalscreening.org.uk*



- European Retinopathy Working Party recommends screening at least 2 yearly after diagnosis and at least yearly or more frequently if retinopathy develops [1]
- ADA recommends yearly or more frequently for type 2 DM [2]
- AAO recommends yearly screening for no DR / BDR and 6-12 monthly screening for mild PPF without maculopathy [3]

1. *Diabet Med* 1991;8:263–67

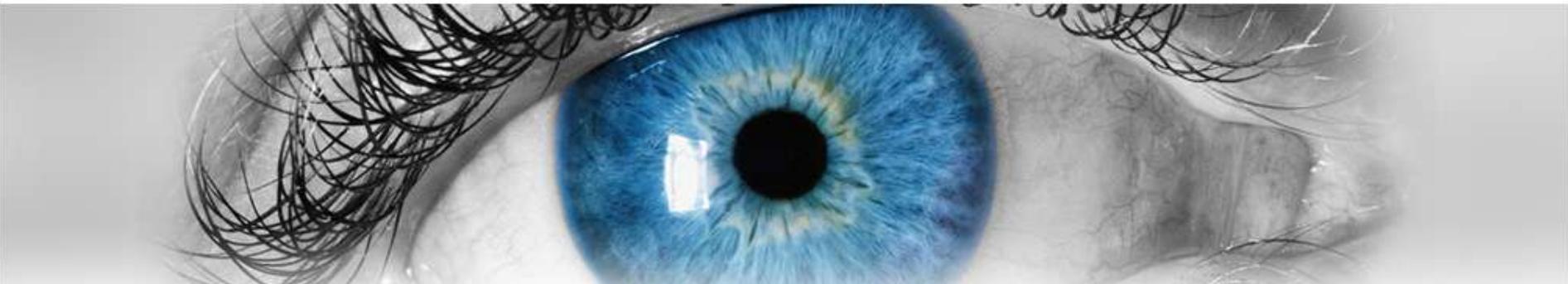
2. *Diabetes Care* 1998;21:157–59. 3

3. <http://www.aao.org/ppp>



Evidence for longer intervals...

- Incidence data
- Cost-effectiveness
- Patient “costs”



Cumulative incidence of STDR in Type 2 diabetes

7615 patients underwent 20,570 screen events

- Progression to STDR in year 1
 - BDR 5%
 - Mild PPF 15%
- 95% likelihood of remaining free of STDR:
 - No DR 5.4 years
 - BDR 1.0 years
 - Mild PPF 0.3 years



Cumulative incidence (CI) of STDR in Type 1 diabetes

501 patients underwent 2742 screen events

- CI of STDR in patients without baseline DR:
 - 0.3% at 1 year
 - 3.9% at 5 years
- 95% likelihood of remaining free of STDR:
 - No DR 5.7 years
 - BDR 1.3 years
 - Mild PPF 0.4 years



CONCLUSIONS

- Patients with both type 1 and type 2 diabetes and no DR at baseline could safely be screened at longer intervals (up to 3 years) unless:
 - duration > 20 years
 - insulin use in patients with type 2 diabetes
- Patients with BDR or the above risk factors need to be screened annually
- Patients with mild PPR need to be screened 4-6 monthly

A close-up photograph of a human eye with a vibrant blue iris and a black pupil. The eye is looking slightly to the right. The eyelashes are dark and appear to be wearing mascara. The skin around the eye is light and slightly wrinkled.

Norfolk Data

- Patients managed solely in general practice
- 1990-2006
- 20,788 people screened at least once - 63,622 screen episodes
- Screen intervals of 18-24 months cf 12-18 months were not associated with a higher risk of STDR
- For a screen interval of >2 years there was a 60% increase in likelihood of STDR being detected
- Complements data from Liverpool

Individualised screen intervals

The screenshot shows a web browser window displaying an expert system interface. The title bar reads "ES_4_DR_Risk_Basic_FF - Windows Internet Explorer". The address bar shows the URL "http://liverpool.ac.uk/Diabetes_Risk_Factors_ES/ES_4_DR_Risk_Basic_FF/View504". The browser tabs include "default: March 2...", "Computing in Cell...", "W: General linear mo...", "W: Organizational...", and "ES_4_DR_Ra...".

The main content area is titled "Expert System for Risk Analysis in Sight-threatening Diabetic Retinopathy using MatSOAP". It features a "Primary Risk Factor" section with five input fields, each with a checked checkbox and a dropdown menu:

- HbA1c [%] with a value of ≥ 8.0
- Diastolic BP [mmHg] with a value of 160
- Systolic BP [mmHg] with a value of ≥ 200
- Cholesterol [mmol/l] with a value of ≥ 8.0
- Disease duration [y] with a value of 5

To the right of these inputs is the "Risk Prediction" section, which displays:

- Risk [%] as 83.7
- Confidence Interval as [46.3 ... 96.9]
- AUROC as 0.769

Below the risk prediction are "Evaluate" and "Report" buttons. At the bottom of the interface, there are "Help" and "Advanced" buttons, and a footer that reads "ACF & M Dept of Medical Physics & Clinical Engineering, DE, 9C & 5PH Clinical Eye Research Centre 9/01/2008". A contact email "contact: Tony Fisher a.c.fisher@liverpool.ac.uk" is also visible.

Example of *v* poor control at 5 years
Risk = 83.7%

www.liverpoolseye.org



Wilson and Jungner screening principles

- The cost of the case-finding programme (including early diagnosis and treatment of patients diagnosed) should be economically balanced in relation to possible expenditure on medical care as a whole

WHO 1968



Cost-effectiveness

Liverpool incidence data suggested that 70% patients with no DR and no high risk criteria could be screened less frequently than annually, resulting in sizeable cost savings*

*this data is based on imaging using 35mm transparencies and it may be that digital imaging is more sensitive at detection of BDR

A close-up photograph of a human eye with a vibrant blue iris and dark eyelashes. The eye is looking slightly to the right. The background is a soft, out-of-focus grey.

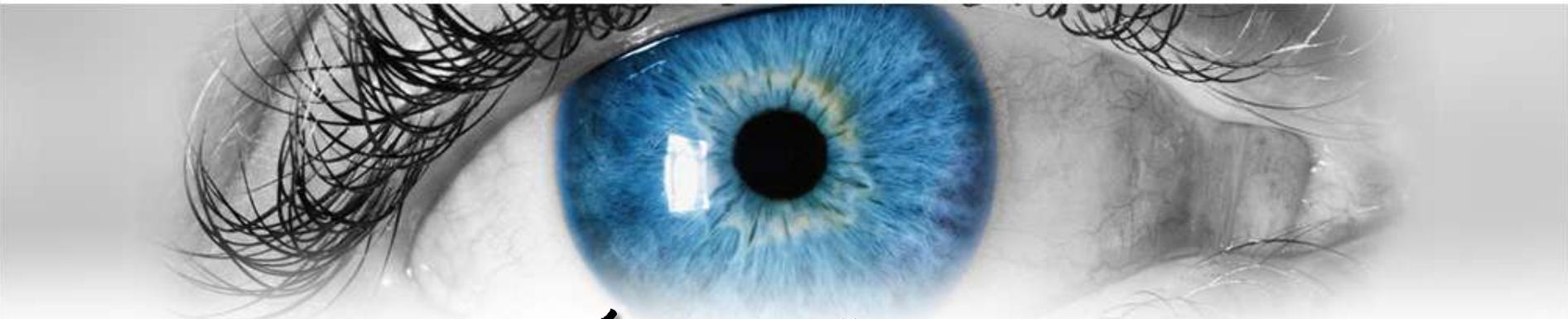
Cost per QALY

- Cost utility analysis allows cost comparisons across different diseases
- Quality adjusted life years (QALYs) are used as a measure of the utility value for a health condition multiplied by the remaining years of life expectancy
- Interventions for diseases with onset at earlier ages show greater impact on QALYs – longer expected period of benefit (e.g. type I diabetes)
- Procedures with a cost per QALY between \$20,000 and \$50,000 considered beneficial



Vijan et al

- Modelling – evaluation of progression of DR and cost
- High risk type 2 patients (younger and HbA1C >11) would have a cost of \$40,530 per QALY
- Low risk patients (older patients with HbA1C <7) cost an additional \$211,570 per QALY
- Screening every 2 years would reduce cost to \$107,510 per QALY. Screening every 3rd year would reduce to \$49,760 per QALY
- Did not take into account cost of effects of blindness



Patient "costs"

- Reduced screening intervals would be more convenient for patients in terms of:
 - Fewer appointments
 - Inconvenience of dilatation
 - Time off work
 - Travelling costs
 - Time



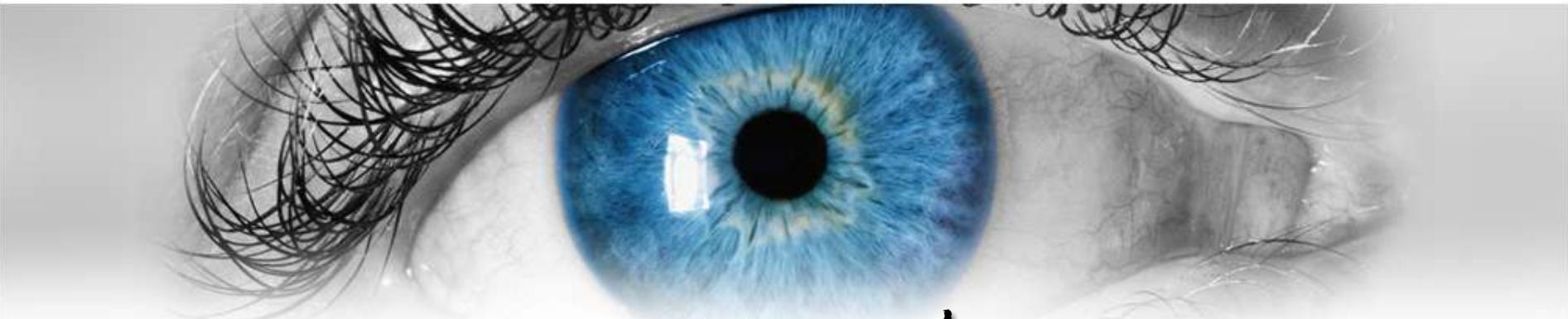
Evidence for annual screening...

- Change in risk factors
- Non-attendance
- Feasibility
- Acceptability
 - to patient
 - to health professionals
- Cost

A close-up photograph of a human eye with a vibrant blue iris and a black pupil. The eye is looking slightly to the right. The surrounding skin and eyelashes are visible, with the eyelashes being dark and somewhat messy. The background is a soft, out-of-focus grey.

Changing Risk factors

- Worsening control
 - Adolescence
 - Stress / depression – family/ personal illness, bereavement, change in circumstances
- Tightening control
 - Nb. Insulin pumps (pregnancy)
 - Retinal worsening
 - Reduce HbA1C by $\geq 3\%$ in 1 year



Non-attendance

- Chronic disease: multiple appointments
- Failure to attend may relate to lack of appreciation by people with diabetes of the risk of visual impairment
- Increased risk of progression of disease
- Failure of programmes to meet the ENSPDR key performance indicator on compliance with screening



Feasibility

- Are the software programmes able to manage screen intervals greater than / less than 12 months?
- Are admin teams able to manage screen intervals greater than / less than 12 months?



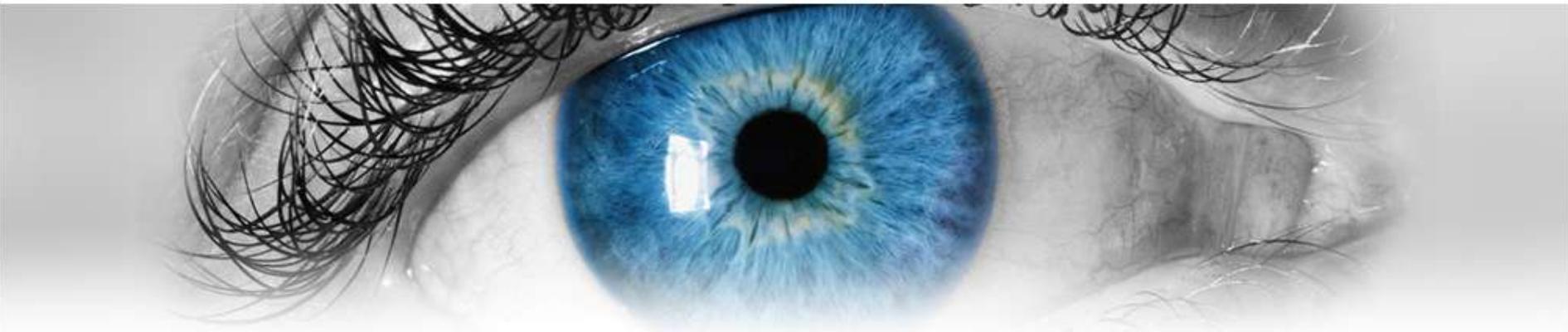
Acceptability

- To patients
 - I am reassured by annual screening
 - What happens if something does develop?
- To health professionals
 - Patient safety
- Research data is not available on relationship between patient / health professional perceptions and screen interval.
Qualitative research is required

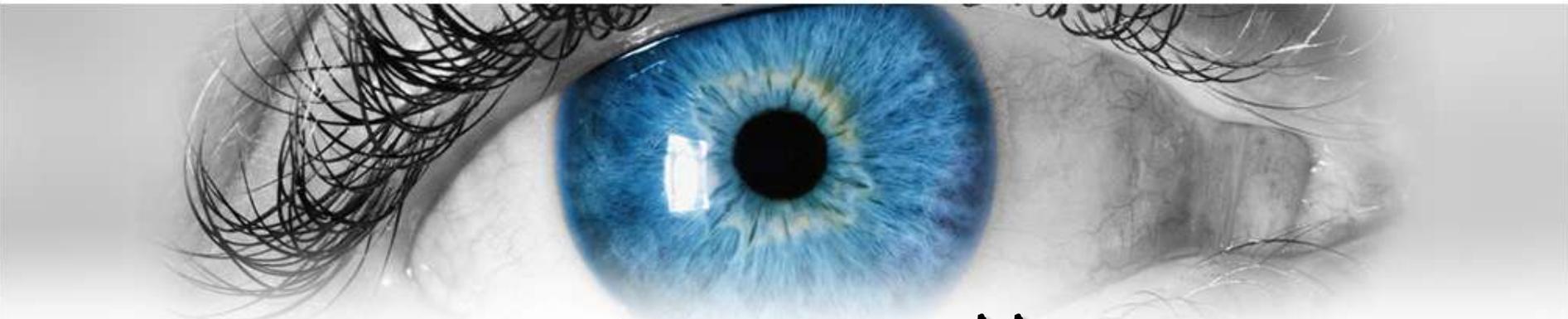


Cost of missed disease

- Litigation costs are significant
- Cost of supporting a visually impaired patient
- Cost on secondary health effects of blindness is scant
- Blindness has also been associated with increased length of hospital stay, nursing home placement, and hip fracture

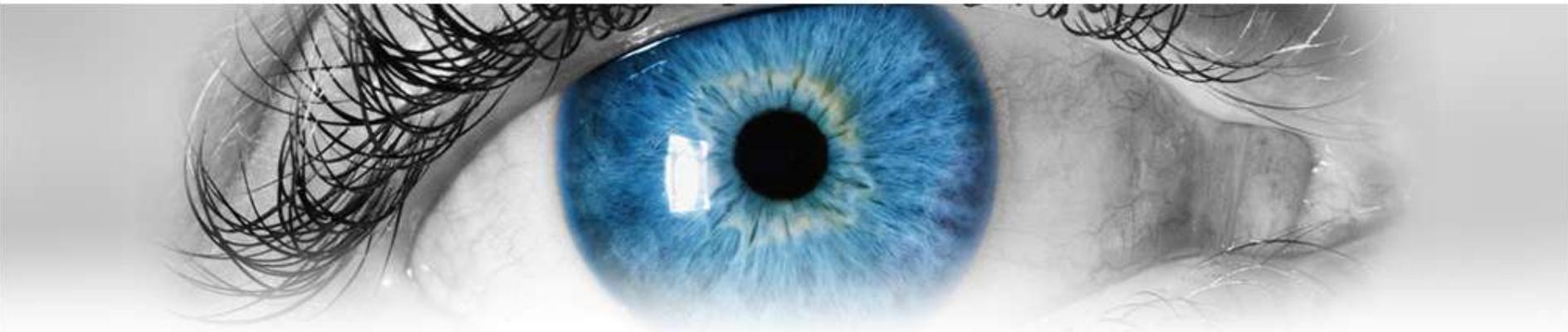


Expert panel and open
discussion

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Straw poll

- Annually
- 2 yearly for R0
- Individualised
- Still undecided



Thank you for taking part
in the great debate!