Serious Eye diseases,
New treatments

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5 major causes of loss of vision

- Cataracts
- Glaucoma
- Macular degeneration
- Retinal Vein occlusions
- Diabetic retinopathy
Causes of global blindness in millions of people (WHO 2002 excludes uncorrected refractive errors)

- Cataract: 18
- Glaucoma: 4
- AMD: 3
- Corneal opacities: 1
- Diabetic Retinopathy: 1
- Childhood blindness: 1
- Trachoma: 1
- Onchocerciasis: 1
- Others: 3


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Cataract
Cataract

- Cataract is an opacity of the lens of the eye
- Symptoms may depend upon the type and morphology of the cataract
- Steroid drops or tablets may worsen the cataract if taken for a long period.
- No drops will reverse the cataract. Homeopathy!
- Treatment is by surgery
Cataract..........blurred vision
Treatment

• Does it bother the patient enough that they want surgery
• Does the patient drive? Threshold for DVLA criteria 6/10
• Does the patient have any other conditions
• 33% will have macular degeneration
• 15% will have glaucoma
• 5% will have diabetic retinopathy
• Most patients will have a guarded prognosis depending upon their other eye conditions
• Only 30-35% will have no other ocular disease
Phacoemulsification

- Small incision surgery
- Generally 2.65 to 2.75 mm surgery
- New Phacoemulsification machine
- Reduced surgery to 2.2 mm
- Stable anterior chamber
- More controlled & efficient cataract surgery
- You can see the surgery at www.londoneyedoctors.co.uk
NHS restrictions

- Sutton and Merton CCG; VA below 6/9.5 or less on Snellen chart (DVLA criteria for driving is 6/10)
- Surrey CCG; 1st eye 6/9, 2nd eye 6/18 or less
Outcomes

- 95-98% will have no complications
- All patients will need spectacles for near as well as distance
- Relative spectacle independence
- Steroid drops for 4-6 weeks
- Upto 25% will have capsular opacification 2-3 years after surgery. This can be treated with Nd YAG laser.
- New cataract machine at Ashtead (old one replacement)
- Nd-YAG laser is already at Ashtead
Glaucoma
Glaucoma is a group of diseases

- Glaucoma is primarily a disease of the optic nerve with progressive loss of neurons & characteristic changes at the optic nerve
- Modifiable risk factors
  - IOP
  - Smoking
  - Hypertension
- **Cannot be reversed** but can be slowed down
- Most common form: Primary open angle glaucoma irreversible visual loss over years
- Most acute form: Acute angle closure glaucoma – irreversible visual loss over 24-72 hours
What can the patient see & what is the problem

- Tunnel vision
- Normal Eye: Build Up of Aqueous Humor Fluid, Trabecular Meshwork
- Eye with Glaucoma: Pressure, Damage to the Optic Nerve
- 2010 U.S. Prevalence Rates Glaucoma

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How to detect

• Check for family history ..... Positive family history + should have yearly check
• At least, yearly optician or ophthalmologist review if IOP raised
• 3 glaucoma tests
## Treatment

<table>
<thead>
<tr>
<th>Drops Category</th>
<th>Generic name</th>
<th>Company name</th>
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<tbody>
<tr>
<td>Beta Blockers</td>
<td>Timolol 0.5%</td>
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<tr>
<td></td>
<td>Timolol 0.25%</td>
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<tr>
<td>Prostaglandin Inhibitors</td>
<td>Latanoprost</td>
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<td></td>
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<td>Travoprost</td>
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<td>Combinations</td>
<td>Timolol/ Latanoprost</td>
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<td>Timolol / Bimatoprost</td>
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<td>Timolol / Travoprost</td>
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<td>Carbonic anhydrase inhibitors</td>
<td>Brinzolamide</td>
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<td>alpha 2adrenoreceptor agonist</td>
<td>Apraclonidine</td>
<td>Iopidine</td>
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</table>
Surgery

- 1-5% of glaucoma patients may need surgery if their disease, IOP control is not satisfactory
- Trabeculectomy
- Viscocanalostomy
- Non penetrating eye surgery
Macular degeneration
Central visual loss

- Rapidly progressive wet AMD
- Slowly progressive Dry AMD
Dry macular degeneration

- **90%**
- Untreatable
- Slowly progressive
- Stop smoking
- Multivitamins – Leutin, Zinc, Omega 3
- Magnifying glasses
- Low vision aids
- CVI

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LVA

• An optical low-vision aid, such as magnifiers, illuminated magnifiers, hand-held magnifiers or flat magnifiers.
• Aids for viewing faraway objects include monoculars and binoculars.
• Non-optical low-vision aids include everything from an angle-poise lamp
• Bold-print books ? Kindle paperwhite, Kobo, Ipad
• Talking clocks
• Liquid level indicators that beep to prevent you burning yourself when using hot water.
WHAT THEY SEE...

Self Monitoring: Amsler Grid is not a substitute for an ophthalmic review. It allows patients to check their eyesight regularly for possible symptoms of macular degeneration.

http://www.blindness.org/content.asp?id=46
Wet AMD

- Rapidly progressive
- Severe visual loss
- Treatable with
  - Intravitreal injections of Lucentis
  - Intravitreal injections of Eyelea
  - Intravitreal injections of Avastin
  - Photodynamic therapy with Verteporfin
  - Stereotactic radiotherapy

- 80% chance of stabilization of vision over 2 years
- 20% chance of deterioration
- After 2 years, chances of stabilization decrease to 50-60%
MARINA - Secondary Endpoint
Mean change in visual acuity over time

*P<0.0001 vs. sham

17.7 letter benefit
17.0 letter benefit
-10.5

Visit (months)
(n=238) (n=238) (n=240)

ETDRS Letters
Sham Ranibizumab 0.3mg Ranibizumab 0.5mg (n=238) (n=238) (n=240)
Retinal Vein occlusions
RVO

- Sudden onset
- Vascular risk factors
- BP, undiagnosed /under treated diabetes, high cholesterol, blood dyscrasias, haematological abnormalities
- Central retinal vein occlusion – more damage – poorer prognosis
- Branch retinal vein occlusion – less damage – better prognosis
- OCT --- Macular odema
- FFA --- Ischaemia – vascular blood flow
- Treatment
  - Aspirin / Plavix / Clopidogrel / warfarin
  - Aggressively treat BP, DM, Cholesterol. Look for blood disorders
Ocular treatment for RVO

- Laser treatment for BRVO and macular oedema

- Ozurdex retinal implant for BRVO or CRVO + macular oedema

- Ischaemic RVO with rubeosis – PRP laser (very poor prognosis anyway)
Diabetic retinopathy
Diabetic Retinopathy

Epidemiology

• The best predictor of diabetic retinopathy is the duration of the disease

• After 20 years of diabetes, nearly 99% of patients with type 1 diabetes and 60% with type 2 have some degree on diabetic retinopathy

• 33% of patients with diabetes have signs of diabetic retinopathy

• People with diabetes are 25 times more likely to become blind than the general population.
RISK FACTORS

- Duration of DM
- Control of DM. Will not prevent but delays
- Hypertension
- Renal Disease
- Pregnancy
- Obesity, hyperlipidaemia, smoking, anaemia
Diabetic retinopathy symptoms

Diabetic retinopathy is asymptomatic in early stages of the disease. As the disease progresses, symptoms may include:

- Blurred vision
- Floaters
- Fluctuating vision
- Distorted vision
- Dark areas in the vision
- Poor night vision
- Impaired color vision
- Partial or total loss of vision
The Effect of Intensive Diabetes Treatment On the Progression of Diabetic Retinopathy In Insulin-Dependent Diabetes Mellitus

Intensive control reduced the
- risk of developing retinopathy by 76%
- slowed progression of retinopathy by 54%;
- reduced the risk of clinical neuropathy by 60%
- albuminuria by 54%

Arch Ophthalmol. 1995; 113:36-51
www.londoneyedoctors.co.uk
Diabetic disease

DR

Diabetic Retinopathy

Diabetic maculopathy
CLINICAL CLASSIFICATION OF DIABETIC RETINOPATHY

- Background
- Pre-proliferative
- Proliferative
- End-stage diabetic eye disease
Background Diabetic retinopathy

- Microaneurysms
- Screening R1
Pre proliferative Retinopathy  R2

- Dot and Blot haemorrhages
- Venous beading in two or more quadrants
- Intraretinal Microvascular Abnormalities
- No signs of proliferative retinopathy
PPDR R2

Venous beading
High-Risk Proliferative diabetic retinopathy

At risk for serious vision loss

Any combination of three of the following four findings

- Presence of vitreous or preretinal hemorrhage.
- Presence of new vessels (neovascularization, NV)
- Location of NV on or near the optic disc.
- Moderate to severe extent of new vessels.
PDR
PDR
Proliferative retinopathy

- NVD
- NVE
- Pre-retinal haemorrhage
- Laser burn scars

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Retinal Diagnostic Tests

- Fundus Photography
- Fluorescein Angiography (FA)
- Optical Coherence Tomography (OCT)
- Ocular Ultrasonography
- Electroretinography (ERG)
B-scan Ultrasound
Treatment strategy

- Strict DM control, Blood Pressure, Cholesterol
- Annual Screening (DESP)
- Laser, anti VEGF / steroid injections, Vitrectomy
Diabetic Retinopathy Treatment
Once DR threatens vision treatments can include:

- Laser therapy to seal leaking blood vessels (focal laser)
- Laser therapy to reduce retinal oxygen demand (scatter laser)
- Anti VEGF or steroid injections
- Surgical removal of blood from the eye (vitrectomy)
Laser Photocoagulation

Laser Photocoagulation is recommended for eyes with:

- Clinical significant macular edema CSME
- High risk Proliferative diabetic retinopathy
TREATMENT

• LASER: Light Amplification by the Stimulated Emission of Radiation
  • Focal
  • Grid
  • Panretinal photocoagulation
Pan-retinal Photocoagulation
Proliferative DR Treatment

• Vitreous Hemorrhage -
  • 1. Pan-retinal photocoagulation
  • 2. Vitrectomy with laser photocoagulation
  • 3. Intraocular VEGF inhibitor*

• Traction Retinal Detachment -
  • 1. Observation if not involving the macula
  • 2. Vitrectomy with membrane dissection

* Off-label use, controversial
Vitrectomy
Diabetic macular edema

• Diabetic macular edema is the leading cause of legal blindness in diabetics.
• Diabetic macular edema can be present at any stage of the disease, but is more common in patients with proliferative diabetic retinopathy.
Diabetic Macular Edema Prevalence

- Mild non-proliferative DR: 3%
- Moderate to severe non-proliferative DR: 38%
- Proliferative DR: 71%

Why is Diabetic macular edema so important?

- The macula is responsible for central vision.
- Diabetic macular edema may be asymptomatic at first. As the edema moves into the fovea (the center of the macula) the patient will notice blurry central vision. The ability to read and recognize faces will be compromised.
Diabetic maculopathy

Hard exudate
Clinically significant macular edema (CSME)

- Thickening of the retina at or within 500 µm of the center of the macula.
- Hard exudates at or within 500 µm of the center of the macula, if associated with thickening of the adjacent retina.
- Area of retinal thickening 1 disc area or larger, within 1 disc diameter of the center of the macula.

ETDRS
DIABETIC RETINOPATHY TREATMENT
NEWER DEVELOPMENTS:

Steroids; Intravitreal Triamcinolone

Anti-VEGF antibody treatment appears to be useful for both macular edema and proliferative retinopathy; Intravitreal Avastin & Lucentis

Long acting steroid implants; Ozurdex and Illuvien

http://drcrnet.jaeb.org
DME laser treatment
DME laser treatment