Top Ten Oral Agents and a Few other Thoughts

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I am a consultant for or am on the Medical Advisory Board of:
- Allergan
- Alcon
- AMO
- Advanced Vision Research
- Inspire
- TLC Laser Center
- Carl Zeiss Meditec
- Synemed
ANTI-VIRALS

- ACYCLOVIR
- FAMVIR
- VALTREX

ANTI-VIRALS

- CLINICAL APPLICATIONS
  - ACUTE VS CHRONIC INFECTION
  - PRIMARY LESIONS
  - EPITHELIAL HERPES SIMPLEX
  - STROMAL HERPES SIMPLEX
  - HERPES ZOSTAR
  - HERPETIC IRIDOCYCLITIS

ANTI-VIRALS

- SIDE EFFECTS
  - RENAL FAILURE/IMPAIRMENT
  - HYPERSENSITIVITY REACTIONS
  - FACIAL EDEMA
  - VISUAL HALLUCINATIONS
If It wasn’t for Bad Luck I would have none at all!

- DR a really nice 58 y/o white male presented with a 4 year history of recurrent HSK with stromal involvement.
- Medical Hx positive for Leukemia well controlled until last 6 months.
- Patient complained of LOV x 6-7 days progressing.
- Additionally patient demonstrated 50-60 lbs weight loss since last visit.

Bad Luck

- Clinical presentation showed:
  - VA – FC @ 3 ft
  - 2+3 Injection
  - Ptosis 2mm
  - Discharge 2+
- SLE: 7mm central lesion with staining. Peripheral white cell ring. AC 2+3 cell with posterior KP’s
Bad Luck

- Initial Therapy
  - Valtrex 1000 mg tid
  - Zymar qid
  - HA 5% TID
  - Neosporin Ung TID
  - Follow up 24 hrs

Bad Luck

- 24 hour follow up:
  - Patient c/o increased pain
  - VA; HM @ 3ft
  - Lesion melting @ 1:00 with 60% thinning
  - Increased white cell perimeter
  - 1/8 chamber hypopyon
  - TX:?

Bad Luck!

- Day two:
  - No change!
  - Tx?

- Day Three:
  - Decreased white cell skirt
  - Hypopyon 90% cleared
  - Decreased pain

VARICELLA ZOSTAR-KERATITIS

- PRIMARY INFECTION
  - CHICKEN POX
  - VACCINATION RECOMMENDED BY
    AMERICAN ACAD of PEDIATRICS

- RECURRENT INFECTION
  - OPHTHALMIC INVOLVEMENT 10-255
  - OPHTHALMIC ZOSTAR > OVER AGE 60
  - UNDER 40 50% IMMUNOCOMPRIMISED
Steroids

- 99% topical use in eye care
- Medrol Dose Pack most common
- Pred Forte Generic since January 2009
- Lotemax/Alrex & Durezol
STEROIDS

- ORAL vs IV ADMINISTRATION
- INITIAL DOSE - 1mg/kg/day
- STANDARD TAPER
  - INITIAL THERAPY 2-3 DAYS, THEN TAPER AS INDICATED FOR CLINICAL RESPONSE
  - ALTERNATE DAY THERAPY- LONG TERM Tx- DOUBLE DOSE QOD THROUGH TAPER

STEROIDS

- INHIBIT PROSTAGLANDIN AND LEUKOTRIENE ACTIVITY BY BLOCKING ACTION OF ENZYME PHOSPHOLIPASE A2.

Steroids

- Oral vs. IV administration
- Initial dose determination (1mg/kg/day)
- Standard taper vs. alternate day therapy
  - Standard taper - start initial dose, monitor in 2-3 days, then taper as appropriate for clinical response
  - Alternate day therapy - for longer term therapy (more than 2-3 weeks), give double dose every other day, continue pattern throughout tapering process
- Prednisone - Initial dose typically in 60-100 mg range as per above

Clinical Case Examples

- Scleritis
- Severe anterior uveitis
- Posterior uveitis
- Inflammatory preseptal cellulitis
- Progressive thyroid eye disease
- DLK
Femtosecond Lasers and Keratomes

Photodisruption

Thousands of laser pulses are connected together in a spiral pattern to create a cleavage plane.

DLK – Interface/edge Inflammation

- **Cause(s)**
  - Too much energy *(usually greater than 3.5uJ)*
  - Edge angle too flat *(usually less than 45° to 50°)*
  - Not enough topical steroid

- **Management**
  - Reduce horizontal and/or side cut energy
  - Steepen edge angle (> 50° to 60°)
  - Pre-peri-post op steroids to reduce cellular infiltrates
  - Post op meds generally same as mechanical keratectomy

“Mirage” Edema

6 KHz
CASE #5

- A 37-year-old white male was referred s/p lasik x 3 weeks with h/o decreased acuity OU (OD>OS).
- Onset was gradual but patient has been symptomatic since Tx with pain/ou.
- Surgical history revealed bilateral abrasions at the time of the procedure involving the inferior half of the cap and bed.
- Patient has had two lifts and scrapes in two weeks

CASE #5

- Physical exam revealed BVA 20/200 OD 20/100 OS.
- External shows minimal injection & OU.
- SLE revealed 2+-3 epithelial irregularities/OU with 3+4 cystic changes, pseudodendrites and frank defects.
- Ta- 18/20 @ 10

Case #5

- Additionally the patient demonstrated 3+ interface haze OU contiguous with and extending beyond the area of epithelial change.
- AC occasional cell.
- Remainder of exam WNL.
- Current medications: Pred Forte q3hour

IOP after DSEK

- Price, FW AJO 2008
- 50 eyes/38 patients
- Mean CCT 701 microns
- Pneumotonometry: 20.3 mmHg +/- 4.5 mmHg
- Pascal: 19.8 mmHg +/- 4.4 mmHg
- Goldmann: 15.9 mmHg +/- 4.9 mmHg
- If IOP is elevated with Goldmann it is probably real
A New Potent Topical Steroid

Background Information and Clinical Experience

Difluprednate
- Developed by Mitsubishi as a dermatological preparation
  - Categorized as a “very strong” steroid in dermatology
- Developed by Senju as an ophthalmic emulsion
- Licensed in June 2006 by Sirion Therapeutics
- NDA submitted in December 2007, granted priority review
- Durezol™ (difluprednate ophthalmic emulsion) 0.05% was approved for the treatment of inflammation and pain associated with ocular surgery on June 23, 2008

Dose Uniformity – Durezol verses Generic Prednisolone Acetate Suspension

Dose Uniformity – Durezol verses Pred Forte Suspension
Steroids vs. Immunomodulation

- Ashcroft DM; BMJ Mar 2005
- Meta-analysis 25 trials
- Tacrolimus (Protopic) / Pimecrolimus (Elidel) vs. Potent and Mild steroids
- Tacrolimus = Potent steroid > Mild
- Pimecrolimus < Potent Steroid
- FDA "Black Box"
- Recommended use:
  - Facial area (steroid atrophy)
  - Pulse therapy
  - Intolerant of steroids

NSAID'S

- IBUPROFEN
- KETOROLAC
- INDOMETHACIN
- NAPROXEN
- TRAMADOL
- CELEBREX

NSAID'S

- CORNEAL OPACITIES (WHORL)
- TINNITUS
- FLUID RETENTION
- EPISTAXIS
- BREAST CHANGES
- ANEMIA/BLEEDING
- CONSTIPATION

NSAID'S

- CLINICAL APPLICATIONS
  - ANALGESIA
  - ANTI-INFLAMMATORY
  - MUSCULOSKELETAL/ MYOSITIS
  - ACUTE GOUT
  - DYSMENORRHEA
  - CME
NSAIDS, H Pylori and Gastric Ulcers

- Lancet 2002 Jan 5; 359: 14-22
  - 1625 NSAID users
  - Peptic ulcer disease
    - 42% H Pylori patients
    - 26% of non-infected patients
  - Peptic ulcer disease
    - 36% of NSAID users
    - 8% of non users
  - Risk of bleeding ulcer (6.1x> in H Pylori on NSAIDS)

Narcotic agents

- Directly affect opioid receptor
- Agonist, partial agonist, or mixed
- Bind to opioid receptors in brainstem, cortical areas and spinal cord
- Mimic endorphins, producing a morphine like effect whether natural or synthetic

Narcotic Agents

- Effective for severe acute pain
- Patient response variability due to individual sensitivity of opioid receptors
- No addiction likely with short term use
- Dosage varies with drug used and patient
- Adverse effects is usually the limiting factor in usage

Narcotic Agents

- Hydrocodone (Schedule III) (Lortab, Vicodin) 2.5-7.0mg tid-qid with acetaminophen
Narcotic Agents
- 6 times more potent than codeine
- Less gastrointestinal problems
- Less sedation
- ?? euphoria

Important notification for patients
- Drowsiness
- Dizziness
- Blurred vision
- Nausea/vomiting/constipation
- Take with food to avoid GI distress
- Avoid Etoh or other CNS agents
- Breathing distress

Contraindications
- Bronchial asthma
- COPD
- Emphysema
- Pregnancy
- Hypersensitivity
- Prior addiction
- Renal/Liver dysfunction
- H/O Etoh use, Concurrent use of CNS agents (Tricyclic antidepressants, Phenothiazines)

An aspirin a day keeps the Doctor away
- Gum PA, etal
- ASA use and all cause mortality
- 6174 patients/ Cleveland Clinic
- Baseline 37% ASA use
- All cause mortality
  - ASA use 4%
  - Non ASA 8%
ORAL CONTRACEPTIVES

- CLINICAL APPLICATIONS
  - BIRTH CONTROL
  - HORMONE REPLACEMENT THERAPY

ORAL CONTRACEPTIVES

- INCREASED CORNEAL CURVATURE
- MIGRAINE / OPTIC NERVE EDEMA
- DRY EYE
- PHLEBITIS/ CVA
- CRVO/BRVO
- CRAO/BRAO

Vein Occlusions

The Eye in Systemic Disease

- Bilateral Optic Nerve Swelling
THE CYCLINES

- TETRACYCLINE
- DOXYCYCLINE
- MINOCYCLINE

THE CYCLINES

- CLINICAL APPLICATIONS
  - ROSACEA
  - POSTERIOR LID DISEASE
  - RECURRENT EROSION
  - CHRONIC CHALZIA
  - NON-HEALING EPITHELIAL DEFECTS

Lipid Secretion: Meibomian Glands

- The lipid layer restricts evaporation to 5-10% of tear flow
  - Also helps lubricate
- Obstruction of meibomian gland ducts reduces lipid secretion
  - Causes increased evaporation of the aqueous component
THE CYCLINES

SIDE EFFECTS
- CONJUNCTIVAL PIGMENTATION
- CALCIUM DEPOSITS
- PHOTOSensitivity
- YEAST INFECTIONS
- DEACTIVATION OF BCP'S
- BENIGN OPTIC NERVE EDEMA

CURRENT CONCEPTS in the MANAGEMENT of PERSISTENT EPITHELIAL DEFECTS and RECURRENT EROSIONS
Recurrent Erosions

**Pathophysiology - basal epithelial basement membrane misdirection** results in:
- Thickened basement membrane
- Reduplicated basement membrane
- Intraepithelial pseudocysts
- Lack of hemidesmosomes

**Medical Management**
- Nocturnal lubrication
- Nocturnal hypertonic saline
- Bandage contact lens
- Treat underlying conditions

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**Anti-Inflammatory Effects of Macrolides**

- The anti-inflammatory effects of Macrolides have been known for the last 40 years.
- Macrolides prevent the formation of:
  - Pro-inflammatory mediators
  - Cytokines
  - Prostaglandins
  - TNF-α


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**Anti-Inflammatory Effects of Macrolides**

- Placebo/controlled trial of Azithromycin (250 mg q.d. x 3 mos) in 60 patients with Cystic Fibrosis.
- Macrolide therapy with fewer courses of IV antibiotics ($p=0.016$), and improved QOL ($p<0.05$). (Walter, et al. Thorax 2002;57:212)
- Efficacy in diffuse panbronchiolitis in Japan.
- Macrolides inhibit PMN chemotaxis, reduce PMN elastase, suppress IL1, 6, 8 and TNF,
Anti-Inflammatory Effects of Azithromycin

- Anti-inflammatory effects which are dose dependent and independent of their antimicrobial effect (Lanaro 2000)
  - Reduce migration of neutrophils (Takeshita 1989)
  - Reduce production of pro-inflammatory cytokines (Hand 1990)
  - Phagocytosis (Kono 1994)
  - Anti-oxidant characteristics (Labro 1989)

The Penicillins

- Penicillinase resistant
  - Methicillin, Oxacillin, Cloxacillin, Dicloxacillin and Nafcillin
  - Staph Aureus/ Staph Epi related infectious disease
  - “MRSI” implies all agents / usually resistant to Cephs/ Aminos/ Macrolides. Use Vancomycin
  - Preseptal Cellulitis/ Paranasal cellulitis/ Hordeola

- Extended Spectra
  - Ampicillin / Amoxacillin
  - Less effective against Strep than Pen V/G
  - Increased range covers H Influenza/ E Coli / Proteus
  - Sensitive to penicillinase
  - Potassium Clavulinate added to reduce B-Lactamase activity
  - Preseptal cellulitis/ Dacryocytitis/ Paranasal sinusitis

The Penicillins

- Side effects
  - Hypersensitivity 2%
    - Type I (Anaphylaxis)
    - Type II (Hemolytic anemia)
    - Type III (Vasculitis/Serum sickness)
    - Type IV (Stevens Johnson Syndrome)
  - GI distress (Infrequently C Difficile)
**Cephalosporins**

Interfere with terminal step of cell wall formation (Blocks peptidoglycan cross linking)
Inactivated only by Beta-lactamases (Gram-) not Penicillinases (Gram +)
Progression from 1st-3rd Generation
- Decreases gram + coverage
- Increases gram – coverage
- Increases Beta Lactamase resistance
- Increases Cost

**Cephalosporins**

- **Second Generation agents**
  - Cefaclor (Ceclor)/ Cefuroxime (Ceftin)/Loracarbef (lorabid)
  - Less effective against gram- than 3rd generation agents
  - Cefaclor most common- hordeloa/ pre-septal cellulitis

**ANTIHISTAMINES**

- **SEDATING AGENTS**
  - DIPHENHYDRAMINE (BENADRYL) 25-50mg
  - CLEMASTINE (TRAVIST) 1mg
  - CHLORPHENIRAMINE (CHLOR-TRIMETON)

- **NON-SEDATING AGENTS**
  - LORATIDINE (CLARITAN) 10 mg
  - CERTIRIZINE (ZYRTEC) 10mg
  - FEXOFENADINE (ALLEGRA) 60mg

**Antihistamines**

- **Sedating Agents** - more effective for acute conditions, fast acting
  - Diphenhydramine (Benadryl) 25-50 mg qhs or q4-6h
  - Clemastine (Tavist-1) 1 mg q12h
  - Chlorpheniramine (Chlor-Trimeton) 4 mg q4-6h
Antihistamines

- Nonsedating Agents - more effective for seasonal allergy, maintenance dosing
  - Loratadine (Claritin) 10 mg qd
  - Cetirizine (Zyrtec) 5-10 mg qd
  - Fexofenadine (Allegra) 60 mg bid
  - Desloratadine (Clarinex) 10 mg qd

Clarinex (desloratadine)

- Pharmacology:
  - Peripheral H1 tricyclic antihistamine
  - Long-acting receptor antagonism / 24 hr.
  - Duration of action
- Formulation:
  - 5 mg tablets, 5 mg dissolvable "Reditabs"
- Usual Dosage (> 12 yrs.):
  - 5 mg daily
- Indications:
  - Allergic rhinitis
  - Chronic idiopathic urticaria
  - Pruritus
  - Hives

CONTRAINDICATIONS:
- Hypersensitivity to drug/components
- Pregnancy
- Category C: Fetal toxicity/no studies
- Nursing patients
- Excreted via breast milk / effects unknown.
- Patients <12 yrs.
- No available studies in children.

Cautions/Warnings:
- Liver or renal dysfunction/disease
- Start w/ 5mg every other day
- Phenylketonuria
- Aspartame (inactive ingredient)
Clarinex (desloratadine)

Adverse Reactions:
- Serious (rare):
  - Anaphylaxis
  - Hepatotoxicity
- Common:
  - Headache
  - Dizziness
  - Dry mouth
  - Myalgia
  - Dysmenorrhea

Approximate Cost:
- #30 (5 mg tabs., 5 mg “RediTabs”): $69

Zyrtec D 12 Hour (cetirizine hydrochloride/psuedoephedrine hydrochloride)

- Pharmacology
  - Selective, peripheral H₁ antihistamine & sympathomimetic amine decongestant.
  - 12 hour duration of action.
- Formulation
  - Bilayer tablets, 5 mg cetirizine /120 mg psuedoephedrine.
- Usual Dosage (>12 yrs.)
  - 5 mg q.d.
- Indications:
  - Ocular symptoms associated w/seasonal allergic rhinitis, perennial allergic rhinitis, chronic urticaria, especially where a decongestant is needed (epiphora, sinus

Contraindications
- Hypersensitivity to drug/class/components.
- Hypersensitivity to hydroxyzine

Pregnancy
- Category C. No controlled human studies.

Nursing

Adverse Reactions
- Serious: Anaphylaxis/hypersensitivity (rare), cardiac arrhythmias, hypertension, hepatitis (rare).
- Common: Anxiety, dizziness, dry mouth, exocilibility, headache, hypertension, insomnia, nausea, nervousness, tremor.

Cost
- #30 Bilayer tablets (5/120 bilayer tabs.) = $40
ANTIHISTAMINES

- Second generation
- Decreased anti-cholinergic effect
- Headache 11%
- Combination therapy (oral/ topical) most effective

ANTI-HISTAMINES

- CLINICAL APPLICATIONS
  - ACUTE VS CHRONIC USE
  - ALLERGIC CONJUNCTIVITIS
  - RHINITIS
  - POST-NASAL DISCHARGE
  - ASTHMA
  - ANAPHYLAXIS
ANTI-HISTAMINES

- SIDE EFFECTS
  - AQUEOUS TEAR/MUCIN DECREASE
  - HEADACHE 11%
  - MYDRIASIS
  - NYSTAGMUS
  - IOP INCREASE

Floppy Eyelid Syndrome
**Classic Patient**
- Male age 30-70
- Overweight or obese
- Chronic irritation, tearing, redness, discharge
- Problem worse on the side on which he sleeps

**Physical Findings**
- Loss of rigidity of tarsal plate
- Easy eversion of lid
- Ptosis
- Lash Ptosis
- Chronic conjunctival changes
- Chronic corneal changes

**Pathophysiology**
- Pathology studies disclosed decreased elastin within tarsal plate and eyelid skin
- Is this due to chronic mechanical irritation or is it the cause of the problem?

**Role of Eye Rubbing**
- Anecdotal association with keratoconus
- Unknown contribution of repeated mechanical irritation of the eyelid
Pathophysiology of Signs/Symptoms

- **PRIMARY:**
  - Repeated eversion of lid during sleep abrades conjunctiva and cornea on bedding
- **SECONDARY:**
  - “Rough” conjunctiva abrases bulbar surface and cornea
  - Distracted lid unable to blink tears across eye
  - Ptotic lashes +/- lid blocks superior vision

Management Options

1. **Conservative**
   - Eye shield to the affected side at bedtime (approximately 1/3rd of patients may be sufficiently treated by a shield alone)
   - Nightly ointment

2. **Surgical**
   - Various methods of eyelid tightening procedures

Surgery for FES

- **Classic Approach = Eyelid tightening:**
  - Wedge excision
  - Lateral tarsal strip
  - Medial plication
- **Disadvantage:**
  - Lid continues to have tendency to evert and stretch over time
  - High reoperation rate

BETA-BLOCKERS

- CARTEOLOL
- NADOLOL
- PROPAANOLOL
- ATENOLOL
- METOPROLOL
BETA-BLOCKERS

- CLINICAL APPLICATIONS
  - HYPERTENSION
  - VENTRICULAR ARRYTHMIAS
  - ANGINA
  - MIGRAINE
  - MI’S
  - ESSENTIAL TREMORS

BETA-BLOCKERS

- SIDE EFFECTS
  - IOP LOWERING
  - DRY EYE
  - BRADYCARDIA
  - BLOOD PRESSURE REDUCTION
  - HYPOGLYCEMIC MASKING
  - PULMONARY DECOMPENSATION

BETA-BLOCKERS

- SIDE EFFECTS
  - CLINICAL DEPRESSION
  - CHF
  - CORNEAL ANESTHESIA
  - IMPOTANCE

ANTI-ANXIETY AGENTS

- PAXIL
- XANAX
- ATIVAN
- PROZAC
- VALIUM
ANTI-ANXIETY

- CLINICAL APPLICATIONS
  - DEPRESSION
  - OCD
  - PANIC DISORDER
  - ANXIETY DISORDER

ANTI-ANXIETY

- SIDE EFFECTS
  - SEIZURES 0.1%
  - ABNORMAL BLEEDING (ECCHYMOSIS & PURPURA)
  - DECREASED PREGNANCY RATE
  - WGT LOSS/ WGT GAIN
  - SEXUAL DYSFUNCTION
  - HYPOTENSION/SYNCOPE

ANTI-ANXIETY

- SIDE EFFECTS
  - AMNESIA
  - IMPAIRED CONCENTRATION
  - EMOTIONAL LABILITY
  - ACCOMMODATIVE DYSFUNCTION
  - CONJUNCTIVITIS
  - MYDRIASIS
  - DRY EYE

The Healthy Eye

Normal tearing depends on a neuronal feedback loop.

Secretomotor Nerve Impulses
Lacrimal Glands
Tears Support and Maintain Ocular Surface Neural Stimulation

Sten et al. Cornea 1998:17(4)
Lacrimal Glands:
- Chronic irritation
- T-cell activation
- Cytokine secretion into tears

Disruption of normal neuronal control of tearing.

Tears Damage Ocular Surface
Cytokines
Disrupt Neural Arc

Stern et al. Cornea. 1998;17:584

Dry Eye Disease

Treatments for Chronic Dry Eye
- Modify environment, habits
- Artificial tears
- Topical cyclosporine
- Topical steroids
- Secretagogues
- Nutritional supplements/vitamins
- Punctal occlusion
- Tarsorrhaphy, moist chamber goggles
- Lacriserts

Treatment Recommendations by Severity Levels

Level 1
- Education and environmental/dietary modifications
- Elimination of offending systemic medications
- Artificial tear substitutes, gels/ointments
- Eye lid therapy


Treatment Recommendations by Severity Levels

Level 2:
- If Level 1 treatments are inadequate, add:
  - Anti-inflammatory agents
  - Tetracyclines (for meibomianitis, rosacea)
  - Punctal plugs
  - Secretagogues
  - Moisture chamber spectacles

Treatment Recommendations by Severity Levels

- **Level 3:**
  - If Level 2 treatments are inadequate, add
  - Serum
  - Contact lenses
  - Permanent punctal occlusion


- **Level 4:**
  - If Level 3 treatments are inadequate, add
  - Systemic anti-inflammatory agents
  - Surgery (lid surgery, tarsorrhaphy; mucus membrane, salivary gland, amniotic membrane transplantation)


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**ERECTILE DYSFUNCTION AGENTS**

- VIAGRA
- CIALIS

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**ERECTILE DYSFUNCTION SIDE EFFECTS**

- COLOR VISION B/G
- HEADACHES
- FLUSHING
- DYSPEPSIA
- DIARRHEA
**Medication Induced Adverse Effects**

- **Sildenafil (Viagra®)**
  - Used in the treatment of erectile dysfunction
  - WHO classification: Possible
  - Anterior Ischemic Optic Neuropathy
    - Painless, immediate loss of vision
    - Swollen optic nerve with APD
    - Altitudinal defect
  - Users are older with vasculopathic conditions
  - Consider not using med with history of AION or small optic nerve cupping

- **Topiramate (Topamax®)**
  - Used in the treatment of epilepsy, bipolar disorder, migraine, weight reduction
  - WHO classification: Certain
  - Secondary acute angle closure glaucoma
  - Acute myopia, up to 9 diopters reported
  - Suprachoroidal effusion, ciliary body edema
  - Not pupillary block; not relieved with PI
  - Institute IOP lowering medications, no miotics
  - Taper Topamax® ASAP

**Medication Induced Adverse Effects**

- **Tamsulosin (Flomax®)**
  - Used in the treatment of benign prostatic hypertrophy (BPH)
  - WHO classification: Certain
  - Triad of intraoperative complications with phaco
    - Floppy iris that billows in response to irrigation
    - Iris prolapse
    - Progressive miosis
  - May need to modify surgical techniques
  - Not seen in less selective α₁-antagonists
  - Discontinuing pre-op does not stop syndrome

**CAI'S**

- ACETAZOLAMIDE - DIAMOX
- METHAZOLAMIDE - NEPTAZANE

**CLINICAL APPLICATIONS**

- ANGLE CLOSURE
- COAG
- PSEUDOTUMOR
Carbonic Anhydrase Inhibitors
- Acetazolamide (Diamox) - fastest acting agent
- Methazolamide (Neptazane) - regarded as safer agent
- Glaucoma indications
  - Acute narrow angle glaucoma 500 mg acetazolamide if IOP > 45 mmHg
  - Primary open angle glaucoma
    - Methazolamide 25-50 mg tid
    - Acetazolamide 250 mg tabs qid
    - Acetazolamide 500 mg sequels bid

HYPEROSMOTICS
- MEDICAL HX
  - GLYCERIN (OSMOGLYN) 1.5mg/kg
  - ISOSORBIDE (ISMOTIC) 1.5mg/kg
- CLINICAL APPLICATIONS
  - ANGLE CLOSURE

Oral Nutritional Therapy
- ARED’s
- Macutrition
- Omega Three’s

ANTI-OXIDANTS
- BLUE MOUNTAIN STUDY
- AREDS
- MONARMD-S: Stability not improvement
- POST CATARACT WOUND HEALING
The Blue Mountain Eye Study
- Smith, W. Ophth 1999; 106 April: 761-67
  - Reviewed the effect of dietary carotene, Vit C, retinol or zinc is associated with AMD
  - 3654 examined patients 1992-4
- Outcomes
  - No statistical difference noted in dietary groups

Macular Degeneration-Mechanisms
- Oxidation. Light-induced oxidative stress causes retinal pigment epithelial (RPE) and, possibly, choriocapillaris injury.
- Inflammation. Oxidative damage results in a chronic inflammatory response within the Bruch membrane and the choroid.
- Neovascularization. Inflammation increases VEGF that causes the damaging growth of new blood vessels.

Diabetic Retinopathy and Macular Edema-Mechanisms
- Oxidation. Hyperglycaemia causes oxidative injury, microthrombi formation, leukostasis with retinal vascular occlusion that leads to ischemia.
- Inflammation. Ischemia increases inflammatory cytokines.
- Neovascularization. Inflammatory cytokines increase VEGF (vascular endothelial growth factor) and bFG (basic fibroblast growth factor) that cause neovascularization.

TREATMENT GROUPS
- Antioxidants
  - 500 mg Vitamin C, 400 IU Vitamin E, 15 mg Beta-carotene
- Zinc (additional antioxidant)
  - 80 mg Zinc Oxide, 2 mg Cupric Oxide
- Antioxidants and Zinc
  - 500 mg Vitamin C, 400 IU Vitamin E, 15 mg Beta-carotene, 80 mg Zinc Oxide, 2 mg Cupric Oxide
- Placebo

### AMD TRIAL – PRIMARY OUTCOMES

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<th>Protective</th>
<th>Harmful</th>
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99% Confidence Interval

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### AREDs Study 1991-2001

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<tr>
<td>2001</td>
<td>BMW m3</td>
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### CONCERNS ABOUT BETA-CAROTENE

- **Current smokers** - advise not to take beta-carotene
- **Past smokers** - caution those who recently quit (within 5 years)
- **Passive smokers** - caution those exposed to heavy smokers

HOLD THE SAUCE

- ANN INTER MED 2002 JUN18;136:884-7
  - Compared rate of bacterialization in sauces found on restaurant tables in Guadalajara and Houston
  - 66% of sauces in Guadalajara cultured e-coli
  - 40% of Houston sauces grew e-coli
  - the heat and acid levels did not prevent bacterialization

Friendship and longevity

- Fratigioni, L etal
- Lancet 2000 Apr 15: 355; 1315-9
- “Influence of Social Network on occurrence of Dementia”
- 1203 patients non-demented
- 75 yrs or older
- 3 yr f/u 176 developed dementia
- single alone 1.9 vs married together 1.0

What are friends for?

- Laurence Roy Stains
- Men’s Health Oct 2001
- “Bowling Alone” Dr Robert Putnam
  - Loners are 2-5 x more likely to die prematurely
I don’t drink should I?
- Wannamethee, SG et al
- Heart 2002 Jan; 87:32-6
  - 7735 males (40-59 y/o)
  - 6503 without CAD/874 CAD events
- Outcomes
  - Stable, moderate, etoh- lowest CHD/Mortality
  - New regular drinkers- no change in CAD
  - No protection for CAD/ Increased risk of other cause of death

Alcohol and Dementia
- Rottenberg A et al
- Lancet 2002 Jan 26; 359: 281-6
- 7983 males/females/ 5395 non-dementia @ baseline
- 6 year f/u standardized questionnaire
- Suspected dementia- neuro consult/MRI
- 197 - dementia/ 0.58 risk ratio for 1-3 drinks /day