

# Community Eye Health

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**INTERNATIONAL  
CENTRE FOR  
EYE HEALTH**

**AN INTERNATIONAL JOURNAL TO PROMOTE EYE HEALTH WORLDWIDE**

## EXTERNAL EYE INFECTIONS

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No exact figures are yet available for the number of people blind due to infections of the cornea with bacteria, fungi, viruses or *Acanthamoebae*. In the summary figures from the World Health Report or the Global Data Bank at the World Health Organization Programme for Prevention of Blindness, infectious keratitis is included in the 10 million or so due to 'other causes'.

Yet if we look at the results of individual surveys of the causes in different countries, blindness due to 'other corneal opacities' or 'corneal scars' is usually greater than the proportion caused by trachoma. Some of these cases will be due to vitamin A deficiency early in life; others to trauma. But a sizeable proportion will be due to suppurative infection (i.e., 'pus-producing' infection) in both eyes, or in the second eye where the causes in the two are different. We need further investigation of the proportions of causes making up these 'other corneal opacities'.

Every ophthalmologist or eye health care worker knows what a severe clinical prob-

lem infective corneal ulceration can present, especially in tropical latitudes. If the published results of the causative organisms in these ulcers are arranged according to geographical latitude, this shows that the proportion due to fungi increases the nearer the study is to the equator, reaching 56% of the total in Accra, Ghana, at a latitude of 8° north. In Hyderabad, India, in the second report in this issue, fungi accounted for 33% of corneal ulcers where an organism could be identified. This is at an intermediate latitude, 17.5° N. Until very recently, antifungal agents, and even the newer broad spectrum antibiotics, have either not been available in many developing countries or have been prohibitively expensive.

So what can be done to prevent these severe corneal infections, and to treat them before they cause irreversible corneal scarring or perforation and loss of the eye?

Because of the shortage of appropriate drugs, a search has been going on for simpler and less expensive antimicrobial agents which could be widely distributed. In India, silver sulphadiazine ointment looked very hopeful for treating fungal keratitis, but has not fulfilled its early promise. Povidone iodine solution is effective as an antiseptic, is widely used pre-operatively for this purpose, and is effective in preventing ophthalmia neonatorum. But it does not appear to penetrate sufficiently deeply into the



*Suppurative keratitis leading to panophthalmitis and phthisis in a Somali child*

*Photo: Murray McGavin*

cornea to treat successfully established fungal infections. Chlorhexidine, in varying strengths, has been used for over 40 years as an antiseptic in the treatment of burns, bladder infections, vaginal infections and gingivitis, as well as a surgical scrub. It is most important that chlorhexidine, when used in the treatment of the eyes, is prepared at the appropriate strength. As a 0.02% solution in water it is an effective treatment for *Acanthamoeba* infection of the cornea. In two small clinical trials in India and Bangladesh, 0.2% chlorhexidine was superior to natamycin in treating a range of fungi causing keratitis. *Aspergillus*, however, remained very difficult to treat. Recent attempts to use chlorhexidine in two locations in Africa have not been so encouraging, although the ulcers are often so far advanced when they present that no topical treatment is going to be effective.

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## Community Eye Health

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Very recently, a number of specific anti-fungal agents have begun to be manufactured in India, and can be bought over the counter in India for 30–50 rupees (40–75 British pence; less than one US dollar) for a 5ml bottle of drops. These include ketoconazole and fluconazole drops as well as natamycin. Clotrimazole ointment is now manufactured in Bangladesh. Ciprofloxacin drops are readily available in India for bacterial ulcers. The way forward, therefore, may be for prevention of blindness agencies, or Ministries of Health in other tropical countries, to import these preparations from India or set up a central manu-

facturing facility in, for example, sub-Saharan Africa.

If effective drugs are now becoming available, it therefore becomes essential that eye care workers recognise these ulcers immediately. Garg and Rao also emphasis in their article that local hospitals should put in place simple microbiology facilities to recognise whether the ulcer is bacterial or fungal. This can be done from corneal scrapes and Gram stain or a smear in potassium hydroxide (KOH) or lactophenol cotton blue. The most appropriate drug can then be started at the earliest opportunity.

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## Indian Supplement to the Journal

The most recent issue has the following articles:

**Status of Education of the Visually Impaired in India**

*Dr Bhushan Punani, Mrs Nandini Rawal*

**Mobile Eye Services – Experience of Christian Medical College  
and Hospital, Ludhiana, Punjab**

*Dr Arin Chatterjee*

Printouts of these articles are available from

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**NB.** All requests concerning the *Journal of Community Eye Health* in India should be referred to the above address

## Community Eye Health

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# Conjunctivitis: Diagnosis and Management

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## Introduction

A healthy conjunctiva is necessary for the maintenance of a healthy cornea and thus the visual acuity of the eye. The conjunctiva contributes to the tear film which has three layers:

(Inner) mucous – adherence to the cornea (from the conjunctiva)  
(Middle) aqueous – wetting agent (from the lacrimal glands)  
(Outer) oil – prevention of evaporation (Meibomian and Zeis glands)

Infections of the conjunctiva can spread to the cornea and can cause a perforation, e.g., gonococcal infection. Allergic conjunctivitis or limbal catarrh can spread over the cornea. ‘Cobblestones’ form under the lid on the tarsal conjunctiva, and can cause corneal ulcers. Chemical injury to the limbal area can destroy the stem cells that are responsible for the re-epithelialization of the cornea. Dryness will damage the surface of the cornea.

## Diagnosis and Management

Conjunctivitis may be

- infective—bacterial, viral or chlamydial
- allergic

Other rarer causes such as molluscum contagiosum, Parinaud’s oculoglandular conjunctivitis or phlyctenular conjunctivitis will not be discussed in this paper.

### Bacterial Conjunctivitis

**Symptoms and signs: red eyes, discharge of pus, pain.**

It is usually bilateral. It may start in one eye and later spread to the other.

The common organisms are the *Staphylococcus aureus*, *Staphylococcus epidermidis*, Group A *Streptococcus* and *Streptococcus pneumoniae*. Other organisms are *Haemophilus influenzae*, *Pseudomonas* and *Escherichia coli*.<sup>1</sup> *Moraxella lacunata* causes an angular conjunctivitis with a whitish discharge at the outer canthus. The spectrum of organisms causing conjunctivitis varies around the world.

Bacterial infection of the conjunctival sac can be secondary to discharge resulting from a foreign body, dry eye, trichiasis, or lacrimal mucocele. It is necessary to examine the lid margins, evert the upper lid, and look for discharge from the lacrimal puncta.

To make a specific diagnosis of the organism involved, a culture should be taken. In most instances the disease will respond if the secondary causes are treated and a broad-spectrum antibiotic is used. Eye drops are more practical than ointments as vision is not blurred with drops. They can be easily and frequently applied. However, most primary clinics will have tetracycline eye ointment as their ophthalmic antibiotic, so this should be used. Chloramphenicol and gentamicin are both broad spectrum antibiotics and often available. Initially the drops should be instilled every 10 minutes until the infection is under control. The eye should not be padded. Frequent eyelid cleaning is necessary.

### Viral Conjunctivitis

**Symptoms and signs: watery discharge, red eye, itch.**

Epidemic keratoconjunctivitis, often due to type 8 adenovirus, may have a follicular reaction of the tarsal conjunctiva. The preauricular lymph nodes may be enlarged.

Epidemic (acute) haemorrhagic conjunctivitis was first reported in West Africa in the 1960s and is usually caused by enterovirus 70. Small subconjunctival haemorrhages are characteristic of this highly infective eye inflammation which often lasts for a only few days.

Viral conjunctivitis is a self-limiting disease and does not require antibiotic treatment unless a secondary bacterial infection occurs. Cold compresses will help the discomfort, but usually the patient will have to let the disease run its course. Antivirals, e.g., acyclovir, are not indicated.

### Allergic (Vernal) Conjunctivitis

**Symptoms and signs: red eye, excessive lacrimation, itch.**

Allergic conjunctivitis is a significant and frustrating part of the work in an eye clinic. Geographical, genetic and environmental factors are influential in this disease.



*Acute haemorrhagic conjunctivitis*

*Photo: Gawn McIlwaine*

There is pigmentation of the conjunctiva, cobblestones of the tarsal conjunctiva and infiltrates at the limbus (corneo-scleral margin). The whole cornea can be covered with infiltrates. Mucus builds up in the tear film. The patient may have other allergies such as rhinitis. Keratoconus is another complication associated with vernal conjunctivitis.

Most cases are mild, the patient needs reassurance but no medication. A few patients will develop serious problems that will need attention, possibly for years. The clinician will have to be supportive to the patient until the disease runs its course. It can cause a child to miss long periods at school but tends to burn out in early adult life.

There is no ideal treatment and some drugs used are harmful. Cold compresses can help with mild symptoms. Astringent drops, e.g., zinc sulphate, will not cure the problem but may relieve symptoms.

Topical steroids such as prednisolone eye drops are frequently used and although complications are uncommon it is vital to be aware of them. For example, corneal ulcers can be made worse, particularly herpes simplex (dendritic ulcers). Vernal catarrh causes corneal ‘shield’ ulcers, which can become secondarily infected and made worse by steroids. Cataract and raised intraocular pressure leading to glaucoma are also complications of long term steroids. However, in severe cases of vernal conjunctivitis systemic steroids may be needed.

Other drops deal with the allergic response at different parts of the immune cascade. Antihistamines are only partially effective. Mast cell stabilisers<sup>2</sup> such as cromolyn sodium 4% and more recently lodoxamide 0.1% are effective if used continuously for many months. These drugs are safe but expensive. Cromolyn powder is available for local production of eye drops. Sodium cromoglycate 2% (Opticrom) may also be available.

Surgical intervention by cryotherapy and scraping of cobblestones is not effec-

## Conjunctivitis: Bacterial, Viral and Allergic

Type	Symptoms and Signs	Management	Prevention
<b>Bacterial Conjunctivitis</b>	Red eye Discharge of pus  Pain/Photophobia (especially if secondary corneal involvement)	Chloramphenicol 0.5% eye drops Gentamicin 0.3% eye drops  Tetracycline 1% eye ointment  Intensive instillation for first day or until symptoms and signs reduce	Personal hygiene: hand washing  Correct cleaning and disinfection of instruments between examinations  Contact lens hygiene
<b>Viral Conjunctivitis</b>	Red eye Watery discharge Itch/Irritation Subconjunctival haemorrhages	Cold compresses to relieve discomfort	Personal hygiene: hand washing  Correct cleaning and disinfection of instruments between examinations
<b>Allergic Conjunctivitis</b>	Red eye Lacrimation +++ Itch/Irritation Trantas spots Cobblestones Mucus build up	Reassurance Antihistamines (eye drops or orally) Steroid eye drops Cromolyn sodium 4% eye drops Lodoxamide 0.1% eye drops	Avoid allergens

tive. Mucous membrane graft to the upper lid tarsal conjunctiva can be useful.

### Prevention of Conjunctivitis

Prevention of infective conjunctivitis relies primarily on good personal hygiene.

- Bacterial conjunctivitis is uncommon but can be spread by the hands or from upper respiratory tract infections. Gonococcal infection is transmitted from the genital tract or urine to the eye by hands. This is a serious breach of normal hygiene. Ophthalmia neonatorum can be prevented by the use of povidone iodine drops, tetracycline eye ointment or other anti-septics or antibiotics at birth.

- Viral conjunctivitis, in particular adenovirus, can sweep through a community or an institution such as a school very quickly. This is highly infectious and needs to be controlled by the enforcement of strict hygiene standards – towels, face cloths, hands and aplplanation tonometers are some examples of how this can easily be transmitted.
- Prevention of allergic conjunctivitis is not possible unless the patient is able to change his or her environment or job or identify the allergen causing the allergy and remove it, e.g., pollen, animal fur. Drugs can cause an allergy that is reversed by stopping the drug. Atropine, neomycin and eye drop preservatives are particularly common causes of such drug reactions.

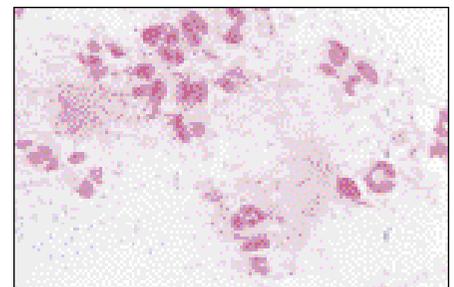
### Summary

Diseases of the conjunctiva are diverse and need proper diagnosis, treatment and appropriate preventive measures.

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- 1 Sandford Smith J. Eye Diseases in Hot Climates. Second Edition, Butterworths, 1990
- 2 Caldwell DR, Verin Hartwick-Young R, Meyer SM, Drake MW. Efficacy and safety of Lodoxamide 0.1% vs. Cromolyn Sodium 4% in patients with vernal keratoconjunctivitis. *Amer J Ophthalmol* 1992; **113**: 632–37

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**Gram –ve rods (*Pseudomonas*) and white cells**

Photo: Melville Matheson

## COMMUNITY EYE HEALTH WORKSHOPS

The International Centre for Eye Health, in collaboration with overseas partners, will be organising one week workshops in Community Eye Health at the following venues:

<b>India:</b>	<b>October 1999</b>
<b>Nigeria:</b>	<b>December 1999</b>
<b>South Africa:</b>	<b>January 2000</b>
<b>Colombia:</b>	<b>April 2000</b>
<b>Pakistan:</b>	<b>April 2000</b>

The courses are designed for eye health workers who are working or plan to work in Community Eye Health.

Letters of enquiry should be sent to:

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**Exhibit of IRC/ICEH publications at the International Ophthalmic Nurses' Association Conference 1999**

Photo: Sue Stevens

# Corneal Ulcer: Diagnosis and Management

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## Introduction

Corneal scar is a significant cause of visual impairment and blindness in the developing world. Corneal infections are responsible for a large proportion of this scarring. A review of the data on indications for corneal transplantation in the developing world revealed that corneal scar was the most common indication (28.1%), of which keratitis accounted for 50.5%. Besides this, about 12.2% of all grafts were done for active infectious keratitis.<sup>1</sup> Thus suppurative keratitis and its complications constitute important causes of ocular morbidity, particularly in the developing world.

Almost any organism can invade the corneal stroma if the normal corneal defence mechanisms, i.e., lids, tear film and corneal epithelium are compromised. While viral infections are the leading cause of corneal ulcer in the developed nations (with *Acanthamoeba* infection in contact lens wearers), bacteria, fungi and *Acanthamoebae* are important aetiological agents in the developing world. The spectrum of corneal pathogens shows a wide geographical variation. At L V Prasad Eye Institute, Hyderabad, 71.9% of all cases of ulcerative keratitis were culture positive. Of the culture positive cases 63.9% were bacterial, 33% were fungal, 2.1% were parasitic, and 6.2% were due to mixed infection. Various organisms isolated from cases of infectious keratitis are shown in Table 1.

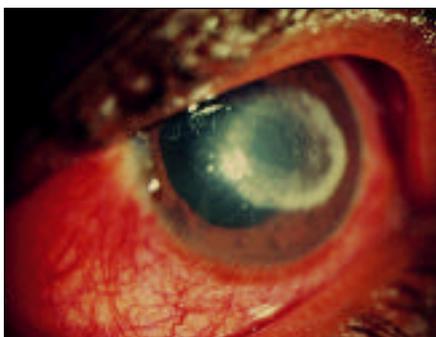


Fig.2. Ring infiltrate in fungal keratitis

Photo: P Garg & G N Rao

In this article we focus on the diagnosis and management of suppurative corneal ulcer.

## Diagnosis

A detailed history and thorough clinical examination using the slit-lamp biomicroscope are important steps in the diagnosis of corneal ulcer. Although clinical signs may be insufficient to confirm infection, a break in the continuity of the epithelium associated with underlying stromal infiltrate should be considered infectious unless proved otherwise. Similarly, there are no distinctive or exclusive signs to identify the responsible organisms, but clinical experience and careful slit-lamp examination can point toward a probable aetiological diagnosis in some cases. Gram-positive cocci typically cause localised round or oval ulceration with greyish white stromal infiltrates having distinct borders and minimal surrounding stromal haze. Keratitis due to gram-negative bacteria typically follows a rapid inflammatory destructive course characterised by dense stromal suppuration and hazy surrounding cornea with a ground glass appearance. Fungal keratitis is usually characterised by a dry raised slough, stromal infiltrate with feathery edges, satellite lesions, and a thick endothelial exudate. *Acanthamoeba* keratitis is characterised by epithelial irregularities with single or multiple stromal infiltrates in a classical ring-shaped configuration. Severe pain and radial keratoneuritis (i.e., inflammation of the corneal nerves, seen as a whitish outline of the corneal nerves) are also characteristics of *Acanthamoeba* infection.

Since the clinical appearance of suppurative keratitis depends on many variables, it is often difficult to arrive at an aetiological diagnosis based entirely on slit-lamp examination. For example, apart from *Acanthamoeba* keratitis (Fig.1), the ring-shaped infiltrate can be seen in fungal keratitis (Fig.2), HSV (herpes simplex) keratitis, and even in *Pseudomonas* keratitis. Similarly, *Nocardia* keratitis presents classically with multiple small white infiltrates arranged in a wreath pattern (Fig. 3), and it can have fine filaments extending into the surrounding cornea, similar to fungal keratitis. Pain out of proportion to the size of infiltrate and radial keratoneuritis, classically described for contact lens-related

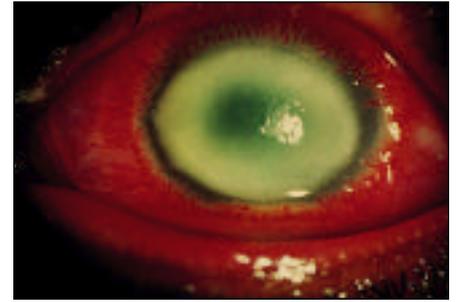


Fig.1. Ring infiltrate in *Acanthamoeba* keratitis

Photo: P Garg & G N Rao

*Acanthamoeba* keratitis, is rarely experienced in non-contact lens related *Acanthamoeba* keratitis. The clinical picture is often confused if the lesions are peripheral, or advanced involving the entire cornea (Fig. 4). Laboratory investigations are therefore required if the causative organism is to be identified.

## Laboratory Investigations

The laboratory procedures used in the diagnosis of infectious keratitis are based on:

- direct visualisation of organisms in the material.
- inoculation of material under appropriate conditions to allow multiplication of organisms.

Whenever a patient with infectious keratitis presents, after detailed clinical examination, corneal scrapings are taken under topical anaesthesia using a sterile No. 15 Bard Parker blade. Scrapings are taken from the edges and base of the ulcer (see Appendix). The material obtained is examined microscopically using Gram's (see Appendix) and Giemsa staining methods and potassium hydroxide 10% or calcofluor white preparation. Calcofluor white is a fluorescent dye and requires a fluorescent microscope. Lactophenol cotton blue stain may also be used which does not require a fluorescent microscope (see Appendix). The material is also inoculated on various solid and liquid media that facilitate the

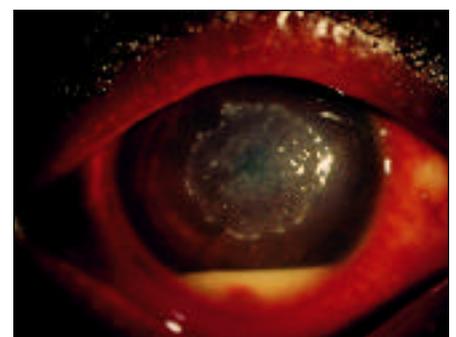
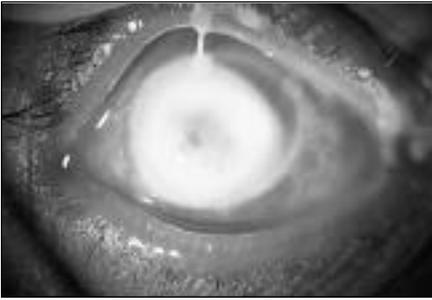


Fig.3. *Nocardia* keratitis with multiple pin-head infiltrates and hypopyon

Photo: P Garg & G N Rao



**Fig.4. Corneal destruction due to *Pseudomonas* infection**

Photo: P Garg & G N Rao

growth of bacteria, fungi, and *Acanthamoeba*. These include fresh blood agar, chocolate agar, Sabraud's dextrose agar (SDA), non-nutrient agar with an overlay of *Escherichia coli*, thioglycolate broth and brain heart infusion broth (Fig. 5). These media are incubated under appropriate atmospheric conditions and are examined daily for growth for at least seven days before a negative report is given. The growth on media is then identified and where appropriate is subjected to an antimicrobial susceptibility test. Micro-

scopy using Gram's staining method and potassium hydroxide (KOH) preparation is simple and quick to perform and often gives useful information for initial medical management. Culture and sensitivity, on the other hand, require more sophisticated facilities.

Although the ophthalmic literature uniformly recommends that microbiological investigations must be performed in all cases of infectious keratitis, these procedures require investment of a certain amount of time and expense by the ophthalmologist, the patient and ultimately the medical system in general. A survey of community ophthalmologists in southern California showed that less than 20% of corneal ulcers were treated in accordance with textbook recommendations.<sup>2</sup> Another study found that less than 4% cases required a change in initial antibiotic therapy based on an inadequate clinical response.<sup>3</sup> It has also been documented that there may be poor correlation between *in vitro* antimicrobial sensitivity and *in vivo* clinical response. Consequently, there is some controversy over the routine use of microbiological investigations (including antimicrobial sensitivity testing) in the management of suppurative keratitis. Based on the experience gained at the L V Prasad Eye Institute and a relatively higher incidence of fungal keratitis (33%) in the tropical climate, we are of the opinion that microscopic examination of corneal scrapings using Gram's staining techniques and KOH (10%) preparation can provide useful guidance for initial therapy in a case of suppurative keratitis.

## Treatment

When treating a patient with suppurative keratitis the clinician has 3 management options:

1. Complete microbiological work-up of all ulcers, followed by initial therapy based on the smear results;
2. Empirical therapy (based on previous clinical experience) with one or more commercially available broad spectrum antimicrobial agents; or
3. Microbiology work-up of severe ulcers where the history or clinical findings suggest an atypical non-bacterial pathogen.

It is clear that option 1 is the best approach for the tertiary referral practice, because most of the ulcers are severe or caused by unusual or resistant organisms that have failed to respond to initial therapy. However, there is a lot of confusion regarding the best option for community

ophthalmologists. A large proportion of suppurative keratitis is caused by bacteria (64%), most of which are sensitive to broad spectrum antibiotics. It is reasonable, therefore, to assume that in small lesions that are away from the visual axis and not associated with risk factors for unusual organisms, initial treatment may be started with a broad spectrum antibiotic at frequent intervals. These patients, however, need close daily follow up to make sure the lesion is improving. At the earliest evidence of deterioration the ulcer should be subjected to a detailed microbiology work-up or referred to a centre where such facilities exist.

Treatment with a commercially available antibiotic that has a broad spectrum of activity against gram-negative and gram-positive organisms, such as ciprofloxacin or ofloxacin, seems to be the least expensive first approach. However, there is a risk of development of resistance particularly with ciprofloxacin.

Microbiological investigations should always be done for the following cases.

- Severe ulcers (a rapidly progressing infiltrate which is more than 6mm in diameter or involves deeper stroma or associated with imminent or actual perforation).
- Cases where history and clinical examination suggest unusual non-bacterial pathogens.

Initial treatment in these cases should be based on the microscopic examination.

Initial treatment in fungal keratitis is usually started with natamycin (5%) suspension administered half hourly. Various antifungal agents used in the treatment of keratitis are shown in Table 2.

For *Acanthamoeba* keratitis, treatment is usually started with polyhexamethylene biguanide (PHMB) 0.02% or chlorhexidine 0.02% (Table 3). Antifungal and anti-*Acanthamoeba* therapy is started only when microbiological evidences exists.



**Fig.5. Various culture media used in laboratory diagnosis of microbial keratitis**

Photo: P Garg & G N Rao

**Table 1: Various Isolates from Cases of Infectious Keratitis. L V Prasad Eye Institute: January 1991 – December 1998 (n=2655)**

<b>Bacteria: n=1689</b>	
Gram positive cocci	
<i>Staphylococcus epidermidis</i>	32.4%
<i>Staphylococcus aureus</i>	7.6%
Other staphylococci	4.0%
<i>Streptococcus pneumoniae</i>	13.1%
-haemolytic streptococci	5.3%
Other streptococci & micrococci	1.6%
Gram positive bacilli	
<i>Corynebacterium</i>	13.9%
<i>Bacillus</i>	1.2%
<i>Nocardia</i>	1.7%
<i>Mycobacterium</i>	0.4%
<i>Propionibacterium</i>	1.2%
Gram negative bacilli	
<i>Pseudomonas</i>	11.1%
<i>Enterobacteriaceae</i>	1.7%
<i>Moraxella</i>	1.4%
<i>Aeromonas</i>	0.4%
<i>Acinetobacter</i>	0.7%
<i>Haemophilus</i>	0.8%
<b>Fungi: n=893</b>	
<i>Aspergillus</i>	33.0%
<i>Fusarium</i>	35.1%
Dematiaceous fungi	14.4%
Other hyaline fungi	16.4%
<i>Candida</i>	1.0%
<b>Parasites: n=73</b>	
<i>Acanthamoeba</i>	100%

**Table 2: Antifungal Agents used in Keratitis**

<b>Polyenes</b>
Nystatin
Amphotericin B
Natamycin
<b>Pyrimidines</b>
Flucytosine
<b>Imidazoles</b>
Clotrimazole
Miconazole
Ketoconazole
Fluconazole
Itraconazole

Modification of therapy is primarily based on clinical response to initial therapy and is guided by the results of culture and sensitivity tests.

### Supplementary Treatment

Cycloplegic agents such as atropine sulphate 1%, homatropine 1% or cyclopentolate 1% instilled three times a day reduce ciliary spasm and produce mydriasis, thereby relieving pain and preventing synechiae formation. Anti-glaucoma agents are used when intraocular pressure is high.

If required, oral analgesics for pain may be used.

The role of topical corticosteroids in the management of suppurative keratitis is controversial and hence they are best avoided.

Simple debridement of necrotic debris in conjunction with intensive topical therapy may help facilitate drug penetration especially of anti-fungal agents.

Tissue adhesive using N-butyl cyanoacrylate with a bandage contact lens is useful in cases with marked thinning or perforation less than 2mm.

Penetrating keratoplasty is performed in cases with advanced disease at presentation where there is no response to medical therapy or when a large perforation is present.

### Prevention

Although not always a preventable disease, certain steps may help reduce the potentially severe consequences of suppurative keratitis.

- Community awareness of risk factors for suppurative keratitis such as minor trauma and the use of contaminated traditional eye solutions in the eye
- Early recognition and institution of appropriate therapy by community health workers or ophthalmologists
- Prompt referral of advanced cases to tertiary eye care centres

**Table 3: Anti-Acanthamoeba Agents used in Keratitis**

<b>Antiseptic biocides</b>
Chlorhexidine
PHMB
<b>Aminoglycosides</b>
Neomycin
Paromomycin
<b>Diamidines</b>
Dibromopropamide
Hexamidine

Suppurative keratitis is a sight-threatening disorder. Early clinical suspicion, rational use of laboratory diagnostic procedures and appropriate therapy can go a long way towards reducing ocular damage from this disorder.

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## Herpes Simplex Virus Keratitis

Herpes simplex virus infection is an important cause of corneal scarring and visual impairment. The clinical features and treatment of herpetic corneal ulceration were the subject of an early edition of the Journal (*J Comm Eye Health* 1990; **3**: 1-4).

Herpes simplex virus is found worldwide, sometimes with devastating

effects (see photos), although Drs Garg and Rao rightly indicate that in developing countries other causes of corneal ulceration are relatively more common.

The subject of herpes simplex virus keratitis is not addressed in this particular issue of the Journal.

**Editor.**



*Herpes simplex virus keratitis (and stomatitis) in an African child*

Photos: John Sandford-Smith

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*Dr Masresha Abuhay, Dean of Gonder Medical College, Ethiopia received a copy of Community Eye Health from the Editor's son, David McGavin*

Photo: James Moulton

## Corneal Scrape

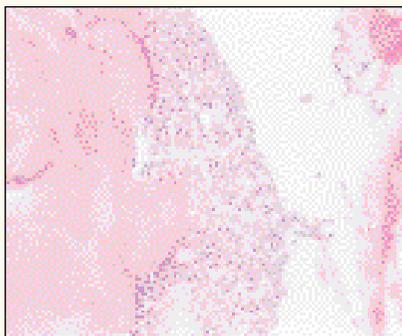
1. The procedure is explained to the patient.
2. The patient is positioned comfortably at the slit-lamp.
3. The patient must be instructed to keep both eyes open during the procedures as blinking will only add to discomfort.
4. Local anaesthetic eye drops are instilled to the affected eye to minimise ocular discomfort and facilitate the corneal scraping procedure.
5. A sterile platinum loop or a sterile needle is used to scrape the base of the ulcer with care. This is to ensure that the infective material is reached as the micro-organisms may lie deep or at the edge of the ulcer.
6. The collected material is plated on the growth media and/or carefully spread on a glass slide. The area around the material is marked with a permanent marker if a Gram staining test has been requested.
7. At the end of the procedure, the patient is given instruction in appropriate care, i.e., handwashing, lid hygiene and instillation of an antibiotic.
8. All specimens are clearly and correctly labelled before being sent to the microbiological laboratory.

**Ramesh Seewoodhary BSc**

## Gram Stain

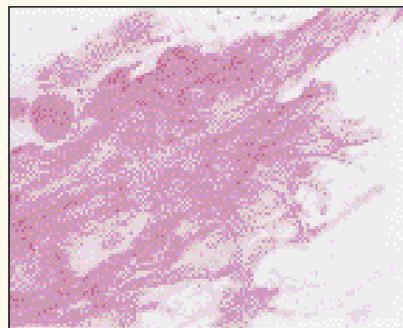
This is by far the most important staining method in bacteriology. It is a staining technique which is employed for the diagnostic identification of a wide variety of organisms. The mechanism of the Gram stain is not fully understood beyond the identifiable differences in cell wall characteristics between those organisms classified as 'Gram +ve' and those classified as 'Gram -ve'. The Gram +ve organisms are able to retain basic dyes at a higher concentration than the Gram -ve species. Probably, the most important difference is in the permeability of the cell wall during the staining process.

Following staining with crystal violet and treatment with iodine, a dye-iodine complex is formed within the cell. This is insoluble in water but moderately soluble in acetone (or alcohol) which



**Gram +ve cocci (*Pneumococcus*)**

*Photo: Melville Matheson*



**Gram stain may show fungal hyphae**

*Photo: Melville Matheson*

is used as a decolouriser. Under the influence of the decolouriser the dye-iodine complex (blue/black in colour) is retained by the Gram +ve group of organisms but flows freely from the Gram -ve group. Presumably, this is due to the former having a less permeable cell wall. The Gram -ve group can now assume the colour of the chosen counter-stain to distinguish between the two groups.

### Melville Matheson BSc

Air dried smear

Heat fixation

Crystal violet (1–2 minutes)

Rinse in gently flowing water

Iodine (1–2 minutes)

Rinse in gently flowing water

Acetone (approx' 2 seconds)

Rinse in gently flowing water

Dilute (1:10) carbol fuchsin  
(1–2 minutes)

Gently blot dry before examination by  
light microscopy

☆ ☆ ☆

## Preparation of Lactophenol Cotton Blue Slide Mounts

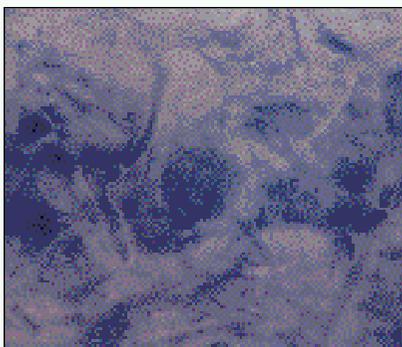
The lactophenol cotton blue (LPCB) wet mount preparation is the most widely used method of staining and observing fungi and is simple to prepare. The preparation has three components: phenol, which will kill any live organisms; lactic acid which preserves fungal structures, and cotton blue which stains the chitin in the fungal cell walls.

### Procedure for corneal scrape material:

1. Place a drop of 70% alcohol on a microscope slide.
2. Immerse the specimen/material in the drop of alcohol.
3. Add one, or at most two drops of the lactophenol/cotton blue mountant/stain before the alcohol dries out.
4. Holding the coverslip between forefinger and thumb, touch one edge of

the drop of mountant with the coverslip edge, and lower gently, avoiding air bubbles. The preparation is now ready for examination.

**Astrid Leck PhD**



**Fungal hyphae in corneal tissue stained by lactophenol cotton blue**

*Photo: Philip Thomas*

# Transmission and Control of Infection in Ophthalmic Practice

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## Introduction

Eye infection may be bacterial, viral, chlamydial, fungal or acanthamoebic, and these infections account for a large proportion of the workload in ophthalmic centres.<sup>1</sup> Cross-infection may occur through contaminated instruments, hands, communal towels and droplets. Patients with dry eye or inadequate lid closure are more susceptible. Other risk factors are low immunity, malnutrition, general disease and extremes of age.<sup>2</sup>

An overview of some common eye infections, causative pathogens and spread mode is given. This is followed by an outline of general infection control principles with additional specific considerations for ophthalmic practice.

## Common Eye Infections and Spread Mode

*Conjunctivitis* may be bacterial, viral or chlamydial and is a common cause of unilateral or bilateral infected red eyes.

- Bacterial conjunctivitis, usually caused by *Staphylococcus aureus*, is more common in children. The signs and symptoms are sticky, purulent discharge, foreign body sensation, with peripheral conjunctival redness. The pupils are normal and the cornea is clear. The visual acuity is usually unaffected unless there is corneal complication. Bilateral purulent discharge in the newborn requires urgent referral as this may indicate infection with *Neisseria gonorrhoeae* or possibly *Chlamydia*. The patient and

parental sexual partners must be examined and treated by a specialist health-care worker as soon as possible. *Neisseria gonorrhoeae* infection may result in loss of sight if treatment is delayed.

- Viral conjunctivitis is bilateral and more contagious with redness developing acutely in one eye first, followed some days later in the second eye. Adenovirus types 8 and 19 can cause kerato-conjunctivitis and subsequent blurring of vision. Other strains may be associated with upper respiratory tract infection. Signs include serous discharge, tarsal follicles, swollen lids and tender pre-auricular nodes. Patients should not attend work or school until infection has cleared, over 1–3 weeks.<sup>3</sup>

Other viral infections include herpes simplex, varicella zoster and molluscum contagiosum.

Herpes simplex conjunctivitis may be present together with a dendritic corneal ulcer. Varicella zoster conjunctivitis occurs secondarily to ophthalmic shingles. Molluscum contagiosum is commonly associated with a mild, but chronic, follicular conjunctivitis and superficial keratitis, which does not respond to antibiotics. Measles and mumps are also causes of conjunctivitis.

**Blepharitis** (inflammation of the eyelids) tends to run a chronic course and may occur together with conjunctivitis because the structures involved are anatomically joined.



*Lid scrubs are essential for blepharitis management*

Photo: Pak Sang Lee

Staphylococci and propionibacteria are common pathogens. In the USA *Staphylococcus epidermidis* is more commonly isolated in patients with blepharitis (95.8%) than *Staphylococcus aureus* (10.5%).<sup>4</sup> Signs and symptoms are red, crusty lid margins, mild lid swelling, itchiness, dry sensation and occasional lacrimation. Vision is normal unless the cornea becomes involved. The condition commonly occurs in unhealthy environments or in those with skin problems. Daily lid 'scrubs' and a healthy diet are essential in managing this chronic disorder. A course of antibiotic eye ointment may be prescribed.

Infection may have a profound effect on the patient's general health as well as damaging sight. The healthcare worker must be aware of the sequence of events in the transmission of infection. Figure 1 shows a possible chain of infection leading to acute conjunctivitis.

Table 1 shows how some viruses can be transmitted in a healthcare environment (see also reference below to adenoviral infection in ophthalmic practice).

In addition, patients with an eye infection need to be given clear instructions as well as appropriate medication to encourage recovery. This may be supported with a written advice sheet. Box 1 gives the necessary information. This could be reproduced as an individual handout or for notice board display in the clinic.

### Box 1: Instructions for Patients with Eye Infection

#### Remember:

#### • Eye infection is easily passed to others

#### DO!

- wash hands before and after instilling eye medication
- use only the drops or ointment prescribed
- wash the face frequently, especially before instilling medication
- wear sunglasses, if available, to provide comfort
- eat a healthy diet to aid recovery
- return to the health centre if the eye does not improve
- destroy medication when the infection clears

#### • Flies will be attracted to sticky eyes

#### DO NOT!

- do not touch or rub the eyes
- do not touch the lids or lashes with the dropper or applicator
- do not share face cloths or towels
- do not wipe the face with clothing
- do not cover the eye with a dressing
- do not go to work or school until the infection clears
- do not store medication in direct sunlight or within reach of children
- do not share medication with others

## General Principles of Infection Control

In many western hospitals, in recent years, the appointment of an Infection Control Officer (usually a nurse) has become commonplace. This highlights the significance and challenge of infection control within clinical areas. Indeed a considerable number of infections are actually acquired within a hospital setting.

### • Personal hygiene and clothing

All healthcare workers of all disciplines have responsibility for infection control and this begins with their own personal hygiene. Individuals with any infection should not have direct patient contact. Any infected or potentially infected lesion must be covered with an occlusive dressing and reported to the person-in-charge who will decide if the staff member should take sickness leave until the infection has cleared.

Clothing should be changed daily. Studies have shown that hospital uniforms, over the course of a day, become a source of bacterial infection.

Jewellery, including wristwatches, should not be worn and fingernails should be kept clean and cut short. Clothing worn in the operating theatre must not be worn in other areas. Hair must be kept clean and covered. Beards are a source of infection. Face-masks must be worn properly to cover the nose, mouth and chin completely, changed for each operation and disposed of carefully. Cotton masks must be washed before re-using.

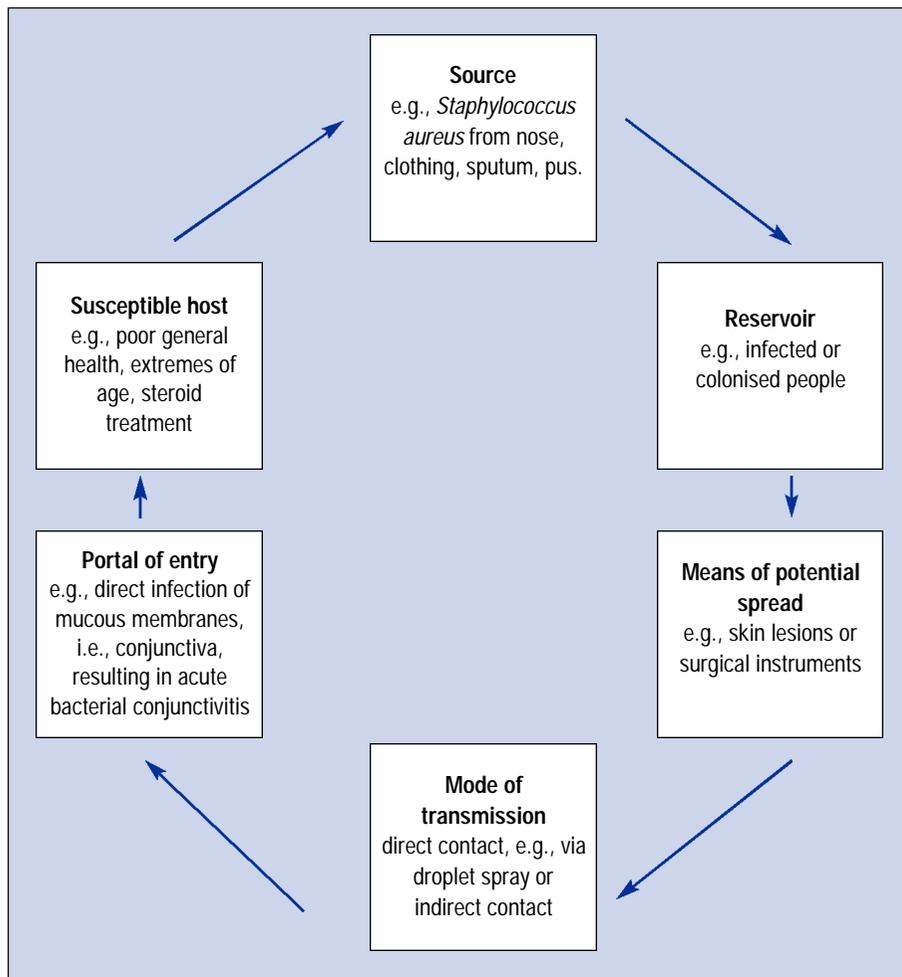


Figure 1: Possible Chain of Eye Infection

### • Handwashing

Hands are the most important ‘instruments’ of healthcare workers and also the principal source of cross-infection in a healthcare setting.

Handwashing is the **most important** of all infection control measures, yet it is usually performed inadequately. Both technique and frequency are important – see Boxes 1, 2 and 3.

### • Gloves

The proper use of gloves prevents cross-infection between patient and healthcare worker and vice versa. Despite the risk to self, a study in Nigeria showed that the main reason for non-compliance in wearing of gloves by healthcare workers with direct patient contact was because the practice was considered unnecessary.<sup>5</sup>

Gloves should be worn on both hands whenever there is potential contact with blood and other body fluids. The wearing of gloves is recommended for all eye surgery. For many years it was accepted that some ophthalmic surgeons chose not to wear gloves because of reduction in touch sensitivity but this practice is no longer an option because of the risk of HIV and hepatitis B infection. A new, sterile pair of gloves should be worn for each patient contact.

Good quality gloves may be re-sterilized but should be checked for damage – e.g.,

Table 1: Viruses that can be Transmitted in a Healthcare Environment	
Virus	Transmission
Varicella zoster	Direct personal contact Droplet Airborne
Herpes simplex type 1	Direct contact with carrier saliva
Cytomegalovirus	Excreted in saliva and urine Transmitted by close contact, droplet spray and kissing
HIV	Body fluids: <ul style="list-style-type: none"> <li>• blood</li> <li>• semen</li> <li>• breast milk</li> <li>• vaginal secretions</li> <li>• synovial fluid</li> <li>• cerebrospinal fluid</li> </ul>
Rubella	Direct or indirect personal contact Droplet Crosses the placental barrier infecting and damaging a growing foetus

Adapted from: Daly J. Biological Hazards. *Nursing Standard* 1998; 13 (3):43–46



**The correct wearing of caps, masks and gloves is important for control of infection**

Photo: Murray McGavin

by filling with water, turning inside out and allowing to dry before re-sterilizing.

An adequate supply of gloves should always be available.

Allergy and sensitivity to the latex material is currently being widely discussed.

### • Waste, spillages, linen and sharps disposal

All clinical waste must be disposed of carefully. Soiled dressings and surgical remnants must be burned immediately. Soiled linen must be removed immediately and washed separately from routine changes of bedding, etc.

Disposable needles must be disposed of immediately after use, and separately in a closed impenetrable container, appropriately labelled. This may be burned or buried, preferably daily. Therefore, a small container is better than a large one.

### Box 2: Handwashing Technique

- Wet hands with clean, preferably running water
- Apply soap or cleanser
- Rub palm to palm
- Rub right palm over back of left hand
- Rub left palm over back of right hand
- Rub palm to palm with fingers interlaced
- Rub backs of fingers on opposing palms with fingers interlocked
- Rub around right thumb with left palm
- Rub around left thumb with right palm
- Rub around fingers of right hand with palm of left hand
- Rub around fingers of left hand with palm of right hand
- Rinse off soap thoroughly with clean, preferably running water, before drying well

N.B. Disposable paper towels are ideal but if a communal towel only is available for drying hands a clean one must be provided daily. Hot-air hand dryers are not recommended!! This is known as **social handwashing** and will take no longer than 30 seconds and is required before and after routine procedures in clinical areas.

**Hand hygiene/disinfection**, using the same technique, is achieved by using an antiseptic for 15–30 seconds and is necessary in the event of known infection, before aseptic procedures, and following contact with blood and body fluids.

**Surgical hand-scrubbing** includes washing the hands and forearms and nail brushing, requiring a minimum of 5 minutes *scrubbing* and a defined technique to remove micro-organisms before participating in invasive surgical procedures. It is an acquired skill needing supervised practice.

### Box 3: Handwashing is Required in the Following Situations:

- Before any aseptic procedure
- Before and after handling any patient
- After handling any soiled item
- Before and after handling food
- Whenever hands are, or even feel, soiled
- When entering or leaving a clinical area
- After using the toilet

If an accident occurs, i.e., a prick with a used needle or sharp instrument, the wound should be allowed to bleed freely for a few minutes, then washed with soap under running water and covered with a sterile dressing. The HIV and hepatitis status of the patient, on whom the needle was used, should be noted. The incident must be reported to the person-in-charge and the injured worker examined by a medical practitioner.

Needles should not be used more than once but if this is not possible it is essential that proper sterilization procedures are followed.<sup>6</sup> Needles, used for the removal of corneal foreign bodies, etc., must not be left on the slit-lamp table top!

Spillages of body fluids must be wiped with disposable paper tissue or cloth, which must then be burned, and the surface cleaned immediately with detergent and water. Heavy-duty gloves should be worn when disposing of any waste material and cleaning after spillages.

### • Environment and equipment

Patients expect, and have a right, to be cared for in a clean, safe environment and all healthcare workers have responsibility to provide this. Basic cleaning of the hospital environment is a cost-effective method of infection control and must always be a pre-requisite for any subsequent disinfection and sterilizing procedures. The areas/items requiring regular attention are walls

and ceilings (often forgotten or ignored), floors, tables, stools and chairs, shelving and work surfaces.

Disposable healthcare materials appeared on the western market almost 40 years ago with the promise of raised standards, labour-saving practices and guarantee of reduction of infection rates. Some economic situations, however, have encouraged the practice of re-use of disposable items to save money. Recycling must be carefully considered and monitored closely to ensure safety is not threatened.

Where the patients' meals are provided by relatives, care must be taken because contaminated food can contribute to hospital-acquired infection.

### Specific Considerations For Ophthalmic Practice

A separate unit for eye patients is ideal, but where this is not possible care must be taken that patients with open infected wounds, ulcers or bed-sores are not accommodated in the same area as eye patients. Patients with eye infections should be separated from other ophthalmic patients in the ward, especially those who have had eye surgery. If surgery is performed on an infected eye the operation must be scheduled last on the operating list and the theatre cleaned thoroughly afterwards.

### • Hands of the examiner and patient

Eye infection can be spread by healthcare workers through simple social greeting of patients, i.e., shaking of hands. Patients often rub their eyes and contaminated hands will transfer the organism to the healthcare worker. It is important that hands are washed immediately before performing an eye examination and after the patient has left before greeting another patient.

### • Slit-lamp biomicroscope

The areas which come into contact with the patient must be washed with soap solution between patient examinations – chin rest, head rim, not forgetting the hand grips!

### • Tonometer prisms

These should be wiped after use on disposable paper tissue and then placed (tip only) in a small pot of sodium hypochlorite 1% for at least 10 minutes between patients.

**(NOTE: The prism must be rinsed in sterile water and dried before use!!)**

If there is suspected adenoviral infection the soaking must be extended to 30 minutes before re-using the same tonometer prism. A fresh sterile pot and new solution of sodium hypochlorite must be provided for every clinic session.



**Expiry dates on drop bottles must be checked**

Photo: Pak Sang Lee

## ● Occluder/pinhole

This should be stored in a container of sodium hypochlorite 1% for at least 10 minutes between patients, rinsed in sterile water or saline and wiped dry before use. A fresh solution must be provided before each clinic session.

**NB. Sodium hypochlorite causes corrosion – do not use stainless steel containers for the above.**

## ● Eye drops

Ideally, each patient should have his or her own bottle of drops and, where there is known infection, separate bottles for each eye! However, in many situations this may be economically impossible. Care should therefore be taken to avoid eyedropper contact with eyelids, lashes, eyebrows and facial skin. Where possible a single-use dispenser should be used in out-patient examinations. Expiry dates must be checked, as out-of-date drops can be a source of infection.

## ● Pathological specimens

Scrapings of the cornea and conjunctiva may be taken using a disposable sterile surgical needle or blade. If a spatula or loop is used it must be sterilized before and after each procedure by flaming, and allowed to cool. Alternatively, it may be sterilized by chemical soaking.<sup>6</sup>

## ● Eye dressings

An infected eye must never be covered with a pad and/or bandage. Used eye dressings must be disposed of immediately and burned. Eye shields must be washed before being re-applied and, in known infected cases, must not be used on other patients. Cotton wool, gauze swabs or tissues, used when instilling drops or ointment, must be disposed of immediately.

## ● Spectacles

Wearers should be encouraged to wash their spectacles daily.

## Policy

Eye infection can happen anywhere as eyes are particularly susceptible to many organisms including Gram -ve bacilli, adenoviruses, herpes simplex virus and fungi.

Cross-infection is a costly and continuing concern. Multi-resistant *Staphylococcus aureus* (MRSA) has made alarming news worldwide as treatment is very difficult. Lives, as well as sight, have tragically been lost.

Health workers must aim to limit hospital-acquired infection. Lack of motivation and poor microbiological knowledge will

result in non-compliance. Eye staff are advised to develop and teach an appropriate infection control policy with regular reinforcement and review.

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**Good personal hygiene and clean uniforms are important for prevention of infection**

Photo: Sue Stevens

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# Epidemiology in Practice: Screening for Eye Disease

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## Introduction

In the belief that 'prevention is better than cure' there has been widespread enthusiasm for screening populations for illness in its early stage, so that a better outcome can be achieved by more effective intervention. This concept has grown in strength in western populations because of the increasing importance of cancer as a major cause of death. Cancer with its insidious course and natural history which moves from a localised and treatable phase to a widespread and untreatable one is an example of a group of conditions for which screening has been believed to be appropriate. But, even in cancer, important lessons have been learnt about the limitations of screening. The only cancer for which screening is widespread in western nations is that of the cervix. There is still controversy as to its effectiveness and meanwhile, breast cancer screening has only been established in a few countries despite evidence that mammography may reduce mortality in certain sections of the population. There are no widespread or national strategies for screening eye conditions in western populations except for the testing of children's vision. This is usually to detect amblyopia at a stage when treatment is thought still to be effective and, thereafter, at school to identify refractive errors. There is also a general view that it is justified to screen known diabetics for retinopathy, but so far there is no consensus on how it should be done and indeed whether it will be effective in preventing blindness. Studies on both these issues are underway.

## Definitions of Screening

There is much confusion over the use of the term 'screening'. Mass screening, opportunistic screening, case finding, screening

camp and screening tests are all examples of the growing uncertainty. It is useful to apply strict definitions to the term in order to avoid confusion. Screening is a public health intervention intended to improve the health of a precisely defined target population. Within this population are individuals considered at risk of the effects of a condition, and screening is justified by the awareness of that condition as an important public health problem. It is the anticipated identification of those who may have a problem and who might benefit from further investigation and treatment. It therefore involves the application of a quick and simple test, usually by paramedics, to large numbers of normal persons, so that those with a possible problem can be identified. It does not make the final diagnosis.

The importance of this concept is that screening is never something that should be undertaken casually and it should always be carefully monitored and evaluated. Without strict criteria, monitoring is impossible. 'Opportunistic screening' is a concept and a term which should be avoided. In a few circumstances it might be appropriate to test casually for a condition in a patient who has presented with another unrelated condition, but this should rather be called 'opportunistic surveillance'. Similarly, 'screening camps' are misnamed. The term 'screening' here implies an element of uncertainty which should not be acceptable when patients are being identified as possible candidates for surgery, either at the base hospital – or worse, at the camp itself. The tests at such camps have to be diagnostic and precise. If they are not, the outcome of cataract surgery may be poor due to poor case selection. Finally, the use of the term 'screening test' should only be used when the test is being used to separate one group of patients from another, where the individuals who test positive go on to more precise diagnostic investigations.

## Problems with Screening: Coverage

Screening is potentially expensive and it is an intervention which is thrust upon the public rather than a response to an individual seeking help. It must, therefore, be constantly and carefully monitored both for its processes and its effectiveness. **False negative** tests are a constant source of concern and there is often public outrage after such

occurrences. **False positive** tests cause undue anxiety and wasted resources. But for the screening programme to be effective, it must reach a high proportion of the population at risk. Failure to achieve this leads to the failure of the programme to meet its targets. This is measured by **coverage** – the proportion of the target population successfully tested in each screening activity. Keep in mind that it is those often hardest to reach in screening programmes who suffer from the worst disease. In diabetes, for example, it is the bilateral amputee or the resentful/indifferent young diabetic who are the least likely to comply with an invitation for an eye examination – and yet they are the most likely to be in need of treatment.

## The Screening Test: Validity

The ability of the screening test to differentiate between those who are disease free from those who are affected is called the test **validity**. Here the terms **sensitivity** and **specificity** are used and these are easily confused.

- **Sensitivity** is the proportion of disease positive individuals who are detected by the test and hence reflects the important group who are disease positive but not detected by the test – the 'false negatives'. A useful way to remember this is that the 'N' of false Negatives is in the 'N' of 'seNsitivity'.
- **Specificity** on the other hand is the ability of the test to correctly identify those who do not have the disease, the proportion of disease free people correctly labelled as disease free. Thus, this reflects the important proportion of people said to have the disease when they have not – the false Positives; and again remembered by the 'P' in 'sPecificity'. Further reading in public health texts will deal with these for those interested.

## Effectiveness of Screening Programmes: Costs

These are all measures of the process of screening. More important ultimately is evidence of the **effectiveness** of screening, showing that the screening programme succeeds in reducing morbidity, disability or mortality from the target condition. Thus, for cancer screening, it must be shown that the screening intervention reduces death rates from the particular cancer. Screening for lung cancer with mobile chest x-ray units was discontinued because it failed to show any effect on death rates. In modern cost conscious health economies, it is now necessary that the cost

of screening can be justified by the health gain achieved. In the case of eyes, this means the number of sight years saved and cutting the social costs of failing to prevent loss of sight. To do this it is necessary to draw up a complex model which shows how the benefits compare with the costs. Such models have been successfully constructed for screening diabetics for retinopathy in fully industrialised economies, and it is on the basis of these models that action is now being taken in the UK to develop national strategies for diabetic screening.

In order to construct such models we need detailed epidemiological information on the prevalence and incidence of the condition, the natural history of the disease (including any differential mortality of

those affected), and the effectiveness of treatment. To decide whether the screening will be economically beneficial, it is necessary then to add information on costs of screening, of treatment (including dealing with false positives) and costs of failure to detect and treat. Unfortunately, diabetic eye disease is probably the only ophthalmic condition for which these requirements can be met. Certainly, this is not yet the case for either glaucoma or amblyopia, though much work is ongoing to rectify the situation.

## The Future: Screening for Genetic Disease

With the huge growth of the Human Genome Project, a global endeavour to

sequence the entire human genetic code, screening is about to enter a new era. The potential to identify carriers of genes which may increase susceptibility to a disease (glaucoma for instance) will attract increasing attention and concern of the public. The need to consider ethical, economic and humanitarian factors will greatly increase, in order to prevent wastage of scarce resources, undue anxiety and the potential stigma associated with identified carriers. Unless there is clear evidence that resources for effective intervention are available for all affected individuals, gene testing should remain in the area of research alone.

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## Abstract

### FIVE AGES OF THE SURGEON

- 1 The trainee wants to be a surgeon: enthusiasm and anxiety

**IF ONLY I CAN DO IT!**

- 2 The trainee succeeds; a surgeon is born: the adrenaline flows

**I CAN DO IT!!**

- 3 A few years on, "In my hands, success rate of 98%".  
The confidence of the experienced surgeon; reluctance to let others do the job not so well:

**ONLY I CAN DO IT**

Many surgeons do not progress beyond this stage.

- 4 Then in time, a feeling that something more is needed:

**IF ONLY I CAN DO IT . . .**

then there is a problem when I'm gone.

Perhaps somebody needs to train a few more surgeons . . .

- 5 At last the realisation that training is my responsibility.

Seeing the need and being willing to train others.

**IF I CAN DO IT, SO CAN YOU!!**

The surgeon is 'born again'.

© Dr Brian Savage  
Kilimanjaro Christian Medical Centre  
PO Box 545  
Moshi, Tanzania

## Age over 46 years does not affect the pressure lowering effect of trabeculectomy in primary open angle glaucoma

M C Briggs  
J L Jay

### Background/aims

Previous reports have suggested that the success rate for trabeculectomy is poorer in younger age groups but these studies often have heterogeneous groups representing different types of glaucoma with variable surgical prognosis. Therefore, the relation between age and the success of trabeculectomy in the single diagnostic category of primary open angle glaucoma (POAG) without identifiable risk factors was examined for failure in the age range 46–85 years.

### Methods

The records of 208 patients who had undergone a first trabeculectomy for POAG were examined retrospectively. Age ranged from 46 to 85 (mean 66.7 years). The outcome of surgery was examined at final available follow up and at 1 and 2 years after surgery. Trabeculectomy was considered a success if intraocular pressure was  $\leq 21$  mm Hg with or without additional medical treatment ('cumulative' success) and an 'absolute' success if intraocular pressure was  $\leq 21$  mm Hg without additional medical treatment.

### Results

Cumulative success for trabeculectomy was 92.3% at final follow up and 96.6% at 2 year follow up; absolute success rate was 66.3% at final follow up and 71.6% at 2 years. There was no significant trend for greater success of trabeculectomy in the older age groups (cumulative success at 2 year follow up, <sup>2</sup> for linear trend 1.07 ( $p=0.3$ ) nor was the drop in intraocular pressure following surgery significantly greater with increasing age (analysis of variance for intraocular pressure lowering from presentation to 2 years' follow up (Kruskal-Wallis  $t=5.9$ ,  $p=0.55$ ). Patients with pseudoexfoliation were excluded from the main analysis as these patients have been shown to have a lower final intraocular pressure following trabeculectomy, a finding which was confirmed in this study.

### Conclusion

This study demonstrates that in the age range 46–85 years there is no demonstrable relation between age at the time of surgery and success of trabeculectomy in POAG.

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## Vitamin A Programme in Afghanistan

Dear Sir

Since 1966, the NOOR Eye Institute (NEI), as part of the International Assistance Mission (IAM), has been serving the people of Afghanistan by providing ophthalmic training and eye care. NEI is running 3 eye care programmes based in different parts of Afghanistan: Kabul, Herat and Mazar-i-Sharif and has known for many years that there is a large problem of vitamin A malnutrition. Preliminary survey work has been carried out to examine the extent of the problem. The results, although carried out on a small scale and, therefore, statistically unreliable, are shocking. The problem appears to be far worse than NEI had previously estimated, although the findings are consistent with anecdotal reports from doctors at our hospitals. Other findings from surveys done by international NGOs confirm that the general malnutrition situation in Afghanistan is extremely poor. This survey does not examine the most potentially at risk group, pre-school children.

### School Screening Survey Results (See Table)

Two primary schools were visited from September to November 1997, and the survey was carried out by ophthalmic technician students accompanied by one expatriate ophthalmic nurse.



Corneal scarring after vitamin A deficiency affecting an Afghan boy

Photo: Murray McGavin

School children found showing signs of xerophthalmia were treated immediately with 200,000 I.U. of vitamin A.

NEI has formed a Vitamin A Committee, an action plan for vitamin A intervention and has begun distribution of vitamin A, while actively encouraging other NGOs in Afghanistan to do the same.

NEI seeks to work with concerned organizations to address the serious vitamin A problem in Afghanistan. We invite your comments and input. Please direct your correspondence to the mailing address given below.

**Robert Antonucci**  
**NEI Vitamin A Committee**  
**NOOR Eye Institute**  
**IAM**  
**PO Box 1167**  
**Peshawar, Pakistan**

Screening: Two Primary Schools, Afghanistan		
Age: No of Children	Classification of Xerophthalmia	
7-10 years : 794	X1A	0.6%
	X1B	5.28%
	XN	5.54%
	<b>Total</b>	<b>11.42%</b>
Over 10 years : 149	X1A	0%
	X1B	2%
	XN	4%
	<b>Total</b>	<b>6%</b>
Overall Total All Ages Indicators for Xerophthalmia 10.6%		

## The Global Initiative for the Elimination of Avoidable Blindness – Vision 2020: The Right to Sight

The Global Initiative – Vision 2020: The Right to Sight was officially launched on 18 February 1999 with the endorsement of **Dr Gro Harlem Brundtland**, Director-General, World Health Organization.

The mission of Vision 2020 is to eliminate the main causes of blindness in order to give all people of the world, particularly the millions of needlessly blind, the right to sight by the year 2020.

In the *Journal of Community Eye Health*, Volume 11, 1998, **Dr Bjorn Thylefors**, Director, Disability/Injury Prevention and Rehabilitation, World Health Organization, described the main emphases of the Global Initiative and the significant cooperation with the **Task Force of the Partnership Committee of Collaborating Non-Governmental Organizations**. Other authors who have written for us on the Global Initiative are **Dr R Pararajasegaram**, President, IAPB; **Mr Richard B Porter**, Executive Director, Sight Savers International and **Rev Christian Garms**, Executive Director, Christian Blind Mission International.

Priority needs focus on three broad categories:

**1 Disease Control:** with emphasis on **Cataract, Trachoma** and the 'SAFE' strategy, **Onchocerciasis, Childhood Blindness** and **Refractive Errors and Low Vision**.

**2 Human Resource Development:** stressing the primary health care approach and also the training of ophthalmologists, ophthalmic medical assistants, ophthalmic nurses and medical students.

**3 Infrastructure and Appropriate Technology Development:** developing sustainability in the use of modern technology, provision of eye beds, local production of eye medicines, refraction capability with spectacles and low vision devices and required surgical instrumentation.

The *Journal of Community Eye Health* will continue to invite expert authors in these fields to write in future issues of the Journal.



*Spectacles were of real benefit to this young student in Uganda*

*Photo: Murray McGavin*

The **Sixth General Assembly of the International Agency for the Prevention of Blindness (IAPB)**, in **Beijing, China, 5–10 September 1999**, will support and seek to develop further the programme of Vision 2020: the Right to Sight. For information on the IAPB Sixth General Assembly contact:

**Dr Gullapalli N Rao, L V Prasad Eye Institute, Hyderabad 500 034, India.**

**Tel: 0091 40 215389/248267.**

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**D D Murray McGavin  
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### EPIDEMIOLOGY RESEARCH AWARDS SCHEME

The **International Society of Geographical & Epidemiological Ophthalmology (ISGEO)** has been pleased to announce that, in 1997 **Dr George Jacob** (Papua New Guinea) and, in 1998, **Dr Okello Quinto** (Uganda) received the **ISGEO Start-up Research Grants**.

These grants (up to US\$1,000) are to help people living and working in developing countries initiate small/pilot ophthalmology research projects. Applications are being accepted for 1999 and a copy of the research application form can be obtained from:

**Dr Paul Courtright, ISGEO Secretary  
BC Centre for Epidemiologic & International Ophthalmology  
St. Paul's Hospital  
1081 Burrard Street, Vancouver, BC,  
V6Z 1Y6, CANADA  
Tel: 001-604-806 - 8169  
Fax: 001-604-806 - 8058  
E-mail: pcourtright@stpaulshosp.bc.ca**



### THE ROYAL COLLEGE OF OPHTHALMOLOGISTS DIPLOMA IN OPHTHALMOLOGY EXAMINATION

The Royal College of Ophthalmologists has introduced an examination leading to the award of the Diploma in Ophthalmology (DRCOphth). The examination will be held twice a year, in June and November.

This Diploma is aimed at those not wishing to pursue a career as a consultant ophthalmologist in the United Kingdom. It should, therefore, be of interest to all doctors with an interest in ophthalmology working outside the European Union.

**Details are available from:**

**Examinations Office, The Royal College of Ophthalmologists,  
17 Cornwall Terrace, London NW1 4QW, UK.**

**Telephone: 00 44 (0) 171 935 0702 (extensions 24, 25, 26)**

**E-mail: rco.exams@btinternet.com**