



CANADIAN ASSOCIATION OF OPTOMETRISTS  
ASSOCIATION CANADIENNE DES OPTOMÉTRISTES

# Introduction to Slit Lamp Utilization

Presented by:  
Dr. Allison Scott



1



2

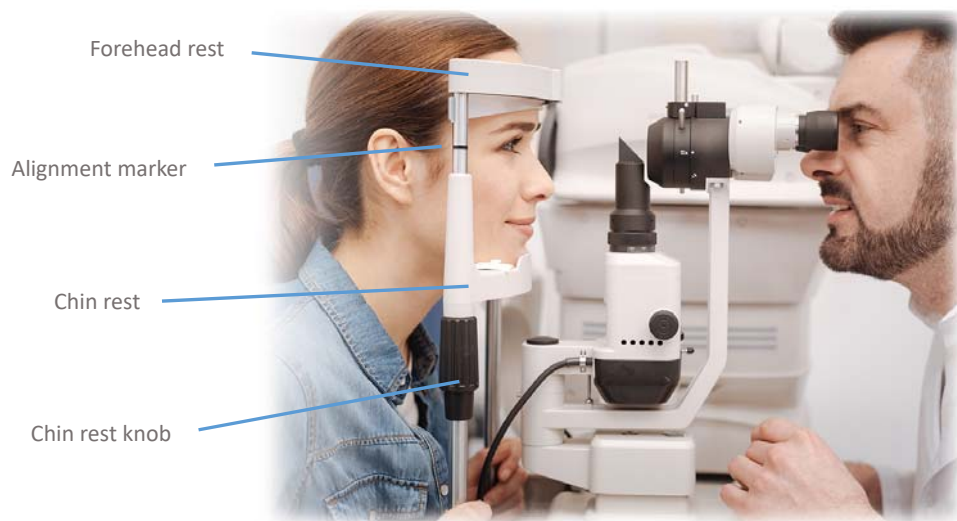
## Slit Lamp Examination

The slit lamp is an essential tool used during the comprehensive eye exam. Made up of a microscope and bright light, it allows the optometrist to examine the different structures of the eye.



3

## Positioning the Patient



4



5



6

## Slit Height and Width



Slit height, filter colour and angle



Slit width

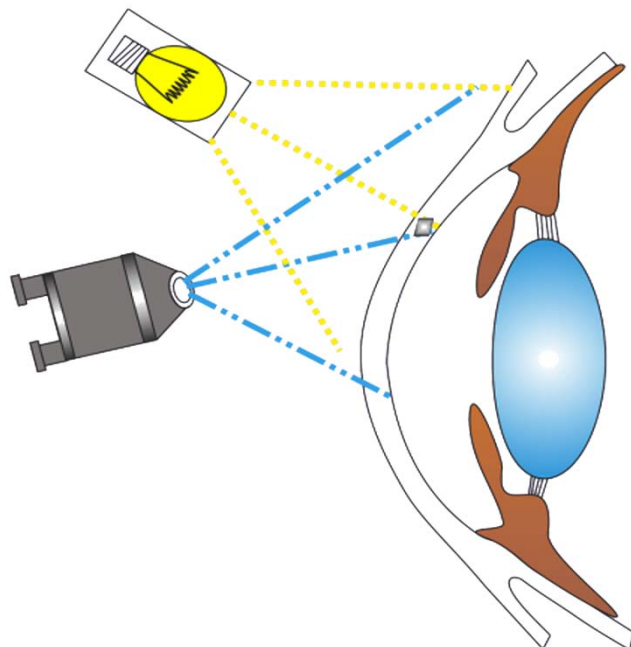
7

## Diffuse Illumination

- Beam Angle: 45°
- Beam height: Max
- Beam width: Max
- Mag: 6-10x
- Illumination: Medium

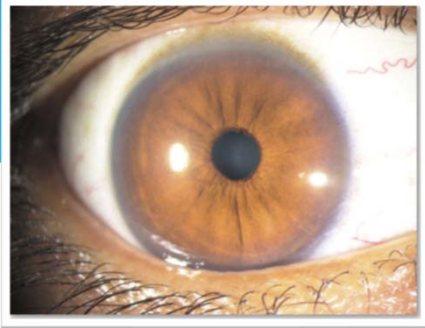
### Used to examine:

- Overview of eye and adnexa
- NaFl can be used to look at FB and defects with cobalt blue filter



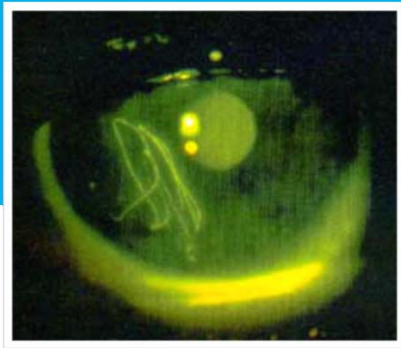
8

## Diffuse Illumination

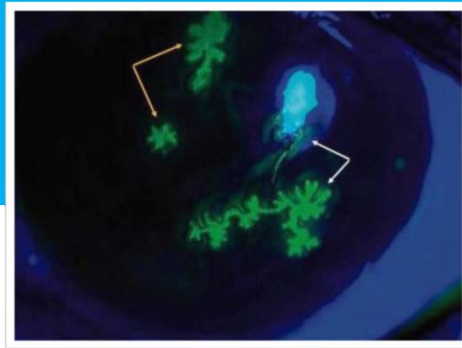


9

## Cobalt blue filter



Photos courtesy of [www.qjmed.oxfordjournals.org](http://www.qjmed.oxfordjournals.org)



Photos courtesy of [www.wickioptik.ch](http://www.wickioptik.ch)

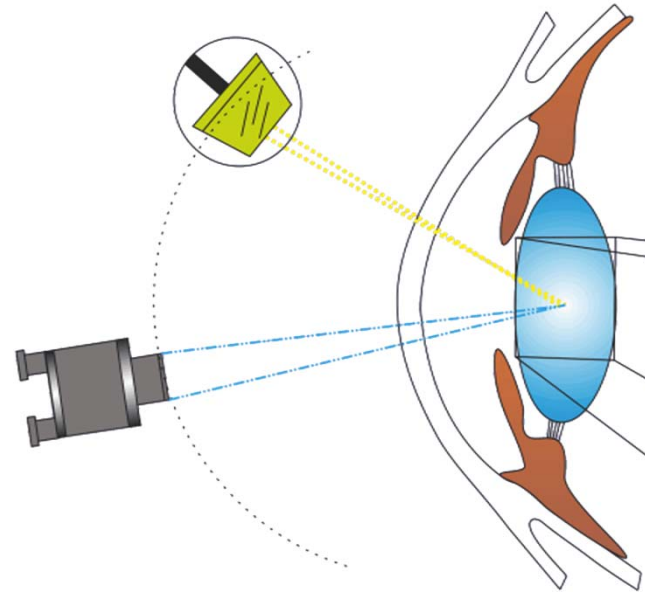
10

## Optic Section

- Beam Angle: 45°
- Beam height: Max
- Beam width: Nearly extinguished
- Mag: 10-16x
- Illumination: Med-Max

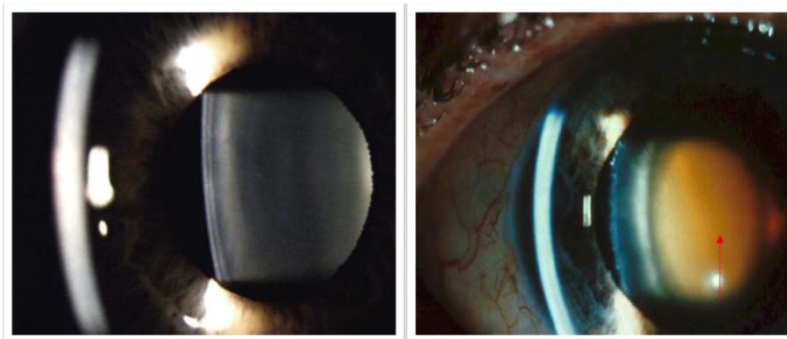
### Used to examine:

- Depth of foreign body
- Stromal thinning
- Layers of cornea
- Anterior chamber depth
- Layers of the lens



11

## Optic Section – The Lens



Clear Lens

Photo courtesy of  
[www.clinicalgate.com](http://www.clinicalgate.com)

Brunescent Cataract

Photo courtesy of  
[www.classconnection.s3.amazonaws.com](http://www.classconnection.s3.amazonaws.com)

12

## Optic Section – The Cornea

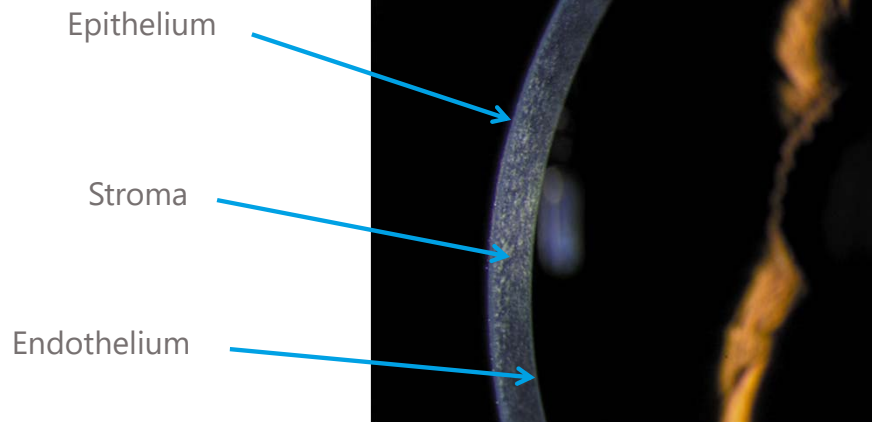


Photo courtesy of: [www.clinicalgate.com](http://www.clinicalgate.com)

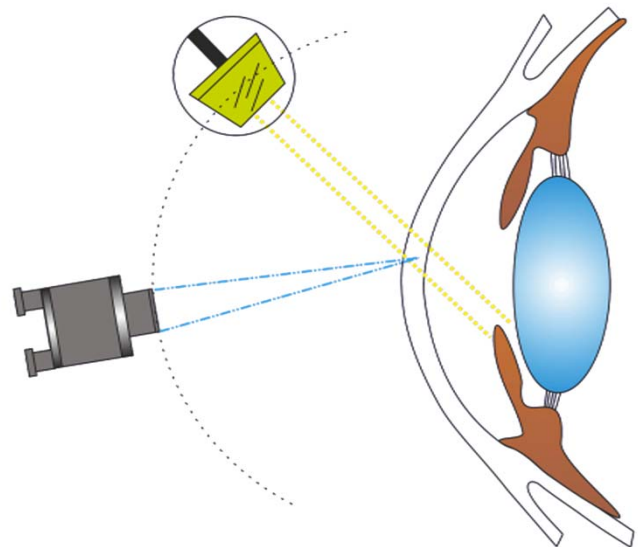
13

## Parallelepiped

- Beam Angle: 45°
- Beam height: Max
- Beam width: 1-2mm
- Mag: 10-16x
- Illumination: Medium

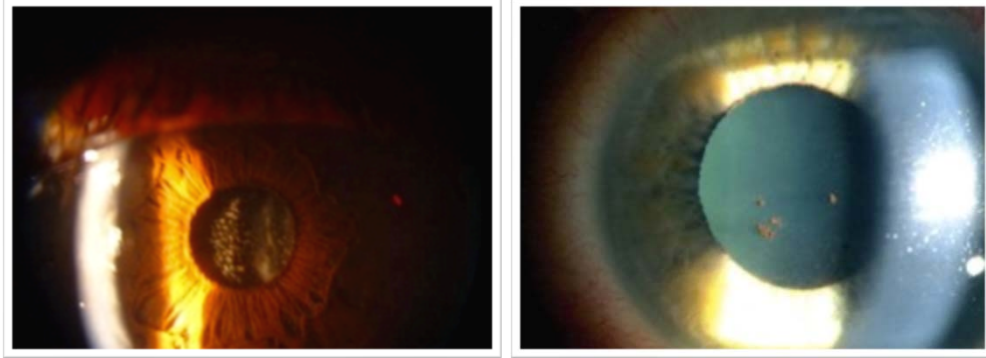
### Used to examine:

- Cornea
- Iris
- Lens



14

## Parallelepiped – The Iris



Photos courtesy of: [www.slideshare.net](http://www.slideshare.net)

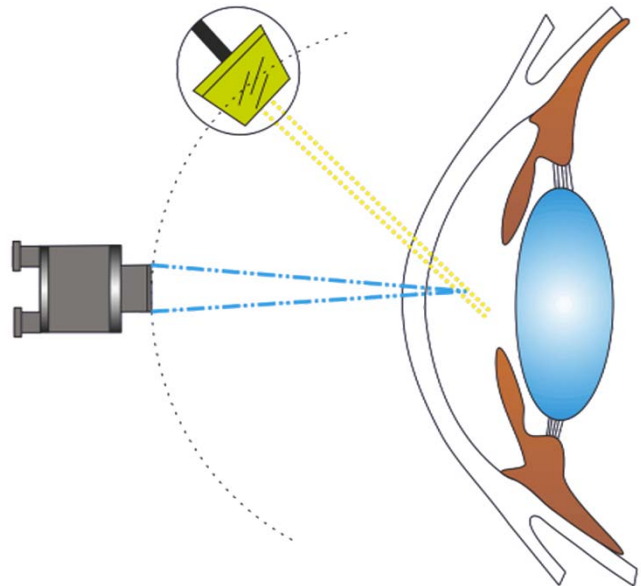
15

## Conical Beam

- Beam Angle: 45°
- Beam height: 1-2mm
- Beam width: 1-2mm
- Mag: 10-16x
- Illumination: Max

### Used to examine:

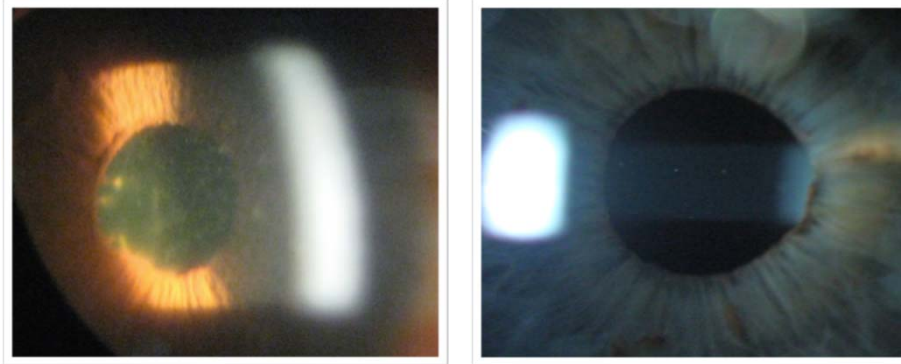
- Inflammatory cells & protein in AC



16



## Conical Beam - Cells & Flare



Photos courtesy of: [www.keeler-symphony.com](http://www.keeler-symphony.com)

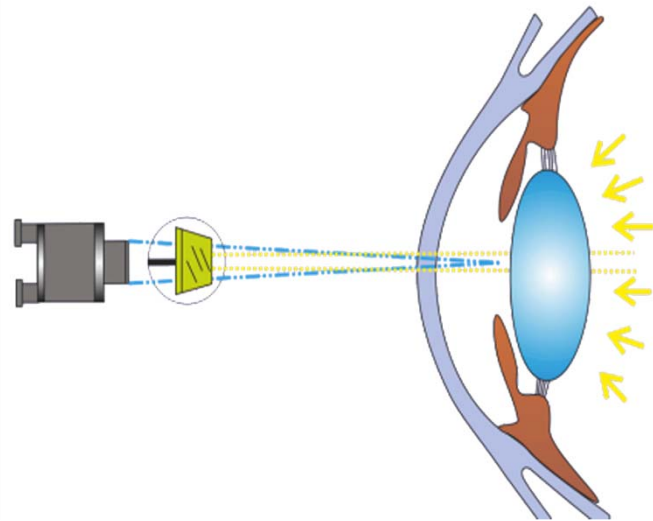
17

## Fundus Retro Illumination

- Beam Angle:  $0^\circ$
- Beam height: 6mm
- Beam width: 1-2mm
- Mag: 6-10x
- Illumination: Med

### Used to examine:

- Lens Opacity



18

## Retro Illumination – The Lens

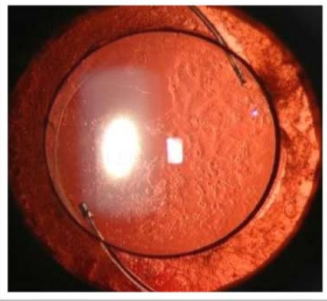


Photo courtesy of  
www.eyerounds.org

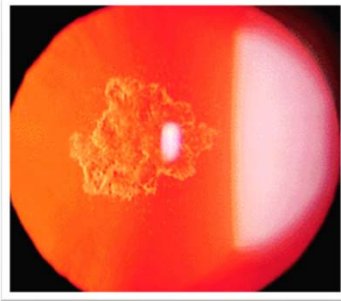


Photo courtesy of  
www.college-optometrists.org

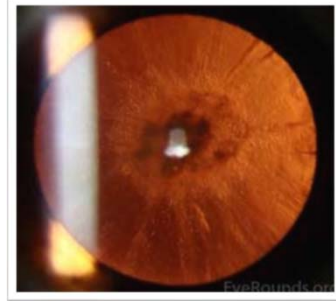


Photo courtesy of  
www.college-optometrists.org

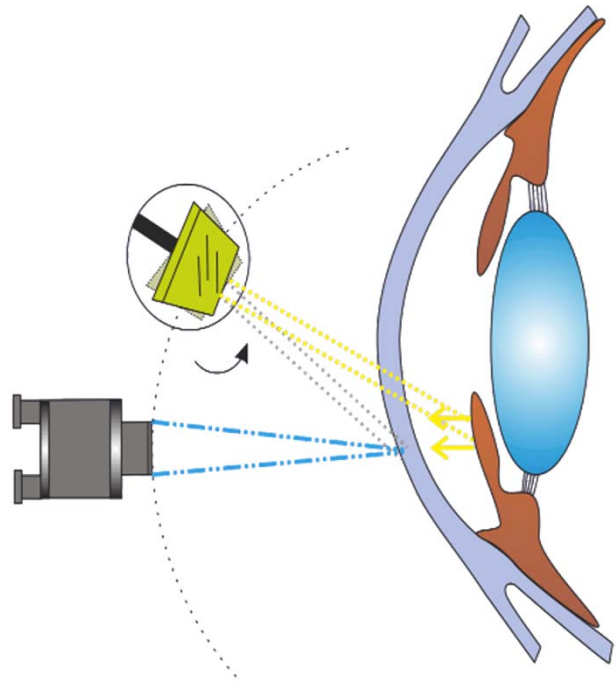
19

## Indirect Illumination

- Beam Angle: 45°
- Beam height: 6mm
- Beam width: 1-2mm
- Mag: 6-10x
- Illumination: Med

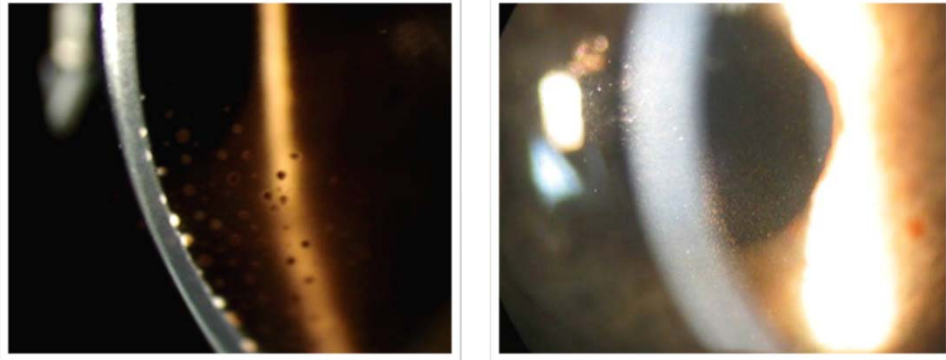
### Used to examine:

- Corneal Opacity
- Endothelium



20

## Indirect Illumination - Cornea



Photos courtesy of: [www.rootatlas.com](http://www.rootatlas.com)

21

## Removing a Foreign Body

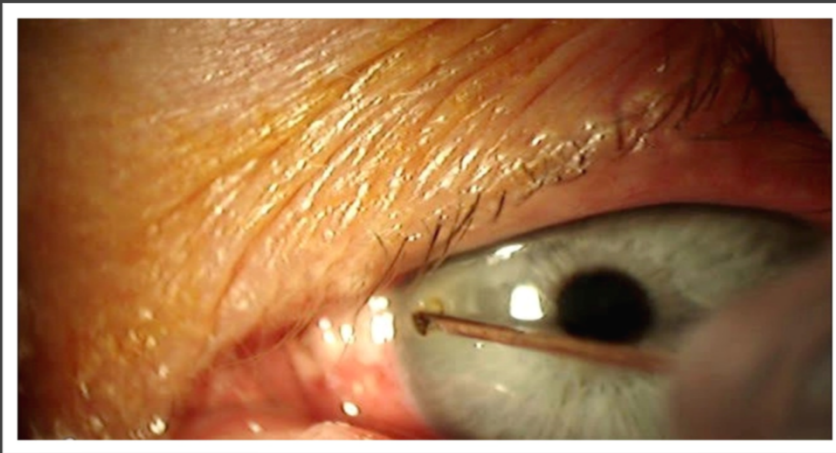


Photo courtesy of: [www.rootatlas.com](http://www.rootatlas.com)

22

## Removing a Foreign Body

### Step 1: Take a careful history

#### What?

- Metal, dust, vegetative matter etc.

#### When?

- Helps with treatment plan after removal (chances of infection, inflammation and rust increase with time)

#### Where?

- Work? Home? Safety glasses?

#### How?

- Helps to determine force of penetration



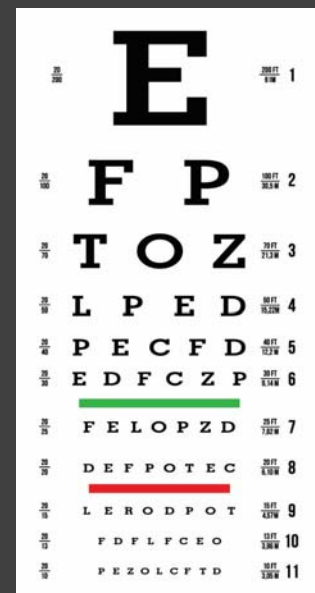
23

## Removing a Foreign Body

### Step 2: Take entering visual acuities

### Step 3: Anesthetize the eye (patient comfort)

- Proparacaine, Tetracaine



24

## Removing a Foreign Body

Step 4: Locate the foreign body

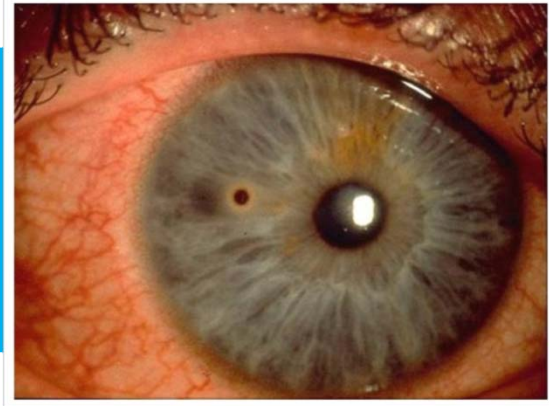
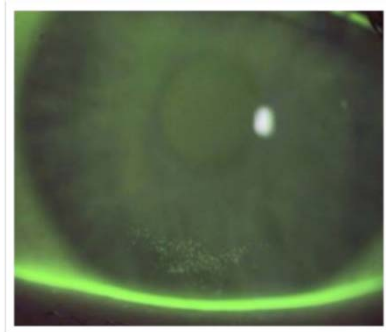


Photo courtesy of: [www.rootatlas.com](http://www.rootatlas.com)

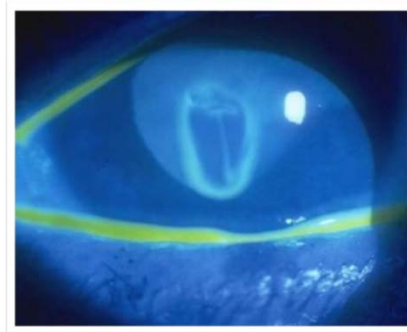
25

## Removing a Foreign Body

Step 5: Check for penetration – Seidel Test



Negative



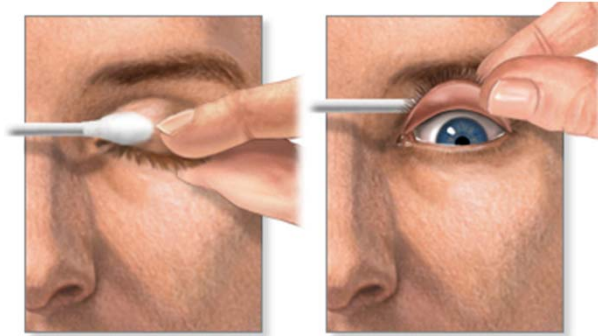
Positive

Photos courtesy of: [www.bauschlomb.com](http://www.bauschlomb.com)

26

## Removing a Foreign Body

Step 6: Invert eyelid to look for trapped foreign body



Twist cotton-tipped  
swab upward

Look downward

Photos courtesy of: keckmedicine.adam.com

27

## Removing a Foreign Body

Step 7: Choose your removal instrument

- Magnetic spud
- 25-gauge 5/8" needle
- Jeweler's forceps



Photo courtesy of: www.alf-img.com

28

## Removing a Foreign Body

### Step 8: Take a Tangential Approach

- Always approach the foreign body tangentially to avoid corneal perforation



Photo courtesy of: [www.iyting.com](http://www.iyting.com)

29

## Removing a Foreign Body

### Step 9: Remove Rust Ring

- If metal is lodged in the cornea for more than 4-6 hours

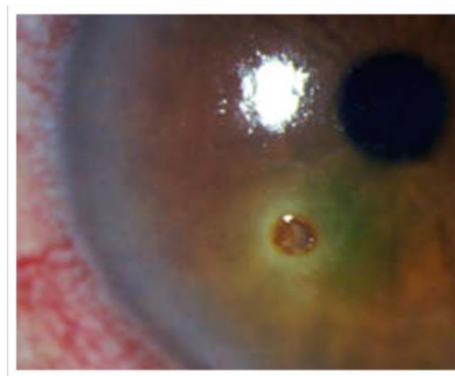


Photo courtesy of: [www.fprmed.com](http://www.fprmed.com)

30

## Removing a Foreign Body

### Step 10: Rx Appropriately

- Broad-spectrum antibiotic for one week

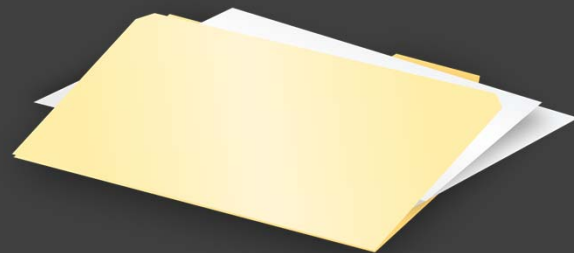


Photos courtesy of: [www.vigamox.com](http://www.vigamox.com)

31

## Foreign Body

### Case Examples



32



## Case 1

---

- 45 year old male
- One month history of foreign body sensation
- Following helping with foam insulation in walls
- Sent from ER



33

## Case 2

---

- 35 year old male
- One day foreign body sensation
- Following removing car muffler
- Sent from ER



34

## Case 3

---

- 50 year old female
- One week foreign body sensation
- Not severe but unrelenting



35



Questions?  
Comments?

36

# Thank You!

37

## References

<http://www.intechopen.com/books/ophthalmology-current-clinical-and-research-updates/imaging-in-ophthalmology>

<http://www.oculist.net/downaton502/prof/ebook/duanes/graphics/figures/v8/0040/001af.jpg>

[http://clinicalgate.com/wp-content/uploads/2015/03/B9780702051944000079\\_f007-005-9780702051944.jpg](http://clinicalgate.com/wp-content/uploads/2015/03/B9780702051944000079_f007-005-9780702051944.jpg)

<https://classconnection.s3.amazonaws.com/129/flashcards/1910129/png/nuclearcataract-14220B91AAD79CBFC80.png>

<http://www.slideshare.net/dkar2013/slit-lamp-instrumentation-and-illumination-techniques>

<http://www.keeler-symphony.com/images/default-source/making-sense/flare-and-cells.jpg?sfvrsn=4>

<http://www.eyerounds.org/atlas/pages/combined-cataract/Cataract-combo-THUMB.jpg>

[http://www.college-optometrists.org/filemanager/root/site\\_assets/museum/artgallery/RETRO-ILLUMINATION\\_OF\\_INTRAOCULAR\\_LENSlarge.jpg](http://www.college-optometrists.org/filemanager/root/site_assets/museum/artgallery/RETRO-ILLUMINATION_OF_INTRAOCULAR_LENSlarge.jpg)

<http://www.mrcophth.com/examinationtechniques/slit-lampexamination.htm>

<http://www.rootatlas.com/wordpress/wp-content/uploads/2007/08/uveitiskp1.jpg>

[http://www.akorn.com/images/products/17478-263-12\\_full.jpg](http://www.akorn.com/images/products/17478-263-12_full.jpg)

38

## References

<https://qph.cr.quoracdn.net/main-qimg-766467c3befc5f3732449cc22eec7056>

<http://dnn.bauschlomb.com/Portals/109/DNNGallery/20776/Positive-Seidel-test-with-blue-light-fluorescein.jpg>

<http://alf-img.com/show/staining-corneal-rust-ring.html>

<https://i.ytimg.com/vi/m6P9y0ZITpg/hqdefault.jpg>

[http://www.fprmed.com/Pages/Physical\\_Findings/Images/Eyes.h41.jpg](http://www.fprmed.com/Pages/Physical_Findings/Images/Eyes.h41.jpg)

[http://www.vigamox.com/img/vigamox/prod\\_img.png](http://www.vigamox.com/img/vigamox/prod_img.png)

<https://www.reviewofoptometry.com/article/foreign-body-removal-in-12-steps>

<http://qjmed.oxfordjournals.org/content/108/7/595>

<http://www.wickioptik.ch/adverse.htm>

<http://keckmedicine.adam.com/graphics/images/en/19662.jpg>

<http://www.aao.org/young-ophthalmologists/yo-info/article/emergent-eye-exam>