Diagnose This: Diagnosis gaps and Suspected needs

Online Education Committee | Diagnose this results: August 2010 – March 2011

METHODS

Semiannually the Online Education Committee (OEC) reviews responses to *Diagnose This* quizzes posted weekly on the ONE Network.

The review focuses on select questions whose responses indicate a potential knowledge gap based on 2 primary criteria:

- At least 500 responses to question
- <70% responses fall outside recommended practice pattern

To decide whether there may be a knowledge gap reflected, the OEC considers the quality of each question and integrity of clinical case presented; scope of knowledge required to answer as recommended; and confidence level of the responses.

The OEC finally discusses their impressions to reach a consensus on which questions may indicate a knowledge gap among the comprehensive ophthalmologist community, and also to provide some evidence why.

During the 8-month review period, 15 questions fit the review criteria. Of these, 6 were strongly suspected of reflecting a knowledge gap that led to the statements below.

The remaining questions were abandoned for contradictory evidence in the question itself or current body of knowledge according to the OEC; poor or unrepresentative images; or as in most cases, poorly formed or targeted questions.

INTENDED USE

The following information may be used to initiate planning for new or revised educational activities, or to substantiate or evaluate the success of existing activities. It does not, however, represent a definitive needs assessment. Activity planners should consider journal studies, surveys, literature, and secondary expert analysis to validate and complement these findings for each new activity planned.

GAPS AND SUSPECTED NEEDS

1. Contact lens fitting and management of related complications.

PEA: Comprehensive

Questions:

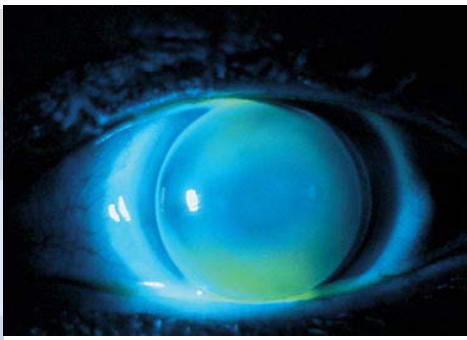
a)

A 34-year-old man visits the ophthalmologist 3 weeks after being fit with new rigid gas-permeable contact lenses. He complains of hazy vision, particularly after removing the lenses and using his glasses. Examination of the cornea reveals the findings shown in the figure. What is the likely cause of the problem?		
Answer Options	**Response Percent**	**Response Count**
A lens that is too loosely fit	12.8%	95
Hypersensitivity to proteins on the lens surface	4.7%	35
Epithelial hypoxia	59.0%	437
Stromal edema	23.5%	174
answered question		741
skipped question		0

Explanation: Epithelial hypoxia is the most likely cause. Referred to as Sattler's veil, this patient's problem represents central corneal epithelial edema that results from hypoxic stress. Sattler's veil may occur with either rigid or hydrogel lenses and is best observed using sclerotic scatter or retroillumination techniques. There is usually a central circular clouding with a distinct demarcation from the clearer peripheral cornea. When epithelial edema of this type occurs with hydrogel lenses, it is usually more evenly spread across the cornea and is therefore somewhat more difficult to see. Patients may complain of hazy vision or spectacle blur that usually dissipates after 30 to 60 minutes. Epithelial edema of this type is usually associated with a tight lens fit. There is no relationship between the development of focal edema and hypersensitivity reactions to lens protein. Contact-lens-induced hypoxia can also produce stromal edema. However, significant light scatter is not produced until greater than 15% stromal swelling occurs.

b)

A patient with keratoconus is fit with a rigid gas-permeable contact lens. The patient's fluorescein pattern is shown. Which of the following characteristics does the fluorescein pattern demonstrate?		
Answer Options	**Response Percent**	**Response Count**
Central bearing	51.7%	391
Peripheral touch	13.2%	100
A lens that is too steep	13.4%	101
Tight lens syndrome	21.7%	164
answered question		756
skipped question		0



Explanation: The characteristics are most clearly of central bearing. The fluorescein pattern seen in this contact lens fit demonstrates marked central bearing, with exclusion of fluorescein from the central cornea where the corneal epithelium directly touches the back of the contact lens. This indicates that the steepest posterior curvature of the lens is considerably flatter than the corneal curvature. Peripheral touch would be indicated if there were thinning of the pooled fluorescein at the periphery of the lens. The fluorescein pattern in a lens that is too steep not only would show a central

accumulation of fluorescein rather than the central thinning that is shown in this photograph, but also might demonstrate an air bubble under the steep lens between its posterior surface and the corneal apex. Tight lens syndrome is a clinical syndrome, not a lens fitting pattern. In tight lens syndrome, either a rigid or soft lens is fit too tight or tightens on the cornea, leading to hypoxia and inflammation.

Interpretation and suggested needs:

In the review of 2 questions on this topic (September 6, 2010 & October 11, 2010), responses indicated that contact lens fitting and related complications are poorly understood. The level of knowledge required to answer the questions falls within the scope of the comprehensive ophthalmologist. Two program directors on the OEC agreed that the topic is poorly taught and rarely mastered during residency, and these poor responses are reflected at their respective institutions. Areas of suspected knowledge deficiencies:

- Rigid gas-permeable contact lens fitting, especially in the presence of keratoconus.
- Interpretation of fluorescein patterns and slit-lamp photos related to common complications among patients prescribed RGP contact lenses. May include: Epithelial hypoxia; stromal edema; and any problem induced by lenses that are too steep, loose, or tight.

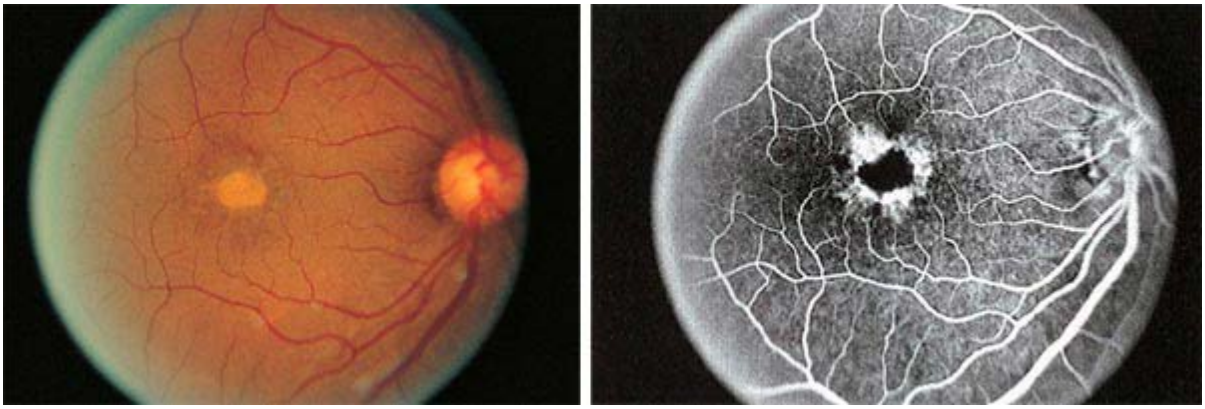
2. Diagnostic evaluation of white retinal lesions.

PEA: Retina

Quesiton:

A 26-year-old myopic man presents with a 5-day history of photopsias, small scotomas, and blurred vision in both eyes. He is recovering from a recent flulike illness. Examination reveals best-corrected visual acuity of 20/50 OD and 20/40 OS. Slit-lamp examination shows mild flare and cell in both anterior chambers and mild vitreous cell in both eyes. The fundus findings are similar in both eyes; the right fundus is shown. Which of the following diagnoses is most likely in this patient?

Answer Options	Response Percent	Response Count
Presumed ocular histoplasmosis syndrome	9.2%	194
Birdshot retinochoroidopathy	16.8%	355
Acute posterior multifocal placoid pigment epitheliopathy	34.8%	734
Multifocal choroiditis	39.3%	829
answered question		2112
skipped question		0



Explanation: Multifocal choroiditis the most likely diagnosis. The clinical picture in this patient represents an inflammatory process of the choroid and retina. Inflammatory retinal and choroidal diseases are classified based on ophthalmoscopic findings and clinical course of the disease, with overlap between many of the diagnoses. Of the choices given, multifocal choroiditis best fits the clinical history and appearance in this patient. The patient's young age is consistent with any of the listed diagnoses except birdshot retinochoroidopathy, which is more common in patients between ages 40 and 60. Bilateral ocular involvement is seen in all of the diagnoses. A preceding viral illness is a frequent history given by patients with either multifocal choroiditis or acute posterior multifocal placoid pigment epitheliopathy. Vitritis is a finding in multifocal choroiditis, birdshot retinochoroidopathy, and acute posterior multifocal placoid pigment epitheliopathy. Acute posterior multifocal placoid pigment epitheliopathy causes multiple yellow-white, flat, round or irregular lesions at the level of the pigment epithelium and choroid, typically larger than the lesions present in this patient. Presumed ocular histoplasmosis syndrome commonly produces peripapillary scarring (not present in this patient) in addition to typical punched-out, peripheral chorioretinal scars and lack of vitreous cells.

Interpretation and suggested needs:

Based on responses to one question, this topic was unanimously suspected a gap. The ability to interpret white retinal lesions was poorly demonstrated (responses ~40% incorrect). The retina specialist on the OEC recommends intervention that distinguishes the various signs/features in the differential diagnosis of multifocal choroiditis, birdshot retinochoroidopathy, acute posterior multifocal placoid pigment epitheliopathy, and other related retinal diseases. Interpretation of fundus findings is of utmost importance here.

3. Management of orbital lymphangioma.

PEA: Oculoplastics

Question:

A 22-year-old patient previously diagnosed with an orbital lymphangioma returns to your office with the presentation shown. Her visual acuity is 20/20 in both eyes, and the intraocular pressure is 18 mm Hg in both eyes. What is the most appropriate management for this patient?

Answer Options	Response Percent	Response Count
Biopsy	18.5%	250
Chemotherapy	6.7%	90

Radiation	16.5%	223
Observation	58.3%	786
	answered question	1349
	skipped question	0

Explanation: The most appropriate immediate management is observation. This patient has experienced an acute bleeding episode into the lymphangioma. There is now marked proptosis, decreased motility, and periocular swelling. The potential for visual loss is present during acute bleeding episodes. Attention should be directed toward reducing orbital and intraocular pressure and improving optic nerve function. Orbital decompression is indicated if optic nerve compromise occurs.

Since the vision and intraocular pressure are normal in this patient, observation with reassurance of the patient is appropriate. If the diagnosis is unknown, a biopsy of the tumor is appropriate but it should be done after the acute event has resolved. Chemotherapy and radiation therapy are not indicated in the treatment of these tumors. Debulking of lymphangiomas may be useful in improving cosmesis or limiting complications.

Interpretation and suggested needs:

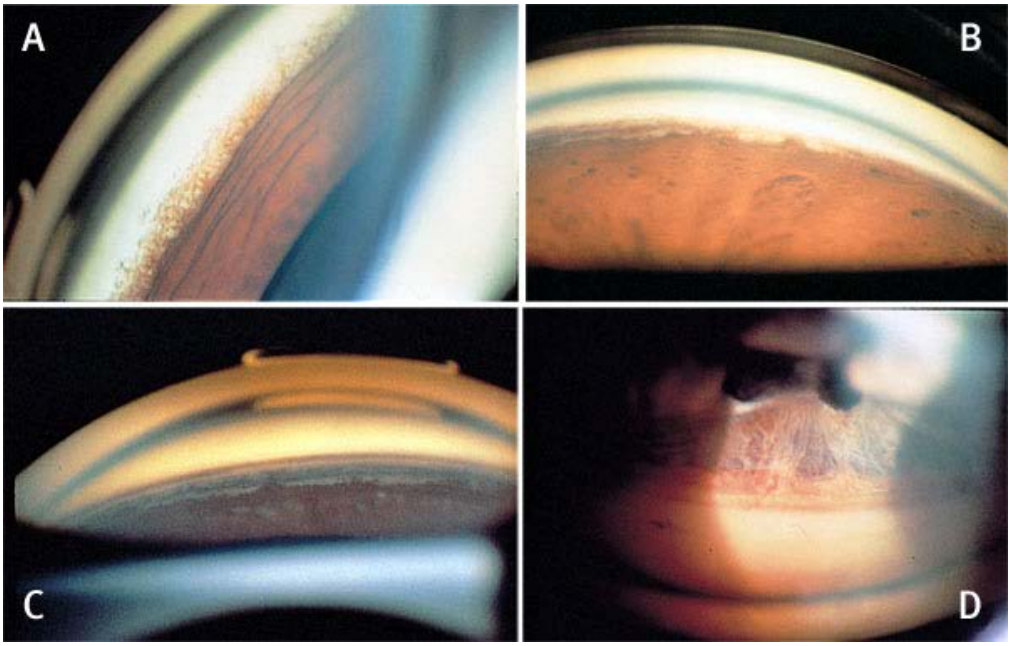
Based on one question (November 1, 2010), the committee found responses favored multiple ill-advised treatments for the management of lymphangioma when it presents without concurrent symptoms or signs. The recommended management is observation; more than 40% of the responses followed invasive paths including biopsy, chemotherapy, and radiation. This clinical picture in the question, based on the impressions of the oculoplastic specialist on the OEC, is clear enough that the comprehensive ophthalmologist should know better than to initiate or recommend any treatment beyond observation. He expected any related learning activity should consider the management of eyelid lesions in general as part of the objectives.

4. Differentiation of abnormal and normal gonioscopic findings.

PEA: Glaucoma

Question:

Which of the gonioscopic photographs shown below would represent a normal anatomic finding?		
Answer Options	**Response Percent**	**Response Count**
Figure A	51.4%	530
Figure B	17.2%	177
Figure C	26.9%	278
Figure D	4.6%	47
	answered question	1032
	skipped question	0



Explanation: Figure A represents a normal anatomic finding.Figure A shows a heavy layer of uveal trabecular meshwork, or iris processes. Figure B shows scattered peripheral anterior synechiae in an eye with previous episodes of acute anterior uveitis. Figure C shows traumatic angle recession, and Figure D shows rubeotic vessels in the angle on the trabecular meshwork of a patient with proliferative diabetic retinopathy.

Interpretation and suggested needs:

According to responses on one question (December 6, 2010), members cannot reliably recognize clear gonioscopic features. The OEC believes gonioscopy is poorly taught and practiced, and gonioscopic findings are poorly interpreted. The glaucoma specialist on the OEC is concerned that the misinterpretation of angle findings can lead to ill-advised treatment approaches or referrals. These responses merit an activity that reviews normal and abnormal anatomical features prominent in gonioscopy, possibly the basic techniques in performing gonioscopy. Intervention at the residency level is probably also warranted.

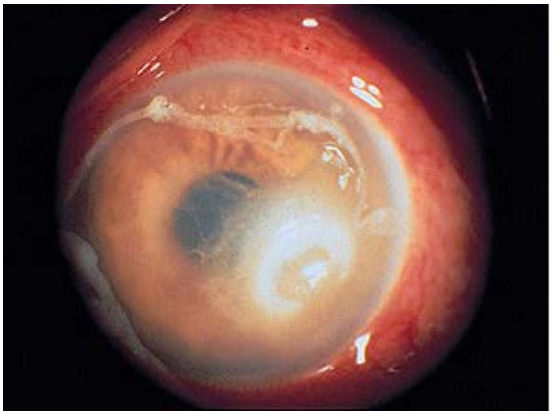
5. Differentiation of microbiologic studies.

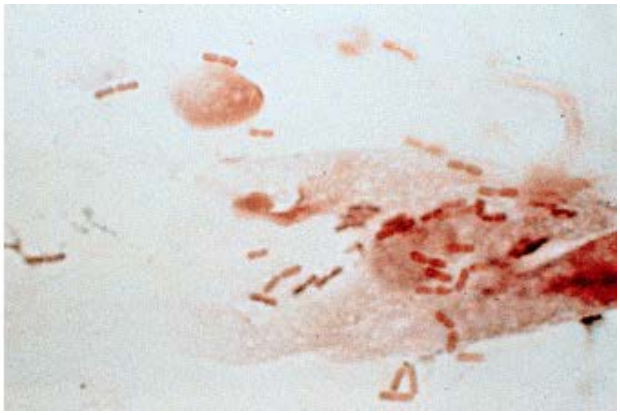
PEA: Cornea and External disease

Question:

A debilitated 63-year-old homeless man developed a red, painful eye 5 days prior to entering your clinic. His cornea at the time of examination is shown on the left, and the results from Gram staining of corneal scrapings are shown on the right.Which organism is most likely involved?		
Answer Options	**Response Percent**	**Response Count**
Pseudomonas aeruginosa	29.9%	359
Klebsiella pneumoniae	18.2%	219
Moraxella lacunata	22.5%	270
Neisseria gonorrhoeae	29.5%	354

answered question	1202
skipped question	0





Explanation: The most likely organism is Moraxella lacunata. Large Gram-negative diplobacilli are characteristic of Moraxella lacunata. Occasionally, these diplobacilli will stain Gram positive as well. This organism is found primarily in individuals debilitated from alcohol abuse, chronic disease, or old age and is, in that sense, an opportunistic organism. The ulcer produced is less rapidly aggressive than those produced by other Gram-negative species, but it will proceed to perforation if left untreated. It is characteristically found in the midperipheral cornea and is variably associated with hypopyon. Susceptibilities vary, but Moraxella is generally sensitive to aminoglycosides. Pseudomonas aeruginosa produces a raised mucoid infiltrate and appears on Gram staining as slender pleornorphic rods. Klebsiella is an uncommon corneal pathogen that is usually the result of enteric contamination of the eye and is characterized by cigar-shaped Gram-negative rods. Neisseria gonorrhoeae produces a hyperacute and rapidly progressive keratoconjunctivitis and is characterized by intracellular Gram-negative diplococci.

Interpretation and suggested needs:

In one question featuring a Gram stain in the patient presentation, responses showed consistent failure to correctly identify *Moraxella lacunata* from a series of organisms including *Pseudomonas aeruginosa, Klebsiella pneumoniae,* and *Neisseria gonorrhoeae*. While the presentation represented an uncommon scenario, the OEC agreed it is one that should be handled better by the comprehensive ophthalmologist. The microbiology in this case--boxcar findings--clearly points to the offending pathology. As the corneal specialist on the OEC commented, appropriate treatment for bacterial pathogens often depends on interpreting the stain correctly. A broad review to differentiate microbiology/pathology findings is warranted; the committee is unsure what exact organisms require focus in an activity, however.