NCLE Basic Exam Review

Domain VI: Dispensing;

Domain VII: Follow-up;

Domain VIII: Regulatory

Developed by the National Federation of Opticianry Schools

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Mr. Steven B. Indelicato has no financial interests to disclose.

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I. Lens Delivery, Solutions and Aftercare

A. **Importance of Patient Management**:

a. Besides the proper fitting of any contact lens, lens success is based on:
   i. Training
   ii. Hygiene
   iii. Proper use of solutions
   iv. Proper techniques for inserting and removing contact lenses
   v. Proper cleaning and disinfection
   vi. Importance of follow-up

B. **Preparing a Soft Contact Lens For Wearing**:

a. Instruct your patients to always wash their hands with a mild soap, rinse completely and dry their hands with a lint-free towel
b. Instruct patients to avoid soaps containing cold cream, lotion, and oily cosmetics
c. Instruct patients to handle their lenses with their fingertips and avoid using their fingernails
d. Fingernails should be kept short and smooth
e. Have patients start off using proper hygienic procedures from the beginning

C. **Lens Packaging:**

a) Instruct patients that prior to opening an individual lens package, shake the lens package to see if the contact lens is floating in the solution
b) Patients should peel back the foil to reveal the lens
c) Have the patient remove or pour the contact lens in the palm of their hand and rinse prior to inserting the lens in their eye
d) Prior to insertion, have the patient check the lens for surface defects, nicks, or tears
e) If the lens is damaged, instruct the patient to use another lens
f) Remind patients that sometimes lenses maybe damaged or missing from lens packages
g) Patient should be instructed to verify that the contact lens is not inverted or turned inside out
h) Taco Test

D. **Soft Lens Application:**

a) Lay out supplies, open contacts and solutions
b) Wash your hands
c) **Have patient wash their hands**
d) **Place lens on patient's index finger**
e) Middle finger of hand that patient usually uses holds down the lower lid
f) Place lens over cornea/iris(for direction you may need to say colored portion as the patient may not know parts of the eye)
g) Direct patient slowly and calmly
h) If lens is not centered have patient turn eye toward location of lens. Lens will self-center
i) After application is complete let patient rest and explain cleaning technique with the solution you want them to use.

E. **Removal:**

a) Have patient open lids as they did with insertion.
b) Use index finger and thumb to reach into the eye and gently pinch and pull lens from eye
c) Repeat instructions until job is complete.

F. **Insertion**:

a) Technique 1 - One Hand Placement
b) Technique 2 – Two-Finger Placement

G. **After Insertion:**

a) Have the patient close their eyelids and gently massage the lens into place through the closed eyelids or
b) Have patient gently manipulate the off-centered lens onto to the cornea, using finger pressure on the edge of the upper or lower lid
c) Never use fingernails to manipulate the lens in place

H. **Removal**:

a) Two Finger Method
b) One Hand Method

I. **The Role of Contact Lens Products:**

a) To remove surface deposits
b) To disinfect microorganisms
c) To improve surface wettability

J. **Considerations for Topical Application:**

a) Osmotic Pressure: .9% - 1% NaCl Equilvalent
b) PH: Tears 7.0 – 7.4 Range
c) Comfort Range 6.6 – 7.8
d) 7.0 - or < is acidic or 7.0 or > is alkaline
e) Buffers help balance the PH in solutions
f) Solutions should be non-abrasive and non-irritating
g) Solutions should be sterile when placed in the eye
h) Preservatives allow for the reuse of a solution

K. **Contact Lens Disinfection:**

a) Thermal Disinfection (Heat)
b) Chemical Disinfection
c) Peroxide or Oxidation Disinfection

L. **Preservatives:**

a) A preservative is added to a solution to ensure that the solution remains sterile under normal conditions of use by destroying or inhibiting the multiplication of microorganisms
b) Benzalkonium Chloride (BAK)
c) Chlorobutanol
d) Thimerosal
e) Chlorhexidine

M. **Additives:**

a) Hydroxypropyl methylcellulose – cushions lens material
b) Dexpant-5 – "Hydrolock" – prevents evaporation

N. **Demulcents:**

a) Enhances comfortable contact lens application
b) Propylene gylcol

O. **Wetting Agents:**

a) Decreases the wetting angle to make the lens more hydrophyllic
b) Polyvinyl Alcohol
c) Plysorbate
d) Absorbobase

P. **Viscosity Builders:**

a) Found in Artificial Tears to add substance to the tear film and prevent increase evaporation
b) Methylcellulose
c) Hydroxethyl Cellulose

Q. **Buffers and Osmolarity Control:**

a) Keep the pH of the solution as close to natural tears
b) Sodium Borate
c) Sodium Chloride
d) Sodium Phosphate
e) Sodium Bicarbonate

R. **Lubricants**

a) Agents that attract moisture and prevent the lens material from drying up when used with contact lenses in the eye
b) Hydroxypropyl Methylcelluose
c) Poloxamine

S. **Decongestants**

a) Phenyleprine HCL
b) Napazoline HCL
c) Epenephrine HCL
d) Tetrahydrozoline HCL

T. **Disinfection**

a) antimicrobial agents
b) protect a care solution's bottle contents from contamination

U. **Solution Guidelines**

a) Follow Directions for your lens care system
b) Wash hands dry before handling lenses
c) Dispose of disinfecting solution after use
d) Air-dry storage cases
e) Never use tap water to store or wash lens cases
f) Replace storage cases every three months

V. **Heat Sterilization**

a) Not used anymore because most lenses are available in 55% water and these lenses cannot be heat disinfected
b) Advantages- Simplicity and reduce cost
c) Disadvantages- Cannot be used with water contents above 55%

W. **Chemical Disinfection**

a) **MPS** – Multi-purpose solution – requires rubbing, rinsing and soaking to achieve disinfection
b) **MPDS** – Multi-purpose-disinfecting solution- must achieve a higher kill rate of bacteria and fungi during the labeled soak time without rubbing or rinsing
c) All MPS systems contain preservatives that disinfect and surfactants and protein removers that help keep the lenses clean
d) Most MPS systems also contain ingredients that may help improve comfort by decreasing dryness
e) All MPS solutions are approved for NO RUB however, the traditional rub and rinse is still highly recommended
f) Advantages- Simplicity and reduced cost, used with any lens
g) Disadvantages- Higher risk of patient hypersensitivity
h) Hydrogen Peroxide (Oxidation System)
    i. Uses 3% H2O2 peroxide. Red tip on bottle indicates not to be placed in eye
    ii. Some systems use a one step or two step system
    iii. Peroxide systems must use a neutralizer to break peroxide down to water
    iv. Most peroxide systems require a minimum of 6 hours and some may require 10 minutes depending on manufacturer

X. **Silicone Hydrogel Lenses:**

a) Advantages – better durability, less protein deposition and increased end-of-day comfort. At present, 82% of practitioners are selecting Silicone Hydrogel materials for new spherical contact lens patients
b) Potential Drawbacks – increased lipid deposits and stiffness of the material
c) Group I Low Water, < 50%, non-ionic
d) Group III Low Water, < 50%, ionic
e) Group V - is in the process of being evaluated and subdivided
f) Unlike HEMA based soft polymers, silicone hydrogels are hydrophopic
g) Nite & Day, Purevision, Acuvue Oasys, Acuvue Advance *except* Biofinity and Avaira have to be surface treated or contain an internal wetting agent for successful wear

Y. **Giant Papillary Conjunctivitis (GPC):**

a) **Symptoms**- Awareness, Itching, Excessive Lens Movement, Papillae Formation under lids
b) **Etiology**- Mechanical irritation, Hypersensitivity to solutions
c) **Management**- Meticulous Cleaning, Reduce Wearing Time, Peroxide
d) **Treatment**- Ocular Medication

Z. **Contact Lens Induced Superior Limbal Keratoconjunctivitis (SLK):**

a) Thimerosal Sensitivity
b) Clinical Signs- Vessel Engorgement, Itching

AA. **Infilitrates**:

c) Accumulation of white blood cells
d) Associated with Thimerosal sensitivity
e) Redness, photophobia
f) Switch to non-preserved solutions

BB. **Acanthamoeba:**

a. Rare painful and potentially blinding infection to the cornea
b. Found in all environments: soil, fresh water, swimming pools, hot tubs, tap water and even bottled water
c. Use of tap water during lens care (to rinse lenses or the storage case)
d. Wearing contact lenses without goggles
e. Use of Ineffective lens care solutions

CC. **RGP Insertion & Removal:**

a. Solutions should not be interchanged with Soft Lens Solutions unless FDA approved
b. RGP Lens Fitting is different than Soft Lens Fitting because all RGP lenses are custom fitted to the patient
c. Always wash and rinse your hands thoroughly before handling your lenses. Clearer soaps are better since they contain less lanolin which can smear the contact lens surface. Avoid liquid soaps which often contain moisturisers that coat lenses. Dry your hands with a lint-free cloth to reduce the chance of trapped dust under the lens.
d. Insert lenses before applying make-up and when using hairspray, close your eyes.
e. Examine the lens before insertion for damage, scratches, nicks or chips, and only wear the lenses for the recommended time.
f. Avoid levering or scraping lenses off flat surface with your fingernails or sharp pointed objects.

g. Insertion

h. Remove the lens from the storage case by gently putting your finger into the lens, it should stick to your finger and lift out. Wiping it out will scratch the lens.
i. Hold the upper lid firmly from above with the middle finger of the other hand. Make sure the finger is placed just where the eyelid meets the eyelashes.
j. Now that the eye is wide open, place the lens on the cornea.
k. Release the lower lid and then the upper lid and blink

l. **Recentering**- Occasionally, a lens may be displaced onto the conjunctiva, (white of the eye) when inserting, or with sudden eye movements or excessive tear flow.
m. Move the lens with the eyelids until it is adjacent to the cornea.
n. It is often easiest to re-center the lens from directly below the cornea by pushing it upwards with the bottom lid.

o. **Removal**: A suction holder is the most recommended method for lens removal. Make sure that it is applied directly to the lens and not onto the eye. When the 'sucker' has suctioned onto the lens gently twist the lens off your eye. To remove the lens from the sucker hold the contact lens and slide off the 'sucker' sideways. Pulling the lens directly off the sucker may result in lens warpage.
p. Blink Removal

DD. **Cleaning and Disinfecting:**

a. Place the lens on the palm of your hand.
b. Apply 1 or 2 drops of your specified cleaning solution on the lens.
c. Rub gently with a back and forth motion for about 10 seconds. Make sure both sides of the lens are cleaned
d. Rinse off THOROUGHLY with conditioning solution. You may need to rinse and rub more than once to ensure the entire cleaner is removed.
e. Rinse hands with water to remove any cleaner. Insufficient rinsing will mean that the contact lens may sting on insertion the next time.
f. Place lenses in storage case ready for sterilization and rewetting.

EE. **Regulations**:

a. **Malpractice**- Unethical conduct or negligence by a professional usually in the health care field, Can be intentional or not intentional
b. **Tort**- Injury or misconduct that causes harm to a person or a person's property
c. **Principles of Informed Consent**- You must provide the patient with enough information so that he or she can make a reasonable decision (Risks of procedure, including loss of vision, Complications)

d. **Duty of Disclosure**- To frankly answer questions about the risk. To disclose alternative procedures available and their risks.
e. **Consent**- may be written, oral or implied. Regardless of the form of consent, the practitioner must be able to prove that the duty of disclosure was met before the consent was obtained

FF. **FCLCA – Fairness to Contact Lens Consumers Act:**

a. The **FCLCA** took effect in August 2004 and is enforced by the FTC
b. After the finished fitting, the Rx must be provided even if the patient does not ask for it
c. Contact lens verification must be made within 8 hours
d. A Valid Contact Lens Prescription includes
    i. *Patient's Name*
    ii. *Issue Date of Prescription*
    iii. *Expiration Date*
    iv. *Prescriber's Name, Address, Phone Number, and Fax Number*
e. **Lens Parameters** must include:
    i. *Base Curve*
    ii. *Power*
    iii. *Diameter*
    iv. *Manufacturer (enough information to duplicate lens)*
    v. *In Private Label cases, the name of the manufacturer, trade name or equivalent is given*

GG. **FDA – Food and Drug Administration:**

a. Created in 1907
b. To promote and protect the public health by helping safe and effective and products reach the market in a timely way.
c. **Regulates**: Food, Drugs, Medical Devices, Animal Feed and Drugs, Radiation Emitting Products and monitors products not regulated

HH. **FTC – Federal Trade Commission**

a. Independent agency of US Government and created in 1914
b. Investigates price fixing, and unfair methods in competition
c. In the ophthalmic industry the greatest impact was in 1978 regarding "Prescription Release Rule"

II. OSHA – Occupational Safety and Health Administration:

a. Mission to save lives, prevent injuries and protect the health of workers
b. OSHA has established emergency procedures

c. **MSDS** – Material Safety Data Sheets- located in every business and lists various steps and procedures to be followed if an accident occurs

II. **HIV and Contact Lenses:**

a. Hand Washing – Hand Washing represents one of the most effective means of avoiding the risk of transmitting or acquiring infections
b. The use of gloves or finger cots by clinicians when cuts, scratches or dermatologic lesions are present on the hands or fingers
c. Instruments that come in direct contact with the patient such as occludes, head rests, chin rests etc. should be wiped clean with alcohol and allow to dry
d. Contact lenses and carrying cases used in trial fittings and follow-up fittings should be disinfected.
e. Hydrogen Peroxide disinfection is the recommended

JJ. **ANSI – The American National Standards Institute:**

a. Formed in 1918
b. Private, non-profit based membership to establish voluntary quality standards for American made products