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On behalf of Vision Expo, we sincerely thank you for being with us this year.

Vision Expo Has Gone Green!


We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE Letter for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.




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Disclosures

I have no disclosures or conflicts of interests




Slide 3



In-Office Surgical Skills: Things We Should Have Learned in School


Parres Wright, O.D., FAAO
Associate Professor
Midwestern University-Chicago College of Optometry



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Epidemiology

- Outpatient surgical procedures in US expected to grow from 129 million in 2018 to 144 million by 2023¹
- Dental surgery segment is expected to be the largest share of outpatient surgical procedures¹
- 1.3 million ambulatory ophthalmic procedures were performed between 2014-2021

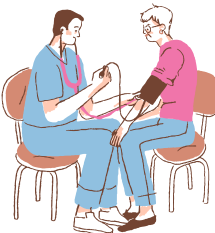


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Epidemiology

- May 2022: 40,640 practicing optometrists²
- 9 states can perform laser procedures
- 22 states can use injections for small procedures like lesion removal

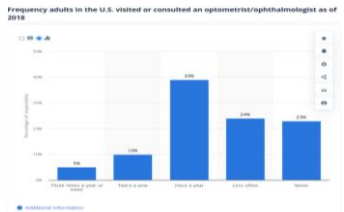


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Epidemiology

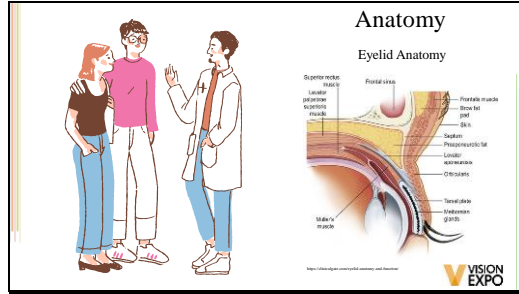
Frequency adults in the U.S. visited or consulted an optometrist/ophthalmologist as of 2019



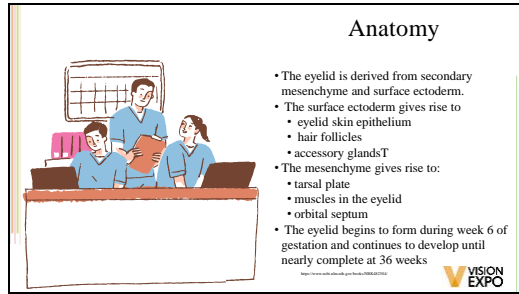
Frequency	Percentage
Never	10%
1-2 times	15%
3-4 times	35%
5-6 times	25%
7+ times	15%

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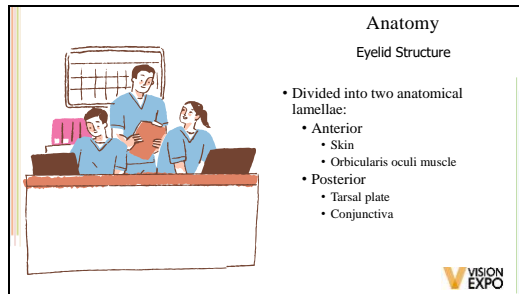
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Anatomy
Eyelid Structure



- Tarsal plate
 - Main structural component of eyelid
 - Contains the Meibomian glands and eyelash follicles
 - ~30 meibomian glands in upper
 - ~20 meibomian glands in lower
- Glands of Zeis and Moll
 - Associated with hair follicles
 - Zeis: secrete lipid
 - Moll: secrete modified sweat



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Anatomy
Eyelid Skin

- Thinnest skin of the body
 - ~1mm thick
- No subcutaneous fat
 - Only loose cutaneous tissue between the eyelid skin and orbicularis oculi





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Surgical Considerations

Many surgical procedures can be done on eyelids to address a variety of eyelid conditions



- Patient Hx
- Eyelid anatomy
- Characteristics of the lesion
- Duration



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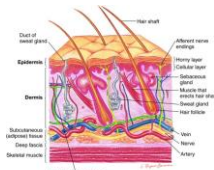
Anatomy and Physiology of the Skin

- The skin is the heaviest single organ of the body
- 16% of the body weight
- 3 layers
 - Epidermis: most superficial layer, avascular, keratinized
 - Where keratin and melanin are formed
 - Relies on underlying vascularized dermis for nutrition
 - Dermis: dense layer of interconnecting collagen and elastin fibers
 - Sebaceous glands, sweat glands, hair follicles and cutaneous nerves
 - Merges with subcutaneous fatty/adipose tissue
 - Subcutaneous/Hypodermis Tissue: fatty and connective tissue



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Anatomy and Physiology of the Skin



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Dermatological Considerations

- May see areas of:
 - Hypopigmentation
 - Hyperpigmentation
 - Loss of hair
- Often in an ocular exam we encounter lesions on the ocular adnexa and face
- Lesions present on the skin and ocular adnexa requires thorough descriptions
- Lesions and their appearance aid us in the diagnosis, prognosis and treatment



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Types of Skin Lesions

- Primary Lesions
 - Macule
 - Papule
 - Nodule
 - Pustule
 - Bulla
 - Pustule
 - Plaque
 - Wheal
 - Vesicle



Chickenpox Vesicle

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Types of Skin Lesions



Scar

- Secondary Lesions
 - Scale
 - Crust
 - Erosion
 - Ulcer
 - Fissure
 - Atrophy
 - Scar

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Table of types of lesions


BOX 16-1 TYPES OF SKIN LESIONS	
<p>Primary Lesions</p> <p>Macule: Circumscribed, flat discoloration, variety of colors.</p> <p>Papule: Circumscribed, solid, elevated lesion, as large as 5 mm in diameter; variety of colors.</p> <p>Nodule: Circumscribed, solid, elevated lesion; larger than 5 mm in diameter.</p> <p>Tumor: Large nodule.</p> <p>Pustule: Circumscribed collection of leukocytes and free fluid.</p> <p>Vesicle: Circumscribed collection of free fluid, as large as 5 mm in diameter.</p> <p>Bulla: Circumscribed collection of free fluid, larger than 5 mm in diameter.</p> <p>Plaque: Circumscribed, elevated, superficial, solid lesion; larger than 5 mm in diameter; often formed by coalescence of multiple papules.</p> <p>Wheal: Firm, edematous plaque; caused by infiltration of the dermis by fluid.</p> <p>Secondary Lesions</p> <p>Scale: Excess dead epidermal cells, resulting from abnormal keratinization and shedding.</p>	<p>Crust: Dried serum, cellular debris (scab).</p> <p>Erosion: Focal loss of epidermis; no penetration beyond dermis.</p> <p>Ulcer: Focal loss of epidermis and dermis.</p> <p>Fissure: Linear loss of epidermis and dermis; sharply defined walls.</p> <p>Atrophy: Depression in the skin, caused by thinning of epidermis or dermis.</p> <p>Scar: Abnormal collection of connective tissue; damage to dermis.</p> <p>Special Lesions</p> <p>Excoriation: Erosion resulting from scratching.</p> <p>Cyst: Circumscribed lesion with a wall and lumen.</p> <p>Lichenification: Thickened epidermis caused by scratching; narrowed surface (scaleboard).</p> <p>Stangeriosis: Dilated superficial capillaries or blood vessels.</p> <p>Comedones: Sebaceous and keratinous material plugging the opening of a hair or sebaceous follicle.</p>

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Lesions by color


- Skin colored
 - Patient's skin color:
 - Lipomas cyst
 - Basal cell carcinoma
 - Neurofibroma
 - Yellow:
 - Papules or plaques
 - Xanthelasma (hyperlipidemia)
 - Purple:
 - Kaposi's sarcoma (AIDS)
 - Red:
 - Hemangioma: benign capillary growths
 - Butterfly rash across nose and cheeks (Lupus)
 - Red-Brown:
 - Papular Sarcoidosis: mostly on face




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Most Common Causes of Benign Eyelid Lesions

- Inflammation of a blocked gland (e.g., chalazion)
- Infection and inflammation of a gland (e.g., hordeolum)
- Lipid accumulation in the dermis (e.g., xanthelasma)
- Cyst formation of adnexal or epidermis structures (e.g., epidermal inclusion cyst, cyst of Moll, cyst of Zeiss)
- Melanocyte proliferation in the dermis and epidermis (e.g., nevus)
- The proliferation of cells in the epidermis (acanthosis) and hyperkeratosis (e.g., seborrheic keratosis, acrochordon/skin tag)
- Infection of the epidermis (usually viral, e.g., verruca vulgaris, molluscum contagiosum)



<https://www.ncbi.nlm.nih.gov/books/NBK582155/>





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- Cutaneous caused by proliferation of melanocytes
 - Mole
- May be congenital or associated with sun exposure
- Benign acquired nevi
 - uniform brown/tan, round, sharp well-delimited borders, usually flat
 - Less than 6mm
 - Require work-up if changes

Classified as:

- Junctional
- Compound
- Dermal




<https://www.healthline.com/health/mole>



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Characteristics of Nevi

NEVI	CHARACTERISTICS
Junction nevus	Flat or slightly elevated Uniform pigmentation Smooth surface Regular borders Symmetric shape
Compound nevus	Slightly to moderately elevated Uniform pigmentation Variable surface: smooth, warty, hairy Regular borders Symmetric shape
Dermal nevus	Elevated Uniform pigmentation (lightest colored) Lobular or warty surface Variable stalk with pedunculation Regular borders Symmetric shape




Clinical Medicine in Questions: Practical Dermatology, Mueller, pg. 206

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Papilloma

- Squamous papilloma
 - Commonly called a skin tag
- Most common type of benign eyelid lesions
- Is a tumor of the skin made of redundant epithelium
- May be excised if cosmesis is an issue or if it affects vision




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Warts

- AKA: verruca vulgaris or papillomata
- Cutaneous neoplasms caused by HPV
- Pedunculated, grape-like, and dome-shaped lesions with a central core of keratin surrounded by thick keratin
- May also be flat: verruca plana
 - Commonly on face
- May affect genitals
 - Cervical cancer
- May occur on eyelid margins and cause viral conjunctivitis
- May be removed



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Seborrheic Keratosis



- Benign skin condition
 - Mostly in elderly patients
- Growth of basal epithelial cells
- Classic appearance is greasy, oily, and pigmented lesion, has a "stuck on" appearance



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Overview



- Chalazion overview
 - Pathophysiology
 - Signs/symptoms
 - Differential diagnosis
- Treatment approaches
 - Risks, benefits, indications, contraindications, complications
 - Techniques



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Chalazion Pathophysiology


- Obstructed meibomian gland that retains sebaceous secretions
- May rupture & release lipid into surrounding tissue, causing [granulomatous inflammation](#)
- Risk factors:
 - Rosacea
 - Blepharitis (posterior - meibomitis)
 - Often previous episodes (but beware of same location!)



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Chalazion Signs & Symptoms

- Varying size
- Time since onset varies
- Generally contained within the tarsus
 - Not easily moveable
- No discharge with palpation
- No lash loss

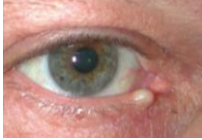


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Cyst of Zeis


- Glands of Zeis secrete lipid
- A cyst of Zeis is a benign cyst arising from a gland of Zeiss. Glands of Zeiss are found at the base of eyelashes alongside glands of Moll. It is usually filled with a yellow oily fluid.



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Cyst of Moll

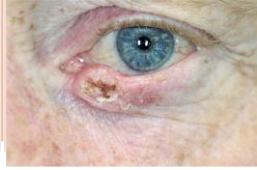


- The glands of Moll or ciliary glands are modified sweat glands
- Arise from blocked apocrine sweat glands
- dome-shaped papules or nodules filled with clear fluid margin of the eyelid
- transillumination a key feature

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malignant Cutaneous Lesions




Squamous Cell Carcinoma

- less common than BCC, but much more deadly
- Appears as greasy reddened, ulcerated nodules or superficial erosive lesions
- Disrupt normal anatomy
- Very aggressive
- Disseminates quickly throughout the body
- Metastasizes

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Malignant Cutaneous Lesions



Squamous Cell Carcinoma

- less common than BCC, but much more deadly
- second most common cutaneous malignancy, second only to BCC worldwide
- dark skinned individuals, SCC is the most common skin cancer
- There is a wide variety of SCC clinical presentations ranging from papules, plaques, or nodules with smooth, hyperkeratotic, or ulcerative secondary characteristics
- Squamous cell carcinomas have a predilection for the lower eyelid and lid margin.
- Surgical excision with frozen section margin controls
 - Possible lymph node biopsy
- Topical imiquimod, 5-fluorouracil, EGFR inhibitors.
- Among African Americans, SCC is the leading cause of mortality by skin malignancy. All suspected SCCs should be investigated further by biopsy.


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Malignant Cutaneous Lesions

Basal Cell Carcinoma

- Skin malignancy that arises from the epidermal basal cells
- Classic appearance is elevated, pearly nodule with an umbilicated, bleeding center
- Variable pigmentation
- Confused with a wide variety of other skin conditions
- Metastasizes
- Most common eyelid malignancy
- Accounts for 90% of all malignant eyelid tumors



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Malignant Cutaneous Lesions

Melanoma

- Cutaneous caused by proliferation of melanocytes and must be distinguished from benign lesions
- May be deadly: affects 7000 people/year
- Associated with sun exposure
- Occur at any age
- Metastasis: increased risk of death, low cure rate
 - Can spread to anterior chamber of eye
- Satellite spread by lymphatic channels
- Can be confused with benign lesions

- Most commonly seen in:
 - Fair-skinned
 - Blue-eyed
 - People w/freckles





Image courtesy of Clinical Medicine in Optometric Practice 2nd edition, VISION EXPO

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Evaluation of Lesions: The ABCDE..FG method

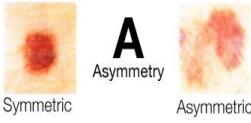
- ABCD Method has been used since to teach clinicians and patients about features suspicious for melanoma. If two or more of these are present, risk of melanoma increases, and biopsy should be considered.
- Asymmetry
- Border irregularity
- Color variations
- Diameter
- Elevated
- Firm
- Growing




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Evaluation of Lesions: (A)symmetry

- Asymmetry on one side of lesion compared to the other
- Asymmetry
 - refers to the fact that when drawing a line through the middle of the mole the two halves will not match.
 - the shape of one half doesn't resemble the other half (lopsided in shape)



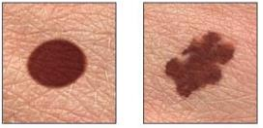
<https://health.usnybrook.ca/navigation/suspicious-skin-lesions-and-melanoma/>



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Evaluation of Lesions: (B)order

- Border irregularity; especially if ragged, notched, or blurred




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Evaluation of Lesions: (C)olor or (C)olor Disruption

- Color variations:
 - more than two colors, especially blue-black, white (loss of pigment due to regression), or red (inflammatory reaction to abnormal cells)
- malignancies are often more than one color or shade.




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Evaluation of Lesions: (D)iameter

- Diameter >6 mm; approximately the size of a pencil eraser
- Evolving or changing rapidly in size, symptoms, or morphology
- Elevated
- Firm to palpate
- Growing progressively over several weeks




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Evaluation of Lesions: (E)levated

- Elevated
- Lump or bump




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Evaluation of Lesions: (F)irmness

- Firm to palpate
- Tumors are typically firm
- Versus Cysts/fluid




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Evaluation of Lesions: (G)rowing

- Growing progressively over several weeks
- Evolving or changing rapidly in size, symptoms, or morphology
- Vs stability



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Evaluation of Lesions: Destruction of tissue

Changes in natural anatomy
destruction of eyelid architecture
Anomalies in structure/Bleeding
Loss of hair/tissue



https://www.hug.com/content/152/hug_02

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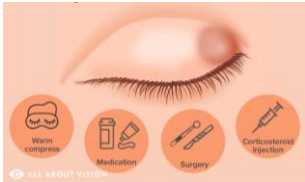
Additional Differential Diagnosis

- Molluscum Contagiosum
- Dermatitis
- Insect bite

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Chalazion Treatment Options



Warm compress Medication Surgery Corticosteroid injection


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Chalazion Treatment Options

1. Medical ("Conservative") therapy
 - Warm compresses QID for at least 10 min sessions
 - Thermal Touch, WC, Lipiflow
2. Intralesional steroid injection - 75-90% success rate
3. Incision & Curettage (I&C) - 80-100% success rate
4. Intense Pulse Light Therapy

Important to educate the patient on every option



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Medical Therapy

- Home therapy & therapeutics
 - Warm compresses
 - Brader/Hydrating masks
 - Lid Scrubs
 - Doxycycline (low dose)
 - Topical antibiotic/steroid
- Success rate?
 - Literature varies
 - Variation in practitioner preferences
 - Likely 50-75% effective



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Anti-Inflammatory Treatment


- MGD:
 - Topical Azithromycin (Azasite)
 - May increase bling to the unit eye
 - 1-2x/day
 - 8-10 weeks
 - Topical Bepihamide (reposal)
 - Sulfacetamide & prednisolone
 - Taper over 1 month
 - 8-10 weeks
 - Oral Azithromycin 500mg x 1 day, 250mg x 4 days (or 500mg x 2 weeks)
 - Also used to treat chlamydia
 - Oral Doxycycline 100mg or 20-40mg BID x 1 month
 - Also anti-inflammatory component used to treat chlamydia
 - 2 capsules for ocular disease



Yoo SE, et al. Korean J Ophthalmol. 2005; 19(4).

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MGD Alternative Treatments:
Lipiflow
TearCare / Thermal 1-Touch
iLux
Mibo Theraflo
Intense Pulse Light Therapy (IPL) – especially for ocular rosacea + MGD
BlephEx and NuLids (home device)
Take “Blinking Breaks”
Omega-3 Fatty Acids (Nordic Naturals, HydroEye, etc.)



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Chalazion Medical Therapy

Indications

- Frequently first line of treatment
- Small lesion (< 6 mm)
- Lesion present less than 2-3 months
- Lesion in medial aspect of lid near punctum
- Patient choice of treatment

Contraindications?

- Allergies to medications?
- Is doxycycline contraindicated?




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Intralesional Steroid Injection

Injection of triamcinolone acetonide (Kenalog) directly into the chalazion

- Success rate **75-90%**
 - Average resolution 2-4 weeks
- May require **two injections (~25%)**
 - Generally separated by 2-6 weeks
 - Always inform patients may need 2 injections with patient education



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Intralesional Steroid Injection

Indications

- Failure of conservative treatment
- Located in medial aspect of lid (won't be able to reach with I&C)
- Patient and/or surgeon choice

Contraindications

- Allergy/sensitivity to steroid
- Darkly pigmented skin? (*not absolute contraindication*)




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Intralesional Steroid Injection

Risks and Complications

- Depigmentation
- Infection
- Bleeding
- Bruising
- Allergic reaction to medicine
- No resolution of lesion (2 injections?)
- Recurrence
 - Alters histology
- Local fat atrophy (not a lot)
- Vision loss





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Intralesional Steroid Injection

Procedure (multidose vial):

- Alcohol swab cap of vial
- Air in syringe
- Inject air into vial
- Draw Kenalog into syringe
- Aim for 10-20 mg/mL. (*need ~8mg*)
 - May dilute Kenalog-40
 - Each mL of the sterile aqueous suspension provides 40 mg triamcinolone acetonide




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Intralesional Steroid Injection

Minimal Concentrations:

- Kenalog-40 is 0.2cc
- Kenalog-20 is 0.4cc
- Kenalog-10 is 0.8cc



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Equipment List

Intralesional Steroid

- Kenalog 10-40 mg/mL
- 1cc syringe
- 18 & 27-Gauge needle (0.5 inch length)
- Topical anesthetic (4% lidocaine)
- Jaeger plate (optional)
- Sharps container

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Choosing Syringes

Syringes vary in sizes from 1ml to 60 ml


The Volume markings are in cc/ml

The larger volume of medication needed the larger the syringe required

Smaller volume syringes are usually used for subcutaneous and intramuscular injections

The larger the capacity, the larger the interval between the volume markings

select a syringe whose capacity is the next size larger than the volume to be measured




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Choosing Needles

- Needle size is designated by length and gauge
- Consider the viscosity of the solution
- nature of the rubber closure on the parenteral container
- Gauge: width of the needle
 - a smaller number indicates a larger diameter and larger lumen inside
 - Lower number, stronger the needle
 - Higher viscosity liquid
- Length: measured in inches
 - Measured from the juncture of the hub and the shaft to the tip of the point.
 - General range is 3/8 inch to 3 1/2 inches

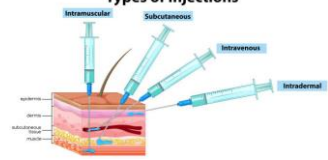


<https://www.allnba.com/photos/16-gauge-needle-photos.html>

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Types of Injections



Injection Angle

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Intralesional Steroid Injection


- Topical anesthetic (proparacaine or lidocaine but may not be necessary)
- Evert the lid or skin side
- +/- Clamp (often don't)
- 25- or 27- Gauge needle (18G to withdraw medication)
- Make sure you're not in a blood vessel
- Aim away from globe
 - Stabilize hand on patient's head
- Inject up to 8 mg of triamcinolone acetonide
 - -0.4-0.5 mL of 20mg/mL
 - -0.2 mL of 40mg/mL

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Intralesional Steroid Injection

- **Transcutaneous* vs. Transconjunctival**
 - Ease of administration
 - Risk of depigmentation (less with transconjunctival)
 - Capacity for steroid deposition

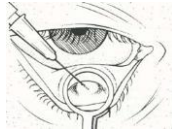


Coursework of NSU College of Optometry

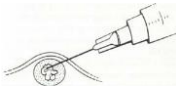


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Intralesional Steroid Injection



transconjunctival




transcutaneous



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Intralesional Steroid Injection

- Pressure with gauze for 2-3 minutes
- Antibiotic drop in-office
- Rx antibiotic?
- Resume warm compresses QID-BID after 2-3 days of procedure
- Pt may notice skin deposits of steroid (whitish)-this is not depigmentation
- RTC 2-4 weeks for second injection (**ALWAYS EDUCATE!**)



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Potential Complications of Injection of Chalazion

- hypergranulation or dysgranulation of lid skin
- yellow or white deposits on the lid skin
- subconjunctival cysts for abscess
- normal lacrimal glandites
- subepithelial cysts
- complications from the injection process include:
 - possible corneal perforation with transient contact by injection needle,
 - microembolism of arterial and choroidal vasculature leading to infection

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Chalazion Incision and Curettage

- Surgically incise & drain chalazion
- Often attempted after conservative measures
- Effective when medical treatment/steroid injection are not

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Chalazion Incision and Curettage



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Chalazion Incision and Curettage

Indications

- Particularly large (>6mm) or chronic (>6-8 months)
- Failure of injection to resolve lesion

Contraindications

- Allergy/Sensitivity to anesthetic
- Unable to hold still (at least ~13 YO)
- Medial aspect, near punctum




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Chalazion Incision and Curettage

Risks and Complications:

- Incomplete removal (thick capsule)
- Infection
- Allergy to anesthetic
- Recurrence (1 in 5 chance)
- Bruising from clamp
- Scarring
- Lid notching
- Permanent gland damage




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Equipment List

• Incision & Curettage

- 1-cc syringe
- 27-Gauge & 30-Gauge needle (0.5 inch length)
- Chalazion clamp
- Feather blade scalpel or Ellman unit
- Curette
- 1% Lidocaine with/without epinephrine 1:200,000
- 4% topical lidocaine
- Jaeger plate (optional)
- Sterile gauze 4x4"
- Cotton tipped applicators
- Erythromycin ung
- Betadine swabs or alcohol pads




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Chalazion Incision and Curettage

Procedure:


- Topical anesthetic OU (proparacaine)
- Alcohol swab
- Betadine for 3 minutes
- Dot the external surface
- Inject 0.3-0.5 cc 1% lidocaine/epinephrine 1:200,000 adjacent to chalazion
 - Fill eyelid & hemostasis
 - Digital massage to spread anesthesia
- Clamp (smallest possible)
 - Tight enough to prevent slippage
 - Ask about discomfort



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Chalazion Incision and Curettage

- Vertical incision
 - Cut away from the globe
 - Snip 2-3 mm from lid margin
 - Feather blade vs Ellman (no tactile feedback)
- Remove capsular contents with curette
- May excise fibrotic capsule with forceps and scissors
 - Cut "X" and snip corners back (most OMDs)
 - • +/- intralesional steroid
- Pressure for 2-3 minutes to achieve hemostasis (use gauze once clamp removed)
- Palpate to make sure you got it all
- Saline rinse & apply tobradex ung with Q-tip




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Chalazion Incision and Curettage

Postop instructions:

- Antibiotic ointment +/- steroid x 4-7 days
 - Erythromycin or Tobradex ung BID
- No warm compresses for 2 days
- Pressure dressing?
- RTC 2-3 weeks




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Sample Chart Documentation

Area cleaned with alcohol pad, anesthetized with 0.2cc 1% lidocaine w/ epi, clamp secured, feather blade used to incise chalazion, curette used to remove contents. Hemostasis achieved. Procedure completed w/o incident, patient tolerated procedure well.


Erythromycin ung applied to eye, patient left in NAD. Rx'd erythromycin ung TID x 1 week, RTC 1 week.



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Other In-Office Surgical Procedures

- Subconjunctival Injections
- Botulinum Toxin injection
- Radiosurgery/Radiofrequency Lesion removal
- Suturing





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**Other In-Office Surgical Procedures:
Subconjunctival Injections**

➤ It has been determined that both anterior AND vitreous levels of drugs can be established from subconjunctival injection

➤ It may be possible to take advantage of the subconjunctival space to deliver posterior drugs to therapeutic levels by using slowly dissolving drugs alone or in combination with semi-solid mediums



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- Allows continual drug delivery
- Increase concentrations of medication with poor ocular penetration
- The needles are short. The thickness of the needle is usually 25 gauge or smaller.
- Usually performed on bulbar conjunctiva under lid

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Subconjunctival Injections

- Requires instillation of topical anesthetic
- Locations selected by gross observation
- Avoid conjunctival vasculature and extraocular muscles
- Never inject 4% lidocaine.
- Usually instill topical antibiotic drop
- Insert eyelid speculum
- Injection should be parallel to the globe

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- Pronounced effect in the anterior segment
- Uses include: steroid injections, antibiotic injections
- Used mainly in cases of stubborn recurrent inflammation and post operatively
- Can be given in cases of severe corneal ulcers





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Subconjunctival Injections


Most common sequelae is subconjunctival Hemorrhage!



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Contraindications of Subconjunctival Injections

- Medication hypersensitivity
- Active Scleritis
- In addition, Secondary Glaucoma may occur





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Botox injections


Perform Botox injections for Blepharospasms
Ocular aesthetics: wrinkles around eyes

2022 UK study showed :

- chemodenervation of the levator muscle
- demonstrate the superiority of this technique compared with transcutaneous administration of botulinum toxin
- use of botulinum toxin to induce ptosis for temporary corneal protection
- useful technique to protect corneal
- resolves



<https://www.2020.org/education/retinors-choice/transconjunctival-injection-of-botulinum-toxin.pdf>



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What is Radiosurgery?

Radiosurgery vs. Electrocautery

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History Of Electrosurgery

- Origins in electrocautery
- Albucais (980BC) used hot iron to stop bleeding
 - Of course, this also caused third degree burns and poor cosmesis
- In 1893, Arsenne d' Arsonval was experimenting with passing high frequency electrical current through tissues and discovered that electric currents >100KHz **DO NOT** cause muscle spasm
 - Known as the **FARADIC EFFECT**-allows muscle to relax after contraction, short duration

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What is Radiofrequency (RF) Surgery?

- Radiosurgery-the passage of high frequency radiowaves through soft tissue to cut, coagulate, and/or remove the target tissue
- Resistance of the tissue to the radiowaves causes water in the cells to heat and the cell vaporizes
- Radiosurgical unit consists of:
 - Active electrode (energized tip)
 - Antennae (passive electrode)
 - Transformer unit
- Ideal frequency = 3.8 - 4.0 MHz

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Ellman Radiowave Technology Overview

Cellular Radiofrequency Absorption

CC10004A2

ellman VISION EXPO

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Electrode Tips

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Electrode Tips

Loop tip gives efficiency

*Ball tip mainly for coagulation of capillary hemangiomas


Straight tip for opening cysts

Ball tip creates less damage; good for small lesions

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Ellman Unit
Vacuum



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Ellman Electrode Plate &
Fingerswitch/Foot Pedal




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Passive electrode plate
—AKA antenna

Plate acts like a radio antenna by attracting the radio waves emitted from the machine and channels the energy back to the unit.



Place under neck or back


The closer the passive electrode is to the surgical site, the less power is required → less chance of lateral thermal damage.

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Advantages of Radiosurgery


- Cuts and coagulates at the same time
- Nearly bloodless field
- Minimal biopsy artifact damage*
- Quick and easy (to do and to learn)
 - > Pressure-less & bacteria-free incisions
- Minimal lateral heat
- Minimal post-op pain
- Rapid healing
- Fine control with variety of tips
- No muscle contractions or nerve stimulation from radiowaves
 - > Paradox effects



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Setting 1


- **Filtered Fully Rectified Waveform – Pure Cutting Action**
- 90% Cutting
- 10% Coagulation
- Cutting current: high frequency sine wave that is not dampened
- Produces very focused heat buildup that ruptures tissue through either molecular activity or through production of steam microbubbles
 - Minimal lateral heat
 - Use for biopsy, incisions, chalazion



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Setting 2


- **Rectified Waveform (blended) – Cut and Coagulation**
- 50% Cutting
- 50% Coagulation
- When don't need biopsy
- Helps greatly with bleeding during procedure
 - > Very useful in vascular regions
- **Great for excising:**
 - Skin tags, verruca
 - **More bleeding lesions**
 - **Waveform we use the most**



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Setting 3
Partially Rectified Waveform (blended) – Coagulation/Hemostasis

- 90% Coagulation
- 10% Cutting
- Coagulating current: high frequency but dampened (rectified) sine wave
- Produces oscillation of molecules leading to generation of intracellular heat that ultimately causes tissue dehydration/coagulation (hemostasis)
- **Use for: bleeding, capillary hemangioma, epilation, punctal occlusion**




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Trichiasis Procedure Technique

- Cut offending lashes
- Anesthetize???
- Grab lash with forceps
- Use microinsulated needle (only tip is active)
- Put needle beside lash shaft into follicle until cannot go further
- Lowest power setting, Coag
- Touch and let off immediately of footplate
- Gently tug lash – if comes out smooth done
 - If not, treat quickly again



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Setting 4
Fulguration – Coagulation and Destruction

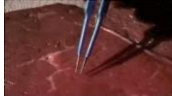
- Spark gap fulguration current for superficial cautery
- Doesn't penetrate deeply – superficial treatment
- We never use clinically...
- **Use for:**
 - **Electrodesiccation (papilloma bed)**
 - **Destruction of cyst remnants**
 - **Intentional destruction of diseased tissue**
 - BCC
 - SCC

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Bipolar Coagulation

- Radiowaves travel only between the two tips of the forceps
 - Antenna is NOT used but it MUST be plugged into the machine
- Pin-point accuracy, microcoagulation in a wet field
- Ideal for coagulation in and around critical anatomy



Frequency = 1.7MHz




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Lateral Heat

Factors Affecting Lateral Heat:

- Electrode contact time: slow passage = increased heat
- Excessive power can lead to sparking (too little power leads to tissue drag)
- Larger electrode head sizes lead to greater power/heat generation
- Different waveforms are associated with different levels of heat:
 - **Fulguration > COAG > CUT/COAG > CUT**
- Higher frequency associated with less lateral heat


$$\text{LATERAL HEAT} = \text{time} \times \text{waveform} \times \text{power} \times \text{electrode size} \times \text{frequency}$$



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Advantages of Radiosurgery

- Cuts and coagulates at the same time
- Nearly bloodless field
- Minimal biopsy artifact damage
- Quick and easy (to do and to learn)
 - Pressureless & **bacteria-free incisions***
- Minimal lateral heat
- Minimal Post-op pain
- Rapid healing
- Fine control with variety of tips
- No muscle contractions or nerve stimulation from radiowaves (Faradic effects)




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Hazards/Contraindications

- Excess lateral tissue damage
- Smoke hazard/unpleasant smells in office
 - **Aerosolization can harbor viral DNA/RNA particulates (COVID risk)**
 - Recommend cryotherapy as an alternative
- **Do NOT perform shave excision on pigmented lesion unless certain is not melanoma!!!**
- Don't use in presence of flammable fumes/liquids
- Implantable defibrillator
- Pacemaker:
 - "Do not work near the heart and place the antenna (or grounding) plate well away from the heart. Use the least power possible. Activate the hand piece intermittently rather than continuously. The cutting mode is the most risky, so avoid it if possible. Use another form of treatment if it is an option. The pacers are purportedly "shielded" and the current in the ESLs should not affect them, but all things are not perfect! Therefore caution is needed. Aystole and tachycardia are potential adverse outcomes."


Plummer and Fowler's Procedures for Primary Care, 3rd Edition, John L. Plummer, MD, FAAP and Grant C. Fowler, MD



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Radiofrequency (RF) Surgery Indications


- Skin papillomas/skin tags
- Seborrheic keratosis
- Verruca
- Sebaceous cysts
- Benign Nevi
- Pyogenic Granulomas
- Incision into chalazion
- Trichiasis
- Xanthelasma
- Biopsies of suspicious lesions (BCC, SCC, melanoma)
- Blepharoplasty incisions*



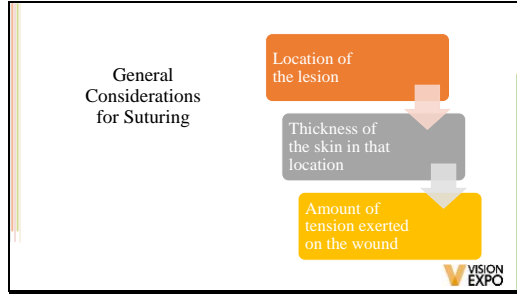
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Suturing

- Equipment, techniques, wound maintenance




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Suturing

- Goals of suturing:
 - Bring together the wound margins
 - Eliminate dead space
 - Hold underlying tissue together
 - Minimize scar formation
 - Ensure that wound edges are not inverted
 - Inversion occurs when the epidermis on either side of the wound curls inward and touches the epidermis on the opposite side
 - Edges should be everted/slightly outward



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Equipment

- Absorbable:
 - Loses most of its tensile strength in less than 60 days
 - Generally used with buried suture technique
 - DO NOT require removal
- Non-absorbable:
 - Maintains tensile strength more than 60 days
 - Used for skin surface sutures
 - Require removal postoperatively
- Basic Suturing Kit includes:
 - Needle holder
 - Fine suture scissors
 - Toothed forceps
 - Skin hook (optional)
- Suture material
 - Absorbable
 - Non-absorbable


10-0 to 8-0: Used to perform delicate procedures such as ophthalmic surgery or nerve repair

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Suturing


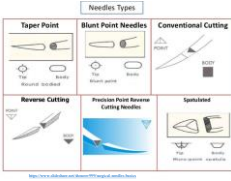
- Suture needles and material vary based on the provider assessing the wound
- Materials are selected based on the wound and needs for closure
- New non-suturing closure methods can be used as alternatives
 - May be better than traditional suturing in some cases
 - Staples
 - Sterile strips
 - Topical adhesives
 - Combination



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Needles


- Suture needles come in variety of shapes and sizes
- Curved needles are almost always used in dermatological procedures and eyecare procedures
- Cutting needle moves through tissue easily
- Conventional: cutting edge on inside of curve
- Reverse: cutting edge outside of curve



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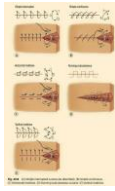
Suturing techniques

- **Simple interrupted suture**
- **Continuous suture**
- Vertical mattress suture
- Horizontal mattress suture
- Running subcuticular suture
- Buried suture
- Retention Sutures
- Relaxation Sutures
- Ligature Sutures
- Purse-string sutures
- Continuous interlocking sutures
- Near and far sutures/pulley suture
- 3-Corner Sutures
- **Frost Sutures:** used during surgeries of the eyelid; prevents the eyelid from turning outward
 - Mainly the lower eyelid
- **Cobbler's Sutures:** used by eye surgeons that desire to vertically or horizontally resect the rectus muscles.
 - The double-arm suture is achieved by using a suture containing a needle at each end.



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Suturing Techniques

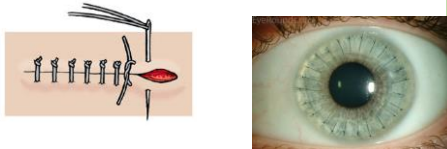


- Multiple ways to suture
- Art to techniques
- Choice depends on surgeon preference

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Simple Interrupted Sutures



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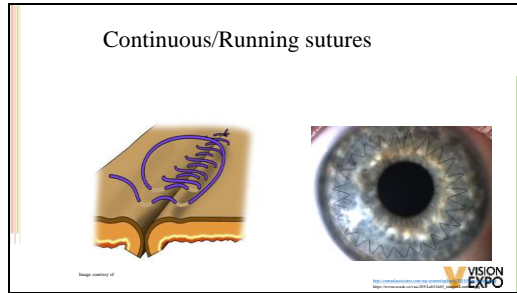
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Simple interrupted sutures

Pros	Cons
<ul style="list-style-type: none">• Placed and tied individually• Good for inexperienced practitioners• Allows closure of the wound cleanly and securely• If infection occurs only a few interrupted sutures need to be removed for treatment• Highest level of control over wound closure	<ul style="list-style-type: none">• Practitioner has to push needle through healthy skin adjacent to the wound• Time consuming• If on the face: do not leave longer than 7 days to avoid cross hatching scars• In ocular sx can get GPC from exposed knots

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Continuous/Running Sutures

- Pros
 - Consist of one strand of suture material that runs along a wound
 - Baseball sutures
 - Provide adequate closure with even tension distribution
 - Times saving compared to simple interrupted
 - Spread tension evenly → great for soft tissue
 - Good for actively bleeding wounds
- Cons
 - Not as strong as interrupted suture
 - Can strangulate blood supply in wounds
 - Suture breaks can cause wound gaps or whole wound to open
 - Often surgeon place a few interrupted sutures in case of breakage

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Buried Interrupted Sutures

- Pros
 - Important for distributing wound tension to the dermis rather than the epidermis and for closing dead space
 - Long-term support for the wound
 - Improves cosmetic result compare to other techniques
 - Good for sensitive areas
- Cons
 - Wound may take a bit longer to heal due to increased amount of suture material left in wound
 - Requires absorbable sutures
 - Knots may take longer to resorb since buried


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Wound Maintenance

- Healing can only happen if two severed areas of tissue align properly and remain intact
- If dead space is not eliminated blood may pool in the wound leading to hematoma, compromising the wound
 - Increase the risk of infection

four distinct stages of wound healing which are (1) hemostasis, (2) inflammatory phase, (3) proliferative ("rebuilding") phase, and (4) maturation



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Complications in Suturing and Wound Maintenance

Ocular Surgery:

- Suture breakage
- Infectious abscess: usually around broken or exposed suture
- GPC conjunctivitis from exposed knots
- Vascularization along sutures

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Errors in Suturing and Wound Maintenance


- Sutures too tight
- Crushing margins of wound
- Getting something in wound
- Not evertng wound edges

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Non-Suture Closures

- **Sterile Strips**
 - Adhesive tapes and skin glue are a useful adjunct to deeper sutures
- **Topical Adhesives**
 - skin glues are particularly useful as they are quick and relatively painless
 - cause minimal wound inflammation,
 - have a lower infection rate than sutures
 - removal of easily
- **Staples:**
 - linear laceration located on the scalp or extremities,
 - a reasonable alternative to sutures
 - can be placed quickly
 - useful in situations where there is brisk bleeding
 - cost-effective
 - easily placed,
 - require minimal training
 - have similar healing times and infection rates as sutures.



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Recognizing and Managing Anaphylaxis

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Recognizing and Managing Anaphylaxis: Early Recognition

- **Recognizing Anaphylaxis**
 - Anaphylaxis requires immediate treatment, thus we must recognize the clinical signs and symptoms
 - Anaphylaxis should be considered when signs and symptoms are generalized
- If hives are generalized or more than one body system is involved
- If there is a serious or life-threatening condition involving one body system
 - Hypotension
 - Respiratory distress
 - Significant swelling of the tongue or lips


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Recognizing and Managing Anaphylaxis: Early Recognition

➤ **Recognizing Anaphylaxis**

- **Respiratory:** sensation of throat closing or tightness, stridor, hoarseness, respiratory distress, trouble swallowing/drooling, nasal congestion
- **Gastrointestinal:** nausea, vomiting, diarrhea, abdominal pain, or cramps
- **Cardiovascular:** dizziness; fainting; tachycardia (abnormally fast heart rate); hypotension (abnormally low blood pressure); pulse difficult to find or "weak"; cyanosis (bluish discoloration); pallor; flushing




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Recognizing and Managing Anaphylaxis: Early Recognition

➤ **Recognizing Anaphylaxis**

- **Skin/mucosal:** generalized hives; widespread redness; itching; conjunctivitis; or swelling of eyes, lips, tongue, mouth, face, or extremities
- **Neurologic:** agitation; convulsions; acute change in mental status; sense of impending doom (a feeling that something bad is about to happen)
- **Other:** sudden increase in secretions (from eyes, nose, or mouth); urinary incontinence



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RECOGNIZING AND MANAGING ANAPHYLAXIS: MANAGING ANAPHYLAXIS

➤ **Managing Anaphylaxis**

- If itching and swelling are confined to the injection site where the vaccination was given, observe patient closely for the development of generalized symptoms
- If symptoms are generalized:
 - activate the emergency medical system --call 911
 - notify the patient's physician
 - assesses the airway, breathing, circulation,
 - assess level of consciousness of the patient.
 - Vital signs should be monitored continuously

http://www.aacpi.org/eng/eng_021012.pdf


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Managing Anaphylaxis

First-line treatment: Epinephrine is the first-line treatment for anaphylaxis

- there is no known equivalent substitute
- Use epinephrine in a 1.0 mg/mL aqueous solution (1:1000 dilution)
- Administer a 0.3 mg dose IM using a premeasured or prefilled syringe or an autoinjector in the mid-outer thigh.
- If using another epinephrine formulation, the recommended dose is 0.01 mg/kg, ranging for adults from 0.3 mg to maximum dose of 0.5 mg.
- Administer IM, preferably in the mid-outer thigh.

* Epinephrine dose may be repeated 2 additional times every 5–15 minutes (or sooner as needed) while waiting for EMS to arrive.



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RECOGNIZING AND MANAGING ANAPHYLAXIS: MANAGING ANAPHYLAXIS

- **Managing Anaphylaxis**

Optional treatment: H1 antihistamines relieve itching and urticaria (hives).

- These medications **DO NOT** relieve upper or lower airway obstruction, hypotension, or shock.
- Consider giving diphenhydramine (e.g., Benadryl) for relief of itching and hives.
- Administer orally 1–2 mg/kg every 4–6 hours, up to a maximum single dose of 100 mg.
- Monitor the patient closely until EMS arrives.
- Perform cardiopulmonary resuscitation (CPR), if necessary, and maintain airway.

https://www.ama-assn.org/amaj/2019/02/15/











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Review of Lesion Evaluation

- ABCDEFGI

When to Refer:

- Suspicious characteristics
- Discomfort/unsure of treatment
- Destruction of tissue/anatomy


NORMAL		CANCEROUS
	A: ASYMMETRY If you draw a line through the center of the lesion, the two halves of a mole won't match.	
	B: BORDER IRREGULARITY The border of a melanoma is irregular, typically geographic: peninsulas, bays, islands.	
	C: COLOUR VARIATION Healthy moles are a uniform colour. A variety of different colours in the same mole is suspicious.	
	D: DIAMETER > 6 MM Greater than 6 mm is suspicious, although melanomas can be smaller.	
	E: EVOLVING Recent change in size, shape or colour, or bleeding or scabbing are suspicious.	



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PATIENT-CENTERED CARE

Take home: Expanding your knowledge and skills allows you to provide a broader range of patient-centered care



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Resources for Scope of Practice Guidelines

- <https://scopeofpracticepolicy.org/practitioners/optometrists/>
- <https://www.getweave.com/optometrist-scope-practice/>

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References

1. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
2. <https://www.the.gov.com/newsroom/2018/11/01/1811>
3. <https://www.statista.com/statistics/517000/optometrists-ophthalmologists-visit-frequency-among-adults-us/> Accessed August 29, 2023
4. <https://scholarlink.com/eyefid-astigmatism-and-fraction/>
5. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
6. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
7. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
8. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
9. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
10. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
11. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
12. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
13. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
14. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
15. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
16. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>
17. <https://www.aetna.com/medicaid-providers/surgical-procedures-market-to-reach-144-million-procedures-by-2023?hcc=article&articleid=1>

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