

Managing Office Emergencies

Wendy L. Wright, MS, RN, ARNP, FNP, FAANP
 Adult/Family Nurse Practitioner
 Owner – Wright & Associates Family Healthcare, PLLC
 Amherst, NH
 Partner – Partners in Healthcare Education, LLC

Objectives

- Upon completion of this lecture, the participant will be able to:
 - Discuss various office emergencies
 - Identify the appropriate management of individuals with the above conditions
 - Discuss medications and treatment options that may be utilized for the above conditions

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Asthma and Asthma Exacerbation

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Prevalence of Asthma

- Impacts approximately 14-15 million individuals in the United States
- Most common chronic disease of childhood affecting 4.8 million children
- Before adolescence, 2 times more common in boys
- Increasing incidence of this disease
 - 76% increase in the prevalence of asthma within the past decade

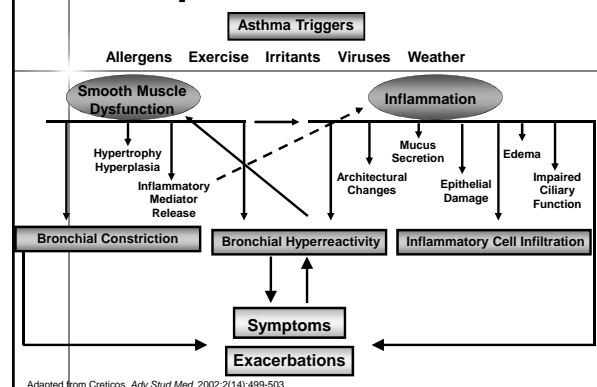
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Impact of Asthma

- Most frequent cause for hospitalization in children (470,000 each year)
 - Emergency room visits and hospitalizations are increasing
- Most frequent cause of childhood death, particularly amongst certain groups (children, african americans)
 - 5,000 people die yearly from asthma

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Components of Asthma

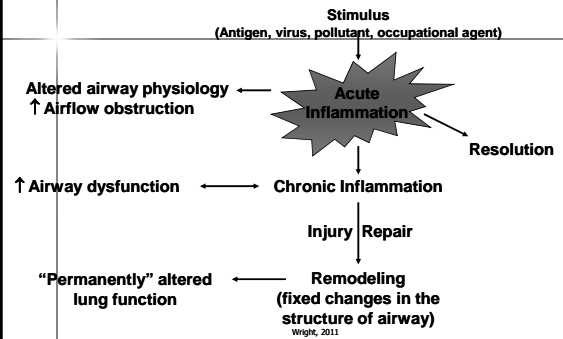


Asthma is...

- A disease of:
 - Inflammation
 - Primary Process
 - Hyperresponsiveness
 - Airway bronchoconstriction
 - Excessive mucous production

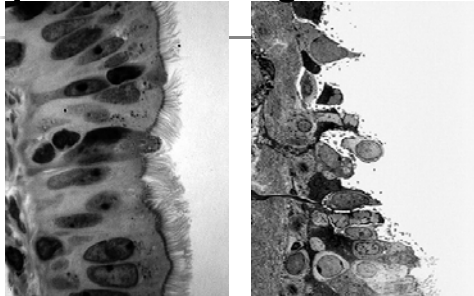
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Consequences of Inflammation in Asthma



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Epithelial Damage in Asthma



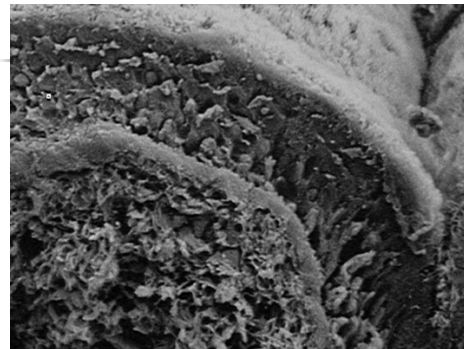
Normal

Asthmatic

Jeffery P. In: Asthma, Academic Press 1998.

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Basement Membrane Thickening



Jeffery P. In: Asthma, Academic Press 1998.

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Diagnosis of Asthma

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Diagnosis of Asthma

- History and Physical Examination
- Pulmonary Function Tests/Spirometry
- Monitoring:
 - Peak Flow Meters

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Methods for Measuring Airway Caliber



Maximum PEFR
airflow achieved

Home

FVC, FEV₁,
FEF_{25%-75%}

Office/Clinic

Airway
Resistance

Clinic/Laboratory

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Symptoms and Signs of Asthma in Children and Adults

- Coughing, particularly at night
 - Cortisol levels are the lowest at night
- Wheezing
- Chest tightness
- SOB
- Cold that lingers x months with a persistent cough

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The Biggest Predictor of Sudden Death from Asthma

- History of hospitalization with or without intubation
- These individuals are at a significant risk for a serious exacerbation again

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Acute Asthma Exacerbation Management

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Case Study

- 6 year old who presents with a 2 day history of increasing SOB and wheezing
- Began after developing a URI
- + nasal discharge, wheezing, cough, fever – 99.6
 - Denies ST, ear pain, sinus pain, pain with inspiration
- Meds: none
- Allergies: NKDA
- PMH: Bronchiolitis: age 6 months – required hospitalization

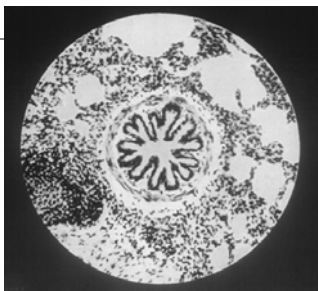
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Physical Examination

- 6 year old who is wheezing audibly and obviously uncomfortable
 - RR: 30 and labored
 - Pulse: 124 bpm
 - Lungs: + inspiratory and expiratory wheezes
 - No use of accessory muscles
 - Remainder of exam is unremarkable

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Cross Section of Bronchiole Showing Bronchospasm



Color Atlas of Respiratory Disease, Volume 2, 1995. Wright, 2011

Acute Asthma Exacerbation

- Measure Spirometry vs. Peak Flow
- FEV₁ is most important number
 - >80% predicted
 - 50% – 79% of predicted
 - < 50% of predicted

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Spirometry Results

- FEV1 = 62% of predicted
- FEV1/FVC = 90%
- What does this mean for our patient?

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Acute Asthma Exacerbation

- Inhaled short acting beta 2 agonist:
 - Up to three treatments of 2-4 puffs by MDI at 20 minute intervals OR a single nebulizer
- Can repeat x 1 – 2 provided patient tolerates
 - Xopenex 1.25 mg nebulizer
 - Reassess spirometry or peak flow after

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Prednisone

- Multiple products available
- Prelone, Orapred, Prednisone
- Prednisone 10 mg 1 po bid x 5 days
- No taper necessary

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Home Nebulizer

- May be important to order the patient a nebulizer to be delivered to his/her home
- Will be set up by a respiratory company
- Patient and parent will be taught appropriate utilization

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	Patient Education
	<ul style="list-style-type: none"> ■ Have plan in place for next URI ■ Preventative therapy? ■ Environmental modification ■ Daily peak flows <p style="text-align: right;"><small>Wright, 2011</small></p>

	Management of Moderate Exacerbations: Response from Emergency Treatment
	<ul style="list-style-type: none"> ■ Good Response <ul style="list-style-type: none"> – Symptom relief sustained x 1hr; FEV1 or PEF \geq 70% – D/C home – Continue SABA & oral corticosteroid – Consider inhaled corticosteroid (ICS) – Patient education / asthma action plan <p style="text-align: right;"><small>Wright, 2011</small></p>

	Management of Moderate Exacerbations: Response from Emergency Treatment
	<ul style="list-style-type: none"> ■ Incomplete Response <ul style="list-style-type: none"> – Mild-moderate symptoms, FEV1 or PEF 40-69% – SABA, oxygen, oral or IV corticosteroids – Can D/C home ■ Poor Response <ul style="list-style-type: none"> – Marked symptoms, PEF <40% – Repeat SABA immediately – ED / 911; oral corticosteroid <p style="text-align: right;"><small>Wright, 2011</small></p>

	Key Differences in the EPR-3 Report
	<ul style="list-style-type: none"> ■ Point of discharge <ul style="list-style-type: none"> – FEV1 or PEF \geq 70% predicted – Response sustained 60 minutes after last treatment – Normal physical exam ■ Continued ED treatment needed <ul style="list-style-type: none"> – FEV1 or PEF 40-69% predicted ■ Consider adjunct therapies <ul style="list-style-type: none"> – FEV1 or PEF <40% predicted <p style="text-align: right;"><small>Wright, 2011</small></p>

	Stridor
	<p style="text-align: right;"><small>Wright, 2011</small></p>

	Stridor
	<ul style="list-style-type: none"> ■ Upper airway obstruction ■ Getting air in more of a problem than getting air out ■ Harsh inspiratory noise ■ Created by an obstruction of the larynx or the trachea <p style="text-align: right;"><small>Wright, 2011</small></p>

Stridor

- Few conditions in pediatrics are as emergent and potentially life threatening as an upper airway obstruction
- Rapid identification and treatment is essential

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Differential Diagnosis for Stridor

- Differential
 - Croup (laryngotracheobronchitis)
 - Mechanical Obstruction (birth)
 - Foreign body aspiration
 - Peritonsillar abscess
 - Epiglottitis
 - Angioedema

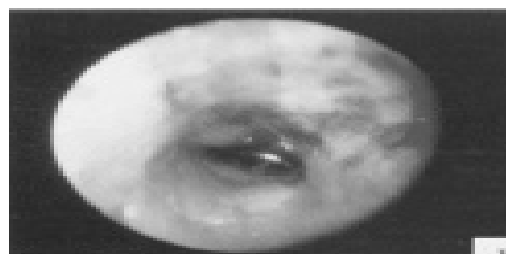
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Croup

- Causes:
 - Usually caused by a virus
 - Parainfluenza or Rhinovirus
- Characteristics:
 - Inflammation and edema of the pharynx and upper airways
 - Narrowing of the subglottic region
 - + laryngospasm is frequently seen

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Croup



Subglottic narrowing

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Croup

- Incidence and Prevalence
 - Peak season – October thru April
 - More severely affects young children
 - Most likely because the airways are more narrow and the mucosa is more vascular which contributes to the increased presence of airway edema

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Croup

- Presentation:
 - Mild URI symptoms x 24 – 48 hours
 - Rhinorrhea, cough, low grade fever, sore throat
 - Followed by a sudden onset of:
 - Croupy cough, hoarseness of the voice and stridor
 - Stridor usually begins when the child awakens suddenly from a nap or during the night with a fever

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Croup	
	<ul style="list-style-type: none"> ■ Presentation: <ul style="list-style-type: none"> – May have wheezing on auscultation – Suprasternal and subcostal retractions are most common – Tachycardia and tachypnea are frequently present – Hypoxemia may occur – Severity and course varies significantly but illness usually lasts about 3 days – 1 week <p style="text-align: right; font-size: small;">Wright, 2011</p>

Diagnosis of Croup	
	<ul style="list-style-type: none"> ■ History and physical examination ■ X-ray <ul style="list-style-type: none"> – May show subglottic narrowing – also referred to the steeple sign – X-ray not generally done on most individuals ■ Important reminder: <ul style="list-style-type: none"> – Avoid oral examination if child is severe until airway is secure <p style="text-align: right; font-size: small;">Wright, 2011</p>

Croup	
	<ul style="list-style-type: none"> ■ Treatment: <ul style="list-style-type: none"> – Exposure to a cool night; child often improves on the way to the ED – Humidification or mist can be helpful – Aerosolized racemic epinephrine can be helpful <ul style="list-style-type: none"> ■ Very short acting agent delivered via nebulizer – Nebulizer with albuterol or Xopenex may offer some benefit – Inhaled corticosteroids/prednisone is frequently beneficial <p style="text-align: right; font-size: small;">Wright, 2011</p>

Pharmacotherapy	
	<ul style="list-style-type: none"> ■ Nebulized epinephrine ■ Nebulized ipratropium bromide ■ Corticosteroids ■ Inhaled corticosteroids <p style="text-align: right; font-size: small;">Wright, 2011</p>

Treatment	
	<ul style="list-style-type: none"> ■ Symptomatic treatment is the most common treatment <ul style="list-style-type: none"> – Increased fluids – Cool mist vaporizer to thin the secretions – Tilting the child's mattress up may be beneficial ■ Antibiotics are not helpful <p style="text-align: right; font-size: small;">Wright, 2011</p>

Peritonsillar Abscess	
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What Is It?

- Peritonsillar abscess is the most common deep infection of the head and neck that occurs in children
- It is typically formed by a combination of aerobic and anaerobic bacteria
- Begins as a superficial infection and then develops into a cellulitis/abscess of the tonsillar region
- Multiple antibiotics are thought to increase the risk for the development

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Peritonsillar Abscess

- Generally begins as an acute febrile URI or pharyngitis
- Condition suddenly worsens
 - Increased fever
 - Anorexia
 - Drooling
 - Dyspnea
 - Trismus

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Peritonsillar Abscess

- Physical examination
 - May appear restless
 - Irritable
 - May lie with head hyperextended to facilitate respirations
 - Muffled or “hot potato voice”
 - Stridor may be present
 - Respiratory distress

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Peritonsillar Abscess

- Physical examination findings
 - Fiery red asymmetric swelling of one tonsil
 - Uvula is often displaced contralaterally and often forward
 - Large, tender lymphadenopathy

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Peritonsillar Abscess



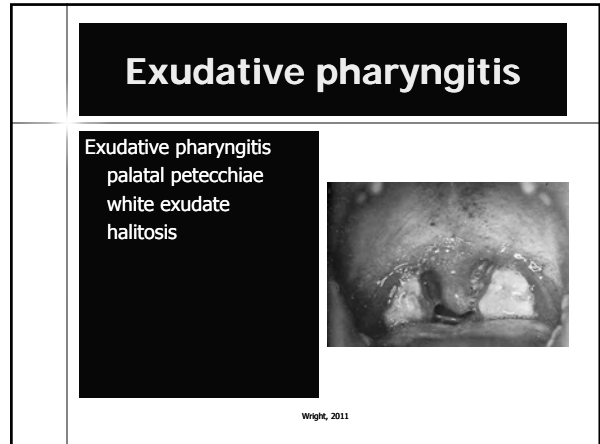
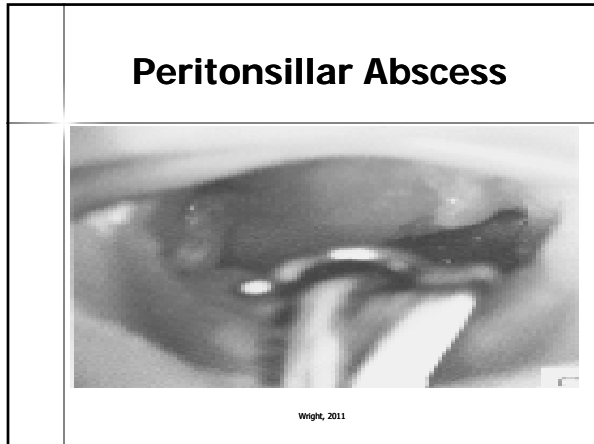
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Peritonsillar Abscess



Trismus

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Important Reminder

- If respiratory distress is severe, do not examine the pharynx

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Treatment

- Aspiration of the abscess may be performed for an accurate diagnosis and treatment
- CT scan of the head and neck
 - Monitor airway at all times
- ENT consult is essential – ED evaluation
- Usual management
 - IV antibiotics
 - Inpatient management

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Anaphylaxis

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Anaphylaxis

- Systemic allergic reaction
 - Affects multiple body organ systems
- Onset is generally acute
 - Manifestations vary from mild to fatal

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	Presentation
	<ul style="list-style-type: none"> ■ Urticaria ■ Angioedema ■ Dyspnea and wheezing ■ Hypotension ■ Flushing ■ Diarrhea, vomiting ■ Chest pain ■ Syncope or seizure <p style="text-align: right;"><small>Wright, 2011</small></p>

	 <p style="text-align: center;"><small>Wright, 2011</small></p> <p style="text-align: right;"><small>56</small></p>

	Step 1
	<ul style="list-style-type: none"> ■ Immediate administration of epinephrine <ul style="list-style-type: none"> – No contraindications to usage – IM or SC – Delaying administration may result in fatalities – May keep epi-pen available in office or have epinephrine available in a multidose vial <p style="text-align: right;"><small>Wright, 2011</small></p>

	Step 2
	<ul style="list-style-type: none"> ■ Call 911 <ul style="list-style-type: none"> – Perform after administration of epinephrine <p style="text-align: right;"><small>Wright, 2011</small></p>

	Step 3
	<ul style="list-style-type: none"> ■ Administer diphenhydramine <ul style="list-style-type: none"> – Preferably liquid or chewable – If not available, tablet is okay – Should be used in addition to the epinephrine, not in place of it <p style="text-align: right;"><small>Wright, 2011</small></p>

	Step 4
	<ul style="list-style-type: none"> ■ Additional measures while awaiting EMS <ul style="list-style-type: none"> – O2 therapy – IV line with hydration – Repeat epinephrine every 5 minutes as dictated by response – May repeat antihistamine as needed – IV corticosteroids <p style="text-align: right;"><small>Wright, 2011</small></p>

Finally

- Make sure that patient has an epipen or kit at follow-up
- Recent study showed that 90% of individuals with an epipen have no idea how and when to use it
- Make sure patient is adequately educated

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Stevens-Johnson Syndrome

- Distinct, acute hypersensitivity syndrome
- Many causes: Drugs, bacteria, viruses, foods, immunizations
- Also known as Bullous Erythema Multiforme
- Stevens-Johnson Syndrome is thought to represent the most severe of the erythema multiforme spectrum
- Two stages
 - Prodrome which lasts 1-14 days
 - 2nd stage: mucosal involvement where at least 2 mucosal surfaces are involved (oral, conjunctival, urethral)

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Stevens-Johnson Syndrome

- Mortality: 5-25%
- Long-term complications are common
- Face almost always involved and mouth always involved
- Entire course: 3-4 weeks
- Most common in children aged 2 - 10

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Stevens-Johnson Syndrome

- Symptoms
 - Constitutional symptoms such as fever, headache, sore throat, nausea, vomiting, chest pain, and cough
- Physical Examination Findings
 - Vesicles that are extensive and hemorrhagic
 - Bullae rupture leaving ulcerations which are covered with membranes
 - Leave large areas of necrosis and skin peels
 - Lesions on the conjunctiva

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Erythema Multiforme



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Erythema Multiforme



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Stevens-Johnson Syndrome	
<ul style="list-style-type: none"> ■ Plan <ul style="list-style-type: none"> - Must rule-out staphylococcal scalded skin syndrome - Therapeutic: HOSPITALIZATION with early ophthalmological evaluation - Steroids are controversial - Others in family may be genetically susceptible - Never take these medications again 	
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Necrotizing Fasciitis	
<ul style="list-style-type: none"> ■ Severe, deep, necrotizing infection ■ Involves subcutaneous tissue down into the muscles ■ Spreads rapidly ■ Caused by Group A Beta Hemolytic Strep, Staph, Pseudomonas, E Coli ■ Mortality: 8-70% depending upon organism and rapidity of treatment ■ Disfigurement common 	
<small>Wright, 2011</small>	

Necrotizing Fasciitis	
<ul style="list-style-type: none"> ■ Symptoms <ul style="list-style-type: none"> - Usually occurs after surgery, traumatic wounds, injection sites, cutaneous sores - Generalized body aches, fever, irritability - Key: Red area of skin that is severely painful (It is out of proportion to findings) - Leg is most common location ■ Physical Examination Findings <ul style="list-style-type: none"> - 1st appears as local area of redness that looks like cellulitis 	
<small>Wright, 2011</small>	

Necrotizing Fasciitis	
<ul style="list-style-type: none"> ■ Physical Examination Findings <ul style="list-style-type: none"> - Tender - Bullae with purulent center which ruptures quickly - Black eschar appears and the pain decreases - Systemic symptoms begin 	
<small>Wright, 2011</small>	

Necrotizing Fasciitis



Bullae: Below these lesions is necrotic tissue Wright, 2011

Necrotizing Fasciitis

- Plan
 - Diagnosis: Culture of wounds, blood cultures, biopsy of area, CBC with differential, urinalysis
 - Therapeutic: HOSPITAL ADMISSION
 - Educational: Good wound hygiene

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Syncope

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15 year-old male

- Passed out in your office after a venipuncture
 - Occurred with standing; witnessed by staff member who helped to ease him to the floor
 - Awoke as soon as he was placed on the floor

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15 year-old male

- No prior similar episodes
 - Occasional episodes of feeling "lightheaded" with quick position change
- PMH: noncontributory

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15 year-old male

- Current status
 - BP=118/82, P=88, RR= 20
 - Alert, oriented X 3
 - PERRLA, fundi WNL

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Syncope

- A transient loss of consciousness characterized by a loss of postural tone, typically sudden in onset with spontaneous recovery
 - Desai, 2001

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Syncope vs. seizure

<ul style="list-style-type: none"> ■ Syncope <ul style="list-style-type: none"> – <5 mins – Injury from fall – No incontinence – Normal CK – No warning – No disorientation post episode 	<ul style="list-style-type: none"> ■ Seizure <ul style="list-style-type: none"> – Often > 5 mins – Usually no injury – Incontinence – Elevated CK – Aura or prodrome – Post ictal state <ul style="list-style-type: none"> ■ Desai, 2001
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Syncope etiology

- Orthostatic hypotension
 - Common cause of syncope
 - HCTZ/diuretics often implicated

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Syncope etiology

- Neurally mediated syncope
 - Vasovagal syncope
 - Most common in young women
 - Prodromal nausea, sweating and malaise
 - Associated with pallor
 - Often occurs in hot, enclosed environments while standing or after witnessing or being involved in an unpleasant event
 - Gradual loss of consciousness rather than seizures where it is associated with a rapid loss
 - Rapid recovery if patient is recumbent

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Syncope etiology

- Situational syncope
 - Cough, defecation, micturition, swallow
 - Cough syncope:
 - Rare
 - Cough causes the patient to Valsalva
 - Micturition syncope:
 - More common in men
 - Typically occurs at night; often associated with alcohol ingestion
 - Most likely the result of a vasodepressor reflex triggered by a sudden decrease in bladder pressure
 - Treatment: urinate in the sitting position; alcohol avoidance

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Cardiac Etiology

- Cardiac outflow obstruction
 - Common cause of syncope in an older individual
 - Variety of causes
 - Complete heart block
 - Valvular
 - Aortic stenosis
 - Aortic dissection

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Syncope etiology

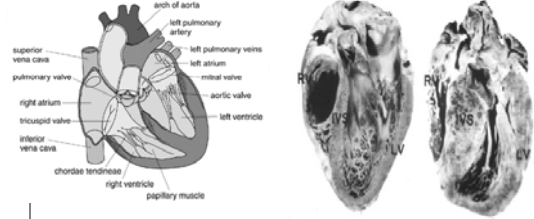
- Dysrhythmia
 - TDP, VT, SVT
 - AV block
 - HR < 30 BPM



Torsades.org

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Outlet Obstruction: HCM



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Syncope Assessment clues

- Episode on arising
 - Orthostatic
- Episode occurred during uncomfortable activity or after witnessing an event
 - Vasovagal
- With rapid head turn, tight collar
 - Carotid artery
- With palpitations before
 - Cardiac dysrhythmia

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Syncope

- Evaluation
 - History
 - Exam
 - Diagnostics
 - Event monitor depending on frequency, tilt test, EPS, GTT, further neurologic or psychiatric evaluation as indicated

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Treatment in Office

- Lower patient to floor or recumbent position on exam table
- Obtain vital signs
- Monitor for safety
- Consider glucose – does patient need glucose tablet or intervention
- Consider juice box, food
- Observation – minimum of 15 minutes
- Documentation

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Chest Pain

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History

- Angina or Ischemic Pain
 - Ache
 - Lasting > 1 min but < 20
 - Associated with activity
 - Radiation
 - N/V
 - Diaphoresis
 - Tightness
 - Pains that are sharp, jabbing, fleeting, superficial are rarely cardiac

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Myocardial Ischemia, Injury, and Infarct

- A study was conducted on 1578 people in whom the clinician determined through history was most likely having “typical” ischemic chest pain-
 - 94% had an MI even when only 60% had changes on ECG suggestive of such

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Ischemia

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Ischemia

- Decreased blood supply and therefore, decreased oxygen
- Characterized by inverted t waves
- Because the chest leads are closest to the ventricles, t wave inversion is usually more pronounced in V1-V6

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Injury

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Injury

- More serious
- Indicates acuteness (now or recent infarct)
- ST elevation
 - This tells us that myocardial infarction is acute. It is the earliest sign of an infarction to record on an ECG
- ST depression: can also indicate injury-subendocardial infarction
- >1mm - MI is imminent until proven otherwise

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Infarction

- Indicates dead tissue which is not capable of conducting electrical impulses
- Q waves help make the diagnosis
- Q is the 1st downward stroke of the QRS complex

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Emergency Protocol

- 12 lead ECG
- Have colleague activate 911 while someone is attending patient
- Nitroglycerin sublingual: 1 every 5 minutes for a total of 3 in 15 minutes
- Aspirin – have patient chew aspirin, if able
- Oxygen 2 – 4 L O2 via nasal cannula
- Stabilization and monitoring until EMS arrives

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Monday, September 25

69 year old male presents with a 3 week history of fatigue, nasal discharge-clear; seen by MD 1 week prior and started on Augmentin. Not feeling any better. PE: pallor, tachycardia, diaphoretic; Lungs clear, HEENT-normal; CBC: wbc: 8.9; rbc: 1.54; hgb: 5.5, hct: 17.2, MCV: 112, MCHC: 32; platelet: 32; Bands: 0; Segs: 5 (L) Monocytes: 21, Abnormal lymphocytes: 33.

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Case Study 2: M.R.

- 46 y.o.w.m presents with a 3 hour history of a headache, located behind his right eye
 - Never had anything like this before
 - 9 on a 1-10 scale (10 severe pain)
 - Associated with blurred vision and watering in right eye
 - Denies trauma, history of systemic or ocular diseases
 - Meds: none Allergies: NKDA

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Case Study 2: M.R.

- PE: Slightly dilated pupil (OD), Nonreactive and mild injection. Firm globe. IOP: 80. Remainder of physical examination-normal.

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Acute Angle Closure Glaucoma

- Definition
 - Sudden blockage of the aqueous outflow tract of the eye
 - Causes: Idiopathic, emotional or physical stress, rarely-instillation of dilating drops
 - Genetic predisposition (1st degree relatives: 2-5% risk)
- Symptoms
 - Severe ocular pain
 - Frontal headache
 - Blurred vision with halos around lights
 - Nausea and vomiting

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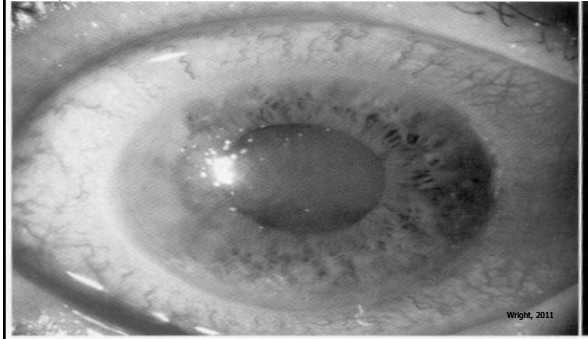
Acute Angle Closure Glaucoma

■ Signs

- Injected eye
- Mid-dilated nonreactive pupil
- Steamy, cloudy cornea
- Firm globe
- Increased intraocular pressure (40-80)
- Narrow angle
- Shallow anterior chamber in other eye
- May simulate a cerebral bleed

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Acute Angle Closure Glaucoma



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Narrow Angles

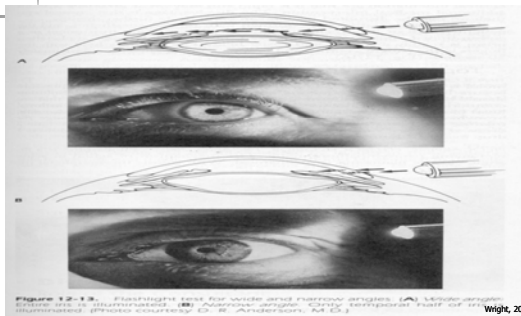


Figure 12-13. Flashlight test for wide and narrow angles. (A) Wide-angle view. (B) Narrow-angle view. Early peripheral part of iris is obscured. (Photo courtesy of Dr. Anderson, M.D.)

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Acute Angle-Closure Glaucoma

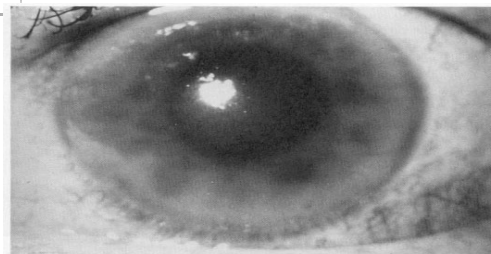


Figure 12-6. This eye demonstrates the hallmarks of acute angle-closure glaucoma: perlimbal injection, corneal edema, and a mid-dilated nonreactive pupil.

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Acute Angle Closure Glaucoma

■ Treatment

- Ocular emergency
- Immediate referral for treatment
- Medical Management
 - Hyperosmotic agents
 - Diamox and eye drops
- Surgical Treatment

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Case Study 3: TY

TY is a 5 yowm who presents with his mom for an evaluation of (R) pink eye. Began this am. Denies discharge, itching, recent URI. Mom denies trauma but does report strange occurrence yesterday. He failed to respond to her calling. When he finally came, he reported being asleep outside.

PE: Absent red reflex-OD; Visual acuity 20/100 (OD); 20/30 (OS); Pupil-slightly constricted (OD). Unable to view the fundus (OD)

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Hyphema

■ Definition

- Bleeding into the anterior chamber of the iris
- Causes include trauma or surgery

■ Symptoms

- Pain, red eye, blood in anterior chamber
- Blurred or Absent vision

■ Signs

- Absence of the red reflex
- Blood in the anterior chamber
- Increased IOP

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Hyphema

■ Signs

- Decreased visual acuity
- Injected conjunctiva (mild-severe)

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Hyphema

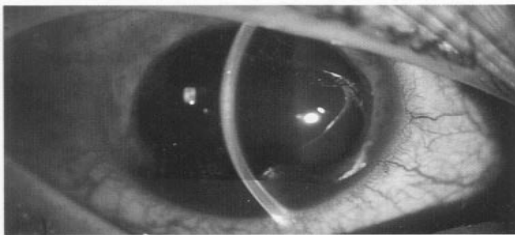


FIG. 19.119 Hyphema. Red blood cells within the anterior chamber have settled into the inferior anterior chamber angle.

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Complication of Hyphema



FIG. 19.120 A complication of hyphema is corneal blood staining. This patient's left cornea has an area of brown staining inferiorly due to prolonged presence of blood within the anterior chamber.

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Hyphema

■ Treatment

- Always assume that the globe is ruptured as 25% have other serious ocular injuries
- Shield the eye and refer immediately
- Can lead to devastating visual complications including blood staining of the cornea, glaucoma, atrophy of the optic nerve

Wright, 2011

Herpes Simplex

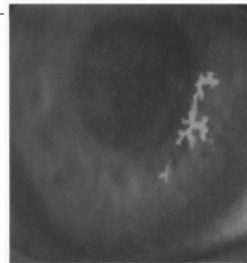


Fig. 5-7 In this case of herpes simplex keratitis an epithelial dendritic stains green with fluorescein dye.

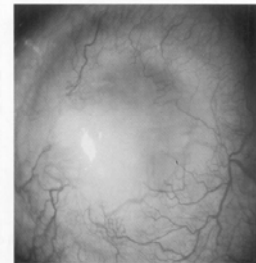
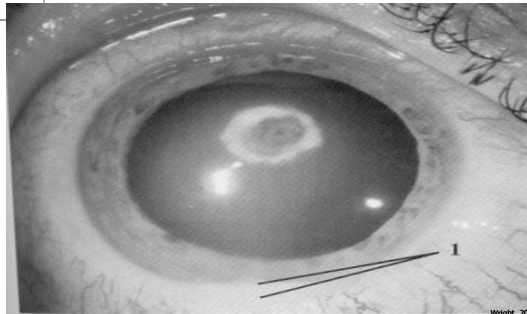


Fig. 5-8 Corneal scarring and corneal vascularization are present in this patient with herpes simplex.

Wright, 2011

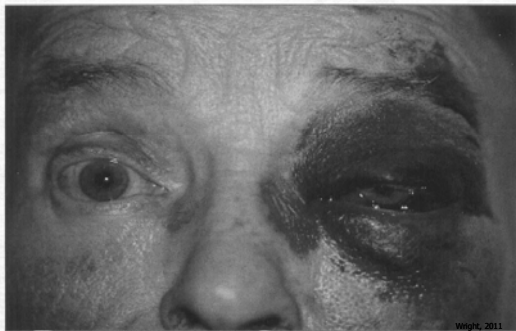
Corneal Ulcer



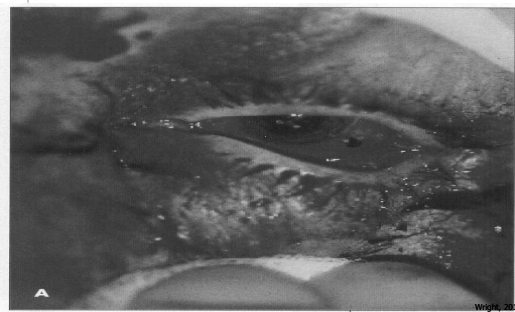
Blowout Fracture



Blowout-Fracture



Aerosol Can Explosion



Orbital cellulitis



- Immediate ENT or ED referral
- Antibiotics – IV will be administered
- Stat CT and labs

Wendy L. Wright, ARNP, FNP

**Wright & Associates Family
Healthcare
Amherst, NH
603-249-8883
WendyARNP@aol.com**