There’s a FUNGUS Among Us

Tour of infections
- Fungal organisms
- Herpes viruses
- Coxsackie viruses
- Human papillomavirus
- Bacterial infections:
  - Actinomycosis, Scarlet fever, TB, Syphilis

Candidiasis
- Pseudomembranous
- Erythematous
  - Central papillary atrophy
    (Median rhomboid glossitis)
- Angular cheilitis
- Chronic hyperplastic

Candidiasis
- Organism:
  - *Candida albicans*

Pseudomembranous
- White creamy plaques that wipe off easily leaving red, but intact mucosa underneath

Disclosure
- Dr. Cordell has no financial support or conflict of interest to disclose.
Erythematous

- Red flat patches
  - May be multiple or one large area
  - Palate – hard and soft
    - May look like petechiae – small red dots
    - Red mucosa underneath a complete denture
  - Tongue – central papillary atrophy
  - Tissue may be tender

Central papillary atrophy
(median rhomboid glossitis)

- Organisms “graze” on keratin produced by filiform papillae
Angular Cheilitis

- Red, cracked, fissured lesions seen in the commissures
- Site: commissures
  - Usually bilateral
- Can progress to cheilocandidosis

- Angular cheilitis may be caused by yeast alone, combination of bacteria and yeast, or bacteria alone
- Can be confused with herpes labialis
  - Bilateral? Vesicles? Prodrome?

Hyperplastic Candidiasis

- Also known as “candidal leukoplakia”
- White patch that cannot be rubbed off
- Often seen on anterior buccal mucosa
- May be problematic because a true leukoplakia may have candidiasis superimposed on it
- Should resolve with antifungal therapy
Diagnosis
• Fungal hyphal organisms visible on biopsy (left) and cytology (right)
• Both stained with PAS - periodic acid schiff

Cultures on sabouraud's agar

Treatment of candidiasis
• Rx: Clotrimazole
  — Oral troches (lozenge) 10mg
  — Disp: 50 tabs
  — Sig: Completely dissolve one tab by mouth 5 times daily until gone
• Pleasant taste, high sugar content
• Poorly absorbed by GI tract so effect is only obtained from direct contact with the mucosa

Treatment of candidiasis
• Rx: Fluconazole
  — 100mg
  — Disp: 11 tabs
  — Sig: Take 2 tabs (200mg) p.o. on day 1 and 1 tab p.o. for next 9 days
• Well absorbed systemically, long half life single daily dose
• Drug resistance can develop with long term use
• Can potentiate the effect of coumadin, dilantin and sulfonylureas (oral hypoglycemics)

Treatment of candidiasis
• Rx: Nystatin
  — Disp: 480 mL bottle OR 50 tabs
  — Suspension 100,000U/mL or pastille/tablets 200,000U
  — Sig: Swish and spit with 1-2 teaspoons (5-10mL) 5 times a day for 10 days. Hold liquid in mouth for 2 minutes at a time.
  — Sig: Dissolve one tab po 5x qd until gone
• Bitter taste masked with high sugar content
• Poorly absorbed by GI tract so effect is only obtained from direct contact with the mucosa
Treatment of angular cheilitis

• Rx: Clotrimazole cream 1%
  – Has both antibacterial and antifungal properties
  – Disp: 15 or 30g tube
  – Sig: Apply thin film to corners of mouth 3-4x qd for 10 days
  – Available over the counter as athlete’s foot cream!

• Rx: Iodoquinol and hydrocortisone (Vytone) Cream 1% $$$$  
  – Both antibacterial and antifungal properties
  – Disp: 1 tube (comes in 1g, 15g tubes)
  – Sig: Apply thin film to corners of mouth 3-4x qd for 10 days

Treatment of Oral Appliances

• Complete dentures / hard bitesplints / NO metal
  – 1 cup water + 1 tsp bleach
  – Soak overnight x10 days
  – Rinse well before reinserting
  – 100% bleach for 10 minutes if unwilling to remove nightly

• Partial dentures / Flippers with metal clasps / Anything with a soft liner / Athletic or soft bite guards
  – Nystatin suspension
  – Soak overnight covered in liquid x10 days
  – Change liquid every other day

• Eliminate chapsticks, lipsticks - could be source of reinfection
**Histoplasmosis**

- Most common systemic fungal infx in US
- Grows as a yeast at body temp and mold in nature
- Soil with bird or bat poop = good growth
- Airborne spores are inhaled

**Histoplasmosis**

- Acute
  - self-limited pulmonary infection
  - asymptomatic or mild flu-like symptoms
    - amount of spores inhaled
    - Immune status of host
  - 2 week illness
  - may develop with calcification of the hilar lymph nodes
  - Tx: Not really necessary, antipyretics

**Histoplasmosis**

- Chronic
  - Lungs primarily affected
  - Immunosuppressed or emphysematous patients
  - Cough, weight loss, chest pain, fever, hemoptysis
  - Tx: Ketoconazole, itraconazole, or IV Amphotericin B
- Disseminated
  - 1/2000 or 5000 of patients with acute infection
  - Progressive spread to extrapulmonary sites
  - Older, immunosuppressed, AIDS
  - Spleen, adrenal gland, liver, lymph nodes, GI, CNS
  - Oral lesions
  - 90% die if untreated

**Disseminated Histoplasmosis**

- Tongue, palate, buccal mucosa
- Single ulcer, may or may not be painful
- Irregular surface, red and or white
- Firm, rolled margins
- *Can mimic SCC*

**Mucormycosis**

- Grows in decaying organic material
- Found worldwide
- Spores are inhaled
- Patients at risk:
  - *Uncontrolled insulin-dependent diabetics*
  - *Immunocompromised patients*
  - Very rare in healthy people
- Rhinocerebral form
  - Nasal obstruction, bloody discharge, facial pain, headache, swelling, cellulitis, visual disturbance w/proptosis
  - May see massive tissue destruction
Mucormycosis

- If maxillary sinus is involved:
  - Initial presentation may be swelling of palate or maxillary alveolar process
  - May lead to palatal ulceration with necrotic surface
  - Massive tissue destruction may result

- Treatment:
  - Radical surgical debridement of necrotic tissue
  - Systemic administration of high does amphotericin B
  - 40-50% of pts with rhinocerebral form die

Human Herpes Virus
(Herpes simplex virus)

- HHV-1 vs. HHV-2
- Transmission:
  - Direct mucocutaneous contact
- 3-9 day incubation period
- Primary infection: young age, often asymptomatic
- Lasts 7-14 days
- Developing nations: ~100% of population by 30yo
- Developed nations: ~50-60% of adult population

Acute Herpetic Gingivostomatitis

- Age: most are 6mo – 5y
- Clinical findings:
  - Fever, headache, malaise
  - Lymphadenopathy
  - Numerous pinhead size vesicles
  - Break open to form ulcers
  - adjacent erythema
- Site:
  - Any oral mucosal site affected

Oral HSV is the most easily acquired herpes virus.
Approximately 50% of Americans are seropositive for HSV-1 by the time they reach adolescence
by age 50 years, 80% to 90% carry the virus

**Acute Herpetic Gingivostomatitis**

- Enlarged inflamed gingiva "fire engine red"
- Pharyngotonsillitis seen more frequently in affected teens and young adults

**Herpes in HIV+**

- More widespread, aggressive lesions
- Atypical pattern
- Persist for extended duration
- Prevalence increases significantly with CD4 <50

**Acute Herpetic Gingivostomatitis**

**Treatment - Within first 72 hrs of onset**

- **Acyclovir 200mg tabs**
  1 tab po q4h, (5x qd) x 5-7 days
- **Acyclovir suspension**
  20 mg/kg po 4X daily for 5-7 days
  Swish and swallow
- **Palliative care**
  - Dyclonine HCl - kids (.5% - 1% topical solution)
  - 2% Viscous xylocaine – not 4 kids
  - Maintain adequate hydration
  - Antipyretics
- Restrict contact with others who are uninfected
- Postpone any elective tx until resolved

**Recurrent Herpes Labialis**

- **Stimulants:**
  - SUNLIGHT
  - wind
  - trauma
  - emotional stress
  - Infection
- ~30% of people with HSV antibodies develop recurrence
Treatment of Recurrent Herpes

— For Adults and Children over 12

Valacyclovir 500mg — most rapidly absorbed
- 2g po stat at onset of symptoms, 2g 12 hrs later
- then 500mg po bid x 4 days (or until prodromal symptoms dissipate)
- Acyclovir 800mg
  - 1600mg po bid day 1 then 800mg po bid x 4 days (or until prodromal symptoms dissipate)
- Acyclovir Suspension 200mg/5ml
  - 20mg/kg (until child is over 40kg)
  - 200mg 5 times daily with 4 hour intervals for 5 days
  - can be extended in severe cases
- Acyclovir Cream 5%
  - Apply 5x qd for 5 days
- Penciclovir Cream 1%
  - Apply every 2 hours for 4-5 days
  - Lab studies have shown this penetrates deeper into tissue than acyclovir cream

Impetigo

- Symptoms
  - Skin
    - Face and extremities
    - Vesicles or bulla → honey colored crusts
    - May be itchy
    - Cervical lymphadenopathy may be seen
  - Clinically diagnostic
    - Refer to derm if unsure
Treatment of Impetigo

- **Mupirocin (Bactroban) 2% ointment**
  - Disp: 15 g tube
  - Sig: Apply to affected area tid for 2-3 weeks or until 1wk after lesions heal
  - Highly effective against staphylococci and Streptococcus pyogenes

- **Systemic antibiotics**
  - 1 week course
  - Clindamycin
  - Cephalexin
  - Dicloxacillin

Recurrent Intraoral Herpes

Site:
- Non-movable mucosa
- Keratinized tissue bound to bone

Clinical findings:
- Multiple 1-3mm vesicles
- Rupture to form erythematous macules and then ulcers
- Patient may not know lesions are present
- Healing in 7 to 10 days

Varicella zoster virus

- Used to cause ~4 million cases of chickenpox annually in US*
  - Most age 5-9
  - Numbers of cases decreasing following vaccine
- **Incubation Period:** 10-21 days
- **Duration:** 7-10 days
- **Vaccine:** Live attenuated VZV vaccine
  - Two doses are about 90% effective at preventing chickenpox
  - Routinely given at age 12 to 18 months
  - Efficacy drops to ~95% after 7 years

* https://www.cdc.gov/vaccines/vpd/varicella/index.html
Primary varicella zoster (Chicken Pox)

- **Spread by:**
  - *air droplets or direct contact*
- **Signs and Symptoms**
  - Malaise, nasopharyngitis, low fever
  - Pruritic exanthem erupting for 4 days
  - Face, trunk, and extremities
  - Erythema → Vesicles → Pustules → Crusts
  - 3-4mm white opaque vesicles
    rupture → 1-3mm ulcers

Primary varicella zoster

- **Diagnosis**
  - History of VZV exposure within 3 weeks
  - Presence of exanthem
  - Cytologic smear, viral cytopathologic effects

12 year old with chicken pox misdiagnosed with poison ivy

- Treated with oral prednisone

Herpes Zoster (Shingles)

- Reactivation of VZV
- occurring in 10-20% of the population
- Increasing frequency with aging
- **Clinically:**
  - Painful erythema and vesicles
  - Lesions stop at midline

Herpes Zoster (Shingles)

- **Highest incidence:** 6th-8th decade
- **Site affected:**
  - Thoracic – 55% of cases
  - Cranial – 15%
  - Lumbar – 14%
  - Cervical – 12%
- Recurs in ~6% of cases
**Herpes Zoster (Shingles)**

- **Treatment:**
  - Antiviral meds
  - Famciclovir
  - Acyclovir
  - Valacyclovir
  - Corticosteroids: postherpetic neuralgia ONLY!!
  - Antipyretics: fever control
  - Antipruritics: diphenhydramine

**Shingles Vaccines**

- **Shingrix: age 50 and older**
  - 2 doses separated by 2-6 months
  - Effective at preventing shingles: 97% age 50-69, 91% 70+
  - Effective at preventing PHN: 91% ages 50-69, 89% ages 70+
  - 85% effective after 4 years

- **Zostavax: age 60 and older**
  - Reduces the risk of developing shingles by 51% and PHN by 67%.

Even if you have had shingles, you can still receive shingles vaccine to help prevent future occurrences


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**Herpangina**

- **Cause:**
  - Coxsackie Virus
  - A type of Enterovirus
- **Age:** 1-4 years
- **Transmission:**
  - Fecal-Oral route
  - Saliva
  - Respiratory droplets
- **Duration:** 10-14 days

**Herpangina: Clinical findings:**

- Fever, malaise, lymphadenopathy
- Sore Throat
- Vesicles and ulcers: 2-10 ulcers

**Site:** soft palate and oropharynx

**Treatment:**

- Palliative care
  - Antipyretics (non-aspirin for kids)
  - Topical anesthetics if needed
Hand, Foot, and Mouth

- **Cause:**
  - Coxsackie Virus infection
    - a type of Enterovirus (Coxsackie A16)
- **Age:** 1-4 years
- **Transmission:**
  - Fecal-Oral route
  - Saliva
  - Respiratory droplets
- **Duration:** 10-14 days

Hand, Foot, and Mouth

- **Clinical findings:**
  - Fever, malaise, lymphadenopathy
  - 1-100 skin lesions
    - Small erythematous macules
    - Develop central vesicles

Hand, Foot, and Mouth

- **Signs and Symptoms**
  - Mouth
    - 1-30 vesicles → 2 to 10mm ulcers
- **Site:**
  - Buccal and labial mucosa, tongue
  - Any oral mucosa can be affected
- **Treatment:**
  - Palliative
    - Antipyretics
    - Topical anesthetics if needed

Coxsackie Viral Infections

- **Definitive Diagnosis**
  - Clinical manifestations are unique to each process
  - Atypical disease presentations
    - Viral isolation from culture
    - Throat or skin culture
    - Analysis of stool specimen

Palliative Care

- **Zilactin B - OTC**
  - Cellulose based
  - Forms a protective seal over ulcer
- **Canker cover**
  - Forms a protective seal over ulcer
- **2% Viscous Lidocaine – pain relief**
  - do not give to children, risk of seizures
  - Teenagers okay if responsible
- **Dyclonine HCl .5 or 1.0% for children**
  - Swish and spit PRN pain
  - Pain relief in children
  - Available OTC in Sucrets
- **Fluids to prevent dehydration**
**Human papillomavirus - HPV**
- over 150 different HPV subtypes
- ~24 types identified in lesions affecting the head and neck
- most common sexually transmitted infection in the US

**CDC Statistics**
- ~79 million Americans are currently infected
- ~14 million people newly infected each year.
- **Genital warts:** About 360,000 people in the United States get genital warts each year.
- **Cervical cancer:** More than 11,000 women in the United States get cervical cancer each year.

http://www.cdc.gov/std/hpv/stdfact-hpv.htm

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**The virus**
- 5 genuses of the Papillomaviridae family
- Subdivided into 2 major groups:
  - cutaneous and mucosal
- **Basic structure:**
  - nonenveloped virus
  - 55 nm diameter
  - icosahedral protein capsid
  - circular double-stranded DNA
    - Only one strand contains open reading frames (ORFs) that are transcribed
    - 8 ORFs (6 early and 2 late)


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**Infection**
- Virus is *epitheliotropic*
- Enters through wounds or abrasions
- Infects basal cells
  - only actively dividing cells in the epithelium

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Low-risk infections
• viral genome remains in nucleus independent of host DNA
• E2 function is not disrupted
  — suppresses transcription of E6 and E7 genes
• Replication of the viral genome occurs in parallel with host genome replication
• Stable viral copy number distributed among daughter epithelial cells


Lesions and viral genotypes

<table>
<thead>
<tr>
<th>Lesion</th>
<th>Viral genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verruca vulgaris</td>
<td>1, 2, 4, 26, 27, 57</td>
</tr>
<tr>
<td>Squamous papilloma</td>
<td>6, 11 (up to 50%)</td>
</tr>
<tr>
<td>Multifocal epithelial hyperplasia (Heck's)</td>
<td>13, 32</td>
</tr>
<tr>
<td>Condyloma acuminatum</td>
<td>2, 6, 11, 53, 54</td>
</tr>
</tbody>
</table>
  can also harbor 16, 18, 31

Verruca vulgaris
• Common wart
• Benign papillary proliferation of squamous epithelium
• Age: Any, children most common
• Site: Any location
  — (skin preference)
• Clinical findings:
  — Exophytic
  — Soft
  — Pedunculated or sessile
  — Rough papillary surface
  — Can see multiple lesions
  — Pink or white
• Dx: clinical features, Biopsy
• Tx: surgical removal
  — On skin - cryotherapy

Squamous Papilloma

- Benign papillary proliferation of squamous epithelium
- Cause: HPV
- Children and adults
- Site: Any location
- Clinical findings:
  - "Wart-like"
  - Exophytic
  - Soft
  - Pedunculated or sessile
  - Finger-like projections
  - Pink or white
Diff dx: Verruca vulgaris
Condyloma acuminatum
- usually presents with multiple lesions

Condyloma acuminatum

- **Age:** any, most commonly adolescents and young adults
- incubation period is 1 to 3 months from the time of sexual contact
- autoinoculation to other mucosal sites is possible
- **Appearance:**
  - More likely sessile
  - Pink
  - well-demarcated
  - nontender exophytic mass
  - short, blunted surface projections
Treatment for all intraoral warts

- Recommend surgical removal (submission for microexam)
- Laser ablation has been used
  - some question as to the airborne spread of HPV through the aerosolized microdroplets created by the vaporization of lesional tissue
- Some lesions may resolve on their own however, given risk of spread recommend removal
- Discuss risk of spread with patients
- Not routinely evaluated by the pathologist for the presence of high-risk HPV genotypes

9-valent vaccine (Gardasil 9)
- HPV types 6,11,16,18,31,33,45,52,58
- Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC)
  - recommends administration to girls and boys beginning at the 11-12 year physician visit.
    - Females 9-26, Males 9-22 or 26
- 2 or 3 dose series
  - All kids who are 11 or 12: 2 vaccines 6-12 months apart
  - Adolescents who receive their 2 shots less than 5 months apart will require third vaccine
  - >14 years: 3 shots over 6 months (0,2 &6 mos)
  - 3 doses – for some immunocompromised patients
- FDA approval changed to 9-45 males and females
  - Announced Oct 5, 2018
  - https://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/UCM622715.htm
- 6 reasons to get HPV vaccine for your child
  - HPV vaccination prevents cancer
  - HPV vaccination provides value, effectiveness and long lasting protection
  - https://www.cdc.gov/hpv/infographics/vaccine-six-reasons.html
**High-risk HPV types**

- **Predominantly oropharyngeal SCC (OpSCC)**
- <5% or oral SCC is HPV associated
- HPV 16 is highly prevalent ~90% in published studies
- Other HPV types 18, -31, -33, -35, -39, -45, -51, -52, -56, -58, -59, -68
- 47%-70% of all cases of oropharyngeal cancers in North American have biologically active HPV **

**HPV related cancers**

- Cervical cancers
  - Types 16 and 18: ~70% of all cases
- Anal cancer
  - Type 16: ~85% of all cases
- Vaginal, vulvar, penile cancer
  - Types 16 and 18: ~50% of all cases


**HPV-associated OpSCC**

- 30,115 new cases of HPV-associated cancers were reported in 1999 and 43,371 in 2015**
  - cervical cancer ↓ 1.6%/year
  - vaginal SCC ↓ 0.6%/year
  - oropharyngeal SCC ↑ : men 2.7% and women 0.8%
  - anal SCC ↑ : men 2.1% and women 2.9%
  - vulvar SCC ↑ : 1.3%
  - penile SCC rates remained stable
- **In 2015 oropharyngeal SCC (15,479 cases among men and 3,438 among women) was the most common HPV-associated cancer**

**HPV-associated OpSCC**

- ↑ Incidence during past 20 years
- **US HPV-positive oropharynx cancer ↑ 225% from 1988 to 2004**
  - SEER Program’s Residual Tissue Repository (RTR) Program
  - 16.3% (1984 to 1989) to 71.7% (2000 to 2004)
- Estimated by 2020, HPV will cause more oropharyngeal cancers than cervical cancers in the US


**Possible causes for increase**

- **Focuses on changes in sexual patterns**
  - significant association b/t HPV+ tonsillar cancer and:
    - increased oral sex partners
    - increased numbers of sex partners
    - early initial sex
  - risk of developing oral HPV infection increased with increases in lifetime oral sex or sex partners
  - open-mouthed kissing has also been associated with the development of oral HPV infection

**High-risk HPV type 16**

- HPV genome typically becomes integrated into the host DNA
- Integration can involve disruption of the E2 gene and its regulatory function
  - E2 gene product is a transcriptional repressor that inhibits transcription of oncogenic E6 and E7 proteins
  - the increased production E6 and E7 accounts for the carcinogenic potential of HPV

• The HPV-16 E6 and E7 proteins are highly expressed in differentiating keratinocytes
  — inactivate the p53 and retinoblastoma (pRb) proteins
  — two important transcriptional regulators /tumor suppressor genes
    • E6 inactivates p53
    • E7 inactivates pRb

Oropharynx

• posterior one-third/base of tongue
• soft palate
• tonsillar pillars
• pharyngeal walls

Kitrina G. Cordell, DDS, MS
LDA Cruise March 2019
Oropharyngeal SCC (OpSCC)

- 90% are found in tonsillar tissue or base of tongue
- predominantly in white men
- 40 to 55 yo
- Patients typically report:
  - high-risk sexual behavior
  - low level of alcohol and tobacco use

Clinical presentation OpSCC

- small T-size (T1-T2)
- large, often cystic, nodal involvement (N+)
  - higher stage
- HPV-positive tumors are often diagnosed in clinically advanced stages III-IV
- tumors are usually endophytic and can be difficult to detect clinically

Patients with HPV-positive OpSCC

- Younger
- majority of patients have little to no history of tobacco and/or high alcohol consumption
- HPV was a favorable prognostic factor for clinical outcome of OpSCC
  - independent of tumor stage, age, gender, grade of differentiation, p53 immunohistochemical results, or DNA ploidy

Prevention

- vaccination
  - will take several decades before the effects of HPV vaccination on cancer incidence will be detected
  - Need to monitor the effects of the present HPV vaccination on the incidence of cervical cancer and OpSCC.

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Bacterial Infections

Actinomycosis

- Caused by any of several Actinomyces species that normally inhabit the mouth
- Often associated with local trauma
- Abdominal (25%), pulmonary (15%) or cervicofacial (55%) areas may be affected

Cervicofacial Actinomycosis

- May follow dental extraction or untreated dental disease
- Diffuse swelling and erythema
- Draining sinus tracts
- “Sulfur granules” – colonies of organisms in purulent exudate
**Actino - Treatment**

- Periapical and pericoronal infections
  - removal of infected tissues
  - 3 week course of penicillin
- Early cervicofacial infection
  - 5-6 week course of penicillin
  - High-dose antibiotics, usually IV PCN for 2 weeks, then oral PCN for 2 weeks
- Good prognosis with appropriate therapy

**Scarlet Fever**

- *Group A, β-hemolytic streptococci*
- Starts as tonsillitis with pharyngitis
- Bacteria produce a toxin that attacks the blood vessels
  - Leads to rash formation
- **Age:** 3-12 most common

**Scarlet Fever**

- **Systemic symptoms:**
  - sudden onset of fever (up to 103-104°F)
    - associated with sore throat, headache, nausea, vomiting, abdominal pain, myalgia, and malaise
    - fever peaks by second day
      - gradually returns to normal in 5-7 days.

- **Skin symptoms:**
  - rash develops 12-48 hrs after fever onset
  - erythematous patches
    - below the ears, chest, and axilla
    - spreads to trunk and extremities over 24 hrs
    - Rash resembles “sunburn with goose bumps”
Scarlet Fever

- **Peeling of skin**
  - 7-10 days after resolution of the rash
  - may continue up to 6 weeks
- most prominent in the:
  - armpit
  - groin
  - tips of the fingers and toes

**Scarlet Fever**

- **Oral symptoms:**
  - **Tonsils, soft palate and pharynx are red and swollen**
  - soft palate: petechiae
  - Tonsils: Yellowish exudate
  - **Strawberry tongue:**
    - white coating on tongue with the fungiform papillae poking through
    - White coating sloughs after 4-5 days to reveal redness
    - So starts white and then turns red
  - **Dx:** Throat culture

Courtesy Dr. Molly Rosebush
**Scarlet Fever**

- **Treatment:**
  - goals when treating scarlet fever:
    - prevent acute rheumatic fever
    - reduce the spread of infection
  - **Penicillin** - drug of choice
  - Cephalosporin may be an effective alternative
  - Erythromycin can be considered as an alternative if Pen allergic

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**Syphilis**

- **Treponema pallidum** - spirochete
- **Transmitted by:**
  - usually intimate sexual contact
  - contaminated blood
  - Maternal transmission to unborn fetus at any stage
  - Risk of miscarriage or congenital syphilis
- **Gender:** Men 8 : 1 Women

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**2016 Sexually Transmitted Diseases Surveillance**

**Figure 31:** Primary and Secondary Syphilis — Rates of Reported Cases by Region, United States, 2007-2016

**Figure 32:** Primary and Secondary Syphilis — Rates of Reported Cases by State, United States and Outlying Areas, 2016

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**2016 Sexually Transmitted Diseases Surveillance**

**Figure 40:** Primary and Secondary Syphilis — Rates of Reported Cases by Race/Ethnicity, United States, 2012-2016

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**2016 Sexually Transmitted Diseases Surveillance**

**Figure 36:** Primary and Secondary Syphilis — Distribution of Cases by Sex and Sexual Behavior, 2016
Syphilis

- **Primary syphilis - Chancre**
  - Develops within 3 months after exposure
  - Genital, anal mucosa
  - <2% are oral
  - usually non-tender, heals in 3-8 weeks if no tx
  - Looks like an large ulcer
  - Orally – lip most common

- **Secondary – Disseminated syphilis**
  - 4-10 weeks after initial infection
  - Fever
  - Non-tender lymphadenopathy
  - **Oral lesion: Mucous patch**
    - 30% of patients
    - Non-tender, highly infectious
    - painless whitish plaques
    - buccal, labial, palatal mucosa and tongue
  - **Skin lesions: maculopapular rash**
    - “nickel and dime” rash
Split papules in commisures - secondary syphilis

Spirochete stain

Syphilis

- Tertiary / Latent syphilis – 1-30 years
  - aneurysm of ascending aorta
  - left ventricular hypertrophy
  - congestive heart failure
  - dimentia and death
- Gumma
  - skin, mucosa, soft tissue, bone
  - granulomatous inflammation
  - firm, nodular ulcer
  - destructive
  - tongue, palate
**Syphilis Dx and Tx**

- **Dx:**
  - Identify the spirochetes in tissue or exudate
  - VDRL test (venereal disease research laboratory)
  - RPR (rapid plasma reagin)
  - Fluorescent antibody testing
- **Benzathine penicillin G (Bicillin)**
  - Primary/secondary syphilis: IM injection single dose
  - Latent/unknown duration/tertiary syphilis: 1x/week x 3wks
- **Doxycycline**
  - Primary/secondary/tertiary: 100 mg PO bid x 14 d
  - Late latent: 100 mg PO bid x 30 d

**Tuberculosis**

- Caused by *Mycobacterium tuberculosis*
- Droplet transmission
- Endemic in many areas of the world
- Estimated that 9 million people around the world develop the disease each year
- 2 million die of TB or its complications

**US Statistics CDC information**

- Foreign-born people in US have much greater infection rate than US-born
  - 29.5% in 1993:
    - 7,403 of 25,102 total cases
  - 68.5% in 2016:
    - 6,351 of 9,272 total cases
- Reported TB Cases
  United States, 2015

**Reported TB Cases, by Race/Ethnicity, United States, 2015**

- *All races are non-Hispanic; multiple race indicates two or more races reported for a person, but does not include persons of Hispanic/Latino origin.
  Unknown race consisted of 0.3% and is not shown.
- As of June 9, 2016.

**Tuberculosis**

- Droplets containing bacteria are inhaled
- Infection is different from active disease
  - *Primary TB – not active disease*
    - lung becomes infected but does not progress to active disease
    - fibrotic calcified nodule forms around the organisms
    - asymptomatic or fever
- Secondary TB – 5-10% of those infected progress to *secondary or active TB*
  - organisms are reactivated later in life
  - usually in immunocompromised people
  - 100x more common in AIDS patients
  - apex of lungs
  - cervical lymphadenopathy
  - Spread to any organ or soft tissue site
**TB – Clinical Features**

- Only 5% of infected patients progress to active disease within 2 years after exposure
- Low grade fever, night sweats, fatigue
- Weight loss ("consumption")
- Chronic bloody cough

**TB – Oral Lesions**

- Rather uncommon
- Solitary chronic painless ulcer
- Most common on gingiva and tongue
- May be due to hematogenous or direct implantation of organisms
TB - Diagnosis

- Positive skin test with PPD (only indicates exposure)
- Chest radiograph
- Culture (may take 4-6 weeks)
- Identification of organisms in biopsy material or sputum
- Molecular testing (PCR, etc.)

TB – Treatment

Usually combination of antibiotics:
- Isoniazid (INH), rifampin, and pyrazinamide daily for 2 months
- Then, INH and rifampin (daily, 2x or 3x weekly) for 4 mos.
- Ethambutol or streptomycin also used

TB – Dental Considerations

- Must distinguish active from inactive disease, based on history, symptoms, medical consultation, etc.
- Anti-TB therapy works relatively rapidly, resulting in a non-infectious state in two weeks

TB – Prognosis

- Generally good in immunocompetent patient
- Problems arise when patients fail to take prescribed medications properly
- Emergence of resistant strains

Necrotizing Ulcerative Gingivitis

- First described in the young men who fought in the trenches during the Boer war and WWI, thus the term “trench mouth”
- Mixed bacterial infection
- Stress, poor oral hygiene, poor diet, immune suppression may contribute

Necrotizing Ulcerative Gingivitis

- Usually affects young adults
- “Punched out” interdental papillae
- Localized or diffuse gingival involvement
- Severe pain, oral malodor, spontaneous hemorrhage
NUG - Treatment

• Debridement
  —using topical or local anesthesia
• Broad spectrum antibiotic
  —tetracycline, PCN, erythromycin, metronidazole
• Mild salt water, chlorhexidine, or dilute hydrogen peroxide rinses
• Improve oral hygiene and diet

Reference Text Suggestions

Thank You!

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