

Oral Health for USMLE Step One

Part 2: Oral Lesions



*Olivia Nuelle, Medical School Class of 2022
University of Massachusetts Medical School
Faculty Adviser: Hugh Silk, MD
E-mail: Howard@12DaysinMarch
www.12DaysinMarch.com*

Oral Health

for USMLE Step One

Anatomy of the Oral Cavity

Pathology of the Oral Cavity

Mouth

Salivary Glands

Pharynx

Lesions

Congenital

Salivary Pathology

Dental Pathology

Other

Section II of Series

Oral Health

for USMLE Step One

Pathology of the
Oral Cavity

Lesions

Congenital

Salivary
Pathology

Dental
Pathology

Other

1. Viral
2. Bacterial
3. Fungal
4. Nutritional Deficiency
5. Autoimmune
6. Medication Induced
7. Precancerous
8. Malignant Neoplasms

Oral Health

for USMLE Step One



Pathology of the Oral Cavity

Lesions

1. Viral
2. Bacterial
3. Fungal
4. Nutritional Deficiency
5. Autoimmune
6. Medication Induced
7. Precancerous
8. Malignant Neoplasms

Congenital

1. Cleft Lip
2. Cleft Palate
3. Osteogenesis Imperfecta
4. Congenital Syphilis

Salivary Pathology

1. Sialadenitis
 - a. Infection
 - b. Obstruction
2. Tumors
 - a. Benign
 - b. Malignant

Dental Pathology

1. Erosion
 - a. GERD
 - b. Bulimia
 - c. Bacteria
2. Caries
3. Abscess

Other

1. TMJ
2. Medications w/ Oral Effects
3. SBE Prophylaxis

Oral Health

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Pathology of the
Oral Cavity

Lesions

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Other

1. **Viral**
2. Bacterial
3. Fungal
4. Nutritional Deficiency
5. Autoimmune
6. Medication Induced
7. Precancerous
8. Malignant Neoplasms

Viral Lesions of the Oral Cavity: Differential Diagnosis

(*Ulcerative Lesions*)

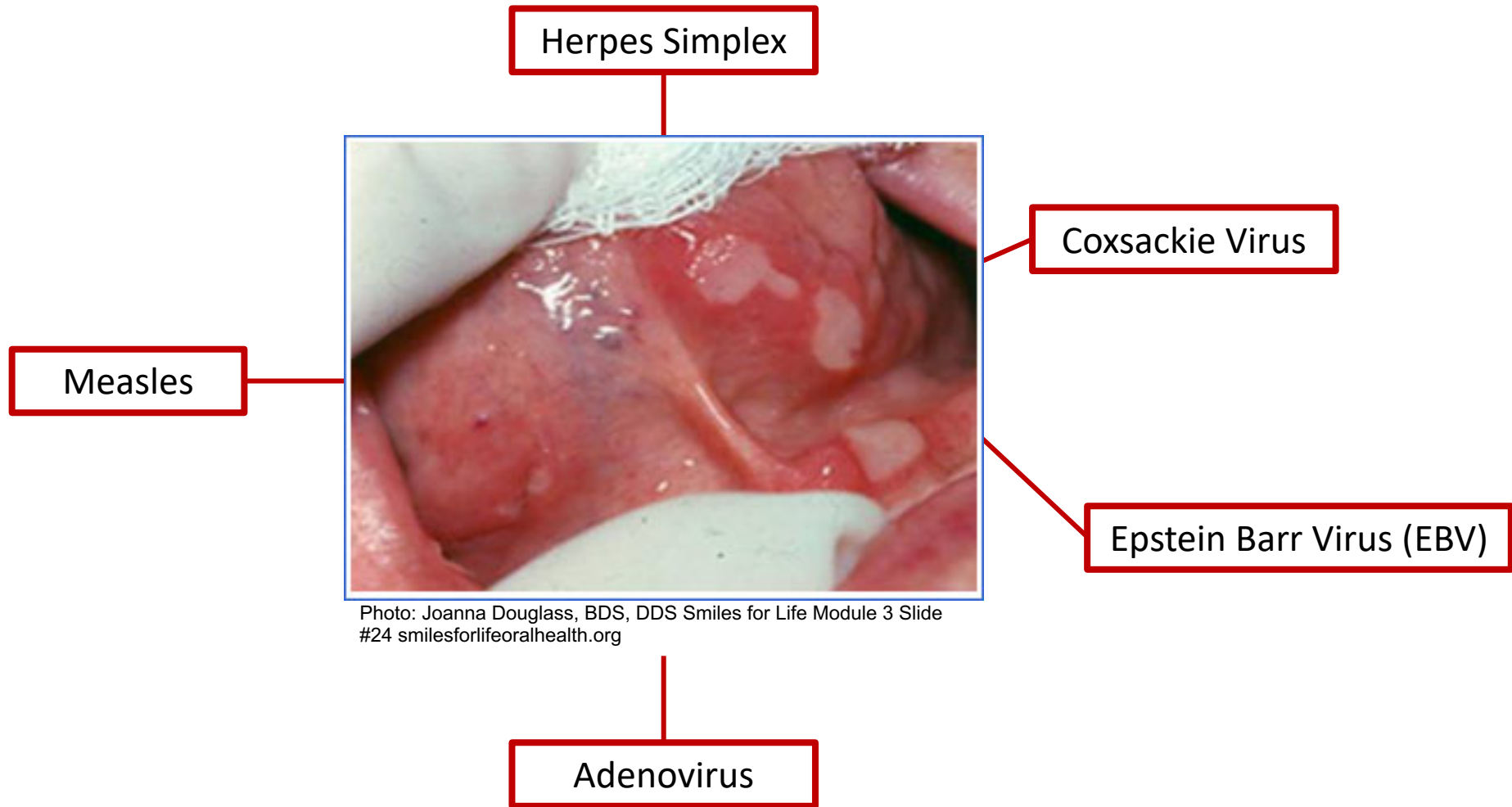
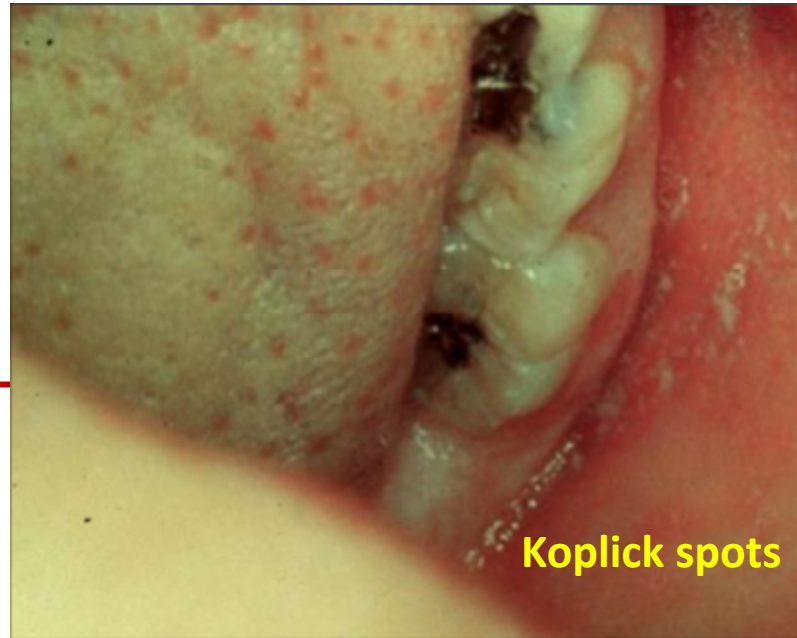


Photo: Joanna Douglass, BDS, DDS Smiles for Life Module 3 Slide #24 smilesforlifeoralhealth.org

Viral Lesions of the Oral Cavity: Ulcerative Lesions

Measles (rubeola): Paramyxovirus
(enveloped, SS RNA)

Measles



Koplick spots

Viral Lesions of the Oral Cavity: Ulcerative Lesions

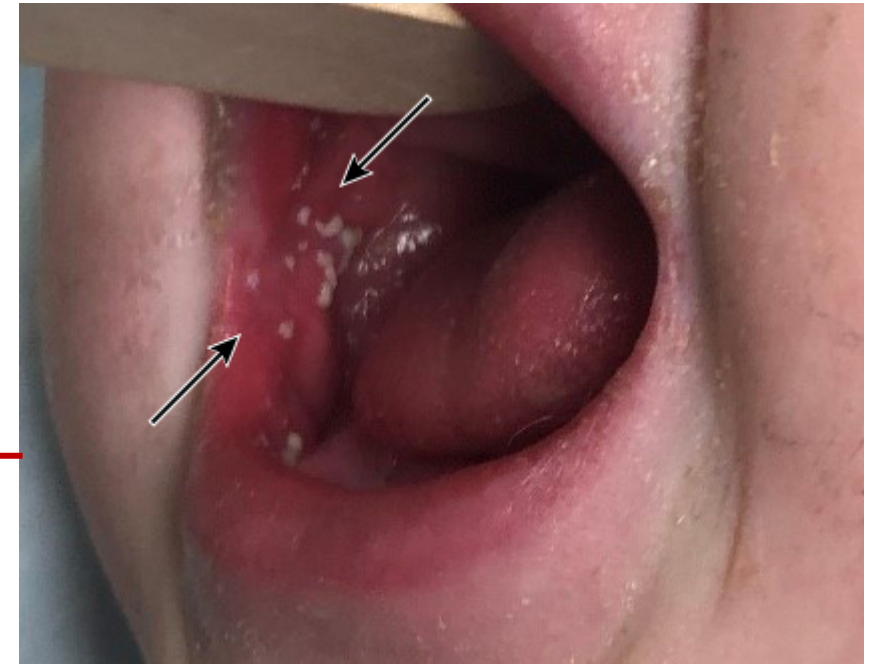
Measles (rubeola): Paramyxovirus
(enveloped, SS RNA)

Measles



**Koplik spots: red spots with
blue/white center on oral mucosa**

Common presentation:
Cough, Coryza, Conjunctivitis →
Koplik spots → descending rash



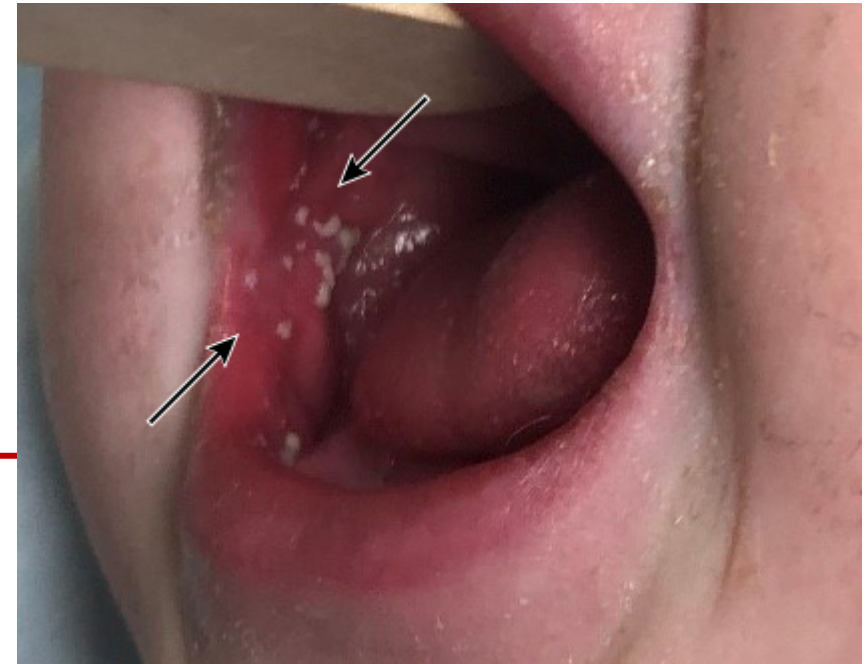
Viral Lesions of the Oral Cavity: Ulcerative Lesions

Measles (rubeola): Paramyxovirus
(enveloped, SS RNA)

Common presentation:
Cough, Coryza, Conjunctivitis →
Kolpik spots → **descending rash**



**Koplik spots: red spots with
blue/white center on oral mucosa**



Viral Lesions of the Oral Cavity: Ulcerative Lesions

Herpes Simplex-HSV1
(*Enveloped, DS DNA*)



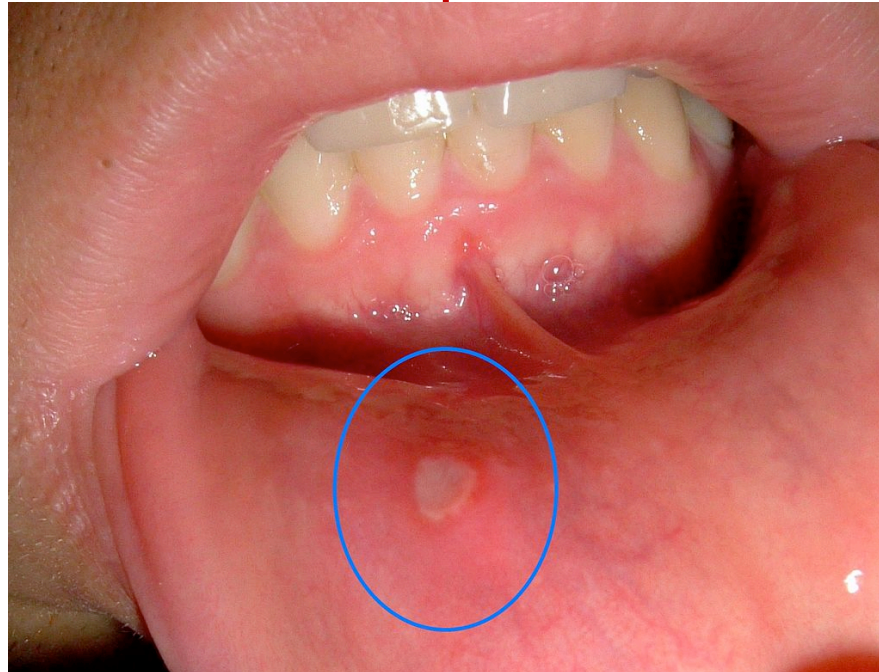
Herpes labialis

- Characterized by a **vesicular** lesion.
- May crust over after rupture.



Viral Lesions of the Oral Cavity: Ulcerative Lesions

Herpes Simplex-HSV1
(*Enveloped, DS DNA*)



Gingivostomatitis is more frequent
presentation in children
Vesicular ulcer (above)

Viral Lesions of the Oral Cavity: Ulcerative Lesions

Herpes Simplex-HSV1
(*Enveloped, DS DNA*)



Herpes labialis

- Characterized by a **vesicular** lesion.
- May crust over after rupture.

Tzanck prep: smear shows the
characteristic multinucleated giant cell



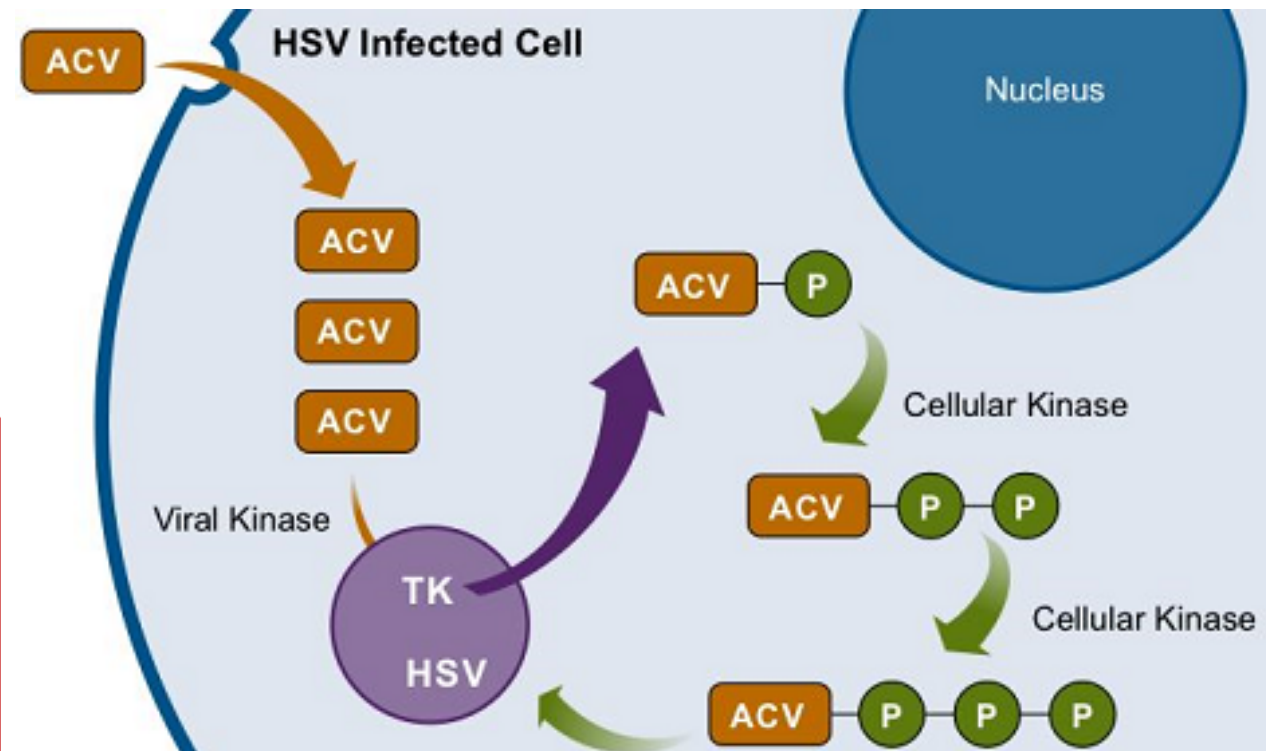
Viral Lesions of the Oral Cavity: Ulcerative Lesions

Herpes Simplex-HSV1
(Enveloped, DS DNA)



**Guanosine analog prodrugs-
activated by phosphorylation
via viral thymidine kinase-
incorporated into viral DNA
blocking replication**

**Treatment: Thymidine Kinase Inhibitors
Acyclovir, Valacyclovir**



Viral Lesions of the Oral Cavity: Ulcerative Lesions

Palms



Coxsackie Virus: Picornavirus
(*naked, SS RNA*)



Soles



Coxsackie Virus: Picornavirus
(*naked, SS RNA*)

Hand Foot and Mouth:

- **Oval shaped rash on palms and soles of feet.**
- **Can present with fever and sore throat due to oral ulcers.**
- **More common in children during summer months**



Viral Lesions of the Oral Cavity: Hairy Leukoplakia

HIV+



Epstein Barr Virus (EBV)
(HH-4; enveloped, DS DNA)

Oral Hairy Leukoplakia
White plaque on the lateral tongue,
CANNOT be scraped off

Viral Lesions of the Oral Cavity: Hairy Leukoplakia

Epstein Barr Virus (EBV)
(HH-4; enveloped, DS DNA)



Mononucleosis ('the kissing disease')

- Fever, Pharyngitis
- Hepatosplenomegaly, lymphadenopathy (LAN)
- Dx: (+) Monospot test



Posterior cervical LAN

Viral Lesions of the Oral Cavity: **EBV Complications**

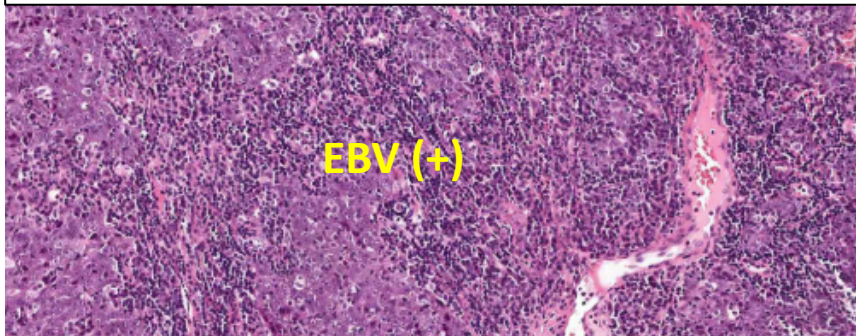
Epstein Barr Virus (EBV)
(HH-4; enveloped, DS DNA)

Mononucleosis ('the kissing disease')

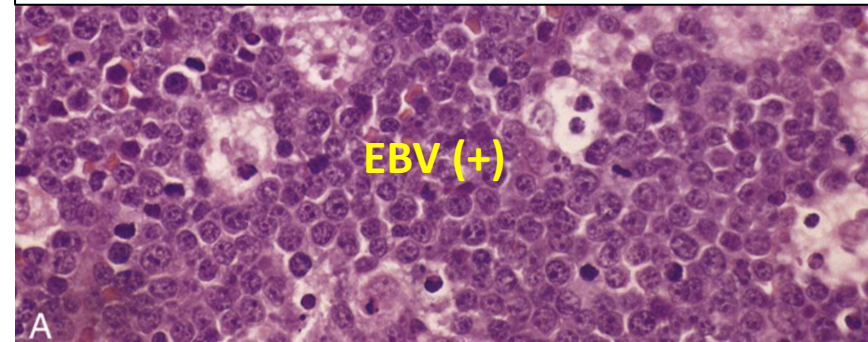
- Pharyngitis, Fever
- Hepatosplenomegaly, Lymphadenopathy (LAN)
- Dx: (+) Monospot test

Complications

Nonkeratinizing Squamous Cell Carcinoma of the Nasopharynx



Lymphoma
Burkitt's (shown) and Hodgkin's



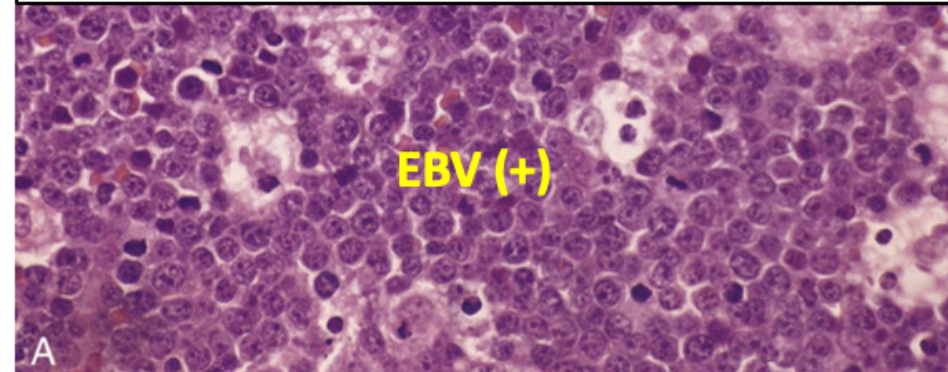
Viral Lesions of the Oral Cavity: **EBV Complications**

Epstein Barr Virus (EBV)
(HH-4; *enveloped, DS DNA*)

Complications



Lymphoma
Burkitt's (shown) and Hodgkin's



Viral Lesions of the Oral Cavity: **Pharyngitis**

Viral pharyngitis



Adenovirus
(*naked, DS DNA*)

Oral Health

for USMLE Step One

Pathology of the
Oral Cavity

Lesions

Congenital

Salivary
Pathology

Dental
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Other

Viral

1. Measles (Rubeola; Koplik spots)
2. HSV-1 (Vesicles, Gingivostomatitis)
3. Coxsackie (Hand-foot-mouth)
4. EBV (HHV-4; Hairy leukoplakia)
5. Adenovirus (Pharyngitis under 3 y.o.)

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1. Viral
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5. Autoimmune
6. Medication Induced
7. Precancerous
8. Malignant Neoplasms

Bacterial Lesions of the Oral Cavity: Differential Diagnosis

Bacterial Pharyngitis

**Streptococcus
pyogenes**

Group A Strep

**Corynebacterium
diphtheriae**

Bacterial Lesions of the Oral Cavity: Pharyngitis

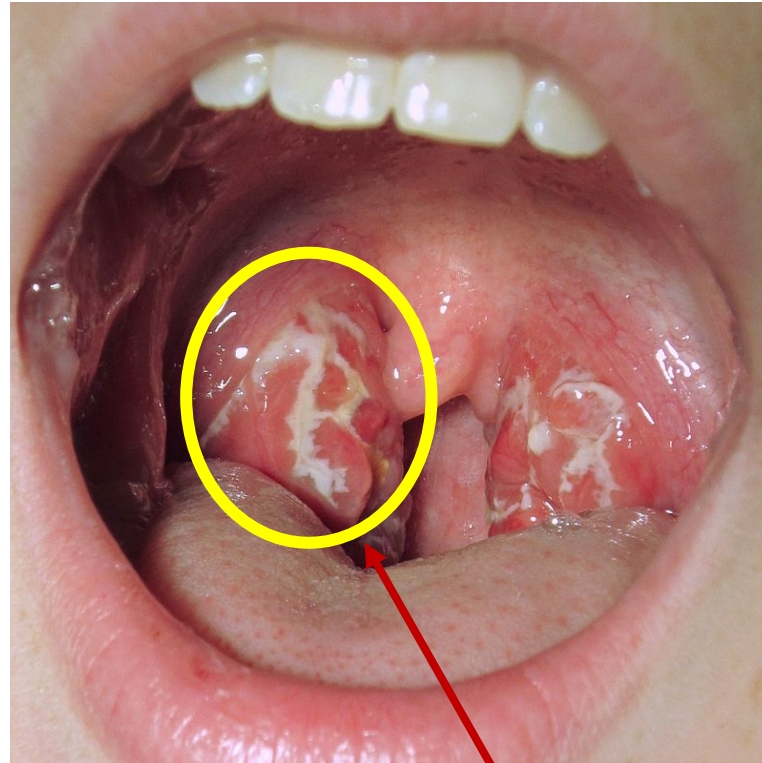


Streptococcus pyogenes

Gram **positive** cocci in chains



Bacterial Lesions of the Oral Cavity: Pharyngitis



Gram positive cocci in chains

White exudate

Streptococcus **pyogenes**

Bacterial Lesions of the Oral Cavity: Pharyngitis



Streptococcus pyogenes

Gram positive cocci in chains

White exudate

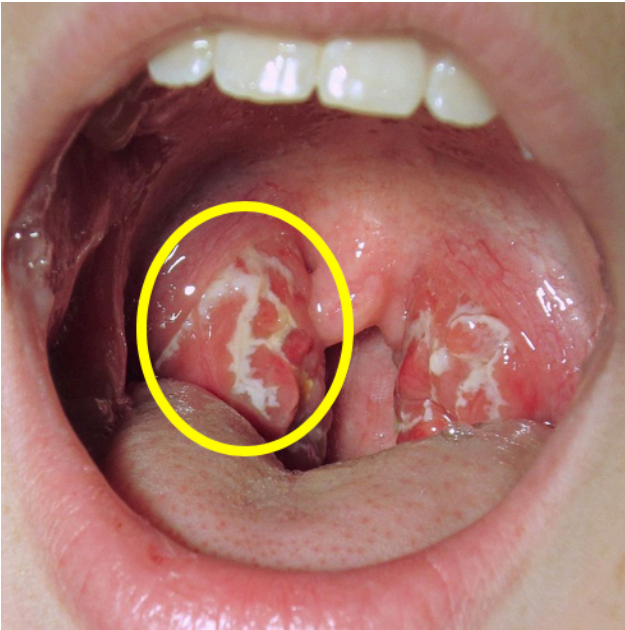
Anterior Cervical
Lymphadenopathy

Bacterial Lesions of the Oral Cavity: **Complications**

Cardiology

Mitral Stenosis and Derivatives:
Part II: Pathology
(i.e. Rheumatic Fever)

Howard J. Sachs, MD
www.12DaysinMarch.com
E-mail: Howard@12daysinmarch.com



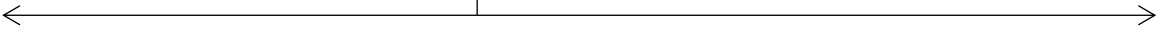
Nephritic Syndromes (IgA Nephropathy and PSGN) for USMLE Step One

**Post-Streptococcal Glomerulonephritis*

Howard J. Sachs, MD
Associate Professor of Medicine
UMass Medical School
www.12daysinmarch.com
E-mail: Howard@12daysinmarch.com

Streptococcus pyogenes

Rheumatic Fever



PSGN

Impetigo = honey-crusted lesions

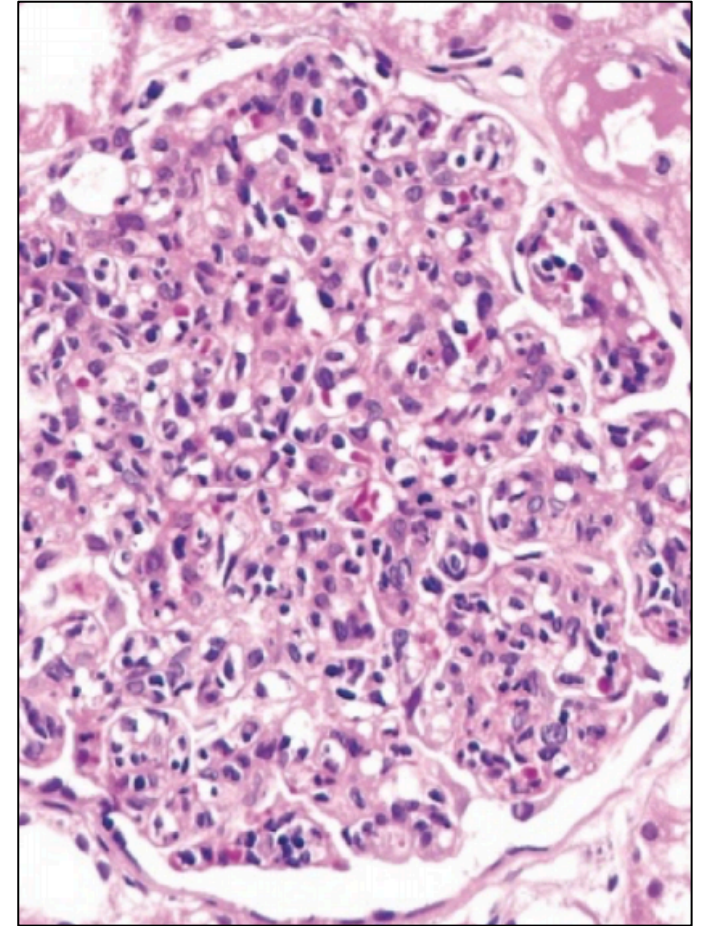
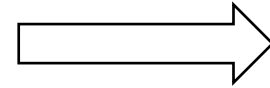


Streptococcus pyogenes

Impetigo = honey-crusted lesions



Streptococcus pyogenes



Poststreptococcal GN

Bacterial Lesions of the Oral Cavity: Differential Diagnosis

Bacterial Pharyngitis

**Streptococcus
pyogenes**

**Corynebacterium
diphtheriae**

Bacterial Lesions of the Oral Cavity: Pharyngitis



Corynebacterium diphtheriae (aka diphtheria)

Gram positive rods



Bacterial Lesions of the Oral Cavity: Pharyngitis



Corynebacterium diphtheriae (aka diphtheria)

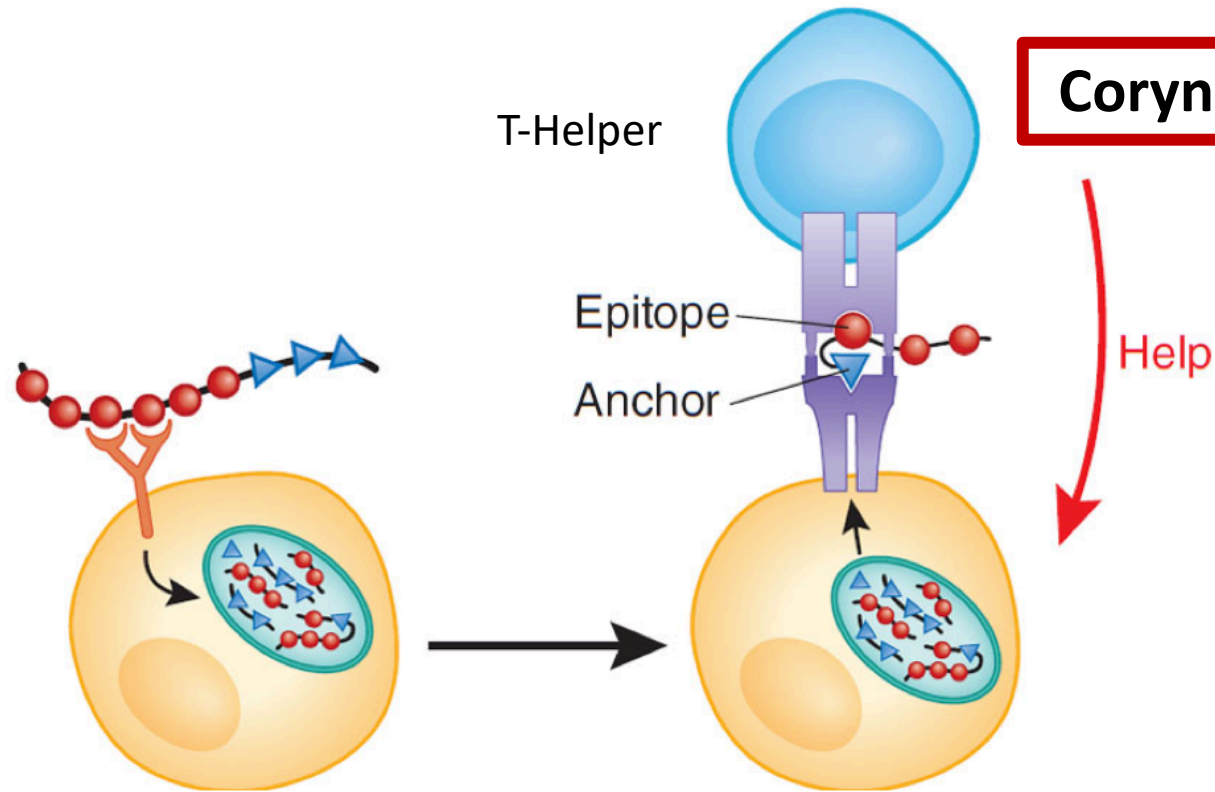
Gram positive rods

Key Derivative:

(mechanism of toxin)

- **AB exotoxin**
- **Inhibits protein synthesis via ADP-ribosylation of EF-2**
- **Causes cell necrosis**
- **Toxoid vaccine prevents diphtheriae**

Bacterial Lesions of the Oral Cavity: Pharyngitis



Corynebacterium diphtheriae (aka diphtheria)

Gram positive rods

Unvaccinated children at risk

Increased immunogenic memory; promotes T-cell activation and class switching from IgM to IgG production.

Bacterial Lesions of the Oral Cavity: Pharyngitis

Corynebacterium diphtheriae (aka diphtheria)



Gram positive rods

Unvaccinated children at risk

Grayish pseudomembranes

Can obstruct the airways

Lymphadenopathy – 'Bull Neck'

Bacterial Lesions of the Oral Cavity: Pharyngitis

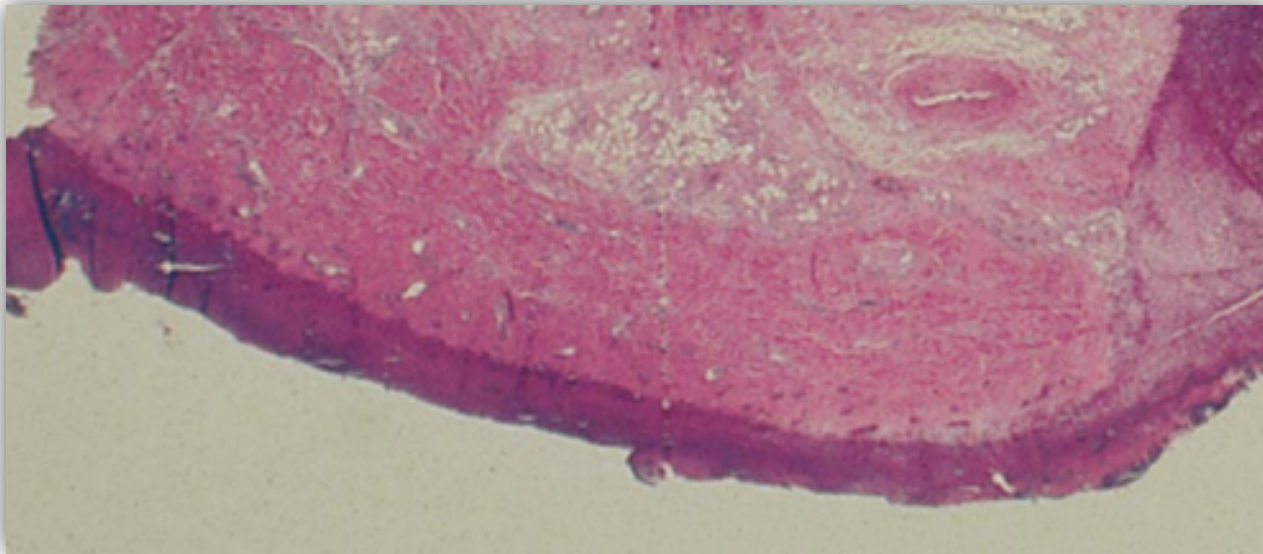
Corynebacterium diphtheriae (aka diphtheria)

Gram positive rods

Unvaccinated children at risk

Grayish pseudomembranes:

- Raised grayish-white membrane
- Contains **neutrophils, dead (or sloughed) epithelial cells & fibrin containing debris**
- Bleeds when scraped



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Other

Bacterial

1. Group A Strep (Exudative pharyngitis, rheumatic fever/ PSGN)
2. C. Diphtheriae (Pseudomembrane, Lymphadenopathy, AB exotoxin; seen in unvaccinated children)

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Pathology of the
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1. **Viral**
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3. **Fungal**
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