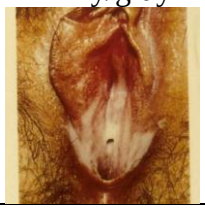
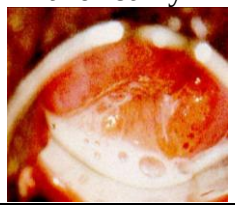
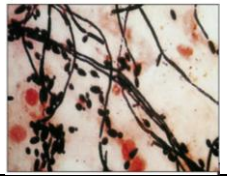
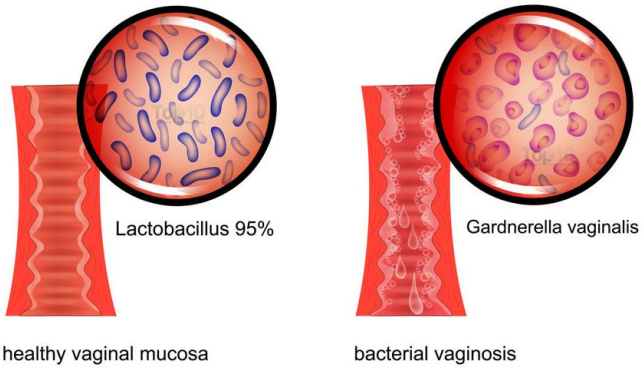
Unit IV – Problem 8 – Microbiology: Vaginitis, Cervicitis and STDs

- **What is the normal flora of the vagina?**
  - Lactobacillus doderleins and it is responsible for vaginal acidity (to prevent infections).
  - **If Lactobacilli decrease in number (especially after menopause or antibiotic treatment), many organisms will start to colonize the vagina:**
    - ✓ S. epidermidis.
    - ✓ Group B, β-hemolytic Streptococci.
    - ✓ Peptostreptococci.
    - ✓ Gardnerella vaginallis.
    - ✓ Mycoplasma hominis, Ureaplasma urealyticum.
    - ✓ Yeasts (Candida albicans).
- **Differential diagnosis of vaginal infections:**

Diagnostic Criteria	Normal	Bacterial vaginosis	Trichomonas vaginitis	Candida vulvovaginitis
Vaginal pH	3.8 – 4.2	> 4.5	> 4.5	< 4.5 (usually)
Discharge	White, thin and flocculent	Thin, milky/gray 	Yellow-green and foamy 	White (cottage-cheese) 
Amine odor (Whiff test)	Absent	Fishy	Non-specific	Absent/yeast like
Microscopic	Lactobacilli and epithelial cells	Clue cells, adherent cocci and no WBC's	Trichomonads and WBC's > 10/hpf	Budding yeast, hyphae and pseudohyphae 

- **Bacterial vaginosis:**
  - **Definition**: it is a polymicrobial clinical syndrome resulting from replacement of normal vaginal flora (Lactobacilli) by the following:
    - ✓ Gardnerella vaginalis.
    - ✓ Prevotella.
    - ✓ Bacteriodes and Mobiluncus species.
    - ✓ Mycoplasma and Ureaplasma species.
    - ✓ Atopobium vaginae.



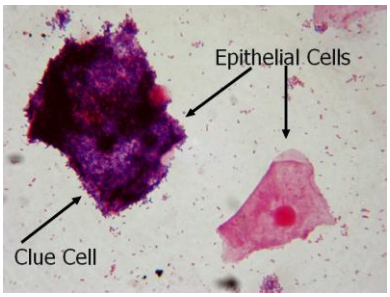
  - **Epidemiology**: most common vaginal infection in females of reproductive age with a yearly incidence of 15% and prevalence of 9-23%.
  - **Clinical manifestations:**
    - ✓ Vaginal discharge: thin, gray-white, homogenous discharge which adheres to vaginal wall.

- ✓ Fishy odor: noticed after menses and intercourse due to alkalinity of blood and semen.
- ✓ Vulvar pruritis: not common but might occur.

- **Risk factors:**
  - ✓ Douching (spray or shower with water).
  - ✓ Multiple sexual partners.
  - ✓ Intrauterine Devices (IUDs).
  - ✓ Low socioeconomic status.
  - ✓ Black ethnicity.
  - ✓ Smoking.
- **Complications of bacterial vaginosis are classified according to the following:**

Pregnancy-related	Unrelated to pregnancy
Pre-term labor	Pelvic Inflammatory Disease (PID)
Low birth weight (< 2500 g)	Cervicitis (inflammation of the cervix)
Intra-amniotic fluid infection	Urinary Tract Infection (UTI)
Premature Rupture of Membranes (PROM)	Sexually Transmitted Diseases (STDs)
Post-partum endometritis	Cervical dysplasia

- **How are you going to diagnose bacterial vaginosis in an infected female?**
  - ✓ Amsel's criteria: this is composed of 4 criteria
    - ❖ Thin, white, homogenous discharge.
    - ❖ Clue cells which are seen under hpf-microscope. These are vaginal epithelial cells which are covered with bacteria and have granular appearance.
    - ❖ pH of vaginal fluid > 4.5
    - ❖ Fishy odor when adding 10% KOH to a sample of vaginal fluid.

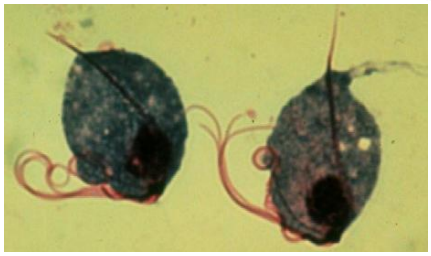


  - ✓ Scoring system:

Organism morphotype	#/oil immersion field	Score
***Lactobacillus*-like (parallel-sided gram-positive rods)**	>30	0
	5-30	1
	1-4	2
	<1	3
	0	4
***Mobiluncus*-like (curved gram-negative rods)**	>5	2
	<1-4	1
	0	0
***Gardnerella/Bacteroides*-like (tiny, gram-variable coccobacilli and rounded, pleomorphic gram-negative rods with vacuoles)**	>30	4
	5-30	3
	1-4	2
	<1	1
	0	0
WBC	>50	0
	24-49	1
	1-23	2
	<1	3
	0	4
Interpretation of score: 0-3 Normal; 4-6 Intermediate, repeat test later; 7-10 Bacterial vaginosis		

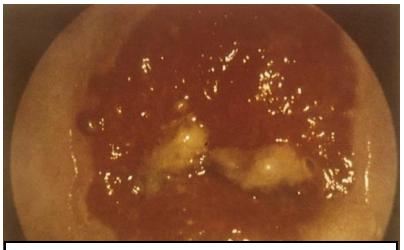
  - ✓ Culture method.

- **Trichomonas vaginalis:**
  - **How to diagnose it?**
    - ✓ Most common: visualization of motile protozoa in a wet mount (this has 60-70% sensitivity). If protozoa cannot be seen → you can use antigen detection by immunofluorescence.
    - ✓ Gold standard: culture.
    - ✓ PCR has no benefit.

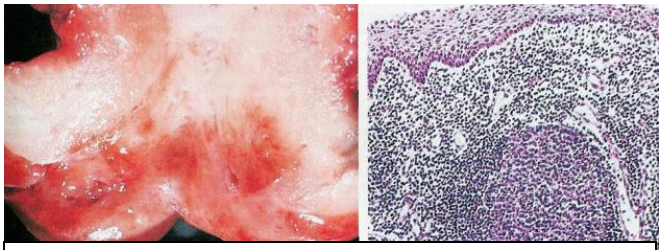


- **Cervicitis:**
  - **Etiology:**

Gonococcal	Non-gonococcal (more common)
Caused by Neisseria gonorrhea which can grow in cervix, uterus and fallopian tubes of a female + urethra (in both male and females).	Caused by Chlamydia trachomatis. It causes a silent disease because ¾ of infected females and ½ of infected males are ASYMPTOMATIC

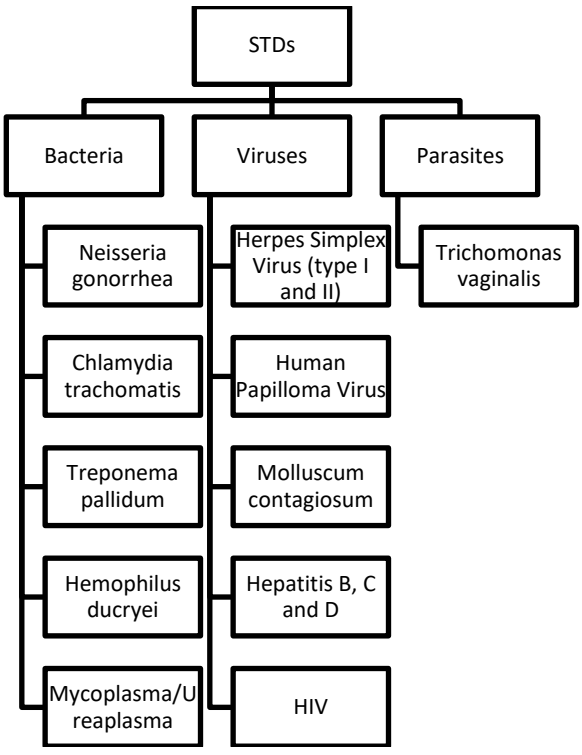


Severe cervicitis



Chronic cervicitis

- **Sexually Transmitted Disease (STDs):**
  - **Definition**: infections/disease transmitted through sexual contact.
  - **Other ways of transmission:**
    - ✓ Exchange of semen.
    - ✓ Blood transfusion.
    - ✓ Direct contact.
  - **Etiology:**



- **Classification of STDs according to what they cause:**

Genital ulcers	**Painless**: Syphilis and Lymphgranuloma venereum
	Painful: Chancroid, Genital herpes simplex and Granuloma inguinale
Discharge	Gonorrhea, Chlamydia, Trichomonas and Candidiasis
Warts and cancer	Genital HPV and cervical cancer. High-risk HPV types which might cause cervical cancer are: 16, 18, 31, 33 and 45. Notice that vaccine is available thus cervical cancer can be prevented.