Candida infection

Types of infection:

- **Females:** Cervicitis – Vulvovaginitis - Urethritis - Bacterial vaginosis (BV) - Salpingitis (pelvic inflammatory disease [PID]) - Endometritis - Genital ulcers
- **Pregnant females :**Disease in the neonate.
- **Children and postmenopausal women**
- **Males:** Urethritis – Epididymitis – Prostatitis - Genital ulcers

Abnormal vaginal secretion:

- **Normal physiological vaginal secretion**
  - **Desquamated vaginal epithelial cell**
  - **Lactobacilli dominate**
  - **PH 3.5 to 4.6**
  - **Oderless**
  - **No itching or irritation**
  - **Deonot soil underclothing1**
- **Vaginal infection:**Trichimoniasis - Vulvovaginitiscandiasis - Bacterial vaginnosis
- **Desquamative inflammatory vaginitis**
- **Cervicitis :** Infectious - Noninfectious
- **Esterogen deficiency**

The human vagina:

- Lined with 25 layers of epithelium cells.
- Separation of microbial pathogens from the normal genital microbiota
- **Organisms:Lactobacilli -** *Corynebacterium*spp. - *Gardnerellavaginalis* – coagulase negative staphylococci, *Staphylococcus aureus - Streptococcus agalactiae - Enterococcus* spp. - *Escherichia coli* – Anaerobes - Yeasts
- Examine PH

Examination:

- Breast
- Adequate illumination
- Magnification if possible
- Give a patient mirror
- Inspect external genetalia [Lesions – Erythema]
- Vaginal mucosa [Erythema – Lesion – Secretion]
- Examination of cervix [Ectropion – Lesions – Erythema - Endocervical secretion]
- Collect cervical and vaginal specimen
- Bimanual examination

Hx of valvovaginitis:

- **General gyneclogical history**(age Neonatal ,pregnancy,prepubescent,atrophic post menop, Onset,,Esterogen depletion)
- **Menstrual history – Pregnancy - Sexual Hx – Contraception - Sexual relationship - Prior infection**
- **General medical Hx** [Allergies – DM – Malignancies – Immunodeficiecy]
- Medication OCP<steroids,duches

Symptomsof valvovaginitis:

- Discharge (quality scanty) physiological OCP
- Oder(BV,FB,EV fistula)
- Valvulardisconfort(HSV)
- Dyspareunia
- Abdominal pain (tricho) PID

Classification of valvovaginitis:

Uncomplicated	Complicated
• **Sporadic / single episode / < 4 per year** • **No underlying disease** • **By Candida albicans** • **Not pregnant** • **Mild to moderate severity** **TX:** • Any available topical agent • **Fluconazole** 150mg as a single oral dose	• **Underlying illness [HIV – DM]** • **Recurrent infection 4 or more per year** • **Non albicans candida** • **Pregnancy** • **Sever infection / symptoms** **Culture confirmation mandatory** **TX:** • Antifungal susceptibility Testing • Treat for 10-14 days with vaginal or oral agent • Other topical [**Boric acid - 5 fluorocytocine**] • Consider treatment of the partners • Long term suppressive treatment for frequently recurrent diseases

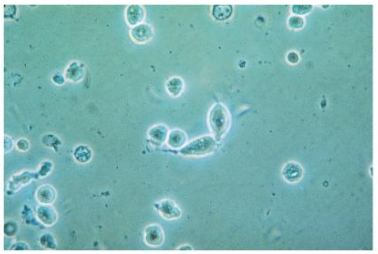
Yeast infection [moniliasis]:

- **Candidiasis**or thrush is a **fungal** infection (mycosis) of any of the Candida species (yeasts) of which **Candida albicans is** the most common.
- Common superficial infections of skin and mucosal membranes by Candida causing local inflammation and discomfort.

Candidal vulvovaginitis / vaginal thrush	
General	• Infection of the vagina's mucous membranes by **Candida albicans.** • 75% of adult women • Found naturally in the vagina • 20-30 years
Risk factors	• **Broad-spectrum**antibiotics. • **Use of corticosteroid medications** • **Pregnancy** • Poorly controlled **diabetes mellitus.** • Immunodeficiency • Contraceptives • Sexual behaviour • Tight-fitting clothing • Female hygiene • Hormonal changes • Change in vaginal acidity.
Symptoms	• Vulval soreness , irritation and itching • Superficial dyspareunia. • Dysuria • Odourless vaginal discharge [thin and watery or thick and white (cheese-like)] • Erythema (redness) • Fissuring - satellite lesions
Dx	• Hx – symptoms – physical & pelvic exam • **Maybe similar to:[STD – Chlamydia – Trichomoniasis – bacterial vaginosis – gonorrhea]**

Tx	• **Butoconazole cream**
	• **Clotrimazole**[1% cream - vaginal tablet]
	• **Miconazole**[2% cream - vagina suppository]
	• **Nystatin**[vaginal tablet]
	• **Oral Agent**:**Fluconazole**- oral one tablet in single dose
	
	• **Short-course topical formulations:**
	  ○ single dose and regimens of 1–3 days
	  ○ effectively treat uncomplicated candidalvulvovaginitis
	  ○ Topical azole drugs are more effective thannystatin
	  ○ Azole drugs relief of symptoms in 80%–90% of cases
	
	• **Tx failure:**
	  ○ In up to 20% of cases
	  ○ If the symptoms do not clear within 7–14 days

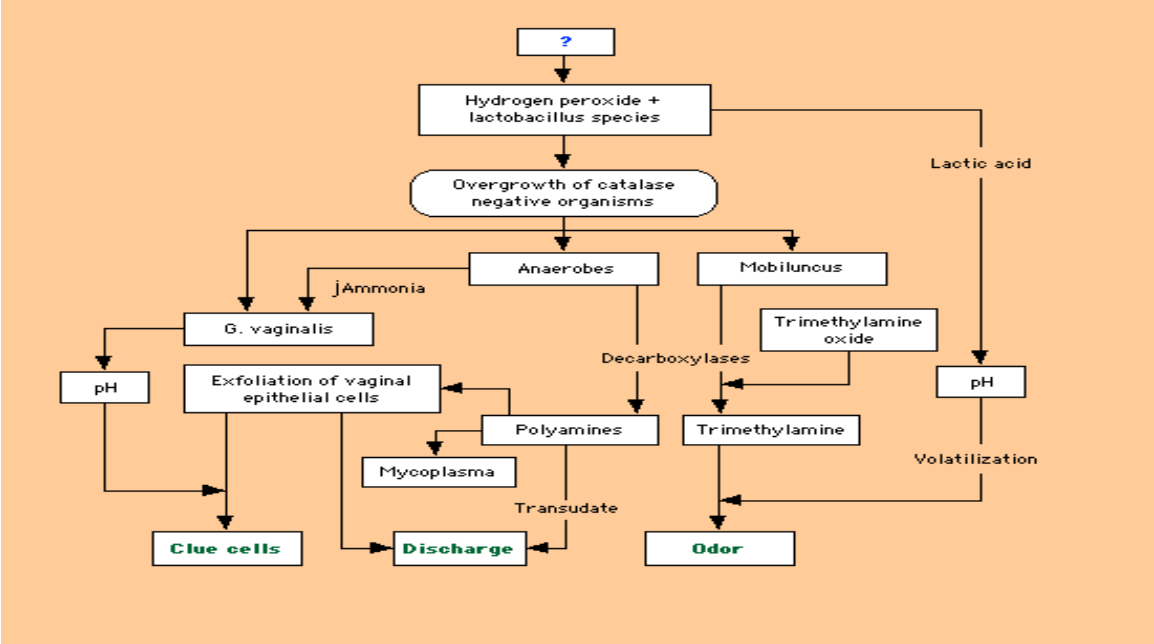
Trichomoniasis [STD]

Symptoms	• **Purulent vaginal discharge** • **yellow or greenish in color** • **Vulvar irritation (strawberry)** • **Dysurea** • **Dyspareunia** • **Abnormal vaginal odor**  Cc nc. the wet mount's fast results
Dx	• **Culture is considered the gold standard for the diagnosis of trichomoniasis.** • **Its disadvantages include cost and prolonged time before diagnosis**

Managment	• **Confirm the diagnosis**
	  ○ **Wet preparation (miss 30%)**
	  ○ **Culture**
	  ○ **Gram Stain**
	• **Confirm all current sexual partners treated**
	• **Oral metronidazole**
	  ▪ **500 mg bid for 7 days**
	  ▪ **2 g daily for 3-5 days**
	• **If Rx failure -Consultation with experts**
	  ○ **Susceptibility testing**
	  ○ **Higher dose of metronidazole**
	  ○ **Alternative Tinidazole**

Bacterial vaginosis [floral imbalance]

Organisms	• **Lactobacillus acidophilus**
	• **Gardnerella vaginalis**
	• **Mycoplasma hominis**
	• **Mobiluncus species**
	• **Anaerobes [Bacteroides (Porphyromonas) - Peptostreptococcus - Fusobacterium - Prevotella**
	
	Lactobacilli:
	• **Compete with other microorganisms for adherence to epithelial cells**
	• **Produce antimicrobial compounds such as:**
	  ○ **organic acids (which lower the vaginal pH)**
	  ○ **hydrogen peroxide**
	  ○ **bacteriocin-like substances**

Pathogenesis	• Marked reduction in lactobacillus [Decreased hydrogen peroxide production] • Polymicrobial superficial infection: overgrowth of G. vaginalis and anaerobic bacteria ○ Lactobacilli predominate after metronidazole treatment  **Pathogenesis of bacterial vaginosis.** The overgrowth of anaerobic microorganisms is accompanied by the production of proteolytic enzymes that act on vaginal peptides to release several biologic products, including polyamines, which volatize in the accompanying alkaline environment to elaborate foul-smelling trimethylamine. Polyamines facilitate the transudation of vaginal fluid and exfoliation of epithelial cells, creating a copious discharge. Clue cells are formed when Gardnerella vaginalis, present in high numbers, adhere to exfoliated epithelial cells in the presence of an elevated pH. (Redrawn by permission from Sobel, JD, N Engl J Med 1997; 337:1896-1903. Copyright© 1997 Massachusetts Medical Society. All rights reserved.)
Epidemiology	• The most common vaginal infection in women of childbearing age [29%]
Risk factors	• Multiple or new sexual partners (sexual activity alteration of vaginal pH) • Early age of first sexual intercourse • Douching • Cigarette smoking • Use of IUD Although sexual activity is a risk factor for the infection, bacterial vaginosis can occur in women who have never had vaginal intercourse
Clinical	• Most cases (50-75%) Homogenous grey vaginal discharge • Dysuria and dyspareunia rare • Pruritus and inflammation are absent • Fishy vaginal discharge [During menstruation - After intercourse] • Minimal itching or irritation • Absence of inflammation is the basis of the term "vaginosis" rather than vaginitis

Dx	• Clinical/Microscopic Criteria
	• Gram Stain ("Gold Standard")
	  ○ Clue cells on saline wet mount of vaginal discharge (on >20% cells)
	  ○ Bacteria adhered to epithelial cells; most reliable single indicator
	• Vaginal pH > 4.5 [Elevated pH and increased amine]
	• Sensitivity 87%; Specificity 92%
	
	Culture --> poor predictive value for G. vaginalis as prevalent in healthy asymptomatic women
	DNA probes --> expensive, poor predictive value alone

Dx by gram stain	**Gram Stain Scoring System for Diagnosis of Bacterial Vaginosis†** **Score** / **Lactobacillus morphotypes** / **Gardnerella and Bacteroides morphotypes** / **Curved gram-variable rods** 0 / 4+ / 0 / 0 1 / 3+ / 1+ / 1+ or 2+ 2 / 2+ / 2+ / 3+ or 4+ 3 / 1+ / 3+ 4 / 0 / 4+ The score is determined by the average number of each morphotype seen per oil-immersion field, but varies with the type of bacteria. Excluding lactobacillus morphotypes, a score of 0 means no morphotypes are present; 1, 0 to 1 morphotype present per high power field; 2, 1 to 4 morphotypes present; 3, 5 to 30 morphotypes present; 4, 30 or more morphotypes present. A total score of 7 to 10 is indicative of bacterial vaginosis infection, 4 to 6 is indeterminate, and 0 to 3 is normal. (Total score = lactobacilli score and Gardnerella vaginalis score and Bacteroides species score and curved gram variable rod score). †Adapted from data in Nugent, RP. J Clin Microbiol 1991; 29:291.
Tx	• **Oral metronidazole 500 mg bid x 7 days *($5)*** – 84-96% cure rate – Single dose therapy (2g) may be less effective • **Oral Clindamycin 300 mg bid x 7 days *($28)* --> Less effective** • **Topical treatments (higher recurrence rates)** – **Metronidazole** gel (0.75%) 5 g PV qhs x 5 days *($30)* • 70-80% cure rate – **Clindamycin** cream (2%) 5 g PV qhs x 7 days *($31)* • Less effective • May lead to Clindamycin resistant anaerobic bacteria

Specimen Obtained during gynecological examination:

- **Vaginal secretion [PH - Saline wet preparation - KOH wet preparation]**
- **Cervical cultural and non cultural [GC - C.trachomatis]**
- **Vaginal culture [Candida - Trichomonas vaginalis]**
- **Cervical cytological examination if not documented within previous 12 months**

Routine bacterial cultures not helpful:

- Routine NOT helpful
- **Wet mount**- 60% sensitive **(Trichomoniasis ,BV)**
- Abnormal or **foul odor** using a (KOH) "whiff test"
- The **Gram stain** is useful to diagnose BV [**Using the Nugent scoring system**]
- A **wet mount + a yeast culture** and *Trichomonas* culture [**Recommended tests to diagnose vaginitis**]
- Performing **only a wet mount**, without yeast or *Trichomonas* culture,
  - **50% of either of these agents of vaginitis will be missed**
- A **sensitive DNA probe assay** is available
  - **Combines the detection of yeasts, *Trichomonas,* and G. *vaginalis* as a marker for BV**

GOOD LUCK

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