

Clinical education:

Introduction to sexually transmitted infections (STIs)

Dr Melanie Bissessor, March 2021



MSHC

MELBOURNE SEXUAL HEALTH CENTRE

Part of **AlfredHealth**

Why STIs?

- **Every STI diagnosed reduces the duration of infectivity**
- **It provides an opportunity to:**
 - Discuss ways to reduce the risk of acquiring or transmitting an STI in the future.
 - Identify partners of infected people so they can be offered testing and treatment.

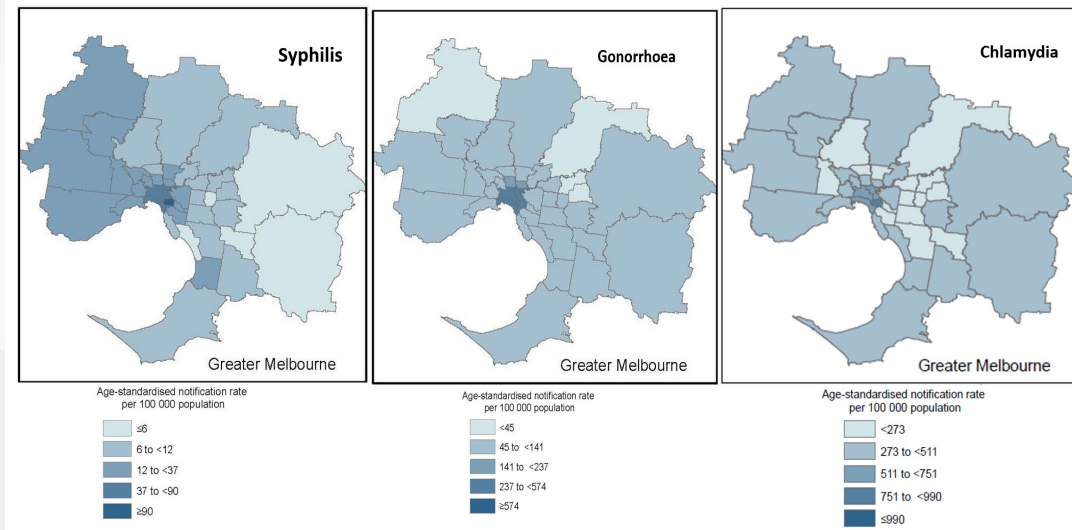


So even though you are dealing with an individual it has impact on the whole population.



Local prevalence of common STIs

Average age-standardised STIs notification rate per 100 000 population

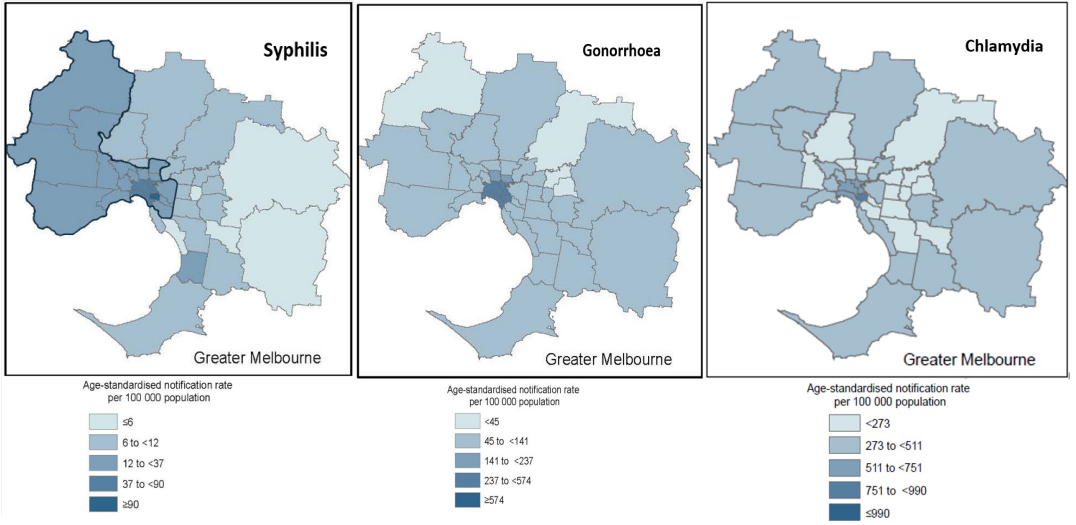


https://kirby.unsw.edu.au/sites/default/files/kirby/report/KI_Annual-Surveillance-Report-2018.pdf



Local prevalence of common STIs

Average age-standardised STIs notification rate per 100 000 population

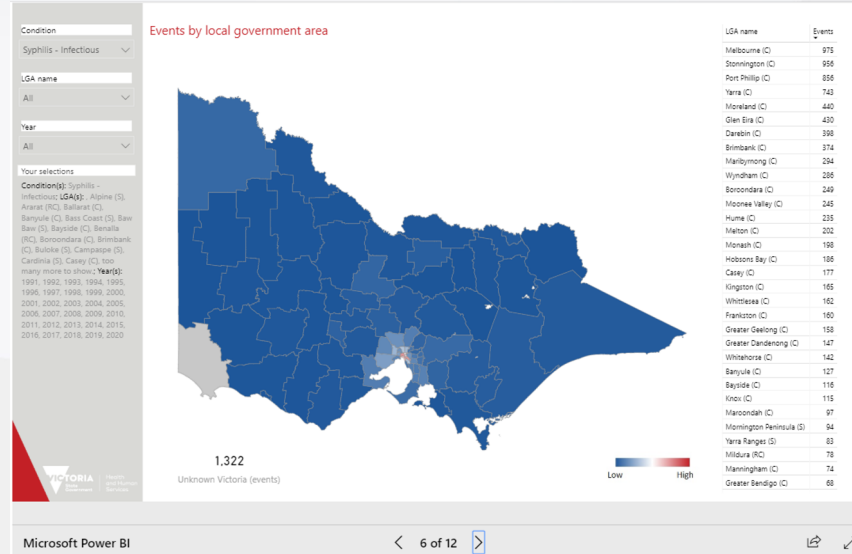


https://kirby.unsw.edu.au/sites/default/files/kirby/report/KI_Annual-Surveillance-Report-2018.pdf



VIC DHHS [Interactive Infectious Disease Report](#)

Surveillance of notifiable conditions in Victoria



Broaching the subject



Starting a conversation about sexual health testing



- Bring the subject up opportunistically



- Use a “hook”



- As part of a reproductive health consultation



- Because the patient requests a “checkup” for STIs



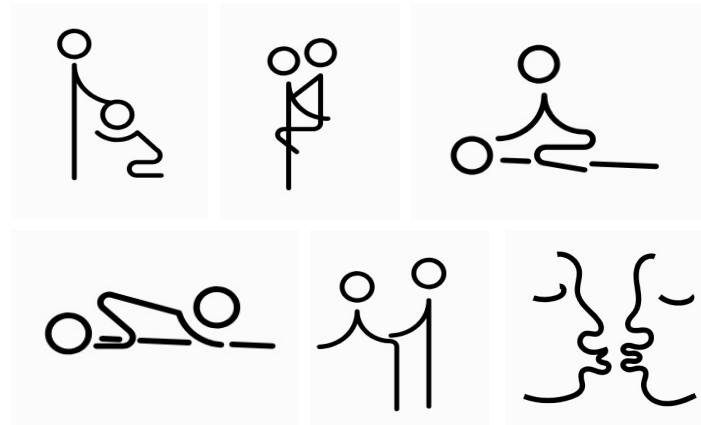
The basics – sexual history

- **WHO are you having sex with**
 - Are you having sex / sleeping with men, women or both?
- **WHAT types of sex are you having sex?**
 - What type of sex are you having - vaginal / anal / oral sex?
- **WHEN did you have sex?**
 - When did you most recently have sex?
- **Why are these questions so important?**



Remember language

When you think of sex what sexual practices would you classify as sex???



Normalising STI testing for your patient

Explain:

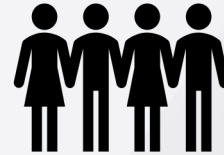
- **The questions help work out which tests to do**
 - Everyone is asked the same questions
 - Questions will be personal
 - Reinforce STIs are common, often you won't know you have one and many easily treated
-
- ✓ Establish trust and make the patient feel comfortable
 - ✓ Address the whole person
 - ✓ **MAKE NO ASSUMPTIONS**



Priority populations for STI screening



Aboriginal and Torres
Strait Islander peoples



Young people
15-29 years of age



Men who have sex with
men



Sex workers




MSHC website-Health Professionals tab

Home Health Professional >



Treatment Guidelines

The icon features a large 'Rx' symbol, a tipped-over pill bottle, and several white pills scattered on a light blue surface.



HIV Prophylaxis

The icon shows a large blue pill labeled 'PrEP' and a group of four stylized human figures in blue, one of whom is pushing a wheelchair.



STI Diagnostic tool

The icon has a red background with the text 'STI' in large black letters, 'DIAGNOSTIC' in yellow on a black banner, and 'TOOL' in white on a red banner.



STI Image Atlas

The icon features the 'STI ATLAS' logo with a blue wave graphic above the text.



Online Education

The icon shows several colorful diamond-shaped icons with various symbols representing different STIs and sexual health concepts.



Online clinical services

The icon depicts a red computer mouse on a blue circular ripple effect background.




Contact Tracing

The icon shows a network diagram with blue and red nodes connected by lines, with the text 'AUSTRALASIAN CONTACT TRACING' above it.



STI Notifications

The icon features a blue background with concentric circles, a red bell icon with a '1' notification badge, and the text 'Sexually Transmitted Infection'.



Clinical Hints

The icon has a red background with five white lightbulbs, each containing a letter: H, I, N, T, S.



Urethral Syndrome



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Classification

- Gonococcal Urethritis
 - *Neisseria gonorrhoea*
- Non-Gonococcal Urethritis (NGU)
 - ~20-30% *Chlamydia trachomatis*
 - ~10-15% *Mycoplasma genitalium*
 - ~5% less common causes
 - ~50% No pathogen identified



Symptoms

- Dysuria
 - Onset, duration, severity, intermittent continuous....
- Urethral Discharge
 - Onset, colour, amount, underwear staining
 - tissue paper sign?
- Urethral Discomfort
 - Pain, irritation, itch, tingling....



Complicated Symptoms

- Scrotal pain and swelling
- Phimosis or paraphimosis
- Conjunctivitis
- Reactive Arthritis
- Reiter's Syndrome
- Disseminated Gonococcal Infection



Infectious Causes

- **Common**

- *Neisseria gonorrhoea*
- *Chlamydia trachomatis*
- *Mycoplasma genitalium*

- **Less Common**

- Herpes Simplex Virus
- Adenovirus
- *Trachomatis vaginalis*
- UTI

- **Others Implicated**

- *Vaginal commensals*
 - *Ureaplasma urealyticum/parvum*
 - *Gardnerella vaginalis*
- Oropharyngeal flora
 - *Neisseria meningitidis*
 - *Haemophilus spp.*
 - *Streptococcus spp.*



Gonococcal Urethritis

- rarely asymptomatic
 - <<10%
- incubation
 - 1 to 14 days (~3 days)
- purulent discharge
 - scanty/moderate/profuse
 - underwear staining
 - tissue paper Sign
- dysuria +/-
- urethral discomfort +/-
- meatitis



Non-Gonococcal Urethritis

- incubation
 - Chlamydia 2 to 4/52 (~3/52)
 - >50% is asymptomatic
 - Mg unknown
- Dysuria
 - absent to mild to moderate
 - intermittent to continuous
- urethral discomfort +/-
- meatitis



Severe Dysuria

- Herpes Simplex Virus
- Sudden Onset, ~days
- Meatitis/ulceration
 - Tender
- Discharge +/-
- Inguinal lymphadenopathy +/-
- Preceded by or concurrent constitutional Symptoms
 - Fever/myalgia/
 - arthralgia



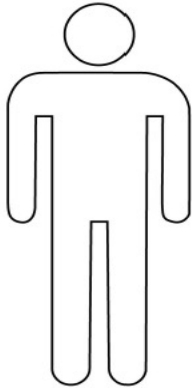
Severe Dysuria

- Adenovirus
- Seasonal variation
- Sudden onset
- Meatitis++
- Discharge
- Inguinal lymphadenopathy +/-
- Conjunctivitis +/-
- Preceded or concurrent constitutional symptoms



STI tool

Men with urethral irritation, dysuria and/or discharge



- First-void urine - 15-20 ml only - for chlamydia, gonococcal and **Mycoplasma genitalium** NAAT testing.
- Swab of discharge (if present) for bacterial (gonococcal) culture



Does NOT have to be early morning specimen, and time since previous urination is irrelevant.



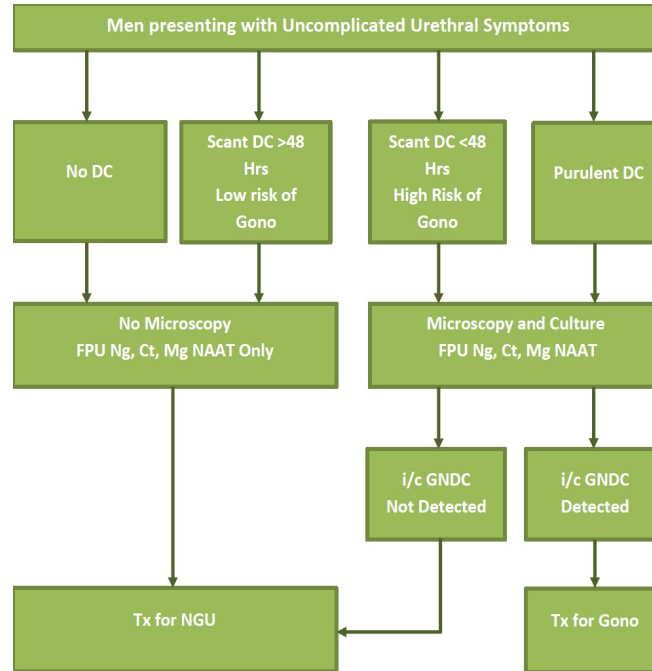
Swab of discharge is sufficient; doesn't have to be a urethral swab.



Investigations

- FPU (or Urethral Swab) for NAAT
 - *N.gonorrhoea*
 - *C.trachomatis*
 - *M.genitalium* (+Macrolide Resistance Mutation(MRM))
- *If gonorrhoea is suspected*
 - Smear of Ur DC for Grams Stain Microscopy,
plus
 - Gonococcal mcs





Matthew

- 26 year old man presents with urethral discharge
- Discharge and dysuria, which started 2 days after having condomless IAS with a casual male partner
- Nil other symptoms
- On Examination..
 - Purulent discharge
 - Redness at meatus/urethral tip
 - Nil lesions/blisters/ulcers/rashes

What could it be?



Matthew

- Before FPU is collected
 - Smear urethral discharge for mcs
 - Gonococcal MC&S
- FPU for Ng/Ct NAAT
- FPU for Mg PCR and MRM
- Pharyngeal and anal swab for Ng/Ct NAAT
- Serology for HIV and Syphilis

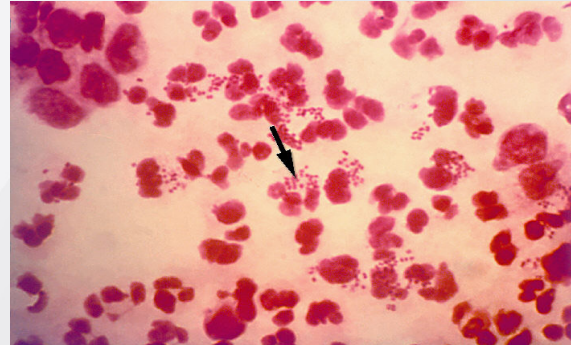


Matthew

Test: Ur Micro

PMNs: +++++
Epi Cells: Positive
Comments:

Bacteria List: GNDC (intracellular), GNDC (extracellular)
Bacteria Comments:



Matthew

- high suspicion of gonorrhoea:

- ▶ purulent discharge
- ▶ onset within soon after exposure
- ▶ MSM or overseas traveller



Results

- HIV: negative
- Syphilis: negative
- TH Ng/Ct :negative
- FPU Ct : negative
- FPU Ng Positive
- Gonococcal Culture:
- *N.gonorrhoea Isolated, + sensitivity report*



Matthew

- Diagnosis
 - Gonococcal urethritis
- Treatment
 - Azithromycin 1g oral once with food
 - Ceftriaxone 500mg with 2ml lignocaine 1% IMI once
 - No sex x 7 days
- Contact trace - Inform all partners and advise them of the treatment needed:
 - Let Them Know website
<http://letthemknow.org.au/>



Resistance-guided Therapy for MG

- ▶ Resistance assays have enabled us to move towards individualized therapy
- ▶ Sequenced resistance-guided strategy for Mgen^{1,2}, has
 - increased first line cure for macrolide-susceptible infections
 - increased cure of macrolide-resistant infections
 - reduced de novo macrolide resistance from 12% with 1g to 3%



Resistance-guided Therapy for MG

Clinical Infectious Diseases
MAJOR ARTICLE

Outcomes of Resistance-guided Sequential Treatment of *Mycoplasma genitalium* Infections: A Prospective Evaluation

Tan R, R. Read^{1,2}, Christopher K. Fairley^{1,2}, Gerald L. Morris^{1,2,3,4}, Jurgens E. Jansen^{1,2,3,4}, Jennifer Dominicki^{1,2}, Karen Worthington^{1,2}, Michelle Doyle^{1,2}, Eliza Mahony^{1,2}, Lily Tan^{1,2}, Eric F. Chan^{1,2}, Rossana M. Gattuso^{1,2,3,4}, and Carissa S. Bradbent^{1,2}

1. Sexual Health Clinic, Faculty of Medicine, Monash and Health Sciences, Monash University, Melbourne; 2. Victorian Sexual Health Centre, Alfred Health, Carlton; 3. Victorian Children's Research Institute, Paediatric Department of Microbiology and Infectious Diseases, Royal Women's Hospital, Melbourne; 4. Victorian and Immunology Program, Monash Diagnostic Centre System, and 5. Royal Children's Hospital, Melbourne, Victoria, Australia; 6. Translational Research Centre, University of Queensland, St. Louis, Queensland, Australia; 7. School of Medicine, Monash University, Victoria, Australia; 8. Department of Microbiology and Immunology, University of Melbourne, Victoria, Australia

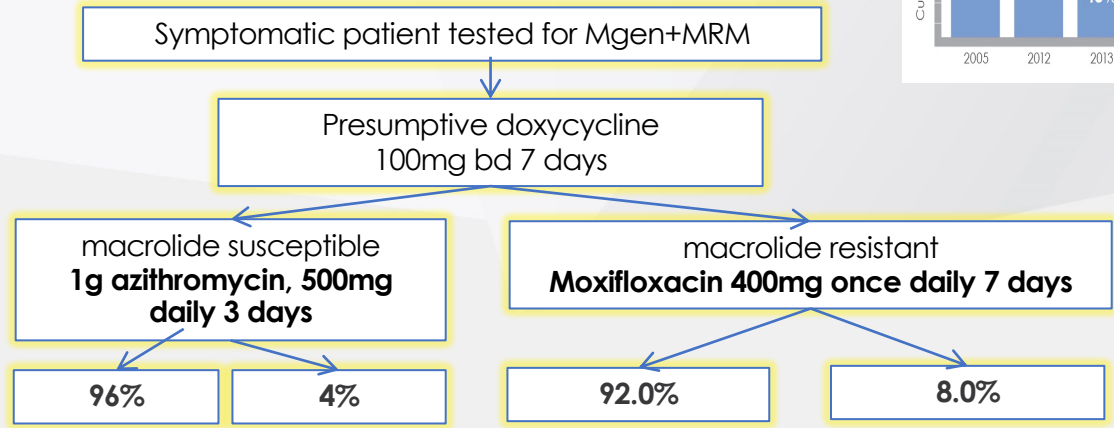
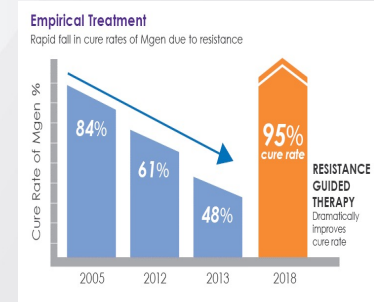
(See the Major Article by Braun et al on pages 569-76 and Editorial commentary by Sulkowski on pages 577-8.)

Clinical Infectious Diseases
MAJOR ARTICLE

Resistance-Guided Antimicrobial Therapy Using Doxycycline-Moxifloxacin and Doxycycline-2.5 g Azithromycin for the Treatment of *Mycoplasma genitalium* Infection: Efficacy and Tolerability

Durga Durukan^{1,2}, Tan R. R. Read^{1,2}, Gerald Morris^{1,2}, Michelle Doyle^{1,2}, Eric F. Chan^{1,2}, Luke A. Yonkers^{1,2}, Christopher K. Fairley^{1,2}, Anthe Agapin^{1,2}, Eliza Mahony^{1,2}, Lily Tan^{1,2}, Marco F. Chan^{1,2}, and Carissa S. Bradbent^{1,2}

1. Sexual Health Clinic, Faculty of Medicine, Monash and Health Sciences, Monash University, Melbourne, Australia; 2. Victorian Sexual Health Centre, Alfred Health, Carlton, Victoria, Australia; 3. Victorian Children's Research Institute, Royal Women's Hospital, Parkville, Victoria, Australia; 4. Translational Research Centre, University of Queensland, St. Louis, Queensland, Australia; 5. School of Medicine, Monash University, Victoria, Australia; 6. Department of Microbiology and Immunology, University of Melbourne, Victoria, Australia; 7. School of Medicine, Monash University, Victoria, Australia; 8. Department of Microbiology and Immunology, University of Melbourne, Victoria, Australia



Durukan, Clin Infect Dis 2019



Options for macrolide-resistant MG when moxifloacin has failed

- Re-purposed pristinamycin and minocycline
- Pristinamycin 1g tds with 100mg doxy bd or 1g qid for 10 days^{1,2}
 - 75% cure, proportion cured did not vary between regimens ($p = 0.91$)
- Minocycline 100mg twice daily for 14 days
 - 71% cure²
- **Combination** doxycycline+sitafloxacin
 - 100mg twice daily, 7 days
 - high cure 92%³

¹Read Emerg Infect Dis 2018, ²Doyle Open Forum Infect Dis 2020 ³Durukan On demand #87; Emerg Infect Dis 2020



New antimicrobial candidates

- Pleuromutilin, lefamulin – binds to 50S bacterial ribosome, inhibits protein synthesis¹
 - active in vitro against GC, CT and Mgen
- Zoliflodacin (Entasis Therapeutics, GARDP)
 - Investigational DNA gyrase/ topoisomerase inhibitor
 - active in vitro against GC and Mgen
- Gepotidacin (Glaxo-Smith-Kline)
 - First in “Triazaacenaphthylene” class, targets DNA Gyrase/Topoisomerase IV
 - Different binding site than fluoroquinolones
 - Phase III, for the treatment of uncomplicated urogenital gonorrhea
 - active in vitro against GC and Mgen

¹Bradshaw, Jensen and Waites, JID 2017, ²Paukner Interscience Conference of Antimicrobial Agents and Chemotherapy, 2014



Anorectal syndrome



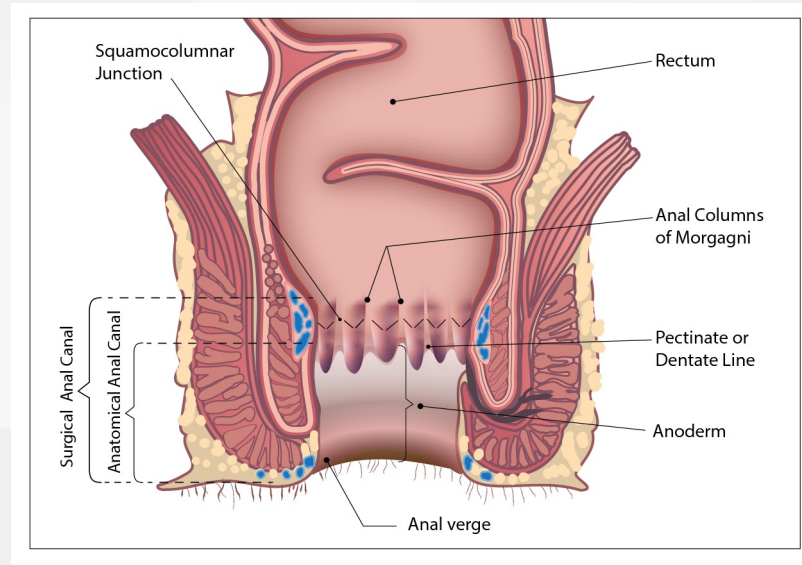
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Anatomy



Proctitis

- inflammation of the rectum (i.e. the distal 12 to 15 cm)
- *Proctocolitis* : symptoms of proctitis, diarrhoea/abdominal cramps and inflammation of the colonic mucosa extending 15cm above the anus
- Enteritis: diarrhoea and abdominal cramping without symptoms of proctitis or proctocolitis



Symptoms

- deep seated anal pain
- PR bleeding
- rectal discharge
- tenesmus
- perianal lumps
- sores/ulcers
- rash
- itch



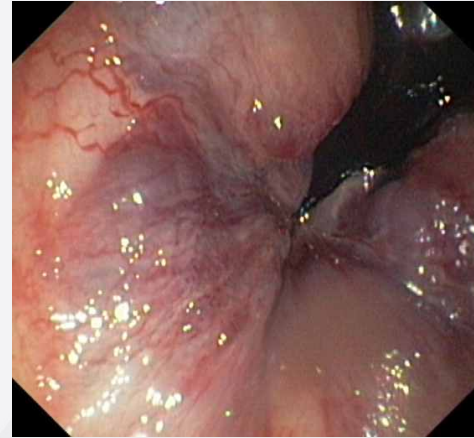
Anal Pain

- severe pain “throbbing”
- pain on defecation
- fear of defecation
 - constipation
- fever and malaise
- sleep disturbance
- inguinal lymphadenopathy



Haemorrhoids

- painless bleeding
 - bright and splashed on toilet bowl
- painful when thrombosed
- itch/irritation
- mucoid discharge
- history of constipation
- straining



Ano-rectal ulcers

- painless or
- extremely painful
- history of trauma
- past history of herpes
- painful defecation
- recent constipation



Causes

STI

- *N.gonorrhoea*
- *C.trachomatis* (LGV)
- *T.pallidum*
- HSV
- *M.genitalium*

Non STI

- inflammatory bowel diseases
 - Crohns
 - Ulcerative colitis
- radiation
- injury
- enemas
- antibiotics and *C.difficile*



Acute Proctitis

- ano-rectal pain
- passing mucus
 - coating on stools
- rectal bleeding
- tenesmus
 - frequent or continuous urge to have a bowel movement



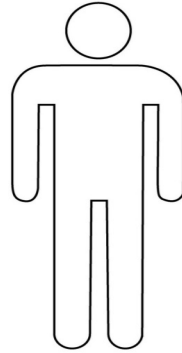
Clinical Approach

- History
 - symptomology
 - incubation period/ last sexual contact
 - past history
- Examination
 - external anal ulceration/lesion
 - discharge



STI tool

Proctitis in men who have sex with other men



Inspect the perianal area and **palpate** the anal canal for ulcers and fissures.

Anorectal swab for NAAT testing:

- chlamydia
- gonococci
- HSV
- syphilis
- Mycoplasma genitalium



- HIV serology
- Syphilis serology
- Hepatitis B serology if unvaccinated or known to be not immune
- Hepatitis A serology if unvaccinated or known to be not immune.



Investigations

- External genital ulceration
 - *HSV PCR*
 - *TP PCR*
- Rectal swab -NAAT
 - *N.gonorrhoea*
 - *C.trachomatis*
 - *HSV PCR*
 - *TP PCR*
- *If gonorrhoea is suspected*
 - *Smear of anal discharge for gram stain microscopy, plus*
 - *Gonococcal micro-culture and sensitivities*



Management

- Start treatment before results come back!
- First line is doxycycline 100 mg bd for 7 days plus valaciclovir 500 mg bd for 10 days. If practical, give ceftriaxone 500 mg IM before starting other treatment.
- **Call or refer** if severe pain or treatment failure.



Management

- no sex during treatment period
- review in 7 days
- contact tracing
- extended course of doxycycline for 21 days if chlamydia positive
 - order LGV serovar



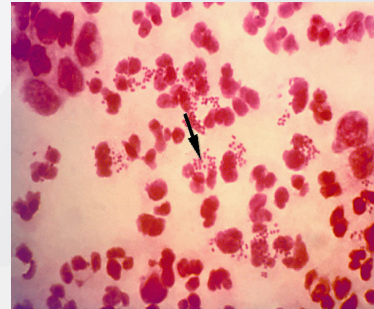
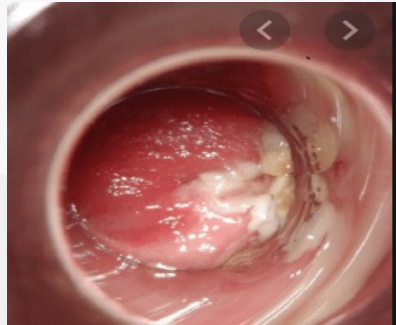
Case 1

- Samuel
- 26 year old man presents with painful anal discharge
- started 2 days after having condomless receptive anal sex with casual male partner
- no other symptoms
- no history of HSV



Examination

- purulent discharge on proctoscopy
- no lesions/blisters/ulcers/rashes



Case 1

- If high suspicion of gonorrhoea:
 - purulent discharge
 - onset within a couple of days of possible exposure



Results

- HIV: negative
- Syphilis: negative
- pharyngeal Ct/Ng :negative
- FPU Ct/Ng : negative
- rectal Ct : negative
- rectal **Ng Positive**
- ***N.gonorrhoea isolated on culture***
- HSV PCR :negative
- TPPCR: negative



Case 1

- diagnosis
 - gonococcal proctitis
- treatment
 - azithromycin 1g oral once with food
 - ceftriaxone 500mg with 2ml lignocaine 1% IMI once
 - no sex x 7 days
- contact trace - inform all partners and advise them of the treatment needed

- Let Them Know website

<http://letthemknow.org.au/>



History

- 10 days ago had oro-anal sex with RSP male
- last casual male sexual contact more than 3 months ago
- never receptive anal sex
- 100% condoms for anal sex
- no history of HSV
- no history of STIs
- regular STI screens



Examination



Case 2

- If high suspicion of herpes simplex:
 - systemic illness
 - recent oral sex
 - visible ulceration
 - onset within a week to 10 days of possible exposure



Results

- HIV: negative
- Syphilis: negative
- pharyngeal Ct/Ng :negative
- FPU Ct/Ng : negative
- rectal Ct /Ng: negative
- HSV PCR :positive- Type I
- TPPCR: negative



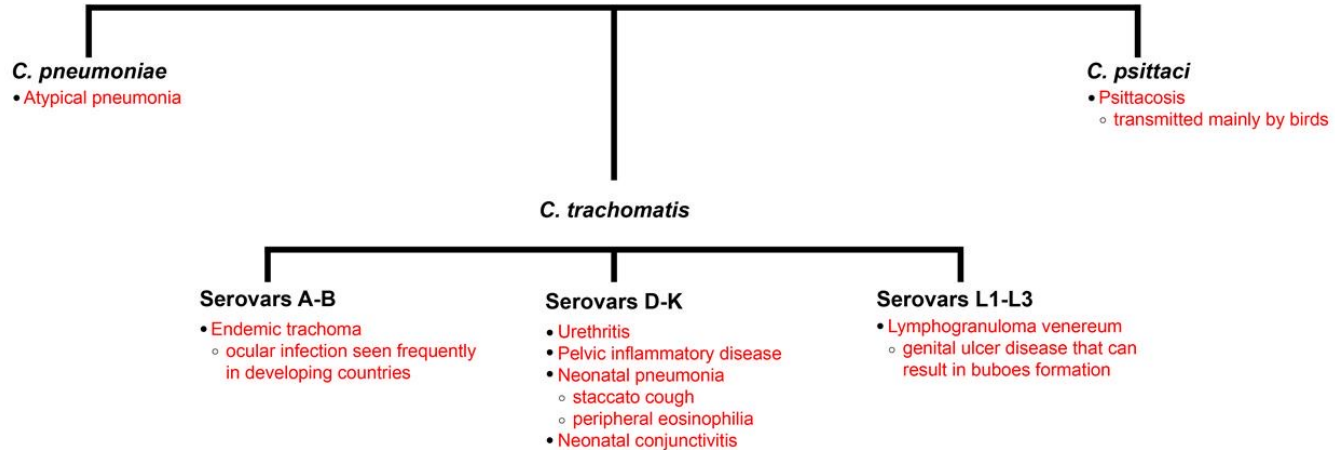
Case 2

- diagnosis
 - HSV I proctitis
- treatment
 - valacyclovir 500 mg twice daily x 10 days
 - topical lignocaine
 - episodic vs suppressive treatment



Chlamydia

Obligate intracellular organism



© Lineage

Moises Dominguez



LGV

- Initially endemic in S. and W Africa, India, SEA and Caribbean
- Outbreaks in high income countries- mainly in MSM
- Most present as proctitis
- Majority of MSM with LGV - HIV associated
- HIV seropositivity was the strongest risk factor for LGV infection



LGV

- 3 different stages

1st Stage:

- Primary infection- (14-21days):
 - small painless genital papules, pustules, or shallow ulcers appear on the skin
 - transient, heal quickly and disappear-often go unnoticed or get mistaken for genital herpes.
 - no accompanying symptoms (usually)



2nd Stage of LGV

- Secondary infection- 2 to 6 weeks after primary:
 - painful and swollen lymph glands develop in the groin area. occur on one side (two-thirds of cases) or both sides of the groin
 - buboes can rupture and drain pus
 - 'groove sign' (guttering along blood vessels) occurs in 15–20% of cases
 - most male patients present with symptoms during this stage



Lymphogranuloma venereum



LGV



GROOVE SIGN



3rd Stage:

- Late stage infection:
 - deep seated infection can lead to abscess, fistula, lymphatic obstruction, severe genital edema, rectal stricture
 - genital deformation



Diagnosis

- serology testing is unreliable- low specificity but late stage may be useful (where there is no ulcer to swab)
- NAAT for chlamydia then LGV serovars
- swab from ulcer, buboes aspirate.
- culture is difficult.



Treatment

- Doxycycline 100 mg bd x 3 weeks -buboes should resolve by 3rd week
- alternative Erythromycin(500mg QID) 3 weeks
- Azithromycin 1g - weekly for 3 weeks (test of cure needed)
- TOC essential



- buboes may require needle aspiration or incision and drainage to avoid rupture or sinus tract formation
- primarily carried out for symptomatic relief but may aid in diagnosis when pus is sent for NAAT
- aspiration safer than incision and drainage, which are associated with a greater risk of post-operative sinus formation



Syphilis

Treponema pallidum



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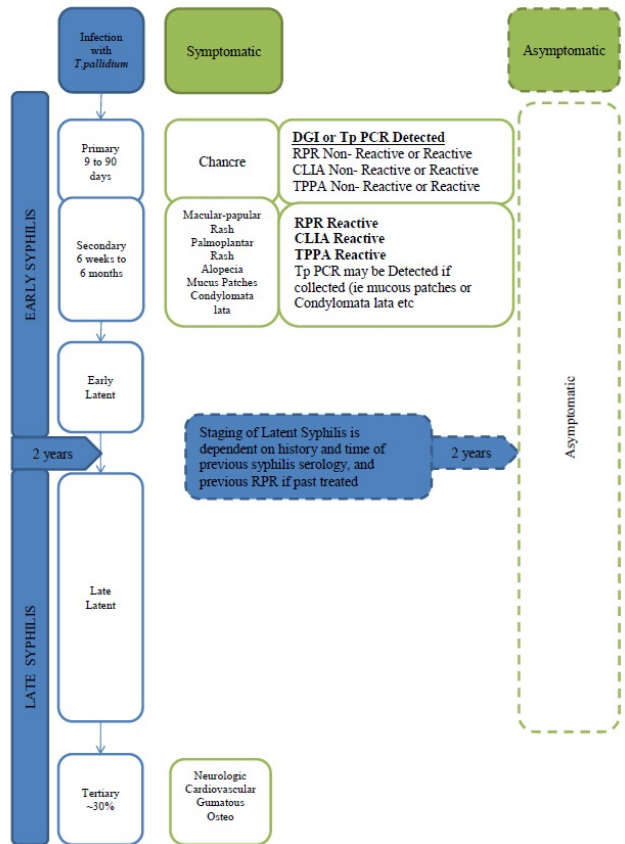
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Syphilis

Treponema pallidum





Diagnosis – Serologic

- *Treponemal specific tests*
 - Chemiluminescence Immunoassay (**CLIA**)
 - IgM/IgG
 - *T.pallidum* Particle Agglutination Assay (**TPPA**)
 - *T.pallidum* Haemagglutination Assay (**TPHA**)
 - Fluorescent Treponemal Antibody Absorbed (**FTA-ABS**)

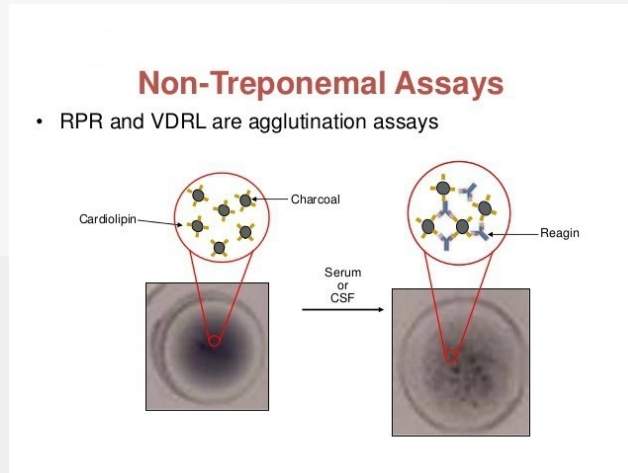
Diagnosis – Serologic

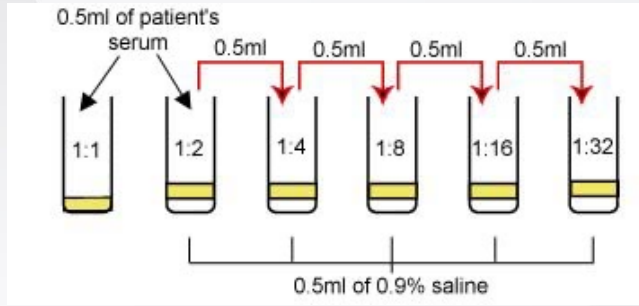
- Non-treponemal Serologic Tests
 - Rapid Plasma Reagin (RPR) Test
 - Provide a titre, index of disease activity
 - 1:2; 1:4; 1:8; 1:16; 1:32; 1:64; 1:128; 1:256...
 - Biologic false positives
 - Autoimmune Disease, Pregnancy, Viral Infections



Non-Treponemal Tests

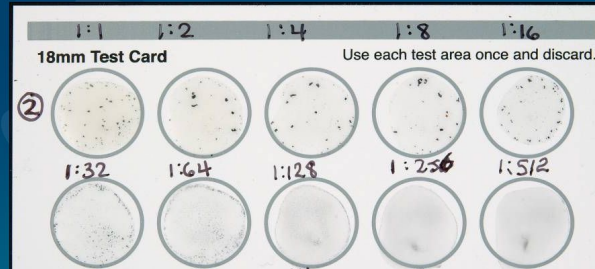
- Rapid Plasma Reagin Test (RPR)





T
M
S
L

Quantitative RPR Test



↑ End-Point Titer (1:64)



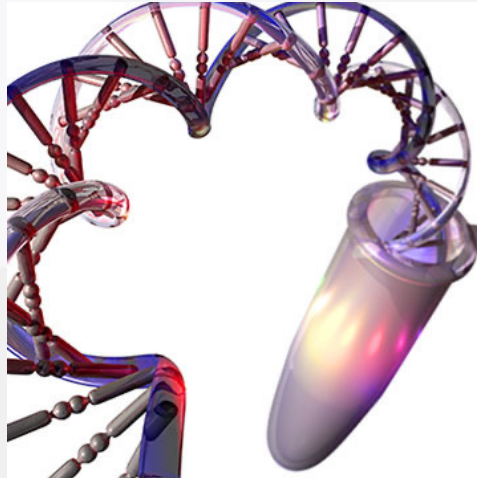
Diagnosis- Direct Identification

- Dark Ground Microscopy



Diagnosis- Direct Identification

- Polymerase Chain Reaction (PCR)



Syphilis Staging

- Early Syphilis (< 2 years)
 - Primary
 - Secondary
 - Early Latent
- Late Syphilis (>2 years)
 - Late Latent
- Latent Syphilis of Unknown Duration

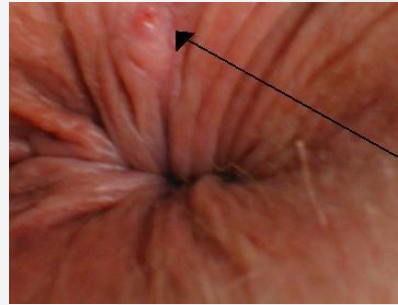


Syphilis Staging

- Tertiary Syphilis (10-20 years)
 - Neurosyphilis
 - Cardiovascular Syphilis
 - Gummatous Syphilis
- Congenital Syphilis



Primary Syphilis



Secondary Syphilis



Secondary Syphilis



Treatment

- Early Syphilis (<2 years)
 - Benzathine Penicillin 2.4 mIU i.m.i once
 - Doxycycline 100mg b.d for 14 days
- Late Syphilis (>2 years or Unknown Duration)
 - Benzathine Penicillin 2.4 mIU i.m.i weekly for 3 weeks
 - Doxycycline 100mg b.d. for 28 days
- **It is always preferable to treat with Benzathine penicillin over Doxycycline due to compliance issues.**

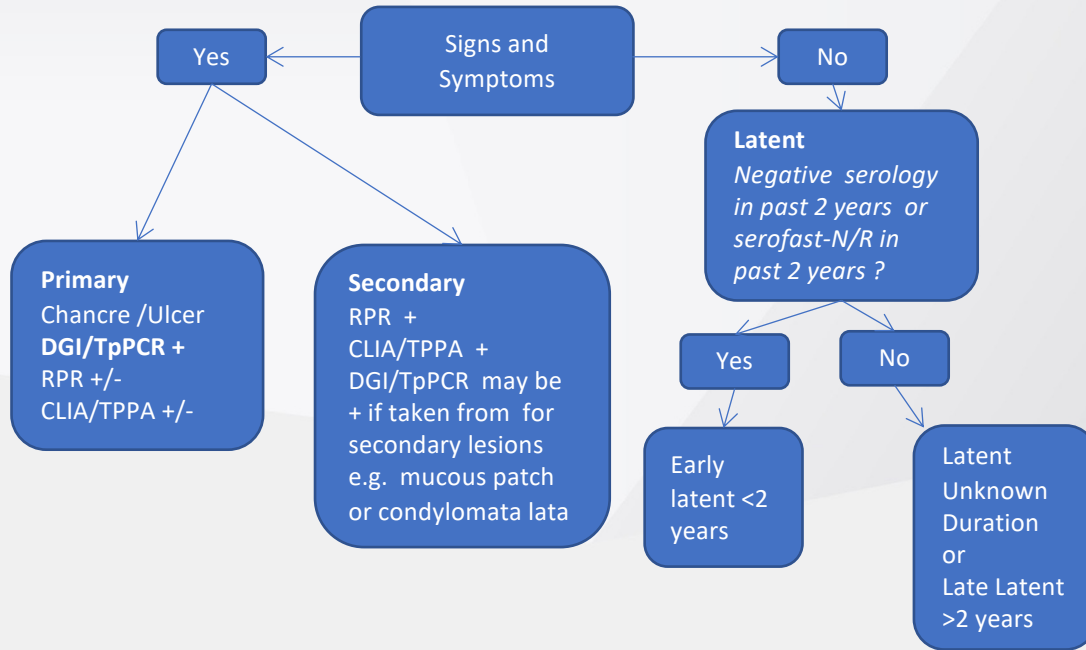


Jarisch-Herxheimer Reaction

- Transient flu-like reaction (headache, fever, chills, myalgia) following initiation antimicrobial therapy for syphilis. (within 24 hours)
 - Self-limiting (<24 hours)
 - Occurs mainly in early syphilis (mostly in secondary)
 - Can exacerbate cutaneous syphilis lesions
 - Rare in late syphilis
 - Rest, paracetamol
 - Pathophysiology is not well understood
-
- Potentially life threatening, inpatient syphilis treatment is recommended in cardio-vascular, neuro-syphilis, ocular syphilis, pregnancy



Basic Staging



Reinfection

- If asymptomatic
- RPR \geq 4 four fold
- RPR = 2 fold rise
 - parallel testing
- Adequate treatment signified by
 - RPR \leq 4 four fold drop in titre



Case 1

- 29 year old
- MSM
- No symptoms
- First STI screen

Date	CLIA	TPPA	RPR	DGI	PCR	Sx	Stage	Rx
27-10-17	Reactive	Reactive	Non-Reactive			ASx	?	?



Case 2

- 36 year old
- painless penile ulcer x 4 days
- regular STI screening every 3 months

Date	CLIA	TPPA	RPR	DGI	Tp PCR	Sx	Stage	Rx
12-08-17	Reactive	Reactive	Non-Reactive	Spirochetes Not Detected	Detected	Ulcer		
20-08-17	Reactive	Reactive	1:8					Day of Rx



Case 3

- 52 year old transgender female
- Multiple partners
- Regular STI screening
- On PREP
- p/h of syphilis
- No symptoms today



Case 3

Date	CLIA	TPPA	RPR	DGI	PCR	Sx	Stage	Rx
23-04-16	Non-Reactive					ASx		
12-01-17	Reactive	Reactive	1:4	Spirochetes Detected	Positive	Genital Ulcer	?	?
14-05-17	Reactive	Reactive	Non-Reactive			ASx	?	
22-02-18	Reactive	Reactive	1:256			ASx	?	?
10-06-18	Reactive	Reactive	1:8			ASx	?	
15-2-19	Reactive	Reactive	1:16			ASx	?	?



Case 4

- 46 year old female
- Recently returned traveller
- Last STI screen 3 years ago
- Treated as a syphilis contact in UK



Case 4

- Very stressed
- No job and couch surfing
- Recurrent cold sores and mouth ulcers



Case 4

Date	CLIA	TPPA	RPR	DGI	Tp PCR	Sx	Stage
25-09-16	Reactive	Reactive	1:32			ASx	?
28-03-17	Reactive	Reactive	1:2			ASx	?
18-04-20	Reactive	Reactive	1:256		Detected	White Patches-Tongue	?

