The Return of the Great Pretender: Syphilis in 2014.

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Internal Medicine Grand Rounds

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CLOAK ROOM
STD

*Objectives

- **To review the microbiology of syphilis.**
- To review the presentation and findings of primary, secondary and tertiary syphilis.
- To provide an update on syphilis infection rates in British Columbia and in specific populations.
- To provide an update of syphilis testing in BC.
- To review diagnosis and treatment of syphilis in British Columbia.
- To review syphilis in pregnancy, and congenital syphilis outcomes.

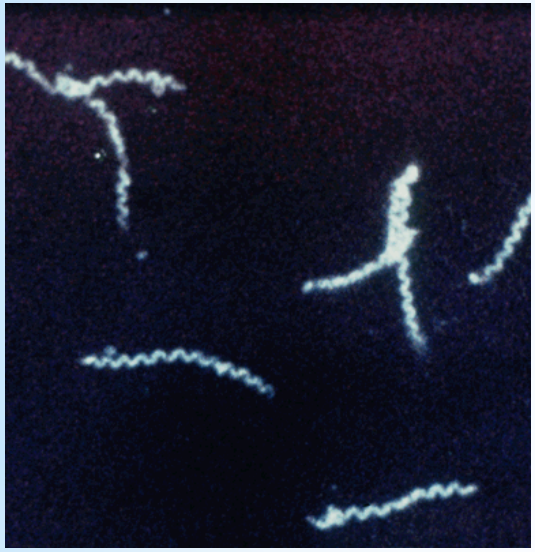
*Classification

Spirochaete (Phylum and class)	**Spirochaetaceae** (Family)	**Treponema** (Genus)	*Treponema pallidum* (Syphilis/**bejel** · Yaws) · *Treponema carateum* (Pinta) · *Treponema denticola*
		Borrelia	*Borrelia burgdorferi*/*Borrelia afzelii* (Lyme disease · Erythema chronicum migrans · Neuroborreliosis) · *Borrelia recurrentis* (Louse borne relapsing fever) · *Borrelia hermsii*/*Borrelia duttoni*/*Borrelia parkeri* (Tick borne relapsing fever)
	Leptospiraceae	**Leptospira**	*Leptospira interrogans* (Leptospirosis)
	Spirillaceae	**Spirillum**	*Spirillum minus* (Rat-bite fever/Sodoku)
Chlamydiaceae	**Chlamydophila**		*Chlamydophila psittaci* (Psittacosis) · *Chlamydophila pneumoniae*
	Chlamydia		*Chlamydia trachomatis* (Chlamydia · Lymphogranuloma venereum · Trachoma)
Bacteroidetes			*Bacteroides fragilis* · *Bacteroides forsythus* · *Capnocytophaga canimorsus* · *Porphyromonas gingivalis* · *Prevotella intermedia*
Fusobacteria			*Fusobacterium necrophorum* (Lemierre's syndrome) · *Fusobacterium nucleatum* · *Fusobacterium polymorphum* · *Streptobacillus moniliformis* (Rat-bite fever/Haverhill fever)

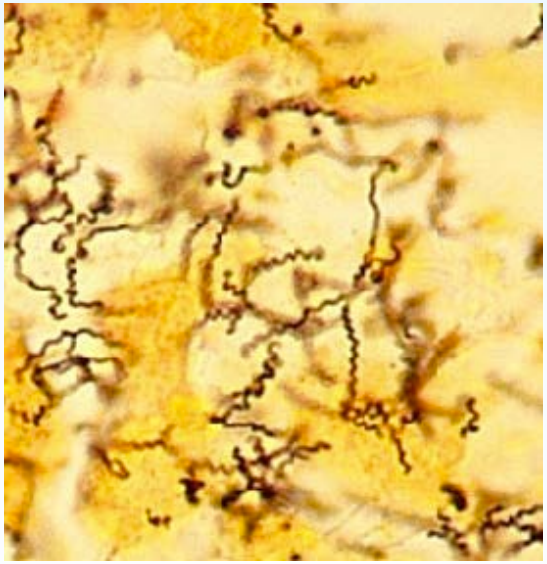
Source: http://en.wikipedia.org/wiki/Treponema

*Syphilis: Microbiology

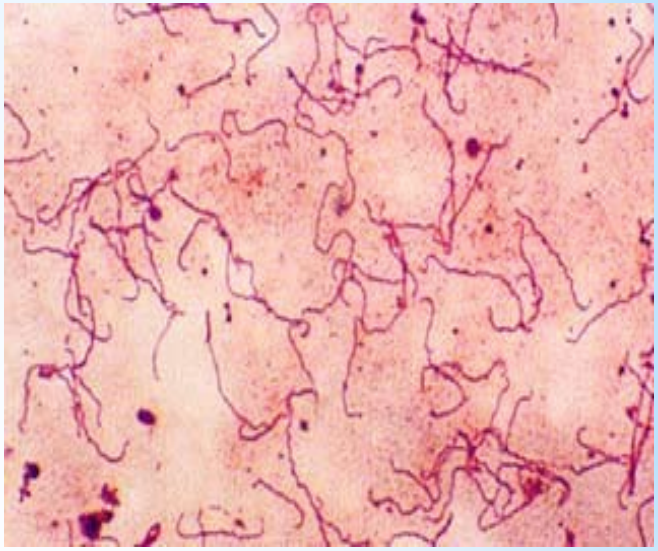
Darkfield



Silver stain



Gram stain



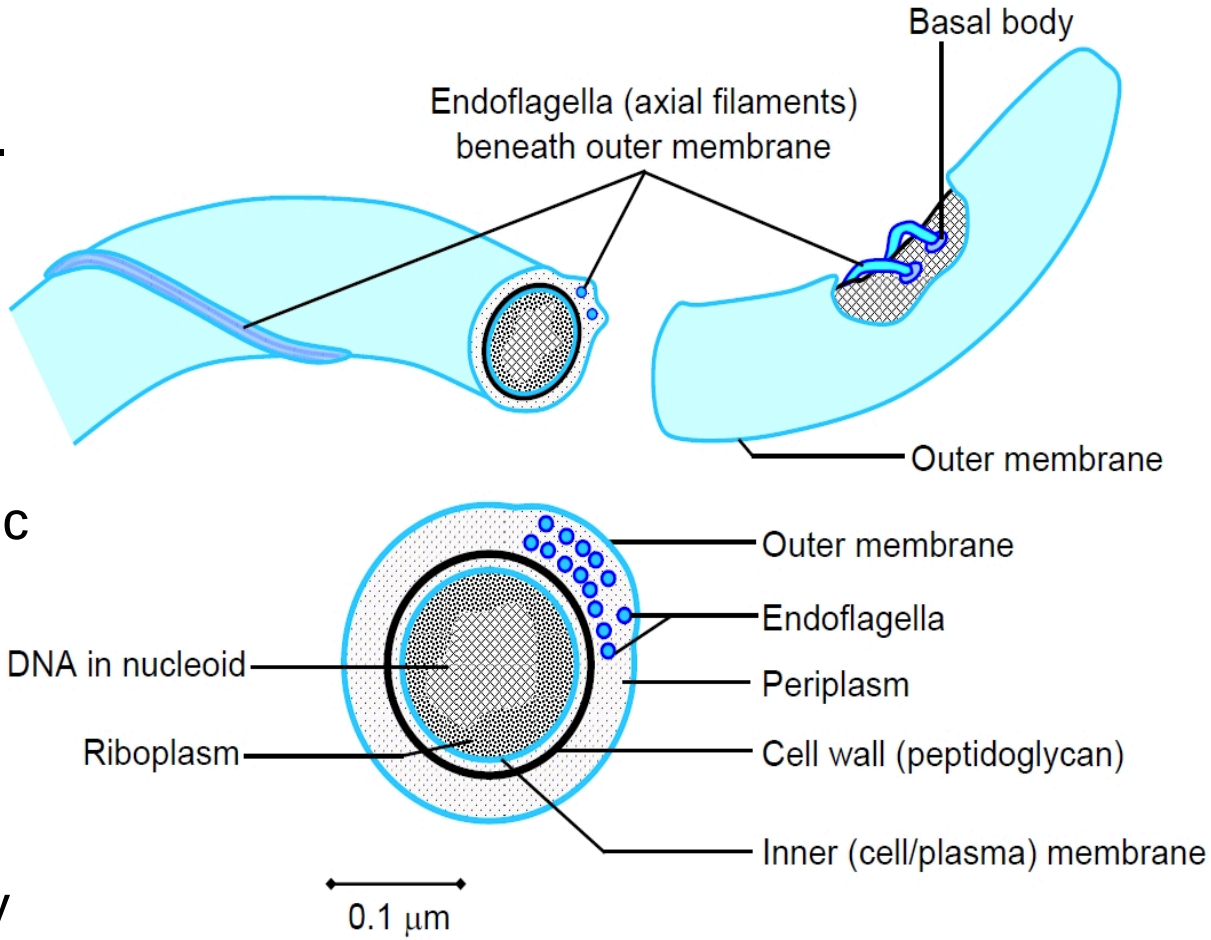
Source:
http://textbookofbacteriology.net/pathogenesis_3.htm; http://faculty.mc3.edu/jearl/ML/ml-5-3.htm:
http://www2.wmin.ac.uk/~redwayk/lectures/Antibiotics/Antibiotics.htm

*Trepomema Cell Structure

Diderm (double-membrane) bacteria, long, helically coiled (corkscrew-shaped) cells.

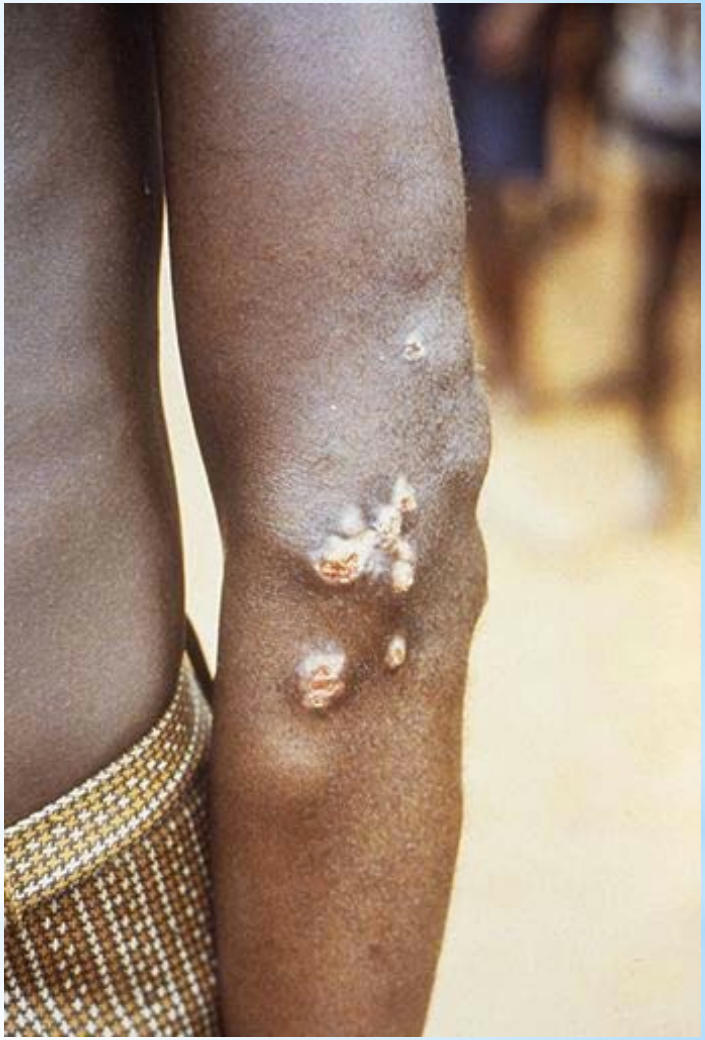
Flagella:
(axial filaments), run lengthwise between bacterial inner and outer membranes in periplasmic space; causes twisting motion allowing movement.

Reproduction:
Asexual transverse binary fission.



Treponema - Yaws

- Treponema pallidum pertenue (YAWS)
- Found in *Homo erectus* skeletons 1.6 million years old
- Found in Africa, Western Pacific, South East Asia.
- Tropical infection of skin, bones and joints
- **Primary:** "mother yaw" nodular/warty lesion (resolves <6 months)
- **Secondary:** months-years later, widespread, highly infectious lesions
- **Tertiary:** 10% of infected, 5-10 years later, wide spread skin, bone and joint destruction
- **Transmission:** Skin to skin contact



http://en.wikipedia.org/wiki/Yaws

*Treponema - Pinta

- *Treponema carateum*
- Found Mexico, South, Central America
- Mildest treponeme, confined to skin

- **Primary:** itchy red, scaly papule or plaque, can be >10 cm, no ulceration
- **Secondary:** months later, “pintids”, pruritic, infectious x years, color changes from red to copper to gray to bluish-black
- **Late:** hypochromia, discoloration, atrophy, achromia.

Source: www.uptodate.com

Primary Pinta Lesion

Late Pinta Lesion:
Cutaneous dyschromia

Treponema – Bejel (endemic syphilis)

- *Treponema pallidum ssp. Endemicum*
- Found along the southern Sahara border, and the Arabian peninsula.
- Transmission mainly among children, direct skin-skin or mouth-mouth contact, shared utensils.

- **Primary:** Small oral patches
- **Secondary:** Mucous patches (painless, shallow), bone pain due to periostitis (esp long bones leg), condyloma lata in intertriginous areas
- **Tertiary:** Juxta-articular nodules, destructive lesions esp. of nose, nasal septum, nasopharynx and soft palate.

Source: www.uptodate.com, http://en.wikipedia.org/wiki/Nonvenereal_endemic_syphilis

* With civilization came syphilization.

*Case 1

- *54 year old HIV+, HCV+ male
- *MSM, Sexually active with long term partner
- *6 days ago began to have jaundice, rash (shown here), fever, N/V
- *N/V/fever now resolved
- *AST 138, ALT 122, TBIli 250

***RPR 1:16,384**

http://std.sagepub.com/content/21/8/537/F5.large.jpg

*The Syphilis Poem…

There was a young man from Black Bay
Who thought syphilis just went away
He believed that a chancre
Was only a canker
That healed in a week and a day

But now he has “acne vulgaris” –
(Or whatever they call it in Paris);
On his skin it has spread
From his feet to his head,
And his friends want to know where his hair is.

There’s more to his terrible plight;
His pupils won’t close in the light
His heart is cavorting,
His wife is aborting,
And he squints through his gun-barrel sight.

Arthralgia cuts into his slumber;
His aorta in need of a plumber;
But now he has tabes,
And saber-shinned babies,
While of gummas he has quite a number.

He’s been treated in every known way,
But his spirochetes grow day by day;
He’s developed paresis,
Has long talks with Jesus,
And he thinks he’s the Queen of the May

*Syphilis - Primary

- *Median incubation 21 days (3-90).
- *Painless papule at site of inoculation (multiple are possible).
- *Ulcerates to form the classic chancre.
- *Heals spontaneously after 3-6 weeks.
- *Widespread dissemination of spirochete.

http://www.your-doctor.net/dermatology_atlas/english/?id=357; http://commons.wikimedia.org/wiki/File:Extragenital_syphilitic_chancre_of_the_left_index_finger_PHIL_4147_lores.jpg; http://www.psychiatrictimes.com/articles/primary-syphilis

*Syphilis - Secondary

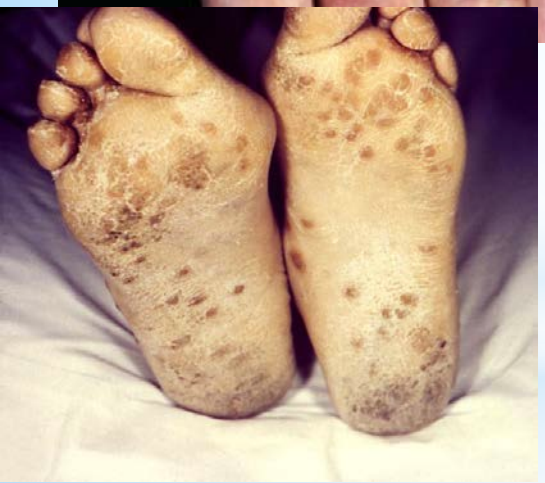
*Weeks-months later, can be concurrent.

*Systemic illness, 25% of untreated.

*Syphilis - Secondary

- *Systemic symptoms
- *Rash
- *Condyloma lata
- *Hepatitis
- ***GI:** infiltrated, ulcerated
- *Lymphadenopathy
- ***MSK:** synovitis, osteitis, perioseitis
- ***Renal:** nephrotic syndrome, nephritis with acute renal failure
- ***Neurologic:** headache, confusion
- ***Ocular:** uveitis, optic neuritis
- *Alopecia
- *Acne vulgaris

*Syphilis - Rash



http://www.webmd.com/sexual-conditions/guide/syphilis
http://manbir-online.com/diseases/Syphilis.html
http://std.sagepub.com/content/21/8/537/F3.large.jpg
http://www.cmaj.ca/content/176/1/33/F1.expansion.html;
http://hardinmd.lib.uiowa.edu/cdc/syphilis13.html

*Syphilis - Secondary

* Condyloma lata
  * Painless, warty, mucosal lesions
  * Develop in warm, moist sites
  * Highly infectious

http://medlibes.com/entry/condyloma-lata

*Syphilis - Secondary

*Alopecia

http://www.aocd.org/resource/resmgr/ddb_highalopecia_areata_1_high.jpg

*Syphilis - Secondary

*Acne vulgaris

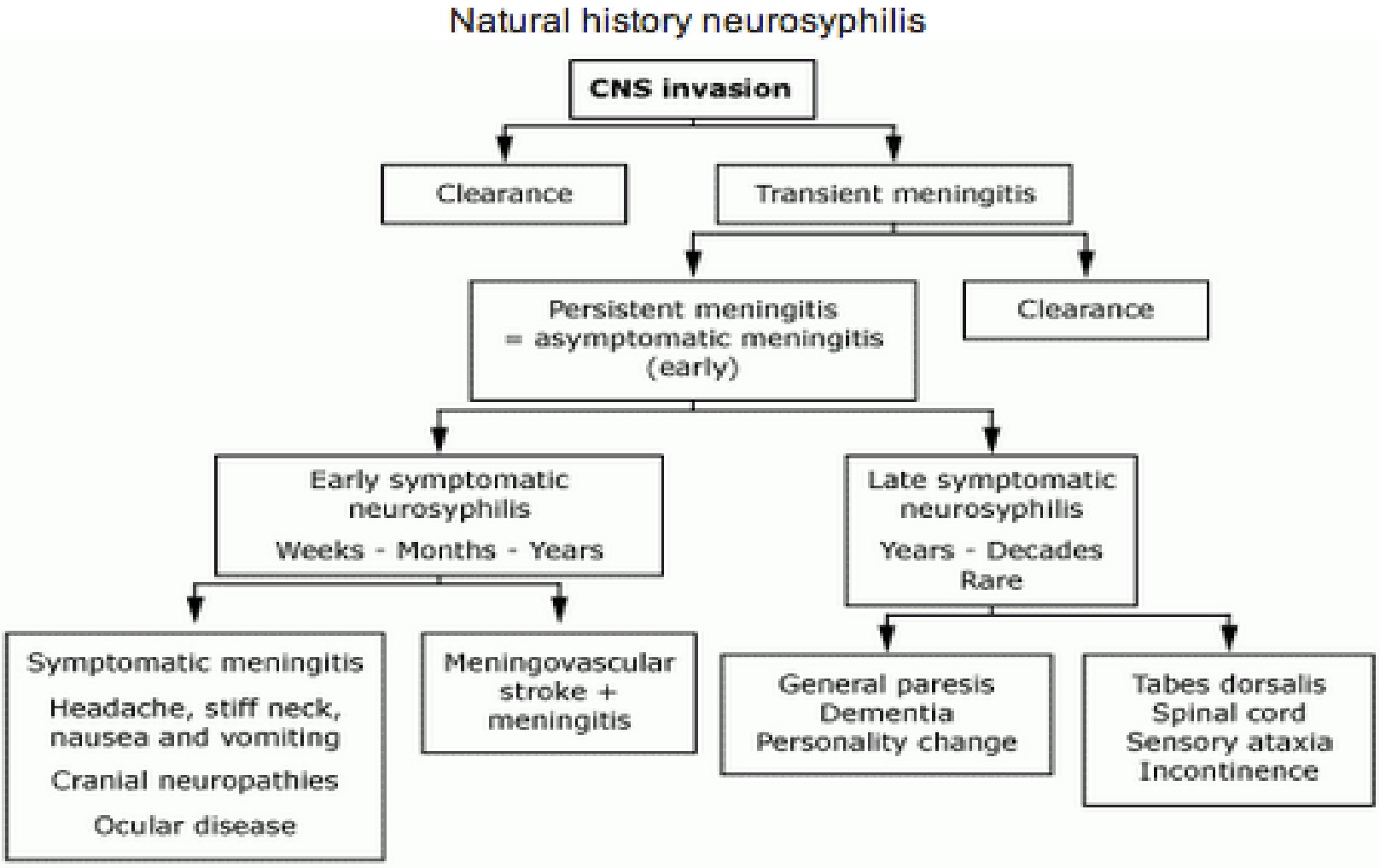
http://www.theacneguru.com/2013/07/08/the-simple-guide-to-different-types-levels-of-acne/

*Syphilis - Latent

* **Early Latent:**
  * First year after infection.
* **Late Latent:**
  * >1 year since infection.
  * Any diagnosis where timing of infection not known should be classified as this.

* By definition is asymptomatic.

*Neurosyphilis



CNS: central nervous system.
Courtesy of Christina M. Marra, MD.
Graphic 64295 Version 2.0

www.uptodate.com

*Neurosyphilis - Early

- *Weeks – years
- ***Symptomatic meningitis**
- ***Cranial neuropathies**
  - *Otosyphilis (hearing loss +/- tinnitus)
  - *CN 7 – facial droop
- ***Ocular**
  - *Posterior uveitis (most common), can involve any eye structure!
- ***Meningovasuclar**
  - *Stroke, meningitis
  - *Infectious arteritis
  - *Spinal cord infarction (anterior spinal artery)

Neurosyphilis - Late (Tertiary)

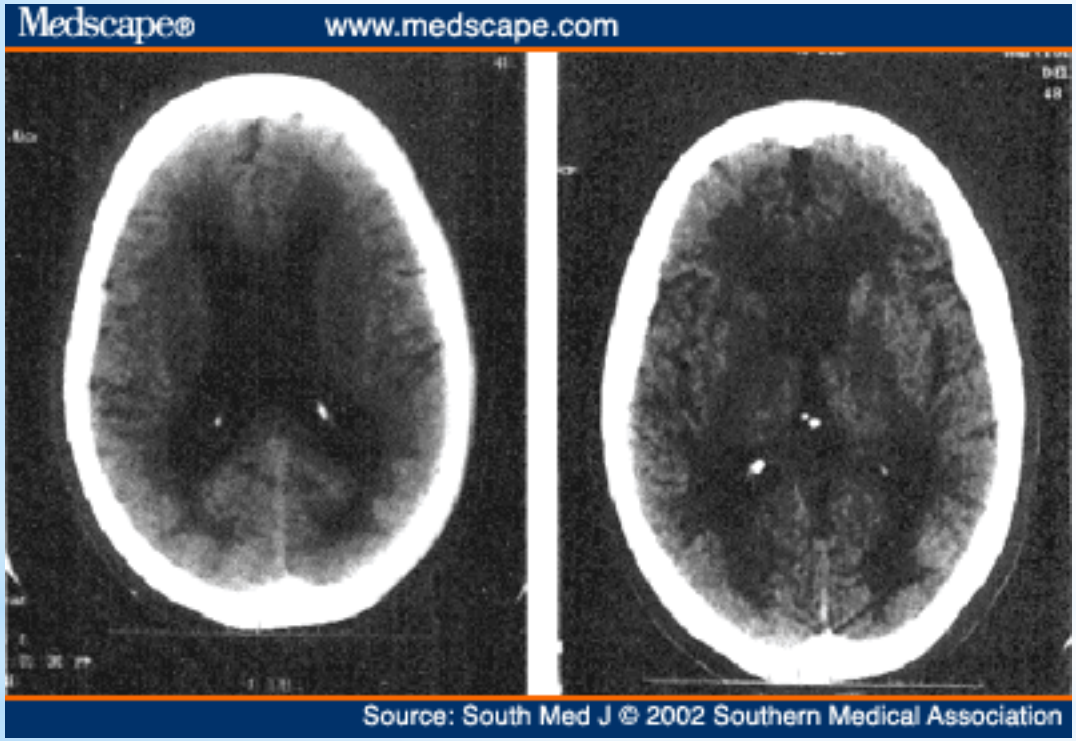
- Years (2-25) after infection
- General paresis
- Tabes dorsalis

*Neurosyphilis – General Paresis

- *Progressive dementing illness
- *1°: forgetfulness, personality change
- *Progressive memory deficits, loss of judgment and dementia
- *Depression, mania or psychosis
- *Neuro exam may be normal OR may have:

dysarthria, facial/limb hypotonia, intention tremors, abnormal reflexes, or abnormal pupillary responses

*Neurosyphilis - General Paresis



Imaging: atrophy

CSF:

WBC 25-75

protein 50-100 mg/dL

CSF VDRL:

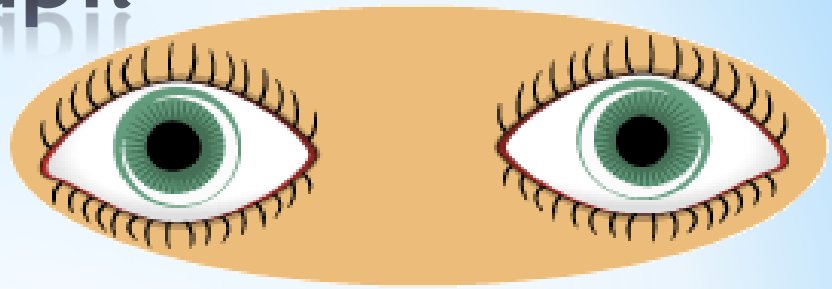
usually +

Neurosyphilis - Tabes Dorsalis

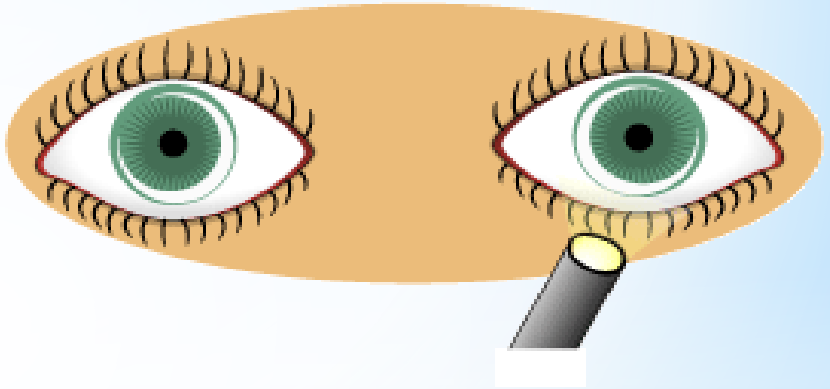
- AKA locomoter ataxia
- Posterior columns spinal cord and dorsal roots
- Occurs on average 20 years after infection

* Argyll-Robertson pupil

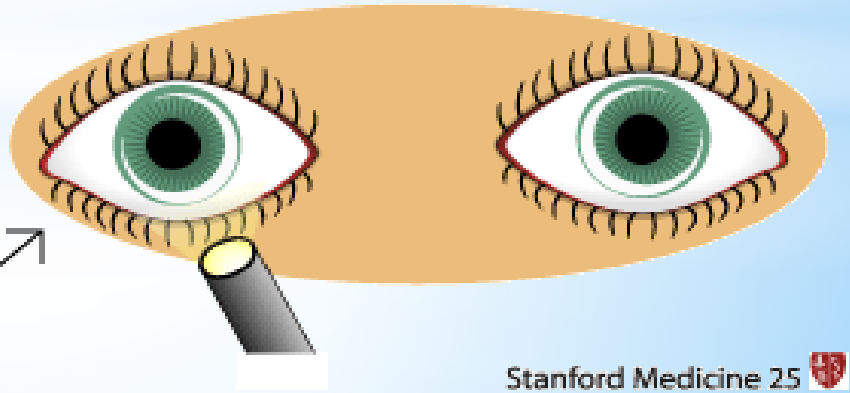
No Light



Normal Response to Light



Positive RAPD of Right Eye



Neurosyphilis - Tabes Dorsalis

- Argyll-Robertson pupil (50%)
- Sensory ataxia
- Lancinating pains (sudden brief stabs of pain lasting minutes to days)
- Paresthesias
- Gastric crises
  (recurrent severe epigastric pain, N/V)
- Impaired vibratory and position sense
- Absent lower extremity reflexes
- And…impaired touch/pain, sensory ataxia, optic atrophy

*Neurosyphilis - Tabes Dorsalis

*__CSF:__

may be normal! Or WBC 10-50, protein 45-75 mg/dL

*__CSF VDRL:__

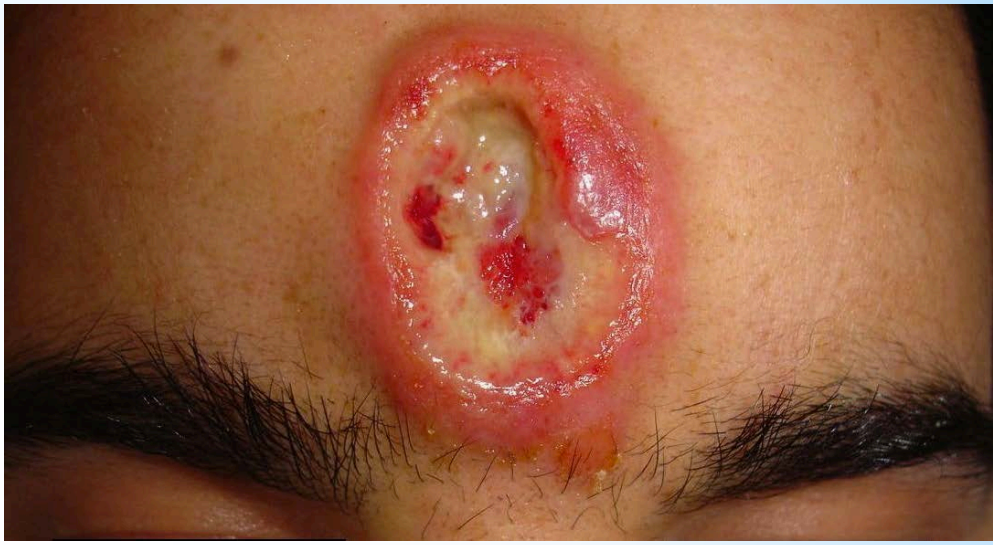
*25% are NON-reactive!

Degeneration of nerves in the dorsal columns

http://www.lookfordiagnosis.com/mesh_info.php?term=Tabes

*Tertiary Syphilis - Gummas

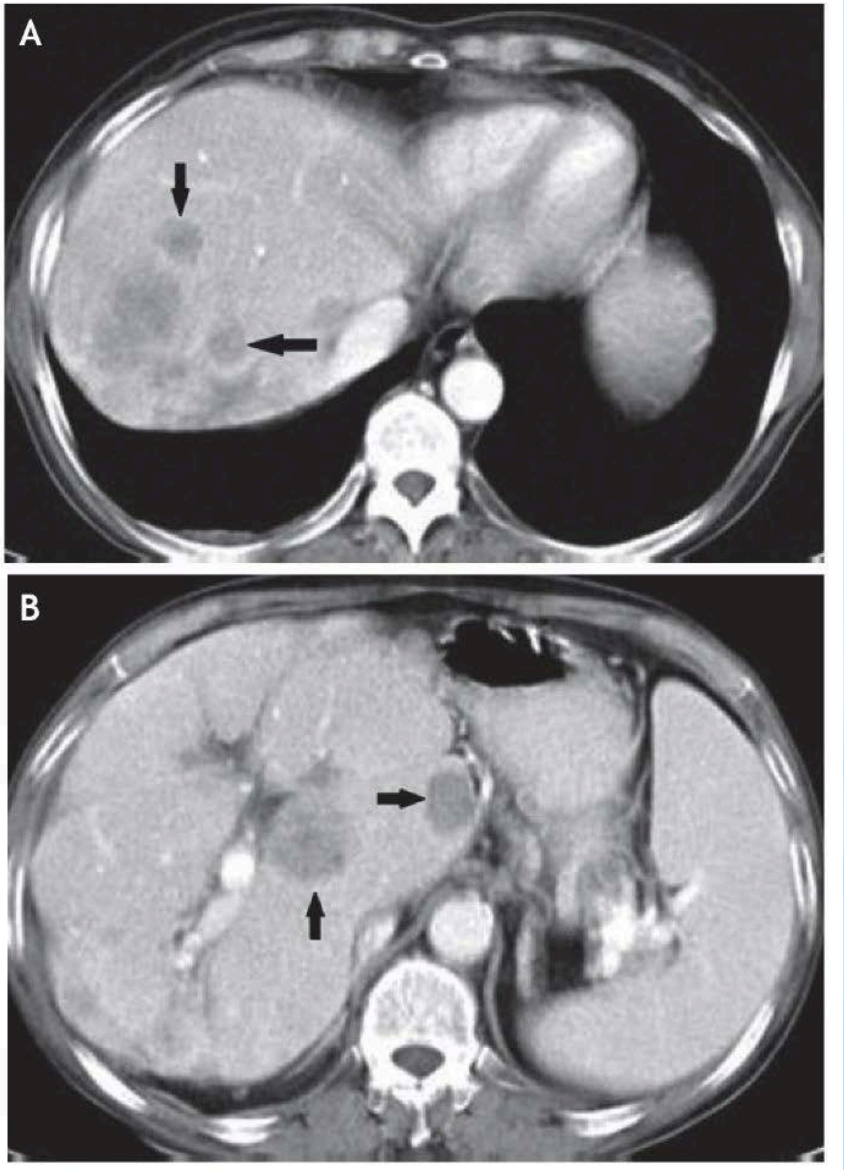
- *Soft tissue/bone
- *Granulomatous infiltration, related to immune response not great enough to eliminate, but great enough to cause tissue damage and granuloma formation



http://digitaljournal.com/article/331536

*Tertiary Syphilis - Gummas

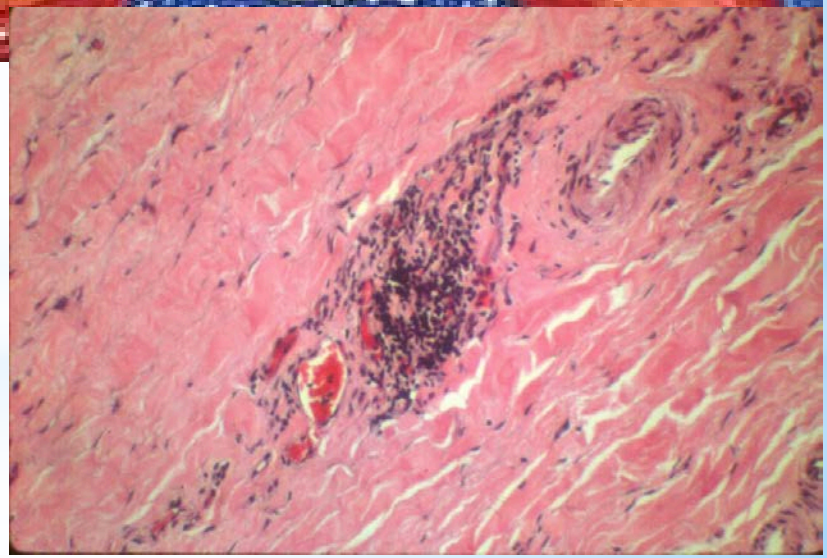
- *May imitate malignancy
- *Granulomatous infiltration on histology



Bruno et al. Journal Portugues e Gastroenterologia 2012;19(2):103-104.

*Tertiary Syphilis -Cardiovascular

*Involves:
  *Ascending aorta: dilated aorta, valvular regurgitation then heart failure
  *Coronary arteries: narrowing, thrombosis
*Typically 15-30 years after infection
*Caused by vascultitis in vasa vasorum leading to weakening of vessel wall

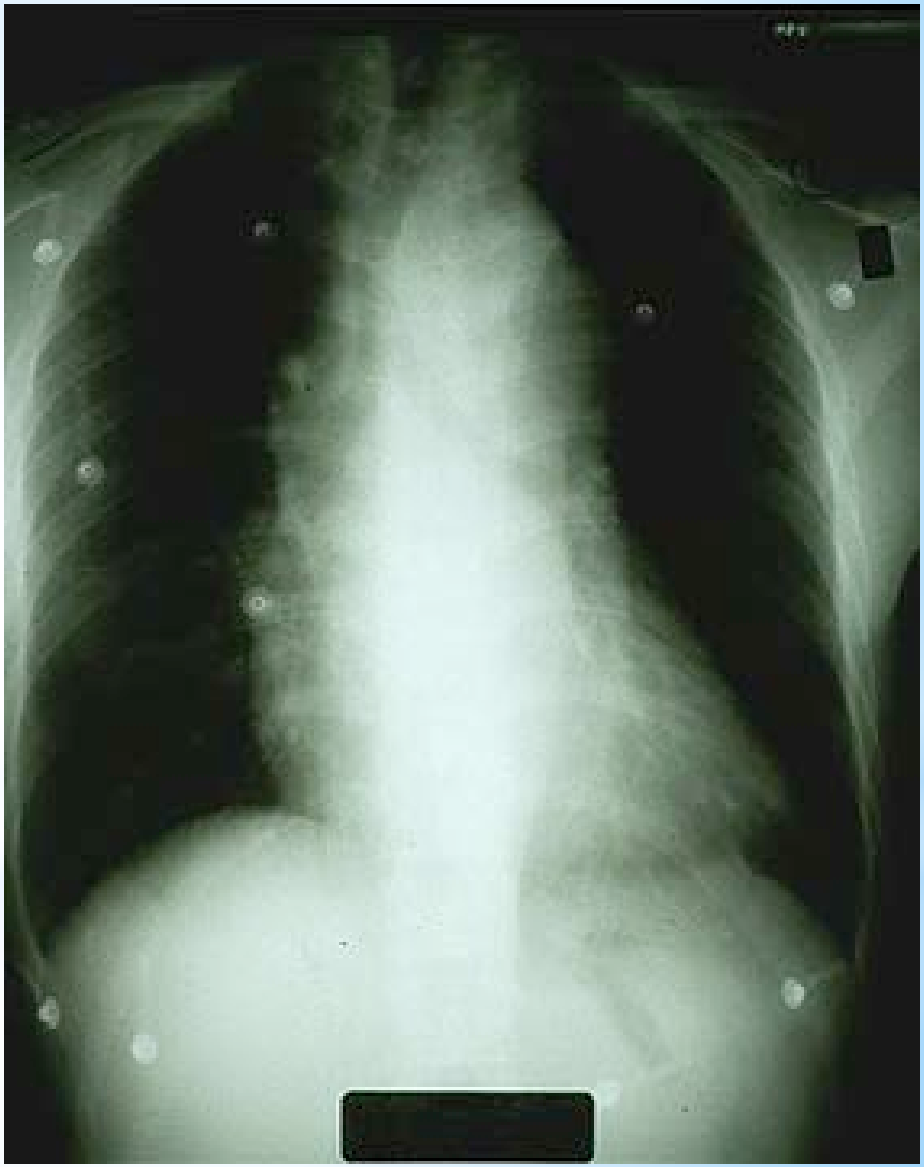


http://ect.downstate.edu/courseware/histopath_exercises/histocardiolcase4slide4.html
http://www.pathology.vcu.edu/education/dental2/lab6.html

*Tertiary Syphilis -Cardiovascular

*Calcification of ascending aorta from chronic inflammation of intima

***If coronaries involved, treatment has been associated with coronary thrombosis immediately post treatment! ?steroids**



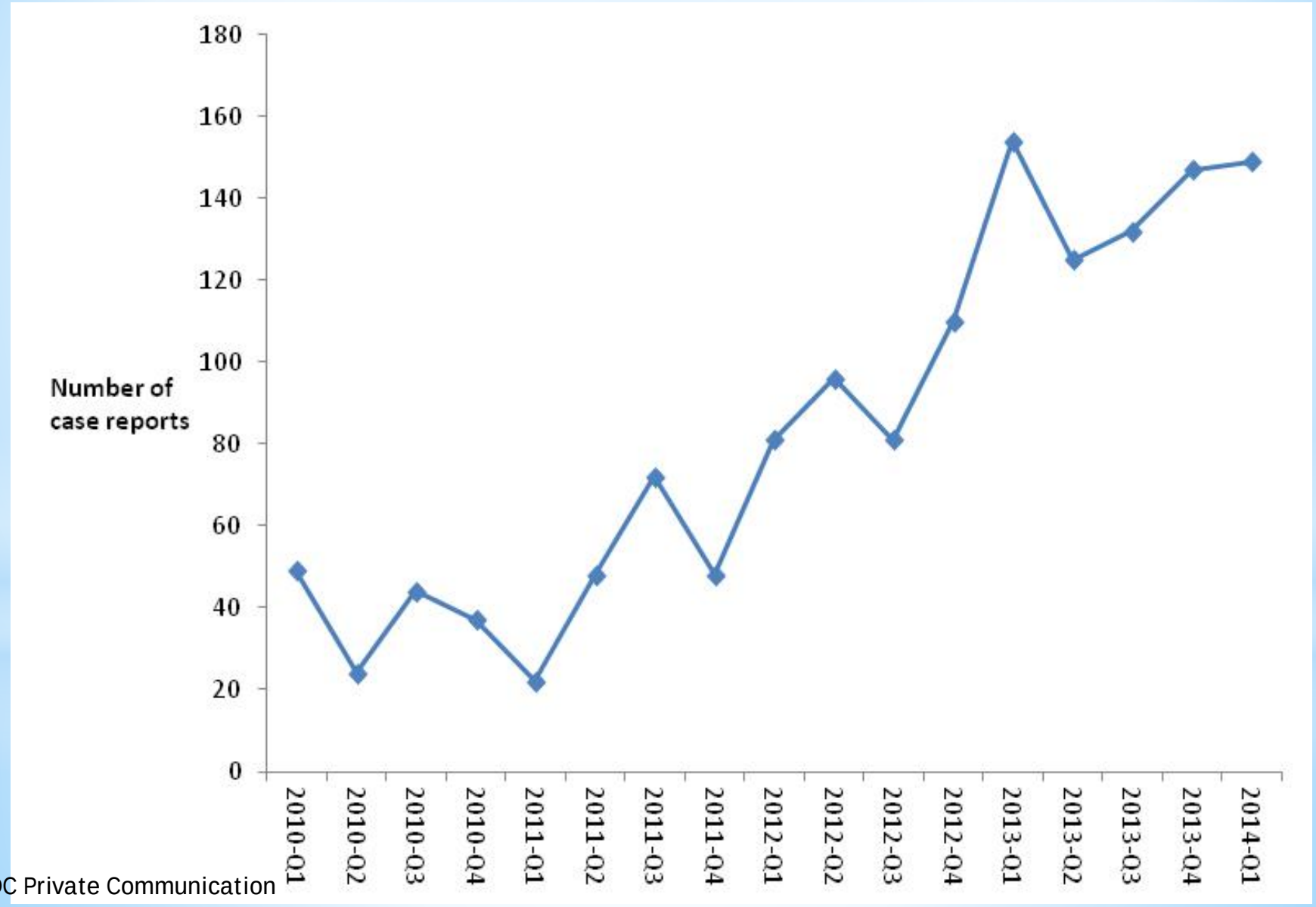
www.uptodate.com

*Syphilis

- *Early 1990's – almost non-existent
- *Increasing over last 15 years
- *2012: rate was 8/100,000, have almost doubled since then!

Source: Infectious Syphilis among gay, bisexual and other men who have sex with men in British Columbia, 2003 to 2012
Accessed from: http://www.bccdc.ca/NR/rdonlyres/B917A2F2-54C5-4691-8015-4F80538CAC1E/OCPS8015_Report_infections_Syphilis_MSMBC_20032012_20130624.pdf

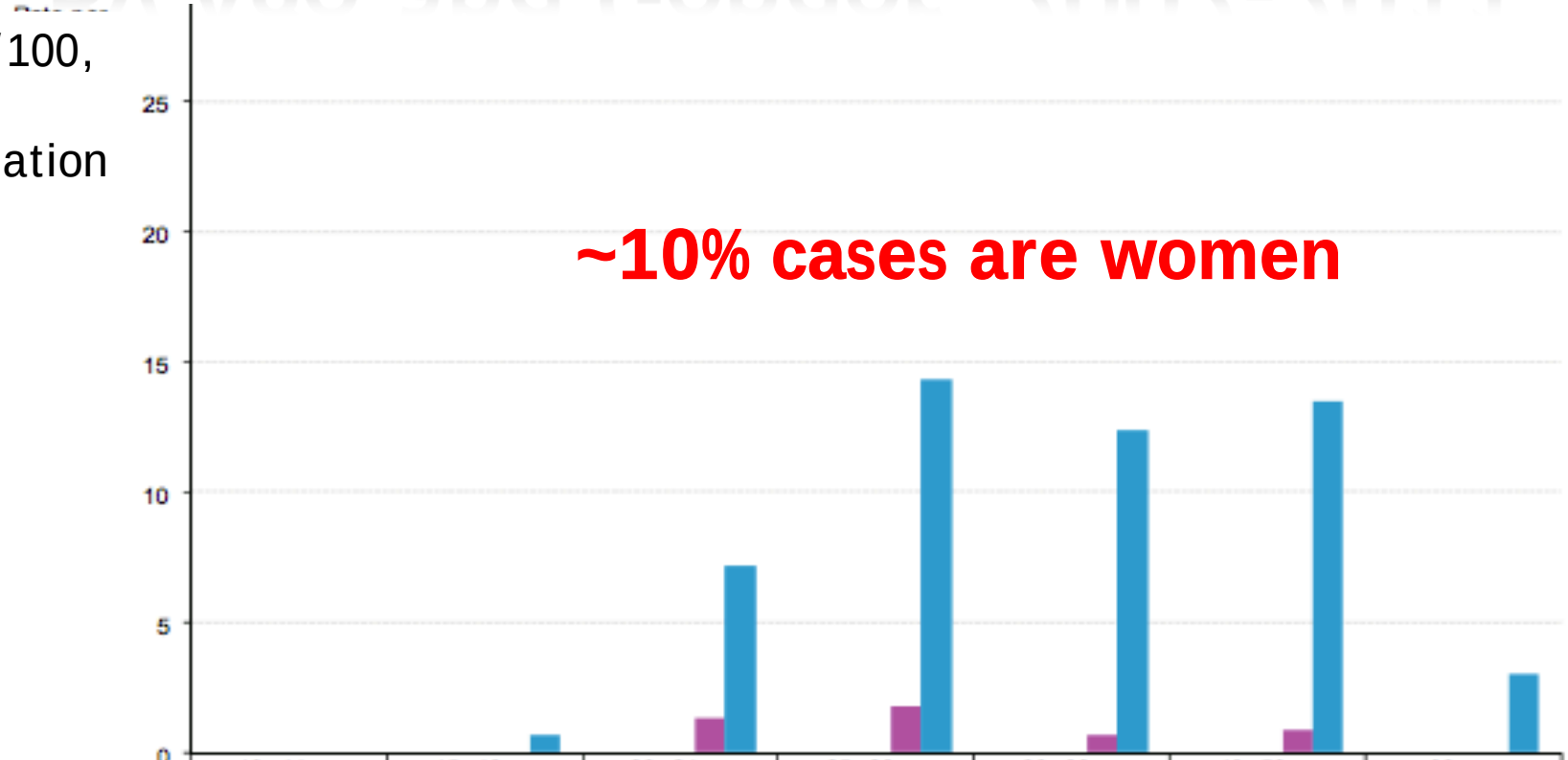
*Infectious syphilis in BC, 2010-2014 Q1



BCCDC Private Communication

*Infectious Syphilis Case Reports - By Age and Gender, 2002-2011

Rate/100,000 population

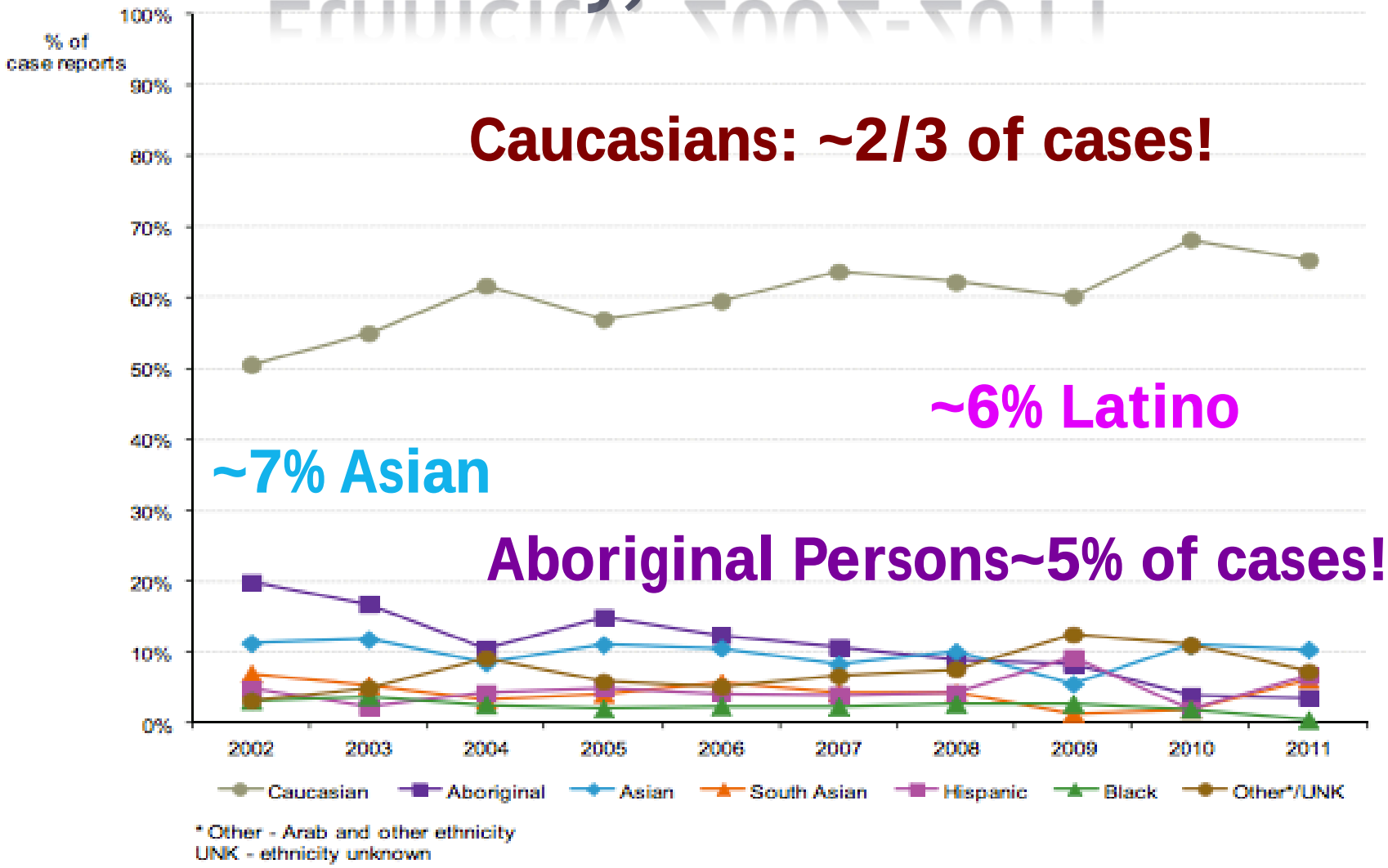


	10 - 14 yrs	15 - 19 yrs	20 - 24 yrs	25 - 29 yrs	30 - 39 yrs	40 - 59 yrs	60+ yrs
Reports - Female	0	0	2	3	2	6	0
Reports - Male	0	1	12	24	37	92	14
Reports - Other *	0	0	0	0	0	0	0
Rate - Female	0.0	0.0	1.3	1.8	0.7	0.9	0.0
Rate - Male	0.0	0.7	7.2	14.3	12.4	13.5	3.0

* Other - transgender and gender unknown

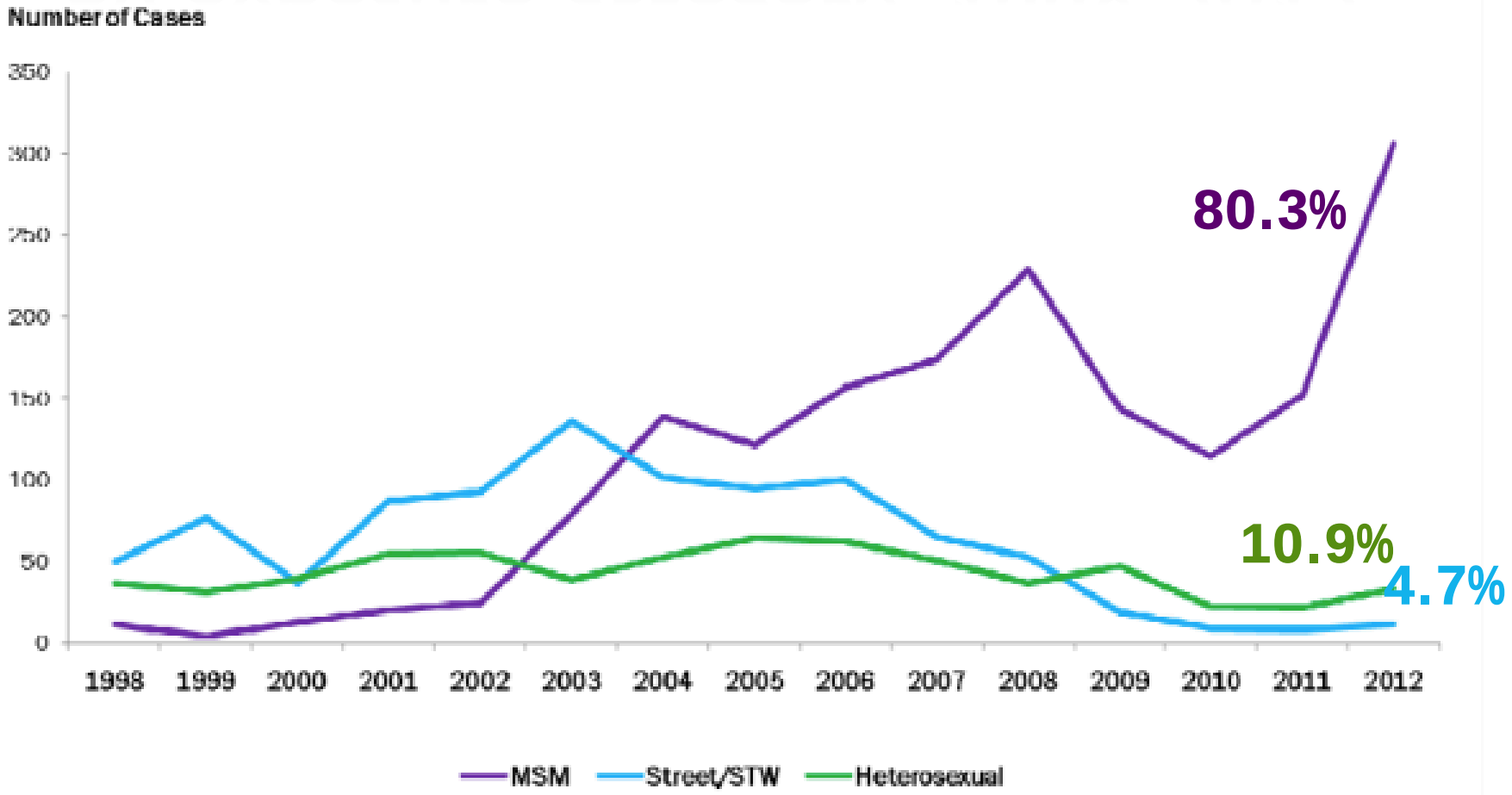
BC Centre for Disease Control. (2012). STI in British Columbia: Annual Surveillance Report 2011. Retrieved from http://www.bccdc.ca/util/about/annreport/default.htm

*Infectious Syphilis Cases By Ethnicity, 2002-2011



BC Centre for Disease Control. (2012). STI in British Columbia: Annual Surveillance Report 2011. Retrieved from http://www.bccdc.ca/util/about/annreport/default.htm

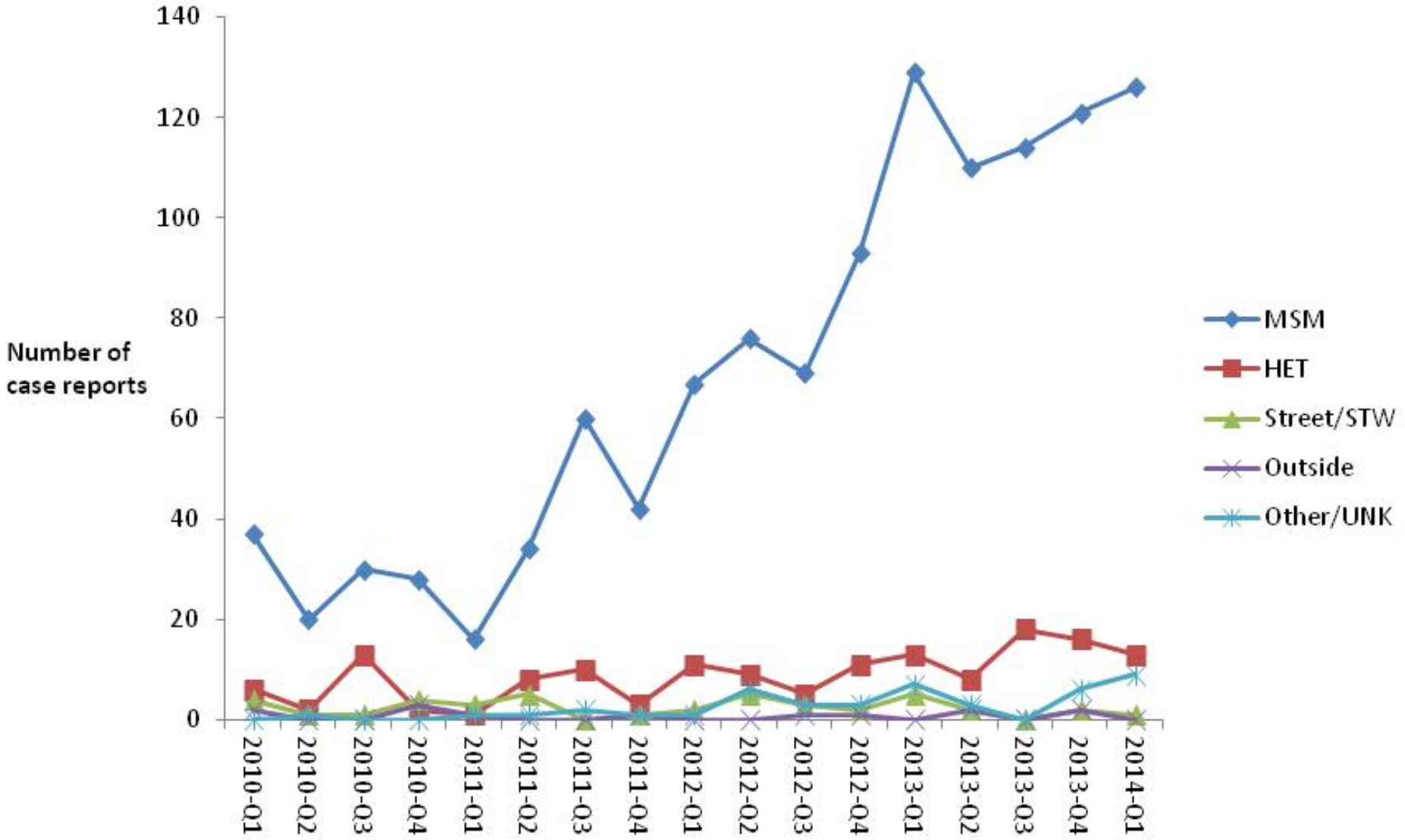
*Infectious Syphilis case reports in BC by exposure category, 1998-2012



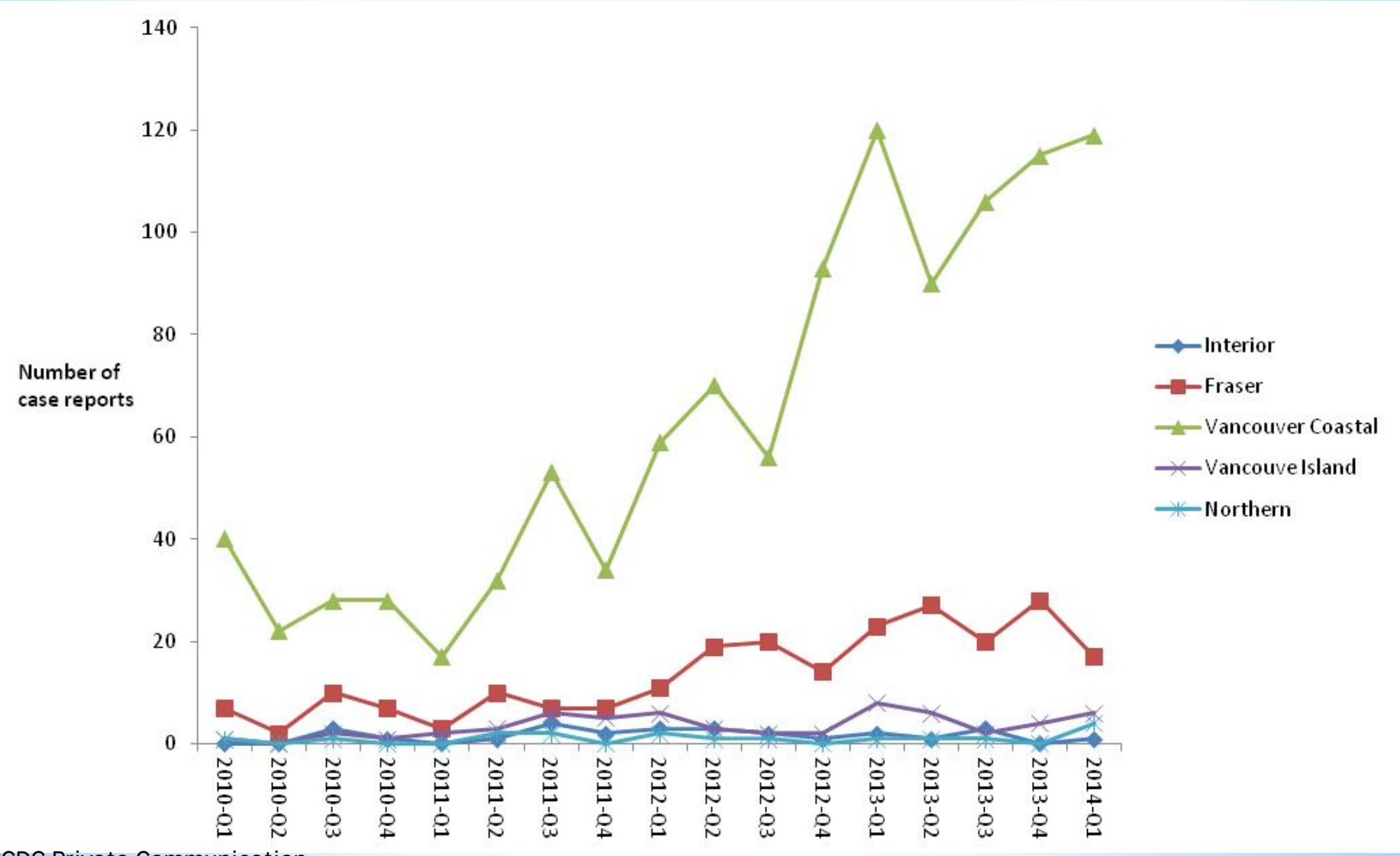
MSM: gay, bisexual, two-spirit, and other men who have sex with men. Street/STW: Includes sex trade workers, patrons of sex trade workers, individuals with housing insecurity (i.e. transient housing, homeless, no fixed address, living on the street).

Source: Infectious Syphilis among gay, bisexual and other men who have sex with men in British Columbia, 2003 to 2012
Accessed from: http://www.bccdc.ca/NR/rdonlyres/B917A2F2-54C5-4691-8015-4F80538CAC1E/OCPS8015_Report_infections_Syphilis_MSMBC_20032012_20130624.pdf

* Infectious syphilis by Exposure Category, 2010-2014 Q1



* Infectious syphilis by HA, 2010-2014 Q1



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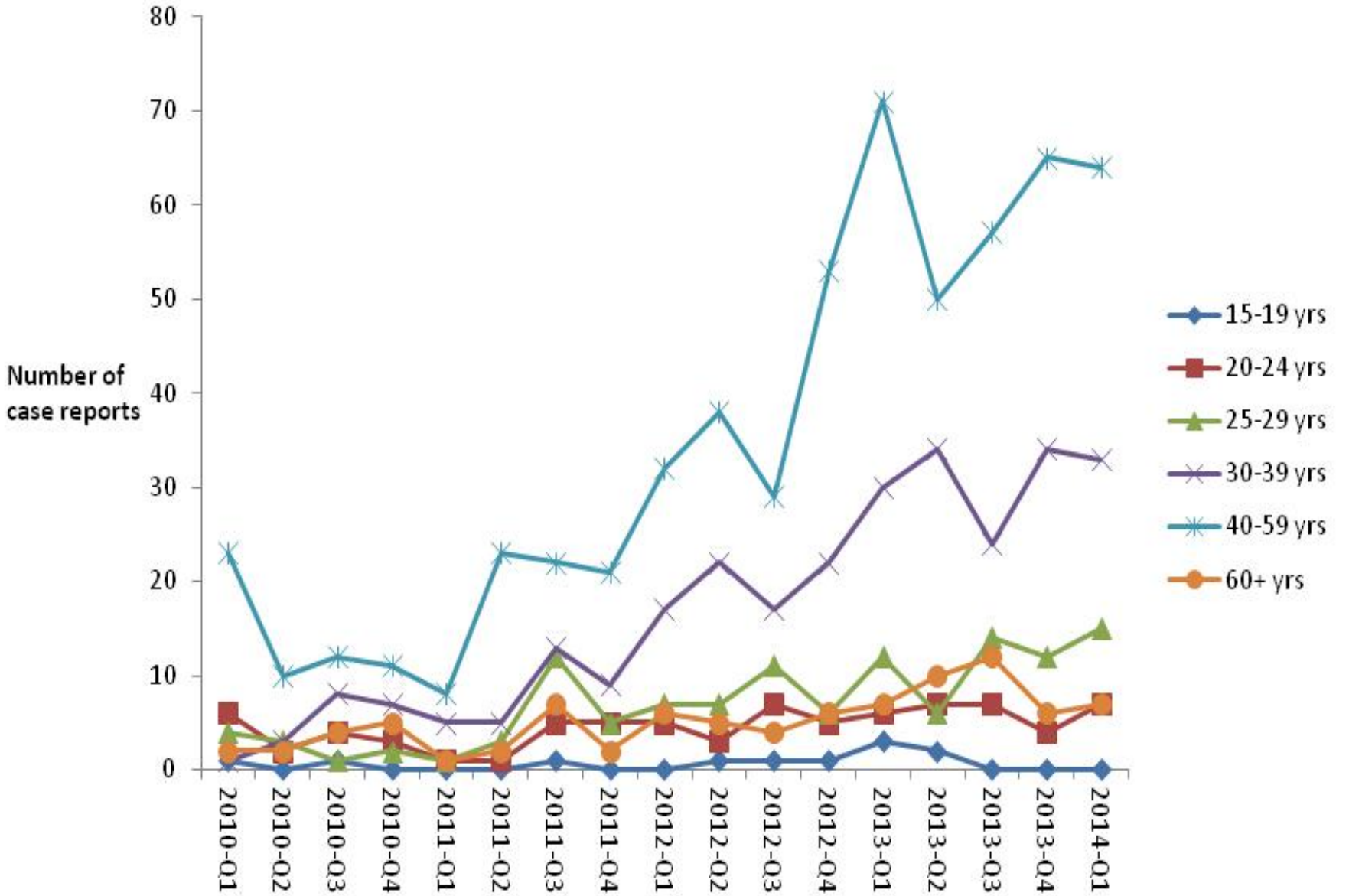
* Infectious syphilis among MSM by age, 2010-2014 Q1



BCCDC Private Communication

*Syphilis - 2013

Year	Primary	Secondary	Early Latent	TOTAL
2011				190
2012	74	65	232	371
2013*	84	104	221	409

2013*: From January 1-September 30, 2013

Tertiary Syphilis: 2 cases reported 2013

~150 more in last quarter 2013

Source: BC Centre for Disease Control, personal communication

*Syphilis

- *>2/3 in MSM population, 53.4% HIV+ (2011)
  - *Median age 41
  - *4% diagnosed with neurosyphilis
  - *15% had more than one diagnosis from 2002-2011
  - *HIV+ had a higher rate of re-diagnosis (21% vs. 7% in HIV-)
- *21% of identified partners tested were positive for syphilis.

Source: Infectious Syphilis among gay, bisexual and other men who have sex with men in British Columbia, 2003 to 2012
Accessed from: http://www.bccdc.ca/NR/rdonlyres/B917A2F2-54C5-4691-8015-4F80538CAC1E/OCPS8015_Report_infections_Syphilis_MSMBC_20032012_20130624.pdf

Syphilis Testing: Non-treponemal

RPR

- Rapid plasma reagin test
- Detects cardiolipin-lecithin-cholesterol antibodies

VDRL

- Venereal disease laboratory test
- Flourescent treponemal Antibody absorbance test
- Detects anti-cardiolipin antibodies

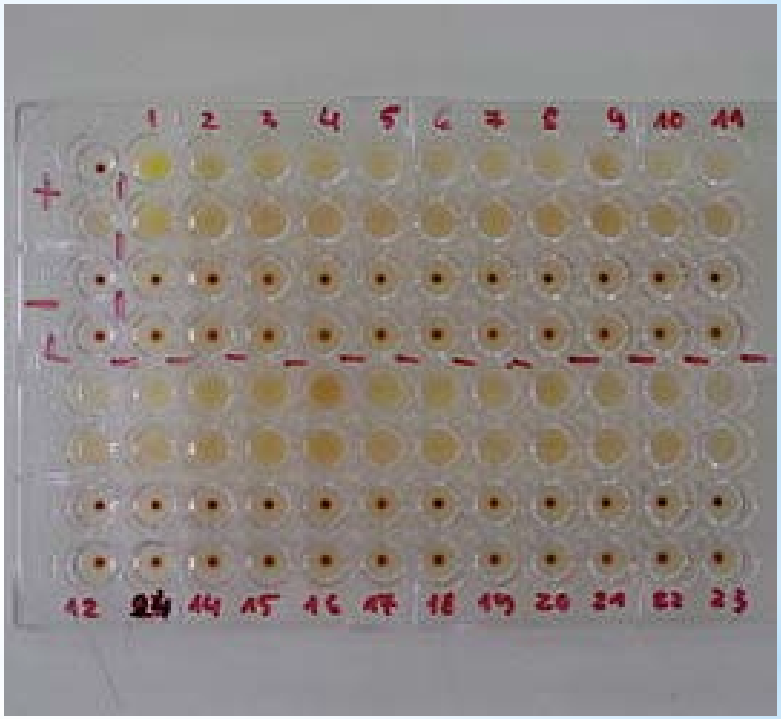
- Detect antibodies to intracellular markers released through cellular damage caused by spirochetes
- False positives: due to other infections, rheumatic disease
- False negatives: very early or **late infection (late latent or tertiary)**, prozone effect
- May use these to follow outcomes of treatment – fall over time

Source: Infectious Syphilis among gay, bisexual and other men who have sex with men in British Columbia, 2003 to 2012
Accessed from: http://www.bccdc.ca/NR/rdonlyres/B917A2F2-54C5-4691-8015-4F80538CAC1E/OCPS8015_Report_infections_Syphilis_MSMBC_20032012_20130624.pdf

Syphilis Testing: Treponemal tests

TPPA

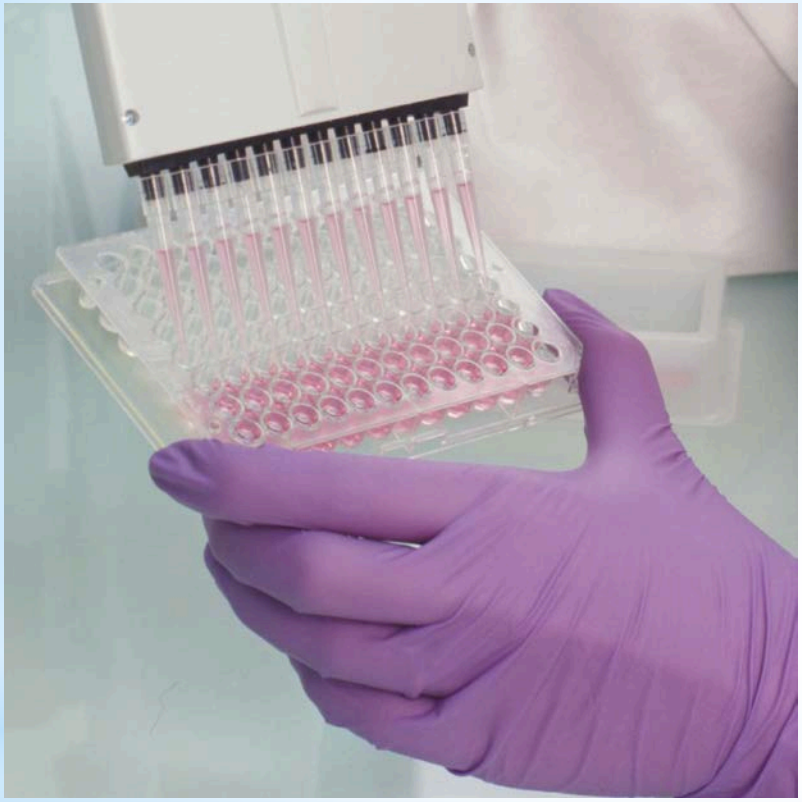
- Treponemal pallidum particle agglutination test
- Detects T. pallidum IgM and IgG antibodies
- **1° syphilis:** sensitivity 85-100%, specificity 98-100%
- **2° and latent:** sensitivity 98-100%



- Positive for life (can not use to follow treatment success)
- More specific than NON-treponemal tests

Source:http://en.wikipedia.org/wiki/Treponema_pallidum_particle_agglutination_assay

*Syphilis Testing: Treponemal tests



FTA-Abs

- *Flourescent treponemal Antibody absorbance test
- *Detects T. pallidum IgM and IgG antibodies

- *Positive for life (can not use to follow treatment success)
- *More specific than NON-treponemal tests

Source: http://udel.edu/~tfigurel/Treponemapallidum8.html

Syphilis -How to Test

- **Current:** RPR
  - If positive is automatically followed by a confirmatory direct treponemal test (TPPA and FTA-Abs)
  - If suspect very early infection – repeat in 2-4 weeks
  - If suspect late latent, or tertiary syphilis may test a direct treponemal test (but must ask specifically)

*New Test: Treponemal CLIA

- *Chemiluminescent immunoassay test.
- *Detects both IgM and IgG antibodies to syphilis infection.
- *High sensitivity and specificity of detection at all stages of disease (>99% for both).
- ***False negatives:** most likely to occur very early in infection.
- ***False positives:** most likely to occur in low risk populations.

http://en.vircell.com/uploads/tx_gtkvircell/VirClia_Kit_Web800x600_07.jpg

New Test: Treponemal CLIA

- If positive or indeterminate is automatically followed by additional testing: RPR then TPPA
- If TPPA negative will do TP-LIA test (line immunoassay).
- If LIA indeterminate, resample, clinical picture.
- Aim for roll-out: Mid-June!

- What do you order?
- **"Syphilis serology"**

CSF: Still order "VDRL"

Syphilis -Who to Test

- All those symptomatic with suspected syphilis
- **Contacts** of syphilis cases
- **Pregnant:** All pregnant women should be tested in first trimester. Retest those at high risk in 3rd trimester (28-32 weeks +/- at delivery).
- Any woman who delivers a hydropic or stillborn infant at >20 weeks gestation
- **Infants** of positive mothers
- **HIV+:** Test q3-4 months (esp. MSM)
- If negative test but high suspicion, repeat in 2-4 weeks
- All those with any other STI

  -where there is one…

* “When it comes to syphilis, suspect your grandmother.”

-Sir William Osler

*Contact Tracing

Syphilis Stage	Trace Back Period
Primary Syphilis	3 months*
Secondary Syphilis	6 months*
Early Latent	1 year*
Late Latent	Assess marital/other long term partners as appropriate, decision to test depends on estimated duration of infection
Congenital	Assess mother + her sexual partner
Stage Undetermined	Consult with BCCDC STI Physician

*If there was no partner during the trace back period or if all partners test negative, then trace back period should be extended to include the previous partner.

*Syphilis -Who to LP

	Who to LP	What is Positive
HIV+	Neurologic symptoms/signs Late latent or 3° syphilis RPR ≥ 1:32 dilutions CD4 ≤ 350 cells/µL Treated syphilis with <4 fold decline in RPR titre Some experts say **ALL**	CSF+ VDRL (sensitivity 30-50%, highly specific) *or* CSF WBC ≥20 cells/µL *or* CSF protein >0.45 *and* CSF FTS-ABS+ (highly sensitive, but non-specific)
HIV-	Neurologic symptoms/signs RPR ≥ 1:32 dilutions Congenital syphilis Tertiary syphilis Previously treated *but* fail to respond adequately	CSF+ VDRL *or* CSF WBC ≥6 cells/µL *or* CSF protein >0.45 *and* CSF FTS-ABS+

BC STI Treatment Guidelines:http://www.bccdc.ca/NR/rdonlyres/46AC4AC5-96CA-4063-A563-0BA9F4A0A6E9/0/STI_Quick_Reference_Guidelines_20090821.pdf
Canada STI Treatment Guidelines: http://www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-ldcits/section-5-10-eng.php

*Syphilis Treatment

Infection Stage	HIV-	HIV+	Penicillin Allergy
Primary, secondary, early latent (<1 yr)	Benzathine Penicillin G 2.4 mu IM x 1 (AII)		Doxycycline 100 mg BID x 14 days (BII) or Ceftriaxone 1 g IV or IM OD x 10 days (BII)
Late latent (>1 year or unknown), tertiary NOT involving the CNS	Benzathine Penicillin G 2.4 mu IM x 3 at weekly intervals (AII)		Doxycycline 100 mg BID x 28 days (BII) or Ceftriaxone 1 g IV or IM OD x 10 days (BII)
Neurosyphilis	Penicillin G 4 mu IV q4h x 14 days (AII)		Penicillin desensitization and Pen G!(AIII) Ceftriaxone 2 g IV/IM x 10-14 days (BII)

BC STI Treatment Guidelines:http://www.bccdc.ca/NR/rdonlyres/46AC4AC5-96CA-4063-A563-0BA9F4A0A6E9/0/STI_Quick_Reference_Guidelines_20090821.pdf Canada STI Treatment Guidelines: http://www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-ldcits/section-5-10-eng.php

*Other Advice…

- *Patients should abstain from sex for 14 days after starting penicillin or until completion of 14 days of doxycycline

- *Recommendations are for similar/same treatment of HIV+ individuals BUT failure rates are significantly higher if HIV+

Stage	%Serologic Failure: HIV+	%Serologic Failure: HIV-
Early syphilis	6.9-22%	~5%
Late syphilis	19-31%	~3-10%
Neurosyphilis	27-28%	~3-10%

Sexually Transmitted Infections 2011;87:9

*Post Therapy RPR and CSF Responses

Stage	RPR & LP Frequency	Successful Response	Plan if Non-Response
Primary, Secondary	RPR q3 mo (3,6,12 months)	≥ 4 fold ↓ @ 6-12 months	Benzathine penG 2.4 mu IM/wk x 3 (Check CSF, if normal, test for HIV)
Latent	RPR q6 months (6,12,24 months)	≥ 4 fold ↓ @ 12-24 months	Repeat CSF exam, retreat
Neurosyphilis	LP q6 months, RPR @6,12,24 months	WBC ↓ @ 6 months; CSF normal @ 2 yrs	Consider re-treatment

MMWR 2010;59(RR-12):26-40; Health Canada: STI Treatment Guidelines 2010

Jarisch-Herxheimer reaction

- Fever
- Chills
- Headache
- Myalgias
- Worsening rash
- Hypotension
- Occurs 2-24 hours post onset treatment for syphilis, and resolves in 24-48 hours
- Can be mistaken as allergic reaction
- Use antipyretics prn

*Case 1: Plan

- *Admitted to hospital
- *Started on doxycycline
- *Allergy Consult
- *LP (RPR>1:32!)
- *STI screen
- *Contact tracing
- *GI to see

http://std.sagepub.com/content/21/8/537/F5.large.jpg

*Case 1: Follow-up

- *CSF
- *Protein: 0.25
- *WBC: 1
- *VDRL: Negative

- *Liver enzymes/bili normalized with treatment
- *RPR declined to 1:16 as of Nov/2013.
- *Allergy testing done later

http://std.sagepub.com/content/21/8/537/F5.large.jpg

*Syphilis and Pregnancy

Case 2: Ms. JC

- 27 y.o. female, 10 weeks pregnant
- Routine pregnancy blood work January 10: RPR 1:8, confirmatory positive
- Negative RPR 2005 (previous pregnancy)
- Treated with Benzathine Penicillin G 2.4 mu IM x 3 at weekly intervals (Jan 21, 28, Feb 5)
- Partner tested negative

http://www.lifestylearena.com/wp-content/uploads/2012/12/First-trimester.jpg

*Case 2: Ms. JC

*RPR Feb 12th(1 week after 3rd dose): 1:128

*U/S: normal

*What is going on?

http://www.lifestylearena.com/wp-content/uploads/2012/12/First-trimester.jpg

*Case 2: Ms. JC

- *RPR March 24: 1:32
- *HIV negative
- *What now?
- *Patient likely had very early infection with Ab titres on the rise when initial RPR done.
- *Rapid repeat blood work likely caught this.
- *Now falling appropriately.
- *BUT…….

http://www.makingmine.com/baby-m-week-20/

Case 2: Ms. JC

- Ultrasound at 26 weeks:
- Placental thickening

- What now?

http://www.makingmine.com/baby-m-week-20/

*Perinatal Transmission

http://www.topnews.in/health/diseases/pregnancy

- *T. pallidum readily crosses the placenta, at any stage of gestation.
- *Frequency of transmission increases as gestation advances.
- *Severity of infection decreases with later infection
- *60-90% transmission if primary or secondary infection
- *40% if early latent infection
- *<10% if late latent infection
- *Not passed in breast milk

*Perinatal Transmission

*40% of untreated pregnancies result in pregnancy loss

*2/3 infants infected asymptomatic at birth

*Most show signs by 3 months

http://www.topnews.in/health/diseases/pregnancy

*Congenital Syphilis

- **Placenta and umbilical cord**
  - Large, thick, pale
  - Umbilical cord edematous, may look like "barber's pole", abscess-like foci of necrosis within Wharton's jelly centered around umbilical vessels
- **Hepatomegaly (almost all infected infants)**
  - If seen on fetal u/s may indicate failure of maternal treatment to prevent fetal infection
  - Jaundice, cholestasis, may worsen with Penicillin before improving

*Congenital Syphilis

- **Rhinitis (snuffles)**
  - Usually develops first week life, white nasal discharge +/- bloody
  - Severe, persistent (infectious by direct contact)
- **Generalized lymphadenopathy**
  - Esp. if epitrochlear
- **Cutaneous lesions**
  - 1-2 weeks after the rhinitis
  - Maculopapular rash (esp. back, buttocks, posterior thighs, soles)
  - Progresses, desquamates, crusts
  - If present at birth, rash may be widely disseminated and bullous (infectious, darkfield shows spirochetes)

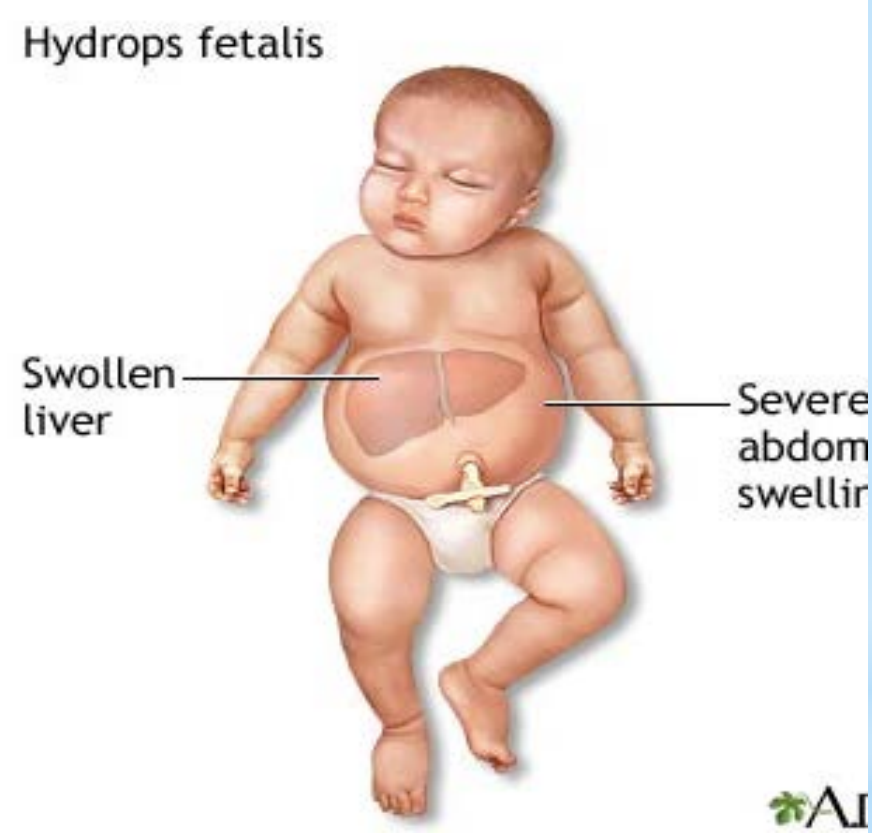
*Hydrops Fetalis

*Increased cardiac output

*Heart failure

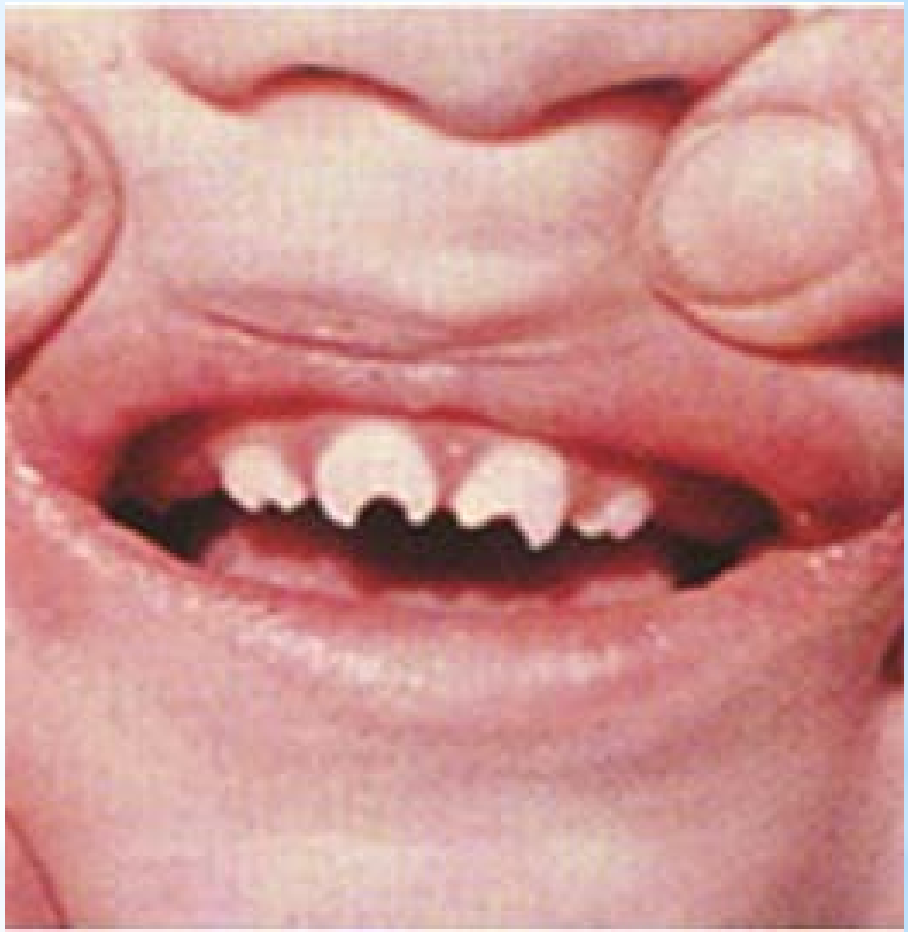
*Edema

  *Corresponds to severely swollen liver/abdomen



*Late Congenital Syphilis

Saddle nose
(from bridge of nose collapsing)



Hutchinson teeth
(notched teeth)

http://www.caribbeanmedstudent.com/2012/08/all-about-torch-infections/

*Congenital Syphilis: Late Findings

- *Saber shin

(anteriorly-curved tibia)

Source: http://tmcr.usuhs.mil/tmcr/chapter35/large35/35-09C.jpg

Case 2: Ms. JC

- Further ultrasounds show only placental thickening
- Maternal RPR: 1:8 at 38 weeks
- At birth, child's RPR 1:32

- What now?

http://www.sofeminine.co.uk/pregnancy/pregnancy-blog-week-40-d24423.html

Guidelines for the little ones

- **Infant Lumbar puncture and possible IV Pen G if….**
  - Infant RPR ≥4 fold maternal RPR (and treat IV)
  - Abnormal physical exam (and treat IV)
  - No or insufficient maternal treatment
  - Maternal treatment <4 weeks prior to delivery
  - Maternal relapse post treatment

- **Single dose Benzathine Pen G IM if….**
  - N exam, titre <4 fold maternal, adequate maternal treatment

*Syphilis Treatment

Infection Stage	HIV-	HIV+	Penicillin Allergy
Pregnancy	Primary/secondary/ early latent: 1 dose (BII), 2 doses (CIII)		No adequate data to suggest anything other than Penicillin acceptable, no doxy!
Congenital	If <1 month: Pen G 50,000 u/kg q12h x 7 days then q8h x 3 days (AII) If >1 month: Pen G 50,000 u/kg q6h x 10-14 days (AII) or if Normal CSF may have 3 IM doses (50,000 u/kg to max of 2.4 mu). All children born to mothers with infectious syphilis: 1 dose benzathine Pen G @ 50,000 u/kg (CIII) (i.e. adequate maternal tx, no concern regarding re-infection, infant has no clinical or lab evidence of infection)		

BC STI Treatment Guidelines:http://www.bccdc.ca/NR/rdonlyres/46AC4AC5-96CA-4063-A563-0BA9F4A0A6E9/0/STI_Quick_Reference_Guidelines_20090821.pdf Canada STI Treatment Guidelines: http://www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-ldcits/section-5-10-eng.php

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*References:

*BCCDC STI Guidelines

http://www.bccdc.ca/dis-cond/commanualCDManualChap5.htm

*Canadian STI Guidelines

http://www.phac-aspc.gc.ca/std-mts/sti-its/index-eng.php

* “He who knows syphilis knows medicine”

-Sir William Osler

Questions?