

BC Children's Hospital and  
BC Women's Hospital + Health Centre

# Congenital Syphilis-Its back!

Dr Chelsea Elwood MD MSc FRCSC  
Dr Laura Sauve MD MPH FRCPC



## Land Acknowledgement

*I respectfully acknowledge that the land I work and live on is the unceded territory of the Coast Salish peoples, including the territories of the Səlílwətaʔ/Selilwitulh (Tseil-Waututh), the xʷməθkwaʔəm (Musqueam) and Skwxwú7mesh (Squamish) Nations.*

*Those nations have cared for and nurtured the lands and waters around us for all time.*



## Disclosure

- The authors have no conflict of interest to disclose.
- LJS has research funding from PHAC, CIHR
- LJS is currently the Vice President of the Canadian Pediatric Society



### CONGENITAL SYPHILIS Addressing a public health crisis

Since 2018, congenital syphilis has undergone a resurgence in Canada.

Rates rose from 4.6 cases per 100,000 live births in 2018 to 13.4 in 2020.



#### Risk factors for syphilis in pregnancy

- A lack of or inadequate prenatal care
- Multiple sexual partners
- Inadequate or no treatment of prior syphilis infection
- Other sexually transmitted and bloodborne infections
- Methamphetamine or other substance use



#### Evaluating infant risk

- Are there maternal risk factors? Are maternal test results available?
- If maternal syphilis is diagnosed, determine treatment adequacy. If concerned about risk, retest mother and compare to infant's test.
- Examine infant for signs of congenital syphilis. Key signs include neonatal sepsis, rash, hepatosplenomegaly and anemia/thrombocytopenia, but any organ system can be affected.

#### And remember:

- At birth, 50% to 90% of newborns are asymptomatic.
- Signs of disease may take months to manifest.
- Symptoms can be broad and mimic other conditions, making diagnosis challenging.
- If untreated, sequelae may take years to develop.

#### Key takeaways:

- #1. No infant should be discharged home without documenting maternal syphilis status, treatment as required, or a plan to test the mother or baby with secure follow-up.
- #2. Every newborn, regardless of risk should have a physical examination looking for signs of congenital syphilis.



Learn more at [www.cps.ca](http://www.cps.ca)

HOME / CLINICAL PRACTICE / POSITION STATEMENTS AND... / DIAGNOSIS AND MANAGEMENT...

### POSITION STATEMENT

816  
Shares



## Diagnosis and management of congenital syphilis – Avoiding missed opportunities



Posted: Mar 28, 2024

The Canadian Paediatric Society gives permission to print single copies of this document from our website. For permission to reprint or reproduce multiple copies, please see our [copyright policy](#).

### Principal author(s)

Sergio Fanella MD, Ari Bitnun MD, Michelle Barton MD, Laura Sauve MD; Canadian Paediatric Society, [Infectious Diseases and Immunization Committee](#)



## Key Objectives

- Be able to interpret syphilis diagnostics in pregnancy – and understand the resources that can help with that interpretation
- Identify which infants need a full workup and treatment
- Understand the follow up implications



## Case: Mother

- 32 yo multipara from a rural area of BC
- substance use prior to pregnancy, stable relationship since diagnosis of pregnancy
- First trimester screening – Syphilis EIA negative
- 9w2d Dating USS – normal
- 18w: Illness with fever, diffuse rash (including palms and soles).
- Workup
  - Throat culture: No group A strep identified
  - Heterophile ab neg for mononucleosis, EBV IgG reactive
- USS 28w2d to assess for LLP detected FL < 10th centile (prev 70th centile at 20 week USS)
- Presented in spontaneous preterm labour at 31w2d- underwent emergency c/s for delivery due to breech presentation



## Case: Baby


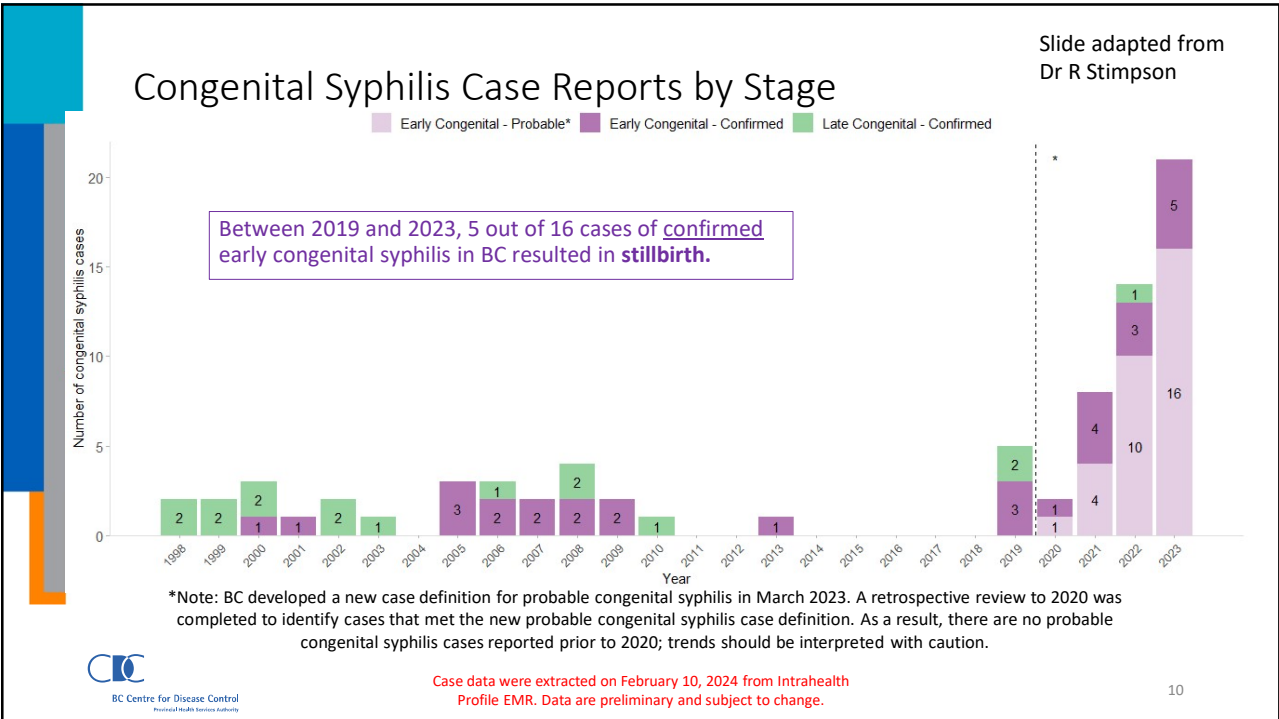
- Baby born with respiratory distress and low apgars
- 12H required intubation and ventilation, anemic
- Progressive worsening hyperbilirubinemia, thrombocytopenia and anemia
- Hepatosplenomegaly
- Desquamation, especially extremities
- T/f to BCCH 1 day of life-> blood transfusion, 2x exchange transfusion



Marked generalized desquamation.



# On day of life 4....

- RPR 1:512

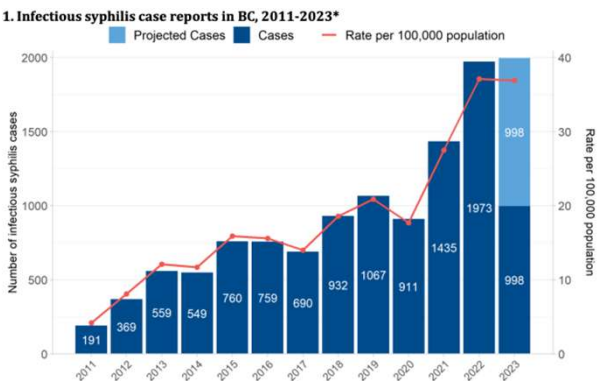
# Syphilis in Pregnancy

Dr Chelsea Elwood


# Syphilis in BC

## 1. Infectious syphilis case reports in BC, 2011-2023\*



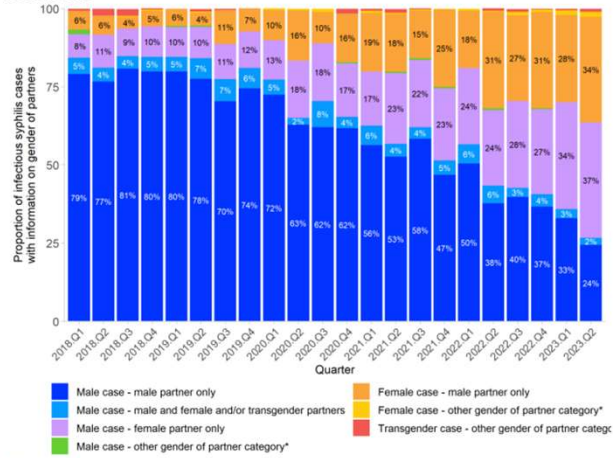
Year	Cases	Rate per 100,000 population
2011	191	~8
2012	369	~12
2013	559	~15
2014	549	~14
2015	760	~18
2016	759	~18
2017	690	~16
2018	932	~20
2019	1067	~22
2020	911	~19
2021	1435	~28
2022	1973	~38
2023*	998	~38

\*Projected case counts/rates assume that the average number of reported cases per month year to date (YTD) will remain constant throughout 2023. See technical appendix (calculations) for more details.  
 Note: 2018 to 2023 case counts are subject to change. Infectious syphilis case reports exclude congenital syphilis cases.



# Syphilis in BC

14. Proportion of infectious syphilis case reports by gender of sexual partner and by quarter, 2018 to 2023



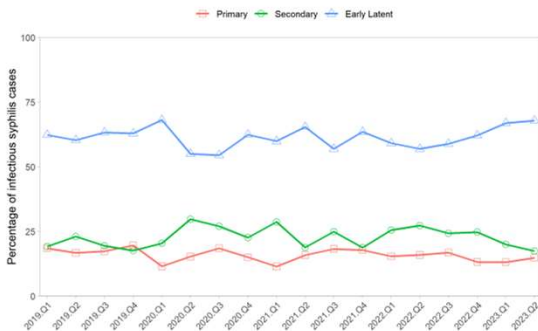
Note: Gender of sexual partner is based on the "gender of sexual partners" variable values collected in Intrahealth Profile EMR which is structured as male, female, transgender and unknown. Data shown reflect male, female, and transgender responses only.



# Syphilis in BC

## Infectious Syphilis in by Stage of Infection

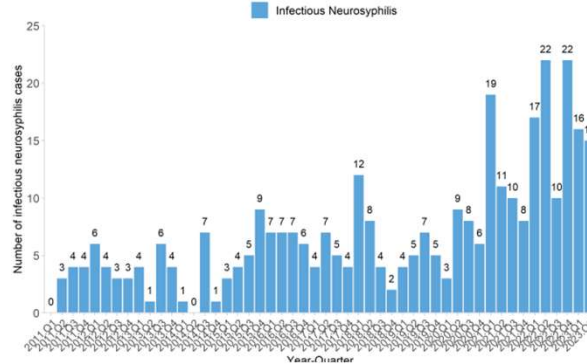
16. Proportion of infectious syphilis case reports in BC by stage of infection and by quarter



Note: Early Latent cases include both Early Latent and Early Latent Probable Stages

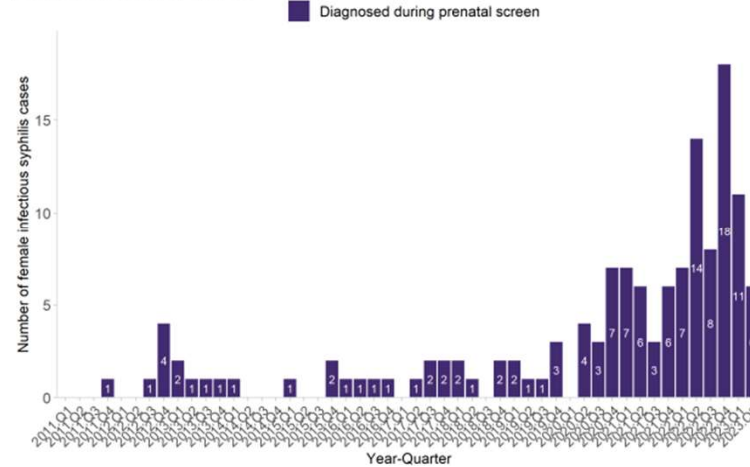
## Infectious Neurosyphilis

17. Infectious neurosyphilis case reports in BC by quarter



### Infectious Syphilis Diagnosed During Prenatal Screening

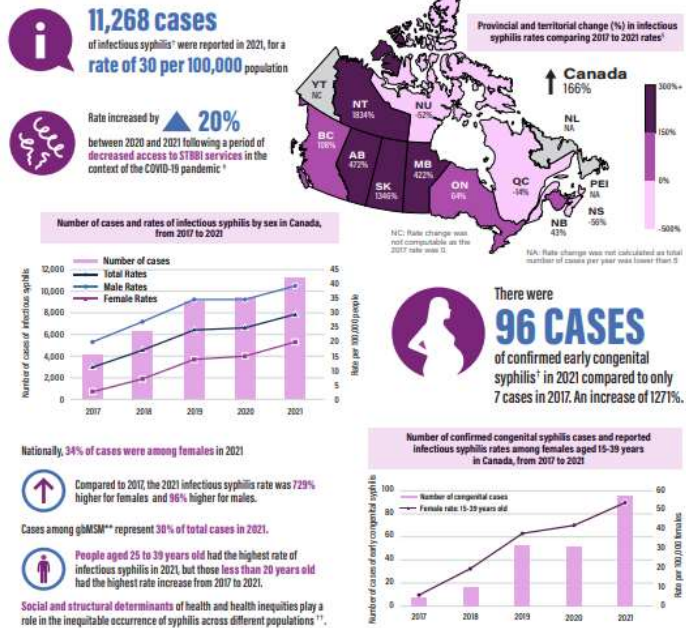
22. Infectious syphilis case reports in BC among females 15-49 years diagnosed during prenatal screening by quarter



Note: Includes maternal infectious syphilis cases aged 15-49 years from STI-IS (cases prior to March 13, 2018) and female infectious syphilis cases aged 15-49 years who were indicated as being pregnant at their time of diagnosis in Intrahealth Profile EMR (cases from March 13, 2018 onwards).



### Congenital syphilis in Canada

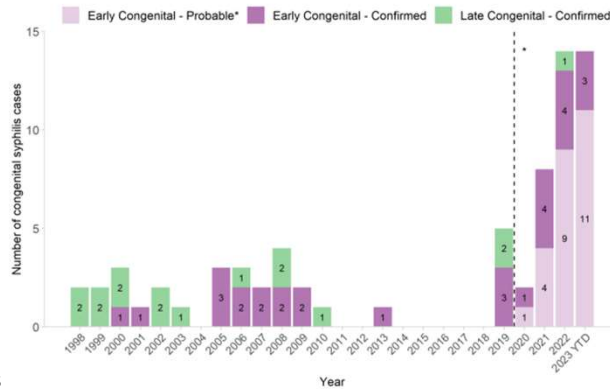


\* Data were obtained directly from provinces and territories (PTs). Some PTs submitted data for the full calendar year of 2021. Two PTs (PE and NL) did not provide any data and two PTs (NB and NS) provided partial coverage; annual counts were submitted. Data for 2021 are preliminary.  
 † Infectious syphilis includes the primary, secondary and early latent (less than one year after infectious stages of infection, during which syphilis is transmissible). Early congenital syphilis is defined as a laboratory confirmation of infection with Treponema pallidum occurring within the first 2 years of birth. Case definitions for diseases under national surveillance. Can Comm Dis Rep 2005;31(5). Retrieved July 2022, from https://www.canada.ca/en/public-health/services/diseases/syphilis/health-professionals/national-case-definition.html



## Congenital Syphilis

From 2019 – present, there have been at least 5 fatal cases (either stillbirth or death in the first 7 days of life)



YTD = January to June 2023

\*BC developed a new case definition for probable congenital syphilis in March 2023. A retrospective review to 2020 was completed to identify cases that met the new probable congenital syphilis case definition. As a result, there are no probable congenital syphilis cases reported prior to 2020; trends should be interpreted with caution.

From BCCDC Q2 Syphilis report

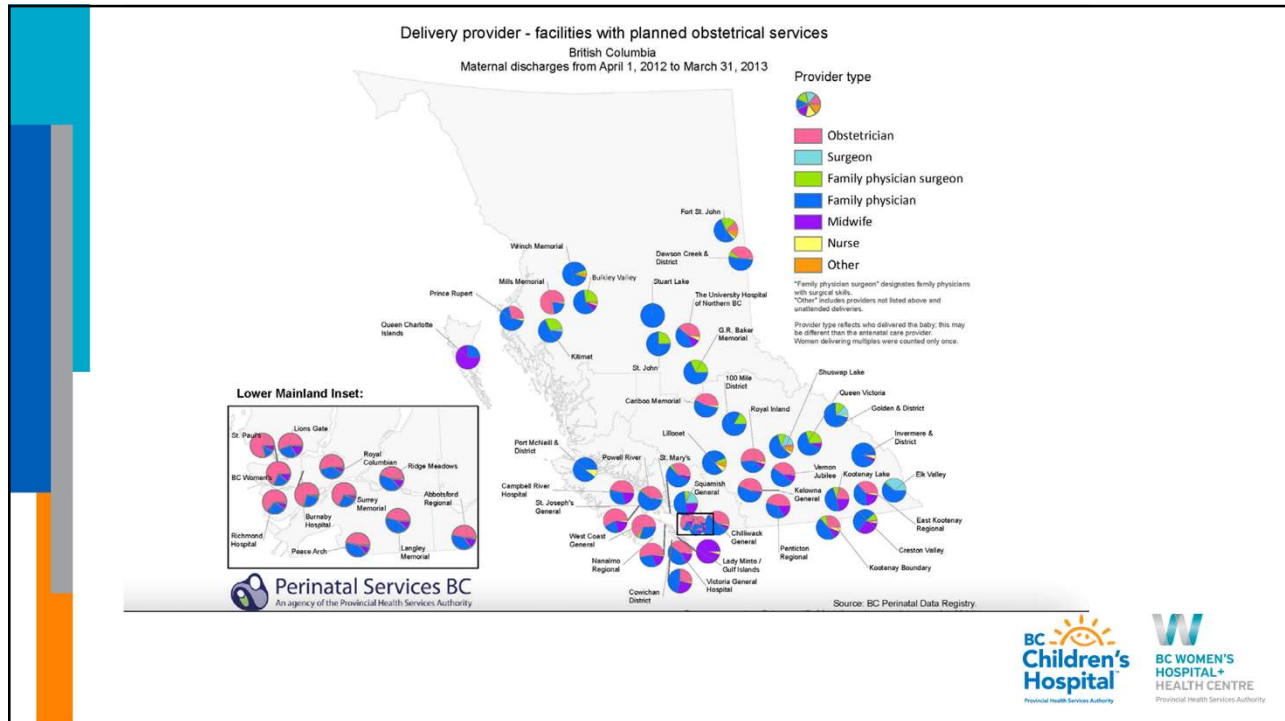
[http://www.bccdc.ca/resource-gallery/Documents/Statistics%20and%20Research/Statistics%20and%20Reports/STI/Syphilis\\_indicators\\_2023Q2.pdf](http://www.bccdc.ca/resource-gallery/Documents/Statistics%20and%20Research/Statistics%20and%20Reports/STI/Syphilis_indicators_2023Q2.pdf)



## 2019 Delivery Screen for all Patients Recommended in BC

- Risk factors for a diagnosis of syphilis in pregnancy
  - Limited or no prenatal care
- 19 cases of maternal syphilis
  - 8 had a previous negative test
  - 11 had no other testing





## Syphilis

A. Primary

B. Secondary

C. Early latent

D. Late latent

60-90%

40%

10%

Most babies with congenital syphilis are asymptomatic at birth – so a lack of symptoms at birth is not reassuring

Risk of congenital infection and sequelae 1% if adequately treat mother

BC Children's Hospital  
Provincial Health Services Authority

BC WOMEN'S HOSPITAL+  
HEALTH CENTRE  
Provincial Health Services Authority

## Syphilis in Pregnancy

- Spontaneous abortion
- Stillbirth (21%)
- Nonimmune hydrops
- Preterm birth (6%)
- Perinatal death (9%)
- Congenital syphilis (16%)

[PLoS One](#), 2019; 14(2): e0211720.

Published online 2019 Feb 27. doi: [10.1371/journal.pone.0211720](https://doi.org/10.1371/journal.pone.0211720)

PMCID: PMC6392238

PMID: [30811406](https://pubmed.ncbi.nlm.nih.gov/30811406/)

Global burden of maternal and congenital syphilis and associated adverse birth outcomes—Estimates for 2016 and progress since 2012



## Treatment in Pregnancy

- **Pregnant** women should be treated with the penicillin regimen appropriate for their stage of infection.
- Pregnant women who have a history of penicillin allergy should be desensitized and treated with penicillin.
- Penicillin G long-acting and is present for 2-4 weeks after injection in detectable levels in serum



## Treatment follow up

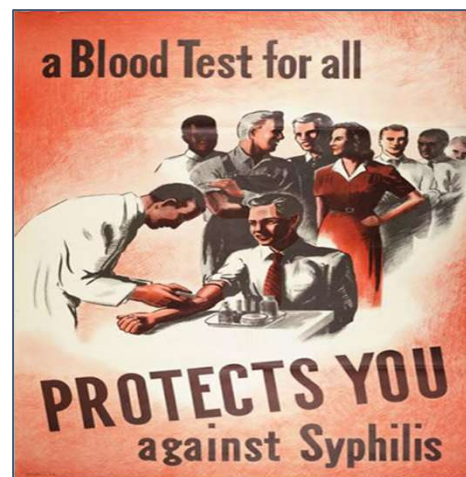
- Successful Treatment 4 fold decrease in RPR/VDRL titer over 3-6mths
- If the decline is slower, consider reinfection with syphilis
- Non-treponemal tests may revert to negative or remain “serofast”
- Treponemal Specific tests will remain positive and are thus not useful in monitoring treatment or for diagnosing reinfection

Cohen, S. E., Klausner, J. D 2013, Mattei, P. L2013



## Syphilis Serology

- *Treponema pallidum* enzyme immunoassay (TP EIA)
- Rapid Plasma Reagin (RPR)
- *Treponema pallidum* Particle Agglutination (TPPA)



# Congenital syphilis manifestations

## Before / At birth

- stillbirth, hydrops fetalis, IUGR, preterm birth (or may be asymptomatic at birth).

## Neonatal

- hepatosplenomegaly; snuffles (copious nasal secretions); lymphadenopathy; mucocutaneous lesions; pneumonia; osteochondritis, periostitis, and pseudoparalysis; edema; rash (maculopapular consisting of small dark red-copper spots that is most severe on the hands and feet); hemolytic anemia; or thrombocytopenia at birth or within the first 4 to 8 weeks of age.

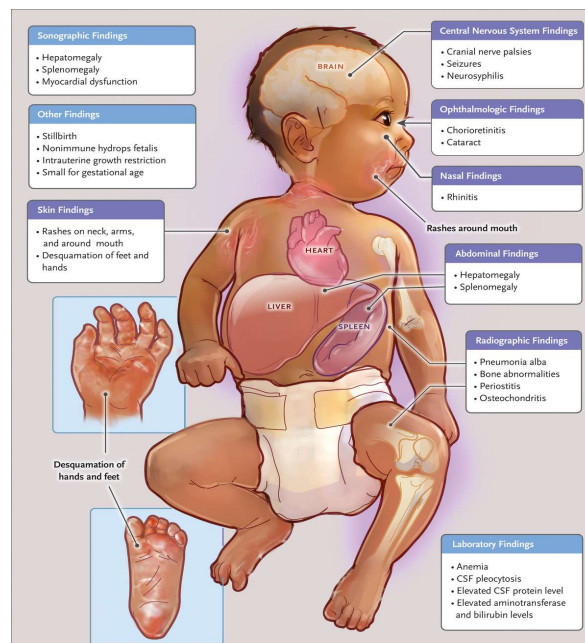
## Late (infancy / childhood)

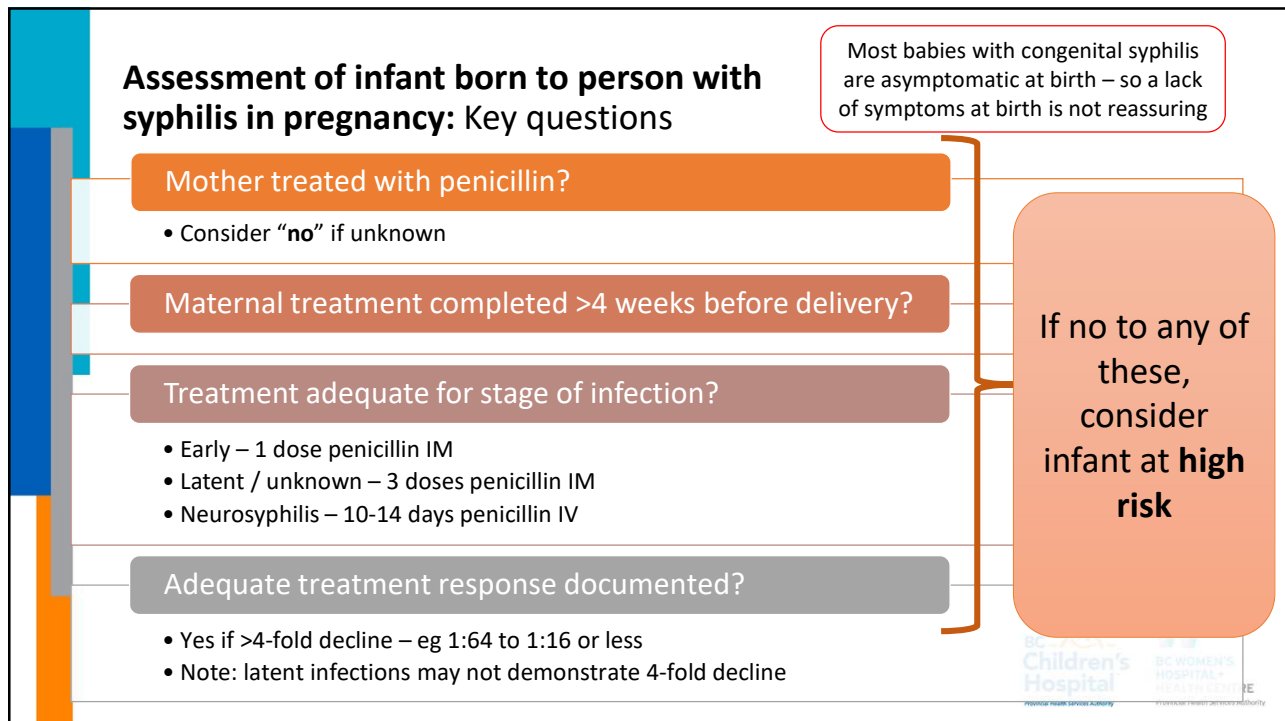
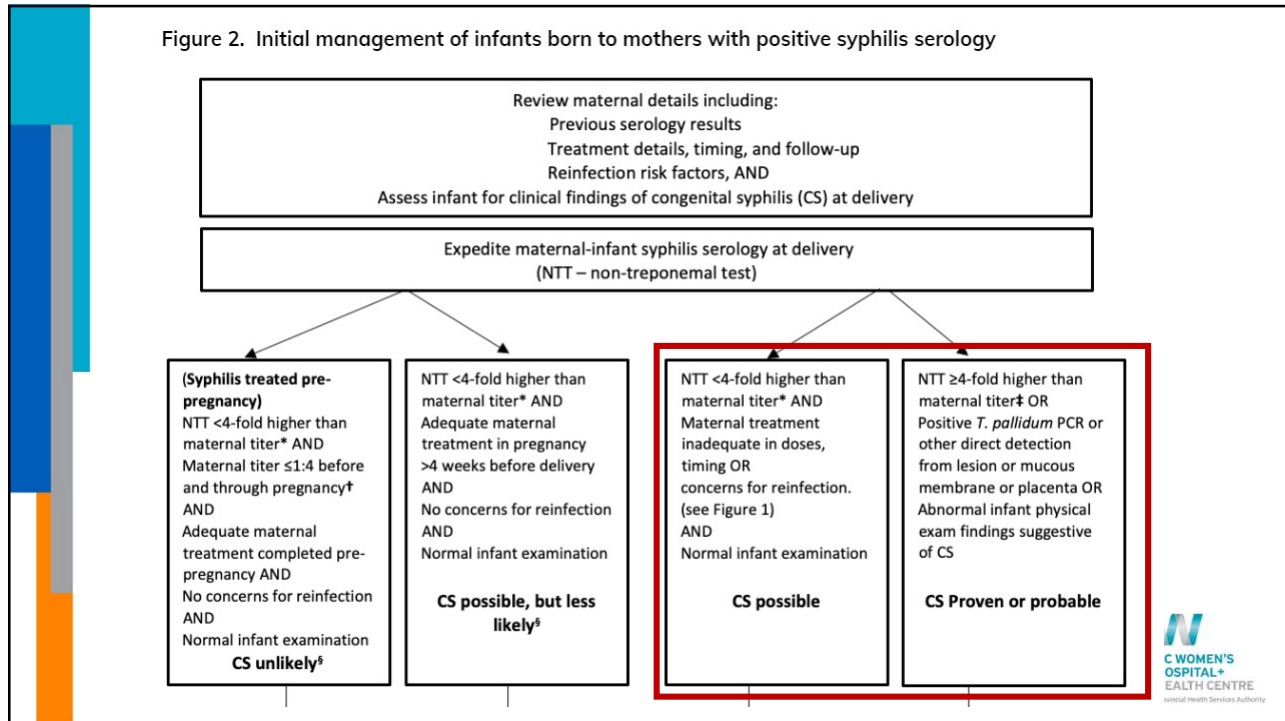
- Involve the central nervous system (CNS), bones and joints, teeth, eyes, and skin.
- Includes... interstitial keratitis, eighth cranial nerve deafness, Hutchinson teeth (peg-shaped, notched central incisors), anterior bowing of the shins, frontal bossing, mulberry molars, saddle nose, rhagades (perioral fissures), and Clutton joints (symmetric, painless swelling of the knees).

<https://www.cps.ca/en/documents/position/congenital-syphilis>

Red Book, Syphilis chapter

## Clinical Signs of Early Congenital Syphilis





## Assessment of infant born to person with syphilis in pregnancy

- Key questions - If **no** to any of the key questions – consider the infant at **high risk**
- Also high risk if:
  - Maternal reinfection or re-exposure without adequate treatment
  - Ultrasound consistent with congenital syphilis
  - Clinical concerns / features at delivery

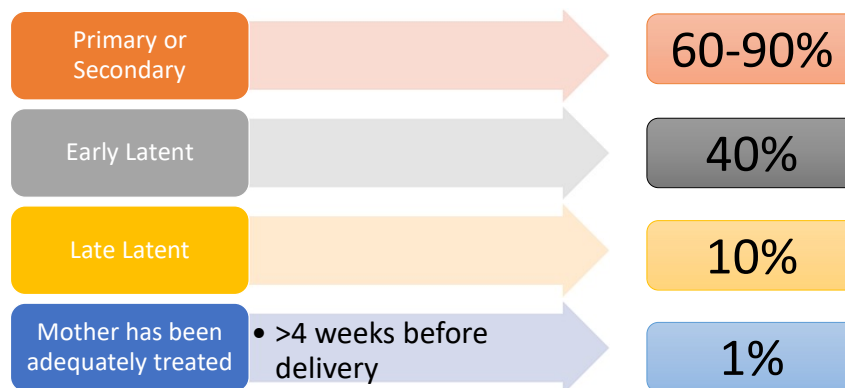
Most babies with congenital syphilis are asymptomatic at birth – so a lack of symptoms at birth is not reassuring

<https://www.cps.ca/en/documents/position/congenital-syphilis>  
Red Book, Syphilis chapter



## *A note on staging...*

Be skeptical of what is written in the chart about staging. Call BCCDC for help!



## Work up for infants at moderate – high risk

- Recommended for all:
  - Serology in mom (if possible) & baby
  - Complete Blood Count (CBC) with differential and platelets
  - Liver function tests (e.g ALT, AST; others as clinically indicated)
  - CSF for cell count, differential, glucose, protein, and syphilis NTT serology
  - Long-bone radiographs (e.g., bilateral femur and tibia/fibula)
  - Audiology (auditory brain stem response)
  - Ophthalmologic Assessment - Ocular syphilis can occur at any stage - more common in infants with neurosyphilis.
- Additional Investigations (Based on Clinical Indication and Availability):
  - Neuroimaging / ultrasound for organomegaly
  - Nasopharyngeal swab and swabs of any mucosal or skin lesions for T. pallidum PCR
  - Pathologic examination (+/- T. pallidum PCR) of the placenta for women with concerns for active infection at birth
- Don't forget - There is a window period, so if baby appears to have congenital syphilis even if 1<sup>st</sup> trimester screening negative, do the full work up.



## Neonatal Serology at Delivery

Slide adapted from  
Dr R Stimpson

- RPR only on baby (**NOT CORD BLOOD**)
- TP EIA- will be positive if mother is positive and generally uses up all the blood
- TPPA- will be done after RPR as a confirmatory test (again if mother's TPPA is reactive baby will also be reactive due to passive transfer of maternal antibodies)



Slide adapted from  
Dr R Stimpson

# Syphilis PCR

- Can be obtained from nasal secretions, visible lesions, rashes, umbilical cord, placenta

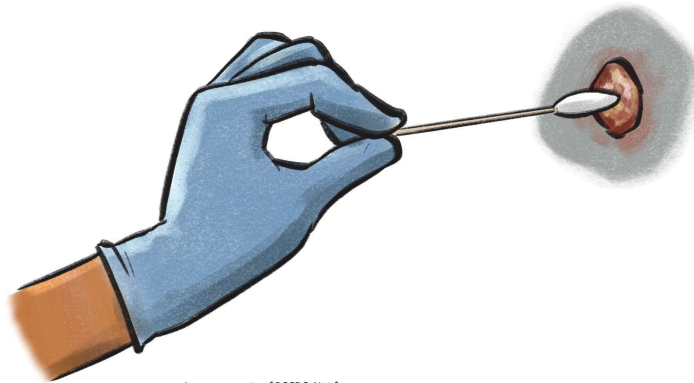


Image property of BCCDC. Not for re-use



**Public Health Laboratory**  
BC Centre for Disease Control  
465 West 12th Avenue, Vancouver, BC V5Z 4R4  
www.bccdc.ca/publichealthlab

**Zoonotic Diseases & Emerging Pathogens Requisition**

Section 1 - Patient/Provider Information (Two matching unique patient identifiers on sample container and requisition are required for sample processing)

PERSONAL HEALTH NUMBER (if available, include Health Services Authority)	ORDERING PRACTITIONER (Name, Address, Report Referral)	DATE RECEIVED
PATIENT SURNAME	Address of report facility	LABORATORY USE ONLY
PATIENT FIRST AND MIDDLE NAME	<input type="checkbox"/> Adult inpatient sample of Burgepost <input type="checkbox"/> Test in patient	SAMPLE NO. (ML)
DOB (YYMMDD)	ADDITIONAL CODES TO PRACTITIONER / CLINIC (Name, Address, NCP#, PHN, Clinic Code, Specialty of 3 codes available)	DATE COLLECTED (YYMMDD)
PATIENT ADDRESS	OUTBREAK ID	TIME COLLECTED (HH:MM)
CITY		
PROVINCE	POSTAL CODE	

Section 2 - Tests Requested

<b>VIRUSES</b> <input type="checkbox"/> Chikungunya Virus Antibody <input type="checkbox"/> Dengue Virus Antibody <input type="checkbox"/> Herpes Virus Antibody* (Herpes simplex cases consultation required) <input type="checkbox"/> West Nile Virus Antibody <input type="checkbox"/> Zika Virus Antibody and PCR (Submit 1 grid top and 1 EDTA blood tube) <input type="checkbox"/> Other, specify _____	<b>BACTERIA</b> <input type="checkbox"/> Anaplasma Antibody <input type="checkbox"/> Anisoplasma (D) IGD <input type="checkbox"/> Bartonella Antibody <input type="checkbox"/> Borrelia burgdorferi ( Lyme disease) Antibody <input type="checkbox"/> Borrelia hensel Antibody <input type="checkbox"/> Brucella abortus Antibody <input type="checkbox"/> Coxiella burnetii (Q fever) Antibody <input type="checkbox"/> Francisella tularensis Antibody <input type="checkbox"/> Leptospira sp. Urine Antigen (if acute) <input type="checkbox"/> Leptospira sp. Antibody <input type="checkbox"/> Rickettsia akashi Antibody (aka. Rickettsia typhi) <input type="checkbox"/> Other, specify _____	<b>PARASITES</b> <input type="checkbox"/> Echinococcus spp. Antibody <input type="checkbox"/> Entamoeba histolytica / Entamoeba dispar Antibody <input type="checkbox"/> Schistosoma spp. Antibody <input type="checkbox"/> Strongyloides spp. Antibody
<b>SYPHILIS</b> <input type="checkbox"/> VDRL / RPR sample only (Send 100 µL in micro and one plain tube) <input checked="" type="checkbox"/> Treponema pallidum Nucleic Acid Testing* (Submit swabs, tissue or body fluid) <input type="checkbox"/> Qualitative RPR Microscopy (Submit 10 µL sample) <input type="checkbox"/> Direct Fluorescent Assay (DFA) Microscopy (Submit 10 µL sample) Signal / Symptom: <input type="checkbox"/> Asymptomatic <input type="checkbox"/> Rash	<b>FUNGUS</b> <input type="checkbox"/> Blastomyces dermatitidis Antibody <input type="checkbox"/> Coccidioides sp. Antibody <input type="checkbox"/> Cryptosporidium Antigen <input type="checkbox"/> Histoplasma sp. Antibody <input type="checkbox"/> Other, specify _____ Travel History Required for Above Tests	<b>DIPHTHERIA/TETANUS</b> Antitoxin** <input type="checkbox"/> Diphtheria <input type="checkbox"/> Tetanus **LIMITED TO: please include: <input type="checkbox"/> +15 year old <input type="checkbox"/> Organ transplant patient <input type="checkbox"/> severe underlying medical condition * CONSULTATION REQUIRED Please telephone Program Head (Clinical Microbiologist) at 604-675-3522 www.bccdc.ca/forms/PUSA-CPHUB.aspx

Slide adapted from  
Dr R Stimpson



## Do I really need to do an LP?....

### Symptomatic / Probable syphilis / High risk for syphilis

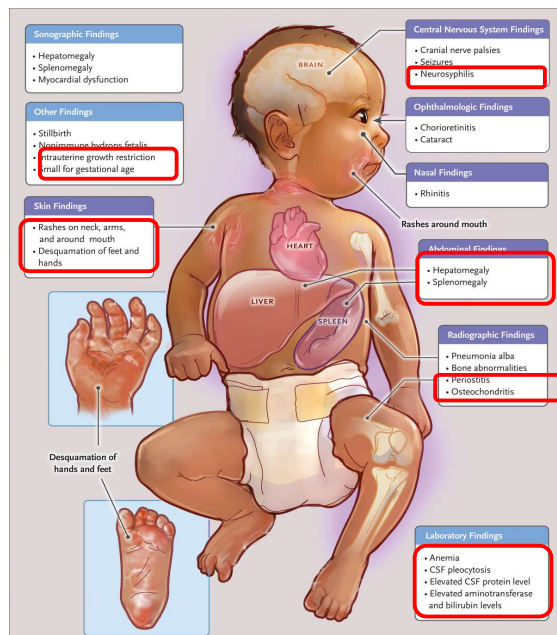
- YES
- Developmental delay, hearing, eye involvement all more likely in confirmed neurosyphilis
- If CSF VDRL is positive – ophthalmology & audiology follow up very important

### Possible syphilis / Low risk

- Potentially can avoid – even if treatment planned

Lim, J., Yoon, S.J., Shin, J.E. et al. Outcomes of infants born to pregnant women with syphilis: a nationwide study in Korea. BMC Pediatr 21, 47 (2021). <https://doi.org/10.1186/s12887-021-02502-9>

## Case



- RPR –
  - Birth: 1:512
  - 12 Weeks: 1:4
  - 6 mo: 1:1
  - 12 mo: NR

Treated with penicillin IV x 10 days

## Case

- Prematurity (born at 30 weeks)
- Physical findings (rash, HSM, sepsis)
- LP – VDRL initially positive – follow up negative
- Long bones – symmetric periosteal reaction & metaphyseal changes
- Audiology – normal
- Ophthalmology – no retinitis
- RPR –
  - Birth: 1:512
  - 12 Weeks: 1:4
  - 6 mo: 1:1
  - 12 mo: NR
- Elevated liver enzymes
- Anemia & thrombocytopenia
- Jaundice (required exchange transfusion)

Treated with penicillin IV x 10 days



## Case: at 1 year

- Thriving – no further health concerns
- Development normal – connected to AIDP
- Follow up with general pediatrician
  - There were some ongoing barriers to care including transport difficulties, difficulty making appointments



## Treatment

- **IV Aqueous crystalline penicillin G 50,000 U/kg/dose IV x 10 days**
  - Under 1 week - Q12h
  - 8-28 days - Q8h
  - Above 28 days - Q6h
- While some sources recommend routinely restarting the course of therapy if >24 hours is missed, evidence behind this is not clear
- Rather than missing doses while awaiting IV replacement...
  - daily IM procaine penicillin 50,000 units/kg/dose for each of the days that intravenous access is not available may be considered (but no current availability)
  - Some experts recommend ceftriaxone but many are hesitant due to lack of documented efficacy

<https://www.cps.ca/en/documents/position/congenital-syphilis>  
Red Book, Syphilis chapter



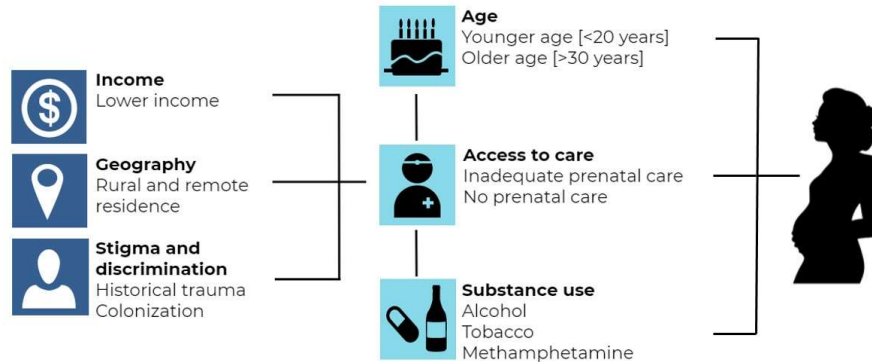
## Post-discharge care

- There is a risk of failure of cure, therefore close clinical follow up needed
- CPS / AAP recommend:
  - Monthly clinical exams x3 months
  - Syphilis serology repeat at 3, 6 and 18 months
    - Note: batch bloodwork with other follow up labs (e.g. Hep B at 7mo if primary immunization series)
    - RPR should be declining by 3 months and substantially improved/resolved by 6 months
    - Maternal transplacental EIA/TPPA should resolve by 18 months but if endogenous, may persist
- No need to repeat LP unless there is evidence of treatment failure

<https://www.cps.ca/en/documents/position/congenital-syphilis>  
Red Book, Syphilis chapter



## PHAC: Most commonly reported risk factors associated with maternal syphilis and related congenital syphilis in the Canadian literature



## Teams in caring for syphilis in pregnancy & exposed / infected infants

- General pediatricians / Primary care / midwife → lead the care locally.
  - No newborn should be discharged without the delivery syphilis testing!
  - Recognize the intersectionalities / barriers to care – trauma aware & antiracist care are critical.
  - All infants with CS should have some form of well child care & developmental surveillance with a healthcare provider following their course of treatment.
- BCW Reproductive ID & BCCH Pediatric infectious diseases on call available 7 days / week to answer questions
- Oak Tree Clinic outpatient consultations
  - Post discharge: BCW Oak Tree Clinic – provides shared care with community providers (available Monday – Friday to discuss cases as needed) for those who were treated for possible or confirmed syphilis
- BCCDC Syphilis program – tracks all syphilis exposed infants and available Monday – Friday to discuss cases as needed – especially assessment of maternal testing and treatment.
- Regional public health – can support connections to care when there are multiple barriers to care

## How Can the BCCDC Syphilis Team support your work?

- Questions? Please call:
  - *RACE line (Sexually Transmitted Infection Service)*
  - *BCCDC Syphilis Physician- 604-707-5610 (M-F)*
- Syphilis Diagnosis and Treatment Records:
  - *BCCDC has records for the province dating back decades*
  - *Relationships with other provinces to obtain out-of-BC records*



BC Centre for Disease Control  
Provincial Health Services Authority

## Resources

- BC Children's Hospital Pediatric Infectious Diseases – via locating 604-875-2212
- BC Women's Hospital Reproductive Infectious Diseases – via locating 604-875-2212
- BCCDC Syphilis Physician- 604-707-5610 (M-F)
- Oak Tree Clinic – <http://www.bcwomens.ca/our-services/specialized-services/oak-tree-clinic>
- Canadian Pediatric Society Infectious Diseases and Immunization Committee
  - <https://cps.ca/en/documents/authors-auteurs/infectious-diseases-and-immunization-committee>
  - Reducing perinatal infection risk in newborns of mothers who received inadequate prenatal care
    - <https://cps.ca/en/documents/position/reducing-perinatal-infection-risk-in-newborns-of-mothers-who-received-inadequate-prenatal-care>
  - The management of infants, children, and youth at risk for hepatitis C virus (HCV) infection
    - <https://cps.ca/en/documents/position/the-management-of-hepatitis-c-virus>
  - Congenital syphilis (*update underway*)
    - <https://cps.ca/en/documents/position/congenital-syphilis>
- American Academy of Pediatrics Red Book
  - Syphilis Chapter - <https://publications.aap.org/redbook/book/347/chapter/5756873/Syphilis>
- Perinatal Services BC
  - Guidance
    - <http://www.perinatalservicesbc.ca/Documents/Resources/Alerts/FAQs-for-OB-care-providers-Syphilis-screening-in-pregnancy.pdf>
  - Congenital syphilis handout for families
    - [http://www.perinatalservicesbc.ca/Documents/Resources/Alerts/patient-resource-syphilis-in-pregnancy.pdf?\\_gl=1\\*t2luj5\\*\\_ga\\*MTQ1NDAxMTUxMjY4xNjczMzk5ODAs\\*\\_ga\\_ZKY1XG50LJ\\*MTCwMTY1MjQ1Mi4zNS4wLjE3MDE2NTI0NTMuMC4wLjA](http://www.perinatalservicesbc.ca/Documents/Resources/Alerts/patient-resource-syphilis-in-pregnancy.pdf?_gl=1*t2luj5*_ga*MTQ1NDAxMTUxMjY4xNjczMzk5ODAs*_ga_ZKY1XG50LJ*MTCwMTY1MjQ1Mi4zNS4wLjE3MDE2NTI0NTMuMC4wLjA)
- BCCDC
  - Communicable Disease Manual
    - <http://www.bccdc.ca/resource-gallery/Documents/Communicable-Disease-Manual/Chapter%205%20-%20STI/Non-certified%20Syphilis%20DST.pdf>

Thank you!  
Questions?



## Routine syphilis testing in pregnancy by trimester

### First

Serology for all

### Second

Serology for any  
with risk factors

Serology + PCR  
where appropriate  
for symptomatic

### Third

Serology for all

Serology + PCR  
where appropriate  
for symptomatic

If loss to follow up a concern, ensure that 3<sup>rd</sup> trimester test results are available prior to discharge of the baby.

