Queensland Clinical Guidelines

Translating evidence into best clinical practice

Maternity and Neonatal **Clinical Guideline**

Syphilis and pregnancy

Queensland Government

Document title:	Syphilis and pregnancy
Publication date:	December 2024
Document number:	MN24.44-V7-R29
Document supplement:	The document supplement details development processes and implementation activities, and is integral to and should be read in conjunction with this guideline
Amendments:	Full version history is supplied in the document supplement
Amendment date:	December 2024
Replaces document:	MN18.44-V6-R23
Author:	Queensland Clinical Guidelines
Audience:	Health professionals in Queensland public and private maternity and neonatal services
Review date:	December 2029
Endorsed by:	Queensland Clinical Guidelines Steering Committee Queensland Maternity and Neonatal Clinical Network
Contact:	Email: Guidelines@health.qld.gov.au URL: www.health.qld.gov.au/qcg

Acknowledgement

The Department of Health respectfully acknowledges the Traditional Owners and Cultural Custodians of the lands, waters and seas across Queensland. We pay our respects to Elders past and present, while recognising the role of current and future leaders in shaping a better health system.

Disclaimer

This guideline is intended as a guide and provided for information purposes only. The information has been prepared using a multidisciplinary approach with reference to the best information and evidence available at the time of preparation. No assurance is given that the information is entirely complete, current, or accurate in every respect.

The guideline is not a substitute for clinical judgement, knowledge and expertise, or medical advice. Variation from the guideline, taking into account individual circumstances, may be appropriate.

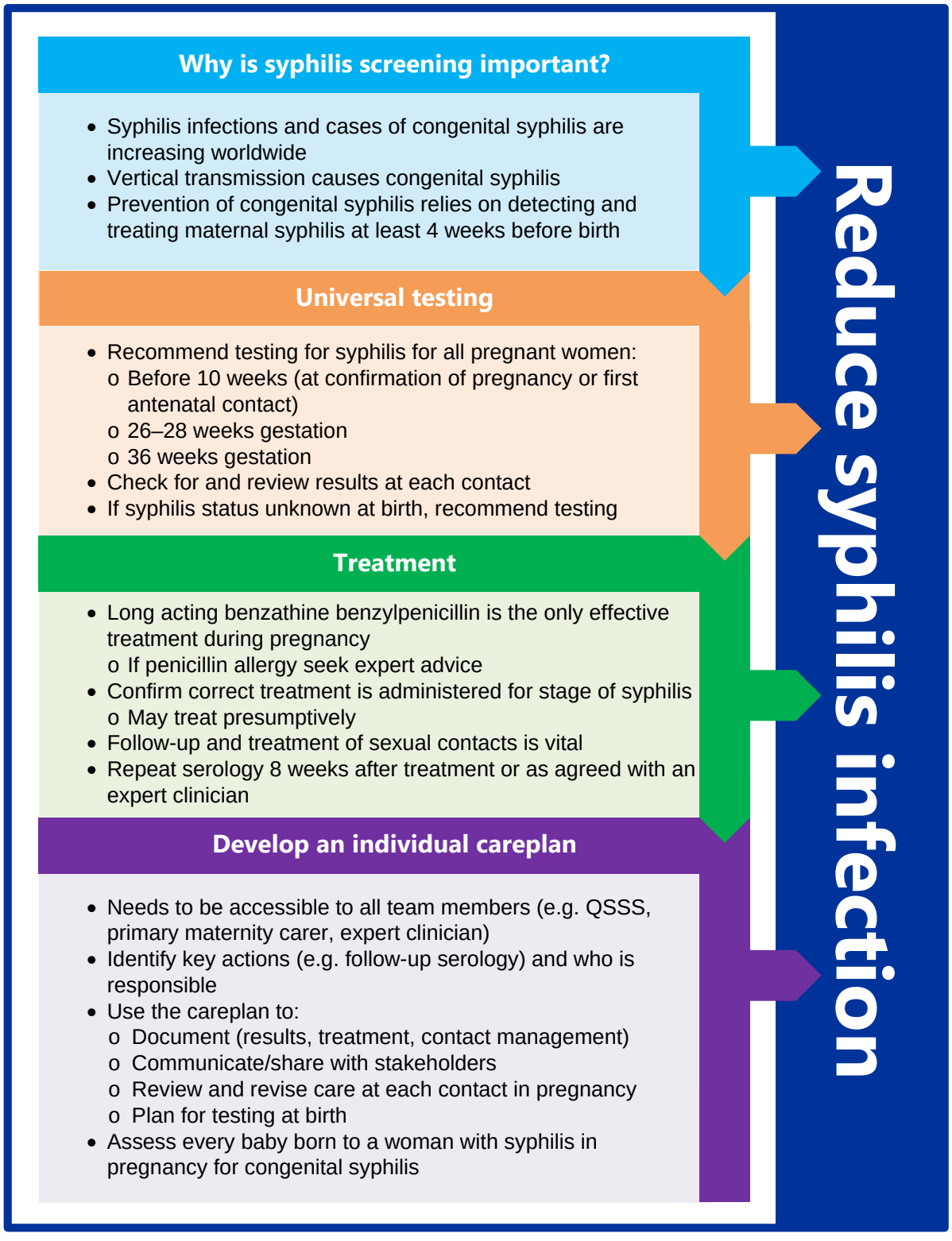
This guideline does not address all elements of standard practice and accepts that individual clinicians are responsible for:

- Providing care within the context of locally available resources, expertise, and scope of practice
- Supporting consumer rights and informed decision making, including the right to decline intervention or ongoing management
- Advising consumers of their choices in an environment that is culturally appropriate and which enables comfortable and confidential discussion. This includes the use of interpreter services where necessary
- Ensuring informed consent is obtained prior to delivering care
- Meeting all legislative requirements and professional standards
- Applying standard precautions, and additional precautions as necessary, when delivering care
- Documenting all care in accordance with mandatory and local requirements

Queensland Health disclaims, to the maximum extent permitted by law, all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs incurred for any reason associated with the use of this guideline, including the materials within or referred to throughout this document being in any way inaccurate, out of context, incomplete or unavailable.

Recommended citation: Queensland Clinical Guidelines. Syphilis and pregnancy. Guideline No. MN24.44-V7-R29. Queensland Health. 2024. Available from: http://www.health.qld.gov.au/qcg

Flowchart: Syphilis and pregnancy approach to care



QSSS: Queensland Syphilis Surveillance

Flowchart version: F24.44-4-V1-R29

Flowchart: Antenatal assessment for syphilis

UNIVERSAL testing for syphilis

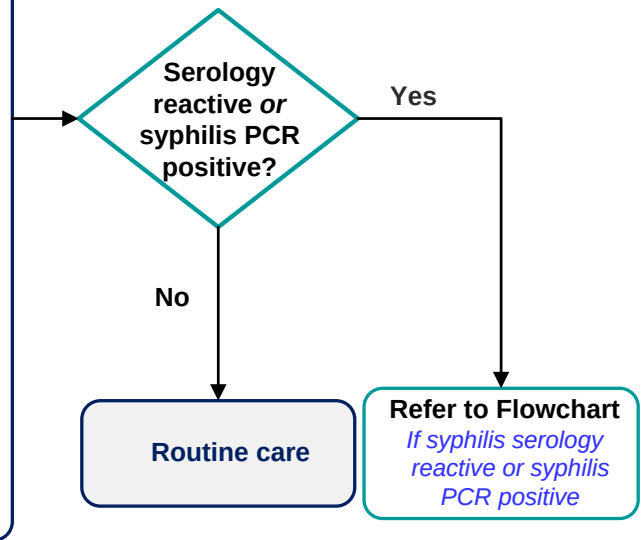
During pregnancy (all women):
- Before 10 weeks (at confirmation of pregnancy or at first antenatal visit)
- 26–28 weeks gestation
- 36 weeks gestation

If lesions/chancre
- Dry swab syphilis PCR and serology

Opportunistically repeat serology
- If indicated following identification of risk
- Upon request

Test mother at birth if (any of):
- No serology at 36 weeks gestation
- Preterm birth with most recent serology more than 4 weeks before birth
- Indicated following identification of risk

Test mother and baby in parallel at birth if:
- Syphilis treated in this pregnancy (irrespective of treatment history)



Assess all pregnant women for risk of syphilis infection

At each contact during pregnancy
- Check syphilis serology results
  - ❑ Offered as per recommendations?
  - ❑ Results reviewed and actioned?
- Actively consider risk of syphilis infection
  - ❑ Normalise discussions (i.e. discuss STI with everyone)
  - ❑ Offer opportunistic testing if indicated
- Consider discussion about:
  - ❑ Importance for own and baby's health
  - ❑ Prevention (safe sex practices)
  - ❑ Partner testing
  - ❑ Testing at birth
  - ❑ Culturally appropriate care

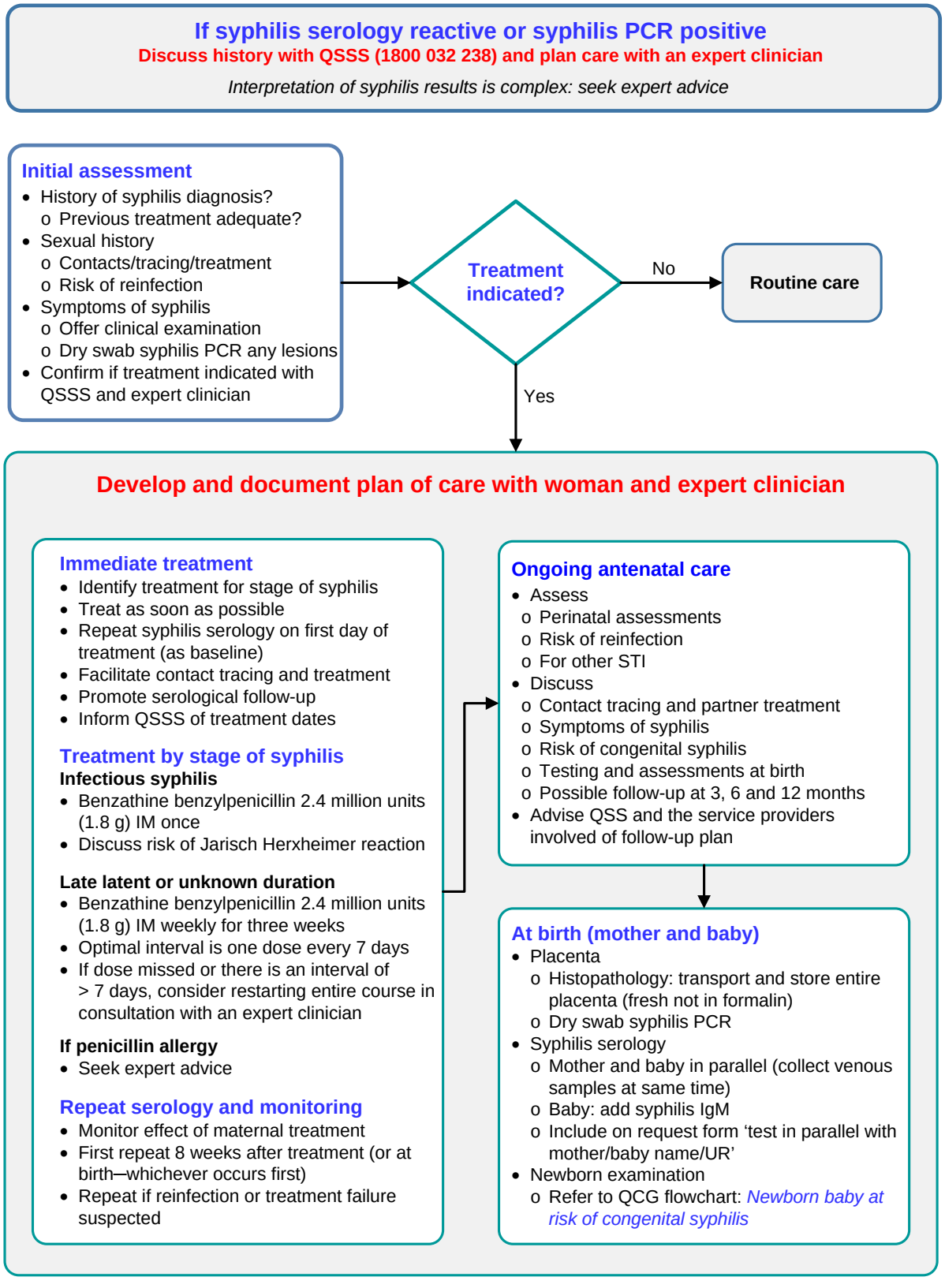
Increased risk of syphilis
- High risk sexual activity*
- History of STI in last 12 months
- Complex social circumstances– may include (but not limited to):
  - o Limited healthcare engagement
  - o Adolescent pregnancy
  - o Drug or alcohol use impacting health
  - o Domestic and family violence
  - o Financial hardship (e.g. poverty, homelessness, coercion)
  - o Discrimination/intergenerational trauma
  - o Incarceration (of woman or sexual partner)
  - o Concern for mental health

***High risk sexual activity:** *Oral, anal or vaginal intercourse without a condom or other barrier method with new, multiple or anonymous people or with a sexual partner who has other concurrent sexual contacts*

PCR: polymerase chain reaction, **STI:** sexually transmissible infection

Flowchart version: F24.44-1-V6-R29

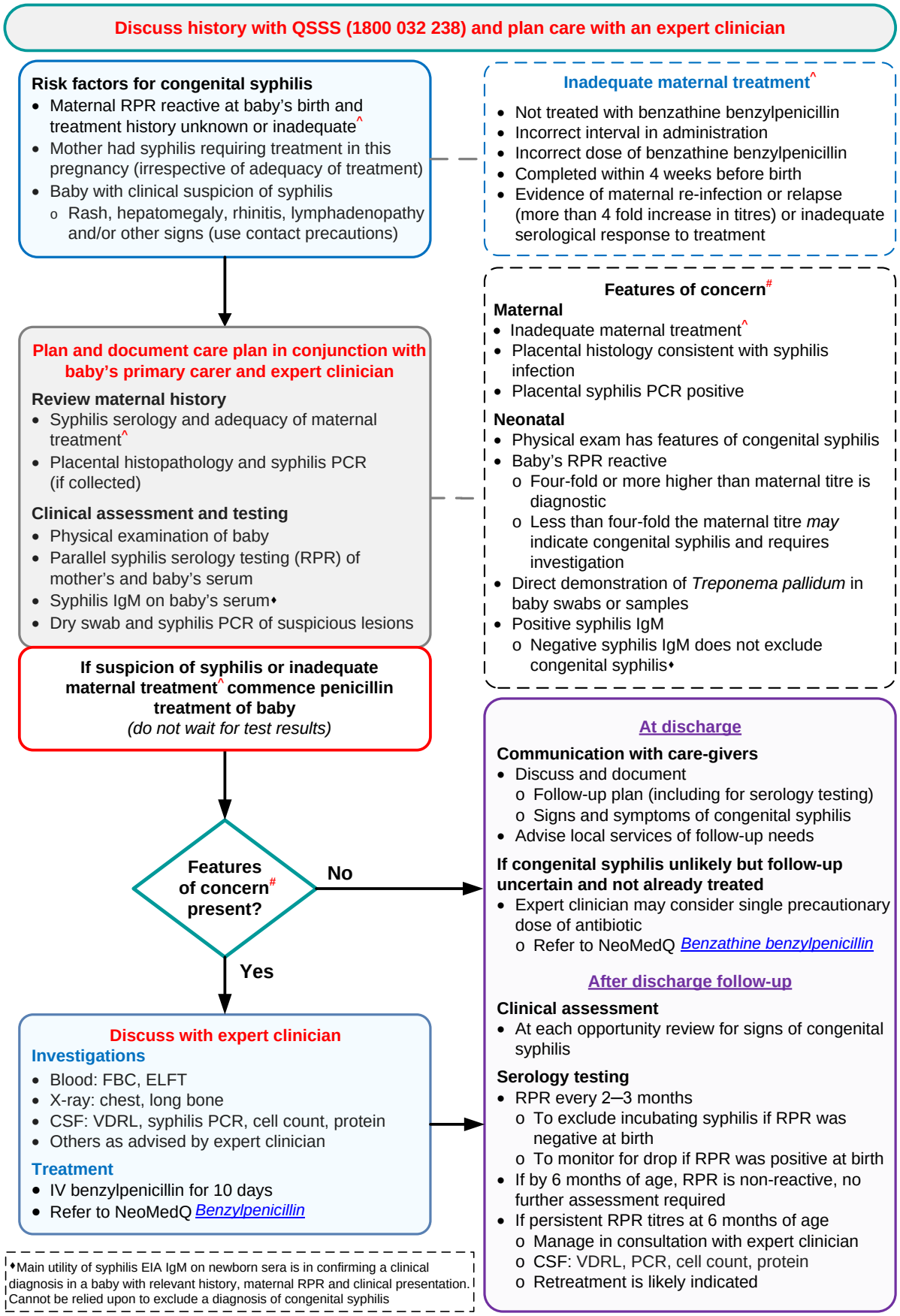
Flowchart: Reactive serology or positive syphilis PCR



IM: intramuscular injection, **PCR:** polymerase chain reaction, **QCG:** Queensland Clinical Guideline, **QSSS:** Queensland Syphilis Surveillance Service, **STI:** sexually transmissible infection

Flowchart version: F24.44-3-V1-R29

Flow Chart: Newborn baby at risk of congenital syphilis



CSF: cerebrospinal fluid, **EIA:** enzyme immunoassay, **ELFT:** electrolyte and liver function test, **FBC:** full blood count, **IgM:** Immunoglobulin M, **IV:** intravenous, **PCR:** polymerase chain reaction, **RPR:** rapid plasma reagin, **VDRL:** venereal disease research laboratory, **>:** greater than, **<:** less than

Flowchart version: F24.44-2-V3-R29

Table of Contents

Abbreviations 8
Definitions 8
1 Introduction 9
1.1 Clinical impact 9
1.2 Prevalence in Queensland 9
1.3 Clinical standards 10
1.4 Aetiology of syphilis 11
1.5 Risk minimisation 11
2 Testing during pregnancy 12
2.1 Risk factors associated with syphilis infection 12
2.2 Universal testing (all pregnant women) 13
2.3 Point of care testing 13
2.4 Contact management 14
3 Syphilis infection requiring treatment 15
3.1 Maternal assessment 15
3.2 Fetal assessment 16
3.2.1 Ultrasound findings 16
3.3 Treatment regimens 17
3.4 Jarisch-Herxheimer reaction 18
3.5 Birth considerations 19
3.6 Maternal discharge and follow-up 19
4 Congenital syphilis 20
4.1 Initial assessment 20
4.2 Initial serology 21
4.3 Further investigations 21
4.4 Diagnosis of congenital syphilis 22
4.5 Treatment for congenital syphilis 22
4.6 Discharge of at risk baby 23
4.6.1 Precautionary single dose 23
4.7 Follow-up of at risk baby 24
References 25
Appendix A: Interpretation of results 27
Acknowledgements 28

List of Tables

Table 1. Clinical impact 9
Table 2. Prevalence in Queensland 9
Table 3. Clinical standards 10
Table 4. Aetiology 11
Table 5. Preventative strategies 11
Table 6. Risk factors associated with syphilis infection 12
Table 7. Universal testing for syphilis 13
Table 8. Point of care (PoC) testing 13
Table 9. Contact management 14
Table 10. Clinical assessment 15
Table 11. Fetal assessment 16
Table 12. Ultrasound findings 16
Table 13. Treatment of syphilis by stage 17
Table 14. Jarisch-Herxheimer Reaction 18
Table 15. Birth considerations 19
Table 16. Discharge planning 19
Table 17. Initial assessment 20
Table 18. Serology 21
Table 19. Further investigations 21
Table 20. Diagnosis of congenital syphilis 22
Table 21. Treatment of congenital syphilis 22
Table 22. Discharge 23
Table 23. Precautionary single dose at discharge 23
Table 24. Possible congenital syphilis 24

Abbreviations

CSF	Cerebrospinal fluid
IgM	Immunoglobulin M
IM	Intramuscular
IV	Intravenous
JHR	Jarisch-Herxheimer reaction
PCR	Polymerase chain reaction
PoC	Point of care
QSSS	Queensland Syphilis Surveillance Service
RPR	Rapid plasma reagin
STI	Sexually transmissible infection
USS	Ultrasound
VDRL	Venereal Diseases Research Laboratory

Definitions

Expert clinician	In this guideline an 'expert' clinician is a clinician with specialist knowledge and experience in the testing, result interpretation, management and treatment of syphilis in the pregnant woman and/or her baby.[1] May include (but is not limited to) an infectious disease physician, sexual health physician, obstetrician, neonatologist, paediatrician nurse practitioner or other clinician with expertise in the management of syphilis.
Congenital syphilis	Occurs in the fetus/baby when infection passes from a woman to her baby during the pregnancy or at the time of birth.
High risk sexual activity	Oral, anal or vaginal intercourse without a condom or other barrier method with new, multiple or anonymous people or with a sexual partner who has concurrent sexual contacts.
Infectious syphilis	Syphilis of less than two years duration (includes primary, secondary and early latent stages). Consider the possibility of infectious syphilis if duration is unknown and there are no symptoms, and/or no evidence of adequate treatment.
Late or limited antenatal care	First presentation for antenatal care occurs in the third trimester, or the recommended antenatal testing and assessment is incomplete.
RPR	In this guideline *RPR* is used to denote a nontreponemal test performed on sera. Other nontreponemal tests may be appropriate/used in some clinical circumstances. Refer to Appendix A: Interpretation of results
Serofast reactive titres	Persistent nontreponemal (RPR) serological response.
Syphilis requiring treatment in pregnancy	In this guideline, *syphilis requiring treatment in pregnancy* is used to mean infectious syphilis that requires or is treated during the current pregnancy OR syphilis of unknown duration or late latent syphilis that is untreated, has been inadequately treated, or where there is no history of adequate treatment and therefore requires treatment during this pregnancy.
Woman/women	Queensland Clinical Guidelines recognise that individuals have diverse gender identities. In QCG documents, although the terms *woman* and *women* are used, these guidelines are inclusive of people who are pregnant or give birth and who do not identify as female.[2]

1 Introduction

The rate of syphilis is increasing in Australia in-line with global trends.[3] Recently, there has been an increased occurrence of baby deaths from congenital syphilis with Queensland having a higher rate than other jurisdictions.[4] The increased incidence of congenital syphilis[3] is disproportionally represented by women and families living with socio-economic disadvantage.[4] Low clinician and community awareness and healthcare system barriers are also key drivers.[5,6]

Rates of syphilis infection are disproportionally higher in First Nations people (men and women), especially in remote and very remote areas.[4] Importantly this is not due to differing patterns of sexual behaviour and condom use but rather complex social factors including poverty, sexually transmissible infections (STI)-related stigma, lack of access to high quality and culturally appropriate health services, incarceration and intergenerational trauma.[7]

1.1 Clinical impact

Table 1. Clinical impact

Aspect	Consideration
Maternal impact	• Although estimates vary, approximately 50–80% of women with syphilis requiring treatment in pregnancy suffer adverse pregnancy outcomes[8] • Early treatment associated with decreased risk for adverse pregnancy outcomes[9] • Maternal syphilis is thought to increase the risk of vertical transmission of HIV and other sexually transmissible infections[10]
Fetus/baby	• *Treponema pallidum* spirochete crosses placenta from 9–10 weeks gestation[8] • Placental infiltration reduces blood flow to the fetus and may lead to growth restriction • The risk of fetal loss is higher when infection present early in pregnancy[8]
Longer term implications	• Up to two thirds of untreated asymptomatic babies are likely to develop symptoms of congenital syphilis within 3–8 weeks of age[11,12] • By three months of age almost all untreated babies will be symptomatic[11] • Longer term adverse outcomes include: o Neurological and developmental delays o Musculoskeletal problems
Risk reduction	• Early testing, detection and treatment of pregnant women with syphilis infection can prevent adverse perinatal outcomes including fetal death[13]

1.2 Prevalence in Queensland

Table 2. Prevalence in Queensland

Aspect	Consideration
Syphilis notifications (infectious and late latent) in QLD 2023[14]	• 20.5% identified as First Nations people • 71.5% were male • 75% of women were of reproductive age (15 to 44 years) • 87.8% were 25 years of age or more • Queensland regions o 68.6% South East Queensland o 19.5% North Queensland o 11.9% Central Queensland
Congenital syphilis in QLD (2018-2023)[14]	• 20 babies were notified with congenital syphilis o 14 liveborn, five stillbirths and one neonatal death o 60% (n=12) were born to First Nations people

1.3 Clinical standards

Table 3. Clinical standards

Aspect	Consideration
Standard care	• Refer to Queensland Clinical Guideline *Standard care*[15] for care considered 'usual' or 'standard' o Includes for example: privacy, consent, decision making, sensitive communication, medication administration, staff education and support, culturally appropriate care • A perceived or actual lack of confidentiality, particularly in smaller and remote communities, may impede presentation for diagnosis, treatment and contact tracing • Counsel women who decline testing about the benefits of early diagnosis and treatment o Refer to Queensland Health Partnering with the woman who declines recommended care[16]
Local protocols	• Identify systems and processes for the coordination and monitoring of serological testing, treatment and follow-up • Identify strategies to maximise diagnosis and treatment opportunities (e.g. follow-up after failure to attend, opportunistic testing (e.g. emergency department presentation)), combined appointments, extending outreach services • Establish local referral pathways that individualise and support access to care for women with syphilis o Likelihood of attendance if referred elsewhere o Issues that may impact on attendance for follow-up (e.g., cost of presenting elsewhere for treatment)
Culturally appropriate care	• Support education and training to develop and maintain cultural competence among healthcare providers • Collaborate with Aboriginal and/or Torres Strait Islander health workers, health practitioners, hospital liaison officers, spiritual leaders, Elders and language interpreters, according to the preferences of the individual woman • Recognise the importance of family and community in the health care decision-making of First Nations people, for both prevention strategies and care delivery
Notifiable disease	• Syphilis is a notifiable disease in Queensland as per the Public Health Act (2005) and Public Health Regulation (2018)[17,18]
Queensland Syphilis Surveillance Service (QSSS)	• Maintains serology and treatment histories for people diagnosed with syphilis in Queensland and receives mandatory laboratory notification • Telephone: 1800 032 238 • North Queensland email: North-Qld-Syphilis-Surveillance-Centre@health.qld.gov.au • Southern Queensland email: QLD-Syphilis-Surveillance-Service@health.qld.gov.au
Follow-up of babies at risk of congenital syphilis	• Formalise responsibility for follow-up of babies at risk of congenital syphilis within the local service • Establish a local process for initiating and ensuring follow-up occurs, including if baby discharged prior to pathology result availability (not recommended) • Analyse and report all confirmed cases of congenital syphilis as per Health Service Directive QH-HSD-032:2014[19] and in accordance with the associated protocol for reporting congenital syphilis[19] o Include stillbirth and intrauterine fetal death where a woman has been diagnosed with infectious syphilis • Use audit processes to monitor and review follow-up care and clinical outcomes

1.4 Aetiology of syphilis

Table 4. Aetiology

Aspect	Consideration
Organism	• Bacterial infection caused by the spirochaete bacterium *Treponema pallidum*[20,21]
Transmission	• Direct contact with infectious lesions of the mucous membranes or abraded skin[8] including oral sex • Almost always as sexually transmissible infection[21,22] • Vertical transmission (transplacental passage) during pregnancy[8,21-23]: • Less commonly: o Infected blood (e.g. shared needles during injecting substance use)[21] o Non-sexual cutaneous contact with infected lesions
Infectious period	• First two years of infection[24] o If untreated, period of high infectivity is 12 months o Sexual transmission uncommon after two years of infection • Become non-infectious seven days after one appropriate dose of benzathine benzylpenicillin, or when all symptoms have resolved after treatment, whichever is longer[25] • Immunity is not conferred by treatment or previous infection—re-infection can occur
Clinical stages	• Primary: mean incubation 21 days (range 9–90 days) from contact to the development of a chancre[24] • Secondary: follows 4–6 months after untreated primary stage • Latent: characterised by reactive serology with no clinical manifestations • Tertiary: Non-infectious—can affect any organ system
Reactive serology	• A treponemal and a nontreponemal test (RPR) are required for the diagnosis of syphilis o An isolated reactive treponemal test or reactive nontreponemal test (RPR) is not adequate for diagnosis[26] • Treponemal serology results remain reactive after adequate treatment of syphilis, therefore reactive results do not necessarily indicate the need for treatment[27,28] • Interpretation of results may need expert clinician guidance.

1.5 Risk minimisation

Table 5. Preventative strategies

Aspect	Consideration
Identifying risk	• Clinician knowledge and awareness of the potential for syphilis infection is a key component of detection and management o Use clinical judgement and sensitivity in discussions o Avoid assumptions based on population characteristics or stereotypes o Follow a systematic and non-judgemental approach
Communication	• Recommend syphilis testing to all pregnant women • Offer information and discuss syphilis, syphilis testing, and safe sex practices including signs and symptoms of STIs during pregnancy • Encourage disclosure about change in or additional sexual partners • Discuss partner treatment for STI
Barrier methods	• Advise condom use (internal or external condoms, dental dams) to help prevent syphilis infection and re-infection during pregnancy (as well as other STIs) o Condoms reduce the risk of syphilis only when the infected area or site is protected from direct contact
Contact treatment/tracing	• If woman or partner treated for syphilis requiring treatment in pregnancy, advise to abstain from sexual activity for seven days after both have received adequate treatment or until symptoms have resolved (whichever is longer)[29] • Offer treatment at the earliest opportunity and presumptively if appropriate • Refer to Section 2.4 Contact management

2 Testing during pregnancy

Identifying women at increased risk of acquiring syphilis can be challenging. Membership of one or more groups defined by common characteristics does not necessarily equate to an increased or decreased individual risk.

2.1 Risk factors associated with syphilis infection

Table 6. Risk factors associated with syphilis infection

Risk factor	Consideration
High risk sexual activity	• Oral, anal or vaginal intercourse without a condom or other barrier method with new, multiple or anonymous people or with a sexual partner who has other concurrent sexual contacts
Complex social circumstances	• Syphilis infection is frequently associated with the social determinants of health and complex social circumstances • Maintain clinical vigilance and re-assess for risk of syphilis infection in the presence of: o Limited healthcare engagement o Adolescent pregnancy o History of STI in the last 12 months o Drug and alcohol use impacting health o Domestic and family violence o Financial hardship (e.g. poverty, homelessness, coercion) o Discrimination/intergenerational trauma o Incarceration (of woman or sexual partner) o Concern for mental health
Geographical location	• No definitive evidence to support recommendations for testing frequency, or interval in declared outbreak or non-outbreak affected areas • Syphilis is more prevalent in some regions (e.g. Asia, Africa, Pacific including Papua New Guinea (PNG)) • Local Hospital and Health Services may increase frequency of recommended antenatal testing according to local prevalence

2.2 Universal testing (all pregnant women)

Table 7. Universal testing for syphilis

Aspect	Consideration
Minimum frequency	• At confirmation of pregnancy or at first antenatal appointment (if not performed at confirmation) o Preferably before 10 weeks gestation[13,30] • At 26–28 weeks gestation • At 36 weeks gestation
Non-pregnancy related healthcare	• Maintain awareness that any engagement/contact for healthcare (pregnancy or non-pregnancy related) is an opportunity for sexual health review including syphilis/other STI related testing or care
At each contact (pregnancy or non-pregnancy related)	• Review syphilis serology results o Has testing been recommended as per schedule? o Identify if appropriate follow-up or action on results has occurred • Actively consider risk of syphilis infection and maintain awareness of the ongoing risk of infection/re-infection after initial testing or treatment
Communication about STI	• Initiate discussion about STI o Use inclusive language (e.g. gender, sexuality) and avoid assumptions o Use a non-judgemental approach and reassure about confidentiality o Emphasise the purpose of testing is to detect, treat and prevent STI for own and baby's health • Include discussion about o Prevention (safe sex practices) o Partner testing o Symptoms of syphilis o Testing at birth
Opportunistic testing	• As part of routine antenatal care, assess for risk factors associated with syphilis infection[31] and recommend additional testing if: o Change or addition of sexual partner(s) o Change in risk behaviours or circumstances o Upon request • Refer to 2.1 Risk factors associated with syphilis infection
Test at birth	• Review syphilis serology at the onset of labour • Test at birth if: o No serology at 36 weeks gestation or results unknown or not available o Preterm birth with most recent serology 4 weeks or more before birth[9] o Syphilis treated in this pregnancy irrespective of treatment history ▪ Test mother and baby in parallel o Indicated by risk assessment
Syphilis serology	• Request *'syphilis serology'* on antenatal pathology forms o Pathology laboratories will determine the individual test as per their standard operating procedure
If lesions/chancre	• Dry swab syphilis polymerase chain reaction (PCR) and collect serology

2.3 Point of care testing

Table 8. Point of care (PoC) testing

Aspect	Consideration
Context	• Laboratory based syphilis serology is the standard for routine antenatal testing • Point of care (PoC) test is preferable to not testing at all
Implementation	• May be useful in selected settings[32,33] to facilitate greater access to testing (e.g. no or limited antenatal care, follow-up is uncertain, difficulty with engagement, partner testing) • Use requires local standard processes for[29]: o Training and competency certification of staff o Quality assurance/record keeping o Confirmation of preliminary reactive PoC testing by laboratory serology • Confirm reactive syphilis serology obtained via PoC test by laboratory test

2.4 Contact management

For the infected person, contact management aims to eradicate infection and prevent re-infection. For sexual partners of infected people, contact management aims to identify and treat undiagnosed syphilis.[34]

Table 9. Contact management

Aspect	Consideration
Definition of a contact	• Anyone who has had sex (including oral and/or anal sex) with a person who has infectious syphilis • Unborn and newborn babies of women with syphilis requiring treatment in pregnancy
Contact tracing	• Diagnosing/treating clinician responsible for contact management plan o Involve contact tracing support officers, the QSSS and an expert clinician in contact management as required • Women may prefer to self-manage the notification of their sexual partner/s o Offer information about online sites to advise partner(s) (e.g. Better to Know[35], Let Them Know[36]) o If risk of domestic and family violence offer clinican management of contact tracing
Look back period for contact tracing[29]	• If primary syphilis: o Duration of symptoms plus three months o If duration uncertain, six months prior to presentation • If secondary syphilis: o Duration of symptoms plus six months o If duration uncertain, 12 months prior to presentation • If early latent or unknown duration: o 12 months prior to presentation
Contact during pregnancy	• If the woman is identified as a contact during pregnancy, treat presumptively without waiting for serology results[13]
Contact with baby infected with syphilis	• Infected baby with moist mucocutaneous lesions is a potential source of infection[29] • If close contact (with baby infected with syphilis) including with lesions or nasal secretions o Perform skin examination and advise about skin lesions o Advise the contact to repeat serology in three months
Treatment of contact	• If exposed to infectious syphilis, recommend empirical treatment regardless of syphilis serology results • If sexual contact less than 90 days before woman diagnosed with syphilis, (primary, secondary or early latent)—even if serological tests are negative o Recommend presumptive treatment for early syphilis • If sexual contact more than 90 days after woman diagnosed with syphilis (primary, secondary or early latent) and serology is positive, recommend treatment based on serological and clinical evaluation and syphilis stage o If test results not immediately available or follow-up uncertain, treat presumptively for early syphilis • Consult with an expert clinician for treatment advice for partner • Refer to Table 13. Treatment of syphilis by stage

3 Syphilis infection requiring treatment

If there is syphilis infection requiring treatment in pregnancy or signs and symptoms of syphilis, conduct a clinical assessment and develop a plan of care (including any treatment) in consultation with the woman and an expert clinician.[29]

3.1 Maternal assessment

Table 10. Clinical assessment

Aspect	Consideration
History[37]	• Reproductive/sexual history[38] • Direct questions about symptoms of syphilis (e.g. genital rashes, lumps and sores; including if current partner is symptomatic) • Previous syphilis testing • Potential for previous infection with non-venereal *Treponema pallidum* infection o Childhood skin infections (e.g. yaws, bejel or pinta) o Previously resident in endemic country
Obstetric history	• Previous adverse pregnancy outcomes (e.g. stillbirth) • Identify live births and consider if other children may now have congenital disease
Clinical examination	• If syphilis requiring treatment in pregnancy o Genital examination[20,38,31] o Skin examination including torso, eyes, mouth, scalp, palms and soles o Neurological symptoms—if present conduct a neurological examination • Symptomatic late disease[28,39] o Skin—mucocutaneous lesions o Musculoskeletal (congenital) o Cardiovascular system (for signs of aortic regurgitation) o Nervous system
Investigations	• Dry swab suspicious genital lesions for PCR[31] • Collect serum and request *'syphilis serology'* on pathology forms • Recommend testing for Human immunodeficiency virus (HIV) and other STIs • In consultation with an expert clinician, consider other investigations as relevant to circumstances
Previous syphilis diagnosis	• If previous syphilis diagnosis, identify: o Year and place of diagnosis o Treatment received (medication, route, duration) o Serological results • Consider pregnant women with reactive serology as having syphilis requiring treatment in pregnancy unless an adequate treatment history is available[31] • Collaborate with QSSS about history and/or expert clinician about staging of syphilis and treatment plan
Serological follow-up during pregnancy	• Retest 8 weeks after treatment or as agreed with an expert clinician • Retest at birth • Discuss the importance of serological follow-up with the woman at the time of treatment, including implications for neonatal management • Document woman's serological response to treatment in the health record
Contact tracing	• Initiate contact management • Refer to Section 2.4 Contact management

3.2 Fetal assessment

Table 11. Fetal assessment

Aspect	Consideration
Context	• Before 18–20 weeks fetal abnormalities are not usually seen because of fetal immunologic immaturity[40] • An abnormal USS is not diagnostic of fetal infection and a normal USS does not exclude fetal infection[41]
USS examination	• If syphilis requiring treatment in pregnancy is diagnosed after 20 weeks gestation, request an USS to evaluate for congenital syphilis[8,29,31] • Do not delay treatment for USS • Include on request form: o Relevant history (e.g. serology, gestation, treatment) • Request assessment of[8]: o Placental size o Amniotic fluid volume (single deepest pocket) o Middle cerebral artery (MCA) Doppler velocity o Liver size and echo density
Ongoing monitoring	• If there are characteristic findings on USS after 20 weeks gestation in a woman with syphilis requiring treatment in pregnancy, suspect fetal infection[8] • Formulate a plan about ongoing monitoring in collaboration with a maternal fetal medicine specialist • If presumptive diagnosis of congenital syphilis, consider sequential monitoring to assess fetal well-being and response to treatment
Successful treatment	• With successful treatment[42]: o MCA abnormalities, ascites and polyhydramnios usually resolve within one month, followed by resolution of placentomegaly o Hepatomegaly can take months to resolve after maternal treatment • Rarely required intrauterine transfusion for fetal anaemia

3.2.1 Ultrasound findings

Table 12. Ultrasound findings

Timing	Finding	Description
Early findings[8,21,42,43]	Normal	• Does not exclude congenital syphilis • Detection of fetal syphilis infection rare before 20 weeks gestation
	Hepatomegaly (70–80%)	• Liver length greater than 95th percentile for estimated gestational age
	Placentomegaly (27%)	• Placental thickness greater than two standard deviations for estimated gestational age
Later findings[8,21,42,43]	Anaemia (33%) based on MCA Doppler	• Middle cerebral artery greater than 1.5 multiple of median (MoM)
	Polyhydramnios (12%)	• Single deepest pocket equal to or greater than 8 cm
	Ascites/hydrops (10%)	• Hydrops: two or more cavities with abnormal fluid collections

3.3 Treatment regimens

Different treatment regimens are required for the different stages of syphilis infection.[23]

Table 13. Treatment of syphilis by stage

Aspect	Recommendation
Commencement	• Recommend antibiotic therapy immediately at the time of diagnosis • Collect a serological specimen on the day treatment is started to provide an accurate baseline for assessment of future response to treatment • Recommend abstinence from sexual activity for minimum of seven days after treatment or lesions have healed (whichever is longer)[21]
Presumptive treatment	• If syphilis requiring treatment in pregnancy is suspected and there is concern about not re-presenting for care—treat the woman and her partner(s) presumptively without waiting for serology results[31]
Primary, secondary and early latent	If not hypersensitive to penicillin with syphilis infection of *less than two years duration* • Benzathine benzylpenicillin 2.4 million units (1.8 g) IM once[1] o Administer as a divided dose of two injections of 1.2 million units (900 mg)—one injection into each buttock (ventrogluteal region or upper outer quadrant[44]) • A second dose can be administered after seven days[1]–consult with expert clinician
Late latent and unknown duration	If not hypersensitive to penicillin with syphilis infection of *more than two years duration* • Benzathine benzylpenicillin 2.4 million units (1.8 g) IM once every 7 days for 3 doses[1] o Administer as a divided dose of two injections of 1.2 million units (900 mg) one injection into each buttock (ventrogluteal region or upper outer quadrant[44]) • If the interval between doses: o 8 or 9 days[31], liaise with an expert clinician about restarting the course o More than 9 days[31], restart the entire course o Requires multiple restarts, discuss with expert clinician
Penicillin hypersensitivity	• Seek expert advice[21,22] • Ask about the reaction[45]: o When occurred, type and severity and management o Antibiotic use since the reaction • Refer to Therapeutic Guidelines for further information[45]
Therapies not recommended	• Macrolides (e.g. erythromycin and azithromycin) ineffective as do not cross placenta and/or have high level of resistance[30] • Doxycycline and tetracycline (may inhibit bone growth), and are contraindicated in the second and third trimester of pregnancy[31,46,47]
Inadequate treatment	• A non-penicillin agent is used • Incorrect dose of penicillin is administered • Incorrect interval between doses • If completed less than four weeks prior to birth[31] (evidence limited) • Inadequate serological response to therapy • Evidence of maternal re-infection or relapse (greater than four-fold increase in titres)

3.4 Jarisch-Herxheimer reaction

Jarisch-Herxheimer reaction (JHR) is an acute non-allergic reaction that may occur after penicillin administration in patients infected with spirochetes, including syphilis.[48] Concerns about JHR are relevant only to the first dose of treatment.

Table 14. Jarisch-Herxheimer Reaction

Aspect	Consideration
Symptoms	• Onset within first 24 hours after initiation of treatment[8,31,49] • Fever, headaches, rigors, joint pain, chills, malaise, transient accentuation of cutaneous lesions, hypotension and tachycardia[8,31,49] • May precipitate uterine contractions (56–67%), decreased fetal movements (67%) and abnormal fetal heart rate (FHR) tracings (50%)[8,21,22,31,49] • Risk of preterm birth or stillbirth in severely affected pregnancies[8] • Newborn babies may experience symptoms following treatment o Refer to Table 21. Treatment of congenital syphilis
Care of woman	• **Do not delay treatment** due to concerns about adequacy of monitoring[20] • Discuss risk of JHR and the potential for subsequent interventions and outcomes relevant to gestation[20] • Fetal heart rate (FHR) auscultation or cardiotocography pre- and post-administration • Advise to: o Stay well hydrated, rest and take paracetamol for pain or fever[20] o Contact a health care provider or nearest birthing facility, if experiencing symptoms[1] • Offer information about JHR Refer to Queensland Clinical Guideline *Syphilis in pregnancy and Jarisch-Herxheimer reaction (JHR)* consumer information[50,51]
Increased surveillance	• Recommend increased maternal and fetal surveillance (and consider inpatient management) for women with (any of): o Co-infection of Human immunodeficiency virus (HIV) o Fetal USS abnormalities/severely affected fetus o High syphilis titres • If inpatient management not practical (e.g. in a remote setting) consider: o Outreach follow-up contact in the community (e.g. by phone, text or personal contact) • Supportive management relevant to symptoms (e.g. antipyretics, intravenous (IV) fluids, tocolysis)

3.5 Birth considerations

Table 15. Birth considerations

Aspect	Consideration
Timing and place of birth	• Planned preterm birth for neonatal concerns may be indicated when there is a high risk of fetal treatment failure (e.g. progressive worsening signs of congenital syphilis or hydrops on USS)[42] o Refer to Table 11. Fetal assessment • Plan place of birth in conjunction with an expert clinician (e.g. consider clinical service capability in relation to expected condition of baby at birth)
Intrapartum care	• All routine intrapartum care is indicated • Notify medical officer/paediatrician/neonatologist about maternal syphilis stage, treatment and fetal USS findings[42] • Test at birth as per indications o Refer to Table 7. Universal testing for syphilis
Placental appearance	• Placenta: often large, thick and pale—characteristic findings[8] • Umbilical cord[52]: oedematous, resembles a "barber's pole" with spiral red and light blue discoloration alternating with streaks of chalky white[8] o May be inflamed with an abscess-like foci of necrosis within Wharton's jelly, centred around umbilical vessels (necrotizing funisitis)[8]
Placental histopathology	• Request placental histopathologic examination and syphilis PCR[1] if: o Syphilis requiring treatment during pregnancy o Reactive RPR serology at baby's birth • Not diagnostic but improves detection in liveborn and stillborn babies • Follow local protocol for collection of dry swab between the chorion and amnion for placental syphilis[1,53] o May be collected by maternity clinicians or by pathology staff upon receipt of placenta at laboratory) • Store and transport entire placenta fresh (not frozen) or in sodium chloride 0.9% (not formalin)
Breastfeeding	• *Treponema pallidum* is not transferred in breast milk • Recommend breastfeeding unless an infectious lesion (e.g. chancre) is present on the woman's breast and/or axillae[21,29]

3.6 Maternal discharge and follow-up

Table 16. Discharge planning

Aspect	Consideration
Review serology	• Review syphilis serology prior to discharge
Discharge communication[22]	• Provide written advice to community health practitioners, especially those responsible for follow-up of both mother and baby (e.g. general practitioner, rural and remote healthcare providers) • Notify QSSS of discharge • Advise of the importance of follow-up appointments and testing • Offer clear pathway for timely access to sexual and reproductive health services including pregnancy choices, fertility control and birth spacing • Offer information about safe sexual health practices and STI testing • If appropriate link with Aboriginal and Torres Strait Islander Community Controlled Health Organisations for ongoing support
Serological follow-up	• If syphilis requiring treatment in pregnancy recommend clinical and serological follow-up at three, six and 12 months • Discuss with an expert clinician if titres: o Do not decrease four-fold within 12 months o Increase four-fold • If syphilis (any stage) diagnosed within three months postpartum, assess the baby for congenital syphilis

4 Congenital syphilis

Suspect congenital syphilis in any baby born to a woman who[31]:

- Had syphilis requiring treatment in pregnancy, irrespective of adequacy of treatment
- Had limited or no antenatal care
- Is diagnosed as having syphilis (any stage) within three months postpartum

4.1 Initial assessment

If congenital syphilis is a possibility[1,27] collaborate with the woman, and an expert clinician about the ongoing plan of care.

Table 17. Initial assessment

Aspect	Consideration
History	• Review maternal serology and adequacy of treatment during pregnancy • Review placental histopathology and syphilis PCR[1] (if collected) o Most informative source for detection of *Treponemal pallidum*)
Clinical examination	• Physical examination[1,11,31] ideally performed by a neonatologist or paediatrician o Other healthcare providers in consultation with expert clinician • 60–90% babies with congenital syphilis are asymptomatic[8] at birth • Signs and symptoms often subtle, non-specific and variable (e.g. low birth weight, preterm birth)[22] • Usually appear by three months of age, most often by five weeks
Hepatomegaly 1,8,20-22,31	• Almost always present with congenital syphilis—may be associated with splenomegaly (but not splenomegaly in isolation) • May have abnormal liver function tests (LFT) • Associated with jaundice and cholestasis
Rhinitis[1,11,21,29]	• Usually during the first week of life and seldom after the third month • White nasal discharge, may be bloody (if secondary to mucosal erosion) or purulent (if secondary bacterial infection) • Nasal discharge contains spirochetes, is contagious and can transmit infection by direct contact (contact precautions required)
Rash[1,11,21,29]	• Usually appears one to two weeks after the rhinitis • Commonly presents with peeling of the hands and feet • Maculopapular consisting of small, initially red or pink spots • Progresses over 1–3 weeks, followed by desquamation, and crusting becoming dusky red or copper-coloured
Other signs[8,20-22]	• Generalised lymphadenopathy o Palpable epitrochlear lymphadenopathy is highly suggestive • Nonimmune fetal hydrops • Soft tissue swelling of the fingers and/or hands (dactylitis) • Skeletal abnormalities of long bones • Ophthalmologic manifestations (e.g. loss of eyebrows, chorioretinitis, uveitis, cataract, glaucoma and chancre of the eyelid) • Nephrotic syndrome (immune complex mediated, responsive to penicillin) • Gastrointestinal manifestations (e.g. rectal bleeding (from ileitis), necrotising enterocolitis, malabsorption) • Hearing deficit

4.2 Initial serology

In most cases, reactive serology represents passive transfer of maternal antibody.[54,55]

Table 18. Serology

Aspect	Consideration
Serology specimen	• Request *syphilis serology* including IgM • Test mother and baby syphilis serology in parallel[1,53,56] o Include mother's name on request form • Venepuncture preferable to heel prick collection o Do not use umbilical cord blood due to risk of false positive[21,31,56] o At least 0.5 mL of blood in serum separator tube (SST) -yellow top microtainer 600 microlitre • Full blood count (FBC), and electrolytes and liver function test (eLFT) (if sufficient blood collected/to reduce recollection venepuncture)
IgM	• IgM antibodies do not normally cross the placenta[57], therefore a positive IgM is strongly indicative of infection in the symptomatic baby (but is not diagnostic in isolation)[56] • Syphilis IgM is relatively insensitive for congenital syphilis o More likely positive if symptomatic and falsely negative if asymptomatic • Negative IgM does not exclude congenital syphilis
Dry swab and syphilis PCR	• Dry swab and request syphilis PCR of suspicious mucocutaneous lesions or body fluids identified on clinical examination[31]

4.3 Further investigations

Consult with an expert clinician about further investigations.

Table 19. Further investigations

Aspect	Consideration
Indication	• Clinical examination is abnormal • Syphilis serology or dry swab syphilis PCR are reactive • Placental investigations are suggestive of congenital syphilis • Inadequate maternal treatment
Serology[1]	• Full blood count (FBC), electrolytes and liver function tests (ELFT)[11,31] o Haematological abnormalities (e.g. anaemia[20], haemolysis, thrombocytopenia)
Cerebral spinal fluid (CSF)[1,11]	• CSF for nontreponemal test (VDRL), cell count and protein[11,21] • CSF abnormalities[58] o CSF pleocytosis (greater than 20–25 white blood cell/microL) for babies less than one month o Elevated CSF protein at less than one month of age[58]: ▪ Term baby greater than 8.3 mmol/L ▪ Preterm baby greater than 9.4 mmol/L • If abnormal CSF values, discuss findings and manage in consultation with an expert clinician o Consider the possibility of meningitis (e.g. Group B streptococcus, herpes simplex virus) o Repeat lumbar puncture not required unless baby exhibits persistent RPR serologic test titres at age 6–12 months
Radiography	• Recommend x-ray of chest and long bones • Abnormal long bone radiographs[11,21,31]—common manifestation (60–80%) o May be sole feature in a baby born to a woman with untreated syphilis • Usually present at birth but may appear in first few weeks of life • Characteristic abnormalities are: o Bilateral, symmetric and periosteal o Can affect multiple bones but most frequently femur, humerus and tibia • Abnormal chest x-ray—generalised infiltration involving all lung areas[31]
Other	• As advised by expert clinician (e.g. neuroimaging, ophthalmologic examination, auditory brain stem response)

4.4 Diagnosis of congenital syphilis

Diagnosis of congenital syphilis can be difficult as maternal reactive antibodies can be transferred through the placenta, complicating the interpretation of serologic tests for syphilis.

Involve QSSS (1800 032 238) and consult with an expert clinician about maternal and neonatal serology, results of additional investigations and to plan treatment and follow-up

Table 20. Diagnosis of congenital syphilis

Aspect	Criteria (as per CDNA case definitions[59])
Confirmed case[59]	• Mother and baby both seropositive by a treponemal specific test
	• AND one or more of the following: o Baby's RPR titre is four-fold or more higher than the maternal titre [1,29] o Direct demonstration of *Treponema pallidum* in blood, nasal discharge, placenta, umbilical cord, amniotic fluid, cerebrospinal fluid (CSF) o Detection of *Treponema pallidum* specific IgM in the baby
Probable case[59]	• Mother is seropositive by a treponemal specific test OR by *Treponema pallidum* specific rapid immunochromatography
	• AND one or more of the following: o Direct demonstration of *Treponema pallidum* as for confirmed case, but without serological confirmation in the baby o Baby seropositive on nontreponemal testing in the absence of IgM testing o A reactive cerebrospinal fluid (CSF) nontreponemal test (i.e. VDRL) in a non-traumatic lumbar puncture
	• AND one or more of the following: o Clinical features suggestive of congenital syphilis on physical examination or on radiograph of long bones o An elevated CSF cell count or protein without other cause o Maternal treatment inadequate during pregnancy
Less likely (all of)	• Baby's RPR is non-reactive at birth • Mother's RPR is o Non-reactive at birth OR o Serofast reactive at birth with adequate pre-pregnancy treatment history • Mother adequately treated • Normal clinical examination • Other investigations normal

4.5 Treatment for congenital syphilis

Table 21. Treatment of congenital syphilis

Aspect	Consideration
Antibiotic of choice	• Benzylpenicillin IV for 10 days o For regimen (doses and frequency) refer to QCG NeoMedQ *Benzylpenicillin*[60]
If difficult IV access	• If peripheral IV is difficult, consider umbilical or central venous catheter • If IV access not available: o Procaine penicillin IM daily for 10 days[1] o For regimen (doses and frequency) refer to NeoMedQ: *Procaine penicillin*[61]
Jarisch-Herxheimer reaction (JHR)	• Consider JHR if baby develops: o High grade fevers, irritability, tachypnoea, tachycardia, exacerbation of existing rash, chills[11] • Management is supportive/symptomatic therapy

4.6 Discharge of at risk baby

Review maternal and newborn serology results prior to discharge. If serology is reactive (mother or baby), discharge is not recommended prior to repeat testing and review of results. Follow local processes and pathways to maximise follow-up opportunities for the baby.[11]

Table 22. Discharge

Aspect	Consideration
Discharge advice	• Inform parents of the results of tests and implications for future health care • Advise parents of the importance of attending for all follow-up appointments and tests (including routine appointments as identified in the personal health record ('*red book*') • Provide parents with written documentation about syphilis test results, diagnosis (if known) and treatment (e.g. in the personal health record or as separate documentation if parents prefer) • Review woman's serology during previous pregnancies and consider whether there are other children who require testing
Establish community connections	• Discuss preferred community provider with the woman • Notify health care providers involved in follow-up, of discharge • Provide written advice of test results and treatment to relevant community health care providers (e.g. general practitioner (GP), child health nurse, Aboriginal and Torres Strait Islander health worker) and consider direct telephone contact • Consider outreach services for ongoing treatment of baby[4] o If appropriate, link woman in with Aboriginal and Torres Strait Islander Community Controlled Health Organisations for ongoing support

4.6.1 Precautionary single dose

A single dose of antibiotic is NOT adequate for treatment of congenital syphilis.

Table 23. Precautionary single dose at discharge

Aspect	Consideration
Indications	• May be considered (at the time of discharge) by an expert clinician if[31]: o Serological follow-up is indicated (congenital syphilis cannot be excluded with certainty) AND o There is concern about re-presentation/ability to follow-up • Refer to Table 20. Diagnosis of congenital syphilis
Antibiotic of choice	• Benzathine benzylpenicillin intramuscular injection (IM) once[3,29] o Refer to QCG NeoMedQ *Benzathine benzylpenicillin*[62]

4.7 Follow-up of at risk baby

Table 24. Possible congenital syphilis

Aspect	Consideration
Indicated	• If treated for congenital syphilis • If the possibility of congenital syphilis cannot be confidently excluded (i.e. does not meet criteria for 'less likely') o Refer to Table 20. Diagnosis of congenital syphilis
Potentially difficult follow-up	• If follow-up testing is potentially difficult: o Aim to repeat testing at least twice in the first six months of life (with at least four weeks between tests) [29] o Consider feasibility of testing at routine follow-up appointments (e.g. immunisation, infant health checks)
Clinical assessment	• Conduct a clinical assessment of the baby at each follow-up opportunity as clinical signs and symptoms may not be present at birth[11] o May be asymptomatic at birth and then develop symptoms within 3–8 weeks of life[11] o Refer to Table 17. Initial assessment • If initial CSF evaluations are abnormal o Repeat lumbar puncture not required unless baby exhibits persistent RPR titres at age 6–12 months
Serological testing	• Do not use treponemal tests to evaluate treatment response (results are qualitative) • RPR every 2–3 months • Retest at three months of age to exclude incubating syphilis o Continue three monthly until non-reactive • If at six months RPR is: o Nonreactive, no further testing required o Reactive, baby is likely infected and requires treatment (or further treatment)
Expected serology	• Passively acquired antibodies decline over time, and become undetectable at 12 to 18 months • Passive transfer of maternal IgG treponemal antibody may persist for more than 15 months[31] • In uninfected babies, a decline in antibody titres is usually seen by three months and are non-reactive by six months
Persistently reactive serology	• If at 6–12 months RPR in a treated baby remain reactive or there is no four-fold drop in serology o Manage in consultation with an expert clinician about re-treatment • Reassess baby, and as indicated and advised, consider: o Further investigations (e.g. CSF analysis for nontreponemal (VDRL), syphilis PCR, cell count and protein; long bone radiography; other tests)[29] o Retreatment with a 10-day course of benzylpenicillin[31] ▪ Refer to QCG NeoMedQ *Benzylpenicillin*[60]

References

1. Australasian Society for Infectious Diseases. Management of perinatal infections [Internet]. 2022 [cited 2024 September 20]. Available from: https://www.asid.net.au.
2. Queensland Clinical Guidelines. Position statement: Gender associated language. Guideline No. O24.79-1-V1-R29. [Internet]. Queensland Health. 2024. [cited 2024 November 20]. Available from: https://www.health.qld.gov.au/qcg.
3. Thean L, Moore A, Nourse C. New trends in congenital syphilis: epidemiology, testing in pregnancy, and management. Current Opinion in Infectious Diseases 2022;35(5):452-60. doi:10.1097/QCO.0000000000000875.
4. Queensland Maternal and Perinatal Quality Council. Congenital syphilis working group report [Internet]. 2023 [cited 2024 November 27]. Available from: https://www.clinicalexcellence.qld.gov.au.
5. Allan-Blitz L-T, Stafford I, Klausner JD. The rise of congenital syphilis as a public health emergency. O&G Open 2024;1(2):014. doi:10.1097/og9.0000000000000014.
6. Warzywoda S, Fowler JA, Nourse C, Wu M, Britton S, Rowling D, et al. Syphilis in pregnancy: a qualitative investigation of healthcare provider perspectives on barriers to syphilis screening during pregnancy in south-east Queensland. Sexual Health 2023;20(4):330-8. doi:10.1071/SH22193.
7. Cama E, Beadman K, Beadman M, Smith K-A, Christian J, Jackson AC, et al. Increasing access to screening for blood-borne viruses and sexually transmissible infections for Aboriginal and Torres Strait Islander Australians: evaluation of the Deadly Liver Mob program's 'cascade of care' across nine sites in New South Wales, Australia. Harm Reduct J 2023;20(1):125-. doi:10.1186/s12954-023-00850-6.
8. Tsai S, Sun MY, Kuller JA, Rhee EHJ, Dotters-Katz S. Syphilis in pregnancy. Obstetrical and Gynecological Survey 2019;74(9):557-64. doi:10.1097/OGX.0000000000000713.
9. Wan Z, Zhang H, Xu H, Hu Y, Tan C, Tao Y. Maternal syphilis treatment and pregnancy outcomes: a retrospective study in Jiangxi Province, China. BMC Pregnancy Childbirth 2020;20(1):648. doi:10.1186/s12884-020-03314-y.
10. World Health Organization. Syphilis [Internet]. 2023 [cited 2024 November 20]. Available from: https://www.who.int.
11. Lopez A, Purewal R. Congenital syphilis: an update. Current Treatment Options in Pediatrics 2023. doi:10.1007/s40746-023-00264-3.
12. Rowe CR, Newberry DM, Jnah AJ. Congenital syphilis: a discussion of epidemiology, diagnosis, management, and nurses' role in early identification and treatment. Advances in Neonatal Care 2018;18(6):438-45. doi:10.1097/ANC.0000000000000534.
13. Australian Living Evidence Collaboration. Pregnancy care guidelines (2.0 published on 22.03.2024) [Internet]. 2024 [cited 2024 September 20]. Available from: https://files.magicapp.org.
14. Queensland Public Health and Scientific Services. Syphilis in Queensland 2018-2023 [Internet]. 2023 [cited 2023 October 31].
15. Queensland Clinical Guidelines. Standard care. Guideline No. MN22.50-V2-R27. [Internet]. Queensland Health. 2022. [cited 2024 November 20]. Available from: https://www.health.qld.gov.au/qcg.
16. Queensland Health. Paterning with the woman who declines recommended care [Internet]. 2020 [cited 2024 September 26]. Available from: https://www.health.qld.gov.au.
17. Queensland Government. Public Health Regulation 2018 [Internet]. 2022 [cited 2024 September 20]. Available from: https://www.legislation.qld.gov.au.
18. Queensland Government. Public Health Act 2005 [Internet]. 2023 [cited 2024 September 20]. Available from: https://www.legislation.qld.gov.au.
19. Queensland Health. Patient Safety Health Service Directive: QH-HSD-032. Version 5.0 [Internet]. 2024 [cited 2024 November 27]. Available from: https://www.health.qld.gov.au.
20. Adhikari E. Syphilis in pregnancy. Obstetrics & Gynecology 2020;135(5):1121-35. doi:10.1097/AOG.0000000000003788.
21. Timmons P, Gada R. Syphilis in pregnancy. Obstetrics, Gynaecology & Reproductive Medicine 2020;30(11):356-8. doi:10.1016/j.ogrm.2020.09.001.
22. Uku A, Albujasim Z, Dwivedi T, Ladipo Z, Konje JC. Syphilis in pregnancy: the impact of "the great imitator". European Journal of Obstetrics & Gynecology and Reproductive Biology 2021;259:207-10. doi:10.1016/j.ejogrb.2021.01.010.
23. Australasian Society for HIV Viral Health and Sexual Health Medicine (ASHM). Bloodborne viruses and sexually transmissible infections in antenatal care [Internet]. 2022 [cited 2024 September 20]. Available from: https://www.ashm.org.au.
24. Centres for Disease Control and Prevention (CDC). Syphilis-CDC detailed fact sheet [Internet]. 2023 [cited 2024 September 20]. Available from: https://www.cdc.gov.
25. Queensland Health. Syphilis [Internet]. 2023 [cited 2023 July 10]. Available from: https://www.conditions.health.qld.gov.au.
26. Therapeutic Guidelines. Overview of management of syphilis–investigations for syphilis [Internet]. 2022 [cited 2024 September 20]. Available from: https://www.tgldcdp.tg.org.au.
27. Centers for Disease Control and Prevention. The diagnosis, management and prevention of syphilis: an update and review [Internet]. 2019 [cited 2024 September 20]. Available from: http://www.cdc.gov.
28. O'Byrne P, MacPherson P. Syphilis. British Medical Journal 2019;365:l4159-l. doi:10.1136/bmj.l4159.
29. Australian Centre for Disease Control. Syphilis CDNA national guidelines for public health units. Version 2.0 [Internet]. 2018 [cited 2024 November 26]. Available from: https://www.health.gov.au.
30. Therapeutic Guidelines. Pregnancy and congenital syphilis [Internet]. 2022 [cited 2024 September 20]. Available from: https://www.tgldcdp.tg.org.au.
31. Centres for Disease Control and Prevention. Sexually transmitted disease guidelines, 2021. Morbidity and Mortality Weekly Report 2021;70(4),
32. Bristow CC, Klausner JD, Tran A. Clinical test performance of a rapid point-of-care syphilis treponemal antibody test: a systematic review and meta-analysis. Clinical Infectious Diseases 2020;71(Supplement_1):S52-S7. doi:10.1093/cid/ciaa350.
33. Rogozińska E, Kara-Newton L, Zamora JR, Khan KS. On-site test to detect syphilis in pregnancy: a systematic review of test accuracy studies. British Journal of Obstetrics & Gynaecology 2017;124(5):734-41. doi:10.1111/1471-0528.14455.
34. Oswal S, Lyons G. Syphilis in pregnancy. Continuing Education in Anaesthesia, Critical Care & Pain 2008;8(6):224-7. doi:10.1093/bjaceaccp/mkn042.
35. Health Equity Matters. Better to know [Internet]. n.d. [updated 2024 September 20]. Available from: https://www.bettertoknow.org.au
36. Melbourne Sexual Health Centre. Let them know [Internet]. 2024 [updated 2024 September 20]. Available from: https://www.letthemknow.org.au
37. Marshall AO. Update on syphilis for women's health nurses. Nursing for Womens Health 2020;24(2):127-33. doi:10.1016/j.nwh.2020.01.009.
38. Kingston M, French P, Higgins S, McQuillan O, Sukthankar A, Stott C, et al. UK national guidelines on the management of syphilis 2015. International Journal of STD & AIDS 2016;27(6):421-46. doi:10.1177/0956462415624059.
39. Hicks. Syphilis: epidemiology, pathophysiology, and clinical manifestations in patients without HIV. 2023. UpToDate Inc. Waltham MA. [Internet] [cited 2023 July 10]. Available from: https://www.uptodate.com.

40. Blencowe H, Cousens S, Kamb M, Berman S, Lawn JE. Lives Saved Tool supplement detection and treatment of syphilis in pregnancy to reduce syphilis related stillbirths and neonatal mortality. BioMedical Central Public Health 2011;11 Suppl 3:S9. doi:10.1186/1471-2458-11-S3-S9.
41. Genc M, Ledger WJ. Syphilis in pregnancy. Sexually Transmitted Infections 2000;76(2):73-9.
42. Rac MW, Revell PA, Eppes CS. Syphilis during pregnancy: a preventable threat to maternal-fetal health. American Journal of Obstetrics & Gynecology 2017;216(4):352-63. doi:10.1016/j.ajog.2016.11.1052.
43. Johnson CT, Sheffield JS. Congenital syphilis. In: Copel JA, D'Alton ME, Feltovich H, Gratacós E, Krakow D, Odibo AO, et al, editors. Obstetric Imaging: Fetal Diagnosis and Care [Internet] second ed: Elsevier; 2018. p. 688-92.e1. [cited 2023 June 26].
44. Australian Injectable Drugs Handbook 9th edition. Benzathine benzylpenicillin [Internet]. 2024 [cited 2023 June 15]. Available from: https://www.aidh.hcn.com.au.
45. Therapeutic Guidelines. Diagnosis of antimicrobial hypersensitivity [Internet]. 2019 [cited 2024 September 20]. Available from: https://www.tgldcdp.tg.org.au.
46. Australian Medicines Handbook. Doxycycline. [Internet]. Adelaide 2024 [cited 2024 September 20]. Available from: https://www.amhonline.amh.net.au.
47. Australian Medicines Handbook. Tetracyclines. [Internet]. Adelaide 2024 [cited 2024 September 20]. Available from: https://www.amhonline.amh.net.au.
48. Dhakal A SE. Jarisch-Herxheimer reaction. In: StatPearles. [Internet]. Treasure Island Florida; 2023. [cited 2024 September 20]. Available from: https://www.ncbi.nlm.nih.gov.
49. Macumber S, Singh AE, Gratrix J, Robinson JL, Smyczek P, Rathjen L, et al. Retrospective cohort study of the incidence and outcomes of Jarisch-Herxheimer reactions after treatment of infectious syphilis in late pregnancy. Sexually Transmitted Diseases 2022;49(10):e107-e9. doi:10.1097/OLQ.0000000000001610.
50. Queensland Clinical Guidelines. Consumer information: syphilis and pregnancy. Guideline No. C24.44-1-V3-R29. [Internet]. Queensland Health. 2024. [cited 2024 November]. Available from: https://www.health.qld.gov.au/qcg.
51. Queensland Clinical Guidelines. Consumer information: syphilis in pregnancy and Jarisch-Herxheimer reaction (JHR) consumer information. Guideline No. C24.44-2-V3-R29. [Internet]. Queensland Health. 2024. [cited 2024 November]. Available from: https://www.health.qld.gov.au/qcg.
52. Sheffield JS, Sanchez PJ, Morris G, Maberry M, Zeray F, McIntire DD, et al. Congenital syphilis after maternal treatment for syphilis during pregnancy. American Journal of Obsterics & Gynecology 2002;186(3):569-73.
53. Queensland Maternal and Perinatal Quality Council (QMPQC). QMPQC Report 2021 [Internet]. 2023 [cited 2023 July 7]. Available from: https://www.clinicalexcellence.qld.gov.au.
54. Kelly M, Hendry S, Norton R. The utility of the syphilis enzyme immunoassay IgM in the diagnosis of congenital syphilis. Diagnostic microbiology and infectious disease 2020;98(3):115152-. doi:10.1016/j.diagmicrobio.2020.115152.
55. Phiske MM. Current trends in congenital syphilis. Indian Journal of Sexually Transmitted Diseases 2014;35(1):12-20. doi:10.4103/0253-7184.132404.
56. Satyaputra F, Hendry S, Braddick M, Sivabalan P, Norton R. The laboratory diagnosis of syphilis. Journal of Clinical Microbiology 2021;59(10). doi:10.1128/jcm.00100-21.
57. Arnold SR, Ford-Jones EL. Congenital syphilis: a guide to diagnosis and management. Paediatr Child Health 2000;5(8):463-9. doi:10.1093/pch/5.8.463.
58. Cooper JM, Sánchez PJ. Congenital syphilis. Seminars in Perinatology 2018;42(3):176-84. doi:10.1053/j.semperi.2018.02.005.
59. Communicable Diseases Network Australia (CDNA). Syphilis (congenital) Australian national notifiable diseases case definition [Internet]. 2024 [cited 2024 November 26]. Available from: https://www.health.gov.au.
60. Queensland Clinical Guidelines. NeoMedQ Benzylpenicillin. Guideline No. NMedQ20.13-V5-R25. [Internet]. Queensland Health. 2020. [cited 2024 January 25]. Available from: https://www.health.qld.gov.au/qcg.
61. Queensland Clinical Guidelines. Procaine penicillin. Guideline No. NMedQ24.117-V1-R29. [Internet]. Queensland Health. 2024. [cited 2024 September 19]. Available from: https://www.health.qld.gov.au/qcg.
62. Queensland Clinical Guidelines. NeoMedQ Benzathine benzylpenicillin. Guideline No. NeoMedQ24.114-1-R29. [Internet]. Queensland Health. [cited 2024 November]. Available from: https://www.health.qld.gov.au/qcg.

Appendix A: Interpretation of results

Interpretation of results can be complex. Discuss results with an expert clinician or QSSS.

Test type	Consideration
Nontreponemal tests	• Reported as a titre (e.g. 1:2; 1:8, 1:64) which corresponds to the highest dilution factor that still yields a positive result o Greater than 1:8 usually indicates active disease and the need for treatment o Less than or equal to 1:8 does not exclude infectious syphilis, particularly if clinical signs suggestive of syphilis or adequate treatment of syphilis not documented • Detect anti-lipid immunoglobulin M or G (IgM or IgG) antibodies which can also be produced in other conditions, therefore not highly specific for syphilis • Usually becomes reactive within three to four weeks post infection • In Queensland includes: o Macroscopic rapid plasma reagin (RPR) on serum o Microscopic venereal disease research laboratory (VDRL) ▪ Pathology Queensland performs VDRL only on CSF although other private laboratories may perform on serum
Treponemal specific tests	• Reported as reactive or non-reactive • Detect antibodies against treponemal specific antigens, therefore highly specific for syphilis o Do not differentiate venereal syphilis from non-venereal syphilis (e.g. yaws, bejel and pinta) o Do not distinguish between current syphilis infection and previous treated or untreated infection • Usually become reactive within two to four weeks post infection • Usually remain reactive (85%) for life regardless of treatment
Direct detection (demonstration) test	• Detects the presence or absence of treponemes in the exudate from lesions of primary, secondary or early congenital syphilis • In Queensland includes: o Nucleic acid amplification tests (NAAT) using polymerase chain reaction (PCR) on dry swab of lesion
Serological activity of syphilis	• Nontreponemal titre at diagnosis helps: o Stage infection o Provides a baseline to assess response to treatment
Syphilis EIA IgM on newborn sera	• Can be falsely negative in the asymptomatic infected baby and does not exclude a diagnosis of congenital syphilis • Main utility is in confirming a clinical diagnosis in a baby with relevant history, maternal RPR and clinical presentation
Monitoring effect of treatment	• Nontreponemal test (RPR) o Expected to decrease following effective treatment and may increase in untreated active infection o A sustained four-fold or greater increase using the same testing method (preferably tested in parallel with the original specimen) suggests re-infection or treatment failure (e.g. from 1:4 to 1:16) o A four-fold fall in titre within six to 12 months after treatment suggests an adequate response o Serofast reactive titres may occur despite adequate treatment particularly if titre high or late diagnosis • Treponemal tests may be negative before a chancre develops and may be negative for up to two weeks afterwards

Acknowledgements

Queensland Clinical Guidelines gratefully acknowledge the contribution of Queensland clinicians and other stakeholders who participated throughout the guideline development process particularly:

Working Party Clinical Lead

Professor Clare Nourse, Paediatric Infection Specialist Queensland Children's Hospital
Dr Diane Rowling, Sexual Health/Public Health Physician Sexual Health, Metro North Public Health Unit
Dr Huda Safa, Obstetrician, Mater Mothers' Hospital
Dr Lizelle Weber, Director of Neonatology, Sunshine Coast University Hospital

QCG Program Officer

Ms Stephanie Sutherns
Ms Jacinta Lee

Working Party Members

Dr Sumudu Brittan, Infectious Diseases Specialist, Royal Brisbane and Women's Hospital
Dr Melissa (Meg) Cairns, General Practitioner Liaison Office, Brisbane North Primary Health Network
Professor Leonie Callaway, Obstetric Medicine Physician, Royal Brisbane and Women's Hospital
Ms Phillipa Cole, Senior Project Officer, Aboriginal and Torres Strait Islander Leadership Team, Metro North Hospital and Health Service
Ms Suzanne Connor, Tropical Public Health Nurse, Cairns
Dr Jocelyn Domingo-Bates, Neonatologist, Mater Mothers' Hospital
Dr Petrina Duncan, Obstetrician & Gynaecologist, Royal Brisbane and Women's Hospital
Ms Katie Edmondson, Nurse Navigator Women's Reproductive Health, Townsville University Hospital
Ms Lucinda Evans, Senior Clinical Pharmacist, Mater Health
Dr Caroline Harvey, Senior General Practitioner (Sexual and Reproductive Heath), Institute for Urban Indigenous Health
Ms Sylvia Khan, Identified Senior Social Worker, Waijungbah Jarjums Maternal & Child Health, Gold Coast University Hospital
Ms Jemma Manwaring, Consumer Representative, Maternity Consumer Network
Ms Elena McLeish, Public Health Nurse, Metro North Hospital and Health Service
Dr Arun Menon, Sexual Health Physician, Townsville University Hospital
Dr Katie Panaretto, Public Health Physician, Office of the Chief First Nations Office
Ms Catherine Spucches, Principal Public Health Officer, Communicable Diseases Branch Queensland Health
Ms Deborah Sutherland, Clinical Midwife, Caboolture Hospital
Ms Emma Turner, Clinical Midwifery/Nurse Consultant, Sunshine Coast University Hospital
Dr Vikram Vaska, Microbiologist/Infectious Diseases Specialist, Mater Hospital
Dr Alicia Veasey, Obstetrician & Gynaecologist, Co-chair Aboriginal &Torres Strait Islander Clinical Network

Queensland Clinical Guidelines Team

Professor Rebecca Kimble, Director
Ms Jacinta Lee, Manager
Ms Stephanie Sutherns, Clinical Midwife Consultant
Ms Cara Cox, Clinical Midwife Consultant
Ms Jacqueline Plazina, Clinical Nurse Consultant
Ms Leah Vekve, Clinical Midwife Consultant
Ms Jillian Clarke, Clinical Midwife Consultant
Ms Liz Milroy, Clinical Midwife Consultant
Ms Melissa Johnson, Clinical Nurse Consultant
Steering Committee

Funding

This clinical guideline was funded by Healthcare Improvement Unit, Queensland Health