Guidelines for the investigation and treatment of infants at risk of congenital syphilis in the Northern Territory

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Copies available from

Centre for Disease Control
Department of Health & Community Services
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Casuarina NT 0811

Comments are welcome and should be directed to the Project/Research officer at the above address.

Further Centre for Disease Control publications available at:
These guidelines were first instituted in 1998, based on original guidelines by Dr Alan Ruben in July 1994, and the review process was commenced by Drs Steven Skov and Ingrid Bucens in November 2001. They have been the subject of a recent working party in Alice Springs, both to consolidate one protocol in use throughout the Northern Territory (NT) and to complement the CARPA Standard Treatment Manual 4th edition (2003) for the management of congenital syphilis.

The main aim of the review was to clarify and simplify both the risk categories and the management of congenital syphilis in infants. With this in mind, the working party have elected to minimise the investigative procedures, eliminating those which are considered to contribute little to the management of individual cases and have the potential to be misleading.

The management guidelines are also predicated on the fact that most Centres for Disease Control in the NT hold extensive local syphilis databases, and are well placed to advise on diagnosis, management and follow-up.

Both the World Health Organisation and Centre for Disease Control (USA) guidelines on the management of Congenital Syphilis were consulted in developing these guidelines.

Revised November 1998, updated April 1999, revised draft October 2003

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Our thanks to Dr Grace Chang, Principle Medical Scientist, Head of Serology, Infectious Diseases Laboratories, IMVS, SA; Dr Gavin Hart, Department of Health Services, SA, for their invaluable contributions.
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Investigation and management of congenital syphilis in the NT

Overview

- The diagnosis of congenital syphilis is complex and there is no single “gold standard” test.
- The majority of affected infants are asymptomatic at birth.
- Neonatal risk is determined principally by maternal serology during pregnancy or at delivery and her previous history, if any, of syphilis management.
- The local Sexual Health and Blood Borne Viruses (SHBBV) Unit / Centre for Disease Control (CDC) can assist with history of past maternal test results and treatment and advice in interpretation.
- The protocol for syphilis testing in pregnancy in high prevalence populations is syphilis serology at first visit, 28-32 weeks gestation and at delivery.
- For low prevalence populations, syphilis serology should be performed at least once during pregnancy.
- No child should leave hospital if the syphilis serostatus of the mother is not known.

Categorise neonatal risk status

- No risk
- Low risk
- High risk

Investigate and treat appropriately

Notify all low and high risk infants to local CDC

CDC to arrange follow up as needed
Interpreting syphilis serology

Interpreting syphilis serology can be complex. It requires knowledge of:

- Current clinical information
- The latest serology result
- The previous serology result
- Previous treatment information

Getting help

Much of the above information will be held in the regional CDC syphilis databases. Occasionally extra information from community health centres will be needed. Assistance in gathering community based information, interpreting results and arranging follow up is available from the SHBBV unit in the local CDC.

<table>
<thead>
<tr>
<th>CONTACT</th>
<th>PHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head of Sexual Health and Blood Borne Virus Unit</td>
<td>89228606</td>
</tr>
<tr>
<td>Darwin Remote Team Coordinator</td>
<td>89228005</td>
</tr>
<tr>
<td>Darwin Clinic 34 Medical Officer</td>
<td>89992681</td>
</tr>
<tr>
<td>Katherine CDC Medical Officer</td>
<td>89379402</td>
</tr>
<tr>
<td>Katherine CDC STD clinic nurse</td>
<td>89379406</td>
</tr>
<tr>
<td>Alice Springs Clinic 34 Medical Officer</td>
<td>89517519</td>
</tr>
<tr>
<td>Alice Springs STD clinic coordinator</td>
<td>89517551</td>
</tr>
<tr>
<td>Alice Springs Syphilis Information System coordinator</td>
<td>89517552</td>
</tr>
<tr>
<td>Gove CDC</td>
<td>89870356</td>
</tr>
<tr>
<td>Tennant Creek CDC</td>
<td>89624250</td>
</tr>
</tbody>
</table>

Syphilis serology

There are 2 types of serology tests routinely done of which the results of both need to be known. Only blood from mother and the child should be used. *Cord blood should not be used* because of the possibility of mixing of maternal and fetal circulations.
Treponemal tests (eg TPHA, TPPA, EIA, FTA-Abs) are reported as either reactive or non-reactive. Once reactive, they usually remain reactive for life even if the person is adequately treated. They indicate whether a person has ever had syphilis in their life and do not reflect current disease activity.

Non-treponemal tests (eg RPR or VDRL) are reported as a titre (eg 1:1, 1:2, 1:4, … 1:32 etc). They have a moderate false positive rate and need to be confirmed by a reactive treponemal test. They may revert to non-reactive after treatment, may revert to non-reactive after many years even without treatment, or may never revert to non-reactive even with treatment. They are used to ascertain disease activity. Briefly, a 2 titre rise over a previous result (eg 1:2 increasing to 1:8) would indicate a new infection. A 2 titre fall after treatment (eg 1:32 going down to 1:8) would indicate an adequate response to treatment. Sometimes in late latent syphilis (ie of more than 2 years duration) a 2 titre fall after treatment from an already low level may not occur.

Testing specimens in parallel

Non-treponemal tests (RPR) are read by comparing agglutination in wells containing different dilutions of serum. The titre reported for non-treponemal tests can vary with different test reagent batches and according to different observers. Most laboratories will keep sera on individual patients for 12-18 months. If there is any doubt about comparing the latest test with the past one, ask the laboratory to re-run the 2 specimens in parallel. This will mean both sera are tested and read under the same conditions and the observation of a difference in titre between them will be more reliable.

Adequate treatment in pregnancy

Certain decisions in the management of possible congenital syphilis depend on whether there was adequate treatment during the pregnancy. This requires several things.

- Penicillin (either aqueous crystalline penicillin G, benzathine penicillin G or procaine penicillin G) is the only drug that reliably treats syphilis during pregnancy. Treatment with any other medication is not “adequate”.
- Treatment must be completed at least 30 days prior to the birth of the child.
- An adequate serological response to treatment must be seen prior to or at delivery (early syphilis: decline in RPR of at least 2 titres or ≥ 4-fold when pre and post treatment sera tested in parallel; late latent syphilis: if no reduction in RPR then maintain low stable titre through to delivery).
Assessment and management

**If there has been no or inadequate antenatal care, venous blood should be collected from mother and baby at delivery and they should both remain in hospital until results are available.**

### A  NO RISK INFANTS

*Mother who have never had syphilis*
- Treponemal tests and RPR negative throughout pregnancy and at delivery.

*Mother who have had adequately treated syphilis before pregnancy and who have not been re-infected*
- Mother seropositive but with documented adequate treatment and adequate response to treatment prior to pregnancy (ie at least fourfold or 2 titre fall in RPR).
- All antenatal and delivery pathology investigations performed and results verified.
- All RPRs during pregnancy and at delivery, are stable (within 1 titre) and no higher than 1:4.
- There is no suspicion or risk of infection late in pregnancy (as far as can be ascertained).

**Investigations**
- Physical examination of child.
- No laboratory investigations are required.

**Management of no risk infants**

If no indication of congenital syphilis on physical examination (see appendix I):
- No treatment.
- No follow-up (unless there is some suspicion of re-infection late in pregnancy).

If clinical signs of congenital syphilis then re-classify as high risk (see below).
B  LOW RISK INFANTS

Mother treated adequately for syphilis during pregnancy

- Treated with appropriate doses of penicillin.
- Treatment completed at least 30 days before the baby is born.
- Documented adequate response to treatment prior to or at delivery (early syphilis: decline in RPR of at least 2 titres or $\geq 4$-fold when pre and post treatment sera tested in parallel; late latent syphilis: if no reduction in RPR then maintain low stable titre through to delivery).

Investigations

- Full physical examination of child.
- Syphilis serology, ie RPR and specific treponemal test (eg TPPA, EIA), performed on mother and child’s venous blood (not cord blood).

Management

- If the child’s RPR $\geq 4$ times maternal RPR or physical examination suggestive of congenital syphilis then reclassify as high risk (see below).

- If the child’s RPR $< 4$ times maternal RPR and physical examination normal then child is low risk and congenital syphilis unlikely (although not completely excluded).

Give treatment: single dose IMI benzathine penicillin at 37.5mg/kg (50,000 units/kg).

Complete congenital syphilis register form (see below) and send to the local SHBBV/CDC unit in the district.

Follow-up: clinical examination and review at 3 months by local medical officer and again at 6 months with syphilis serology on child: ie specific treponemal test (eg TPPA, EIA) and RPR and clinical examination. Follow up to be coordinated by the local SHBBV/CDC unit.
C  HIGH RISK INFANTS

Child re-classified from no risk or low risk to high risk (see above).

Mother seropositive during pregnancy and any one or more of the following:
♦ clinical examination of child suggestive of congenital syphilis.
♦ child’s RPR on venous specimen $\geq 4$ times titre of mother at delivery.
♦ maternal treatment during pregnancy was uncertain, absent, inadequate or with a non-penicillin regimen.
♦ maternal treatment was not completed 30 days before delivery.
♦ maternal treatment completed but no adequate serological response to treatment documented prior to or at delivery.
♦ maternal re-infection post-treatment likely (eg partner not treated).

Investigations
♦ Full physical examination of child.
♦ Syphilis serology, ie RPR and specific treponemal test (eg TPPA, EIA), performed on mother and child’s venous blood (not cord blood).
♦ A lumbar puncture should be considered only if the child has symptoms or signs of congenital syphilis.

NB: Concerning lumbar punctures: Making the diagnosis of congenital neurosyphilis requires interpretation of several CSF parameters and is extremely complex. If the CSF is at all blood stained, interpretation of its serology is unreliable. If an LP is necessary the child should be transported to a centre where it can be safely and competently performed and the specimens dealt with appropriately.
Management

Regardless of the result of any tests, all high risk infants should be immediately treated with benzyl penicillin 50mg/kg/dose IV 12 hourly for 10 days

In equivocal circumstances, and after consultation with a senior paediatrician, ID physician and consultant microbiologist, other investigations may be considered as clinically indicated but should not delay this treatment. These might include:

- Lumbar puncture (VDRL, TPPA or FTA-Abs, cell count and protein level).
- Long bone X-rays.
- Darkground microscopy of foetal/placental tissue (if available).
- Histopathology of umbilical cord.
- PCR testing of amniotic fluid, placenta or cord.

If, as a result of these investigations being normal, and after consultation with a senior paediatrician, ID physician and consultant microbiologist the child may be reclassified as low risk, the IV medication can be ceased and a single dose of benzathine penicillin given instead.

Complete congenital syphilis register form (see below) and send to the local SHBBV/CDC unit in the district.

Follow-up: clinical examination and review at 3 months by local medical officer; clinical review by a paediatrician is mandatory at 6 months with syphilis serology on child: ie specific treponemal test (eg TPPA, EIA) and RPR and clinical examination.

A lumbar puncture should only be considered if one was performed at birth and was consistent with neurosyphilis. Follow up to be coordinated by the local SHBBV/CDC unit.
Follow up of high and low risk infants

- Low and High risk children should have a clinical examination by a local medical officer at 3 months and serology (RPR and Treponemal test) and repeat examination at 6 months of age. High risk children must be reviewed by a paediatrician at 6 months.
- In the absence of congenital syphilis or if congenital syphilis was adequately treated, the non-treponemal test (RPR) should be non-reactive by 6 months of age. Occasionally it may persist longer in infants treated after the neonatal period.
- Treponemal tests may remain reactive in a child due to the persistence of maternal antibodies for as long as 12 months. If the treponemal test in a child is reactive at 12 months of age it is indicative of congenital syphilis.
- Follow-up coordinated by the SHBBV/CDC unit will continue until the child is seronegative.

Table 1: Interpretation and action after serology at 6 months in low and high risk infants

<table>
<thead>
<tr>
<th>Results at 6 months of age</th>
<th>Interpretation and Actions</th>
</tr>
</thead>
</table>
| RPR and treponemal test non-reactive and clinical examination normal | Either no congenital syphilis or adequately treated congenital syphilis  
No further action                                                                 |
| RPR reactive, treponemal test reactive, clinical examination normal | Requires further assessment: consult with senior paediatrician and senior specialist at SHBBV/CDC Unit in Darwin or Alice Springs |
| RPR reactive, treponemal test non reactive, clinical examination normal | Probably false positive RPR: consult with local SHBBV/CDC unit                              |
| Clinical examination suggestive of congenital syphilis       | Requires further assessment: consult with senior paediatrician and senior specialist at SHBBV/CDC Unit in Darwin or Alice Springs |
Appendix I:

Symptoms and signs of early congenital syphilis

A wide spectrum of severity exists. Usually symptoms appear between 3 weeks and 3 months. Only severe cases are clinically apparent at birth

- may cause prematurity, intra uterine growth retardation (IUGR) and low birth weight
- sero-sanguinous nasal discharge (“snuffles”)
- skin lesions: extremely variable – macular, papular, scaling, annular, vesicobullous, desquamation, paronychia, mucous patches, condylomata lata
- hepato-splenomegaly, jaundice, lymphadenopathy (especially epitrochlear)
- anaemia (haemolytic), leucocytosis, leucopenia, thrombocytopenia
- osteochondritis (usually perinatal) or periostitis (may take months), “pseudoparalysis” of Parot (secondary to pain or fractures) affecting long bones, cranium, ribs and spine
- CNS: mostly asymptomatic but may cause leptomeningitis, hydrocephalus etc
- chorioretinitis, uveitis and glaucoma
- nephrotic syndrome and pancreatitis
- “sepsis” syndrome
Appendix II:

Rationale for Investigation and Management of Congenital Syphilis in the NT

**Congenital syphilis in the NT**

Syphilis is a common infection in the NT with rates of infection far in excess of that of the rest of Australia. In 2003 there were 324 cases of syphilis giving a rate of 158 per 100,000 compared to the Australian rate of 8.9 per 100,000\(^1\). Congenital syphilis is also relatively common and clinicians need to be constantly aware of the potential for it. There is great variability in the notification of both congenital and non-congenital syphilis from year to year as seen in Table 1. No data is readily available concerning whether these cases were symptomatic, early or late cases. It is difficult to interpret these trends as notifications are influenced by the occurrence of disease in the community, the amount of general screening performed, the effectiveness of antenatal care programs and the notification behaviour of clinicians.

**Table 2: Syphilis and congenital syphilis notifications in the NT\(^1\)**

<table>
<thead>
<tr>
<th></th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
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<tbody>
<tr>
<td>Cong syphilis</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>13</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Non cong Syphilis</td>
<td>335</td>
<td>339</td>
<td>280</td>
<td>400</td>
<td>425</td>
<td>315</td>
<td>289</td>
</tr>
</tbody>
</table>

During these years, 37/49 (75.5%) of the cases of congenital syphilis were notified from the Alice Springs region. In contrast only 46.4% of all non-congenital cases occurred in that region (p < 0.01). There are higher rates of syphilis in the Alice Springs region, but the local Sexual Health Unit’s very close liaison with the hospital may also give rise to a greater degree of notification.

\(^1\) NT Notifiable Disease Database
The protocol

The NT management guidelines are largely based on the US CDC and World Health Organisation treatment guidelines with some modification for NT conditions. The particular conditions in the NT that lead to these changes are:

- High rates of syphilis and large numbers of seropositive pregnant women mainly in remote communities.
- High mobility of patients in remote communities and difficulties in follow-up.
- Lack of immediate access to specialised tests for direct detection of *Treponema pallidum*.
- The lack of specialist paediatric care and certain laboratory facilities outside of Darwin and Alice Springs.

Central to the control of congenital syphilis is its early detection and treatment in antenatal care programs. All health services that provide such programs to high prevalence populations in the NT follow the antenatal screening program as laid out in the Congress Alukura / Nganampa Health Council Women’s Business Manual. This involves performing syphilis serology at the first visit, early third trimester (28-32 weeks) and at delivery. For low prevalence populations, it is recommended that all women have at least 1 syphilis serology performed at some time during their pregnancy and that no child leave hospital without the result of this serology being known.

When the child is born, the point of first assessment concerning congenital syphilis is the mother’s serology at delivery. If she is seropositive then her history of previous serology and treatment if any are taken into account along with a physical examination of the child. Depending on this assessment syphilis serology may be performed on the child. Cord blood serology is not performed because of difficulties that arise in interpretation of results due to mixing of maternal and fetal circulations. The child is then classified as either no risk, low risk or high risk.

**No risk**

Children born to mothers who have no serological evidence of ever having had syphilis are considered to be “no risk”.
Guidelines for the investigation and treatment of infants at risk of congenital syphilis in the NT

A child is also considered “no risk” if the mother is seropositive but there is clearly documented evidence of adequate treatment and response to treatment before the pregnancy, the full regimen of antenatal screening and nothing to suggest there may have been a late infection.

Children in the “No risk” category have a physical examination and if that is normal no further investigation or follow up is performed. This is consistent with US CDC guidelines.

A caveat concerning this classification is that there is always the remote possibility of the mother becoming infected after the last test in those who are not tested at birth or of a late infection where a test at birth is done before seroconversion has occurred. However, this appears to be a rare event.

**Low risk**

This grouping contains children whose mother was treated for syphilis during pregnancy. If the mother’s treatment and response to treatment are clearly documented and considered adequate and the child’s examination and serology give no indication of likely infection, the child is considered to be “low risk”.

These children are examined and have syphilis serology performed at birth. If neither of these indicate infection, no further investigations are performed, and the child is treated with a single injection of benzathine penicillin.

The criteria for making these judgements and recommended actions are fully consistent with the US CDC guidelines.

Children in this category are to be followed up with a clinical examination by a local medical officer at 3 months of age with repeat examination and serology at 6 months of age. Hospitals will notify the case to the local SHBBV/CDC unit which will then ensure that follow up is performed in the community. If the treponemal serology is positive at 6 months of age, a more detailed assessment will take place.

**High risk**

This group contains children

a) who have clinical or laboratory evidence of being affected, or
b) who do not have direct clinical or laboratory evidence of infection themselves but whose mother was not treated before or during pregnancy or whose treatment or response to treatment was inadequate.

The protocol recommends that all these children receive a full course of 10 days intravenous penicillin therapy.

On the basis of discussions with paediatricians and sexual health program staff throughout the NT, the approach is to provide full treatment but not routinely offer the full suite of other investigations and in particular to not routinely perform a lumbar puncture (LP). The reasons for this are:

- only in Alice Springs and Darwin is there the regular capacity to perform an LP in neonates,
- LP specimens are frequently contaminated with blood which renders them uninterpretable for this purpose,
- because of the variation in CSF protein and cell counts that occurs in neonates, results are often difficult to interpret, and
- the results would rarely affect the decision to provide full treatment to the child.

Similarly, given the decision to offer full treatment, no other investigations (eg long bone X rays) are recommended as a routine. The protocol refers to several investigations that might be performed if clinically indicated.

The protocol also refers to the discretion of senior specialists to perform a range of investigations (which might include LP) which, if all were completely normal, might justify treatment with a single injection of benzathine penicillin and close follow up instead of 10 days of intravenous therapy. However, the nature of the consultations were that this would be exceptional and that the usual management of high risk children would be 10 days of therapy regardless of the results of examination and investigation.

Children in the high risk category are to be followed up with a clinical examination by a local medical officer at 3 months of age. At 6 months of age serology will be performed and the child
examined by a paediatrician. Hospitals will notify the case to the local SHBBV/CDC unit which will then ensure that follow up is performed in the community.

It is in relation to the investigations performed in “high risk” children that the NT protocol diverges slightly from the US CDC guidelines. The essential point of difference is that the US guidelines advocate that children with direct evidence of being affected (clinical signs, child’s RPR $\geq 4$ fold that of the mother or direct detection of $T. pallidum$) should have a lumbar puncture performed. In other respects the NT protocol is virtually identical.

**Bibliography**


Appendix III

**Congenital Syphilis Register**

**NOTIFICATION SHEET**

Please send via internal mail to: CDC in your local district

<table>
<thead>
<tr>
<th>RDH</th>
<th>KDH</th>
<th>GDH</th>
<th>TCH</th>
<th>ASH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notifying Doctor: ................................................. Date: ___ / ___ / ___

(If available, affix hospital stickers below, child on left, mother on right)

<table>
<thead>
<tr>
<th>Child’s name:</th>
<th>Mother’s name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s DOB: ___ / ___ / ___</td>
<td>Mother’s DOB: ___ / ___ / ___</td>
</tr>
<tr>
<td>HRN: ..........................................................</td>
<td>HRN: ..........................................................</td>
</tr>
</tbody>
</table>

Address/Community: ....................................................................................................................

Date of first day of child’s treatment: ___ / ___ / ___

Six month follow-up mentioned in discharge letter: Yes ☐ No ☐

<table>
<thead>
<tr>
<th>Risk status and Treatment given</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ high risk,</td>
</tr>
<tr>
<td>ie benzyl penicillin 50mg/kg/dose IV 12/24 for 10 days</td>
</tr>
<tr>
<td>☐ low risk,</td>
</tr>
<tr>
<td>ie benzathine penicillin 37.5mg/kg IM stat</td>
</tr>
<tr>
<td>☐ other, please specify</td>
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Drug: .................................................................................................................................

<table>
<thead>
<tr>
<th>IM</th>
<th>IV</th>
<th>oral</th>
</tr>
</thead>
</table>

Length of course .......... days

Mother’s serology

<table>
<thead>
<tr>
<th>Date test</th>
<th>Trep test</th>
<th>RPR</th>
</tr>
</thead>
</table>

Child’s serology

<table>
<thead>
<tr>
<th>Date test</th>
<th>Trep test</th>
<th>RPR</th>
</tr>
</thead>
</table>

Lumbar puncture on infant: Yes ☐ No ☐

If yes, results:

<table>
<thead>
<tr>
<th>RBC Count</th>
<th>WCC</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TPPA ....... VDRL ..............
ASSESSMENT AND MANAGEMENT OF CONGENITAL SYPHILIS

ASSESS MATERNAL STATUS AT DELIVERY; if seronegative, baby remains “No risk”

TREATED PRIOR TO PREGNANCY AND ALL OF THE FOLLOWING
- Documented adequate treatment and response prior to pregnancy and
- All antenatal and delivery tests performed this pregnancy and
- All RPRs during pregnancy and at delivery, are stable and no higher than 1:4 and
- No risk of reinfection late in pregnancy

MOTHER TREATED ADEQUATELY FOR SYPHILIS DURING PREGNANCY
- Treatment with adequate penicillin regime completed 30 days before delivery and
- No possibility of reinfection (e.g., partner treated) and
- 2 titre drop in RPR or maintaining low stable titre after treatment (Late Latent)

MOTHER SEROPOSITIVE EIA, TPPA or FTA positive
- NB if no antenatal care, evaluate carefully re high risk

ANY ONE OF:
- Treatment not completed 30 days before delivery
- Likelihood of reinfection high
- No or inadequate treatment
- Treatment with non-penicillin regime
- If treated, no adequate and documented response to treatment

HIGH RISK
- Collect venous blood sample from mother and baby for syphilis serology and Examine baby
- Symptoms/signs Congenital syphilis

NO RISK
- No treatment No Follow up (see text)

LOW RISK
- Collect venous blood from mother and baby and compare the RPRs
- Baby RPR >= 4 times maternal RPR?

NO

*TREAT WITH BENZATHINE PENICILLIN G 37.5 Mg (50,000 units)/Kg IMI AS SINGLE DOSE

YES

*TREAT WITH BENZYL PENICILLIN, 50 Mg (50,000 UNITS)/Kg/dose IV 12 HOURLY x 10 DAYS

EXAMINE BABY Symptoms/signs congenital syphilis?

YES

NO

NO RISK

YES

EXAMINE BABY Symptoms/signs congenital syphilis?

NO

TREATED PRIOR TO PREGNANCY AND ALL OF THE FOLLOWING

YES

*Complete Congenital Syphilis Register form and send to your local CDC for all cases treated, in order for follow-up to be arranged.
For further information contact

Centre for Disease Control Darwin
Ph:  08 89228874
Fax:  08 89228809

www.nt.gov.au/health/cdc

OR

Your regional CDC

Alice Springs  Ph:  08 89517550
Katherine  Ph:  08 89739049
Nhulunbuy  Ph  08 89870359
Tennant Creek  Ph  08 89624259