Christchurch Sexual Health
314 Riccarton Road

Dr Edward Coughlan
Clinical Director
Fig 1 Treponema pallidum.

French P BMJ 2007;334:143-147
Fig 2 Numbers of diagnoses of syphilis (primary, secondary, and early latent), by sex, recorded in genitourinary medicine clinics in England, Wales, and Scotland (equivalent Scottish data not available before 1945).

French P BMJ 2007;334:143-147
ESR 2014 report

- Number of cases of early Syphilis increased notably between 2013 and 2014
- 85 to 141 cases
- Predominantly male 95.7%
- Of those mostly MSM
- Mostly Auckland and Canterbury
Number of infectious syphilis cases in SHCs in males by age group, 2010–2014

The rise of Syphilis in Christchurch

- The infectious syphilis outbreak in Christchurch continues
  - 2011 – 8 cases all male
    median age 42yrs
  - 2012 – 26 cases all male
    median age 24yrs
Arrow direction = who named who as a contact with double arrow indicating they named each other
ESR codes: A1=Primary, A2=Secondary, A3=Latent Syphilis / Unknown=no first or surname given/♂=named but untraceable/♀ neg = named and tested
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<th>Year</th>
<th>Total</th>
<th>(MSM)</th>
<th>(MSMS/WSW)</th>
<th>(MSW)</th>
<th>(WSM)</th>
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Syphilis ‘back with a vengeance’

Homosexual hookups easy with iPhone apps

Headline

Three charts

1. Syphilis cases in Connecticut
2. Number of diagnoses
3. Percentage of cases

Alarming trend

People can access sexual partners with the greatest freedom they have ever had now.

Infectious system cases in Connecticut

In 2010, there were 5,000 cases of syphilis diagnosed.

It is very important for us to realize that despite our advances in technology, these diseases are still prevalent in our community.

In our community, syphilis cases are rising rapidly.

In 2010, there were 5,000 cases of syphilis diagnosed.

Syphilis is caused by Treponema pallidum, a spiral-shaped bacteria that is transmitted through sexual contact.

The bacteria can enter the bloodstream and infect various parts of the body, causing a variety of symptoms.

Syphilis can be transmitted through oral, vaginal, or anal sex, and is considered a sexually transmitted infection (STI).

People with syphilis do not always have symptoms, and the disease can go untreated for years.

Syphilis can be treated with antibiotics, but it is important to seek medical attention right away.

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Syphilis: The Facts

What is syphilis?

Syphilis is a sexually transmitted infection caused by a bacteria (bug) called Treponema pallidum. This bacteria enters the body through tiny breaks in the skin, mainly in the anal area, genital area, or the mouth.

Important! There has been a sudden increase in syphilis in New Zealand in the last few years. Initially it was mostly seen in homosexual men but is now occurring in heterosexual men and women. It is very important to get checked out if you have any new genital sores or if you think you may be at risk.
Minister of Health’s visit to CDHB Sexual Health Centre

Tony Ryall, Minister of Health, made a special visit to the CDHB Sexual Health Centre on Thursday following interest from a recent story in The Press.

The purpose of the Minister’s visit was an opportunity for him to hear about emerging health issues in Canterbury.

Dr Coughlan says the team were very grateful to the Minister for taking the time to meet them and hear about some of the issues facing our communities.

“Minister Ryall showed a lot of interest in what the team had to say and seemed very impressed with our enthusiasm and commitment in providing an excellent service to the people of Canterbury,” Dr Coughlan says.

“It was a really positive meeting. We believe Sexual Health often goes under the radar, as there is still a lot of stigma associated with it. Having the Minister come and listen to what we think needs to be done to improve health outcomes was incredibly encouraging and we look forward to seeing what comes out of it.”
Hnr Tony Ryall, Health Minister, Cathie Parkes, Sexual Health Centre Charge Nurse Manager, Dr Edward Coughian, Sexual Health Centre Clinical Director, Dr Heather Young, Sexual Health Centre Physician, Margaret Knowles receptionist, Dr Ramon Pink, Canterbury Medical Officer of Health, Maureen Coshall, Sexual Health Centre Nurse Specialist, Sue Teague, Sexual Health Centre Service Manager
Syphilis

- Order - Spirochaetales
  - Genus:
    - Treponema
    - Borrelia
    - Leptospira
Treponema Species

- Treponema pallidum subspecies pallidum
  - Venereal Syphilis
- Treponema pallidum subspecies pertenue
  - Yaws
- Treponema pallidum subspecies endemicum
  - Endemic Syphilis
- Treponema pallidum subspecies carateum
  - Pinta
Clinical Features

- Primary
  - Incubation period 2 -3 weeks (range 9 to 90 days)

- Secondary
  - Incubation period 6 -12 weeks (range 1 to 6 months)
- Early Latent
  - Asymptomatic
  - <2 years duration (US 1 year)
- Late Latent
  - Asymptomatic
  - .2 years duration
Tertiary
- Cardiovascular: 10 to 30 years after initial involvement, aortitis is most common manifestation
- Neurosyphilis
  - Asymptomatic, meningeal, meningo-vascular, parenchymatous
  - Gummatous
- Congenital syphilis
Fig. (1). Stages of Syphilis.

Primary syphilis
- Chancre
- Bilateral inguinal lymphadenopathy

Secondary syphilis
- Rash
- Laryngitis
- Condylomata lata
- Hepatitis
- Meningitis
- Lymphadenopathy
- Low grade fever

Late latent syphilis
- Asymptomatic greater than 2 yrs post infection

Early latent syphilis
- Asymptomatic 2 yrs or less post infection

Tertiary syphilis
- (10-30 yrs)
- Cardiovascular: Aortitis, Aortic regurgitation, Aneurysm
- Neurosyphilis: Vascular – Seizures, stroke, Myeopathy – tabes dorsalis, General paresis

Benign Gummatous
- (>5 yrs)

Untreated

Non-Infectious

# 1 yr or greater in US and European guidelines [10, 11]
Natural History

- Descriptions of untreated syphilis described in 2 large prospective study and one retrospective study:
  - Oslo Study
  - Tuskegee Study
  - Rosahn study
Oslo study

- Started in 1891 by Boeck
- 1978 patients
- After 20 years continued by Brusgaard
- Between 1949 and 1951 Gjestland reviewed 1404 of the original 1978 patients
- Large review of data in 1964 by Clark and Danbolt
  - Clark, Danbolt 1964 Med Clin North America 48: 613-623
Tuskagee
- In 1932 US Public Health Service followed African American with untreated syphilis
  - Heavily criticized on ethical grounds

Rosahn
- Reviewed all autopsies form 1917 to 1941 at Yale
Summary:
- 15 to 40% of patients with untreated syphilis develop recognizable late complications
- Higher mortality rate noted
- Men twice as likely to develop late complications
- Suggested that African American more likely to develop cardiovascular syphilis, white more likely to develop neurosyphilis

“Borrowed “from Sheila Jodah, USA, STI
Local immune response
Clearance of T. pallidum from Early Lesions
“Stealth“ pathogen – low concentrations of integral membrane proteins

Antigenic variation changing the antigens exposed to immune response

- Phase variation: ON - OFF
- On but changed in variation
TprK

- Translocated Promoter Region
- This gene is highly expressed and located in outer membrane
- Induces robust early immune response
- Sequences variable in 7 discrete regions
- => Immune evasion & re-infection
Infect with clonal treponemes

Treponemes expressing target TprK are killed

Antigenic variants are selected

TprK Immune Selection
Tests

- Dark Ground
  - Experience is disappearing

- Direct Fluorescent-antibody Test for Treponemes
  - Invalid for mouth lesions because of commensal treponemes

- PCR
  - For use with ulcers. Uses orange top tube CHL ask for syphilis PCR
Serological

- Non-Treponemal
  - Rapid Plasma Reagin (RPR), Venereal Disease Research Laboratory (VDRL)
  - can get false positives
  - 25% will turn negative without treatment
  - Most will turn negative with treatment but if syphilis is long standing may become serofast
  - with secondary syphilis get rising titres
  - 13 - 41% negative with chancre
    - Hutchinson CM Med Clin North AM 1990 74:1389
Serology

- Treponemal Tests
- eg T pallidum haemagglutination assay (TPHA), T pallidum particle agglutination (TPPA), Syphilis enzyme immunoassay (EIA) (IgG and IgM), Treponema pallidum Immunoblot
- Once positive tend to remain positive even with treatment, Tend to become positive before non treponemal tests around 2 weeks after infection
Treatment

- Penicillin remains treatment of choice.
- This is long acting ie benzanthine penicillin
- In NZ this is Penicillin G benzathine (BICILLIN LA 2.4)
- For early syphilis 2.4 megaunits stat by intramuscular injection
- For late latent 2.4 megaunits, stat, 1 week and 2 weeks
- NOT Benzylpenicillin
- LA long acting, LA long acting, LA long acting
Elimination
In adults with normal kidney function plasma half-life is approximately 30 minutes. Most of the administered dose (50 to 80%) is eliminated along renal pathways in an unchanged form (85 to 95%). Tubular excretion is inhibited by probenecid which is sometimes given to increase plasma-penicillin concentrations. Biliary elimination of the active medicine accounts for only a minor fraction (about 5% of the dose).

Rx| 3 days - Benzylpenicillin Sodium 1 x 10[6] U inj (equiv. 600 mg) - 2.4 mu IM o
SICS: 2.4 mu IM o, one injection per week for 3 wks
A is 22 year old young man
Referred by GP for management of syphilis.
He had presented with a rash on his torso which had not resolved (quite subtle)
=> syphilis serology had been done
=> RPR 1:32
TPHA :reactive
Syphilis EIA :reactive
He reported these sexual contacts over the last 6 m or so;
- D
- M
- S
D

- Had been referred here by his GP a few months previously
- Had penile ulcer with negative serology
- Negative dark ground, Negative HSV
- Positive DFA for treponemes (but took a week or so to come back)
- Then
- RPR 1:2, TPHA pos EIA pos
D

- He only gave history of contact with 3 females
M

- Some what older at 39
- Had negative serology
- Treated as a contact

- And S
- negative serology as well and treated as a contact
- He was treated with Benzathine Penicillin (BICILLIN LA) 2.4 megaunits by intra muscular injection
- JHR discussed ie Jarisch-Herxheimer reaction
J was a young MSM referred by his GP who on routine screening found to have positive serology ie RPR 1:64. He reported no symptoms.
Other presentations

- Right upper quadrant pain, abnormal liver function tests and hep A., B., C negative.
- Great response to i.m. penicillin
- Persistent “snuffles” and alopecia
Pregnancy

- Untreated syphilis during pregnancy can profoundly affect pregnancy outcome, resulting:
  - in spontaneous abortion,
  - stillbirth, non-immune hydrops fetalis
  - intrauterine growth restriction,
  - premature delivery, and perinatal death,
  - congenital syphilis

*Sex Transm Infect* 2000;76:73-79 doi:10.1136/sti.76.2.73
Harman published a report in England on the outcome of 1001 pregnancies in 150 women with untreated syphilis and 826 pregnancies in a control group of 150 women with similar social status. Among the syphilitic group, 17.2% of the pregnancies resulted in a spontaneous abortion, 22.9% in newborn death, and 21% in congenital syphilis. Healthy infants were delivered in 38.9% of the cases, almost half of that in the control group.


Sex Transm Infect 2000;76:73-79 doi:10.1136/sti.76.2.73
In a study of 59 cases of untreated maternal syphilis, half of the mothers with primary or secondary syphilis delivered a premature or stillborn child, and the other half had syphilitic infants. The rate of congenital syphilis and perinatal accidents decreased slightly in early latent syphilis. With the late latent syphilis, approximately 10% of the infants were stillborn, and another 10% had congenital syphilis.


Sex Transm Infect 2000;76:73-79 doi:10.1136/sti.76.2.73
A commonly held but erroneous obstetric principle stated that infection of the fetus does not occur before 18 weeks.\textsuperscript{1} Silver and immunofluorescence staining of the fetal tissue,\textsuperscript{2} or polymerase chain reaction and rabbit infectivity testing of amniotic fluid\textsuperscript{3} showed that \textit{Treponema pallidum} gains access to the fetal compartment as early as 9–10 weeks.

\begin{itemize}
\item 1) Dippel A. The relationship of congenital syphilis to abortion and miscarriage, and the mechanism of uterine protection. Am J Obstet Gynecol 1944;369–79.
\end{itemize}

\textit{Sex Transm Infect} 2000;76:73-79 doi:10.1136/sti.76.2.73
Congenital Syphilis

- Can involve almost all fetal organs
- Early (<2 years) and late congenital syphilis
- Nasal discharge – 15 to 60% if have clinical evidence of congenital,
- Myriad cutaneous lesions
- Hepatosplenomegaly and haematological changes
- Characteristic skeletal involvement
- CNS
Congenital Syphilis

- Marked differences according to stage of maternal infection
  - If infection early in pregnancy
    - then incidence of still birth was 25%
    - Infected infant 41%
  - If infection late in pregnancy
    - Still birth 12%
    - Infected infant 2%

- Ingraham 1951 Acta Dermato-Venerol 31(supp24):60-88
Late Congenital Syphilis

- Delayed consequences of localised inflammatory processes established at sites of treponemal infection
- Frontal bossing
- Saddle nose deformity, saber shins
- Teeth = Hutchinson's teeth – molars – conical, tapered to apex, notched
- Primary lesion heals with local host response
- BUT secondary syphilis follows with chronic infection
- Evasion of the immune response
Mulberry Molar
- Interstitial keratitis
- Deafness
- Cluttons joints
- Neurosyphilis
Summary

- If painless genital ulcer(s) with or without inguinal lymphadenopathy, consider primary syphilis.
  - Do a viral swab for herpes simplex virus (HSV), organise syphilis serology, and arrange sexual health assessment for syphilis polymerase chain reaction (PCR) swab
Summary

- If any of the following, conduct syphilis serology:
  - any genital ulceration.
  - all men who have sex with men (MSM) at least annually, especially if HIV positive
  - for unusual clinical presentations e.g., lymphadenopathy, unexplained abnormal liver function tests, alopecia, pyrexia of unknown origin.
  - Rash on palms of hands / soles of feet
  - Torso rash if not explained especially prior to biopsy
  - Rash in MSM
  - if patient has had sexual contact with a person diagnosed with syphilis (serology usually carried out by sexual health clinic)