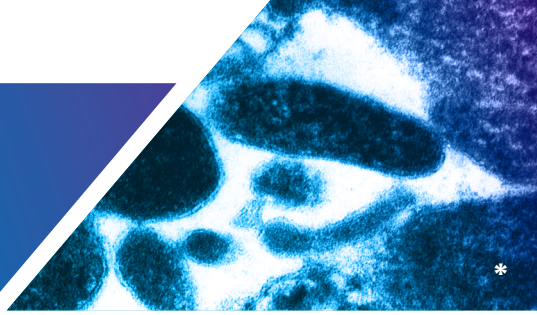
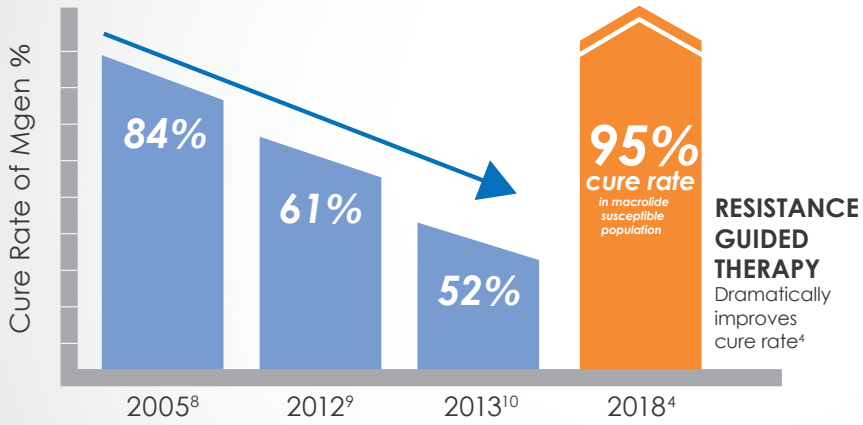
Emerging STI Superbug:
Mycoplasma genitalium



Antibiotic Resistance in *M. genitalium*

- *M. genitalium* (Mgen) is a recognised STI with clinical presentation similar to that of *Chlamydia trachomatis* (CT).[1]
- Mutations in the 23S rRNA gene of *M. genitalium* have been linked with clinical treatment failure and high level *in vitro* macrolide resistance.[2]
- Macrolide resistance mediating mutations have been observed in 20-80% of cases in the UK, Denmark, Sweden, Australia, and Japan.[3,4,6]
- Resistance is already developing towards the second-line treatment moxifloxacin (fluoroquinolone).[4-6]

Resistance Guided Therapy (RGT) uses diagnostics to inform treatment decisions

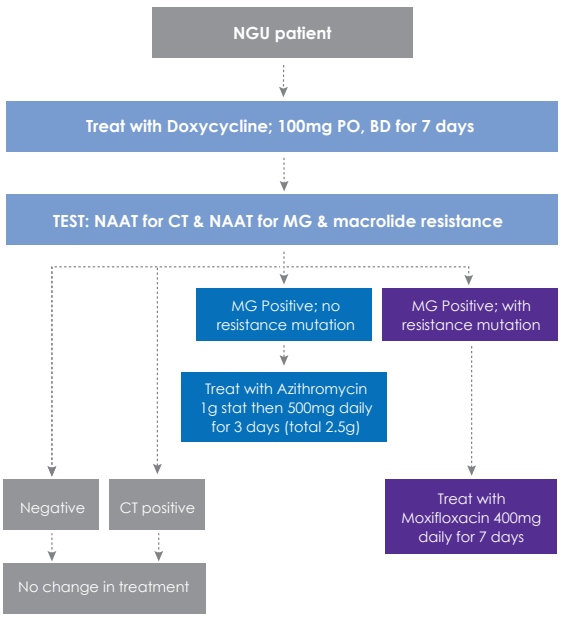


Macrolide resistance exceeds 50% in some populations.[4]

Cure rates after standard single-dose macrolide treatment can be as low as 40%.[7]

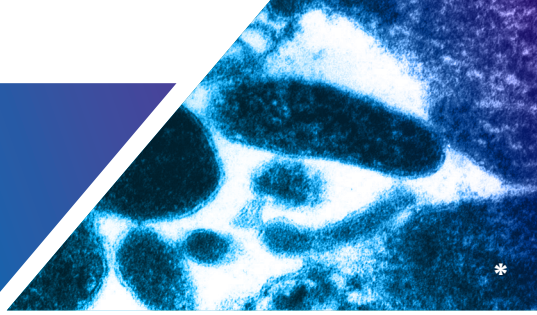
Greater than 92% of patients were cured using RGT[4]

- Management guidelines for Mgen infections (Figure 1) now recommend testing for macrolide resistance to help determine appropriate treatment.[11-13]
- RGT applied to a population with high levels of antibiotic resistance and cure rates below 67% significantly improved patient outcome.[4]
- Cure rates in the Mgen macrolide-susceptible population exceeded 94%.[4]
- Cure rates in the Mgen macrolide-resistant population exceeded 92%.[4]
- Using doxycycline for initial STI treatment reduces overall use of azithromycin and reduces initial bacterial load which may improve subsequent Mgen treatment.[4]



Australian STI management guidelines for symptomatic non-gonococcal urethritis, proctitis, and cervicitis include a recommendation to assess the macrolide resistant status of M. genitalium infections to direct appropriate treatment.[8]

Mycoplasma genitalium



- *M. genitalium* (Mgen) was first identified in the 1980s[14] and is now a recognised sexually transmitted infection (STI), more prevalent than *N. gonorrhoeae* in many populations.[15,16] Mgen is associated with 10–35% of non gonococcal urethritis (NGU)[17,18] and as much as 45% of persistent/recurrent urethritis.[12]
- Mgen is an extremely fastidious and slow growing organism,[3] making nucleic acid amplification testing (NAAT) the only viable diagnostic solution.[12,19] Treatment options are limited as mycoplasma lack a cell wall, thus are unaffected by many common antibiotics.[18,19] Of additional concern is the apparent rapid rate of mutation of Mgen, resulting in an alarming increase in antimicrobial resistance (AMR) over relatively short periods of time.[3]

Potential Health Risks

- Most Mgen cases are asymptomatic, any associated symptoms are similar to other STIs such as chlamydia.[1]
- The presence of Mgen is associated with an increased risk of NGU[18] and of acquiring HIV.[20]
- Increased risk of cervictis, PID, preterm birth, spontaneous abortion and infertility in women has also been reported.[21]

Signs and Symptoms[11,12]

- **Urethritis**
- **Mucopurulent cervicitis**
- **Urethral or vaginal discharge**
- **Acute pelvic pain and/or PID**

RISK FACTORS[12]

- Individuals with high-risk sexual behaviour
- Sexual contact with individuals diagnosed with an STI or PID
- Contact with individuals infected with *M. genitalium*

Improve patient management. Test for macrolide resistance.

References: **1.** Manhart LE & Kay N. Curr. Infect. Dis. Reps. 2010; 12(4):306-313. **2.** Jensen JS et al. Clin. Infect. Dis. 2008; 47(12): 1546-1553. **3.** Jensen JS & Bradshaw C. BMC Infect. Dis. 2015; 15 :343. **4.** Read TRH et al. CID June 5 2018 doi.org/10.1093/cid/ciy477. **5.** Unemo, M. & Jensen, J.S. Nat. Rev. Urol. 2017 Mar;14(3):139-152. **6.** Couldwell DL. et al Int. J. STD AIDS. 2013 Oct;24(10):822-8. **7.** Manhart LE. et al Clin Infect Dis. 2013;56(7):934-42. **8.** Bradshaw CS et al. PLOS ONE 2008;3(11):e3618. **9.** Bissessor M et al. Clin Infect Dis. 2015;60(8):1228-36. **10.** Read TRH et al. Clin Infect Dis. 2017;64(3):250-256. **11.** Australian STI Management Guidelines – Mycoplasma genitalium 2018. **12.** Jensen J. et al 2016 European guideline on Mycoplasma genitalium infections. **13.** Fifer H. et al Fourth Joint Conference BHIVA/BASHH April 2018 EICC, UK. **14.** Tully JG. et al Lancet. 1981; I: 1288–91. **15.** Seña AC. et al Clin Infect Dis.2018 Jan 12. **16.** Manhart L.E. Sex Transm Dis. 2017 Aug;44(8):463-465. **17.** Tabrizi SN et al. PLoS ONE. 2016. 11(6): e0156740. **18.** Taylor-Robinson D & Jensen JS. Clin. Microbiol. Rev. 2011; 24(3): 498-514. **19.** Centers for Disease Control and Prevention, 2015 Sexually Transmitted Diseases Treatment Guidelines. **20.** Napierala Mavedzenge, S & Weiss HA. AIDS. 2009; 23: 611–20. **21.** Lis R,. et al Clin. Infect. Dis. 2015; 61 (3): 418-426.

***** Electron micrograph depicting *M. genitalium* adhering to Vero cells. EM performed by Jens Blom from culture by Jørgen Skov Jensen, Statens Serum Institut.

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