



Genital lesion producing pathogens diagnosed using *PlexPCR*

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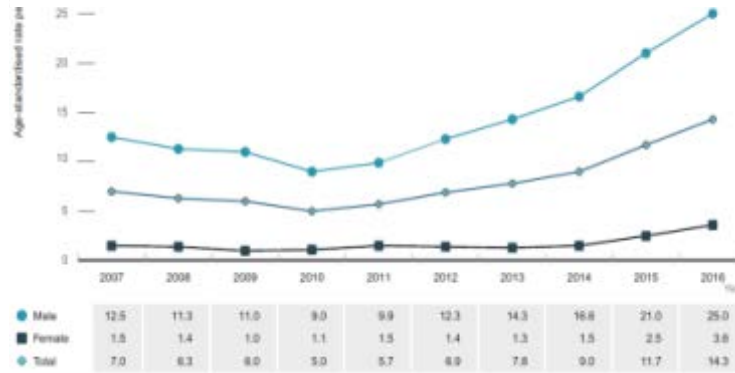
Etiologic Agents of Genital Ulcers

- 🧬 Herpes simplex virus 1 (HSV-1)
- 🧬 Herpes simplex virus 2 (HSV-2)
- 🧬 *Treponema pallidum* (causes syphilis)
- 🧬 VZV

Syphilis Rates Increasing in Australia

Australia 2007–2016

Infectious syphilis notification rate

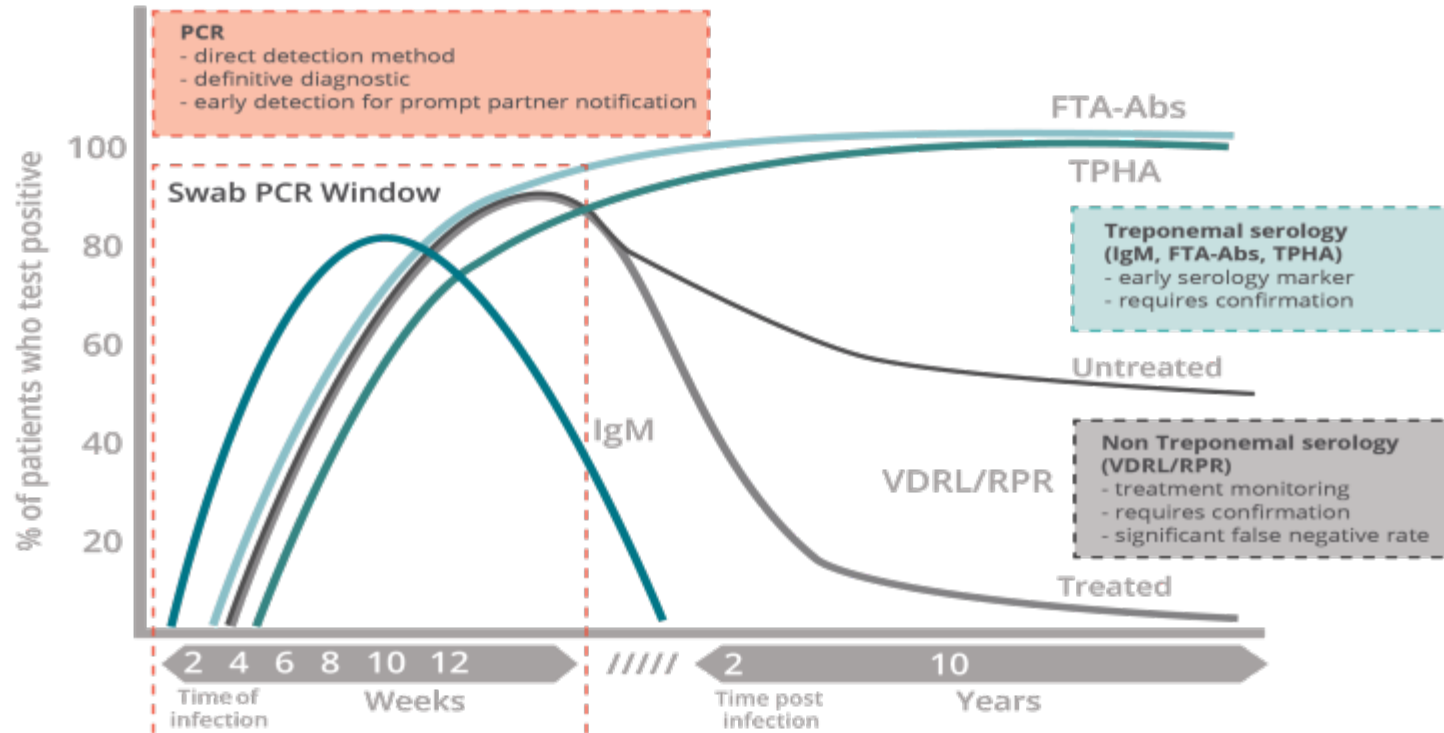


Source: Australian National Notifiable Diseases Surveillance System.



Gonorrhoea and syphilis on the rise in Melbourne

Clinical Stages of Syphilis



* Primary Lesion


‡ Secondary Lesion


Serological windows and associated testing recommendations based on IUSTI and EU guidelines for management of syphilis.^{6,8}

* Appearance of primary lesion is typically 3 weeks after infection (early as 10- and as late as 90- days), lasting 3-6 weeks.⁹

‡ Symptomatology of secondary infections include mucous membrane lesions (appearing after primary lesions heal) in addition to skin rashes.⁹

PCR Diagnosis of Primary Syphilis

-  Shields et al BMC Infectious Diseases 2012, 12:353
 - 10% of PCR positives were serology negative
 - 4/5 showed delayed seroconversion

-  Heymans et al JCM 2010, 48(2):497-502
 - 12% of PCR positives were negative by clinical diagnosis (dark-field and serology negative)
 - 44% of cases suspected of primary syphilis were HSV1/2 positive

Positive PCR result from a lesion may precede development of any or all of the serological markers

Clinical presentation of primary syphilis

“Classic” chancre
Single ulcer
Painless, non-tender
Indurated base

Clinical presentation of primary syphilis

“Classic” chancre	“Atypical” presentation
Single ulcer	Multiple: 33-47% ^{1,2,3,4}
Painless, non-tender	Painful/tender: 25-49.2% ^{1,2,3,4}
Indurated base	Non-indurated: 7.8% ²

Common “atypical” presentation of primary syphilis

¹ Andersen KE. Acta Derm Venereol. 1978;58(6):554-5.

² Chapel TA. Sex Transm Dis. 1978 Apr-Jun;5(2):68-70.

³ Hourihan M et al. Sex Transm Infect. 2004 Dec;80(6):509-11.

⁴ Towns JM et al. Sex Transm Infect. 2016 Mar;92(2):110-5.

Why Include VZV?

 3% prevalence in adults presenting with genital herpes ¹

 Case studies:

- 3 children VZV genital infection ²
- Perianal VZV presenting as suspected child abuse ³

 Implications for:

- Therapy (increased dose); Likelihood of recurrence
- Emotional and psychological well being

¹ Birch CJ et al. Sex Transm Infect. 2003 Aug;79(4):298-300.

² Simon HK et al. Ann Emerg Med. 1995 Jan;25(1):111-4.

³ Christian CW et al. Sex Transm Infect. 2003 Aug;79(4):298-300.

PlexPCR VHS

 **Delivers actionable clinical information**

Rapid qPCR format (<1.5 hours)

 **Specimen Types**

Cutaneous and mucocutaneous swabs

	Channel	Target
1 Well	1	HSV-1
	2	HSV-2
	3	VZV
	4	<i>T. pallidum</i>
	5	Internal Control

PlexPCR VHS combination provides cost-effective screening of genital ulcer disease


Clinical Performance of PlexPCR VHS

- 427 lesion swab samples from genital and non-genital sites
- Public Health Laboratory (Bristol, UK)

		HSV-1		HSV-2		VZV		Syphilis	
		+	-	+	-	+	-	+	-
PlexPCR VHS	+	83	1	70	1	47	1	21	0
	-	2	341	0	356	0	379	0	406
	Total	85	342	70	357	47	380	21	406
Sensitivity		97.7% (95% CI 91.8-99.7%)		100.0% (95% CI 94.9-100.0%)		100.0% (95% CI 92.5-100.0%)		100.0% (95% CI 83.9-100%)	
Specificity		99.7% (95% CI 98.4-100.0%)		99.7% (95% CI 98.5-100.0%)		99.7% (95% CI 98.5-100.0%)		100.0% (95% CI 99.1-100.0%)	

Excellent clinical sensitivity and specificity

Prevalence in genital lesions

-  Prevalence study by Public Health Laboratory (Bristol, UK)
 - PlexPCR VHS tested on genital swabs from routine HSV testing (n=295)

Target	Prevalence
HSV-1	24.1%
HSV-2	21.4%
HSV-1 & HSV-2	0.68%
VZV	0.34%
<i>T. pallidum</i>	1.69%

VZV and Syphilis also detected in HSV requests from genital lesions

Summary

- 🧬 PCR from lesions can aid diagnosis of syphilis
- 🧬 VZV can also be found in genital lesions
- 🧬 Clinical diagnosis alone can be unreliable
- 🧬 PlexPCR VHS test can provide a cost-effective method to screen for the causes of genital ulcer disease
- 🧬 Syphilis is increasing, including in 'low risk' populations

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