Maternal Perinatal Infection Screening

Version	Status	Authorisation	Consensus Date
1.1	• Minor formatting changes • Additional minor information added in multiple areas • Preferred serology tube further outlined	Head of Department – Microbiology	17th September 2025
1.0	Initial document	Head of Department – Microbiology	4th September 2021

Introduction

The TORCH acronym is a prompt to remember key infections in a pregnant woman and neonate. Untargeted TORCH serology testing has been repeatedly demonstrated to have very low utility. Consequently, the request "TORCH screen" is no longer provided at PathWest laboratories.

It is recommended that the clinical pattern of disease be used as a guide to specific testing (see table 1 and 2). This document is intended to guide appropriate microbiological diagnostic sampling. Due to their breadth, additional investigations such as liver function tests, coagulation profiles and radiological imaging that may aid in establishing a diagnosis are not included.

Of note, maternal booking bloods are stored in the laboratory for at least one-year post receipt. Dependent on the provider of antenatal care, these samples may be stored at PathWest or an external pathology provider. These samples can be used as an additional time point to confirm seroconversion when required.

Polymerase chain reaction (PCR) is a nucleic acid amplification test that detects DNA or RNA of the targeted pathogen.

A Clinical Microbiologist can guide test result interpretation, where required.

Guide

Table 1: Infection Differential Guided by Maternal and Fetal Presentation

Table 2: Maternal Test Selection by Potential Aetiology

Table 3: Test Sample Type and Volume

Table 1: Infection Differential Guided by Maternal and Fetal Presentation

Signs	CMV	Enterovirus	HSV	Parvovirus B19	Rubella[&]	*Toxoplasma*	*T. pallidum (Syphilis)*	Varicella (Primary)	Zika virus
Fetal Cranial abnormalities									
Microcephaly/ Macrocephaly	+				+	+		+^	+[*]
Intracranial calcification	+				+	+			+[*]
Ventriculomegaly	+					+		+^	+[*]
Fetal cardiac abnormalities									
Structural heart defect					+				
Fetal size									
Hydrops fetalis				+			+		
Intra-uterine growth retardation	+				+	+	+	+^	+[*]
Fetal limb abnormalities									
Limb hypoplasia or shortening								+^	
Maternal Rash									
Non-vesicular	+	+[=]		+	+		+		+[*]
Vesicular		+[=]	+					+[%]	

Table 1: Maternal screening during pregnancy. [&] Congenital rubella is highly unlikely in the setting of demonstrated maternal immunity; check maternal prior to consideration of testing of the neonate. **^**May be relevant in the setting of maternal infection consistent with primary varicella infection (chickenpox) during the first two trimesters of pregnancy. [%] Primary varicella infection can present as a vesicular rash affecting multiple dermatomes, with lesions occurring in crops at different stages (nodular to vesicular). Varicella reactivation (shingles) can occur in pregnancy, typically restricted to one dermatome and is negligible risk to the in-utero foetus. [*] A clinically compatible illness and exposure history required. This includes travel to an area with known Zika activity or sex without a condom with someone who lives or travelled in an area with Zika activity**.** [=] Enterovirus may present with rash on the palms of hands and soles of the feet.

Table 2: Maternal Test Selection by Potential Aetiology

Aetiology	Maternal Test Selection
Cytomegalovirus (CMV)	**Preferred initial test:** • CMV serology (IgG and IgM): If IgG positive, CMV IgG Avidity testing should be requested. Low avidity is suggestive of recent infection. **To confirm congenital infection** • Amniotic fluid[&] CMV PCR: Increased accuracy if performed at > 21/40 gestation and > 6 weeks after maternal infection.
Enterovirus	• Throat and rectal swab for enterovirus PCR • Lesion swab, if present for enterovirus PCR
Herpes simplex virus (HSV-1 and HSV-2)	**Active lesion/ vesicle:** • HSV PCR on swab of lesion **To confirm previous infection** • HSV IgG serology
Human immunodeficiency virus (HIV)	HIV screening now utilises serology and molecular techniques • HIV serology with addition EDTA whole blood tube for confirmation
Parvovirus B19	**Parvovirus serology (IgG and IgM):** preferred initial screen.
Rubella	**Preferred initial test** • Rubella serology (IgG and IgM) **To confirm congenital infection** • Amniotic fluid[&] Rubella PCR: Increased accuracy if performed at > 21/40 gestation and > 6 weeks after maternal infection.
Toxoplasma gondii	**Preferred Initial test** • *Toxoplasma* serology (IgG and IgM). • If IgG positive, *Toxoplasma* IgG Avidity: Low avidity is suggestive of recent infection **To confirm congenital infection** • Amniotic fluid[&] *Toxoplasma* PCR: Increased accuracy if performed at 18-20 gestation or > 4 weeks after maternal infection.
***Treponema pallidum* (syphilis)**	**Preferred test** • Syphilis serology **Active lesion/vesicle:** • Lesion syphilis PCR

Varicella Zoster Virus (VZV)	**Active lesion(s)** • Lesion/ vesicle VZV PCR • +/- VZV Serology (IgG and IgM) if uncertainty exists as to whether infection is primary or consistent with shingles (Herpes Zoster) **To confirm previous infection:** • VZV IgG serology (perform urgently in the setting of antenatal exposure as VZIG should be consider for seronegative women). **Congenital varicella syndrome** • Amniotic fluid[&] VZV PCR: May be considered at least one month after maternal infection in conjunction with fetal imaging (ultrasound and/or MRI) findings.
Zika Virus	A clinically compatible illness (fever, rash and arthralgia) and compatible exposure history required before further testing. This includes travel to an area with known Zika activity or sex without a condom with someone who lives or travelled in an area with Zika activity. **If symptom onset <2 weeks** - Baseline serology (IgM and IgG) - Blood and urine PCR - Repeat serology in two weeks **If symptom onset >2 weeks** - Serology (IgM and IgG)

Table 2: Maternal test selection by potential aetiology (see Neonatal Congenital Infection Screening document for neonatal test selection). [&] Amniotic fluid testing can be used to confirm congenital infection. However, the risks and benefits of obtaining this sample should be considered and other diagnostic approaches utilised first, where possible. Guidance should be sought from an Obstetrician that specialises in congenital infections or a Clinical Microbiologist.

Table 3: Test Sample Type and Volume

Aetiology	Serology* "Gold top" tube preferred		PCR#		
	IgM	**IgG**	**Blood** (EDTA tube)	**Other fluid including amniotic fluid**	**Swab type% and site**
Cytomegalovirus	325 µL	325 µL	-	200 µL	X
Enterovirus	X	X	X	X	Dry swab: throat and rectal swab, lesion
Herpes simplex virus (HSV-1 and HSV-2)	X	325 µL	X	X	Dry swab: lesions
Human immunodeficiency virus	325 µL		500 µL	X	X
Parvovirus B19	325 µL	325 µL	500 µL	200 µL	X
Rubella	200 µL	300 µL	500 µL	200 µL	X
Toxoplasma gondii	300 µL	300 µL	X	200 µL	X
***Treponema pallidum* (syphilis)**	650 µL		X	X	Dry swab: lesion
Varicella (VZV)	380 µL	380 µL	X	X	Dry swab: lesion
Zika Virus	50 µL	50 µL	500 µL	200 µL	X

Table 3: Test sample type and volume. * A "gold top" serum separator tube (SST) is preferred for both neonates and adults. For serology tests (IgG and IgM), the minimum stated volumes are per specific test and should be added to calculate the required volume for collection. For example, if both CMV IgG and IgM are required, the minimum serum volume is 650 µL. Sample volumes in this guide are expressed in whole blood volume based on a haematocrit of 55%. # For PCR, a single sample can be used to process multiple tests. % Any dry swab type is acceptable. Swabs in charcoal or amies are not acceptable

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