

# Medically assisted reproduction in patients with a viral infection/ disease

## Summary of the evidence



	Type of infection	Vaccine available	Horizontal / sexual transmission	Horizontal transmission during MAR	Prevention of vertical transmission by CS	Vertical transmission via breastfeeding	Prophylaxis in neonate
HBV	Acute / Persistent	Yes	Yes	Yes → Vaccinate unaffected partner	Probably not	Probably not	Yes
HCV	Acute / Persistent	No	Limited	Limited	Probably not	Probably not	No
HIV	Acute / Persistent	No	Yes	Yes → Semen processing for males	If detectable viral load	Yes	Yes
HPV	Transient	Yes	Yes	Yes	Probably not	Probably not	No
HTLV I/II	Acute / Persistent	No	Yes	Yes	Unknown	Yes	No
ZIKV	Transient	No	Yes	Yes	Probably not	Unknown	No

	Virus detected in sperm	Virus detected in oocytes	Virus detected in placenta	Virus detected in breastmilk	Impact on MAR outcome	
HBV	Yes	Yes	Yes	Yes (HBsAg)	Contradictory data	No effect
HCV	Probably not	Probably not	Probably not	Probably not	Contradictory data	Contradictory data
HIV	No*	No	Contradictory data	Yes	No	Yes
HPV	Yes	No data	Contradictory data	Yes	Yes	Unclear
HTLV I/II	No data	No data	No data	Yes	No data	Probably not
ZIKV	Yes	No data	Yes	Yes	No data	No data

\*Only viral-like particles the size of HIV have been detected in spermatozoa.

### Patient population

- Female testing positive
- Male testing positive
- Couple testing positive

### Abbreviations

CNP: combined neonatal prophylaxis  
 CS: caesarean section  
 HBV: Hepatitis B virus  
 HBIG: Hepatitis B Immunoglobulin  
 HCV: Hepatitis C virus  
 HIV: Human Immunodeficiency virus  
 HPV: Human Papilloma virus  
 HTLV: Human T-lymphotropic virus  
 ZIKV: Zika virus

### Glossary

MAR: overarching term for all types of assisted reproduction, referring to IUI, IVF and ICSI in this guideline.  
 HT: horizontal transmission; the transmission of this virus from one person or group to another person, usually through contact with bodily fluids, such as blood.  
 VT: vertical transmission; the transmission of this virus from mother to baby during pregnancy or at birth. Transmission might occur across the placenta, in the breast milk, or through direct contact during or after birth.

## Management in the clinic

HBV	Male testing positive	Female testing positive	Couple testing positive
	Vaccinate non-infected partner		
Before MAR	Consult with infectious disease / liver disease specialist		
	Discuss: - Risk of viral vertical transmission (not eliminated by MAR) - Newborn prophylaxis		
During MAR	IUI, IVF or ICSI depending on infertility work-up		
	Routine semen processing		
After MAR	Caesarean section not recommended		
	Breastfeeding not contra-indicated		
	Vaccination of the neonate	Vaccination of the neonate + HBIG administration	

HCV	Male testing positive	Female testing positive	Couple testing positive
	Consult with infectious disease / liver disease specialist		
Before MAR	Discuss: - Risk of viral horizontal transmission (not eliminated by MAR) - Risk of viral vertical transmission (not eliminated by MAR)		
During MAR	IUI, IVF or ICSI depending on infertility work-up		
	Specific semen processing*	Standard oocyte processing	Specific semen processing*
After MAR	Caesarean section not recommended		
	Breastfeeding not contra-indicated		

\*Density gradient centrifugation followed by washing and swim-up

HIV	Male testing positive	Female testing positive	Couple testing positive
	Consult with infectious disease specialist		
Before MAR	Undetectable viral load	HIV detected in blood	Undetectable viral load
		HIV detected in blood	Undetectable viral load (female)
			HIV detected in blood
	Risk of HT	Risk of VT	Risk of VT + HT
	Risk of VT	Risk of VT	Risk of VT + HT
During MAR	IUI, IVF or ICSI depending on infertility work-up		
	Specific semen processing* and semen HIV PCR testing recommended	Standard oocyte processing	Specific semen processing* and semen HIV PCR testing recommended
After MAR	Caesarean section recommended if detectable HIV viral load		
	Breastfeeding = option	Breastfeeding not recommended	
	CNP		

\*Density gradient centrifugation followed by 2 semen washing steps, followed by swim-up

HPV	Male testing positive	Female testing positive	Couple testing positive
Before MAR	Discuss: - Possibility of postponing MAR (transient infection) - Risk of viral horizontal transmission (not eliminated by MAR)		
During MAR	IUI, IVF or ICSI depending on infertility work-up		
	Routine semen processing		
After MAR	Caesarean section not recommended		
	Breastfeeding not contra-indicated		

HTLV I/II	Male testing positive	Female testing positive	Couple testing positive
	Consult with infectious disease specialist		
Before MAR	Discuss: - Risk of viral horizontal transmission (not eliminated by MAR) - Risk of viral vertical transmission (not eliminated by MAR)		
During MAR	IUI, IVF or ICSI depending on infertility work-up		
	Routine semen processing		
After MAR	Caesarean section not recommended		
	Breastfeeding not recommended		

ZIKV	Male testing positive	Female testing positive	Couple testing positive
If detected before MAR	Postpone MAR treatment		
	For 3 months	For 2 months	For 3 months
If detected during MAR	Cancel cycle		
If detected after MAR	Caesarean section not recommended		
	Breastfeeding not contra-indicated		

## Laboratory safety



Storage tank
Since viruses can survive and be transmitted via liquid nitrogen (LN2), separate storage of reproductive cells according to viral positive and viral negative status is recommended.
Emptied and dried cryo tanks and transport shippers should be disinfected according to local standard operating procedures to reduce the potential of cross-contamination.
Individual clinics must risk assess to decide the number of cryo tanks needed.
Separate cryopreservation dewars should be used to quarantine gametes and embryos from patients with unknown infectious status.

Storage environment
Vapour phase cryopreservation could be considered over liquid nitrogen in terms of safety to reduce the risk of cross-contamination.
Provided the cryomaterial is not compromised, cryodevices, such as sealed semen straws/vials, should be cleaned with a disinfectant wipe after removal from LN2 storage to mitigate risk of transmission of pathogens from the cryodevice surface.
Hermetic sealing of cryovials with additional covers could reduce the risk of cross-contamination of stored material.
The use of high security straws in combination with thermal sealing is the preferred approach as it minimises the risk of cross-contamination.

Laboratory
Given that personal protective equipment (PPE), laboratory equipment and exposed surfaces can be contaminated even after good laboratory practice, disinfection and changing PPE between cases can reduce the risk of cross-contamination.
The recommended procurement, processing, release and storage procedures should be used for all samples, not only virally positive samples.