Strategy 3
Prevention

1. Universal screening for pregnant women and neonatal vaccination for hepatitis B
2. Use antivirals for preventing MTCT of HBV
3. Post-vaccination serologic testing
4. Prevent healthcare-related transmission of HBV and HCV
5. Reduce the risk and disease burden in vulnerable populations

Mother-to-child transmission (MTCT) is an epidemiologically important route of HBV transmission, which accounts for the prevalence of HBV infection in Hong Kong. Preventing MTCT by vaccination and other available means should be the focus.

There is no vaccine for hepatitis C. Its prevention measures should be on controlling the practices known to spread it and curing chronic infection.

Strategy 3.1: Reduce mother-to-child transmission (MTCT) of HBV

61. WHO has set a clear target of achieving 0.1% HBsAg prevalence or less among the 5 year olds by 2030 as surrogate of a 90% reduction in incidence of chronic HBV infection.

62. In Hong Kong, universal screening of pregnant women for HBsAg during each pregnancy and universal neonatal hepatitis B vaccination, launched in 1988, are key priorities. In addition, hepatitis B immunoglobulin (HBIG) has also been administered for babies born to HBsAg-positive mothers, providing immediate and short-term protection against HBV infection. The focus has mainly been on protecting the babies by ensuring the completion of the vaccination series and at-birth prophylaxis. Action is also needed to ensure the HBV-infected women are referred to appropriate care and treatment.

63. Universal screening of pregnant women for HBsAg during each pregnancy and universal neonatal vaccination must be continued to be an integral part of the MTCT prevention programme, and its coverage is regularly monitored and evaluated by the Immunisation Coverage Survey (Local Indicator 4).

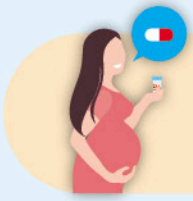
Strategy 3.1.1
Using antivirals to prevent MTCT of HBV

64. It is vital to acknowledge that the current measures, including universal screening of all pregnant women, at-birth prophylaxis with HBIG, as well as hepatitis B vaccination for newborns of infected mothers, are unable to prevent all MTCT of HBV infection.

Box 2. Findings from a local study about MTCT of HBV [41]

- MTCT continued to occur at a rate of 1.1% (7 out of 641 HBsAg-positive mothers), despite the use of hepatitis B vaccines and HBIG.
- Babies born to women with high levels of viraemia were particularly vulnerable.

HBV DNA level at 28 – 30 gestation weeks	Proportion of HBsAg-positive pregnant women	Risk of immunoprophylaxis failure
> 7 $\log_{10}$ copies/mL (about 2 X 10^6 IU/mL)	22.3%	4.9%
> 8 $\log_{10}$ copies/mL (about 2 X 10^7 IU/mL)	18.9%	5.8%



Effective antivirals which can further reduce the risk of MTCT of HBV are available.

65. At present, there are effective antivirals which can further reduce the risk of MTCT of HBV. International studies have confirmed the success of the use of antivirals for pregnant women with high HBV DNA to further prevent MTCT [42,43]. As of now, WHO has recommended her Member States to evaluate its use [44], while many developed countries have already endorsed it as standard medical practice [45,46].

66. To eliminate MTCT of HBV in Hong Kong, use of antivirals for HBsAg-positive pregnant women with high viral load should be adopted to fill the missing link in the elimination of MTCT.

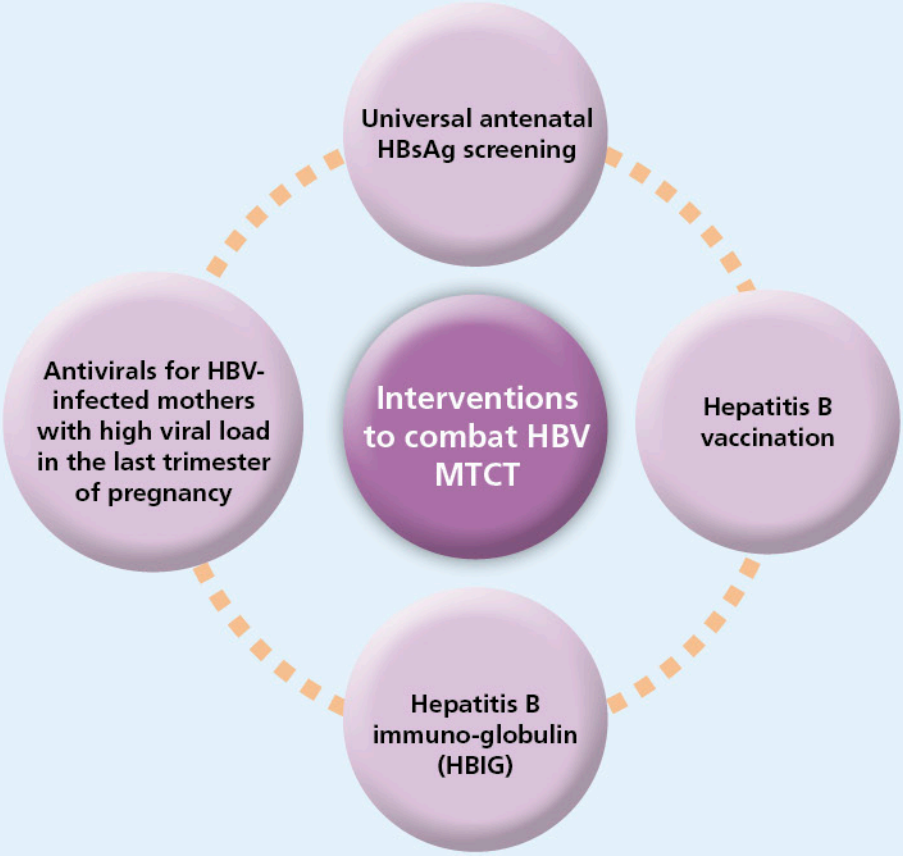


Figure 8. Interventions to combat MTCT of HBV

67. Based on about 5% seroprevalence of HBsAg among pregnant women in 2016 - 2018 and the annual number of births of around 60 000 in Hong Kong for preliminary projection, an estimate of 3 000 pregnant women will have to be tested for potential need of antiviral prophylaxis per year. This number is anticipated to fall with time, while seroprevalence of antenatal mothers decreases.

68. Of note, logistic challenges will be many, in that early identification of high-risk mothers would be crucial to allow timely initiation of antiviral treatment. Safeguards against hepatitis flare also need to be put in place if the mother discontinues treatment after delivery.

Actions

3.1.1.1 A policy initiative to provide HBsAg-positive mothers with high viral load with a treatment option to use antivirals should be established.

3.1.1.2 HBsAg-positive pregnant women with high viral load should be provided with a treatment option to use antivirals. The HBV viral load cut off for providing antivirals to pregnant women is at >200 000 IU/mL and the number of target patients is estimated to be around 800 per year. These mothers will continue to receive long-term management of their liver condition after giving birth. For HBsAg-positive pregnant women with a viral load ≤ 200 000 IU/mL, they would be referred to doctors conversant with HBV treatment for routine assessment and management of the liver condition.

3.1.1.3 Its implementation would be supported by addressing the service gaps in drug, laboratory and manpower: widening the indications in HA Drug Formulary for the appropriate antivirals, covering this target patient group, building laboratory capacity and establishing nurse clinic to augment the capacity and alleviate pressure of hepatology clinics and antenatal clinics. At the beginning of 2020, Prince of Wales Hospital (PWH) and Queen Mary Hospital (QMH) piloted the service.

3.1.1.4 The service will then be rolled out to eight more hospitals in HA, including the remaining six birthing hospitals in 2020/21.

3.1.1.5 Professional training to specialists in obstetrics and gynaecology (O&G), public and private sectors, on the use of antivirals in prevention of HBV MTCT using the platform of the Hong Kong College of Obstetricians and Gynaecologists should be explored.

3.1.1.6 The acceptance of using antivirals to prevent MTCT will be reviewed.

Strategy 3.1.2
Post-vaccination serologic testing for babies born to HBsAg-positive mothers

69. While the current strategy of hepatitis B vaccination coupled with HBIG administration for HBV-exposed newborns is highly effective in preventing the development of the carrier state in babies born to HBsAg-positive mothers, there are still 5 - 10% of high-risk babies who may not be protected [47].

70. To further minimise and eventually eliminate perinatal HBV transmission completely, further strengthening of the current programme is required. WHO and the Western Pacific Region emphasise that post-vaccination serologic testing (PVST) of babies born to HBsAg-positive mothers is important to determine effectiveness of prevention of MTCT of HBV when antenatal HBV screening is in place [48].

Post-vaccination serologic testing (PVST)

71. The purposes of PVST:

- To identify babies born to HBV-infected women who do not have an adequate immune response to an initial hepatitis B vaccine series and thus require revaccination
- To enable early identification of HBV-infected babies to ensure appropriate medical care for them
- To provide useful systemic information to monitor the programme and overall prevention strategy

72. PVST consists of testing on HBsAg and anti-HBs of all babies born to HBV-infected women at the age of 9 - 12 months (or 1 - 2 months after the final dose of the vaccine series, if the series is delayed) [49]:

- HBsAg test: to exclude or to confirm HBV infection
- Anti-HBs test: to check immunity against HBV infection

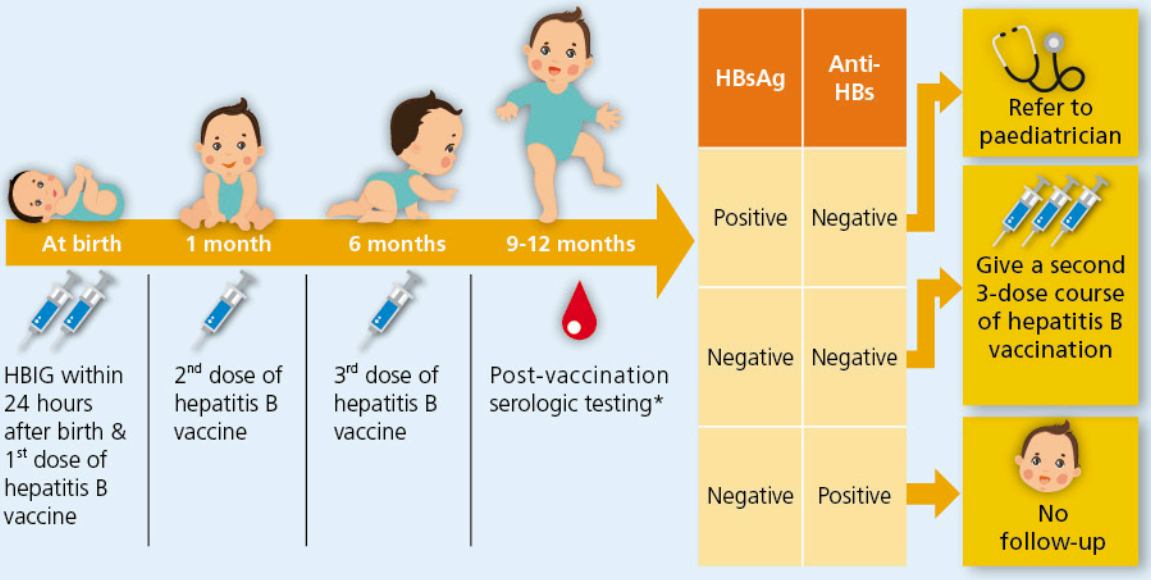
73. Appropriate action will be taken based on the results of PVST (Table 7).

Table 7. Interpretation of PVST results and the corresponding actions

Blood result		Interpretation	Follow-up
HBsAg	Anti-HBs*		
Negative (–)	Positive (+)	Vaccine responders and seroprotected	Not required
Negative (–)	Negative (–)	Vaccine non-responders	Give a second 3-dose series of hepatitis B vaccines, followed by re-testing for HBsAg and anti-HBs 1 - 2 months after the final dose**
Positive (+)	Negative (–)	Hepatitis B infection	Refer to paediatricians for appropriate medical follow-up

* A negative test result refers to an anti-HBs level < 10 mIU/mL and a positive test refers to an anti-HBs level ≥10 mIU/mL;

** In general, persons who do not respond to an initial 3-dose vaccine series have a 30 - 50% chance of responding to a second 3-dose series.



* Testing should not be performed before the age of 9 months to avoid detection of passive anti-HBs from HBIG administered at birth. In case of defaulted scheduled PVST appointment, PVST can be offered to babies up to the age of 24 months, to be in line with many PVST studies.

Figure 9. Flowchart of post-vaccination serologic testing

Actions

- 3.1.2.1 A policy initiative to provide post-vaccination serologic testing to babies born to HBsAg-positive mother should be established.
- 3.1.2.2 The implementation plan and the associated resources implication has to be established.
- 3.1.2.3 Professional training on PVST to obstetricians and paediatricians would be provided.
- 3.1.2.4 The logistics and workflow of PVST would be established.
- 3.1.2.5 PVST would be conducted for babies born to HBsAg-positive mothers.
- 3.1.2.6 The acceptance of PVST programme would be reviewed.

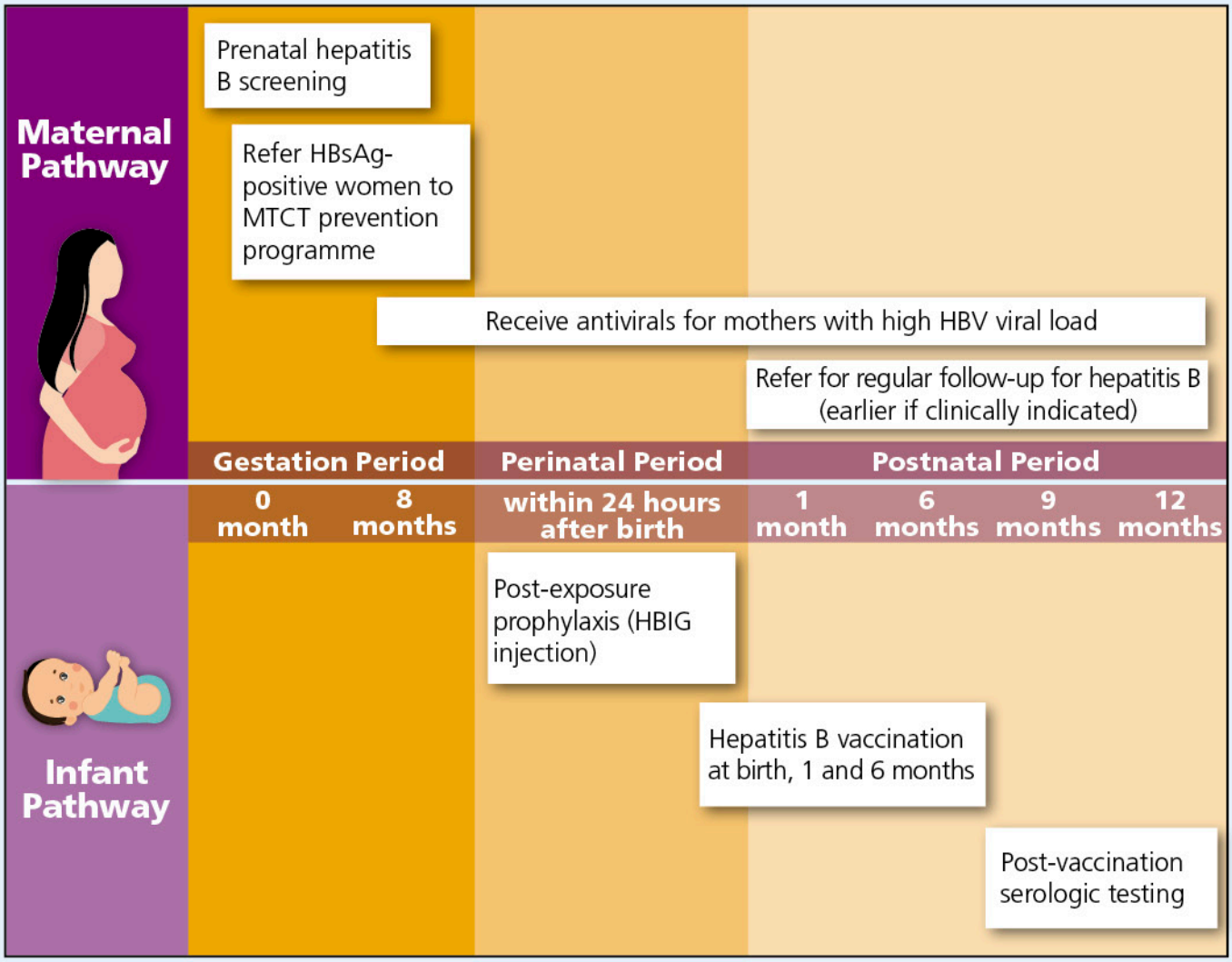


Figure 10. Hepatitis B MTCT prevention pathways with the use of antivirals and PVST

Strategy 3.2: Prevent healthcare-related transmission of HBV and HCV

74. Globally, transmission of HBV and HCV occurs in healthcare settings primarily due to failure of ensuring safe blood supply or upholding infection control standards. Many recommendations by WHO, such as a centralised transfusion service and other infection control procedures, are already in place in Hong Kong.

75. In Hong Kong, blood safety strategies are based on 100% voluntary non-remunerated blood donations, donor selection, and quality-assured screening by antibody and nucleic acid testing of all donated blood and blood components used for transfusion. These strategies can prevent transmission of HBV and HCV effectively. Since 1978, screening of blood donors for HBsAg has been in place to prevent transfusion-transmitted HBV infection. Nevertheless, transfusion of contaminated blood and blood products was a significant mode of transmission of HCV before the institution of blood donor screening for HCV in 1991.

76. Various local infection control guidelines have clearly and consistently recommended prevention of nosocomial transmission of blood-borne viruses by Standard Precautions, hepatitis B vaccination and documentation of post-vaccination serology for healthcare workers, as well as management of occupational exposure, including medical evaluation for testing, treatment and use of post-exposure prophylaxis as appropriate [50,51,52,53,54]. These widely adopted infection control measures in the local healthcare settings have substantially reduced healthcare-related transmission of HBV and HCV.

Actions

3.2.1 The current blood safety strategies should be continued and new developments to be monitored and reviewed.

3.2.2 A systemic look back exercise was undertaken in 1990s to ensure patients potentially infected with HCV through contaminated blood or blood products were traced, investigated and managed. Clinically indicated treatment will be continuously provided to people contracted HCV through blood or blood product transfusion.

3.2.3 Infection control training on Standard Precautions, such as aseptic technique, proper sharps handling and management of needlestick injury or mucosal contact, is being provided to healthcare workers on a regular basis, with an aim to reduce their chance of acquiring or passing on infections of bloodborne viruses, including HBV and HCV, through occupational exposure.

Strategy 3.3: Reduce risk and disease burden in vulnerable populations

77. People who inject drugs (PWID) and HIV-positive MSM constitute key populations for intervention, as they are not only disproportionately burdened with HCV infection, but also carrying transmission risks to others through risk practices [55].

78. The development of DAA offers a cure of HCV infection. The strategy of "Treatment as Prevention" by targeting effective DAA treatment to vulnerable population groups, such as PWID and HIV-positive MSM, is discussed in the "Treatment" section. Notably, the network of methadone clinics affords the opportunity to engage PWID.

Actions

3.3.1 Given the emergence of sexually acquired HCV infection in HIV-positive MSM, condom programming has to be intensified and harm reduction approach should be taken, especially those having chemsex. Moreover, the possibility that sexually acquired HCV crosses to HIV-negative MSM should also be scrutinised.