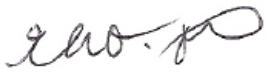
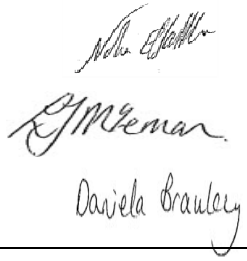
NHS Grampian Guidance for staff on Blood Borne Virus (BBV) Testing

Lead Author/ Co-ordinator:	Dr Emmanuel Okpo, Consultant in Public Health Medicine	
Reviewer:	Dr Noha El-Sakka, Clinical Lead Virology Dr Lindsay McLeman, Clinical Lead Viral Hepatitis Dr Daniela Brawley, HIV Clinical Lead	
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Signature: 

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Version History

Revision Date	Previous Revision Date	Summary of Changes (Descriptive summary of the changes made)	Changes Marked* (Identify page numbers and section heading)
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		Added: "This continues to be a problem locally and in 2015, 26% of all new diagnoses were classified as late diagnosis."	Page 2, **HIV**
		Link to Occupational Health Service (OHS) updated	Page 3, **1.4 Groups to which this document does not apply**
		Added: "To assist staff to communicate with non-English speaking patients, parents, relatives or friends, a "face to face" interpreter or the "Language Line" telephone interpretation service can be made available when consultation or care is provided. Material in translation can also be provided. If the patient has a communication disability, appropriate communication support such as British Sign Language (BSL) interpreters, audio, accessible/pictorial material, large print and other formats and support can be provided. For more information, contact either Nigel Firth on (01224 5)52245 or Roda Bird on (01224 5)51116."	Page 8, **3.2 Who can request an HIV test?**
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Purpose/description: To provide all NHS Grampian staff involved with people at risk of or living with BBV infections (HBV, HCV, and HIV) easily accessible advice on BBV testing based on National guidelines.

Policy statement: It is the responsibility of all staff to ensure that they are working to the most up to date and relevant policies, protocols, procedures and pathways.

Responsibilities for implementation:
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Sector: General Managers, Medical Leads and Nursing Leads.
Departmental: Clinical Leads.
Area: Line Manager.

Responsibilities for review of this document:
Lead Author/Co-ordinator: Dr Emmanuel Okpo, Consultant in Public Health Medicine.

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NHS Grampian Guidance for staff on Blood Borne Virus (BBV) Testing

1. Introduction

This guidance has been produced jointly by NHS Grampian Health Protection, Infection Unit (INFU), Genitourinary Medicine (GUM), Liver Service and Virology under the auspices of the NHS Grampian Sexual Health and Blood Borne Virus (BBV) Managed Care Network (MCN). This guidance updates and supersedes the previous BBV testing guidance for practitioners in Grampian produced by the Health Protection team in 2011 (HPT 2011). It provides advice on all aspects of blood borne virus (BBV) testing in Grampian.

The BBVs covered in this document are Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV).

1.1 Objectives

This guidance aims to provide all NHS Grampian staff involved with people at risk of or living with BBV infections, easily accessible advice on BBV testing based on national guidelines including:

- Who should be offered a BBV test
- Who can request a BBV test
- What BBV test to offer and when
- How to interpret a BBV result
- When and where to refer individuals with a BBV infection for treatment, care and support

This guidance will be reviewed every two years, or when necessary, to take into account new research evidence and changes in national guidance.

1.2 Background

Improvements in the treatment of BBV infections i.e. Hepatitis B Virus, Hepatitis C Virus and Human Immunodeficiency Virus have significantly reduced morbidity, mortality and transmission of these diseases over recent years. However, it is estimated that a significant number of individuals infected with these viruses are unaware of their infection. For any individual living with a BBV to fully benefit from treatment, care and support they need to be aware of their infection. This requires diagnostic testing.

Hepatitis B

Each year around 50 cases of HBV infection are diagnosed in Grampian; most are newly diagnosed chronic infections with only a few recent (acute) infections. The majority of hepatitis B infections are in individuals from high prevalence countries, including Asia, sub-Saharan Africa and Eastern Europe, or men who have sex with men (MSM) and people who inject drugs (PWID). Infection of an adult with HBV results in an acute self limiting disease in the majority of cases. Only about 5% of immunocompetent patients and 40% of immunocompromised patients develop chronic infection. Cirrhosis or cancer of the liver may develop in up to 20% of chronic carriers over 10-50 years (Gilson 2006).
There is no cure for HBV infection but available treatment is effective in suppressing viral replication and halting the progress to severe liver damage in those infected. There is an effective vaccine against HBV infection.

Hepatitis C

In Scotland, it is estimated that approximately 1% of the population are infected with HCV. The majority of HCV infections are diagnosed in injecting drug users (previous and current injectors) and it is estimated that over half of those infected are unaware of their infection. Most (70-80%) individuals develop chronic HCV and it is estimated that more than 20% will develop cirrhosis and liver cancer over the next 10-50 years if left untreated. There is no vaccine available for HCV infection. However, treatment is effective, leading to complete eradication of the virus in the majority of individuals who receive antiviral therapy.

HIV

About 1 in 4 (25%) of those infected with HIV in the UK are unaware of their infection and late diagnosis is associated with significant HIV morbidity and mortality (HPA 2012). Testing, with early diagnosis of HIV infection, means that infected people can access effective treatment early and prevent onward transmission of HIV. A UK-wide audit in 2006 and a review of deaths in Aberdeen in 2008 found that late diagnosis was a major cause of death in people infected with HIV. This continues to be a problem locally and in 2015, 26% of all new diagnoses in Grampian were classified as late diagnoses. Many of those infected with HIV present with various health problems before they are eventually diagnosed. Each of these episodes represents a missed opportunity for earlier diagnosis. Typical symptoms could include chronic diarrhoea; repeated episodes of bacterial pneumonia or pyrexia of unknown origin. See appendix 2 [page 16] for a full list of HIV indicator conditions.

1.3 Groups to which this document applies

The guidance is aimed at and applies to all staff who work with people at risk of or living with a BBV infection including:

- Accident and Emergency Department
- General Practitioners
- GMed staff
- Health Protection Nurses
- Hospital Medical Staff
- Infectious Disease Consultants
- Nurses and Midwifes
- Public Health Consultants
- Substance Misuse Staff
- Third Sector Organisations and Local Authority staff providing BBV testing on behalf of NHS Grampian including early intervention and social workers

1.4 Groups to which this document does not apply

The guidance does not provide advice on testing for occupational health issues or clinical management of BBV cases. Separate guidelines exist for the management of HBV, HCV and HIV (British HIV Association (BHIVA) 2015 (2016 interim update), National Institute for Health and Care Excellence (NICE) 2013, Scottish Intercollegiate Guidelines Network (SIGN) 2013). For occupational health issues please visit https://gohealthservices.scot.nhs.uk/

2. Evidence Base - BBV Testing Recommendations

Current guidelines and standards produced by Healthcare Improvement Scotland (HIS), the British HIV Association, the British Association for Sexual Health and HIV (BASHH), the British Infection Society (BIS) and Scottish Intercollegiate Guidelines Network recommend increased testing as the way to reduce late diagnosis and the risk of transmission of BBVs.

2.1 Hepatitis B

It is recommended that Hepatitis B testing should be offered to:

- **people born or who have lived in a country of high prevalence, predominantly, Asia, Eastern Europe, Africa and the Caribbean**
- **MSM who are not already fully immunised against HBV**
- **everyone who has been diagnosed with HIV or HCV infection**
- **people who may have had unsterile medical treatment abroad, or treatment in countries where infection control procedures are inadequate**
- **people who may have had unsterile body piercing or tattoos**
- **those who are being investigated for unexplained persistently abnormal aminotransferases (not raised alkaline phosphatase, bilirubin or gamma glutamyl transferase)**
- **anyone who has EVER injected drugs**
- **sexual partners and close contacts of those diagnosed with hepatitis B**
- **pregnant women in each pregnancy**
- **children of women known to be infected with HBV**
- **patients requiring immunosuppressive therapy including biological treatments and antineoplastic chemotherapy.**

2.2 Hepatitis C

The Royal College of General Practitioners and Scottish Intercollegiate Guidelines Network recommend that HCV testing should be offered to:

- **anyone who has EVER injected drugs**
- **people born or who have lived in a country of high prevalence, predominantly, Asia, Eastern Europe and Africa**
- **everyone who has been diagnosed with HIV or HBV**
- **people who may have had unsterile medical treatment abroad, or treatment in countries where infection control procedures are inadequate**
- **people who may have had unsterile body piercing or tattoos**
- **those who are being investigated for unexplained persistently abnormal aminotransferases (not raised alkaline phosphatase, bilirubin or gamma glutamyl transferase)**
- **sexual partners and close contacts of those diagnosed with HCV**
- **MSM where sexual activity can lead to trauma and bleeding**
- **pregnant women, if other risk factors such as injecting drug use (IDU) are present**
- **children of women known to be HCV Ribonucleic Acid (RNA) positive.**

2.3 HIV

Current guidelines and standards produced by HIS, BHIVA, BASHH and BIS recommend increased testing as a way to reduce late diagnosis and the risk of transmission. These guideline documents recommend that:

1. **Where the prevalence of diagnosed HIV infections is greater than 2 in 1,000, HIV testing should be offered to all individuals aged 15-59 registering in general practice as well as to all general medical admissions.**

2. **HIV testing should be universally offered in each of the following settings:**
   - **Genitourinary medicine (GUM) or sexual health clinics.**
   - **Antenatal services in every pregnancy.**
   - **Termination of pregnancy services.**
   - **Drug dependency programmes.**
   - **Healthcare services for those diagnosed with any of tuberculosis, HBV, HCV and lymphoma.**

3. **HIV testing should also be offered and recommended as part of routine care to the following patients:**
   - **any patient presenting for healthcare where HIV, including primary infection, enters the differential diagnosis**
   - **all men and women diagnosed with a sexually transmitted infection**
   - **all sexual partners of HIV-infected men and women**
   - **all men that have sexual contact with other men**
   - **all female sexual contacts of MSM**
   - **all patients reporting a history of IDU**
   - **all men and women known to be from a country of high HIV prevalence (>1%)**
   - **all men and women who report sexual contact abroad or in the UK with individuals from countries of high HIV prevalence.**

4. **For the following, testing is in accordance with existing Department of Health guidance:**
   - **Blood donors.**
   - **Dialysis patients.**
   - **Organ transplant donors and recipients.**
   - **All patients requiring immunosuppressant therapy.**

3 BBV Testing

3.1 Who should be tested for BBVs?

NHS Grampian recommends that the following categories of individuals should be offered BBV testing:

- **Anyone who requests a BBV test.**
- **Anyone who is from an area of high prevalence for any BBV (HBV, HCV, HIV).**
- **Anyone who reports current or previous risk behaviour or anyone with a clinical presentation or condition that could be associated with HBV, HCV or HIV.**
- **All new prison inmates admitted to HMP Grampian.**
- **All new patients registering at a GP surgery who have been born, raised or otherwise resident in a country of high BBV prevalence, including all returning travellers who have had sexual contacts in these countries.**

It is recommended and is good practice to consider testing for all three infections whenever faced with an individual at risk of any BBV. This is because HBV, HCV and HIV all share similar risk factors and similar modes of transmission. Furthermore, infection with more than one of the viruses can have significant impact on the clinical course and management of the individual infections. In addition, the treatment guidelines differ in HIV or hepatitis mono and co-infected populations (BHIVA 2013).

A summary of who should be tested and what test to request is presented in appendix 3 [page 18].

3.2 Who can request a BBV test?

All doctors, midwives, nurses and trained healthcare workers in specialist and non specialist settings in NHS Grampian, including those working in an accident and emergency department or general practice, should be able to arrange a BBV test and consent a patient.

It is no longer necessary to have a lengthy pre-test discussion. A BBV test should be regarded the same as any other test where the result could influence the patient's management and informed consent for a BBV test should be obtained in the same way as is currently done for any other medical investigation.

The BHIVA/BASHH UK guidelines for HIV recommend that when discussing HIV testing

with a patient, the main issue to cover is the benefit of having a test and how the test results will be given. A typical dialogue might be: *"So that we can find out what's going on and decide the best treatment for you, we need to do some investigations. We'll do an X-ray of your chest and take some blood to check your liver and kidneys plus look for some viral infections including hepatitis and HIV. Do you have any questions or is that OK?"*

It is important that blood borne virus testing and related services are provided in a culturally sensitive way. Otherwise, patients at high risk and their families may be deterred from accessing the services available.

To assist staff to communicate with non-English speaking patients, parents, relatives or friends, a "face to face" interpreter or the "Language Line" telephone interpretation service can be made available when consultation or care is provided. Material in translation can also be provided. If the patient has a communication disability, appropriate communication support such as British Sign Language (BSL) interpreters, audio, accessible/pictorial material, large print and other formats and support can be provided. For more information, contact either Nigel Firth on (01224 5)52245 or Roda Bird on (01224 5)51116.

3.3 Window period

A window period is the time from exposure to the infection to a positive test. During this period the normal serological response cannot be detected by the usual testing methods. All BBVs have a window period. It is important to establish whether the person being tested could be in the window period, or has been at risk of exposure to infection during the window period for each virus. If tested during the window period, they should be offered re-testing, if initial tests are negative, after the appropriate window period. The table below shows the window period:

Table 2: BBV Window period

	HCV	HBV	HIV
Window period	up to 6 months	up to 6 months	up to 2 months

3.4 Virology request

All samples should be sent to the Virology Laboratory where a full diagnostic virology service is available between the hours of 08:30-17:00 Monday to Friday. A limited service is available out of hours. Where samples are required to be tested urgently, please contact the Virology Laboratory on 01224 552452 (or if not available, the duty Microbiologist

available via ARI switchboard, 0345 456 6000).

The Virology laboratory assumes that consent for BBV testing has been obtained when an electronic or printed request specifying a BBV test is received in the laboratory.

Any request for BBV testing of a sample already in the laboratory must be discussed with Virology Laboratory staff 08:30-17:00 Monday to Friday on 01224 552452 and outwith these times with the duty Microbiologist available via ARI switchboard, 0345 456 6000.

3.5 Methods of BBV testing

The preferred and recommended method for BBV testing is a venous blood sample because this is universally available and is the most cost effective. Other methods of testing include Dried Blood Spot (DBS) Testing or point of care tests (POCT).

3.5.1 Venous blood testing

Venous blood is ideal for BBV testing and is the preferred method for testing in Grampian. Send one purple top 10 ml EDTA tube (if available). For all samples for BBV testing, the following information should be provided on the request form:

- Patient's name, surname, Community Health Index Number (CHI) OR patients anonymous code
- Name of requesting clinician
- Date and time specimen taken
- BBV test requested
- Clinical Indication for BBV test

3.5.2 Dried Blood Spot testing

DBS testing removes the need for venepuncture and is most suitable for patients with damaged peripheral veins, including those with a history of IDU or poor venous access. DBS testing is currently used in areas where there is prior agreement including non-NHS sites.

3.5.3 Point of Care Tests

A POCT only tests for a single pathogen and is therefore best used in selected outreach settings. It is not used routinely for testing or screening, however POCT for HIV and syphilis is available under special circumstances at Grampian Sexual Health Service.

3.6 How often to test

Repeat testing is recommended for the following:

- MSM should be tested at least annually for HBV (if not immune), HCV and HIV as well as syphilis, however 3-monthly testing is recommended if at high risk.
- PWID should be tested annually for HBV (if not immune), HCV and HIV or sooner if clinical symptoms are suggestive of a BBV.
- Pregnant women who refuse BBV testing at antenatal booking should be re-offered testing around 28-32 weeks and again at 36 weeks. Women presenting to services for the first time in labour (e.g. women who have not engaged with routine antenatal care) should be offered urgent testing. Any test sample obtained after 24 weeks should be marked URGENT and a telephone call made to advise the lab. Results should be available within 24 hours of receipt of the specimen by the laboratory to allow immediate intervention to prevent mother to child transmission and referral to the relevant specialist service for further assessment if results are positive. For tests done out of hours, including weekends and public holidays please telephone labs to advise.
- To contact the laboratory during office hours (8.30am-5pm), please call 01224 552452. To contact the laboratory at any other time please contact the on call microbiologist, via the ARI switchboard, on 0345 456 6000.
- Testing should also be considered for the infant of a woman who has refused testing during the antenatal period.

3.7 BBV Test Results: Interpretations

All positive Hepatitis B surface Antigen (HBsAg) and HCV RNA results should be notified by the laboratory to the Health Protection Team in line with national public health legislation (Public Health (Scotland) Act 2008).

3.7.1 Post-test discussion and giving result of a BBV test

The result of any BBV test is best given to the patient face-to-face. In some situations and where such protocols exist, the result may be given by telephone. In all cases, whether the result is negative or positive, the post-test discussion should cover the following:

- An explanation of the test result and whether re-testing is required.
- Addressing any concerns or queries the patient might have regarding the test result.

- A discussion regarding harm/risk reduction e.g. the use of condoms, use of sterile injecting equipment, HIV post exposure prophylaxis (PEP).
- A discussion regarding HBV immunisation.
- A discussion around the need for contact tracing where this is required.
- A discussion around referral to a specialist for further investigation, treatment and care.
- Signposting to community services providing support for BBVs.

It is very important to let the patient who has tested negative for HBV, HCV or HIV know that this result does not mean immunity from infection. Nor does it mean that the patient is not engaging in activities that continue to put him or her at risk. For patients who continue to engage in risky behaviour, it is important to identify barriers to risk reduction and to give information about steps patients can take to minimise or eliminate possible exposure to HBV, HCV and HIV. The healthcare provider should emphasise the importance of being re- tested if the patient has engaged in risk behaviours during the “window period”.

According to the 2014 BASHH statement on window period (BASHH 2014), ‘Patients attending for HIV testing who identify a specific risk occurring less than 4 weeks previously should not be made to wait before HIV testing, as doing so may miss an opportunity to diagnose HIV infection (and in particular acute HIV infection during which a person is highly infectious). They should be offered a fourth generation laboratory HIV test and be advised to repeat it when 4 weeks have elapsed from the time of the last exposure.

A negative result on a fourth generation test performed at 4 weeks post-exposure is highly likely to exclude HIV infection. A further test at 8 weeks need only be considered following an event assessed as carrying a high risk of infection. NHS Grampian Virology Laboratory use fourth generation HIV test kits. These kits detect HIV-1 and HIV- 2 antibodies and HIV-1 p24 antigen.

3.7.2 Interpretation of results

Please see appendices 4 [page 20], 5 [page 21] & 6 [page 22] for interpretation of HBV, HCV and HIV serology results and further actions and appendix 7 [page 23] & 8 [page 26] for summary of tests and testing flow chart respectively.

3.8 Referral to specialist clinical* and community support services

- Adult patients with confirmed HCV infection or chronic HBV infection should be

referred to NHS Grampian Liver Service for assessment, treatment and monitoring.

- All adult patients diagnosed with HIV should be referred to the GUM clinic or the Infection Unit promptly for clinical assessment, treatment and monitoring. If an unwell patient or woman in labour is diagnosed HIV positive, please contact the on call GUM consultant or Infection Unit registrar/consultant urgently for management advice. All patients diagnosed HIV positive are reviewed for “missed opportunities” for diagnosis and if present, this will be given as feedback to clinical teams.
- Children who are diagnosed with HCV, HBV or HIV should be referred to RACH.
- Where there is co-infection with HIV and HBV or HCV this should be discussed with and referral made to both the Liver Service and Infectious Disease or GUM consultant.
- Referrals to specialist services should be by letter via the SCI gateway. Initial contact with specialist service may be via telephone.

There are a number of third sector agencies that provide support in the community to those with a BBV diagnosis or those living with a BBV. A list of these organisations can be found in appendix 9 [page 27].

*See appendix 10 [page 28] for information and contact numbers for specialist clinical services.

4 References

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http://www.bts.org.uk/Documents/Publications/Guidance%20on%20the%20microbiological%20safety%20of%20human%20organs,%20tissues%20and%20cells%20used%20in%20transplantation.pdf

UK National Guidelines for HIV Testing 2008, British HIV Association · British Association for Sexual Health and HIV · British Infection Society
http://www.bhiva.org/documents/Guidelines/Testing/GlinesHIVTest08.pdf

5 Distribution list

- Accident & Emergency department staff
- Consultants in Public Health Medicine
- General Practitioners
- GMed staff
- GUM Consultants
- Health Protection Nurses
- Hospital Medical staff
- Infectious Disease Consultants
- Nurses and Midwives
- 3rd Sector / Voluntary Organisations providing BBV testing on behalf of NHS Grampian

Appendix 1: Abbreviations

A&E	Accident and Emergency
Anti-HBc	Hepatitis B anti-core antibody
Anti-HBs	Hepatitis B anti-surface antibody
ARI	Aberdeen Royal Infirmary
BASHH	British Society for Sexual Health and HIV
BBV	Blood Borne Virus
BHIVA	British HIV Association
BIS	British Infection Society
CHI	Community Health Index
DBS	Dry Blood Spot
GP	General Practice
GUM	Genitourinary Medicine
HBcAb	Hepatitis B core antibody
HBeAb	Hepatitis B e antibody
HBeAg	Hepatitis B e antigen
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HIV	Human Immunodeficiency virus
IDU	Injecting Drug Use
IgM	Immunoglobulin M
INFU	Infection Unit
MSM	Men who have sex with men
OH	Occupational Health
PCR	Polymerase chain reaction
PWID	Person Who Injects Drugs
RNA	Ribonucleic acid

Appendix 2: Clinical indicator diseases for adult HIV infection

	AIDS-defining conditions	Other conditions where HIV testing should be offered
Respiratory	• Tuberculosis • Pneumocystis	• Bacterial pneumonia • Aspergillosis
Neurology	• Cerebral toxoplasmosis • Primary cerebral lymphoma • Cryptococcus meningitis • Progressive multifocal leucoencephalopathy	• Aseptic meningitis/encephalitis • Cerebral abscess • Space occupying lesion of unknown cause • Guillain-Barre syndrome • Transverse myelitis • Peripheral neuropathy • Dementia • Leucoencephalopathy
Dermatology	Kaposi sarcoma	• Severe or recalcitrant seborrhoeic dermatitis • Severe recalcitrant psoriasis • Multidermatomal or recurrent herpes zoster
Gastroenterology	Persistent cryptosporidiosis	• Oral candidiasis • Oral hairy leukoplakia • Chronic diarrhoea of unknown cause • Weight loss of unknown cause • Salmonella, shigella or campylobacter • Hepatitis B infection • Hepatitis C infection
Oncology	Non-Hodgkin's lymphoma	• Anal cancer or anal intraepithelial dysplasia • Lung cancer • Seminoma • Head and neck cancer • Hodgkin's lymphoma • Castleman's disease
Gynaecology	Cervical cancer	• Vaginal intraepithelial neoplasia • Cervical intraepithelial neoplasia Grade 2 or above

Haematology		Any unexplained blood dyscrasia including: • Thrombocytopenia • Neutropenia • Lymphopenia
Ophthalmology	Cytomegalovirus retinitis	• Infective retinal diseases including herpesviruses and toxoplasma • Any unexplained retinopathy
ENT		• Lymphadenopathy of unknown cause • Chronic parotitis • Lymphoepithelial parotid cysts
Other		• Mononucleosis like syndrome (primary HIV infection) • Any Lymphadenopathy of unknown cause • Any sexually transmitted infection

Source: BHIVA, BASHH, BIS (2008) UK National Guidelines for HIV testing

Appendix 3: Summary of individuals who should be offered testing and type of test to request

Lifestyle/behaviours	**HCV antibody**	**HBV**	**HIV**
Any individuals with a history of current or past injecting drug use	Yes	core antibody*****	Yes
Individuals who change sexual partners frequently, including men who have sex with men (MSM) and their female contacts; and male or female commercial sex workers	If risk factor (e.g. traumatic anal sex)	core antibody	Yes
Individuals with sexual contact abroad or with individuals from high prevalence countries	If high risk country or exposure	core antibody*****	Yes
Community/workplace contacts	**HCV antibody**	**HBV**	**HIV**
Individuals with tattoos or other body piercing procedures, where infection control may have been inadequate	Yes	surface antigen	Yes
Close contacts (e.g. family, household, injecting partners) of HBV infected individuals; support for this is available from the Health Protection Team 01224-558520	-	surface antigen & core antibody	-
Individuals not immunised against HBV as infants, whose parent(s) were born in areas of high HBV prevalence	-	surface antigen	-
Individuals born or coming from a high or intermediate HCV/HBV/HIV endemic area	Yes	core antibody*****	Yes
Individuals with a current or past sexual partner who is HCV/HBV/HIV positive	Yes	core antibody *****	Yes
Children (more than 12-15 months old) born to HCV/HBV/HIV positive mother (virus-specific testing advised)	Yes	surface antigen	Yes

Health issues	**HCV antibody**	**HBV**	**HIV**
Individuals diagnosed with HCV/HBV/HIV (all 3 to be offered at baseline, when any of 3 is positive)	Yes	core antibody	Yes
Individuals diagnosed with a sexually transmitted infection	If additional risk or partner HCV positive	consider core antibody**	Yes and syphilis
Individuals with an unexplained persistently elevated aminotransferase or jaundice	Yes	surface antigen	Yes
Individuals with selected diagnoses linked to immuno-suppressed health states	-	-	Yes
Individuals requiring immunosuppressive therapy (including biologics)	Yes	core antibody	Yes
Pregnant women, through antenatal screening or not	If risk factor	surface antigen	Yes
Healthcare issues	**HCV antibody**	**HBV**	**HIV**
Individuals receiving dialysis	Yes	surface antigen	Yes
UK recipients of blood products (pre-1986), blood (pre-1991), organ/tissue transplant (pre-1992)	Yes	surface antigen	Yes
Individuals who have received medical or dental treatment where infection control is, or is suspected to be, inadequate, particularly in countries where BBV prevalence is moderate or high	Yes	surface antigen	Yes
Blood and/or tissue donors	Yes	surface antigen	Yes

* Individual should be immunised if susceptible otherwise request surface antigen only
** Unless previously fully immunised and demonstrating a satisfactory HBsAb response

Appendix 4: Interpretation of HBV serologic test results and further actions

HEP B SEROLOGIC TEST	RESULT	INTERPRETATION	FURTHER ACTIONS
HBsAg anti-HBc anti-HBs	negative negative negative	Non immune. Patient is susceptible to HBV infection	• Offer HBV immunisation if at ongoing risk of exposure • BBV prevention advice • Offer advice on risk reduction • Offer HIV and HCV testing if ongoing risk
HBsAg anti-HBc anti-HBs	negative positive positive	Indicates past exposure to HBV. Immune due to natural infection.	• No further action regarding HBV unless individual becomes immunocompromised or develop unexplained elevated aminotransferases • Offer testing for HCV and HIV
HBsAg anti-HBc anti-HBs	negative negative positive	Indicates previous HBV immunisation. Immune due to HBV immunisation	• No further action. • Offer HCV and HIV testing if at risk
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive positive negative	Acutely infected (or rarely acute exacerbation of chronic HBV infection)	• Harm reduction advice • Contact tracing and immunisation of household and sexual contacts • Offer HCV and HIV testing • Discuss with Infection Unit
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive negative negative	Chronic HBV infection	• Refer to Liver Service for further care • Offer HCV and HIV testing
HBsAg anti-HBc anti-HBs	negative positive negative	Four possibilities: 1. Resolved infection (most common) 2. False-positive anti- HBc, thus susceptible 3. “Low level” chronic infection 4. Resolving acute infection	• Discuss with Virus Laboratory • Repeat test

Appendix 5: Interpretation of results of tests for HCV infection and further actions

TEST OUTCOME	INTERPRETATION	FURTHER ACTIONS
HCV antibody non reactive/negative	No HCV antibody detected	• No further action required • BBV prevention advice • If recent exposure is suspected, repeat HCV antibody test after 6 months*. • Offer advice on risk reduction • Offer HBV and HIV testing if ongoing risk
HCV antibody reactive/positive	Presumptive HCV infection	• A repeatedly reactive result is consistent with: ✓ HCV infection ✓ HCV infection that has resolved ✓ false positivity for HCV antibody. • Test for HCV RNA (by PCR) to identify current infection.
HCV antibody reactive/positive PLUS HCV RNA detected	Current HCV infection	• Provide person tested with appropriate counselling • Offer testing for HBV and HIV if not done • Refer to Liver Services for further care and treatment.
HCV antibody reactive/positive PLUS HCV RNA not detected	No current HCV infection	• Repeat HCV RNA after 6 months, if negative no further action required in most cases. • In certain situations, particularly where there is ongoing risk, follow up with HCV RNA testing and appropriate counselling. • Offer testing for HBV and HIV if not done

*Where a HCW is exposed to a known HCV RNA positive source test for HCV RNA.

Appendix 6: Interpretation of HIV test results

TEST OUTCOME	INTERPRETATION	FURTHER ACTIONS
Negative	Susceptible to HIV infection	• Repeat test if in 'window period' or ongoing risk behaviour • Offer advice on risk reduction • Offer HBV and HCV testing if ongoing risk
Positive	Ongoing HIV infection	• Offer infection prevention and harm reduction advice • Offer HBV and HCV testing • Refer to Infection Unit or GUM for treatment and monitoring, sexual health screening and contact tracing

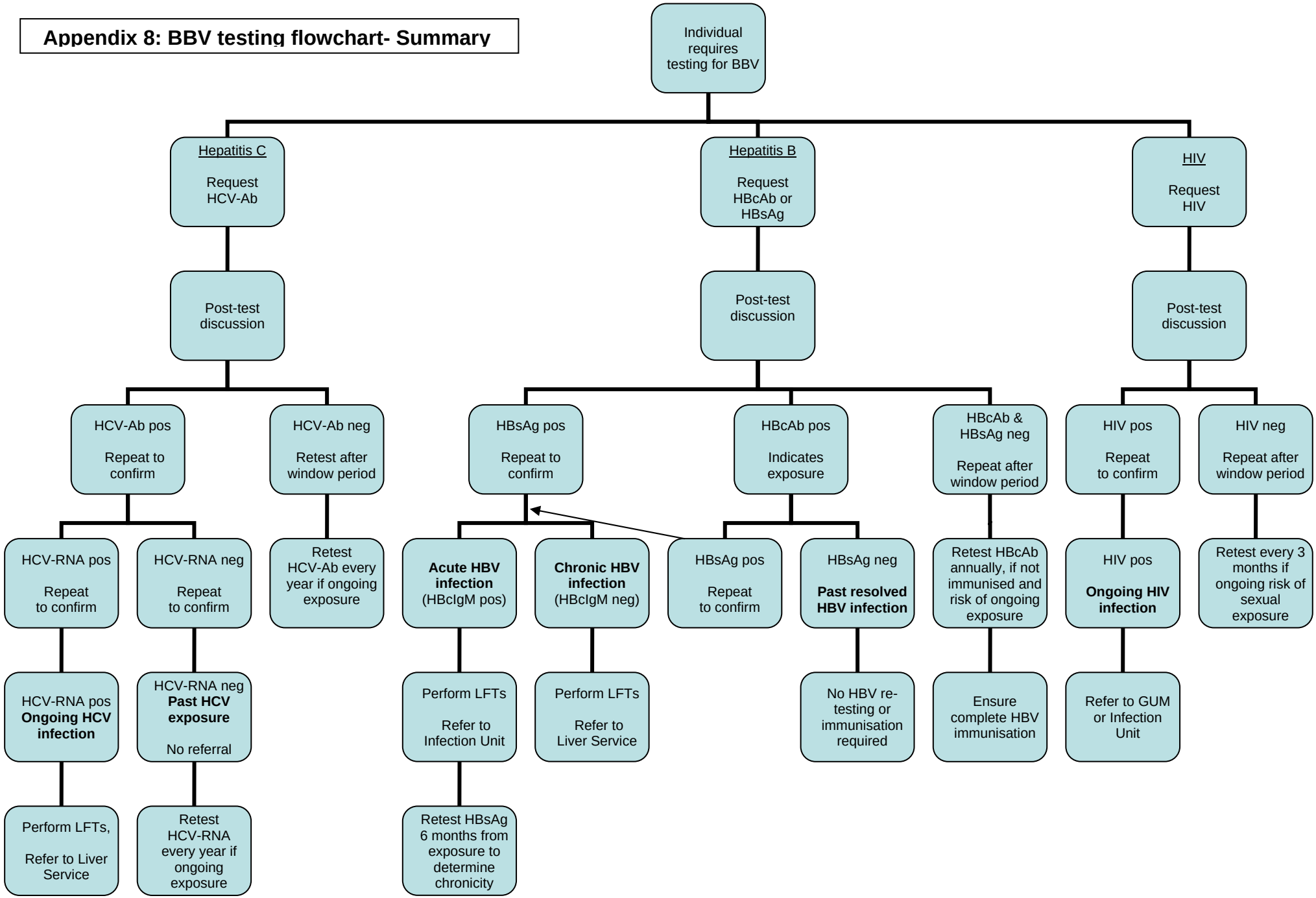
Appendix 7: Summary of BBV tests, when to request and interpretation of results

Type of BBV Test	When to request	Interpretation of result and further test
Hepatitis C antibody	Baseline test to assess ongoing or past HCV infection.	• Positive indicates exposure to HCV • HCV RNA testing (by PCR) differentiates between current and past infection: ✓ A positive result indicates current active infection ✓ A negative result indicates past/resolved infection • If past infection, individual is susceptible to re-infection as antibody is not protective.
HCV RNA	Specialist test (using polymerase chain reaction, PCR) to amplify HCV ribonucleic acid (RNA) when HCV antibody is positive. Used to: ✓ monitor chronic active infection ✓ monitor HCV treatment ✓ screen for infection in immuno- compromised patients (as unable to make the antibody).	Positive PCR indicates active HCV infection.
Hepatitis B core antibody (HBcAb, anti-HB core) antibody to HBV core antigen	Baseline HBV screening test for ongoing and past infection, generally used for well patients who, if at continued risk of exposure and are susceptible (core antibody negative), should be offered HBV immunisation. If HBcAb positive, virology lab automatically does further testing to establish current infection status.	• Positive indicates exposure to HBV at some time. • HBsAg testing differentiates between past and current infection: ✓ positive indicates ongoing infection ✓ negative indicates past/resolved infection.

Hepatitis B surface antigen (HBsAg)	Baseline diagnostic HBV test, generally used for unwell patients, e.g. those with jaundice or unexplained elevated aminotransferases and for selected HBV screening (e.g. occupational, antenatal). Also used if HBcAb is positive to ascertain ongoing HBV infection, see above.	A positive HBsAg indicates ongoing infection and transmissibility.
Hepatitis B IgM core antibody (HBcIgM, IgM anti HBc)	Specialist test for HBV added by laboratory staff only when HBsAg or core antibody is positive to assess acuteness of HBV infection.	If strongly positive, usually indicative of HBV exposure within the previous three months i.e. acute HBV infection. (Rarely can indicate acute exacerbation of chronic infection).
Hepatitis B e antigen (HBeAg)	Specialist test for HBV added by laboratory staff only when HBsAg is positive. Also used for chronic HBV patients attending specialist care	A positive result indicates high HBV transmissibility.
Hepatitis B e antibody (HBeAb) antibody to HBV e antigen	Specialist test for HBV added by laboratory staff usually when HBsAg is positive.	A positive result usually indicates lower risk of HBV transmissibility (unless mutant virus present).
Hepatitis B DNA (HBV DNA)	Used to assess clinical staging and to monitor response to treatment for chronic HBV patients attending specialist care.	A positive result correlates with active HBV replication.
Hepatitis B surface antibody (HBsAb) antibody to HBV surface antigen	Non-routine test. Used to assess response to immunisation. Only needed in selected groups (e.g. healthcare workers, immuno-compromised patients, renal dialysis patients). See https://www.gov.uk/government/publications/hepatitis-b-the- green-book-chapter-18	A positive result usually indicates HBV immunity as a result of past infection or active immunisation.

HIV types 1 and 2 Combined HIV antigen and antibody to HIV 1 and HIV 2	Baseline screening and diagnostic test for HIV. When positive, the laboratory arranges appropriate specialist confirmatory tests.	A positive result indicates ongoing infection with HIV.

Appendix 8: BBV testing flowchart- Summary



Appendix 9: Support Services in Grampian - 3rd Sector Agencies

Alcohol and Drugs Action	7 Hadden Street Aberdeen AB11 6NN	01224 577120
Turning Point Scotland North Aberdeenshire Recovery Service	Chalmers Hospital Banff AB45 1JA	01779 470490
Turning Point Scotland North Aberdeenshire Recovery Service	9 St Peter Street Peterhead AB42 1QB	01779 470490
Arrows – A Quarries service	23 High Street Elgin, IV30 1EE	01343 610 500
Terence Higgins Trust	2 Rose Street Aberdeen AB10 1UA	01224 582135

Appendix 10: Specialist Services and Laboratory Information

Specialist Service	Contact Address	Day time contact
Infectious Diseases	Infection Unit, Ward 111, Aberdeen Royal Infirmary, Foresterhill, Aberdeen, AB25 2ZN	**0345 456 6000**
Liver Service	Peter Brunt Clinic, Aberdeen Royal Infirmary, Foresterhill, Aberdeen, AB25 2ZN	**01224 559988**
GUM	Aberdeen Health Village, 50 Frederick Street Aberdeen	**0345 337 9900**
Pediatric HIV services	Royal Aberdeen Children's Hospital, Westburn Road, Foresterhill, Aberdeen, AB25 2ZG	**0345 456 6000**
Virology Laboratory	Virology Laboratory, Department of Medical Microbiology, Aberdeen Royal Infirmary, Foresterhill, Aberdeen, AB25 2ZN	**01224 552452**
Health Protection	Summerfield House, 2 Eday Road, AB15 6RE	**01224 558520**
Out of Hours service*	Via ARI Switchboard	**0345 456 6000**

*All services can be contacted via ARI switchboard out of hours

Appendix 11: Other useful Information

For further information about ongoing work in Grampian related to HBV, HCV or HIV, please contact the Sexual Health and BBV Managed Care Network at: 01224 558521 or nhsg.mcn-shbbv@nhs.net