



Oceania  
Society for  
Sexual  
Health and  
HIV  
Medicine

**RECOMMENDATIONS**  
  
**for**  
  
**HIV MEDICINE**  
  
**and**  
  
**SEXUAL HEALTH CARE**  
  
**in**  
  
**PACIFIC SMALL ISLAND**  
  
**COUNTRIES & TERRITORIES**

(First Edition, July 2007)

This document was compiled by Gary Rogers MB,BS, PhD, from the HIV & STI Section in the Public Health Programme of the Secretariat of the Pacific Community, on behalf of, and in close consultation with, the interim board and members of the Oceania Society for Sexual Health and HIV Medicine. The Society endorses its recommendations. It is based on the small amount of operational research undertaken in the Pacific and on relevant international guidelines tailored to the circumstances facing clinicians and their patients in Pacific small island countries and territories.

The document is intended only to provide general information to health professionals and no liability is accepted by the Society, the Secretariat of the Pacific Community or the editor for the consequences of decisions made by professionals after consulting these recommendations. Health care workers should utilise professional judgement and due care in providing or recommending particular treatments to their patients or clients.

The development of the recommendations was supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria; and the New Zealand Agency for International Development.

Adopted 22 July, 2007.

## Contents

Contents .....	1
Introduction .....	5
Diagnosing HIV infection .....	7
HIV screening tests .....	7
Reactive HIV screening tests and confirmatory testing.....	8
'Window period' .....	10
Recommended testing algorithm for Pacific Island countries and territories .....	11
Which tests to use for screening and confirmation .....	11
Diagnosing HIV in the infants of mothers living with HIV .....	13
Organising care for people living with HIV .....	15
Criteria for effective and sustainable antiretroviral therapy .....	15
The nine criteria for effective and sustainable antiretroviral therapy .....	16
'Core teams' for HIV care .....	16
Process and content for initial training of core teams.....	17
Mentorship and support of core teams .....	17
Monitoring people with HIV not yet taking antiretroviral therapy.....	18
Using of antiretroviral therapy in adults and adolescents .....	19
When to start antiretroviral therapy .....	20
Clinical staging.....	22
What to start: which medications are recommended for first line therapy? .....	22
How to start antiretroviral therapy .....	24
Monitoring people taking antiretroviral therapy .....	25
Drug substitution for toxicity .....	26
Women with HIV who wish to become pregnant .....	27
Antiretroviral therapy failure and second line regimens .....	28
Preventing HIV transmission from mother to child .....	29

# HIV Medicine and Sexual Health Care Recommendations

Counselling and testing for HIV and other sexually-transmissible infections among pregnant women and their male partners.....	30
Managing women who have a reactive HIV screening test during pregnancy.....	30
Antiretroviral therapy for the mother .....	31
Mode of delivery .....	34
Antiretroviral prophylaxis for the infant .....	34
Infant feeding choices .....	35
Caring for infants born to mothers with HIV .....	36
Managing of potential exposures to blood borne viruses including HIV in health care settings .....	37
Prevention of occupational exposures .....	37
Systems for management of occupational exposures.....	38
Risks of transmission associated with particular occupational exposures .....	38
Managing Occupational Exposure – Immediate Steps.....	39
First Aid .....	39
Reporting.....	39
Medical assessment after occupational exposures .....	40
The Exposure and the ‘Source’ Patient.....	40
The exposed health care worker .....	41
Post-exposure prophylaxis .....	42
PEP for HIV.....	42
PEP for hepatitis B .....	44
PEP for tetanus.....	44
PEP for hepatitis C .....	45
Clinical follow up and counselling .....	45
Special considerations .....	46
Managing other sexually-transmissible infections.....	47
Testing for other STIs .....	47
Consent to testing .....	47
Which tests to do.....	48
Treatment for other STIs.....	48

Syndromic treatment.....	48
Reactive or positive test results .....	49
Follow up.....	49
Contact tracing.....	49
Chlamydia and Gonorrhoea .....	49
Detection.....	49
Syndromes and symptoms .....	49
Treatment .....	50
Pelvic inflammatory disease .....	51
Trichomoniasis .....	54
Detection.....	54
Symptoms .....	54
Bacterial Vaginosis.....	55
Detection.....	55
Symptoms .....	55
Treatment .....	55
Candidiasis .....	56
Symptoms and signs .....	56
Treatment .....	57
Appendix 1 .....	58
OSSHHM-endorsed content for basic HIV Core Care Team training .....	58
Appendix 2.....	62
Summary of WHO clinical staging of HIV disease in adults and adolescents .....	62
Appendix 3.....	63
Identified leaders of core HIV care teams in Pacific Island countries .....	63
Federated States of Micronesia.....	63
Fiji Islands.....	63
Kiribati .....	63
Marshall Islands.....	64

# HIV Medicine and Sexual Health Care Recommendations

Palau .....	64
Samoa .....	64
Solomon Islands .....	64
Tuvalu .....	64
Vanuatu .....	64

## Introduction

The first diagnosis of Human Immunodeficiency Virus infection (HIV) in the Pacific was made in 1984 in the Marshall Islands but only recently have people living with HIV in most countries and territories in the region been able to benefit from effective treatment. In the developed countries of the Pacific Rim as well as New Caledonia and French Polynesia, the introduction of combination antiretroviral therapy in the mid 1990s resulted in a dramatic reduction in the death rate from the complications of HIV infection and marked improvement in the health of most people living with the virus.

In the last few years, the availability of financial assistance from the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) and the Asia Development Bank (ADB), as well as technical support from the Secretariat of the Pacific Community (SPC) and the World Health Organization (WHO), has enabled resource-constrained Pacific Island countries to start to provide antiretroviral therapy to their citizens who are living with HIV.

The effective and sustainable provision of HIV treatment is technically demanding but Pacific Island HIV physicians and care teams are beginning to develop substantial experience in its use under the mentorship of technical advisers from SPC and WHO.

Population surveys undertaken in several Pacific Island countries in 2004 & 2005 demonstrated that the prevalences of other sexually-transmissible infections (STIs) such as *Chlamydia trachomatis* and gonorrhoea in the region are among the highest in the world and that many of these infections, particularly in women, are asymptomatic.<sup>1</sup>

In October 2006, ten HIV physicians from six Pacific Island countries met and decided to form a professional society of health workers engaged in the care of people living with HIV and people experiencing sexual health issues, including other STIs.

Since then, membership of the Oceania Society for Sexual Health and HIV Medicine (OSSHHM) has expanded to include health care workers from ten Pacific Island countries and territories.

The Society's objectives include:

To ensure optimal care for all people living with HIV and other STIs and for people experiencing other sexual health issues

To provide expert advice on HIV, other STIs and sexual health to country and territory governments, relevant organisations and health care workers

In order to meet these objectives, this document has been prepared by collecting and distilling regionally-developed guidelines and pertinent sections of relevant evidence-based international guidelines with full acknowledgement. Additionally, commentary on international guidelines is provided, based on the experience of OSSHHM members, to assist readers to apply the recommendations in the Pacific context. Where appropriate, the specific issues that apply on particular Pacific Islands or groups of islands are examined.

This first edition focuses on the most urgent areas where consistent guidance is needed for health care workers. It is intended to expand the scope of these recommendations across the spectrum of HIV medicine and sexual health care in subsequent revisions.

## HIV Medicine and Sexual Health Care Recommendations

The combined population of the 21 Pacific small-island countries and territories (namely American Samoa, Cook Islands, Federated States of Micronesia, Fiji Islands, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Pitcairn Islands, Samoa, Solomon Islands, Tokelau Islands, Tonga, Tuvalu, Vanuatu and Wallis & Futuna) is about three million people, which is less than half of the population of a small European country like Switzerland (population 7.5 million). Although each Pacific country and territory has its own unique character and culture, there are also many similarities between the islands in terms of their context and the issues they face. Further, common funding mechanisms are available to support the response to HIV and other STIs across many Pacific Island states.

For these reasons, OSSHHM believes that the approach to setting standards for HIV medicine and sexual health care that has been utilised to date, where each country or territory develops its own guidelines, represents an unwarranted duplication of effort and leads to inconsistency in the quality of care that people living with HIV and people with sexual health problems receive across the region.

Accordingly, the Society invites the governments of Pacific Island countries and territories to consider endorsing the evidence-based and Pacific-relevant recommendations contained in this document as national or territorial policy in relation to the practice of HIV medicine and sexual health care.

The science of sexual health and HIV medicine changes with extraordinary rapidity and so it is necessary for clinical guidelines in these areas to be updated regularly. It is OSSHHM's intention to update this collection of recommendations at least biennially and more often if there are substantial changes in the evidence over a shorter timeframe. Readers are referred to the Society's website ([www.spc.int/hiv/osshhm](http://www.spc.int/hiv/osshhm)) where the most recent revision of the recommendations will always be available.

## Diagnosing HIV infection\*

Being diagnosed with HIV infection is a very significant life event. Accordingly, it is essential that great care is taken to ensure that the diagnosis is made reliably. However, technical constraints in some Pacific Island settings make it difficult to obtain definitive confirmation of the diagnosis of HIV infection in a timely fashion and this can present particular difficulties for diagnosing clinicians and their patients.

### *HIV screening tests*

Initial testing for HIV infection is usually undertaken using assays that identify the presence of antibodies to HIV proteins in the blood (or occasionally other body fluids) of people being tested.

All pathological tests have to balance **sensitivity** (the ability to correctly identify a condition when it is present) against **specificity** (the ability to indicate that a condition is present only when it actually is, and not in range of other circumstances that may cause a test to be reactive). Because of this balance, there are five possible outcomes when any test for HIV antibodies is undertaken:

1. True positive – the test is reactive (it indicates that HIV antibody is present) and the person from whom the specimen was taken is actually infected with HIV
2. False positive – the test is reactive but the person from whom the specimen was taken is **not** actually infected with HIV
3. Inconclusive – the test is unable to decide whether HIV antibody is present or not
4. True negative – the test is non-reactive (it indicates that HIV antibody is not present) and the person from whom the specimen was taken is not actually infected with HIV
5. False negative – the test is non-reactive but the person from whom the specimen was taken **is** actually infected with HIV.

---

\* Please note that this section currently refers only to the laboratory aspects of HIV diagnosis and the particular issue of reactive results that may be true or false positives. OSSHHM also recognises the importance of appropriate counselling and informed consent in relation to all HIV testing. Guidelines and standards for these areas are currently being developed and will be included in a revised version of this document to be published later in 2007.

## HIV Medicine and Sexual Health Care Recommendations

Failing to identify that a person has HIV could have serious consequences and so most pathological tests for HIV antibody are 'tuned' so that they have a high sensitivity. This means that, provided the test is properly conducted, the test kit has not expired and it has been correctly stored (and provided that the person being tested is not in the 'window period', see page 10) false negative results are very rare for HIV tests.

### Reactive HIV screening tests and confirmatory testing

The 'price' for choosing a high sensitivity for HIV antibody tests is that they have a relatively low specificity. That means that reasonably often they will show false positive results (they will be reactive when the person does **not** actually have HIV). For example, if samples from a thousand people who **don't** have HIV are tested using a particular HIV test kit, on average, four of them will show reactivity (the test will be falsely positive) even though the person from whom it was taken does not in fact have HIV.

This effect is particularly important in populations, like most Pacific Islands at present, where the proportion of people who have HIV is quite low. See the box on this page for an example of why this is the case.

#### How likely is it that a reactive HIV screening test is a 'real' positive?

1. Assume that a particular HIV test has a false positive rate of 0.4% (four out of a thousand people who **don't** have HIV and are tested will have a reactive result)
2. Consider a population where the proportion of people with HIV is really high, say 20%.
  - Because a fifth of all people in this setting have HIV it is much more likely that a person who chooses (at random) to have a test will actually have HIV than that the test will be falsely positive
  - A positive result in this population is **much more likely to be true than to be false**
3. Now consider a population (like the general community in many Pacific Islands) where the proportion of people who have HIV is much lower, say one in ten thousand, or 0.01%.
  - In this setting, because only one in ten thousand people really have HIV, it is much more likely that a false positive test will occur than that a person who chooses (randomly) to have a test will actually have HIV
  - A positive screening test result in this population is **much more likely to be false than true**
4. Other factors apart from the population prevalence of HIV need to be considered too.
  - If the person being tested is known to have had unprotected vaginal or anal sex with someone who has confirmed HIV then, relatively speaking, it becomes more likely that a positive screening test will be true than false
  - If the person being tested has clinical signs and symptoms that are suggestive of HIV infection then, relatively speaking, it becomes more likely that a reactive screening test will, in fact, be a true positive

For these reasons it is really important that when a screening HIV test is reactive or repeatedly inconclusive, the sample is sent to a reference laboratory for confirmatory testing as soon as possible. Generally, the same sample used for initial testing should be sent to the reference laboratory, unless there is insufficient serum left for confirmatory testing.

Because of this complexity, OSSHM recommends that a small team of people including one laboratory scientist and one clinician (the identified leader of the Core HIV Care Team – see page 16 and page 63) be nominated in each Pacific Island country or territory to oversee the follow-up of people who have reactive HIV screening tests. All laboratory technicians who undertake HIV testing should be instructed to telephone these key people whenever they find a reactive or repeatedly inconclusive HIV screening test, **before** any report about the test is made to the health care worker who requested it or to the person who was tested.

Counselling the person who has been tested when this occurs can be challenging. For practical purposes it is appropriate to say in most Pacific settings that:

*there is some reaction on the screening test and we need to do further testing to work out what this means.*

To help the person understand what is going on it may be helpful to refer to information in the box on the previous page.

For a person who does not have suggestive symptoms and where it does not appear likely from the sexual history that they have had unprotected vaginal or anal sex with someone with HIV, you could say something like:

*There is a chance that what we are seeing on the blood test means that you actually do have HIV but it is more than likely that you don't. We need to arrange for further testing to make sure.*

The person will obviously need considerable support to cope with the stress of this situation and careful counselling to ensure that they understand the definitive result once confirmatory testing has been performed. The person should also be sensitively advised of the need to avoid unprotected vaginal or anal intercourse, blood donation and any other activity that could provide the opportunity for further HIV transmission until definitive confirmation of the person's status is obtained. If the person has a regular sexual partner it will be necessary for the situation and uncertainty to be discussed with the partner. The clinician should offer the person who has been tested assistance in undertaking this discussion so that the partner can also fully understand the situation and recognise that the reactive test may well be a false positive.

Where it is relatively more likely that the person's screening test will turn out to be a true positive, the advice given should be more circumspect. This might be the case if the person came to testing because they are a contact of someone who has been diagnosed to have HIV or where they have symptoms or clinical signs suggestive of HIV disease. In this setting, you could say something like:

*Well, the screening test is positive and this may well mean that you have HIV but we won't know for sure until we have done some extra testing.*

Again it is clear that the person will need considerable support during the period of uncertainty and after the definitive result is known. It will also be necessary for the person in this circumstance to avoid activities that may result in further HIV transmission as described above.

There are often delays in obtaining confirmatory testing for positive HIV screening results in many Pacific Island settings due to geographical and logistic issues. Sometimes it will be necessary to make urgent clinical decisions based on a positive screening test result. The most important example is the woman who has a reactive screening test in late pregnancy (see page 30). In this situation, clinical assessment and sexual history taking are very important since (as described in the box on the previous page) they give important clues as to whether a positive screening test is likely to be false or true.

Occasionally, confirmatory testing at the reference laboratory will yield an 'indeterminate' result. This requires that a second sample be drawn from the patient and sent to the reference laboratory for analysis. In this case, a further period of uncertainty results causing further stress for the person who has been tested and the clinician. The principles outlined above, including reference to the clinical assessment and sexual history for clues as to the likely final outcome, should continue to be applied while there is ongoing uncertainty about whether the person actually has HIV.

## HIV Medicine and Sexual Health Care Recommendations

Where a reactive or inconclusive screening test is obtained from a unit of blood donated for transfusion or from a sample taken to determine someone's suitability to donate blood or organs to another person, the unit should be discarded and the person should be initially rejected as a donor until confirmatory testing and follow up have been undertaken. The prospective donor should be contacted by a health care worker, advised confidentially and in person about the reactive result, and provided with counselling and support as discussed above.

Except in the case of women who test positive in late pregnancy (see page 30), it should almost never be necessary to initiate antiretroviral therapy before definitive confirmation that a person is actually infected with HIV has been obtained.

### 'Window period'

As has already been discussed, most HIV antibody tests are 'tuned' to maximise sensitivity (at the cost of reduced specificity). For this reason, it is very rare for samples from a person with established HIV infection to test falsely negative, provided the test has been conducted according to manufacturer's instructions, the test kit has not expired and it has been stored under appropriate conditions.

The exception to this general statement is the case of people who have only recently been infected with HIV. In this setting, the person's body may not yet have developed detectable levels of antibody by the time when the sample is taken.

If, for example, a person's sample is drawn and tested for HIV antibodies two weeks after a sexual exposure at which they became infected with the virus, the sample would be likely to be non-reactive even though at the time the person is indeed infected with HIV. This is because the new HIV infection is still becoming established in the person's body and the immune system is still in the process of developing an antibody response to it.

On average, HIV antibody tests become reactive about three to four weeks after the occasion when a person has been newly infected with HIV. Sometimes, for a range of reasons, this 'window period' is rather longer.

For practical purposes, a non-reactive HIV antibody test done on a sample taken **twelve weeks or more** after the last occasion on which the person might have been exposed to HIV can be regarded as definitive evidence that the person has not been infected.<sup>†</sup>

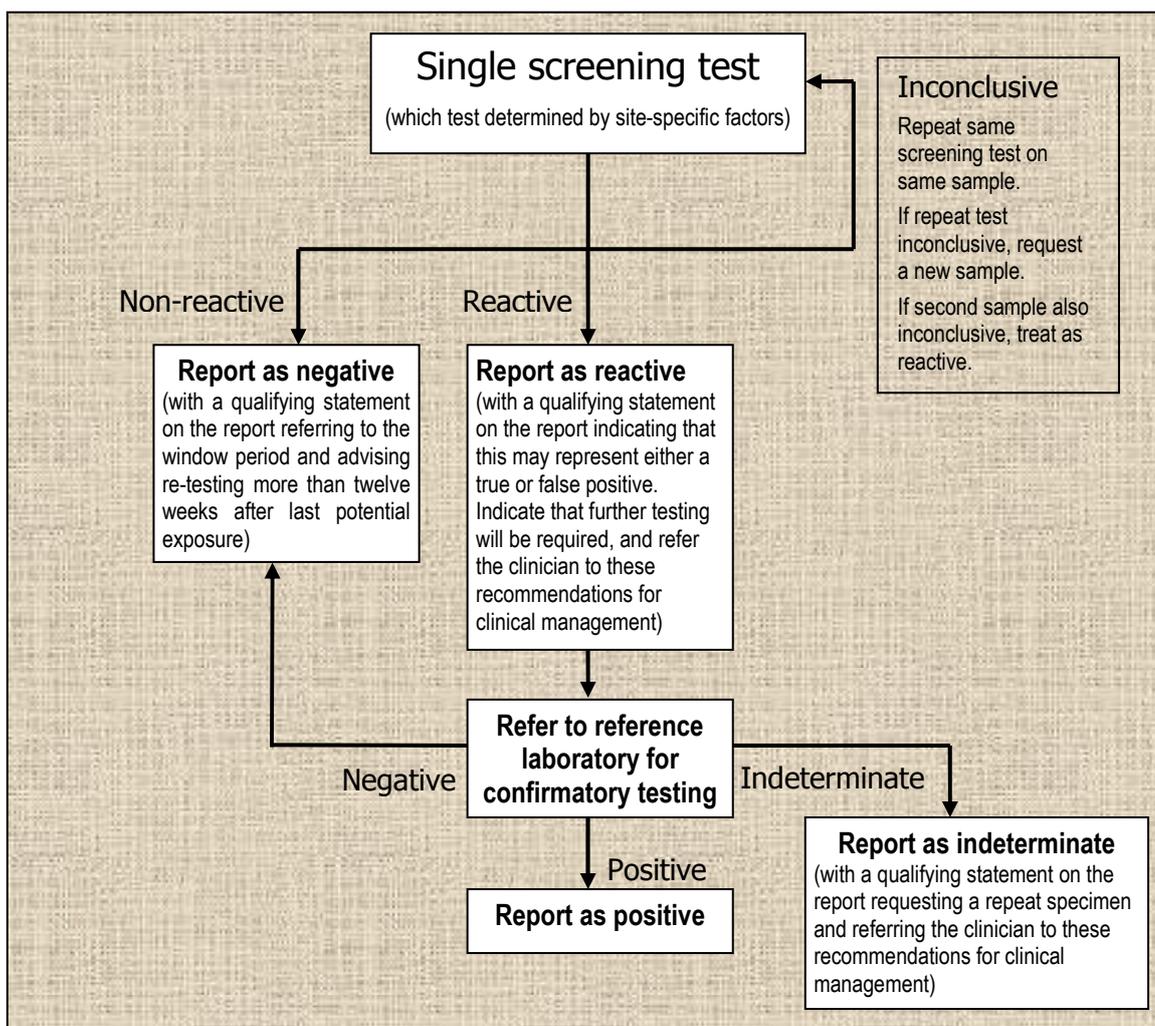
If a test has been done for whatever reason on a sample drawn during this 'window period' and found to be non-reactive, it is important that the test be repeated more than twelve weeks after the last exposure. If it is negative at this stage, the patient can be counselled that they have not acquired HIV from the exposure incidents concerned.

---

<sup>†</sup> The exception to this general advice is where antiretroviral medications have been given as post exposure prophylaxis for a particular incident (see Managing potential exposures to blood borne viruses including HIV in health care settings, on page 36). The evidence shows that in this circumstance the window period can sometimes extend beyond twelve weeks, presumably because the antiretroviral drugs delay the time course over which infection is established in the body even if they fail to prevent it. Where post exposure prophylaxis medication has been given, the window period should be extended to six months and a person should not be fully reassured that HIV infection has been prevented until a non-reactive result is obtained on a sample taken after the expiry of this period.

## **Recommended testing algorithm for Pacific Island countries and territories**

A wide variety of protocols for HIV diagnosis have been in use in Pacific Island countries in the last few years. This has led to considerable confusion among laboratory workers and clinicians as well as inconsistent standards of care for people presenting for HIV testing. After consideration of the circumstances across a number of Pacific Island settings, OSSHHM, along with the Laboratory Network of the Pacific Public Health Surveillance Network (LabNet), now recommends a simplified 'one screen' algorithm as described in Figure 1.



**Figure 1: General HIV testing algorithm for Pacific Island countries and territories**

### **Which tests to use for screening and confirmation**

There are differences between Pacific Island countries and territories in the way that HIV testing is organised and the sophistication of laboratory services available. New Caledonia, for example, has a 'Level 3' reference laboratory on-island (Institut Pasteur Nouvelle-Calédonie) while Niue has only a small 'Level 1' laboratory with a single part-time laboratory worker. On some islands, a large number of HIV screening tests are performed in the reference laboratory and any reactive specimens are confirmed on-site while on other islands few tests are performed and it is necessary to transport reactive specimens to a reference laboratory overseas for confirmation.

## HIV Medicine and Sexual Health Care Recommendations

Accordingly, different testing techniques will be appropriate for screening and for confirmation in different circumstances. The central principle of the algorithm described in Figure 1 on page 11, that only one screening test is utilised and that all reactive and repeatedly inconclusive samples are subjected to confirmatory testing in a reference laboratory, still applies whatever technologies are used for the two steps.

For most Pacific Island countries and territories it is recommended that a single 'rapid' HIV antibody test is used for initial screening. In most settings the Abbott Determine test kit is the most suitable for this purpose since it has very high sensitivity, is simple to use and can be performed on a single sample if necessary. In some laboratories, the larger number of tests performed each week makes the Serodia rapid HIV test a more appropriate choice. In a few well-developed Pacific laboratories with a high throughput of specimens, automated enzyme immuno-assay (ELISA) testing may be appropriate for initial screening.

Where rapid tests are used, it is important to note that only one type of test kit should be used for screening on any specimen. If the initial test is non-reactive, the specimen should be reported as negative. If it is reactive, the sample should be referred for confirmatory testing. If the test is inconclusive, it should be repeated using the **same type** of test kit according to the algorithm in Figure 1 on page 11. It is **not** recommended to re-test reactive or inconclusive specimens with a different test kit (such as the Serodia, if the Determine was used for initial screening, or vice versa).

### ***Keep it simple – only use one screening test***

- Screen the blood sample with one rapid HIV antibody test (Abbott Determine is recommended for most Pacific laboratories)
- If the test is **non-reactive**, report the specimen as **negative** (see Figure 1 on page 9)
- If the test is **reactive**, refer the specimen for **confirmatory testing** (see Figure 1 on page 9)
- If the test is **inconclusive**, repeat **the same** rapid test as recommended in Figure 1 on page 9
- **Don't** re-test the specimen with a **different** rapid test. For example:
  - Don't use Serodia if you have used Determine initially
  - Don't use Determine if you have used Serodia initially

Which tests should be used for confirmatory testing varies between laboratories. At Mataika House reference laboratory in Suva, reactive samples from Fiji and referred samples from Kiribati and Tuvalu are confirmed using a validated algorithm involving one rapid test and two ELISA tests. At Institut Pasteur Nouvelle-Calédonie, reactive samples from New Caledonia and Vanuatu are confirmed using a combination of ELISA and Western Blot testing, as are samples from Samoa, Tonga and the Solomon Islands at laboratories in Australia and New Zealand. Samples from American Samoa, the Federated States of Micronesia, Guam, Marshall Islands, Northern Mariana Islands and Palau, that are reactive to an HIV screening test are referred to laboratories in Hawai'i, where confirmation is usually undertaken using the Western Blot technique.

No international evidence-based guidelines have been published in the last decade to guide confirmatory testing for specimens that are reactive on screening tests for HIV antibody, and none have ever been produced that specifically address issues in the Pacific Islands.

At present, OSSHHM recommends that confirmatory testing is undertaken according to the protocol in place in the reference laboratory to which specimens are sent, provided that at least one additional test of a different type from the screening test and with a specificity greater than 95% is part of that protocol. In the longer term, OSSHHM recommends that specific validation studies be undertaken, utilising reactive, non-reactive and inconclusive samples from the Pacific, to ensure that confirmation protocols are appropriate for Pacific Island populations.

### ***Diagnosing HIV in the infants of mothers living with HIV***

Diagnosing whether babies born to mothers who have HIV have been infected with the virus during pregnancy, delivery or breast feeding is more complicated than diagnosing HIV in adults and older children. This is because antibodies pass from mothers to their foetuses before birth. As a result, all babies of mothers with HIV will have antibodies to HIV present in their blood when they are born and for a period afterwards, even if they haven't actually been infected with the virus themselves. Since HIV is usually diagnosed by looking for the presence of HIV antibodies, samples from all babies of mothers with HIV will test 'positive' irrespective of whether the baby is actually infected with the virus.

Because babies with HIV may become seriously ill quickly, it is important to try to diagnose whether a baby has really been infected as early as possible.

Because antibody testing is not reliable in young babies for the reasons described, tests that look instead for nucleic acid from HIV itself are utilised instead. Only babies who have actually been infected with HIV will have HIV nucleic acid in their blood. These tests are not available in most Pacific laboratories but referral of specimens to an overseas reference laboratory can usually be arranged.

OSSHHM recommends that babies of mothers with HIV have blood drawn and referred for nucleic acid testing six weeks after birth. This is because a high proportion of mother-to-child transmissions of HIV occur during labour and delivery. If transmission occurs at this time, it will take several weeks for the virus to reproduce in the baby's body to an extent where viral nucleic acid can be detected in the blood, especially if mother and baby have received antiretroviral medications in order to reduce the chance of transmission. A negative test for HIV nucleic acid on the blood of a baby six weeks after birth indicates definitively that the child did not acquire HIV during labour or delivery.

Where a mother with HIV elects to breast feed her baby, it should be recognised that HIV transmission can occur at any time until the baby is completely weaned. In this circumstance, it may be appropriate to re-test the baby's blood for HIV nucleic acid six weeks after breast feeding is stopped, or earlier if the baby shows clinical features suggestive of HIV infection.

All babies of mothers with HIV should be monitored closely for signs suggestive of HIV infection. Where specimen referral for nucleic acid testing is not possible, the baby should be assumed to be infected and managed accordingly (see page 36). Blood should be drawn from the baby for HIV antibody testing when the baby is nine months old. If the test is non-reactive at that time it can be concluded that the baby has not been infected.<sup>‡</sup>

---

<sup>‡</sup> However, if the mother is breast feeding it is still possible that the baby has been recently infected and is in the window period or that infection will occur subsequently.

## HIV Medicine and Sexual Health Care Recommendations

If the test is reactive or inconclusive no definitive conclusion can be drawn and the test should be repeated every three months. A non-reactive test at any stage during this follow up indicates that the baby is not HIV infected.<sup>§</sup> If the antibody test is still reactive when the baby reaches 18 months of age, it may then be concluded that the baby **is** infected, as all maternally-derived HIV antibody should have been lost from the circulation by this time. At this point confirmatory testing should be undertaken on blood from the baby to verify the diagnosis.

### Diagnosing HIV in the babies of mothers with HIV

- **All** infants born to mothers who have HIV will test positive for HIV antibodies at birth and for the first few months of life, **whether they are infected or not**, because of **maternal antibodies** passed across the placenta
- A test for **HIV nucleic acid** done at a reference laboratory on a sample drawn from a baby at **six weeks** of age will reliably determine whether the baby was infected at or before birth
- Babies born to mothers with HIV should be **monitored** closely and managed as if they are HIV infected until it is definitely known that they are not (see page 36)
- If nucleic acid testing is not available, an antibody test should be performed on the baby's blood at nine months of age. If the test is **negative** it can be assumed that the baby was **not** infected at birth
- If the test is **positive** at nine months, **no conclusion can be drawn** and the test should be repeated three monthly until a negative result is obtained or the baby reaches 18 months of age
- A **reactive** antibody test at **18 months** of age indicates that the baby **is** HIV infected and confirmatory testing should be undertaken to verify the diagnosis
- Where the babies of mothers with HIV are **breast fed**, infection can occur at any time until the baby is fully weaned. If the baby is not definitively known to be infected, a nucleic acid test **six weeks** after the cessation of breast feeding will determine definitively whether the baby has been infected

---

<sup>§</sup> However, if the mother is breast feeding it is still possible that the baby has been recently infected and is in the window period or that infection will occur subsequently.

## **Organising care for people living with HIV**

The impact of HIV infection is experienced across the full spectrum of the lives of people who are living with the virus, including the biological, psychological and social dimensions. Similarly, successful treatment for HIV infection requires a biopsychosocial perspective because factors across all of these aspects will bear on a person's capacity to adhere accurately to treatment and to stay engaged with the care team.

HIV infection remains a highly stigmatised condition and this may sometimes lead to people living with the virus being disadvantaged in the distribution of health resources. Health care workers should provide support and encouragement to their patients and clients but also have an advocacy role in ensuring that appropriate services are made available for people with HIV in their communities.

### ***Criteria for effective and sustainable antiretroviral therapy***

Effective provision of combination antiretroviral therapy is an essential component of HIV care since the majority of people living with HIV will need to start on these medications during the course of their infection in order to avoid becoming ill and dying from the disease.

Once someone with HIV starts on antiretroviral therapy, current evidence indicates that they will need to take it continuously and very accurately for the rest of their lives. For many this means that medication supplies and the social conditions that enable accurate adherence to treatment will need to be maintained for well in excess of twenty or more years.

Health care workers and health system decision-makers have an ethical responsibility to ensure not only that antiretroviral treatments and the systems to deliver them are made available to people living with HIV but also that they will be sustained for the long anticipated lives of people taking the treatment.

In 2004, the WHO convened a meeting of HIV coordinators from a number of Pacific Island countries at which nine criteria for effective and sustainable antiretroviral therapy provision were agreed. OSSHHM endorses these criteria\*\* and believes that all Pacific Island countries and territories where there are people living with HIV should strive urgently to achieve them.

Many people with HIV need access to treatment urgently if they are to survive. Accordingly, OSSHHM believes that the nine criteria should not form a barrier to commencing treatment for people with HIV whose lives depend on it. Rather, they should be seen as 'aspirational' criteria that need to be achieved in parallel with initiating treatment programmes.

OSSHMM believes that a country or territory that decides to initiate antiretroviral therapy needs to develop and implement an urgent, timed, costed and funded plan to achieve the criteria within a short timeframe from the commencement of treatment.

---

\*\* OSSHHM has slightly modified the original wording of the criteria to take account of subsequent developments in HIV care. It endorses the criteria as they appear in this document.

## **The nine criteria for effective and sustainable antiretroviral therapy**

1. There is a clear commitment to provide antiretroviral therapy in the country or territory from national or territorial decision-makers
2. A clearly assigned central unit, with an identified leader, is responsible for oversight of medical care for people receiving antiretroviral therapy in the country or territory
3. People living with HIV have been involved in development of care services
4. An ongoing supply of antiretroviral therapy has been secured and at least six months supply for the number of people to be treated is available in country
5. A technically-sound antiretroviral therapy protocol has been developed and is available (adoption of these recommendations would be considered to fulfil this criterion)
6. A local partnership exists between public health services, clinical services and community organisations to ensure a continuum of care and support for people living with HIV, including support for adherence to treatment
7. A core multidisciplinary HIV care team has been identified and has received appropriate training
8. Diagnostic services are available to perform HIV antibody tests and essential routine tests to monitor for drug toxicity
9. An adequate patient record system exists to ensure that the progress of people living with HIV being cared for by the core team can be effectively monitored

## ***'Core teams' for HIV care***

The concept of a 'core multidisciplinary HIV care team' introduced in the nine criteria has been further developed from the experience that several Pacific Island countries have had in setting up and operating core teams. This team needs to be able to provide comprehensive care for people living with HIV that takes account of the biological, psychological and social aspects of their health and provides ongoing support and follow-up to assist them to adhere accurately to antiretroviral treatment over the long term.

OSSHM recommends the following membership for an effective core team at any Pacific Island HIV treatment and care site:

1. An identified team leader – the primary HIV care doctor for the site
2. A nurse coordinator for the team (often the country's 'HIV Coordinator' but needs to be able to be closely involved in the care of people living with HIV)
3. At least one additional doctor (a physician, primary health care, sexual health or public health doctor who can fill in for the primary doctor when s/he is off-island)<sup>††</sup>
4. An obstetrician
5. A midwife

---

<sup>††</sup> In settings where different doctors have responsibility for the outpatient and inpatient care of people living with HIV, it is essential that both an inpatient and a public health or outpatient doctor are included in the core team.

6. A paediatrician
7. A counsellor (if a qualified counsellor exists or is available – if not, the nurse coordinator takes on this role)
8. A pharmacist (who will take responsibility for antiretroviral stock management and communication with the regional pharmacist, as well as supporting patient adherence. At some smaller island sites, the nurse coordinator takes on this role also if no pharmacist is available.)
9. A laboratory officer (who can take responsibility for referral of confirmation and monitoring specimens to overseas laboratories and after further support perform low-cost CD4 counting in country)
10. A person living with HIV

Note: It is recognised that in countries with smaller case loads membership of the HIV Core Care Team will not be the only, or even the primary, job of many of the team members. The team would generally operate as a 'virtual team', where members such as the obstetrician and paediatrician have received training and undertake to stay up to date with HIV care knowledge so that they can be called upon when required.

### ***Process and content for initial training of core teams***

OSSHM believes that initial training of core HIV care teams should be facilitated by one or more clinicians with extensive practical experience in HIV care and should be undertaken **in the Pacific Island country or territory where the team is to operate.**

Only through visiting the treatment site can training facilitators gain an appreciation of the particular issues that will bear on effective HIV care in that setting. Further, in-country training allows all members of the team to participate and starts to build cooperation and cohesiveness within the team. It also allows the facilitator to work with the team to identify and develop plans to overcome structural barriers that might impede the scale up of HIV care services at the site.

In-country training begins the development of an ongoing collegial relationship between members of the team and the training facilitator, who should provide ongoing remote mentorship for team members after the training. Finally, in-country training minimises the negative impact on service delivery that results from taking essential personnel out of their countries and territories for regional or international training events.

OSSHM has assessed and endorses core content developed and refined by the HIV & STI Section in the Public Health Programme at the Secretariat of the Pacific Community for the initial training of HIV care teams on Pacific Islands.

This content appears as Appendix 1 on page 58.

### ***Mentorship and support of core teams***

The comprehensive care of people living with HIV is technically demanding and the outcomes of care have been shown to be related to the level of experience of the health care workers providing it.

## HIV Medicine and Sexual Health Care Recommendations

Many Pacific Island countries and territories are early in the development of their response to HIV and especially systems of treatment and care for people who are living with the virus. Accordingly, it is essential that newly-formed care teams are provided with intensive remote mentorship by experienced HIV clinicians as they begin to care for people with HIV following their initial training.

OSSHMM recommends that, where possible, ongoing mentorship should be provided by the same experienced HIV clinician who has facilitated the initial in-country training sessions so that an ongoing collegial relationship between the mentor and members of the core team can develop.

Health care worker members of core care teams should be encouraged to become active members of OSSHMM as a further source of collegial support and continuing education. This also enables them to engage with issues and developments in relation to HIV medicine and sexual health care that are bearing on the Pacific region so that they can be effective advocates for the welfare of their patients and clients in their country or territory and in the regional arena.

As the network of OSSHMM members gains experience, knowledge and skill in HIV care it is intended that members of the Society will increasingly be able to support and provide mentorship for each other. Over a number of years, this should eventually obviate the need for expert mentors from outside of the region.

### ***Monitoring people with HIV not yet taking antiretroviral therapy***

Once a core care team has been established it is recommended that efforts are made to re-contact all people who have been diagnosed with HIV in the country previously so that they can be assessed for antiretroviral therapy (see When to start antiretroviral therapy on page 20) and have their health monitored.

OSSHMM recommends that people who do not yet need to start treatment should be reviewed by members of the team every three months with a regular appointment, rather than waiting for them to present with clinical problems. At these regular clinic visits the following activities should be undertaken:

- Enquiry should about any new symptoms, energy level and the person's general state of physical and emotional wellbeing
- General clinical examination including, as a minimum:
  - Skin and lymph nodes
  - Recording the person's weight
  - Throat and mouth and chest
  - Abdominal examination
  - Examination of other systems guided by clinical history
- Discussion of psychosocial aspects of the person's life including any new sexual partners with gentle reinforcement of HIV prevention messages
- Ensuring that positive women of childbearing potential have access to effective contraception unless they expressly wish to become pregnant
- CD4 count if available in-country or by international referral

## Using of antiretroviral therapy in adults and adolescents

Since antiretroviral drugs first became available in the late 1980s a very wide range of agents has been developed and a vast and increasing body evidence has emerged about the best ways to use them to maximise the long term effectiveness of HIV treatment.

To help clinicians to make sense of this complexity and provide the best advice to their patients, a number of expert bodies (such as the WHO,<sup>2</sup> the British HIV Association<sup>3</sup> and the United States Department of Health and Human Services<sup>4</sup>) have produced guidelines for antiretroviral therapy. Very high level technical analysis of the available evidence is undertaken in the development of these guidelines and they are updated frequently to take account of the evolving body of science in this area. In some countries such as Australia, this extensive and expensive process has been circumvented by the general adoption of guidelines from another country (the United States in Australia's case) with a 'commentary' being written each time the original guideline is reviewed to contextualise and modify the recommendations for a different setting.

Clearly, each of the available guidelines is oriented towards the care of people living with HIV in the particular setting for which it was developed. The British and US guidelines, for example, take account of the organisation and financing of health care in their respective countries and assume that clinicians utilising them will have access to drug choices and monitoring technologies that are the standard of care in those settings.

The WHO guidelines, on the other hand, are focussed on 'resource-limited settings' and advocate a 'public health approach' to care provision. This is an orientation where individualisation of therapy to take account of the circumstances of each person starting treatment gives way to prescribed standardised approaches that enable the treatment of large numbers of people by clinicians with limited experience. Certainly, many Pacific small island countries and territories are 'resource-limited' but none has the very large numbers of people with HIV needing treatment for which this approach to HIV care was developed.

Nevertheless, the 2006 WHO guideline *Antiretroviral therapy for HIV infection in adults and adolescents* is well researched and recommends rational combinations of drugs for initial and, where needed, second-line therapy.<sup>2</sup> OSSHHM broadly endorses the document and recommends that health care workers consult it to gain an understanding of the science and reasoning that underpins the recommendations for antiretroviral therapy.

Utilising the approach developed in Australia, key elements of the 2006 WHO guideline are distilled in this document along with commentary that takes account of other published guidelines and the experience of OSSHHM members, to contextualise the recommendations for Pacific small island countries and territories.

## ***When to start antiretroviral therapy***

Evidence is now emerging to suggest that HIV causes significant and probably irreparable damage to the immune systems of people who acquire it within weeks of first infection. At a clinical level these effects are subtle, however, and many people who are in the first few years of their HIV infection remain well and largely asymptomatic. Within a few months of infection, a near-equilibrium is achieved in most people with HIV where immune cells are replaced almost as quickly as they are damaged and virus is destroyed by the body almost as quickly as it replicates.

If ideal treatments for HIV were available it would be logical to start them as soon as HIV is diagnosed (as one would for other infections like tuberculosis). Completely ideal treatments are not available, however, and many have been associated with significant long term side effects related to the duration of therapy. Starting therapy very early also places a prolonged burden on the person with HIV to adhere accurately to a medication regimen over a longer period. This may account for the partial correlation observed between the duration of therapy and the likelihood that resistance to antiretroviral therapy will develop. Finally, the costs of antiretroviral therapy are significant and so delaying its introduction until later in the course of HIV disease will allow a larger total number of people to be treated within a constrained budget.

As a consequence, recommending the timing for initiation of antiretroviral therapy requires the clinician to exercise judgement in relation to the balance between the factors already mentioned and the desire to optimise treatment outcomes and prevent the development of severe complications of HIV disease.

Measurement of the number or proportion of lymphocytes in the person's blood that carry the 'CD4' marker (known as the 'CD4 count' or simply 'T cell count') has proven to be a useful measure of the degree of immune damage that has occurred and a powerful predictor of and whether the person will develop a severe complication in the succeeding few months. Where it is available, this test provides an excellent tool to guide advice on when it is appropriate to commence antiretroviral therapy.

The WHO 2006 guideline advocates that antiretroviral therapy should be recommended in relation to CD4 lymphocyte count according to the scheme in Table 1 on page 21 (adapted from the table on page 14 of the WHO guideline<sup>2</sup>). In the context of the Pacific Islands where smaller numbers of people are in need of antiretroviral therapy, OSSHHM recommends a slightly less conservative approach to the recommendation of antiretroviral therapy based on CD4 count, which is outlined in its commentary also included in the table.

Until recently, CD4 counting was only available in the Pacific context in New Caledonia and French Polynesia. Some Pacific Island countries have been able to refer specimens to laboratories in Australia, New Zealand, Hawai'i or New Caledonia for the test. OSSHHM recommends international referral for CD4 counting where feasible but recognises that it is logistically difficult since fresh blood is required for the procedure and significant transport delays can render specimens untestable.

In mid 2007, low-cost, 'low-tech' manual CD4 counting was trialled at Mataika House laboratory in Fiji for the first time, with technical support and training from the Burnet Institute. If this trial proves successful, it is intended that support will be provided to set up this technology in other Pacific Islands countries with significant numbers of people living with HIV. OSSHHM strongly supports this development.

Where CD4 counting is available, it is recommended that it be undertaken when a person is first assessed after diagnosis and three months thereafter. OSSHHM recommends that CD4 results be recorded graphically in the patient's medical record so that the approximate slope of their decline becomes apparent. In a person with HIV whose CD4 is between 200 and 350 cells per microlitre, a steep downward trajectory for the count should lead to earlier recommendation that antiretroviral therapy be initiated.

CD4 lymphocyte count (cells per microlitre)	WHO guideline recommendation <sup>##</sup>	OSSHMM commentary
<200	Recommend that antiretroviral therapy be started, regardless of clinical stage <sup>§§</sup>	OSSHMM supports this recommendation
200 - 350	Recommend that antiretroviral therapy be started if the patient: <ul style="list-style-type: none"> <li>• is in clinical stage 4</li> <li>• has tuberculosis</li> <li>• has had severe bacterial infections</li> <li>• is pregnant <b>and</b> is in clinical stage 3.</li> </ul> Otherwise, begin to discuss antiretroviral therapy and recommend that it be commenced before the CD4 count falls below 200 cells per microlitre.	<ul style="list-style-type: none"> <li>• OSSHHM believes that antiretroviral therapy should be recommended to <b>all</b> people with HIV in this cell count range who have <b>significant symptoms</b> related to their HIV.</li> <li>• OSSHHM recommends that combination antiretroviral therapy should be offered to <b>all</b> women with HIV who are <b>pregnant</b> from the end of the first trimester (see 'Preventing HIV transmission from mother to child' on page 29).</li> </ul>
>350	Do not recommend that antiretroviral therapy be started	<ul style="list-style-type: none"> <li>• OSSHHM believes that antiretroviral therapy should occasionally be recommended in people with CD4 counts &gt;350 based on individual assessment if, for example, the patient has significant symptoms that are likely to be HIV-related.</li> <li>• OSSHHM recommends that combination antiretroviral therapy should be offered to <b>all</b> women with HIV who are <b>pregnant</b> (see above)</li> </ul>

**Table 1: Treatment recommendations by CD4 lymphocyte count (adapted from <sup>2</sup>)**

Experience in other parts of the world has shown that while CD4 counting is very useful in informing decisions about when to recommend antiretroviral therapy it is not essential and lives can be saved by initiating antiretroviral therapy on the basis of clinical assessment where CD4 is not available.

<sup>##</sup> The language of the recommendations has been altered slightly to emphasise the partnership relationship between HIV clinicians and their patients recommended by OSSHHM. See also the box 'Is the patient 'ready' for treatment ?' on page 21.

<sup>§§</sup> See discussion on clinical staging on page 22.

## Clinical staging

The WHO guideline includes a detailed, and recently revised, clinical staging system to which the reader is referred.<sup>1</sup> A summary of the classification is reproduced in this document as Appendix 2 on page 62. The system has definite utility and OSSHHM recommends that staging according to the scheme be undertaken when people with HIV are first assessed and after significant new clinical events.

In the context of Pacific small island countries and territories, however, OSSHHM does not believe that reliance on fine differentiation between clinical stages is essential in determining when the initiation of antiretroviral therapy should be recommended.

OSSHHM advocates more simply that, in settings where CD4 testing is not yet available, **all** people with confirmed HIV who have

**significant HIV-related symptoms** should be recommended to start on combination antiretroviral therapy as soon as they are emotionally and socially 'ready' to begin (see box on this page).

## ***What to start: which medications are recommended for first line therapy?***

The regimen employed at the initiation of antiretroviral therapy represents the patient's best chance of achieving prolonged suppression of HIV replication. It should be selected carefully since it is intended that the patient will continue to take it for the rest of her or his life.

An ideal initial antiretroviral regimen would have the following characteristics:

- Simple
- Effective
- Low pill burden
- Minimal side effects
  - Short term
  - Long term
- Affordable

The WHO guidelines recommend that starting regimens should include two nucleoside or nucleotide reverse transcriptase inhibitors (NRTIs) and a non-nucleoside reverse transcriptase inhibitor (NNRTI) 'based on available evidence, clinical experience and programmatic feasibility for the wider introduction of ART in resource-limited settings.'<sup>2, p18</sup>

### ***Is the patient 'ready' for treatment?***

- **Accurate adherence** to antiretroviral therapy is critical if antiretroviral drug resistance is to be avoided and the treatment is to be effective in the long term
- Accordingly, it is **essential** that people living with HIV only start on antiretroviral therapy if they:
  - understand **why** the treatment has been recommended
  - understand the importance of accurate **adherence** and the reasons why it is so critical
  - are **able** to adhere accurately in terms of their social circumstances and the availability of support
  - are **committed** to adhering accurately
- Before antiretroviral therapy is prescribed the person should be carefully **counselled** and an **assessment** made of whether the patient is 'ready' to start in terms of these criteria
- It may take **several** clinical consultations, perhaps supplemented, where possible, by discussion with someone already taking antiretroviral therapy, before a person is **emotionally** and **socially 'ready'** to start
- Antiretroviral therapy should **not** be prescribed until the person with HIV and their clinician believe that they are 'ready' to start, **irrespective** of the severity of their clinical disease and the urgency of their biological need for treatment.

They go on to argue that

Regimens based on combination of two NRTIs plus one NNRTI are efficacious, are generally less expensive than other regimens, have generic formulations, are often available as fixed dose combinations and do not require a cold chain. In addition, they preserve a potent new class (protease inhibitors) for second-line treatments.<sup>2, p18</sup>

The WHO-recommended first-line regimens can be summarised as follows<sup>\*\*\*</sup>:

<b><u>Either:</u></b>	<b><u>plus either:</u></b>	<b><u>plus either:</u></b>
abacavir	emtricitabine	efavirenz
or		
stavudine	or	or
or		
<b>tenofovir</b>	lamivudine	nevirapine
or		
<b>zidovudine</b>		

Zidovudine or tenofovir are the preferred drugs in the left hand column with stavudine and abacavir recommended as substitutes in the event of significant toxicity. The reader is referred to the WHO guidelines for detailed consideration of each drug on the list in terms of its advantages and disadvantages in first line regimens.<sup>2, pp20-21</sup>

For resource-constrained Pacific Island countries, OSSHM recommends the following combination from the WHO list as the standard first line regimen:

**zidovudine**          plus          **lamivudine**          plus          **efavirenz**

This regimen is available in generic formulations including fixed dose combinations, is relatively inexpensive and while it is associated with short term side effects in some people (which can be managed and for which the patient can be properly prepared) it appears to be relatively non-toxic in the longer term.

The use of efavirenz is preferred over nevirapine, on balance, because of the higher risk of significant hypersensitivity reactions to nevirapine, particularly in patients with higher CD4 counts. The incidence of these reactions among Pacific Islander populations is unknown, but they have certainly been observed during initial role-out of antiretroviral therapy. Experiencing this hypersensitivity can lead to a negative impression of HIV treatment that is likely to be conveyed to other members of small communities in Pacific settings, which will militate against antiretroviral uptake. Nevirapine is contraindicated males with CD4 counts above 400 cells/microlitre and females with CD4 counts above 250 cells/microlitre because of a higher incidence of hypersensitivity. Many Pacific Island countries have difficulty obtaining CD4 count testing and so there is a significant risk that if nevirapine were used first line, patients with higher CD4 counts might be inadvertently started on the drug inappropriately. The drug also requires reduced-dosage introduction, which adds complexity when the patient is trying to establish a new medication routine.

---

\*\*\* With drugs in each column listed in alphabetical order.

## HIV Medicine and Sexual Health Care Recommendations

The major disadvantage of efavirenz is that it is contraindicated in the first trimester of pregnancy because of the potential for teratogenic effects. Thus, it is critical that women taking the drug for whom pregnancy is a possibility use effective methods of contraception. As discussed under 'Preventing HIV transmission from mother to child' on page 29, however, effective contraceptive methods are important for all women living with HIV unless they specifically wish to become pregnant. On balance, therefore, OSSHM recommends the use of efavirenz rather than nevirapine in the initial regimen.

### ***How to start antiretroviral therapy***

Once a decision has been made to start antiretroviral therapy the person needs to be carefully prepared. This preparation starts with the process described in the box on page 22 to determine whether the person is emotionally and socially 'ready' to begin, and may take several clinical consultations. Once this has been determined it is essential to explain to the person carefully the dosing schedule for the drugs and the side effects that may be experienced.

Explaining how to take the medications is best done with the pill bottles in front of you, so that you can be sure the person knows which pills to take when. Once you have done this it is advisable to ask the person to explain how and when they will take the pills back to you so that you can check that they have understood and remembered your advice. It is also useful to provide written instructions and to include the person's spouse or partner if they have one (with the patient's express consent) so that they can help with reminding.

For the recommended starting regimen it is suggested that this usually be taken as:

- 1 x zidovudine 300mg plus 1 x lamivudine 150mg with breakfast
- 1 x zidovudine 300mg plus 1 x lamivudine 150mg plus 1 x efavirenz 600mg with dinner, about twelve hours after breakfast.

It is critically important to explain the likely side effects so that the person knows what to expect and does not interrupt therapy out of concern when they are experienced. For the recommended regimen, the following explanations are particularly important:

- There is a very high chance that the person will experience some light-headedness, dizziness, drowsiness, insomnia or will generally feel strange after the first few doses of efavirenz. This is likely to improve after a few days.
- There is a reasonable chance that the person will experience some nausea or headache or both in relation to the zidovudine. The nausea will be minimised by ensuring that the tablets are always taken with food. If it occurs at other times in the day, a small snack will sometimes help. If these symptoms occur they can sometimes take several weeks to settle but will almost always be gone by six weeks from starting therapy.
- There is some risk that the person will experience anaemia (which can be explained as a fall in the number of red cells in the blood) as a result of the zidovudine. This could make the person feel tired or even have serious consequences. For this reason it is important that the person returns for follow up tests when requested and reports any new symptoms to the prescribing doctor.
- There is a small chance that the person will develop an allergic reaction to one of the drugs resulting in a skin rash or other symptoms. If this occurs, they should seek urgent help from the HIV care team.

As part of this explanation, it should be emphasised that there is often a lot that can be done to manage side effects so the person should not 'suffer in silence' but should seek help from the HIV care team earlier than planned if needed.

Zidovudine-related headache, for example, will usually respond to simple analgesics and an anti-nauseant such as prochlorperazine or metoclopramide given half an hour before the dose can be useful short term to manage nausea. If the person experiences severe and persistent central nervous system side effects from efavirenz, it can sometimes be useful to move the dose from dinner time to bedtime temporarily, though this has the disadvantage of needing to remember three dosing points in the day rather than two. Efavirenz is absorbed more slowly when given away from food and this can sometimes reduce the severity of the side effects. For people who experience insomnia as a result of efavirenz, it can sometimes be helpful to move the dose to breakfast instead of dinner.

It is also important to warn people starting on antiretroviral therapy that they may experience a variety of symptoms in the first few weeks on therapy so that they may 'feel worse before they feel better' and that this is to be expected. For example, they may experience a 'flare' of skin rashes that they have previously experienced. It should be explained that this is a sign of the immune system recovering and responding to organisms in the skin that it has been unable to react to before (immune reconstitution syndrome). It is important for the person to realise that these effects are not adverse effects of the medication but encouraging signs of immune recovery and that they are likely to resolve spontaneously quite quickly though specific treatment (such as steroid cream) can be provided if they are severe. Similarly, a patient with anogenital or plantar warts should be warned that these could get worse short term as the immune system recovers and the body responds to wart virus already present in the skin.

Women of childbearing potential (and their partners, where appropriate) should be counselled on the importance of not becoming pregnant whilst taking the recommended first-line regimen and appropriate contraception should be provided (see also 'Positive women who wish to become pregnant' on page 27).

Blood should be taken just before a person starts antiretroviral therapy for measurement of haemoglobin and, where available, liver function tests. These results act as a baseline against which to compare tests undertaken during monitoring. Where viral load testing is available through referral to a reference laboratory, it a sample should also be taken for this test just before treatment begins.

### ***Monitoring people taking antiretroviral therapy***

When a person starts on antiretroviral therapy it is important that they are given information about who to contact if they need help urgently in the first few days of treatment. It is a good idea to telephone or have a team member visit them the following day to ensure that all has gone well with the first doses and provide reassurance about side effects if necessary.

They should then be reviewed in the clinic at one week and two weeks from starting therapy. At these visits enquiry should be made about any side effects that have been experienced and blood should be taken for haemoglobin testing.

It is also important to ask about adherence to therapy but this should be done in a way that embodies the spirit of partnership that is central to HIV care and allows the patient to be honest without fearing disapproval.

# HIV Medicine and Sexual Health Care Recommendations

Rather than the accusatory:

*You haven't missed any pills have you?*

you might say something like:

*I know how hard it can be to take every one of the pills without missing any. How have you been going with that?*

A further review should be undertaken at one month from starting, at which time blood can be drawn for a repeat viral load test if it is available, as well as for haemoglobin measurement. It can be expected that by one month the viral load should have been reduced to less than a tenth of what it was before therapy (at least a 'one-log' reduction, e.g. from 100,000 to less than 10,000 copies per ml; or from 30,000 to less than 3,000). If this reduction is not seen, it is important to enquire (carefully, as described above) about adherence to therapy or whether the treatment has been interrupted for some reason. The patient will not always volunteer this information unless gentle enquiries are made on the basis of the viral load result.

The frequency of clinical review after the first month is at the discretion of the treatment team. Many Pacific Island care teams review their patients monthly to ensure that they remain in close contact and provide a months supply of medication at a time. For patients who live further from the centre, especially on outer islands, it is reasonable to review them only three monthly once the pattern of treatment adherence is firmly established. At each review the patient's history is taken and examination conducted as described under 'Monitoring people not yet taking antiretroviral therapy' on page 18.

Haemoglobin should be measured three monthly for the first year of therapy that includes zidovudine or earlier if the patient has symptoms or signs suggestive of anaemia. Where it is available, the viral load should be measured every three months. By three months from the time of starting antiretroviral therapy, it is expected that the viral load should be below 400 copies of virus per ml and by six months it should be below the limit of detection of the test (usually 50 copies per ml). If these targets are not achieved further gentle enquiries about adherence are indicated and advice from a more experienced colleague should be sought through the OSSHHM network.

CD4 counting is also valuable during immune recovery and if it is available it should be performed every three months until it has been over 500 cells per microlitre for two consecutive counts. Thereafter it need only be performed once a year provided the viral load remains below the limit of detection.

## ***Drug substitution for toxicity***

Where a person on the recommended first line regimen experiences severe persistent clinical toxicity it may be necessary to substitute one of the drugs in the regimen with an alternative. OSSHHM recommends that whenever practicable advice is sought from more experienced practitioners through the OSSHHM network before such a substitution is undertaken.

The most common scenario of persistent toxicity encountered in the Pacific to date has been the development of continuing anaemia in association with zidovudine. This appears to be more common in people who start antiretroviral therapy later in the course of their disease when there has been significant HIV-related damage to the bone marrow. Sometimes transfusion of red blood cells is indicated if the patient has symptomatic anaemia and it may be reasonable to continue the standard regimen for a while after transfusion to see whether the haemoglobin falls again.

If the patient's haemoglobin cannot be kept above 6.5 g/dl without ongoing transfusion, drug substitution is definitely indicated.

The ideal drugs for substitution in this scenario are either abacavir or tenofovir but both of these drugs are quite expensive and it is preferred to reserve them for a second line regimen.

An alternative strategy is to substitute stavudine (40mg twice daily unless the patient's weight is below 60kg, in which case 30mg twice daily) for the zidovudine. The problem with stavudine is that it is associated with a very high incidence of disfiguring lipoatrophy (fat loss from the face and limbs) with long term use. To avoid this outcome, it is sometimes recommended to substitute stavudine for a defined period (usually twelve months) and then substitute back to zidovudine after that time (when the bone marrow may have recovered) with close monitoring of the haemoglobin. There are no controlled trials to support this strategy but it may provide a pragmatic solution to the problem of persistent anaemia in some patients.

The other scenario that is likely to be faced in Pacific Island countries is the rare patient who has severe and persistent central nervous system symptoms in association with efavirenz, such as hallucinations or frank psychosis. Nevirapine may be an appropriate substitute in this scenario but should only be used where it is known or can be presumed that the patient's CD4 count is low (below 400 for males or below 250 for females).

More information on drug substitution for toxicity is available in the WHO guidelines.<sup>2, pp 32 – 33</sup> Decisions in these scenarios can be difficult and it is recommended that they be undertaken in full partnership with the patient and with advice from more experienced colleagues through the OSSHHM network.

### ***Women with HIV who wish to become pregnant***

As has been discussed, efavirenz is considered to be contraindicated in the first trimester of pregnancy because of an excess of birth defects observed in non-human species in trials during the drug's development, as well as four clinical reports of neural tube defects in the babies of women taking the drug. For this reason, it is vital that women taking the recommended first line regimen be counselled about this concern and provided with appropriate and effective means of contraception. As discussed on pages 44-45 of the WHO guidelines,<sup>2</sup> medroxyprogesterone acetate depot injection (Depo-Provera) is probably the most appropriate contraceptive choice for women on antiretroviral therapy. Close follow up of women of childbearing potential taking the recommended first line regimen is critically important to ensure that contraceptive coverage is always maintained.

In the scenario where a woman taking the standard regimen wishes to become pregnant, OSSHHM recommends that efavirenz be temporarily substituted with a protease inhibitor (preferably lopinavir/ritonavir 400mg/100mg twice daily with food) from the time that a decision to become pregnant is made. Once the pregnancy reaches the end of the first trimester, efavirenz may be substituted back. Nevirapine is not a suitable substitute for most women taking the recommended regimen who wish to become pregnant because the drug is contraindicated in women with CD4 counts higher than 250 cells per microlitre. Since women in this scenario will usually have been on antiretroviral therapy for some time, they are very likely to have a CD4 count above this threshold.

## HIV Medicine and Sexual Health Care Recommendations

Where a woman taking efavirenz is discovered to be pregnant, a rapid assessment of the dates of the pregnancy should be undertaken, utilising ultrasonography if there is any doubt.

If the pregnancy is early in the first trimester then substitution of lopinavir/ritonavir for efavirenz, should be considered. If the pregnancy has passed or is about to pass the end of the first trimester, then drug substitution is not indicated as the period of concern will already have passed. In this last scenario, the parents should be counselled again about the risk of teratogenicity (this information should already have been provided when the therapy was initiated) and the options regarding the continuation of the pregnancy considered, where options are available under the laws of the country concerned.

### ***Antiretroviral therapy failure and second line regimens***

The best chance to achieve durable and effective antiretroviral therapy is when treatment is first initiated and the importance of careful assessment and preparation of the patient (see the box on page 22) cannot be over emphasised.

The WHO guidelines provide detailed advice on how to identify antiretroviral therapy failure by clinical, immunological and virological means, as well as how to manage this outcome.<sup>2, pp 34 – 43</sup>

Relatively few people are expected to be treated for HIV in the small island countries and territories of the Pacific in the foreseeable future, and fewer still will experience antiretroviral therapy failure. For this reason, OSSHHM recommends that individualised assessment be undertaken, with advice from more experienced clinicians, whenever antiretroviral therapy failure is suspected in patients in the region. This will involve the use of viral load tests conducted at reference laboratories as well as careful and sensitive assessment of the patient's prior adherence and the factors that have influenced it.

Similarly, OSSHHM recommends that where second line regimens are required for people experiencing definite antiretroviral failure, these should be individualised on the basis of expert advice and, where possible, genotypic resistance testing conducted in a reference laboratory.

In general terms, second line regimens are likely to include a ritonavir-booster protease inhibitor (most often lopinavir), with two carefully-selected nucleoside drugs.

## Preventing HIV transmission from mother to child

The 2006 WHO guidelines *Antiretroviral drugs for treating pregnant women and preventing HIV infection in infants in resource-limited settings – Towards Universal Access*<sup>5</sup> build on earlier UN agency policy that recommends a four-pillared approach to the prevention of HIV infection in infants:

1. Primary prevention of HIV infection in adults, especially women of childbearing potential
2. Prevention of unintended pregnancy in women living with HIV
3. Prevention of HIV transmission from mothers living with HIV to their infants
4. Development of effective systems for the care, treatment and support of mothers living with HIV, their children and families.<sup>6</sup>

A regional consultation on the prevention of mother-to-child transmission in the Pacific conducted by UNICEF in Suva in April 2007 identified a fifth area of focus (which could also be considered a particularly important aspect of the first pillar):

5. Prevention of HIV infection in women who are already pregnant.

The promotion and ready availability of counselling and HIV testing (with fully informed consent) for women who are pregnant is an important overarching strategy since without it pillars 3 and 4 cannot be implemented. The counselling associated with antenatal testing also provides an opportunity to address pillar 5, especially if regular male partners of antenatal women (where they have them) are invited to undergo HIV testing at the same time.

OSSHMM endorses this enhanced comprehensive approach to the prevention of HIV infection in infants. It urges Pacific Island countries and territories to scale up prevention efforts that are based on evidence, especially the widespread distribution and promotion of condoms. These efforts should include a particular focus on the gendered aspects of Pacific social structures that increase the risk to women and the increased vulnerability to HIV acquisition associated with the extreme rates of other sexually transmissible infections (see 'Managing other sexually-transmissible infections' on page 47).

The prevention of unintended pregnancy in women with HIV has already been underlined in these recommendations in relation to the potential teratogenicity of the recommended first line antiretroviral regimen for the region (see page 27). OSSHMM emphasises that all people living with HIV should be engaged with regular clinical follow up and that this follow up should include provision of appropriate and effective contraceptive measures for positive women of childbearing potential who do not expressly wish to become pregnant.

### ***Counselling and testing for HIV and other sexually-transmissible infections among pregnant women and their male partners***

The recently-published WHO *Guidance on provider-initiated HIV testing and counseling* does not definitively recommend that HIV testing be routinely offered to women who are pregnant in communities with low HIV prevalence or concentrated epidemics.<sup>7</sup> However, the true prevalence of HIV is unknown in Pacific Island countries and territories, and the epidemic of HIV in the region is rapidly evolving. For these reasons, OSSHHM recommends that all women who are pregnant **should** be routinely counselled on HIV and **offered** an HIV antibody test with fully-informed consent. The test should be offered as early as possible in pregnancy and ideally the regular male partners of pregnant women should also be provided with counselling and offered testing at the same time.

Additionally, very high rates of other sexually-transmissible infections were documented among antenatal women in Second Generation Surveillance studies undertaken in six Pacific Island countries in 2004.<sup>1</sup> For this reason, OSSHHM recommends that serological testing for syphilis and nucleic acid testing for gonorrhoea and chlamydia should also be offered to pregnant women (and, where possible, their regular male partners) as a routine part of antenatal care (see also 'Managing other sexually-transmissible infections on page 47). Where other sexually-transmissible infections are diagnosed, they should be appropriately treated.

### ***Managing women who have a reactive HIV screening test during pregnancy***

It is important to emphasise that most women who have a reactive screening test for HIV during pregnancy in the small island countries and territories of the Pacific at present will **not**, in fact, have HIV.

Thus it is critical that reactive screening test results be managed very carefully in order to minimise the potential trauma to the woman and her family while still ensuring that optimal precautions are taken to minimise the risk of HIV transmission to the infant if the woman is really HIV infected (See 'Diagnosing HIV infection' on page 7 and, especially, 'Reactive HIV screening tests and confirmatory testing' on page 8).

OSSHHM recommends that laboratories report reactive screening test result to the leader (or acting leader) of the core HIV care team in the country immediately (before any result is given to the requesting clinician or the person tested). The current list of core HIV care team leaders can be found in Appendix 3 on page 63.

The HIV care team leader should ensure that these recommendations are followed and should seek urgent advice from more experienced colleagues through the OSSHHM network.

The original specimen that tested reactive should be immediately sent for confirmatory testing in a reference laboratory. This result should be available within a week provided the optimal means of transport and reference laboratory protocols are utilised. The OSSHHM network and regional laboratory support officers should be utilised to ensure that any barriers to the specimen being transported on the next scheduled flight and being tested urgently at the reference laboratory are overcome.

The action to be taken whilst awaiting confirmation depends on the dates of the pregnancy which must be accurately and urgently established, utilising ultrasonography if there is any doubt.

If the pregnancy is at less than 30 weeks of gestation, it is reasonable to wait for confirmation before taking any urgent action beyond ensuring good usual antenatal care for the mother. The mother should be counselled about the reactive specimen and the confirmation process according to the algorithm on page 9.

If the pregnancy is at more than 30 weeks gestation, then the mother should be carefully counselled according to the recommendations on page 9 but additionally should be advised that, because of the potential risk to the baby if the result turns out to be correct, it is strongly advised that action be taken in case the result is true.

If the woman accepts this proposal then antiretroviral therapy should be initiated and action taken as if the woman were definitely known to have HIV, as described below. If the confirmatory testing is unequivocally negative, then the antiretroviral therapy can be discontinued once this result is known. OSSHHM emphasises the importance of utilising support from more experience clinicians through the OSSHHM network before a judgement is made that a confirmatory test is unequivocally negative. If there is any doubt, the antiretroviral therapy should be continued and a second specimen tested.

### ***Antiretroviral therapy for the mother***

The following actions are recommended once the mother has been confirmed to be living with HIV, where pregnancy occurs in a woman known to be HIV positive or in the circumstance discussed in the preceding paragraph.

All of the international guidelines reviewed recommend full combination antiretroviral therapy for women who are pregnant and require antiretroviral therapy at the time of assessment for the maintenance of their own health. The guidelines differ, however, on the best option for women with early HIV disease who are pregnant but may not require antiretroviral therapy for several years in relation to their own health.

The British HIV Association guidelines recommend that women in this situation

*may be treated with a short-term antiretroviral therapy (START) commencing in the 2nd trimester with standard [‘highly active’ antiretroviral therapy] regimens with the intention to achieve undetectable viral loads of <50 copies per ml prior to delivery.<sup>3</sup>*

This approach recognises that it may be appropriate to discontinue this treatment after delivery (and breastfeeding, if it is undertaken). The British guidelines accept the use of fewer drugs in a purely prophylactic regimen as an ‘alternative approach’ in women ‘who have a viral load of less than 10,000 copies per ml’.

The US guidelines recommend that

*[s]tandard combination antiretroviral regimens for treatment of HIV-1 infection should be discussed and should be offered to all pregnant women with HIV-1 infection regardless of viral load;*

and state specifically that

*[w]hen initiation of antiretroviral therapy is considered optional on the basis of current guidelines for treatment of nonpregnant persons, infected pregnant women should be counseled regarding the benefits of standard combination therapy for fetal protection and should be offered such therapy.<sup>4</sup>*

They go on to state that describe the time-limited use of zidovudine monotherapy as part of regimens to prevent mother to child transmission of HIV is ‘controversial’. They

## HIV Medicine and Sexual Health Care Recommendations

argue that the use of such regimens 'might be an appropriate option' for women with viral loads **lower than 1,000** copies per ml who 'wish to restrict exposure of their fetus to antiretroviral drugs during pregnancy'.

Only the WHO guidelines *Antiretroviral drugs for treating pregnant women and preventing HIV infection in infants in resource-limited settings – Towards Universal Access* recommend the general use of less intensive prophylactic regimens, rather than combination antiretroviral therapy, for pregnant women with HIV who do not yet require treatment for their own health.<sup>5</sup>

As has been discussed in relation to the WHO general recommendations for antiretroviral therapy on page 19, the current WHO HIV guideline set adopts a 'public health approach'. This orientation was developed for settings where there are very large numbers of people to be treated, limited drug resources and very limited opportunity to individualise management to suit the needs of the particular patient. The availability of expert support through the OSSHHM network and the small number of people requiring treatment currently in the small island countries and territories of the Pacific need to be considered when applying these guidelines in this region.

In grappling with this controversy, OSSHHM has called on basic principles.

It is recognised that the most significant risk factor for mother child transmission antenatally, perinatally and during breastfeeding (if it is undertaken) is the HIV viral load of the mother. There is no doubt that the most effective way to reduce maternal viral load is with full antiretroviral therapy.

It is also well recognised that, as a general principle, whenever antiretroviral therapy is used, the aim is to reduce the replication of HIV to the lowest possible levels, as quickly as possible, and keep it there, in order to prevent the development of antiretroviral resistance through an evolutionary process.

The risk of development of antiretroviral resistance during the twelve weeks of zidovudine monotherapy associated with prophylactic regimens appears to be low in women with low viral loads (hence the references to 1,000 copies per ml in the US guidelines and 10,000 copies per ml in the British guidelines). Most Pacific small island settings do not yet have ready access to viral load testing, however, and so will be unable to ensure (without a prolonged delay) that the prophylactic approach is not being used in women for whom this risk is substantial.

Further, apart from the concern about the use of efavirenz in the first trimester of pregnancy already considered, there is no evidence at present to indicate that recommended antiretroviral drugs are harmful to the foetus or neonate despite their use in a large number of pregnancies.

OSSHHM advocates that the full range of options for the use of antiretroviral drugs to prevent mother to child transmission should be discussed with pregnant women living with HIV in Pacific Island countries and territories, including the advantages and disadvantages of each approach. However, on the balance of the evidence, **OSSHHM believes that all women with HIV who are pregnant should be recommended to begin standard antiretroviral therapy as soon as possible after the end of the first trimester of pregnancy** (see page 22).

Women who are already taking antiretroviral therapy when they become pregnant should continue it but, if the pregnancy is discovered early in the first trimester, consideration needs to be given to substituting efavirenz as discussed under 'Positive women who wish to become pregnant', on page 27.

Women commencing antiretroviral therapy because they are pregnant require the same preparation and assessment as everyone starting treatment (see 'Is the patient "ready"' on page 22). It is important, however, that the woman and her health care team consider the welfare of the foetus as well as the mother in reaching a conclusion about whether antiretroviral therapy should be commenced.

If a woman elects to undertake exclusive breastfeeding rather than exclusive substitute feeding (see Infant feeding choices on page 35), OSSHHM recommends that standard antiretroviral therapy should be continued at least until all breastfeeding has stopped.

If a woman has commenced antiretroviral therapy solely because she was pregnant and her antepartum clinical status indicates that she may not require antiretroviral therapy for her own health for several years, consideration can be given to stopping antiretroviral therapy after the risk of mother to child transmission has passed. If this is anticipated, it should be discussed with the woman and planned before antiretroviral therapy begins.

If antiretroviral therapy is stopped after delivery or at the end of breastfeeding, measures should be taken to avoid a period of effective monotherapy caused by stopping drugs with different half-lives at the same time. Expert advice should be sought through the OSSHHM network so that the latest evidence can be considered with regard to stopping the regimen safely. At the time of writing, the best option is probably to substitute lopinavir/ritonavir (400mg/100mg twice daily with food) for the efavirenz for a period of one month, then discontinue the zidovudine, lamivudine and lopinavir/ritonavir simultaneously.

If the woman is early in her HIV infection, has definitively decided not to breastfeed her infant, and it is known, or it is reasonable to assume, that her viral load is low, consideration can be given to utilising the prophylactic regimen recommended in the WHO guidelines *Antiretroviral drugs for treating pregnant women and preventing HIV infection in infants in resource-limited settings – Towards Universal Access*, namely:

- Zidovudine 300mg twice daily starting at 28 weeks or as soon as possible thereafter and continued until seven days post partum
- Lamivudine 150mg at the onset of labour and twelve hourly thereafter for seven days
- Nevirapine 200mg as a single dose at the onset of labour.<sup>5</sup>

If combination antiretroviral therapy (or zidovudine as part of the prophylactic regimen described above) was instituted for at least a month prior to elective caesarean section or the onset of labour, then additional intrapartum antiretroviral drugs are not indicated.

For women who are diagnosed HIV positive late in pregnancy, or are known to be HIV positive but present late in pregnancy, standard antiretroviral therapy should be instituted as soon as possible but, additionally, a single dose of 200mg nevirapine should be given orally at the onset of labour or (with a sip of water only) two hours before elective caesarean section is commenced.

## HIV Medicine and Sexual Health Care Recommendations

For women who have a reactive HIV screening test during labour, or women who are known to have HIV but present in labour with no prior antenatal care or antiretroviral therapy, the following regimen should be given (orally) as soon as possible:

- 600mg of zidovudine (2 x 300mg)
- 150mg lamivudine
- 200mg nevirapine (if nevirapine is not available, 600mg efavirenz can be used)

300mg of zidovudine and 150mg lamivudine should be given twelve hours later and then continued twice daily. 600mg efavirenz should be given 24 hours after the initial doses and continued once daily.

### ***Mode of delivery***

The current WHO guidelines make little reference to the mode of delivery but they build on earlier advice that recommended elective caesarean section for in settings where it can be conducted safely.<sup>8</sup> Similarly, the US<sup>4</sup> and British<sup>3</sup> guidelines generally recommend elective caesarean section at 38 weeks gestation and OSSHHM endorses this recommendation.

The capacity of Pacific Island countries and territories to provide elective caesarean section services with a low complication rate is thought to vary. Further, the rate of mother to child transmission associated with normal vaginal delivery is low if the woman has been on combination antiretroviral therapy for at least a month prior to birth. OSSHHM recommends that, in discussing delivery options with pregnant women with HIV, clinical judgement should be exercised to determine whether the additional benefit gained from elective caesarean section is outweighed by the potential risks of the procedure in a particular setting.

The evidence suggests that the benefit of caesarean section in reducing mother to child transmission is only seen if the procedure is undertaken electively. If labour begins prior to a planned elective caesarean section, and especially if the membranes have ruptured, it is recommended that the woman have a normal vaginal delivery. There is, however, a clear association between prolonged rupture of membranes and mother to child transmission. Thus, it is important in this setting that the labour be carefully monitored using partography to ensure that it is progressing well. In the case of prolonged or obstructed labour, OSSHHM recommends that emergency caesarean section be undertaken earlier rather than later.

Although the evidence is lacking, common sense dictates that routine episiotomy, the use of scalp electrodes and foetal blood sampling should be avoided during vaginal delivery of women with HIV. Similarly, instrumental delivery should be avoided where possible in favour of emergency caesarean section.

### ***Antiretroviral prophylaxis for the infant***

In common with the WHO and other guidelines,<sup>2,3,4</sup> OSSHHM recommends the administration of prophylactic antiretroviral drugs to newborn infants with the hope of preventing any viruses that may have been acquired during birth from leading to established HIV infection in the infant.

Where the mother has received at least a month of antiretroviral therapy prior to the birth, the following regimen is recommended for the baby:

- nevirapine 2mg/kg oral suspension immediately post partum (single dose), AND
- zidovudine 4mg/kg twice daily for seven days

Where the mother has not received antiretroviral therapy for at least a month antepartum, it is recommended that the zidovudine be continued for four weeks instead of just seven days.

### ***Infant feeding choices***

Both the US<sup>4</sup> and British<sup>3</sup> guidelines recommend that women with HIV avoid breastfeeding because of the well recognised risk of post-natal mother to child transmission of HIV by this means. There is, however, considerable evidence to suggest that infants who are substitute-fed in resource-poor countries are at significantly increased risk of mortality compared to their breastfed peers.<sup>9</sup>

Since the goal of interventions to prevent mother to child transmission of HIV is *HIV-free infant survival*, the advantages and disadvantages of breast versus substitute feeding need to be carefully considered in providing advice to mothers with HIV in the Pacific.

Current WHO guidance on this issue recommends that

*[w]hen replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected women is recommended.<sup>9</sup>*

There is accumulating evidence to suggest that **exclusive** breastfeeding (giving only breast milk with exclusion of all other fluids and solids) is associated with a substantially lower risk of transmission than mixed feeding. For this reason, the WHO guidance suggests that

*[e]xclusive breastfeeding is recommended for HIV-infected women for the first 6 months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe for them and their infants before that time.<sup>9</sup>*

The final choice about infant feeding is, of course, up to the parents of the child. Clinicians will need to exercise professional judgment about the extent to which substitute feeding would be 'acceptable, feasible, affordable, sustainable and safe' in the particular circumstances when making recommendations in this area.

OSSHM strongly recommends that parents be counselled about the increased transmission risks associated with mixed feeding and provided with support, encouragement and material assistance to maintain either exclusive formula feeding or exclusive breastfeeding according to their circumstances and choice.

Other possible options in relation to infant feeding for mothers with HIV include:

- Exclusive 'wet nursing' by another woman who is known not to have HIV and who is able to practice abstinence or 100% condom use
- Home pasteurisation of breast milk.

There is not yet strong evidence to support either of these practices but information about their use may be obtained from colleagues through the OSSHM network.

### ***Caring for infants born to mothers with HIV***

Establishing definitively whether an infant has acquired HIV from her or his mother is complex (see 'Diagnosing HIV in the infants of mothers with HIV' on page 13). Even if they have not acquired HIV themselves, babies born to mothers living with HIV are at risk of adverse outcomes for a number of other reasons:

- If they are substitute-fed, they will be at increased risk of gastroenteritis, respiratory infections and other adverse outcomes because they are deprived of the recognised health benefits of breastfeeding
- If the mother is ill she may have difficulty caring for the infant appropriately
- The family may be economically vulnerable due to illness or death of adult relatives.

It is important that these babies are closely monitored by health care teams, including particular attention to feeding, growth, the development of diarrhoea and other conditions such as respiratory infections and otitis media. OSSHHM recommends that infants born to mothers with HIV receive specific prophylaxis for pneumocystis pneumonia as follows, from the age of six weeks until it is definitively established that they have not been HIV infected (see page 13):

- Trimethoprim 150mg/m<sup>2</sup> daily AND
- Sulphamethoxazole 750mg/m<sup>2</sup> daily, given as co-trimoxazole oral solution.

Any intercurrent illnesses should be treated vigorously and the family should be counselled on the importance of seeking medical help early in the case of diarrhoea or other significant symptoms in the infant.

Occasionally it will be appropriate to consider the initiation of combination antiretroviral therapy in infants who are failing to thrive and who exhibit signs suggestive of HIV infection even when the diagnosis has not yet been definitively established. It is anticipated that this scenario would be most unusual in the small island states and territories of the Pacific, however, as it is usually possible to send blood to Australia, New Zealand, Hawai'i or New Caledonia for nucleic acid testing with minimal delay.

Where antiretroviral therapy is indicated for infants, it is essential that they be initiated on three antiretroviral simultaneously to avoid the development of viral drug resistance. The following regimen is generally recommended, but OSSHHM strongly recommends that practitioners seek advice from more experienced colleagues through the OSSHHM network before initiating antiretroviral therapy in infants:

- zidovudine 4mg/kg twice daily
- lamivudine 4mg/kg twice daily
- nevirapine 4mg/kg once daily for the first 14 days followed by 7mg/kg twice daily thereafter.

## **Managing of potential exposures to blood borne viruses including HIV in health care settings<sup>+++</sup>**

Health care workers can experience incidents during the course of their employment that involve contact with blood or body substances. Such exposures may put the person at risk of acquiring a blood-borne infection.

Adherence to standard infection control practices is the first line of protection for health care workers against occupational exposure to HIV and other blood borne viruses such as Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV).

These concerns are pertinent to all people who may be in a healthcare setting. This includes clinical staff and students, non clinical staff (administrators, house-keeping, laundry staff and maintenance workers), laboratory staff, volunteers, private contractors, consultants and visitors.

### ***Prevention of occupational exposures***

Prevention of exposure through safer practices, barrier precautions and other methods is the most effective strategy to reduce the risk of infection with HIV and other blood borne pathogens in health care settings.

There are three significant priorities in prevention:

- All health care workers need to be trained in, and be able to demonstrate competency in, the implementation of standard precautions<sup>+++</sup>
- All staff need to be provided with the necessary materials and protective equipment
- Operational protocols and systems at health care facilities should be designed and refined to minimise the risk of occupational exposure.

OSSHM recommends that these priorities should be defined and articulated in infection control policies and guidelines for every health care facility.

Health care workers should also be knowledgeable about the risks of acquiring HIV and HBV sexually. They should have ready access to condoms, as well as confidential HIV and STI counselling, testing and treatment counselling services.

Practices to reduce the incidence of occupational exposures include:

- Not recapping needles
- Not disconnecting needles from syringes after use
- Always transporting sharp objects in a kidney dish or puncture proof container
- Always placing used sharps in puncture proof containers for proper disposal (preferably by incineration)

---

<sup>+++</sup> This section is based on guidelines developed for workers involved in the first round of Second Generation Surveillance studies in the Pacific, supported by the Global Fund.

<sup>+++</sup> Standard precautions were formerly known as 'Universal Precautions'.

## HIV Medicine and Sexual Health Care Recommendations

- Ensuring sharps containers are readily available in the immediate vicinity of where sharp instruments are used
- Ensuring sharps containers are not placed on the floor or low surfaces where they may be accessed by young children.

### ***Systems for management of occupational exposures***

OSSHM recommends that health care employers ensure that:

- An efficient local system is established for reporting and managing potential exposures of health care workers to blood and body substances
- Confidentiality of injured health care workers is maintained
- Expert advice is available to all health care workers 24 hours a day and processes are in place to facilitate rapid assessment, which is essential to ensure timely administration of specific prophylaxis if appropriate
- All occupational exposures are fully documented to ensure that procedures can be reviewed and strengthened.

### ***Risks of transmission associated with particular occupational exposures***

Occupational exposures include:

- Percutaneous injuries or cuts with used instruments (such as solid or hollow bore needles or scalpel blades) involving blood or other body substances
- Contamination of fresh cuts or abrasions with blood or other body substances
- Contamination of the eyes or other mucous surface with blood or other body substances.

Pooled data from several studies of HCWs exposed to HIV in the workplace suggest that the risk of HIV transmission after percutaneous exposure to HIV-infected blood is approximately 0.3%.<sup>10</sup>

The following exposure characteristics are associated with relatively higher levels of risk:

- A deep injury
- Visible blood on the 'sharp' device causing the injury
- Injury by a needle that has previously been used in the patient's vein or artery
- If the patient has a high viral load.<sup>§§§</sup>

The risk of transmission from a 'sharp' object contaminated with other infected body fluids or tissues is believed to be lower than for exposure to infected blood.

---

<sup>§§§</sup>High viral loads are most likely to be present in people who are in the acute (recently infected) or late phases of HIV infection. Viral loads over about 30,000 copies per ml are generally considered 'high' for this purpose.

After a mucous membrane (eye, nose, or mouth) exposure to HIV-infected blood, the risk is approximately 0.09%.<sup>10</sup>

For a person unvaccinated against HBV, the risk after percutaneous exposure is 23-37% if the 'source' person is hepatitis B 'e' antigen (HBeAg) negative and 37-62% if the 'source' is HBeAg positive. Infection with hepatitis B is possible following mucous membrane exposure but has not been quantified.<sup>11</sup>

The risk for HCV infection after percutaneous exposure to infected blood is approximately 1.8%. Infection with HCV following mucous membrane exposure has not been quantified but is thought to be rare.<sup>11</sup>

## ***Managing Occupational Exposure – Immediate Steps***

### **First Aid**

- After percutaneous exposure, injuries and cuts should immediately be washed very thoroughly with soap and water, and then the wound covered with a dressing. If running water is not available, clean the site with an alcohol based hand rub solution. Do not use any strong solutions, such as bleach or iodine as these may irritate the wound and make the injury worse
- Splashes to unbroken, intact skin should immediately be washed. If running water is not available, clean the site with an alcohol based hand rub solution
- Splashes to the mouth or nose should have the fluid immediately spat or blown out and the site should then be rinsed thoroughly with water or saline and spat/blown out again. Repeat this several times. Do not use soap or disinfectant in the mouth or nose
- Splashes to the eyes should be irrigated with clean water, saline or sterile irrigation fluid. If wearing contact lenses leave them in place while irrigating, then remove after the eye is clean and cleanse the lenses in the normal manner. Do not use soap or disinfectant in the eye.

### **Reporting**

- The health care worker should then immediately report the exposure to their supervisor or manager
- The supervisor should arrange immediate medical assessment of the health care worker and the patient who is the 'source' of the exposure, if this is known
- Complete an exposure report, which should contain the following information:
  - The name of the staff member involved
  - Area where the incident occurred, such as the ward, operating room or emergency room
  - A description of the incident
  - The name of the 'source' person whose blood or body substances were involved in the incident (if known)
  - If the source of the blood is unknown, this must also be documented

## HIV Medicine and Sexual Health Care Recommendations

- Send a copy of the exposure report to the institutional Infection Control professional. The exposed health care worker's supervisor should be made aware of any standard precaution procedural risks or lapses in a confidential, sensitive and non-judgmental way.

### ***Medical assessment after occupational exposures***

A medical risk assessment involves taking and recording the history and details of the occupational exposure to assess the risk of the exposed person acquiring HIV, HBV and HCV from the 'source' person. This assessment should be undertaken by a trained professional **immediately** after first aid is attended, regardless of what time of day the occupational exposure occurs. Information to be examined during the assessment includes:

- Date, time and location of the exposure
- Duty being performed at time of the exposure
- How the exposure occurred
- Protective clothing such as gloves being worn at time of incident
- Nature of exposure such as percutaneous, mucous membrane, non-intact skin
- Type and volume of blood or other body fluids involved
- Duration of contact with blood or other body fluids
- If the exposure was a sharps injury: the type of implement involved, whether it was visibly contaminated with blood, the depth of injury and whether bleeding occurred
- If the exposure was a needle stick injury: the gauge of needle, size of syringe, purpose for which needle had been used
- If the exposure involved non-intact skin: the condition of skin
- HIV, HBV and HCV status of the 'source' person (if known)
- HBV immunity and vaccination history of the exposed person.

### **The exposure and the 'source' patient**

- The exposure should be evaluated for its potential to transmit a blood-borne pathogen based on body substance and severity of exposure. Source identification and testing is **only** necessary if the results will change the clinical management of the exposed worker.
- If the exposure is assessed as having no or low risk of HIV transmission, then medication for post-exposure prophylaxis against HIV is not indicated. This is regardless of whether the source person is known to be HIV positive or not. In low risk exposures testing of the source is not necessary.
- When testing of a 'source' patient of unknown status *is* appropriate, it should only occur with the person's informed consent.
- The 'source' person should receive appropriate pre-test counselling and a plan for referral for care, treatment and support.
- Confidentiality must be maintained throughout the process.

## **The exposed health care worker**

Medical assessment constitutes an emergency for the exposed health care worker. Assessment should include baseline tests on a venous blood specimen from the health care worker, with fully-informed consent, to ascertain whether the exposed person was already infected with a blood-borne pathogen from previous exposure before the incident:

- Baseline testing should occur as soon as possible following exposure (after first aid has been completed), and certainly within 72 hours
- Pre-test counselling for HIV should occur before any blood is taken for testing (see below)
- Baseline tests are usually HIV antibody, hepatitis B surface antigen (HBsAg) and surface antibody (HBsAb) as well as hepatitis C antibody where this test is available
- The health care worker's tetanus immunisation status should be considered
- Follow up retesting for HIV, HBV and HCV (where available) should occur at six weeks, three months and six months.

Clinical evaluation and baseline testing of the exposed health care worker should proceed only after pre-test counselling and with informed consent. This should always include:

- A realistic assurance of privacy and confidentiality
- Review and, if necessary, further explanation of HIV, HBV and HCV infection and their consequences
- Explanation of testing, possible results and confirmatory testing
- Assessment of risk related to past and current sexual and other behaviours, as well as any previous occupational exposures
- Assessment of risk related to the occupational exposure in question
- Explanation of low transmission risk for HIV associated with occupational exposure
- Assessment of anxiety level and coping mechanisms
- Obtaining informed consent for testing
- Obtaining informed consent for a pregnancy test (if indicated)
- Planning for precautions whilst awaiting test results (and whilst taking post exposure prophylaxis medication, if indicated) including consideration of safer sexual practices or abstinence, cessation of breast feeding if lactating and any required modification of occupational duties (this would only be necessary for health care workers whose work includes exposure prone procedures, that is those that involve the use of sharp instruments in confined spaces such as the mouth, vagina, or the chest or abdominal cavities)
- Providing information about the potential adverse effects of antiretroviral medications
- Addressing any other risks identified by sexual and behavioural history
- Arranging support whilst awaiting results, and whilst taking post exposure prophylaxis medication (if indicated)

## HIV Medicine and Sexual Health Care Recommendations

- Review the sequence of events that preceded the exposure, and provide exposure risk reduction education in a sensitive and non-judgmental way.

### ***Post-exposure prophylaxis***

Post Exposure Prophylaxis (PEP) is treatment to reduce the likelihood of HIV, HBV and tetanus infection in health care workers after possible occupational exposure. There is no PEP available for HCV.

#### **PEP for HIV**

There are no prospective trials to prove the effectiveness of PEP for HIV in humans. Our understanding of the pathogenesis of HIV infection suggests that antiretroviral drugs should be further reduce the already low rate of infection following occupational exposure provided treatment is initiated early enough. A retrospective case controlled study suggested that the use of zidovudine is associated with an approximately 80% reduction in risk.<sup>12</sup> Clinical trials of the use of antiretroviral drugs for prevention of mother-to-child transmission of HIV consistently demonstrate good efficacy following perinatal exposure, even in babies who do not receive treatment until after birth. Although these results are encouraging, protection of newborns is not absolute and the relevance of this situation to occupational exposure cannot be guaranteed.

PEP is certainly not 100% effective and there have been several documented cases of HIV infection despite the use of PEP in this setting.

Where PEP is indicated it should be offered immediately without waiting for the results of HIV testing from the 'source' of the exposure. PEP for HIV should be provided using a combination of two antiretroviral drugs as soon as possible after exposure to a 'source' person with confirmed HIV (or where it is medically likely that the 'source' person is infected with HIV). When the injury involves an increased risk of infection (an injury caused by a large-bore hollow needle, associated with a deep puncture, or caused by a device visibly contaminated with blood or a device that has been in a patient's artery or vein), the regimen should be expanded to include a third antiretroviral drug.

Table 2 (on page 43) and the flow chart in Figure 2 (on page 44) summarise current indications for HIV PEP.

Following occupational exposure in a health care worker that meets the criteria in Table 2, antiretroviral drugs for PEP may be provided according to the regimens prescribed in Table 3 on page 43.

PEP should start as soon as possible after the injury or exposure, no later than 72 hours and, if possible, within 4 hours of exposure. In general, it is not recommended to start PEP when the exposure happened more than 72 hours ago.

Nevirapine should **not** be used for PEP because of a very substantial risk of skin and liver toxicity in people with normal immune function.

Risk posed by exposure <sup>A</sup>	Infection status of the 'source' person <sup>B</sup>				
	HIV-positive, class 1	HIV-positive class 2	Unknown status	Unknown 'source' person	HIV-negative
Lower	Basic 2-drug PEP is recommended	Expanded (3-drug) PEP is recommended	Generally PEP is not warranted but basic 2-drug PEP can be considered if the 'source' person has risk factors for blood borne virus infections <sup>C</sup>	Generally prophylaxis is not warranted but basic 2-drug prophylaxis can be considered in settings where it is likely that the 'source' may have had a blood borne virus	PEP not warranted
Higher	Expanded (3-drug) PEP is recommended	Expanded (3-drug) PEP is recommended	Generally PEP is not warranted but basic 2-drug PEP can be considered if the 'source' person has risk factors for blood borne virus infections <sup>C</sup>	Generally prophylaxis is not warranted but basic 2-drug prophylaxis can be considered in settings where it is likely that the 'source' may have had a blood borne virus	PEP not warranted

Notes:

A. Injuries caused by solid needles and superficial injuries pose a lower risk of infection; those involving a large-bore hollow needle, a deep puncture, a device visibly contaminated with blood, or a needle used in a patient's artery or vein pose a higher risk of infection. PEP with antiretroviral drugs is not indicated for contact between intact skin and blood or other body fluids contaminated by HIV.

B. Class 1 HIV positive status is defined by asymptomatic HIV infection or, if known, a viral load <30,000 copies per ml; Class 2 HIV positive status is defined by symptomatic HIV infection, acute seroconversion illness, or a viral load >30,000 copies per ml.

C. If the 'source' person has risk factors for HIV infection, prophylaxis is optional and should be based on an individualised decision made jointly by the exposed health care worker and the treating doctor.

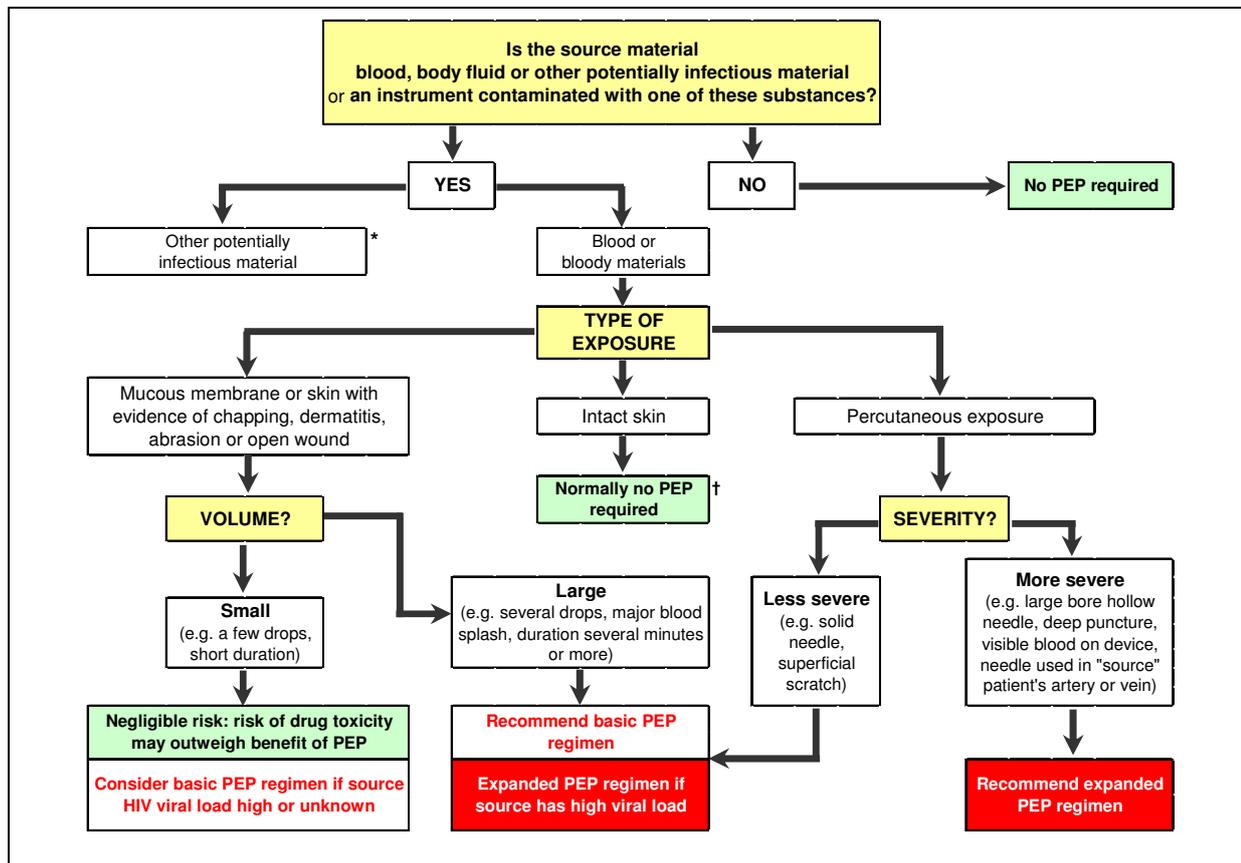
**Table 2: Indications for Prophylaxis against HIV Infection after Percutaneous Injury or Mucosal Exposure, according to Infection Status of the 'Source' Person**

REGIMEN	DOSES	PRINCIPAL ADVERSE EFFECTS
<b>BASIC PEP (for lower risk exposure)</b>		
<b>zidovudine</b>	One 300 mg tablet twice daily for four weeks	Anaemia, neutropenia, nausea, headache, insomnia, muscle pain, weakness;
<i>plus</i> <b>lamivudine</b>	One 150 mg tablet twice daily for four weeks	Abdominal pain, nausea, diarrhoea, rash, pancreatitis (all very rare)
<b>EXPANDED PEP (for higher risk exposure) – Basic 2-drug regimen <i>plus</i></b>		
<b>efavirenz</b>	One 600 mg tablet at bed time for four weeks	Rash (including Stevens-Johnson syndrome), insomnia, somnolence, dizziness, trouble concentrating, abnormal dreaming; potentially teratogenic in 1 <sup>st</sup> trimester of pregnancy
<b>EXPANDED PEP (for higher risk exposure in health care workers in the first trimester of pregnancy) – Basic 2-drug regimen <i>plus</i></b>		
<b>lopinavir/ritonavir</b>	400mg/100mg twice daily for four weeks	Diarrhoea, nausea, abdominal pain, weakness, rash

**Table 3: Antiretroviral regimens for post-exposure prophylaxis**

Routine use of three drugs is not recommended for all exposed persons because adding a third drug increases the probability that adverse events will occur, further complicates antiretroviral drug adherence and reduces the chance that the full four-week course of PEP will be completed.

If prophylaxis is commenced and the 'source' person is subsequently determined to be HIV negative, antiretroviral drugs should be discontinued.



**Figure 2: US Centers for Disease Control and Prevention algorithm for evaluating the risk of HIV transmission following occupational exposure**

## PEP for hepatitis B

Childhood vaccination against HBV is included in the expanded programme of immunisation in Pacific Island countries. OSSHM recommends that health care institutions should institute a programme to offer immunisation for HBV to all health care workers.

Not all Pacific Island country laboratories are able to offer testing for HBV. Where testing and hepatitis B immunoglobulin (HBIG) are available, Table 4 on page 45 summarises the recommended actions to protect health care workers against HBV after occupational exposure.

## PEP for tetanus

Although exposure from discarded needles found in public places such as beaches are thought to pose a very low risk of blood borne virus transmission, tetanus prophylaxis should be considered in this circumstance. Where the exposure constitutes a tetanus-prone injury, recommended prophylaxis depends on the exposed person's past history of tetanus immunisation:

- If less than 5 years since immunisation, then no tetanus immunoglobulin or tetanus toxoid is necessary.
- If 5-10 years since immunisation, a tetanus toxoid or Adult Diphtheria immunisation and Tetanus combined booster is recommended.
- If greater than 10 years since immunisation both tetanus immunoglobulin and tetanus toxoid or Adult Diphtheria and Tetanus immunisation (in different limbs) is recommended.

		'Source' Patient		
		HBsAg positive	Unknown	
Health Care Worker	Unvaccinated	HBIG x 1 dose <i>plus</i> Hepatitis B vaccine x 3 doses	Hepatitis B vaccine x 3 doses	
	Vaccinated	Serological 'Responder' (HBsAb $\geq$ 10 mIU/ml)	No treatment	No treatment
		Serological 'Non-Responder' (HBsAb <10 mIU/ml)	HBIG x 1 dose <i>plus</i> Hepatitis B vaccine x 3 doses	If higher risk exposure: HBIG x 1 dose <i>plus</i> Hepatitis B vaccine x 3 doses
		Antibody status unknown	<b>Test HCW for anti-HBs if available</b> If anti-HBs $\geq$ 10 mIU/ml: No treatment If anti-HBs <10 mIU/ml: HBIG x 1 dose <i>plus</i> Hepatitis B vaccine x 3 doses	<b>Test HCW for anti-HBs if available</b> If anti-HBs $\geq$ 10 mIU/ml: No treatment If anti-HBs <10 mIU/ml: Hepatitis B vaccine x 3 doses

**Table 4: Post exposure prophylaxis for hepatitis B (where serological testing, HBIG and HBV vaccine are available)**

### PEP for hepatitis C

Few Pacific countries can currently test for hepatitis C and there is no HCV prophylaxis to offer at this time. Immunoglobulin is ineffective for HCV. Potential PEP agents such as ribavirin and interferon are not currently recommended since they are potentially very toxic and unlikely to be available.

### *Clinical follow up and counselling*

In addition to HIV antibody testing at the time of the injury, exposed health care workers should also be offered repeat testing at six weeks, three months and six months after exposure.

Health care workers who take PEP should use condoms (or abstain from sex) until serology is negative at six months post-exposure. Female health care workers who are lactating may consider cessation of breast feeding. Health care workers whose work includes exposure-prone procedures (those involving the use of sharp instruments in confined spaces such as the mouth, vagina, and the chest or abdominal cavities) should consider with their clinician whether they need to modify their practice until seronegativity is confirmed at six months following the exposure.

If the health care worker is infected with HIV she or he will usually develop an acute retroviral syndrome 2 to 6 weeks after exposure. This is an illness that resembles glandular fever with fevers, sweats, malaise, lethargy, anorexia, nausea, myalgia, arthralgia, headache, sore throat, diarrhoea, lymphadenopathy and rash.

## HIV Medicine and Sexual Health Care Recommendations

Occupational exposure to HIV is a frightening experience and some psychological morbidity (anxiety, depression, insomnia) and even post-traumatic stress disorder are relatively common among health care workers following such an exposure. Early and frequent follow-up appointments for counselling and clinical review are essential.

Should the healthcare worker become HIV positive, clinical management should follow these recommendations and ongoing counselling and support will be essential.

### ***Special considerations***

Where the 'source' person is already taking antiretroviral therapy (especially a second-line or other drug combination), the possibility of HIV drug resistance should be considered. In this situation, and in all other complex circumstances, treating clinicians should seek advice from more experienced colleagues through the OSSHM network as soon as possible.

## **Managing other sexually-transmissible infections\*\*\*\***

Other sexually-transmissible infections (STIs) are extremely common in Pacific Island countries and territories. They often cause no symptoms or mild symptoms that go unrecognised. People are often unaware that they have been at risk of acquiring an STI and, especially in the Pacific, people may not disclose to health care workers that they may have been at risk because of stigma.

Untreated STIs can have a significant adverse impact on reproductive health and pregnancy outcome but most can be treated with a single dose of appropriate antibiotics. In addition, people who have another STI are at markedly increased risk of acquiring or transmitting HIV during sexual activity.

Health care workers are sometimes unaware of signs and symptoms of STIs and don't always offer appropriate testing and treatment but it is known that treatment prevents complications and the risk of transmission to other people.

### ***Testing for other STIs***

In general, testing should be targeted in a way that is cost effective and has the most potential benefit. Testing should be targeted in particular to:

- People who present with signs or symptoms of STIs
- People who have been newly diagnosed with HIV
- People at highest risk of infection because of their age (15 to 30) or because of their sexual history
- Antenatal women, where detection and treatment can prevent adverse outcomes and neonatal infection

### **Consent to testing**

Testing for HIV and other STIs often go hand in hand. The general principles of consent, confidentiality and counselling (the 3 Cs) must be respected for both. Testing must be voluntary, confidential and undertaken with the patient's consent. People being offered testing have the right to decline a test and should not be coerced or tested against their will or without their knowledge.

In order to give informed consent, people must be given information that allows them to understand what they are being tested for and what are the consequences of testing. With regard to STI testing, the person must be given specific information and understand:

- What STIs are, how they are transmitted and prevented
- How STIs are treated and the consequences of not treating them
- What tests will be done

---

\*\*\*\* OSSHHM acknowledges the assistance of Dr Janet Knox, acting Coordinator of Surveillance and STI Response in the HIV & STI Section at SPC for her assistance with the development of this chapter on the basis of published guidelines

## HIV Medicine and Sexual Health Care Recommendations

- What specimens will be taken and how they will be collected
- When and how the results will be given
- What will happen in the event of a positive result (e.g. treatment, contact tracing, other tests or examination)
- How information will remain private and confidential

People being offered STI testing should also be counselled about behavioural prevention of HIV and other STIs. They should be provided with condoms.

### **Which tests to do**

Tests for syphilis are available in most Pacific Island countries and territories. Most laboratories can also perform gonorrhoea culture. A programme is currently underway to assist laboratories to set up urine-based testing for chlamydia and gonorrhoea using strand displacement technology.

A comprehensive check up for STIs should ideally include:

#### Blood for both men and women:

- Syphilis: RPR titre and treponemal test
- Hepatitis B: Hepatitis B surface antigen (do not repeat if the person is known to have a chronic infection)
- HIV: HIV antibody

#### Asymptomatic men and women:

- First void urine test for chlamydia and gonorrhoea

#### Symptomatic men:

- If discharge is present, external urethral swab for gonorrhoea (Microscopy, culture and antibiotic sensitivities) AND
- First void urine for chlamydia and gonorrhoea

#### Symptomatic women (do a speculum and bimanual examination):

- Endocervical swab for gonorrhoea (Microscopy, culture and antibiotic sensitivities)
- Endocervical swab for chlamydia
- High vaginal swab for trichomonas, bacterial vaginosis and candida (wet mount, gram stain and culture)

If taking a pap smear, take the swabs before the pap smear.

## ***Treatment for other STIs***

### **Syndromic treatment**

Syndromic management refers to treating a person who presents to a clinic with a set of signs or symptoms. Treatment should cover the STIs that could typically cause the signs or symptoms. Contact tracing should be initiated at the same time.

## **Reactive or positive test results**

STIs are also treated when they are detected on tests. Even if tests are available, syndromic management should be provided to people who present with signs and symptoms of STIs while awaiting test results.

## ***Follow up***

It is essential to follow up people who are treated for other STIs to ensure that the medication was completed, the symptoms have resolved and the patient's contacts have been treated.

## ***Contact tracing***

Contact tracing is not always straightforward but is an important part of STI management. Prompt and appropriate treatment of contacts is important to prevent re-infection of the 'index' patient and to prevent further transmission of the infection

Contact tracing should be done in confidentially and in private. The name of the index case should never be disclosed to the contact and the names of contacts should not be recorded in the index case's medical records.

For gonorrhoea, chlamydia and trichomonas, contacts should be treated irrespective of their own test results.

Domestic violence is a real issue in Pacific Island countries and territories. The risks of domestic violence need to be weighed up against the risk of re-infection and innovative strategies may be required to ensure that contacts can be followed up without placing the index patient at risk. Advice should be sought from more experienced colleagues through the OSSHHM network in complex circumstances.

## ***Chlamydia and Gonorrhoea***

Chlamydia is a common infection amongst 15 to 30 year olds, gonorrhoea is less common. Both infect the same type of cells (columnar or cuboidal cells) and cause a similar spectrum of disease. Without treatment, men and women can remain infectious for 1- 2 years.

## **Detection**

Gonorrhoea: Gram stain and culture of endocervical swab (women), external urethral swab (men). Antibiotic sensitivities should be done where available. Where available, asymptomatic patients can be tested on a first pass urine test.

Chlamydia: Testing for Chlamydia is currently being developed in Pacific Island countries and territories. Where it is available, testing can be done on endocervical swabs or from male or female urine.

## **Syndromes and symptoms**

In men chlamydia and gonorrhoea can cause:

- Urethritis (in young men this is almost always due to an STI):
- Epididymo-orchitis
- Infertility

# HIV Medicine and Sexual Health Care Recommendations

Common symptoms in men include:

- Pain, burning or stinging on passing urine (dysuria) or urethral discharge
- Pain, redness and swelling in the testes (usually one sided)

In women chlamydia and gonorrhoea can cause:

- Cervicitis (discharge or bleeding)
- Pelvic Inflammatory disease (untreated 10-30% of women will develop endometritis, salpingitis, ovarian or pelvic abscess)
- Fallopian tube damage increasing the risk of infertility and ectopic pregnancy

Pregnancy and neonatal infection:

- Miscarriage in early pregnancy
- Chorioamnionitis causing premature rupture of membranes and premature delivery in late pregnancy
- Post partum infection
- Neonatal infection
  - Conjunctivitis or pneumonitis (chlamydia)
  - Conjunctivitis or disseminated infection (gonorrhoea)

Common symptoms in women:

- Abnormal bleeding (intermenstrual, post coital)
- Abnormal discharge (from the cervix)
- Low abdominal or pelvic pain (Symptoms of chlamydia pelvic inflammatory disease are often mild or subclinical. Low abdominal pain, similar to period pain may be the only symptom.)
- Threatened miscarriage in early pregnancy (pain or bleeding)
- Premature rupture of membranes in late pregnancy
- Low abdominal pain post partum

Both men and women:

- Proctitis, conjunctivitis and pharyngitis.

Chlamydia: reactive arthritis and Reiter's syndrome

Gonorrhoea: septic arthritis, disseminated infection.

## Treatment

Treat for **both** chlamydia and gonorrhoea with any of the following:

- Presents with signs or symptoms of uncomplicated or lower genital tract infection (urethritis, cervicitis)
- If complicated infections are present (PID, epididymitis) commence treatment as below, but continue treatment as outlined in relevant protocols
- Chlamydia AND gonorrhoea detected on a test

- Gonorrhoea ALONE detected on a test (this is because co-infection with chlamydia is common, and treatment for gonorrhoea does not treat chlamydia)

**Men and non pregnant, non breastfeeding women**

Azithromycin 1g orally as a single dose

(If not available use doxycycline 100mg twice a day for 7 days)

**AND**

Ciprofloxacin 500mg orally as a single dose

Treat contact(s)

**Pregnant or breastfeeding women**

Azithromycin 1g orally as a single dose

(If not available replace with a 7 day course of Amoxicillin OR Erythromycin<sup>\*\*\*\*</sup>)

**AND**

Ceftriaxone 250mg IM as a single dose (administer with 2mls 1% lignocaine)

Treat contact(s)

Treat for chlamydia only if:

- Chlamydia alone is detected on a test:

**Men and all women**

Azithromycin<sup>\*\*\*</sup> 1g orally as a single dose

Treat contact(s)

**Pelvic inflammatory disease**

10 – 30% of women with untreated chlamydia or gonorrhoea will develop an upper genital tract infection. Thus, pelvic inflammatory disease will be common among age groups or in communities where chlamydia and gonorrhoea are common (15 to 30 year olds). Prompt and appropriate treatment of women and their partners has a significant impact on preventing or limiting damage to fallopian tubes and subsequent risk of infertility and ectopic pregnancy.

Pelvic inflammatory disease can also cause miscarriage in early pregnancy and post partum infection.

---

<sup>\*\*\*\*</sup> Use either Amoxicillin 500mg three times daily OR Erythromycin 500mg four times daily for 7 days

<sup>\*\*\*</sup> If not available replace with doxycycline (men and non pregnant women) or amoxicillin OR erythromycin (pregnant and lactating women) as outlined above

# HIV Medicine and Sexual Health Care Recommendations

The signs and symptoms associated with pelvic inflammatory disease are variable, ranging from mild low abdominal pain through to an acute abdomen. Chlamydia disease is often sub clinical or causes mild symptoms that may not progress and are often not recognised. The severity of symptoms does not predict the severity of fallopian tube damage.

Common symptoms include low abdominal or pelvic pain (like period pain but in between menstruation) and irregular bleeding (intermenstrual, post coital or heavier, more painful, menstruation)

The diagnosis of pelvic inflammatory disease is clinical and based on a combination of findings (history, clinical signs and symptoms) with the exclusion of other causes. Positive test results for chlamydia or gonorrhoea assist in making a diagnosis, but are often negative. Therefore negative tests **do not** exclude pelvic inflammatory disease.

The presence of a new onset of low abdominal pain in a young woman (aged 15 to 30), with other causes excluded, is highly predictive of pelvic inflammatory disease. A bimanual examination will usually elicit pain on moving the cervix or palpating the adnexae.

In women of child bearing age presenting with low abdominal pain, the following tests should be done:

## 1. Pregnancy test. If positive:

- Refer urgently for pelvic ultrasound to exclude or confirm an ectopic pregnancy
- If no ectopic pregnancy is found, pelvic inflammatory disease could be the cause of a threatened or complete miscarriage

## 2. Urinalysis

- Nitrites positive: treat for urinary tract infection
- Note that leucocytes are common on urinalysis in all women and alone are not predictive of anything
- Urinary symptoms such as pain on passing urine and frequency are predictive of urinary tract infection
- Low abdominal pain alone (with no urinary symptoms where nitrites are negative on urinalysis) is predictive of pelvic inflammatory disease not urinary tract infection
- Remember that sexually active women may have a combination or all of the above (they may be pregnant have an STI and have a urinary tract infection)

## 3. STI tests (chlamydia and gonorrhoea) if available

- A negative test does not exclude pelvic inflammatory disease (most women will have negative tests) and should not be used to make the diagnosis.

Treatment for pelvic inflammatory disease

Irrespective of the circumstances, treatment should always cover infection with:

- Chlamydia
- Gonorrhoea
- Anaerobic bacteria

The priorities in treating pelvic inflammatory disease are to:

- Initiate prompt and appropriate treatment
- Ensure treatment for chlamydia and gonorrhoea
- Treat contacts (for chlamydia and gonorrhoea) to prevent re-infection

**Outpatient treatment of non-pregnant, non breastfeeding women**

Azithromycin 1g orally as a single dose

(If not available use doxycycline 100mg twice a day for 10 to 14 days)

**AND**

Ciprofloxacin 500mg as a single dose

**Continue** the next day with:

Metronidazole<sup>§§§§</sup> 400mg twice a day for 10 to 14 days

If possible give another Azithromycin 1g a week after the initial dose

Treat contacts to cover chlamydia and gonorrhoea

**Outpatient treatment of pregnant or breastfeeding women**

Azithromycin 1g orally as a single dose

(If not available use Amoxicillin or Erythromycin for 10 to 14 days)<sup>\*\*\*\*\*</sup>

**AND**

Ceftriaxone 250mg IM as a single dose

(administer with 2mls 1% lignocaine)

**Continue** the next day with:

Metronidazole<sup>§§§§</sup> 400mg twice a day for 10 to 14 days

If possible give another Azithromycin 1g a week after the initial dose

Treat contacts to cover chlamydia and gonorrhoea

---

<sup>§§§§</sup> Advise no alcohol during treatment and for 24 hours after the last dose

<sup>\*\*\*\*\*</sup> Use either Amoxicillin 500mg three times daily OR Erythromycin 500mg four times a day for 10 to 14 days

# HIV Medicine and Sexual Health Care Recommendations

## Inpatient treatment of pelvic inflammatory disease

If inpatient treatment is indicated (for severe pain, during pregnancy, in a young woman or with a patient who may not adhere) replace oral medication with intravenous where possible and continue with oral medication on discharge.

Remember to provide adequate treatment for chlamydia whilst in hospital. Ensure contacts are treated before discharge.

## ***Trichomoniasis***

Trichomonas is a common STI that rarely causes symptoms in men but can cause vaginal discharge and premature rupture of membranes in pregnancy. Women can remain infected with trichomonas for years, therefore detection does not necessarily indicate recent acquisition.

### **Detection**

- Wet mount of a high vaginal swab
- Pap smear
- Can also be detected on examination of urine under light microscopy

### **Symptoms**

Trichomonas in men rarely causes any symptoms but occasionally can cause urethritis

Trichomonas in women can cause:

- Vaginitis
- Chorioamnionitis in late pregnancy leading to premature rupture of membranes
- Neonatal infection: mucus membranes can be infected during delivery

Common signs and symptoms of trichomonas in women include:

- Vaginal itching, soreness with patchy red inflammation on examination
- Vaginal discharge (commonly thin, white to green in colour with a fishy odour and frothy appearance on examination)
- (During pregnancy) premature rupture of membranes and premature delivery

Trichomonas should be treated if:

- Signs or symptoms of trichomonas are present on examination
- The organism is detected on microscopy (wet mount)
- The organism is detected on pap smear

**Men and all women**

Metronidazole<sup>++++</sup> 2 g as a single dose

OR

Metronidazole 400mg twice a day for 7 days

Advise no alcohol during treatment and for 24 hours after the last dose

Treat contacts

## ***Bacterial Vaginosis***

Bacterial vaginosis (also known as 'gardnerella') is not a STI, but is a common cause of vaginal discharge in women. It is caused by a bacterial overgrowth and commonly occurs at the end of menstruation. Bacterial vaginosis can resolve by itself but should be treated in pregnancy as it is associated with miscarriage and premature rupture of membranes.

### **Detection**

Bacterial vaginosis is diagnosed by the presence of typical bacteria or 'clue cells' on wet mount of a high vaginal swab or on pap smear.

### **Symptoms**

- Vaginal discharge: thin white discharge, fishy odour
- Miscarriage, premature rupture of membranes
- Bacterial vaginosis DOES NOT cause vaginal itching or soreness or inflammation on examination

### **Treatment**

Treatment is indicated if bacterial vaginosis is detected on a swab or pap smear or where a woman presents with signs and symptoms of the condition.

Bacterial vaginosis often resolves without treatment but should be treated in pregnancy as it is associated with miscarriage and premature rupture of membranes

---

<sup>++++</sup> Metronidazole is not recommended for use in the first trimester of pregnancy, but it may be used during the second and third trimesters. If treatment has to be given during the first trimester, then in order to reduce the risks of any adverse effects, lower doses are recommended.

Metronidazole<sup>\*\*\*\*</sup> 2g orally as a single dose

OR

Metronidazole 400mg twice a day for 7 days

Advise no alcohol and for 24 hours after the last dose

Contacts DO NOT need to be treated

## ***Candidiasis***

Candidiasis (also known as thrush, monilia, yeast or fungal infection) is not an STI but is a common cause of vaginal itch, soreness and discharge in women. It can also cause itching and soreness, redness and white discharge under the foreskin in men (balanitis). Severe thrush can cause linear cracks in the skin (usually in skin folds). *Candida albicans* is yeast that is commonly found in the vagina, and only causes symptoms if it overgrows. It can overgrow in the presence of:

- High oestrogen levels (for example in pregnancy)
- High or uncontrolled sugar levels (diabetes)
- Change in normal vaginal flora (antibiotics)

Candidiasis can also be severe and affect the mouth and oesophagus in people with immunosuppression, especially people with HIV. People with severe, recurrent candidiasis should be counselled and offered testing for diabetes and HIV.

## **Symptoms and signs**

In women:

- Vaginitis
  - Red, sore, itchy, inflamed vulva and vagina
  - If discharge it is typically white, clumpy and sticks to the vaginal walls

In men

- Balanitis
  - The head of the penis (under the foreskin) is red, sore, itchy and there may be a white discharge

---

<sup>\*\*\*\*</sup> Metronidazole is not recommended for use in the first trimester of pregnancy, but it may be used during the second and third trimesters. If treatment has to be given during the first trimester, then in order to reduce the risks of any adverse effects, lower doses are recommended.

## **Treatment**

Treatment is indicated if the person presents with signs or symptoms of candidiasis. When the organism is detected on a swab or pap smear, treatment is only needed if symptoms are present.

Topical antifungal cream or pessaries e.g.

Clotrimazole, nystatin, miconazole

Contacts do not need to be treated

## ***Appendix 1***

### ***OSSHM-endorsed content for basic HIV Core Care Team training***

Training is conducted as six half-day sessions.

#### **Session 1: Introduction to support for HIV care under the Pacific Regional HIV Strategy**

**Pre-test** to assess participants' knowledge in advance of training

**Presentation** covering the following topics:

- Introductory discussion on HIV epidemiology and the 'state of play' with HIV services in the country
- Introduction to the Pacific Regional HIV Strategy Implementation Plan (PRSIP) including:
  - Partners involved
  - Countries covered
  - Funding streams
- Key messages about antiretroviral therapy
  - Does not have to be expensive and currently available under regional funding streams
  - Does not just delay death but can keep people well for the long term
  - HIV as a chronic manageable illness
- Provision of antiretroviral therapy under the PRSIP
  - Regional procurement mechanism in Suva
  - Drugs are WHO pre-approved
  - Country eligibility for funding streams
  - Pharmacist-to-pharmacist support for stock management
  - Training, technical support and mentorship for clinical teams from SPC in medium term, plus WHO
  - OSSHM
- Nine criteria for effective and sustainable antiretroviral therapy
  1. Commitment to provide ART in the country from national decision-making bodies
  2. Assigned central unit, with an identified leader, responsible for provision of medical care to people receiving ART
  3. People living with HIV have been involved in development of care services
  4. Ongoing supply of ART secured and at least six months supply available in country
  5. Technically-sound ART protocol developed and available
  6. A local partnership between public health services, clinical services and community organisations exists to ensure a continuum of care and support for people taking treatment, including support for ART adherence
  7. A core multidisciplinary HIV care team has received appropriate training
  8. Diagnostic services available to perform HIV antibody tests and essential routine tests to monitor for drug toxicity
  9. An adequate patient record system exists

Tea break

**Group work** to assess the site against the nine criteria and plan action needed to ensure they are met in the near future.

### Session 2: The biology of HIV and HIV treatment

**Presentation** covering the following topics:

- HIV lifecycle (demonstrated using an animated film)
  - Fusion
  - Reverse transcription
  - Integration
  - Transcription and polyprotein synthesis
  - Protease activity
  - Assembly
  - Budding
- Resistance
  - Application of evolutionary theory
  - Relationship between resistance and adherence
  - Clinical implications

Tea break

**Group work** on the factors that bear on adherence and strategies to enhance it.

### Session 3: Introduction to the spectrum of HIV disease

**Presentation** covering the following topics:

- The dynamic nature of HIV infection in terms of production and destruction of HIV and CD4 lymphocytes (bucket and tap analogy)
- Likely impossibility of eradication due to long-lived cells with integrated proviral DNA
- “AIDS”. Discussion of history and current meaning
- Monitoring people with HIV not yet on treatment (including ‘prevention with positives’)
- Physical examination
- CD4 count
- Viral load
- Common course of HIV infection
- Common HIV related conditions, their management and prophylaxis:
  - Skin problems
  - Candidiasis
  - Oral hairy leukoplakia
  - Acute necrotising ulcerative gingivitis
  - Kaposi’s sarcoma
  - Aphthous ulcers
  - CMV retinitis
  - Pneumocystis pneumonia
  - Tuberculosis
  - Wart virus infections
  - Herpes simplex

# HIV Medicine and Sexual Health Care Recommendations

- Varicella zoster
- Tinea
- WHO clinical staging of HIV

Tea Break

## Interactive case discussion:

1. A young woman presenting with recurrent vaginal thrush who turns out to have HIV
2. A 35 year old man who is known to have HIV diagnosed overseas who presents for a 'check up'

## Session 4: Prevention of mother to child transmission of HIV

**Presentation** covering the following topics:

- Prevalence and mechanisms of mother to child transmission of HIV
- Risk factors for MTCT:
  - Overall
  - Specific to transmission during pregnancy
  - Specific to transmission during labour and delivery
  - Specific to transmission during breast feeding
- The four elements of PMTCT under the WHO/UNICEF guidelines:
  - Primary prevention of HIV in women
  - Prevention of unintended pregnancy in women with HIV
  - Measures to reduce risk of transmission from HIV positive mothers to their babies
  - Treatment, care and support services for women with HIV, their babies and their families; including:
    - Antenatal care and HIV testing
    - Antiretroviral therapy
    - Labour and delivery
    - Neonatal prophylaxis
    - Infant feeding
    - Diagnosis of HIV in infants
    - Care of infants born to mothers with HIV

Tea Break

## Interactive case discussion:

- A 20 year old woman who presents to antenatal clinic 30 weeks by dates. She is found to have gonorrhoea and also tests positive for HIV.

## Session 5: Antiretroviral therapy

**Presentation** covering the following topics:

- Fusion inhibitors
  - Mode of action (illustrated by animated film)
- Nucleoside reverse transcriptase inhibitors (NRTI)
  - Names, codes and combinations
  - Mode of action (illustrated by animated film)
  - Adverse effects
  - Final common pathway of most NRTI toxicity:

- Structure and function of mitochondria
- Consequences of mitochondrial failure
- Peripheral lipoatrophy
- Non-nucleoside reverse transcriptase inhibitors (NNRTI)
  - Names and codes
  - Mode of action (illustrated by animated film)
  - Adverse effects
- Protease inhibitors
  - Names and codes
  - Mode of action (illustrated by animated film)
  - Adverse effects
- Drug interactions
- When to start?
- Choice of starting regimen
- Monitoring people taking antiretroviral therapy
- Antiretroviral failure and second line regimens
- Continuum of care and engaging other health and welfare services

Tea break

**Interactive case discussion:**

1. 26 year old man diagnosed HIV positive two years ago with weight loss and falling CD4 – preparation for starting and early follow up (including role plays)
2. 36 year old woman on treatment with stavudine/didanosine/ nevirapine overseas for several years presents with mitochondrial adverse effects. Diagnosis and management.

**Post test** to assess effectiveness of training

**Session 6: Next steps and clinical mentorship**

**Interactive discussion** covering any issues that remain unclear and identifying the next steps for implementation.

This session also utilised to provide **direct mentorship of clinicians** in clinic if patients are available to be seen.

## Appendix 2

### ***Summary of WHO clinical staging of HIV disease in adults and adolescents***

<b>Clinical stage 1</b>
Asymptomatic Persistent generalized lymphadenopathy
<b>Clinical stage 2</b>
Unexplained moderate weight loss (under 10% of presumed or measured body weight) Recurrent upper respiratory tract infections (sinusitis, tonsillitis, otitis media, pharyngitis) Herpes zoster Angular cheilitis Recurrent oral ulceration Papular pruritic eruptions Seborrhoeic dermatitis Fungal nail infection
<b>Clinical stage 3</b>
Unexplained severe weight loss (over 10% of presumed or measured body weight) Unexplained chronic diarrhoea for longer than one month Unexplained persistent fever (intermittent or constant for longer than one month) Persistent oral candidiasis Oral hairy leukoplakia Pulmonary tuberculosis (current) Severe bacterial infections (e.g. pneumonia, empyema, pyomyositis, bone or joint infection, meningitis, bacteraemia, severe pelvic inflammatory disease) Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis Unexplained anaemia (below 8 g/dl ), neutropaenia (below $0.5 \times 10^9/l$ ) and/or chronic thrombocytopaenia (below $50 \times 10^9/l$ )
<b>Clinical stage 4</b>
HIV wasting syndrome Pneumocystis pneumonia Recurrent bacterial pneumonia Chronic herpes simplex infection (orolabial, genital or anorectal of more than one month's duration or visceral at any site) Oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs) Extrapulmonary tuberculosis Kaposi sarcoma Cytomegalovirus infection (retinitis or infection of other organs) Central nervous system toxoplasmosis HIV encephalopathy Extrapulmonary cryptococcosis including meningitis Disseminated non-tuberculous mycobacteria infection Progressive multifocal leukoencephalopathy Chronic cryptosporidiosis Chronic isosporiasis Disseminated mycosis (coccidiomycosis or histoplasmosis) Recurrent septicaemia (including non-typhoidal Salmonella) Lymphoma (cerebral or B cell non-Hodgkin) Invasive cervical carcinoma Atypical disseminated leishmaniasis Symptomatic HIV-associated nephropathy or HIV-associated cardiomyopathy

## Appendix 3

### ***Identified leaders of core HIV care teams in Pacific Island countries***

#### **Federated States of Micronesia**

##### Chuuk:

Dr Dorina Fred

Email: ochochkon@hotmail.com

##### Kosrae:

Dr Carolee Masao

Email: cmasao@fsmhealth.fm

##### Pohnpei:

Dr Elizabeth Keller

Email: supjkeller@yahoo.com

##### Yap:

Dr James Edilyong

Email: jedilyong@fsmhealth.fm

#### **Fiji Islands**

##### Suva:

Dr Sophaganine Ty Ali

Email: nin6085@gmail.com

##### Lautoka:

Dr Arvin Chaudhary

Email: achaudhary@connect.com.fj

##### Labasa:

Dr Jason Mitchell

Email: jmitch69hk@yahoo.com.hk

#### **Kiribati**

##### Tarawa:

Dr Teraira Bangao

Email: t.bangao@yahoo.com

# HIV Medicine and Sexual Health Care Recommendations

## **Marshall Islands**

### Ebeye:

Dr Chocho Thein

Email: chocho\_thein@yahoo.com

### Majuro:

Dr Zachraias Zachraias

Email: z\_zachraias@yahoo.com

## **Palau**

### Korror:

Dr Angela Marcil

Email: a\_marcil@palau-health.net

## **Samoa**

### Apia:

Dr Siniva Sinclair

Email: SinivaS@health.gov.ws

## **Solomon Islands**

### Honiara:

Dr Tenneth Dalipanda

Email: tdalipanda@nrh.gov.sb

## **Tuvalu**

### Funafuti:

Dr Stephen Homasi

Email: s.homasi@yahoo.com

## **Vanuatu**

### Port Vila:

Dr Basil Leodoro

Email: basil\_leodoro@yahoo.com

## References

- <sup>1</sup> University of New South Wales, SPC, WHO et al. *Second Generation HIV/STI and Behavioural Surveillance Surveys in 6 Pacific Island Countries: Fiji, Kiribati, Samoa, Solomon Islands, Tonga, Vanuatu (2004-2005)*. University of New South Wales, 2006.
- <sup>2</sup> World Health Organization. *Antiretroviral therapy for HIV infection in adults and adolescents: recommendations for a public health approach*. WHO Press, Geneva, 2006.
- <sup>3</sup> Gazzard B on behalf of the BHIVA Writing Committee. British HIV Association (BHIVA) guidelines for the treatment of HIV-infected adults with antiretroviral therapy (2006). *HIV Med* 2006; 7:487–503.
- <sup>4</sup> DHHS Panel on Antiretroviral Guidelines for Adults and Adolescents. *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents*. US Department of Health and Human Services, 2006.
- <sup>5</sup> World Health Organization. *Antiretroviral drugs for treating pregnant women and preventing HIV infection in infants in resource-limited settings – Towards Universal Access*. WHO Press, Geneva, 2006.
- <sup>6</sup> World Health Organization. Strategic approaches to the prevention of HIV infection in infants : report of a WHO meeting, Morges, Switzerland. WHO Press, Geneva, 2003.
- <sup>7</sup> World Health Organization. *Guidance on provider-initiated HIV testing and counselling in health facilities*. WHO Press, Geneva. 2007.
- <sup>8</sup> Newell M. Prevention of mother-to-child transmission of HIV: challenges for the current decade. *Bull WHO* 2001; 79: 1138–1144.
- <sup>9</sup> Inter-agency Task Team on Prevention of HIV Infections in Pregnant Women, Mothers and their Infants. *Consensus statement on breastfeeding by women with HIV*. WHO, Geneva (accessed 18<sup>th</sup> July, 2007 from <http://www.who.int/hiv/mediacentre/Infantfeedingconsensusstatement.pdf>)
- <sup>10</sup> Panlilio AL, Cardo DM, Grohskopf LA, Heneine W, Ross CS. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis. *MMWR* 2005; 54(RR-9):1-17.
- <sup>11</sup> Centers for Disease Control and Prevention. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis. *MMWR* 2001;50(RR-11): 1-54.
- <sup>12</sup> Cardo DM, Culver DH, Ciesielski CA, et al. A case-control study of HIV seroconversion in health care workers after percutaneous exposure. *N Engl J Med* 1997;337:1485–90.