Despite the major advances in treatment that have been made over recent decades, the human immunodeficiency virus (HIV) remains a significant and complex global health challenge. In the field of HIV nursing, it has never been more important to appreciate the lived experience of those with HIV and facilitate improved health outcomes through collaboration, negotiation and trust. This article discusses ways to prevent the spread of HIV, the signs and symptoms of the virus, and how it is diagnosed.

Prevention
There is no ‘one-size-fits-all’ way to prevent the onward transmission of HIV. Prevention requires a holistic and multi-faceted approach involving biomedical, behavioural and structural interventions. The reasons for the continued transmission of HIV are complex, with a host of behavioural, psychosocial, cultural, religious and economic determinants acting as barriers to prevention.

Table 1 outlines some primary prevention methods, along with potential barriers to their effectiveness.

Signs and symptoms
Since HIV therapy was introduced in 1995, HIV has shifted from being a fatal disease to a chronic one so there is now a focus on keeping patients healthy and minimising any symptoms or side-effects from medications. Some people living with HIV experience a diverse range of short- and long-term symptoms, often attributed to the status of their immune system and CD4 count (Table 2 – CD4 cells are a type of lymphocyte, discussed in more detail in the first article in this series). However, medications, comorbidities, stigma and social factors also contribute significantly to people’s health at every phase of infection.

Notifying all sexual partners at risk of infection aims to prevent further transmission.

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**Clinical Practice**  

**Review**

Table 1. *Primary prevention methods*

<table>
<thead>
<tr>
<th>Prevention method</th>
<th>Description</th>
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<tbody>
<tr>
<td>Barrier methods</td>
<td>Barrier methods, such as condoms, can be used to prevent the transmission of HIV during vaginal, anal and oral intercourse if used consistently and correctly. Cultural and economic factors can mean they are not always accessible or acceptable to some populations.</td>
</tr>
<tr>
<td>Early diagnosis and treatment</td>
<td>Diagnosing HIV early through regular HIV testing reduces the risk of onward transmission. Early diagnosis leads to early treatment and reduced infectivity. Barriers to early testing and treatment, such as fear and stigma, still exist.</td>
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<tr>
<td>PEP and PEPSE</td>
<td>PEP and PEPSE are short-course HIV medications. When given within 72 hours of exposure to the HIV virus, they can decrease the risk of acquiring HIV. Both PEP and PEPSE can be obtained from sexual health clinics and emergency departments; they must be considered an emergency prevention measure as they are not always effective.</td>
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<tr>
<td>PREP</td>
<td>PREP is a combination of two HIV medications, usually in one pill, that can be taken daily to protect people at risk of developing HIV. If taken consistently, it can be highly effective at preventing the transmission of HIV through sexual contact. PREP is recommended for people who are HIV negative and at high risk of acquiring HIV, such as those who report low condom usage, who accept money or gifts for sex, or who are sexual partners of individuals who are HIV positive and not taking their medications regularly.</td>
</tr>
<tr>
<td>Needle exchange</td>
<td>Needle exchanges provide free, clean needles for the safe use of illicit drugs, and offer a facility to safely dispose of used needles.</td>
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<tr>
<td>Education</td>
<td>Education is essential to prevent transmission and reduce stigma. This can include education about safe sex, safe relationships or ‘myth busting’. In some contexts, culture, spirituality and low literacy can impede the effectiveness of education so it must be delivered carefully and sensitively.</td>
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<tr>
<td>Safe infant feeding</td>
<td>To reduce transmission from breast milk, education and intervention around safe infant feeding are essential. In resource-limited areas there may be reduced access to alternatives, such as formula milk and clean drinking water.</td>
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<tr>
<td>Behavioural and psychosocial intervention</td>
<td>Counselling, group therapy and public awareness campaigns are often effective at targeting behaviours, stigmas and psychosocial issues. Peer support and peer mentors are invaluable, giving people a role model and trustworthy voice that understands their lived reality. Peer mentors understand the context in which they work and can translate public health messages to their audience in a relatable and meaningful way.</td>
</tr>
<tr>
<td>Legislation</td>
<td>Stigma plays a significant part in exacerbating the burden of HIV: it affects holistic wellbeing, which can disengage people from healthcare and lead to risk-taking behaviours. Laws to safeguard people living with HIV from discrimination are vital for reducing stigma, particularly in areas such as employment and immigration.</td>
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**Acute phase**  
Upon initial infection with HIV – usually in the first 2-6 weeks – people can often experience a diverse and non-specific set of symptoms that tend to resolve after 1-2 weeks when the body starts to produce antibodies. These symptoms are often described as flu-like and include fever, myalgia, malaise, gastrointestinal disturbances and headaches.  
People in this phase may visit their GP or access healthcare but appear to have short-lived, generalised symptoms of a seasonal virus or transient stomach upset that do not trigger further investigation.  

**Chronic latent phase**  
Following the development of antibodies, the number of virus particles in the blood reduces and HIV replication reduces. People generally have no symptoms, although some have persistently swollen lymph glands. As the CD4 count diminishes in the absence of treatment, minor symptoms may start to appear such as skin rashes, oral sores and fatigue. People may notice they get seasonal illnesses more often and take longer to recover.  

**Advanced HIV infection**  
Advanced HIV infection (previously called AIDS) is diagnosed when a particular type of infection or cancer arises as a result of a severely reduced immune system. These are usually opportunistic infections, viruses, fungi or parasites that would not usually cause illness in people who are not immunocompromised. These infections can affect any body system, creating a multitude of symptoms.  
There is an agreed set of infections and conditions that are indicators of advanced HIV infection; these are referred to as AIDS-defining conditions. British HIV Association (BHIVA) guidelines by Nelson et al (2011) provide further information about these conditions and their treatment and Table 3 lists some examples.  

**Diagnosis**  
In 2014, the Joint United Nations Programme on HIV/AIDS (UNAIDS) set an ambitious global target for nations to achieve "90-90-90" by 2020. This meant:  
* 90% of all people with HIV would know their HIV status;  
* 90% of people living with HIV would receive anti-retroviral therapy;  
* 90% of people receiving anti-retroviral therapy would have viral suppression (UNAIDS, 2014).  
The UK achieved this target two years early, although 43% of people diagnosed with HIV are still being diagnosed at a late stage (BHIVA, 2020). This is important because being diagnosed late increases the
Clinical Practice

Review

risk of developing complications and the risk of onward transmission.

National guidelines for HIV testing were published in 2008 by BHIVA, the British Association of Sexual Health and HIV, and the British Infection Society. The guidelines are currently being updated but, at present, they recommend HIV testing for:

- Groups at increased risk of HIV, such as men who have sex with men, people who inject drugs, transsexual women and people from countries with a high prevalence of HIV;
- People attending health services associated with an increased risk of HIV, such as tuberculosis clinics and substance-misuse services;
- People presenting with symptoms or signs consistent with an HIV-indicator condition, such as lymphoma;
- People accessing healthcare in areas of high HIV prevalence (BHIVA et al, 2008).

There are many barriers to HIV testing, which need to be addressed to improve the rate of early diagnosis. These barriers include psychosocial, physical, structural and economic determinants, such as the following:

- Fear of judgement, for example among transsexual women, sex workers or drug users;
- Fear of impact on immigration status;
- Lack of knowledge, training or staff in NHS settings;
- Lack of funding or reimbursement for HIV testing across primary and secondary care settings;
- Lack of awareness or low perception of individual risk-taking behaviour;
- Lack of clinician skill to communicate or risk assess;
- Lack of access or proximity to a testing provider;
- Fears around a positive result, including stigma, confidentiality, rejection and discrimination;
- Fear of prosecution for reckless transmission.

There have been many interventions to try to improve HIV testing. These have often been locally determined, based on a health-needs assessment of the local population. A national strategy, however, has been to introduce opt-out testing. This has been adopted in antenatal screening in the UK for many years and uptake is near universal. As a result of this, vertical transmission of HIV from mother to child has nearly been eliminated in the UK, dropping from 2% in 2000-01 to 0.3% in 2012-14 (Carter, 2018).

Opt-out testing is also now used in sexual health clinics and other settings in which patients have a higher risk of HIV, such as tuberculosis and lymphoma clinics. Opt-out testing of patients attending medical services such as emergency departments and medical assessment units in areas of high prevalence is also a strategy, which is showing acceptability from patients and clinicians (BHIVA et al, 2008). Despite this recommendation featuring in the National Institute for Health and Care Excellence (2016) guidance for HIV testing, it can often be hindered by financial and structural barriers.

Another successful strategy is the introduction of home testing through self-sampling kits. These can reduce a host of barriers to testing, including fears around confidentiality and accessibility of services. These tests are available from pharmacies and must be CE-marked in the UK to be lawfully sold or advertised.

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Table 2. Symptoms associated with CD4 count

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<thead>
<tr>
<th>CD4 count*</th>
<th>Symptoms experienced</th>
</tr>
</thead>
<tbody>
<tr>
<td>800-1200 (normal count)</td>
<td>Well, with no symptoms</td>
</tr>
<tr>
<td>500-799 (generally healthy count)</td>
<td>Well, with no symptoms</td>
</tr>
<tr>
<td>350-499</td>
<td>Minor immune symptoms</td>
</tr>
<tr>
<td>200-349</td>
<td>Major symptoms and opportunistic infections</td>
</tr>
<tr>
<td>&lt;200</td>
<td>Severe symptoms of advanced HIV infection</td>
</tr>
</tbody>
</table>

*Number of CD4 cells per mm³ of blood.
Source: Universal Healthcare (Bit.ly/1HHIVSTages)

Window period
The HIV testing process involves a window period, which is the time between infection and a test being able to detect the infection. During this period, a person can be highly infectious but a test still gives a negative result.

Different generations of testing apparatus exist so advice should always be sought from the clinician or manufacturer about the window period, including, if necessary, when a retest should be performed.

Contact tracing
Contact tracing (also called partner notification) is the process of contacting sexual partners and advising them that they have been exposed to an infection. The intention is to notify as many partners at risk of an undiagnosed HIV infection as possible, and encourage them to attend for counselling, prevention, testing and treatment to stop further transmission.

Partner notification is a highly successful public health strategy, but is often viewed with apprehension by patients and must be handled with great care by an experienced sexual health or HIV professional – usually a sexual health adviser or clinical nurse specialist. Patients are often very anxious about violations of their privacy and confidentiality and, in some cases of HIV status disclosure, may be at risk of violence, discrimination or criminalisation. The specialist nurse or sexual health adviser should have a good understanding of the patient’s social and sexual networks, and any risks associated with partner notification, such as domestic violence.

The World Health Organization (2016) has developed specific standards for partner notification. Partner notification should always be voluntary: mandatory or coercive tactics should never be employed. Partner notification is a collaboration between specialist and patient, based on negotiation, empathy and trust, and a good rapport with patients is associated with successful outcomes.

Patients should be offered multiple options for methods of notification and given counselling around the risks and benefits. After this has been done, an approach should be selected that meets the patient’s preferences. There are a number of types of partner notification:

- Passive notification – a trained professional encourages the patient to share their diagnosis with their partner(s) themselves, and is given support and counselling to achieve this;
- Assisted notification – a trained provider, such as a health adviser or specialist nurse, confidentially contacts the patient’s sexual contacts to offer them counselling, prevention advice and testing.
The WHO (2016) guidelines also provide information about a variety of other methods, including contact slips, contact notification and where a healthcare professional accompanies HIV-positive clients when they disclose their status and the potential exposure to HIV infection to their partner.

Partner notification can be highly beneficial to patients: it is associated with increased adherence to medical care and better psychosocial health (Hosseinipour and Rosenberg, 2015). Broad conversations between the specialist and patient also allow other pertinent issues to be explored, such as attitudes to sex, understanding of viral-load testing and transmission (which is discussed in more detail in the first article in this series), shame and body image. It can be a longitudinal process. The health adviser should always know when to stop and re-evaluate, particularly if resistance occurs; for example, terms such as ‘must’, ‘should’ and ‘need’ can cause resistance. Motivational interviewing techniques are often an effective strategy.

### Table 3. Examples of conditions indicative of advanced HIV infection

<table>
<thead>
<tr>
<th>Condition type</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
</table>
| Respiratory    | PCP (Pneumocystis carinii pneumonia) | - Causative agent – *Pneumocystis jirovecii* (a fungus)  
- Symptoms – severe opportunistic infection that presents abruptly and quickly causes respiratory failure; also causes chest pain, fever and dyspnoea  
- Treatment – antimicrobial therapy such as co-trimoxazole, usually for 21 days and often delivered concomitantly with steroids, to reduce inflammation. Mechanical ventilation and intensive care can be required in severe cases (Nelson et al, 2011)  
- Impact – PCP remains a leading course of opportunistic infection. Before HIV therapy was introduced, PCP affected 20 in every 100 people living with HIV, with significant mortality (Truong and Ashurst, 2019) |
| Oro-gastro-intestinal | Candidiasis (thrush) | - Causative agent – *Candida* fungal species, for example *Candida albicans*  
- Symptoms – *Candida* can affect the oropharynx and oesophagus. Symptoms include dysphagia, reflux, mouth ulceration and sternal pain. Many other conditions can trigger thrush, such as antimicrobial therapy or chemotherapy  
- Treatment – anti-fungal medications, such as fluconazole or caspofungin  
- Impact – oral thrush is the most frequent opportunistic fungal infection and is often an initial manifestation of HIV infection (Vazquez, 2010) |
| Neurological    | Toxoplasmosis | - Causative agent – *Toxoplasma gondii* (a parasite)  
- Symptoms – can cause abscess formation in the brain, leading to encephalitis. Symptoms include focal neurological signs, fever and headache (Nelson et al, 2011)  
- Treatment – pyrimethamine, sulfadiazine, folinic acid  
- Impact – if left untreated, toxoplasmosis can lead to seizures, coma and death. The parasite often causes no symptoms in those who are not immunocompromised. It is prevalent in the developed world; up to 50% of the global population have been exposed to it (Flegr et al, 2014) |
| Cancer         | Kaposi’s sarcoma | - Causative agent – human herpesvirus 8  
- Symptoms – purple lesions on the skin, mouth or other organs such as the lung  
- Treatment – HIV therapy will often shrink or slow the growth of the lesions; chemotherapy may be used in advanced or rapidly progressing cases (British HIV Association, 2014)  
- Impact – the lesions in the lung can cause shortness of breath, while lesions in the mouth and throat can cause swallowing and eating difficulty. Large lesions on the skin can lead to swelling and pain. |


