MAIN CONTENTS

Chapter 8:

Gynaecology and other reproductive healthcare

contents

contents (continued)

1. Introduction

Gynaecology refers to the field of medicine addressing the female reproductive system, while andrology addresses the male reproductive system. Intersex, transgender, and transsexual people may have a combination of female and male reproductive organs and sexual characteristics, whether by birth or due to one or more medical or surgical interventions.

Reproductive health refers to the health of an individual's reproductive system, processes, and functions, at all stages of their life. Good reproductive health implies that an individual has the ability "to have a responsible, satisfying and safe sex life" and "the capability to reproduce and the freedom to decide if, when and how often to do so" [1].

This chapter describes the essentials of reproductive health assessment (screening, investigations, diagnosis) and management (treatment and/or referral) and covers common gynaecological and andrological conditions, cancers of the reproductive tract, and infertility. For information regarding initial assessment of the client, see *Chapter 2: Facility requirements and client history/examination*.

Acronyms

AUB	abnormal uterine bleeding
BPH	benign prostatic hyperplasia
HPV	human papillomavirus
LNG-IUD	levonorgestrel intrauterine device
NSAIDs	non-steroidal anti-inflammatory drugs
PCOS	polycystic ovary syndrome
PDE5	phosphodiesterase type 5
PID	pelvic inflammatory disease
PSA	prostate-specific antigen
STI	sexually transmitted infection
VIA	visual inspection with acetic acid
WHO	World Health Organization

2. Puberty

Puberty is the stage of life when sexual maturity takes place. Girls usually experience puberty earlier than boys. It is a process that usually happens between 8 and 13 years of age for girls and 9 and 14 years of age for boys. It causes physical changes and affects boys and girls differently. Puberty involves a series of biological and physical transformations, including the development of secondary sex characteristics and the achievement of fertility (*Table 1*). Tanner stages are commonly used to describe the onset and progression of pubertal changes [2]. Boys and girls are rated on a five-point scale. Stage 1 is preadolescent, while stage 5 means that genitalia are the final adult form in size and

TABLE 1: Signs and symptoms of puberty

	Boys (9–14 years)	Girls (8–13 years)
Signs and symptoms	• Testicles (scrotum) and penis get bigger • Hair grows in the pubic area and armpits • Facial hair develops • Muscles grow, voice deepens	• Breast development (some may use the term breast 'buds') • Hair grows in the pubic area and armpits • Hips and thighs get bigger (build-up of fat) • Menstruation (this usually happens last)
	Both boys and girls may get acne and experience a growth spurt	

shape. The process usually happens naturally. As well as physical changes, it can impact mental and emotional health, and some adolescents may report depression, anxiety, and risk-taking behaviours, such as substance use and unsafe sex.

Precocious puberty, a condition that occurs when sexual maturity begins earlier than normal, begins before age 8 for girls and before age 9 for boys. Children affected by precocious puberty may fail to reach their full height and experience psychological and social issues related to their appearance. Delayed puberty is the term for a condition in which the body's timing for sexual maturity is later than the normal range of ages (>14 years). Both precocious puberty and delayed puberty can be indicative of hormonal production disorder and genetic disorders. More detailed history-taking, examinations, and investigations are needed to confirm the underlying causes. Counselling and mental support should also be provided to clients and their families during the process. In addition to dealing with the underlying diseases, hormonal products can be used to slow or increase sexual development. If required, clients can be referred to a specialist.

3. Management of common gynaecological conditions

Clients may present with symptoms that require gynaecological examination, assessment, investigation, and treatment. Examination and assessment procedures are described in *Chapter 2: Facility requirements and client history/examination*. This section provides more information on the common gynaecological conditions of abnormal uterine bleeding, uterine fibroids, pelvic pain, menopause, and infertility.

3.1 Abnormal uterine bleeding

Normal menstrual bleeding occurs every 24–38 days with varying amount of flow and generally lasts less than 8 days with no bleeding in between menses. Abnormal uterine bleeding (AUB) is any deviation from the normal menstrual cycle and is categorized according to the PALM-COEIN system (*Table 2*).

Diagnostic terms, such as menorrhagia, metrorrhagia, oligomenorrhea, and dysfunctional uterine bleeding have been abandoned as they had no consistently agreed meaning or definition. Chronic AUB is defined as AUB that has been present for most of the previous 6 months [3,4,5].

3.1.1 Causes and risk factors

There are multiple causes of AUB and each client may have more than one underlying condition. In some cases, no cause may be found. Potential causes of AUB are classified according to structural or non-structural causes in the PALM COEIN classification system (*Table 2*). The most common causes of AUB include structural causes such as polyps (AUB-P), fibroids (AUB-L), and cancers of the uterus or cervix (AUB-M); and non-structural causes such as disorders of ovulation (AUB-O); effects of contraceptive methods, such as intrauterine devices or oral contraceptive pills (AUB-I); and bleeding disorders (AUB-C). This system does not cover vaginal bleeding in pregnancy, such as ectopic pregnancy or incomplete abortion (see *Chapter 9: Maternal health*) or bleeding related to infectious causes (see *Chapter 6: Sexually transmitted infections*).

TABLE 2: PALM-COEIN classification system for abnormal uterine bleeding

PALM (structural causes)	COEIN (non-structural causes)
Polyp (AUB-P)	**C**oagulopathy (AUB-C)
Adenomyosis (AUB-A)	**O**vulatory dysfunction (AUB-O)
Leiomyoma (AUB-L)	**E**ndometrial (AUB-E)
Malignancy and hyperplasia (AUB-M)	**I**atrogenic (AUB-I)
	Not otherwise classified (AUB-N)

Source: Munro et al. [5].

3.1.2 Assessment and management of chronic AUB (symptoms present for ≥6 months)

3.1.2.1 History-taking

In addition to basic history-taking, questions to rule out chronic AUB should focus on excluding pregnancy, infection, and reproductive cancers, and establishing how bothersome the symptoms are for the individual client.

3.1.2.2 Examination

After general physical examination, proceed with examination of the female reproductive tract as described in *Chapter 2: Facility requirements and client history/examination*. It is crucial to identify if there are clinical signs of anaemia, hormonal causes of AUB such as hypothyroidism, or suspicious pathological findings such as polyps and cancer.

Based on the examination result, conduct more examinations such as blood test, thyroid function, ultrasound, endometrial biopsy, or cervical cancer screening to confirm the diagnosis.

3.1.2.3 Management of chronic AUB

Management of chronic AUB depends on the underlying cause. When structural causes, such as fibroids or malignancy are found, surgical procedures may be necessary (see *Section 3.2.2* for details on management options for uterine fibroids). When the underlying cause is non-structural, treatment should be focused on improving any detrimental effects on quality of life (social life, employment, psychological well-being, and sex life) rather than focusing on menstrual blood loss. Discuss the range of treatment options with the client. If necessary, offer a follow-up contact for reassessment.

While dilatation and curettage may be used to assess the endometrium for hyperplasia or malignancy, it is not an effective treatment for AUB. Aspiration using a manual vacuum aspirator may be used to sample endometrial tissue for biopsy.

Hysterectomy is not a first-line treatment for AUB and is not recommended unless other treatments have failed and the client desires it after appropriate counselling.

In adolescents, AUB most frequently occurs as a result of persistent anovulation due to the immaturity or dysregulation of the hypothalamic–pituitary–ovarian axis. AUB in adolescents may also be due to hormonal contraceptive use, pregnancy, pelvic infection, coagulopathies, or tumours. As many as 19 per cent of adolescents with AUB who require hospitalization may have an underlying coagulopathy, which emphasizes the importance of screening for coagulation disorders in these clients [6].

AUB most frequently occurs in women aged 19–39 years as a result of pregnancy, structural lesions (e.g. leiomyomas or polyps), anovulatory cycles (e.g. polycystic ovary syndrome [PCOS]), use of hormonal contraception, and endometrial hyperplasia. Endometrial cancer is less common but may occur in this age group. In women aged 40 years to menopause, AUB may be due to anovulatory bleeding, which represents normal physiology in response to declining ovarian function. It may also be due to endometrial hyperplasia or carcinoma, endometrial atrophy, and leiomyomas [6].

First-line treatments for chronic AUB in non-pregnant clients without underlying structural causes (for bleeding during pregnancy, see *Chapter 9: Maternal health*)

For clients who do not currently want to get pregnant:

- The levonorgestrel-releasing intrauterine device (LNG-IUD) reduces blood loss, although it can take up to 12 months to achieve the maximum effect [7].
- If LNG-IUD is not acceptable, oral norethisterone and medroxyprogesterone acetate can decrease bleeding volume.

For clients who have a regular menstrual cycle and who wish to become pregnant and do not wish to take hormones or in whom hormone treatment is contraindicated, offer the following during menstruation as first-line treatments:

- Non-steroidal anti-inflammatory drugs (NSAIDs), such as mefenamic acid and ibuprofen, if clients are not allergic to NSAIDs.
- Antifibrinolytics, such as tranexamic acid.
- Refer clients who wish to become pregnant but who experience irregular cycles suggestive of anovulation to a specialist for further assessment, while also offering temporary treatment using the options above.

Second-line treatments

- Combined oestrogen and progestin therapies, such as combined oral contraceptive pills, are effective when progestins alone (e.g. LNG-IUD) have not been successful or are not acceptable to the client.
- Less invasive surgical treatments in the form of endometrial ablation and resection may be preferred by clients and are becoming more widely available in higher-level facilities.

3.1.3 Assessment and management of acute AUB

A small number of clients present with acute AUB either as a new episode of bleeding or on top of a known history of chronic AUB.

The immediate management depends on the client's clinical stability (exclude signs of hypovolaemic shock) and haemoglobin levels. The immediate reduction of bleeding can be achieved with the combination of norethisterone or medroxyprogesterone acetate and oral tranexamic acid. LNG-IUD is not the first option for acute AUB. If bleeding is excessive, intravenous oestrogen or gonadotropin-releasing hormone (GnRH) may be considered at specialist centres.

3.2 Uterine fibroids

Fibroids, also called leiomyomas, are a common benign tumour of the uterus consisting of smooth muscle cells and fibroblasts, ranging in size from a few millimetres to 30 cm or larger. They generally develop slowly and persist until menopause, after which they usually shrink. Their prevalence is unknown as they are often asymptomatic.

Fibroids can cause heavy menstrual bleeding, pelvic pain, secondary dysmenorrhoea, urinary tract problems (frequency, urgency, urinary incontinence, or hydronephrosis) and non-specific bowel problems (e.g. bloating, constipation). Fibroids can also be associated with subfertility and, rarely, pregnancy-related problems, such as need for caesarean or preterm delivery, malpresentation, miscarriage, or acute pain caused by degenerative changes when a fibroid grows rapidly in the presence of high levels of sex hormones during pregnancy, outgrowing its blood supply [8].

3.2.1 Causes and risk factors

Fibroids develop in women of reproductive age and are "promoted and maintained by exposure to oestrogen and progestogen" [8]. Risk factors include increasing age (from puberty to menopause), early puberty, obesity, black ethnicity, and family history [8], while increasing parity and use of oral or injectable hormonal contraception decrease the risk [9].

3.2.2 Management and treatment

Healthcare providers should take a complete client history and perform relevant examination. Diagnostic evaluation should exclude other causes of AUB and pelvic masses [6]. Assess how fibroids affect the client's quality of life and whether the client wishes to get pregnant. If surgery is considered, assess surgical suitability (e.g. obesity, presence of multiple comorbidities, or previous abdominal surgery).

There are three pathways to manage uterine fibroids [10]:

- *Expectant management* is suitable for clients who have no symptoms or those with AUB without anaemia who wish to 'watch and wait'.
- *Medical management* of AUB associated with fibroids is the same as for other causes of AUB.
- *Surgical management* may be needed to address complications of fibroids that are detrimental to quality of life. Refer to a specialist for consultation about surgery.
    - Myomectomy removes the fibroids only and is the preferred method for clients who wish to preserve their fertility.

Hysterectomy or ablation may be appropriate for clients who have completed childbearing. Clients should be counselled on all treatment options that are available and accessible, with a discussion of the risks and benefits of the treatment options to guide counselling and shared decision-making [11].

3.3 Pelvic pain

Pelvic pain can be acute or chronic and can arise from the digestive, urinary, or reproductive system. This section focuses on gynaecological conditions and causes, but for both acute and chronic pelvic pain it is important to consider non-gynaecological causes as part of the assessment.

3.3.1 Acute pelvic pain

3.3.1.1 Causes

Acute pelvic pain may be due to pelvic inflammatory disease (PID), ectopic pregnancy, miscarriage, intrauterine fetal death, menstrual cramps (dysmenorrhea), ovarian torsion, ruptured ovarian cysts, or other causes, including non-gynaecological causes [12].

3.3.1.2 History-taking, examination, and investigations

In addition to general history-taking, it is essential to assess the severity, location, frequency, and duration of the pain and associated symptoms, such as dyspareunia, dysuria, and nausea/vomiting. Healthcare providers should keep in mind that other non-gynaecological causes, including appendicitis, may also cause acute lower abdominal pain. *Table 3* shows the differential diagnoses of acute pelvic pain.

Perform relevant examination and test to confirm the diagnosis, such as pregnancy testing and bimanual pelvic examination. The absence of a palpable mass does not exclude ovarian cysts or ectopic pregnancy as a cause of pain. *Table 4* (next page) provides clinical clues from client history and examination to aid diagnosis of acute pelvic pain.

3.3.1.3 Management

When a client presents with acute pelvic pain, healthcare providers must be alert to the possibility that surgery may be required urgently (e.g. for ovarian torsion, ectopic pregnancy). When there is strong suspicion of serious complications and surgery is not available at the facility, prepare the client and arrange referral/transfer as soon as possible.

3.3.2 Chronic pelvic pain

Chronic pelvic pain is a symptom, defined as "intermittent or constant pain in the lower abdomen or pelvis of a woman of at least 6 months in duration, not occurring exclusively with menstruation or intercourse and not associated with pregnancy" [13].

TABLE 3: Differential diagnosis of acute pelvic pain

Women of reproductive age
Gastrointestinal: Appendicitis; bowel obstruction; diverticulitis; gastritis; inguinal hernia; irritable bowel syndrome; mesenteric venous thrombosis; perirectal abscess
Gynaecologic: Adenomyosis; degenerating uterine fibroid; ectopic pregnancy; endometriosis; mittelschmerz; ovarian torsion; pelvic inflammatory disease; ruptured ovarian cyst; tubo-ovarian abscess
Urinary: Cystitis; pyelonephritis; ureterolithiasis
Other: Dissecting aortic aneurysm; lead poisoning; malingering; narcotic seeking; porphyria; sickle cell crisis; somatization disorder
Pregnant women
Corpus luteum haematoma; ectopic pregnancy, endometritis (post-partum); ovarian torsion; ovarian vein thrombosis (post-partum); placental abruption; uterine impaction
Adolescents
Similar to women of reproductive age, with the addition of imperforate hymen and transverse vaginal septum
Post-menopausal women
Similar to women of reproductive age, minus ectopic pregnancy and ovarian torsion

Source: Reproduced/translated with permission from Kruszka PS, Kruszka SJ. Evaluation of acute pelvic pain in women. Am Fam Physician. 2010;82(2):141-7.

TABLE 4: History and physical examination clues to the diagnosis of acute pelvic pain

Clinical clues	Suggested diagnosis
History	
Bilateral pelvic pain	PID
Dysmenorrhoea	Endometriosis, uterine fibroid
Dyspareunia	Endometriosis, ovarian cyst
Dysuria	PID, UTI
Gross haematuria	Kidney stone, UTI
Left-sided pelvic pain	Diverticulitis, kidney stone, ruptured ovarian cyst
Midcycle pain	Mittelschmerz
Nausea and vomiting	Appendicitis, ovarian torsion
Pain migration from periumbilical area to right lower quadrant of abdomen	Appendicitis
Radiation of pain to groin	Kidney stone, ovarian torsion
Right-sided pelvic pain	Appendicitis, kidney stone, ovarian torsion, ruptured ovarian cyst
Urinary frequency	UTI
Vaginal bleeding	Ectopic pregnancy, uterine fibroid
Vaginal discharge	PID
Physical examination	
Adnexal mass	Corpus luteum cyst, diverticula of colon, ectopic pregnancy, endometriosis, follicular cyst, PID, uterine fibroids
Bilateral abdominal tenderness	PID
Cervical motion, uterine, or adnexal tenderness	PID
Fever	Appendicits, PID, pyelonephritis
Hypotension	Ectopic pregnancy, ruptured haemorrhagic ovarian cyst
Left lower quadrant abdominal tenderness	Diverticulitis
Right lower quadrant abdominal tenderness	Appendicitis
Vaginal mucopurulent discharge	PID

PID = pelvic inflammatory disease, UTI = urinary tract infection.

Source: Reproduced/translated with permission from Kruszka PS, Kruszka SJ. Evaluation of acute pelvic pain in women. Am Fam Physician. 2010;82(2):141-7.

3.3.2.1 Causes

There is often more than one component or contributing factor to chronic pelvic pain and the cause(s) may not be identifiable at initial assessment. Some causes of chronic pelvic pain include endometriosis, chronic PID, fibroids, pelvic congestion syndrome, and psychological factors [14].

3.3.2.2 History-taking, examination, and investigations

Healthcare providers should ask about the pattern of the pain and its association with other problems, including psychological, bladder, and bowel symptoms, the effect of movement and posture on the pain, if it radiates, and if anything improves or worsens it.

Provide necessary examinations and investigations to confirm the diagnosis, including ultrasound. Diagnostic laparoscopy carries risks and should only be used as a second-line investigation.

3.3.2.3 Management and treatment

Treat the underlying conditions. Even if no explanation for the pain can be found initially, attempts should be made to treat the pain empirically and to develop a management plan in partnership with the client, including pain control.

3.3.3 Pelvic inflammatory disease

3.3.3.1 Causes and risk factors

Pelvic inflammatory disease (PID) refers to infection of the upper reproductive tract caused by ascending infection from the cervix or vagina. There is also a risk of formation of tubo-ovarian abscess leading to scarring and deformation of the fallopian tubes, which in turn can lead to tubal infertility and an increased risk of ectopic pregnancy, as well as chronic pelvic pain. It is most commonly caused by the cervical sexually transmitted infection (STI) *Chlamydia trachomatis* (chlamydia), but it can also be caused by *Neisseria gonorrhoeae* (gonorrhoea), *Mycoplasma genitalium*, *Gardnerella vaginalis*, *Haemophilus influenzae,* and *Ureaplasma urealyticum* (see *Chapter 6: Sexually transmitted infections*) [15]. Risk factors for PID include age younger than 25 years, new or multiple sexual partners, unprotected sex, sex with a symptomatic partner, and young age at onset of sexual activity (younger than 15 years) [16].

3.3.3.2 History-taking

Healthcare providers should be vigilant in assessing clients presenting with any degree of lower abdominal pain as symptoms may not be severe. Ask about history of previous STIs and/or PID. A thorough sexual history will assess the most common risk factors for PID. This involves sensitive questioning techniques (see *Chapter 3: Counselling* and *Chapter 6: Sexually transmitted infections*).

3.3.3.3 Examination and investigations

A thorough general physical and gynaecological examination is essential to exclude other causes of lower abdominal pain, such as endometriosis, ovarian cyst rupture, and torsion. Pregnancy should be ruled out as symptoms could be due to an ectopic pregnancy.

3.3.3.4 Management and treatment

Treat mild to moderate PID with oral antibiotics, without admission. There is no added benefit to administering intravenous antibiotics if the client is able to take them orally. Global recommended parenteral antibiotic regimens for PID are summarized in *Box 1* (next page). However, consult and adhere to local guidance for antibiotic treatment.

Counselling points to discuss with the client on starting treatment:

- The benefits of telling their partner about the presence of an STI and the risks if their partner is not also tested or treated.
- The long-term risks of pelvic infection (possible effects on fertility, risk of ectopic pregnancy, chronic pelvic pain) and the increased risks of reinfection.
- Unprotected sex should be avoided until the client and their partner's treatment is complete.

BOX 1: Global guidelines for parenteral treatment of acute pelvic inflammatory disease		
Basic parenteral regimen options (one of the following):		
1. Cefotetan 2 g IV every 12 hours	**PLUS**	Doxycycline 100 mg orally[a] or IV every 12 hours
2. Cefoxitin 2 g IV every 12 hours	**PLUS**	Doxycycline 100 mg orally[a] or IV every 12 hours
3. Clindamycin 900 mg IV every 8 hours	**PLUS**	Gentamicin loading dose IV or IM (2 mg/kg), followed by a maintenance dose (1.5 mg/kg) every 8 hours; single daily dosing (3–5 mg/kg) can be substituted
Alternative parenteral regimen:		
Ampicillin/sulbactam 3 g IV every 6 hours	**PLUS**	Doxycycline 100 mg orally[a] or IV every 12 hours

Abbreviations: IV, intravenous; IM, intramuscular.

[a] Doxycycline should be administered orally if possible due to the pain of intravenous infusion.

Source: Workowski et al. [17].

3.3.4 Endometriosis and adenomyosis

Endometriosis is a disease where tissue similar to the lining of the uterus grows outside the uterus, causing pain and/or infertility [18]. Adenomyosis is characterized by endometrial tissue growing into the muscular uterine wall (myometrium) resulting in heavy or prolonged menstrual bleeding, dysmenorrhea, dyspareunia, bleeding between menstruation, infertility, or it can be asymptomatic [18].

3.3.4.1 History-taking

During history-taking, the provider should suspect these conditions in clients who have one or more of the following symptoms:

- endometriosis: cyclical/chronic pelvic pain, painful periods, pain with sex, pain with bowel movements, painful urination, abdominal bloating, and infertility
- adenomyosis: heavy menstrual bleeding, painful periods, pain with sex, and abdominal bloating [19,20]

3.3.4.2 Examination and investigations

The provider should conduct a general physical examination, abdominal examination, and examination of the reproductive tract, including bimanual pelvic examination. Pelvic ultrasound can be arranged if indicated [19,20].

3.3.4.3 Diagnosis

Diagnosis can be delayed for many years because the examination and investigations may appear normal, although normal findings do not rule out these conditions.

A careful history of menstrual symptoms and chronic pelvic pain provides the basis for suspecting endometriosis or adenomyosis. Although several screening tools and tests have been proposed and tested for endometriosis, none are currently validated to accurately identify or predict individuals or populations that are most likely to have the disease. Early suspicion of endometriosis is a key factor for early diagnosis, as endometriosis can often present symptoms that mimic other conditions and contribute to a diagnostic delay. In addition to medical history, referral from the primary healthcare level to secondary centres where additional investigations (such as pelvic ultrasound) are available may be needed [19,20]. Imaging studies, such as ultrasonography, magnetic resonance imaging, and computed tomography are useful only in the presence of a pelvic or adnexal mass [21].

Histologic verification, usually following surgical visualization, confirms the diagnosis of endometriosis, particularly for the most common superficial lesions. The need for additional investigations or histologic confirmation should not prevent starting empirical medical treatment.

3.3.4.4 Management and treatment

The first-line treatment for endometriosis or suspected endometriosis is simple analgesia, such as paracetamol and/or NSAIDs. Hormonal treatments such as combined oral contraceptives or progestogen-only contraceptives, including LNG-IUD, can be offered to all clients with suspected or confirmed endometriosis if they are not trying to get pregnant. These treatment options are not a cure for endometriosis but instead help to manage symptoms and improve quality of life. These treatments may be started without a formal diagnosis of endometriosis.

If symptoms do not respond to medical therapies, surgery may be an option and direct visualization of endometriotic lesions on organs or the pelvic walls along with histologic confirmation provides definitive diagnosis of endometriosis. During surgery, adhesions (scar tissue) and/or ovarian cysts can also be directly visualized and treated by excision and ovarian cystectomy. This should be conducted in a well-equipped facility with trained surgeons. Surgical management carries risk, including the risk of additional adhesion formation which can worsen pelvic pain.

Similar management, including expectant management, medical management, and surgical management (such as hysterectomy) can be used to treat clients with adenomyosis.

For both, a multidisciplinary treatment approach addressing different symptoms and overall health is often needed and requires referral to different specialists, such as physiotherapists and psychologists, in addition to gynaecologists/infertility specialists.

Endometriosis/adenomyosis and infertility: Refer clients with known endometriosis or adenomyosis who wish to become pregnant to a specialist facility, if needed. Additional information can be found in *Section 6: Infertility*.

3.4 Menopause

Menopause is the natural and permanent cessation of menstruation due to the loss of ovarian follicular activity. It can be diagnosed after 12 months of amenorrhoea, at which time the individual enters the post-menopausal state. Menopause, or the last menstrual period, usually occurs in the early 50s. If it occurs before the age of 40 it is defined as premature menopause.

The perimenopause refers to the years before menopause is diagnosed, characterized by increasingly irregular ovulation and menstruation cycles, prolonged episodes of amenorrhoea, and finally the total cessation of menses.

Clients experiencing early perimenopause or premature menopause are at increased risk of mortality and serious morbidity, including cardiovascular disease, cognitive decline, dementia, Parkinsonism, and osteoporosis due to the decrease in oestrogen levels. Post-menopause also leads to a higher risk of osteoporosis, cardiovascular disease, stroke, and atrophic changes in the vagina and bladder, due to the decrease in oestrogen and other effects of ageing [22,23].

3.4.1 History-taking, examination, investigations, and diagnosis

Diagnosis of menopause is clinical and retrospective based on absence of menses for 12 months. Not everyone will have symptoms, but some may experience hot flushes, night sweats, mood changes, sexual disorders, and sleep disturbance. Providers should assess the severity of the symptoms and to what extent they are affecting the client's quality of life.

Blood test, such as follicle-stimulating hormone, is not always needed but can confirm the diagnosis of menopause if needed.

Examinations and investigations are generally only needed to exclude other possible causes of the symptoms (e.g. pregnancy, thyroid disease, PCOS) [22,23].

3.4.2 Management and treatment

Care for clients with menopausal symptoms should be individualized dependent on the nature of their symptoms and their preference.

Hormone replacement therapy in the form of combination oestrogen/progestin formulations, if available, can reduce hot flushes by 80–90 per cent and increase the client's sense of well-being. Consider

antidepressants if the symptoms are psychological and mood-related.

Provide general advice on stages and symptoms of the menopause, available treatments and their associated risks, advice on bone health, and support groups.

Offer general non-medical advice on managing hot flushes/night sweats with self-care measures and behaviour changes, including avoiding alcohol, caffeine, warm clothing, and stress [22,23].

3.4.3 Contraception around the menopause

Clients can be advised that they can stop contraception at 55 years of age as spontaneous conception after this age is very rare [24]. Inform the client that while fertility will decline naturally, effective contraception is still needed before the menopause if they wish to avoid pregnancy.

Clients using combined hormonal contraception may find that their symptoms in the perimenopause are masked and may only present themselves if the method is stopped. Combined hormonal contraception can be used as an alternative to hormone replacement therapy for control of vasomotor symptoms and to prevent loss of bone mineral density. The use of antidepressants (selective serotonin reuptake inhibitors and serotonin-norepinephrine reuptake inhibitors) may also have some effect in treating vasomotor symptoms associated with menopause [25].

3.4.4 Post-menopausal bleeding

All bleeding after the menopause (12 months or more after the last menstrual period) should be considered abnormal. The most common cause for light or scanty bleeding after menopause is atrophy of the lower genital tract or irregular ovulation. Less commonly, postmenopausal bleeding can be caused by endometrial hyperplasia and endometrial cancer.

Initial assessment should include a thorough history of the bleeding (including review of a bleeding diary if available) and gynaecologic exam including speculum exam and bimanual pelvic exam to evaluate the vagina, cervix, and uterus. If the bleeding persists and/or no cause of bleeding is identified through history and physical exam, endometrial biopsy or dilation and curettage may be warranted to evaluate for endometrial hyperplasia or cancer.

4. Management of common andrological conditions

Andrology is a medical specialty that focuses on male health, including the male reproductive and urological systems. Different from gynaecology, andrology has only been studied as a distinct specialty since the late 1960s. Andrology covers a wide number of conditions and functions, including penile issues, genitourinary disorders, and male fertility. Common procedures are vasectomy, circumcision, and prostatectomy. This section covers benign prostatic hyperplasia (BPH), hydrocele, testicular torsion, and erectile dysfunction. Prostate cancer is discussed with other reproductive cancers. For STI infection, see *Chapter 6: Sexually transmitted infections*.

4.1 Benign prostatic hyperplasia

BPH is also called prostate gland enlargement. This is a common condition when men get older. It can cause urinary bladder, ureteral, or even kidney problems. The risk factors include ageing, family history, obesity, and underlying medical diseases (e.g. diabetes) [26].

4.1.1 History-taking, examination, investigations, and diagnosis

The common signs and symptoms include frequency and urgency, nocturia, and difficulty starting urination. The size of the prostate gland is not relevant to the severity of symptoms. It is essential to exclude other possible causes, such as urinary tract infection, kidney stones, and cancers during history-taking and assessment.

Healthcare providers can perform rectal examination or ultrasound to check the prostate for enlargement. Prostate-specific antigen test and prostate biopsy can assess for prostate cancer [26].

4.1.2 Medical and surgical treatments

A variety of treatments are available for BPH. The goal is to relieve symptoms. If there are no symptoms or symptoms are tolerable, treatment is not necessary.

Medical therapy is the most common option for mild to moderate BPH. The options include alpha blockers, 5-alpha reductase inhibitors, and tadalafil. In addition to BPH, tadalafil can also treat erectile dysfunction. For clients with moderate to severe symptoms, minimally invasive and surgical approaches, such as transurethral resection of the prostate and laser therapy, can be considered.

Follow-up care is essential, whether clients choose to observe symptoms or take medical or undergo surgical treatments. Healthcare providers should review the severity of symptoms and give the most appropriate suggestion based on the client's quality of life.

4.2 Hydrocele

A hydrocele is a collection of serous fluid between the layers of the membrane that surrounds the testis or along the spermatic cord. This commonly happens to male infants and in newborns. In most cases, the situation will resolve spontaneously within the first year of life. In adolescent and adult males, hydrocele is usually related to history of trauma, infection, surgery, and tumour. Hydroceles usually do not affect fertility [27].

4.2.1 Examination and diagnosis

The clinical presentation is painless and swollen scrotum(s). The diagnosis can be made by physical examination. Ultrasound scan is not always needed but can be used to support the diagnosis. There are two types of hydroceles, communicating and non-communicating. A non-communicating hydrocele usually remains similar size, whereas a communicating hydrocele has contact with the abdominal fluid, which results in size change and potential hernia development [27].

4.2.2 Treatment

Treatment depends on the client's age and the symptoms caused by the hydrocele. Usually it can resolve when the underlying condition improves. Medication can treat the underlying condition but not a hydrocele. If the symptoms remain, the healthcare provider should discuss surgical repair with the client. This can prevent further complications, such as hernia [27].

4.3 Testicular torsion

Testicular torsion, a twisting of the spermatic cord and its contents, is a surgical emergency. It usually happens to boys and adolescent males. Torsion must be excluded when clients present with acute scrotal pain. Timely recognition and treatment are necessary for testicular salvage [28].

4.3.1 History-taking, examination, and diagnosis

Clients with testicular torsion typically present with severe acute unilateral scrotal pain, nausea, and vomiting. Some other non-specific symptoms include fever or urinary complaints. Physical examination may reveal a high-riding testicle with an absent cremasteric reflex. The affected testicle can also have an abnormal horizontal orientation. Testicular torsion is a clinical diagnosis therefore image studies, such as ultrasound, are not necessary. The window for treatment is 4–8 hours only for testicular salvage. When torsion is suspected, healthcare providers should arrange surgical exploration as soon as possible to avoid permanent ischaemic damage. A negative surgical exploration is preferable to a missed diagnosis. Refer clients if needed [28].

4.3.2 Management

Manual detorsion should be attempted if surgery is not available immediately; however, it should not replace or delay surgical intervention. Detorsion of the affected spermatic cord is performed until no twists are present. Orchiectomy should be considered when the affected testicle appears grossly necrotic. Contralateral orchiopexy should be performed regardless of the viability of the affected testicle [28].

4.4 Erectile dysfunction

Erectile dysfunction is the inability to achieve or maintain an erection. Male erection occurs reflexively or psychogenically. This means erectile dysfunction can be a psychogenic, endocrine, non-endocrine, or mixed disorder. Regardless of the causes, erectile dysfunction imposes negative effects on interpersonal relationships, mood, and quality of life. Erectile dysfunction is more prevalent in older people; more than half of males aged 40–70 years have mild to moderate erectile dysfunction [29].

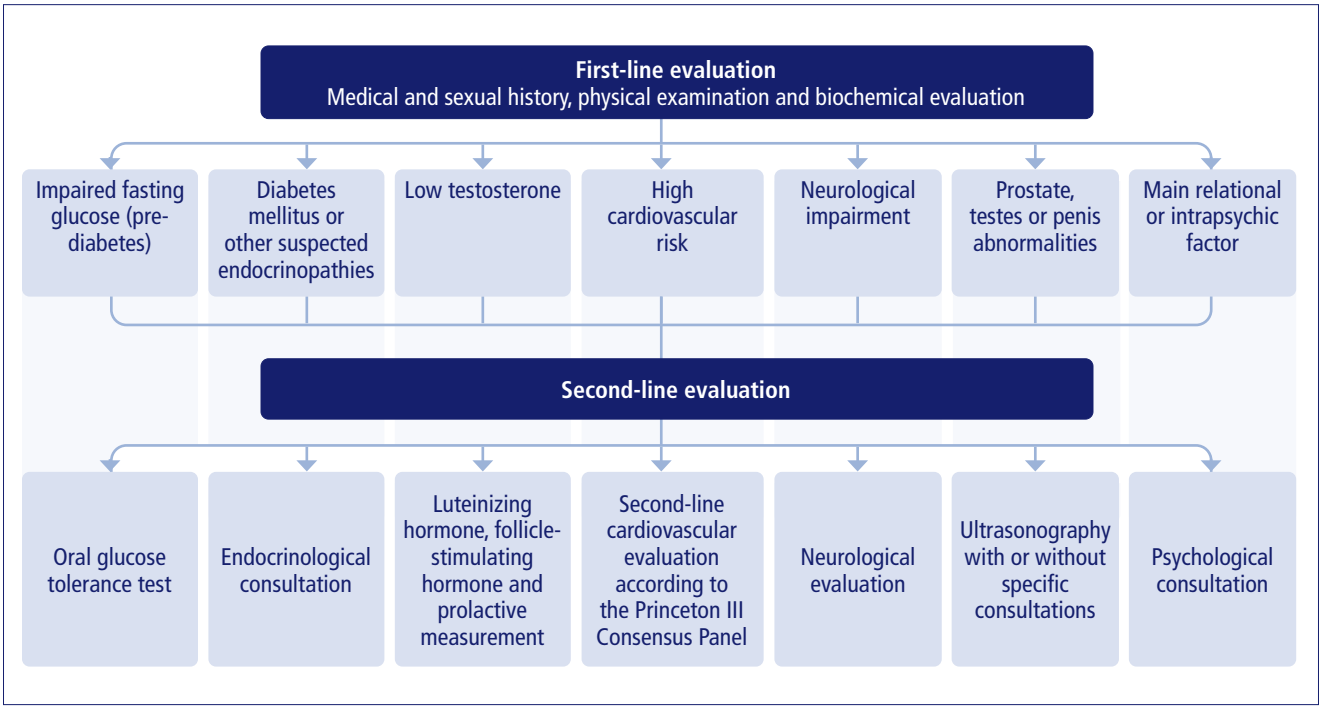
4.4.1 History-taking, examination, and diagnosis

Many factors can result in erectile dysfunction. Healthcare providers should take a detailed history to identify the underlying cause and propose relevant treatment. Alcohol, smoking, overweight/obesity, and unhealthy diet habits can affect erectile function. Other risk factors include diabetes, cardiovascular diseases, BPH, medications, and psychogenic reasons. Healthcare providers should be aware that all sexual dysfunctions are stressful and can lead to psychological disturbances. *Figure 1* provides a suggested diagnostic work-up for clients with erectile dysfunction [29].

4.4.2 Management

If a specific aetiology is identified, treat the underlying situation. In most cases, the management of erectile dysfunction is empirical. Healthcare providers can start from lifestyle modification and review the client's medications and add first-line therapies using phosphodiesterase type 5 (PDE5) inhibitors or suggest vacuum erection devices to improve the client's quality of life. Different PDE5 inhibitors have different

FIGURE 1: Suggested diagnostic work-up for clients with erectile dysfunction



Source: Reproduced/translated with permission from Yafi FA, Jenkins L, Albersen M, et al. [29]: Erectile dysfunction. Nat Rev Dis Primers. 2016;2:16003.

TABLE 5: Properties of available phosphodiesterase type 5 inhibitors

Drug name	Trade name (company)	Peak absorption post ingestion (hours)	Serum half-life (hours)	Take on empty stomach?
Sildenafil*	Viagra (Pfizer)	1–2	3–5	Yes
Vardenafil*	Levitra (GlaxoSmithKline)	1–2	3–5	Yes
Tadalafil	Cialis (Lilly)	2–4	18	No
Avanafil	Stendra (Mitsubishi Tanabe)	0.5	6	No

* Consider taking 1–2 hours prior to a meal.

Source: Reproduced/translated with permission from Yafi FA, Jenkins L, Albersen M, et al. [29]: Erectile dysfunction. Nat Rev Dis Primers. 2016;2:16003.

strengths. *Table 5* compares different PDE5 inhibitors. Healthcare providers should explain the effects and side effects of PDE5 inhibitors and let clients choose the medication that suits them. Vacuum erection devices are a non-pharmacologic option, which create a negative pressure vacuum to draw blood into the penis. Clients should use them carefully, as incorrect use can cause haematoma and petechiae. Other options include intracavernosal injection and surgical procedures, such as penile implants, which require care from a specialist.

Many people with erectile dysfunction experience depressive symptoms and anxiety. Sexual dysfunction is not only an issue for the individual but also for their partner(s). Sexual function improvement is significantly relevant to treatment responses in their partner. Healthcare providers should provide support to both individuals, if needed [29].

5. Transgender groups

Gender is a social construct whereas sex is typically assigned at birth based on characteristics of the genitalia. Gender identity reflects an individual's internal sense of self. Transgender refers to an individual whose self-gender identity differs from the sex that was assigned at birth. For example, a transgender woman or a male-to-female transgender person is an individual who was assigned as a male at birth but self-identifies as a woman. Healthcare providers should be aware of the importance of transgender health issues, including mental health support, availability of hormone therapy and surgical therapy, and follow-up. Healthcare providers caring for transgender clients would benefit from gender sensitization training in counselling, history-taking, physical exam, and treatment. In general, healthcare professionals' knowledge about reproductive options in the transgender community could be improved. Pregnancies are possible after transitioning and therefore contraceptive counselling remains a crucial part of healthcare [30,31,32].

5.1 History-taking and physical examination

Healthcare providers should address transgender clients with the name, pronouns, and gender identity that the client prefers. The physical examination should refer to the anatomy that is present rather than the gender presentation. Chest and genital examination can be distressing for clients. Healthcare providers should explain the importance of the examination before carrying out any examination.

5.2 Surgical therapy and medical treatment

Medical treatment and surgical therapy are not essential for transgender individuals. However, for some clients, these additional supports can help them adapt their appearance to better match their gender self-identify. Before the treatment, healthcare providers should make sure that clients understand what effects are reversible and what are irreversible. Fertility preservation options

should also be discussed during the counselling. For example, some transgender male clients may consider preserving their uterus and ovaries.

Medical treatment is used to reduce the endogenous hormone level and to replace it with other hormones. Clients who decide to accept hormone replacement treatment need to be monitored regularly (see *Appendix 1* for regimens and monitoring of hormone therapy). For transgender men, physical changes, such as cessation of menses, can happen during the first 6 months of testosterone therapy. Deepening of the voice and clitoromegaly are irreversible with discontinuation of hormonal therapy. For transgender women, decreased spontaneous erections and increased breast tissue growth are common in the first year of oestrogen and anti-androgen therapy. However, hormonal therapy cannot change the voice therefore some individuals may wish to have additional speech therapy.

Transgender men and women may ask for different surgical procedures to change their physical appearance: chest/breast surgery, genital surgery, or non-genital and non-breast interventions. For instance, a transgender woman may undergo augmentation mammoplasty, penectomy, vaginoplasty, facial feminization surgery, etc. These surgical procedures are usually carried out at higher-level health facilities rather at the primary care level. However, healthcare providers should be aware of the possible need for mental health support, preoperative assessment, and postoperative care.

5.3 Routine health maintenance

Hormone therapy may have side effects therefore healthcare providers should ensure that clients are aware of the importance of regular follow-up. For instance, transgender women exposed to endogenous oestrogen should receive regular breast cancer screening. The Pap smears of transgender men may have inadequate cytology if they are being treated with testosterone therapy, which causes cervical atrophy. Furthermore, oestrogen hormone therapy may increase the risk of venous thromboembolism and deep vein thrombosis, particularly among clients who smoke.

In addition to hormone-related sexual and reproductive healthcare, providers should know that transgender people are vulnerable to STIs including HIV and sexual and gender-based violence, and should provide relevant support and counselling when needed. Some presentations of STIs, including HIV, may not be typical due to surgeries, medications, and sexual practices.

6. Infertility

Infertility is defined by the World Health Organization (WHO) as "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse" [33].

Primary infertility is when pregnancy has never been achieved by a person. Secondary infertility is infertility after at least one prior pregnancy has been achieved [34].

Some individuals or couples may seek fertility care for reasons other than infertility; for example, same-sex partners, HIV serodiscordant heterosexual couples, or before or after cancer treatment [34].

6.1 Causes and risk factors

While the results manifest in women, it should be emphasized that infertility is an issue for both members of a couple and the causes may relate to either or both partners. Risk factors that can affect fertility in both men and women include age, smoking, alcohol use, obesity, and exposure to environmental pollutants and toxins.

6.1.1 Causes of infertility in women

- Tubal factors: blocked fallopian tubes caused by untreated STIs, complications of unsafe abortion, post-partum sepsis, endometriosis, or abdominal/pelvic surgery.
- Uterine factors: uterine malformations, fibroids, endometriosis.
- Ovarian factors: anovulation or irregular ovulation due to PCOS or other ovulatory disorders such as perimenopausal hormonal changes.
- Endocrine factors: pituitary tumours, underactive or overactive thyroid [34].

6.1.2 Causes of infertility in men

Infertility in men can be related to either endogenous (internal) or exogenous (external) factors. These include:

- Obstruction of the reproductive tract (ejaculatory ducts and seminal vesicles) commonly due to injuries or infections.
- Hormonal disorders: pituitary tumour, testicular cancers, or hypogonadism (abnormally low testosterone).
- Varicoceles leading to reduction or failure of sperm production.
- Abnormal sperm function and quality that may be due to medications (i.e. anabolic steroids) or environmental exposures [34].

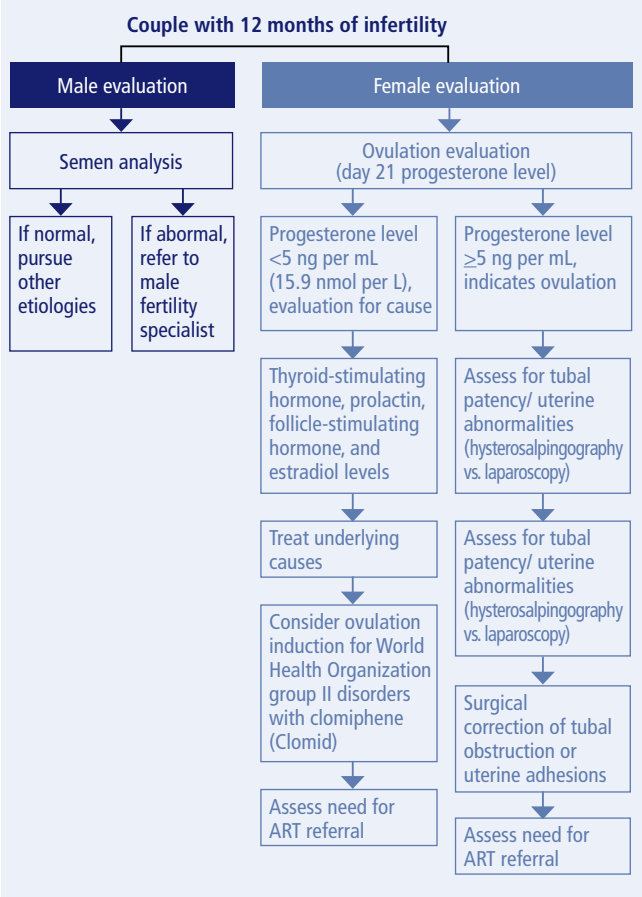
6.2 Assessment in a couple

It is imperative that each case of infertility is investigated and managed as a couple. The couple should be seen together because they will both be affected by the investigation. The first step for the healthcare provider is to take a thorough history including any past pregnancies achieved for both partners and their outcomes, past medical and surgical history, menstrual and gynaecologic history for the female partner (infertility may be the presenting symptom of endometriosis), and current occupation (assessing for occupational/environmental exposures). Based on the history and physical exam, the healthcare provider can establish what simple tests can be performed and if there are any treatments that can be initiated locally and assess whether there is value in referring to a specialist, if available.

6.3 Counselling and medical advice for couples living with infertility

Counselling is essential throughout the process and may initially be required to dispel myths about the cause of infertility, such as prior contraceptive use or sexual history, and to decrease the stigma associated with infertility that clients may experience.

FIGURE 2: Infertility evaluation



Source: Reproduced/translated with permission from Lindsay TJ, Vitrikas KR [35]: Evaluation and treatment of infertility. Am Fam Physician. 2015;91(5):308–14.

Figure 2 summarises the initial evaluation of male and female infertility.

After history-taking, basic exam and investigations such as STI testing should be carried out to exclude some possible causes of infertility. Treat underlying diseases if any. Starting with evaluation of male factors (through semen analysis) before undertaking more expensive investigation of female factors can be more cost-effective. The other commonly used investigation options for female factors include ultrasound scan, hysterosalpingogram (X-ray to detect the patency of fallopian tubes), and diagnostic laparoscopy.

Stress resulting from infertility can adversely affect a couple's relationship, thereby increasing fertility difficulties. Advice on general lifestyle and well-being, such as body weight control, regular exercise, and avoiding use of harmful substances during investigation and treatment of infertility can be helpful.

6.4 Management and treatment

Treatment is dependent on aetiology. Some treatments can be carried out at primary care level whereas others may require referral to specialist facilities. All healthcare providers can counsel clients and their partner early in the investigation process about optimum timing for sex during the menstrual cycle, and reinforce the importance of lifestyle changes before, during, and after treatment, including abstinence from smoking and maintaining a healthy body weight.

There are three main types of fertility treatment:

- Medicine: Common treatment for clients with ovulatory dysfunction, prescribed orally or intramuscularly. Clomifene, an oral medication to stimulate ovulation, is a commonly used. Metformin or letrozole is common for clients with PCOS.
- Surgery: Different aetiologies or diseases can be managed by various surgical treatments including myomectomy, resection of endometrial lesions, or lysis of reproductive tract adhesion/obstruction.
- Assisted reproductive care: Not all assisted options are complicated and expensive. Intrauterine insemination is a simple process in which quality prepared sperm is inserted into the uterus directly. In vitro fertilization is more complicated; mature eggs are retrieved from the ovary and fertilized by sperm in a quality-controlled laboratory. The fertilized egg(s) are then transferred into the uterus. The process of in vitro fertilization is generally expensive and is performed by specialists.

7. Common reproductive tract cancers

Comprehensive control of any cancer consists of prevention, early detection, timely diagnosis and treatment, and access to palliative care. Healthcare providers should be familiar with national cancer prevention and control protocols and local referral pathways for clients who require further treatment or palliative care.

7.1 Cervical cancer

Although a preventable disease, cervical cancer is the fourth most frequent cancer in women and of the estimated deaths from cervical cancer in 2020, about 90 per cent of these occurred in low- and middle-income countries. Most cervical cancer (95 per cent) is caused by the human papillomavirus (HPV), which is the most common viral infection of the reproductive tract [36] (see *Chapter 6: Sexually transmitted infections*). HPV types 16 and 18 cause over 70 per cent of cervical cancer cases. In most cases, HPV infection (including high-risk types) will resolve without treatment. In a minority of cases, HPV does not resolve and chronic infection with a high-risk HPV type can lead to the development of precancer and cancer. People who are immunocompromised, such as those living with HIV, are more likely to have HPV infections that develop rapidly into precancer and cancer. Other risk factors include HPV type, coinfection with other STIs, higher parity, young age at first birth, and tobacco use [37].

7.1.1 HPV vaccination

Early HPV vaccination protects against particular types of HPV infection prior to exposure. Provision of HPV vaccination for girls aged 9–14 years is recommended by WHO and should be implemented based on national guidelines [36].

Cervical screening is still required for vaccinated individuals because the vaccines do not protect against all HPV types that may cause cervical cancer.

7.1.2 Cervical screening and treatment

WHO recommends that cervical cancer screening should be performed in women between the ages of 30 and 49 years (25–49 years in women living with HIV). Screening can stop at age 50 when there have been two consecutive negative screening results. If resources are available, screening can also be offered to women aged 50–65 years who have never been screened [38].

Screening tests that can be used to identify precancerous cervical lesions include HPV DNA testing, visual inspection with acetic acid (VIA), and cytology. WHO recommends HPV DNA testing as the preferred screening methodology, where available.

For cervical cancer prevention to have maximum impact, screening must be linked to treatment and post-treatment follow-up. To reduce health facility visits and prevent loss to follow-up, a **single-visit approach** is recommended to ensure affected populations receive quality and timely cervical cancer screening and treatment at the same visit. If a single-visit approach is not feasible, clinics should develop and maximize communication channels, including digital health interventions (DHIs), such as via social media or hotlines, to deliver screening results, plan treatment if needed, and organize any necessary referrals for cancer treatment [39].

There are two different options for combining screening and treatment: Screen-and-Treat or Screen, Triage, and Treat.

Screen-and-Treat approaches include:

- HPV DNA (self- or clinician collected) as the primary screening test followed by treatment.
- VIA as the primary screening test followed by treatment.

Screen, Triage, and Treat approaches include:

- HPV DNA as the primary screening test, followed by HPV 16/18 triage, followed by treatment and using VIA triage for those who screen negative for HPV 16/18.
- HPV DNA as the primary screening test followed by VIA triage, followed by treatment.
- High-risk HPV DNA as the primary screening test, followed by colposcopy triage, followed by treatment.
- HPV DNA as the primary screening test, followed by cytology triage, followed by colposcopy and treatment.
- Cytology as the primary screening test, followed by colposcopy triage, followed by treatment.

Seven algorithms describing the screening and treatment approaches listed above are available in the WHO guideline for screening and treatment of cervical precancer lesions [38].

BOX 2: Self-care in cervical cancer screening

HPV self-sampling gives individuals the control and privacy to collect their own specimens for screening for cervical cancer, while the health system will review the results and assist them in interpreting and acting on these results, including accessing treatment when applicable. If this is available in the country, healthcare providers including IPPF Member Associations should support clients to have adequate information, make informed choices, and receive the healthcare and follow-up if needed.

Source: IPPF [39].

7.1.2.1 HPV testing

This test uses molecular testing methods to detect DNA from high-risk HPV types in vaginal and/or cervical samples. While HPV testing younger women is likely to detect transient HPV infections that will be spontaneously cleared, a positive HPV test in a woman aged over 30 years is more likely to indicate a persistent or chronic HPV infection that may cause cervical precancer and cancer.

The test can be performed by any trained healthcare provider or self-collected by the client (*Box 2*) [38].

7.1.2.2 Visual inspection with acetic acid (VIA)

VIA can be performed by trained mid-level providers such as nurses and midwives. With VIA, early cell changes on the cervix can be seen with the naked eye, using a speculum, after application of dilute acetic acid. The results are immediate, therefore treatment for precancerous lesions (see *Section 7.1.3*) can be performed at the same time. The process and how to assess the findings are described in *Appendix 2*.

WHO recommends rapidly transitioning away from VIA as the primary screening test due to inherent challenges with quality assurance [38].

7.1.2.3 Cytology

A sample of cells is taken from the cervix and either fixed on a slide (Pap smear) or placed in a transport

medium (liquid-based cytology) and sent to be examined for abnormal cells using a microscope.

Cytology is more resource intensive than other cervical screening methods because of the laboratory costs, transportation, supplies, and expertise required.

While HPV DNA testing is the preferred method for primary screening, WHO notes that existing programmes with quality-assured cytology as the primary screening test should continue until HPV DNA testing is operational [38].

7.1.3 Treatment options for precancerous cervical lesions

Once a decision to treat is made, it is good practice to treat as soon as possible within 6 months to reduce the risk of loss to follow-up. In circumstances when treatment is not provided within this time frame, it is good practice to re-evaluate the client before treatment. For clients who are pregnant, good practice includes deferral until after pregnancy [38].

Treatment options include ablative treatments (cryotherapy, thermal ablation) and excisional treatments (loop electrosurgical excision procedure [LEEP] also known as large loop excision of the transformation zone [LLETZ], cold-knife conization) [38,40] (see *Appendix 3*). For clients who are eligible for ablative treatments (see *Box 3*), or in settings where LEEP is available for those who are not eligible for an ablative treatment, a single-visit screen and treat approach is preferred.

BOX 3: Eligibility for ablative treatments

- There is no suspicion of invasive cancer or glandular disease (i.e. adenocarcinoma or adenocarcinoma in situ).
- The transformation zone is fully visible, the whole lesion is visible, and it does not extend into the endocervix.
- The lesion is type 1 transformation zone (the transformation zone is entirely visible and only ectocervical).

Source: WHO [38].

Choice of treatment may be constrained by cost and the resources required to provide the treatment, while the treatment itself may be limited by feasibility, training, and quality-assurance resources [38].

Management of abnormal/positive screening results for clients living with HIV is the same as in the local general population.

Refer any client with suspected cancer to a specialist as soon as possible.

7.1.4 Follow-up guidance on cervical screening

The recommended intervals between screening depend on the screening test used. For HPV DNA testing, the recommended interval following a negative screening for women aged 30–49 years in the general population is every 5–10 years. For VIA or cytology, the recommended interval is every 3 years. Clients with HIV should be screened for cervical cancer starting at age 25 every 3–5 years following negative screening with HPV DNA testing and every 3 years with VIA or cytology [38].

7.2 Breast cancer

Breast cancer is the leading cause of cancer death among women globally. Early detection of breast cancer is the key to breast cancer control. Less than 1 per cent of all breast cancer cases occur in men [41]. Most clients presenting with breast cancer will not have specific, identifiable risk factors (see *Appendix 4*). A small proportion of breast cancer cases can be linked to family history and specific genetic mutations (BRCA1, BRCA2, and tumour protein) that put these individuals at high risk of breast cancer [42]. Key risk factors, such as prolonged oestrogen exposure (early menarche/late menopause), family history of breast or ovarian cancer or other hereditary breast/ovarian syndrome, nulliparity, high body mass index, tobacco use, or harmful use of alcohol can be identified and discussed during a consultation.

7.2.1 Screening and early detection

Breast inspection includes observation of the skin, nipples, and areolae. Some warning signs include symptoms of Paget's disease (eczema on one nipple),

asymmetrical nipple retraction, and unexplained nipple discharge [43]. Clinical breast examination is a low-cost method of screening for breast cancer and is the same procedure for examining clients presenting with breast symptoms (see *Chapter 2: Facility requirements and client history/examination, Section 4.4*).

Breast self-examination (see *Appendix 5*) has not been assessed as a method of routine screening but is recommended for raising awareness among people at risk.

Mammography and ultrasound can be used for routine screening for early detection of breast cancer, but mammography is resource intensive and therefore only used in screening programmes in high-resource settings.

Early diagnosis programmes based on awareness of early signs and symptoms and prompt referral for diagnosis and treatment are important for breast cancer control [42].

7.2.2 Diagnosis and management of abnormal findings on breast examination

The presentation of key pathologies, their history, clinical presentation, and diagnostic tests are summarized in *Table 6*. Not all breast lesions are malignant. If unsure or unable to make a diagnosis, healthcare providers should refer the client. Refer any client with suspected cancer to a specialist as soon as possible.

In men, the cancer generally develops in the small amount of breast tissue behind the nipples [44]. Presentation and clinical examination are similar to breast cancer in women, with the nipples affected primarily.

TABLE 6: Differential diagnosis of breast pathologies

Pathology	History and presentation	Diagnostic tests and signs to look for
Fibroadenoma	*History:* there may be nothing significant in the client's history *Examination:* smooth rubbery mobile mass	• *Mammogram:* oval or round, circumscribed, may have coarse calcifications • *Breast ultrasound:* solid, oval or round, circumscribed, lobulated, width greater than height

Fibrocystic changes	*History:* often accompanied by breast pain; symptoms (pain) typically fluctuate with menstrual cycles
	Examination: rubbery, well-circumscribed, mobile masses
		• Breast ultrasound:
		  ◦ simple cysts: well-circumscribed with sharp borders, no internal echoes
		  ◦ complex cysts: cystic and solid components
		• *Mammogram:* cannot distinguish between cystic and solid masses, but may be indicated after ultrasound
		• *Breast aspiration:* will confirm that the mass is a cyst and can lead to resolution of cyst

Fat necrosis	*History:* prior breast trauma, surgical breast reduction or augmentation *Examination:* firm mass, irregular border	• *Breast ultrasound:* indistinct margins, solid • *Mammogram:* indistinct margins, sometimes with calcifications • *Biopsy:* fat necrosis

continued

TABLE 6: Differential diagnosis of breast pathologies *continued*

Pathology	History and presentation	Diagnostic tests and signs to look for
Intraductal papilloma	*History:* bloody nipple discharge *Examination:* mass, usually small, may not be palpable	• *Mammogram:* may be negative • *Breast ultrasound:* dilated duct with oval mass • *Breast ductogram:* filling defect in the duct • *Biopsy:* papillary growth pattern; benign intraductal papilloma, papilloma with atypia (atypical papilloma), papilloma with ductal carcinoma in situ (DCIS), papillary DCIS, or invasive papillary carcinoma
Breast abscess	*History:* breast pain, fever, alarming and rapid enlargement *Examination:* breast lump is fluctuant and tender, skin erythema, mastitis	• *Breast ultrasound:* fluid-filled cavity containing debris • *Breast aspiration:* purulent fluid
Invasive breast cancer	*History:* gradual breast enlargement noted, personal or family history of breast cancer *Examination:* hard fixed mass, nipple inversion, nipple discharge, skin retraction, *orange peel appearance*, lymphadenopathy	• *Mammogram:* indistinct or spiculated margins, increased density, fine pleomorphic calcifications • *Breast ultrasound*: irregular shape, ill-defined margins, height greater than width, punctate calcifications, hypoechogenicity
Ductal carcinoma in situ (DCIS)	*History:* usually incidental finding in asymptomatic client *Examination:* there may be a breast mass and/or nipple discharge, breast tenderness, cracking of skin	• *Mammogram:* often associated with microcalcifications • *Biopsy:* for histopathological investigation to confirm diagnosis

7.3 Prostate cancer

Prostate cancer is the most common type of cancer in men, and the second most common cause of cancer death in males in the UK (after lung cancer) [45].

Prostate cancer usually develops slowly and presents late, with symptoms only appearing when the prostate is enlarged enough to affect the urethra, causing problems with urination, or when the cancer has metastasized to the bones, causing pain. Prostate enlargement and ensuing urination symptoms occur frequently with benign prostate enlargement, and thus is not always indicative of cancer [45].

Most cases of prostate cancer are detected in men aged 50 years or older and incidence increases with age. Risk factors for developing prostate cancer include black ethnicity and genetic causes/family history of prostate cancer (in the father or brother).

7.3.1 History-taking

Diagnosis of prostate cancer based on history is challenging. Most symptoms are not specific, including problems with urination, erectile dysfunction, haematuria (blood in urine), or bone pain, especially in the lower back.

7.3.2 Examination and investigations

Digital rectal examination can be used to assess for prostate cancer in clients with unexplained symptoms (as listed above) and/or in those with raised or rising prostate-specific antigen (PSA) levels (see *Chapter 2: Facility requirements and client history/examination, Section 4.5*).

A PSA test measures the levels of PSA in the blood, which may be present in increasing levels in the presence of prostate cancer. However, the PSA test can be affected by other conditions (e.g. prostate enlargement) and give a false-negative or false-positive result. PSA testing should not be routinely offered to asymptomatic clients.

Refer to national guidance on the use of PSA, digital rectal examination, and other tests for screening and/or for investigation of symptoms of prostate cancer, such as biopsy and ultrasound.

7.3.3 Management and treatment

Clients with suspected prostate cancer can be offered a prostate biopsy to confirm diagnosis and imaging to assess the stage of prostate cancer. If a facility cannot provide the appropriate diagnostic and/or treatment healthcare, providers should refer the client to a specialist.

7.4 Other cancers of the reproductive tract

Clinical signs and symptoms and investigations for other cancers of the reproductive tract are summarized in *Table 7*.

Investigations will likely take place at higher-level or specialist facilities. After assessment by a specialist, and histological diagnosis (if available), treatments for all cancers can involve a combination of surgery, chemotherapy, and radiotherapy, depending on the stage of the disease, the health status of the client, and the availability of expertise, equipment, and facilities.

TABLE 7: Clinical signs and investigations for other cancers of the reproductive tract

Location	Risk factors, signs, and symptoms	Investigations
Endometrium	• Age over 50 years, nulliparity, obesity, use of unopposed oestrogens, tamoxifen use • Intermenstrual bleeding, post-menopausal bleeding • If early, there may be no signs • Later, a large irregular uterus may be palpable	• Ultrasound may show thickened endometrium especially in postmenopausal clients; uterine mass if advanced • Endometrial biopsy to confirm diagnosis histologically
Ovary	• Family history of ovarian or breast cancer • Symptoms (often vague): lower abdominal discomfort, alteration in bowel habit, bloating, nausea, dyspepsia, or distension; as disease advances, there is weight loss and anorexia • If early, there may be no signs on examination; adnexal mass may be detected on a bimanual examination • In advanced disease, there are ascites and a tense, distended abdomen • Client may appear cachectic (emaciated)	• Ultrasound will show the presence of a complex mass with a mixture of solid cystic elements

continued

TABLE 7: Clinical signs and investigations for other cancers of the reproductive tract *continued*

Location	Risk factors, signs, and symptoms	Investigations
Vagina	• Irregular vaginal bleeding especially after sex • On speculum examination there may be a suspicious lesion, which is likely to be irregular, highly vascular, and bleeds readily when touched; care must be taken not to cause bleeding	• Colposcopy will show abnormal vessels • Biopsy is required for specific diagnosis
Testicles	• Age 15–55 years • Painless testicular swelling or dull ache/scrotal heaviness • Well-circumscribed testicular lump • Late presentation relates to presence of metastases – cough or breathlessness if spread to lung lymph nodes, pain in abdomen from abdominal node spread	• Ultrasound • Blood tests for tumour markers such as alpha-fetoprotein; if available, this can differentiate the type of cancer (seminoma or non-seminoma) • Biopsy and histology
Penis	• Men aged over 50 years, smokers, men with phimosis, associated with HPV infection • Presents with penile growths, change in colour, bleeding, discharge, and phimosis	• Biopsy of abnormal areas for diagnosis and staging • Treatment depends on stage, from topical therapy to surgery and radiotherapy
Anus	• Slightly more common in women than men; associated with HPV infection • Pain or pressure in the anus or rectum, a change in bowel habits, a lump near the anus, rectal bleeding, itching, and/or discharge	• Anoscopic assessment and biopsy • Anal Pap smears when anal colposcopy is available, for early detection of anal cancer in high-risk individuals

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9. Appendices

Appendix 1: Treatment options for transgender clients and monitoring of transgender hormone therapy

TABLE 1: Treatment options for transgender clients

Type	Dose	Comments
Male to female		
Estrogen		
Oral estradiol	2.0–6.0 mg/d	Consider sublingual use to avoid first-pass effect
Transdermal estradiol patch	0.025–0.4 mg/d twice wk	Preferred to oral to prevent thrombotic events
Parenteral estradiol valerate or cypionate	5–30 mg IM every 2 wk	
2–10 mg IM every wk	Preferred to oral to prevent thrombotic events	
Anti-androgen		
Spironolactone	100–300 mg/d	Check potassium 1–2 wk after initiating
Cyproterone acetate	25–100 mg/d	Not available in US
GnRH agonist (leuprolide)	3.75–7.5 mg IM mo	Often do not use
Female to male		
Testosterone		
Parenteral testosterone Enanthate or cypionate	100–200 mg IM (or SQ) every 2 wk	If serum testosterone is in lower normal range but patient still has low libido, dose can be titrated slowly while monitoring for AEs
Transdermal testosterone gel	2.5–10 g/d	Gives smoother levels but can rub off on partner or children
Testosterone undecanoate	1,000 mg every 12 wk	Not available in US

Abbreviations: AE, adverse effects; GnRH, gonadotropin-releasing hormone agonist; IM, intramuscular; SQ, subcutaneous.

Source: Reproduced with permission from Frontline Medical Communications Inc. Transgender Care in the Primary Care Setting: A Review of Guidelines and Literature. California: Hashemi et al; 2018.

TABLE 2: Monitoring of transgender hormone therapy

Male to female	Female to male
Evaluate the patient every 2–3 months in first year, then 1–2 times per year	Evaluate the patient every 2–3 months in first year then 1–2 times per year
Measure serum testosterone and estradiol every 3 months during the first year, then every 6 months in the 2nd year, and then yearly; goal total testosterone level should be < 50 ng/dL and estradiol < 200 pg/mL; prolactin should be checked at baseline and then at least annually during the transition and then every 2 years	Measure testosterone every 2–3 months until level in normal physiologic range, then every 6 months in the 2nd year, then yearly; check prolactin if patient has any symptoms
If on spironolactone: check serum electrolytes every 3 months for the first year and then yearly	Measure estradiol level during first 6 months of treatment or until no bleeding for 6 months
Check CBC, LFT at baseline and follow-up visits	Check CBC, LFT at baseline and follow-up
Lipid panel: based on USPSTF recommendations	Lipid panel: based on USPSTF recommendations
HbA_{1c}: based on USPSTF recommendations	HbA_{1c}: Based on USPSTF recommendations

Abbreviations: CBC, complete blood count; HbA1c, hemoglobin A1c; LFT, liver function test; USPSTF, US Preventive Services Task Force.

Source: Reproduced with permission from Frontline Medical Communications Inc. Transgender Care in the Primary Care Setting: A Review of Guidelines and Literature. California: Hashemi et al; 2018.

Appendix 2: Visual inspection with acetic acid (VIA)

A. Before applying acetic acid

- With the speculum in place, observe the size and shape of the cervix.
- Identify the external os. Note any normal (non-pathological) as well as any pathological features of the cervix: columnar epithelium (red), squamous epithelium (pink), squamocolumnar junction (SCJ), transformation zone.
- Assess the characteristics of discharge: quantity, colour, odour, and thickness.

TABLE 1: Findings of visual inspection BEFORE applying acetic acid

Normal findings (non-pathological features of the cervix)	• **Post-menopausal**: thinning and atrophy of the squamous epithelium; the cervix appears pale and brittle • **Ectropion:** large area of red appearance around the external os with SCJ far away from the os • **Nabothian cysts**: bulging blue-white or yellow-white nodules, with a smooth delicate lining with branching blood vessels; can be large and distort the shape of the cervix • **Healed laceration** of the cervical lips, external os

Pathological findings	**Non-cancerous:**
	• **Condylomata (genital warts)**: raised, grey-white areas within or outside the transformation zone in the squamous epithelium, similar lesions in the vagina and vulva
	• **Cervicitis:** extensive erosive red areas extending to the vagina in severe infection/ inflammation; bleeding from the cervix; contact bleeding; multiple small ulcers; signs of small blisters containing fluid
	• **Cervical polyp**: smooth mass protruding from the cervical canal beyond the external os, which may appear dark red or pink-white; necrotic polyp resembles a cervical cancer
	• **Leukoplakia** appears as a smooth-surfaced, white area on the cervix that cannot be removed or scraped off
	
	Invasive cancer:
	• Very early invasive cancer: rough, reddish, granular area, possible contact bleeding
	• Advanced invasive cancers: contact bleeding and necrosis and
	  ◦ a large exophytic growth with an ulceroproliferative bulging mass with polypoid or papillary excrescences, arising from the cervix or
	  ◦ a predominantly ulcerating growth replacing most of the cervix
	  ◦ foul-smelling discharge from secondary infection
	• Occasionally presents as an infiltrating lesion with a grossly enlarged irregular cervix

B. After applying acetic acid

Apply dilute (3–5 per cent) acetic acid using a swab and wipe away any secretions. Wait 1 minute, and observe the characteristics of the acetowhite lesion(s):

- **Number of lesions**.
- **Size, extent, dimensions:** cover the entire or part of the transformation zone; cover entire cervix.
- **Location**: in, near, or far from the transformation zone touching the SCJ.
- **Intensity and uniformity of the white colour**: shiny white, cloudy white, pale white, dull white.
- **Borders and demarcations**: clear and sharp or indistinct diffuse margins; raised or flat margins; regular or irregular margins; areas of erosion within the lesion.
- **Extension**: into the endocervical canal.

TABLE 2: VIA results 1 minute AFTER applying acetic acid

VIA negative (-) (normal) findings	• No acetowhite lesions on cervix • Polyps protrude from the cervix with bluish-white acetowhite areas • Nabothian cysts appear as button-like areas, as whitish acne, or pimples • Dot-like areas in the endocervix (due to grape-like columnar epithelium staining with acetic acid) • Shiny, pinkish-white, cloudy-white, bluish-white, faint patchy, or doubtful lesions with ill-defined, indefinite margins, blending with the rest of the cervix • Angular, irregular, digitating acetowhite lesions, resembling geographical regions, distant (detached) from the SCJ (satellite lesions) • Faint line-like or ill-defined acetowhitening is seen at the SCJ • Streak-like acetowhitening is visible in the columnar epithelium • Ill-defined, patchy, pale, discontinuous, scattered acetowhite areas
VIA positive (+) findings	**VIA + for precancer** • Distinct, well-defined, dense (opaque, dull- or oyster-white) acetowhite areas with regular or irregular margins, close to or abutting the SCJ in the transformation zone or close to the external os if the SCJ is not visible • Strikingly dense acetowhite areas seen in the columnar epithelium • Entire cervix becomes densely white • Condyloma and leukoplakia occur close to the SCJ, turning intensely white after application of acetic acid **VIA + for invasive cancer** • Clinically visible ulceroproliferative growth on the cervix that turns densely white after application of acetic acid and bleeds on touch

Source: Adapted from Sankaranarayanan R, Wesley RS. A Practical Manual on Visual Screening for Cervical Neoplasia. IARC Technical Publication No. 41. Lyon: International Agency for Research on Cancer (IARC); 2003. Available at: http://screening.iarc.fr/viavili.php. Accessed 3 January 2020.

Appendix 3: Description of cryotherapy and loop electrosurgical excision procedure

	Cryotherapy	LEEP
Description	An ablative method that eliminates precancerous/abnormal areas on the cervix by freezing them (along with normal areas), when a highly cooled metal disc (cryoprobe) is applied to the cervix. Supercooling of the cryoprobe is accomplished using a tank with compressed carbon dioxide (CO_2) or nitrous oxide (N_2O) gas	An excision method that removes precancerous/abnormal areas – and the entire transformation zone – from the cervix using a loop made of thin wire powered by an electrosurgical unit. The loop tool both cuts and coagulates, followed by use of a ball electrode to complete the coagulation In addition to treating (removing) the precancer, LEEP also produces a tissue specimen that can be sent to a pathology laboratory for the extent of the lesion to be assessed. However, the specimen can have charred borders, making lesion margins difficult to interpret
Provider/ facility	Cryotherapy can be performed at any level of the health system, by a healthcare provider (doctor, nurse, midwife) that is skilled in pelvic examination and trained in cryotherapy	It should only be performed by a trained and competent healthcare provider, such as a gynaecologist, in a facility where back-up is available for management of potential problems, i.e. at least a secondary-level facility (i.e. a district hospital)
Client eligibility	Screen-positive clients (i.e. by HPV test, VIA, or cytology) or clients with histologically confirmed CIN2+ are eligible for cryotherapy if the entire lesion and squamocolumnar junction are visible, and the lesion does not cover more than three-quarters of the ectocervix. If the lesion extends beyond the cryoprobe being used, or into the endocervical canal, or if the lesion is suspicious for invasive cancer, then the client is not eligible for cryotherapy. Eligibility can be determined using VIA	Screen-positive clients (i.e. by HPV test, VIA, or cytology), or those with histologically confirmed CIN2+ are eligible for LEEP if the lesion is not suspicious for invasive cancer
Anaesthesia	Treatment takes about 15 minutes and is associated with only mild discomfort, so no anaesthesia is required	The procedure can be performed under local anaesthesia on an outpatient basis and usually takes less than 30 minutes

continued

Appendix 3: Description of cryotherapy and loop electrosurgical excision procedure *continued*

Post-procedure	Following cryotherapy, the frozen area regenerates to normal epithelium; this takes 1 month. The client should be advised that during this time they may have a profuse watery discharge and should avoid sex until all discharge stops or use a condom if sex cannot be avoided	Following LEEP, the client should stay at the outpatient facility for a few hours to assure bleeding does not occur. The client should be advised to expect mild cramping for a few days and some vaginal discharge for up to a month while the tissue regenerates. There can be bloody discharge for 7–10 days, which can transition to yellowish discharge. The client should avoid sex for a month or use a condom if sex cannot be avoided

Source: Adapted from World Health Organization. Comprehensive Cervical Cancer Control: A Guide to Essential Practice. Second edition. Geneva: WHO; 2014. Available at: http://apps.who.int/iris/bitstream/handle/10665/144785/9789241548953_eng.pdf. Accessed 31 January 2020.

Appendix 4: Summary of breast cancer risk

Risk factors a client cannot change:

- **Getting older.** The risk for breast cancer increases with age; most breast cancers are diagnosed after age 50.
- **Genetic mutations.** Inherited changes (mutations) to certain genes, such as BRCA1 and BRCA2. Women who have inherited these genetic changes are at higher risk of breast and ovarian cancer. Men who have inherited them, especially BRCA2, are at higher risk of breast and prostate cancer.
- **Early menarche (before age 12) and late menopause (after age 55).** This exposes the individual to endogenous oestrogens for longer, raising the risk for breast cancer by a small amount.
- **Having dense breasts.** Dense breasts have more connective tissue than fatty tissue, which can sometimes make it hard to see tumours on a mammogram. Women with dense breasts are more likely to get breast cancer.
- **Personal history of breast cancer.** Individuals who have had breast cancer are more likely to get breast cancer a second time.
- **Personal history of certain non-cancerous breast diseases.** Some non-cancerous breast diseases, such as atypical hyperplasia or lobular carcinoma in situ, are associated with a higher risk of getting breast cancer.
- **Family history of breast cancer.** An individual's risk for breast cancer is higher if they have a first-degree relative or multiple family members on either their mother's or father's side of the family who have had breast cancer. Having a first-degree male relative with breast cancer also raises the risk.
- **Previous treatment using radiation therapy.** Individuals who have had radiation therapy to the chest or breasts (such as treatment for Hodgkin lymphoma) before age 30 have a higher risk of getting breast cancer later in life.
- **Men with conditions that increase systemic oestrogen:** Klinefelter syndrome and cirrhosis of the liver (as well as obesity).

Risk factors a client can change:

- **Not being physically active.** Women who are not physically active have a higher risk of getting breast cancer.
- **Being overweight or obese after menopause.** This is associated with a higher risk of getting breast cancer, compared with those who are not obese. Obesity is also a risk factor in men.
- **Using combination hormone therapy.** Taking hormones to replace missing oestrogen and progesterone in menopause for more than 5 years raises the risk for breast cancer. The hormones that have been shown to increase risk are o*estrogen* and *progestin* when taken together.
- **Taking oral contraceptive pills.** Certain OCPs have been found to raise breast cancer risk.
- **Late or no pregnancy.** Having the first pregnancy after age 30 and never having a full-term pregnancy can raise breast cancer risk.
- **Drinking alcohol.** Studies show that drinking alcohol increases a woman's risk of developing breast cancer. The same may be true in men.

Sources: Adapted from Centers for Disease Control and Prevention [website]. What Are the Risk Factors for Breast Cancer? Available at: https://www.cdc.gov/cancer/breast/basic_info/risk_factors.htm. Accessed 4 February 2020; National Cancer Institute [website]. BRCA Mutations: Cancer Risk and Genetic Testing. Available at: https://www.cancer.gov/about-cancer/causes-prevention/genetics/brca-fact-sheet. Accessed 4 February 2020; and National Health Service [website]. Breast Cancer in Men. Available at: https://www.nhs.uk/conditions/breast-cancer-in-men/. Accessed 4 February 2020.

Appendix 5: Steps for breast self-examination

Examine breasts monthly, after a menstrual period.

For all steps of breast self-examination, the client should be advised that the breast tissue on each side extends from the collarbone down to the bra-strap line below the breasts, and from the central breastbone to the right and left into the armpits (axillae).

Step 1: Visually inspect breasts in a mirror

- Start with arms down by the sides, then straight up in the air and finally with hands pressed firmly on hips. Take note of any:
- lump or thickening in the breasts, whatever their size
- change in the appearance or shape of the breasts
- alteration in the position or level of the nipples
- dimpling of the skin surface
- retracted nipples
- discharge or bleeding from the nipples
- puckering of the skin surface like that of an orange (*peau d'orange*)

Step 2: Examine breasts while lying down

Place a pillow under the left shoulder and the left arm under the head. Use the right hand to feel the left breast with the pads of the middle three fingers, keeping the hand flat. Repeat vice versa to examine the right breast with the left hand. The breast should be palpated lightly but firmly in a systematic way, e.g. in concentric circles or quadrants.

Step 3: Examine breasts while standing up

Follow a systematic approach to palpation as in Step 2, but standing up, e.g. in the shower.