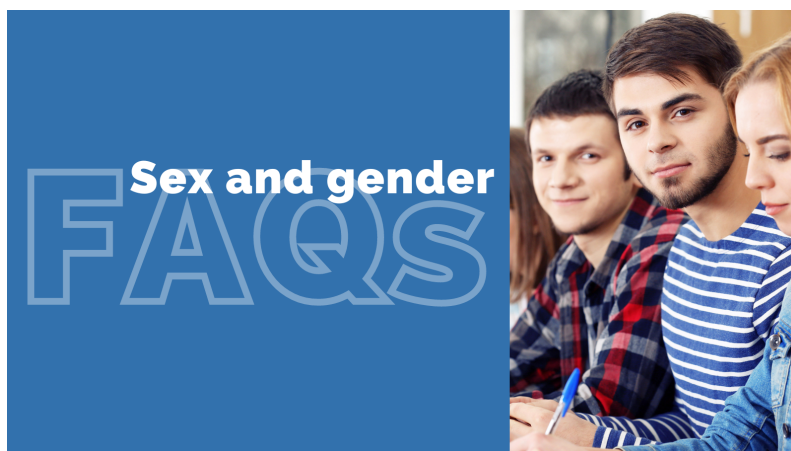


FAQs – sex and gender

We explain in clear language what's meant by “sex”, “gender”, “trans”, “intersex”, “gender dysphoria”, “gender-affirming care” and other related terms.



The words “sex” and “gender” are often mixed up. In the past couple of decades “gender” has increasingly taken the place of “sex” in legal documents; in professional and public language it is preferred because it does not have the double meaning of “sexual intercourse”. But as the theory of gender identity has spread, it has caused confusion, because some people are referring to sex and others to gender identity. This is particularly serious for healthcare, which requires clear communication and full knowledge of a patient’s biology.

- [What is sex?](#)
- [Can people change sex?](#)
- [What are DSDs? What is intersex?](#)
- [What is gender?](#)
- [What is gender-identity ideology?](#)
- [What is “gender-affirming” care?](#)
- [What is gender dysphoria?](#)
- [What is medical transition?](#)
- [How do puberty blockers work?](#)

What is sex?

- The two sexes, male and female, evolved on Earth more than a billion years ago.

- Each person's sex is fixed at conception, and depends on their genes.
- There are thousands of differences between male people and female people. Some are obvious (facial hair, vocal pitch, body shape, genitals and so on) and some are not (in the immune system, internal organs and at the cellular level, for example).
- Visible differences between the sexes become much greater during puberty.
- It is easy to tell what sex most adults are, even at a glance.

How the human sexes are defined

Sex in humans (and all other mammals) is determined at conception, and observed at birth (and often before) by medical professionals. There are two distinct biological categories: male and female, each of which plays a different part in reproduction. These two categories are shaped by evolution, and have existed on Earth for well over a billion years.

In sexually reproducing species, like humans, a new individual is created by combining one each of a male sex cell and a female sex cell. These male and female gametes are called eggs and sperm. Microscopic material called DNA, which encodes instructions on how to build a body, is combined from the two to make a new, unique individual.

The word **male** refers to individuals, or body parts, that have followed the developmental pathway that supports the production of sperm. In humans and other mammals, the male role in creating a new individual is limited to providing the sperm that fertilises an egg.

The word **female** refers to individuals, or body parts, that have followed the developmental pathway that supports the production of eggs. In humans and other mammals, the female role in creating a new individual goes well beyond providing the egg. Females also grow the new individual inside their uteruses (pregnancy), give birth to it and produce milk afterwards to sustain it (breastfeeding).

In humans, each of the two gametes contains genetic information coded as DNA and arranged in 23 pairs of chromosomes, half each from the mother and the father. Two of the chromosomes, called the sex chromosomes, are a different shape from the others, rather like the letters "X" and "Y". Female people have two X chromosomes; male people have an X and a Y. (For the rare exceptions, see "What are DSDs?")

During reproduction, the mother always contributes an X chromosome; the father may contribute an X or a Y. If the father contributes a Y, the new individual will have XY chromosomes. If the father contributes an X, the new individual will have XX chromosomes.

The way a fertilised egg develops depends on which of these two patterns it contains:

- XY chromosomes encode instructions for developing into a boy in the womb, and then into a man at puberty – the male developmental pathway.

- XX chromosomes encode instructions for developing into a girl in the womb, and then a woman in puberty – the female developmental pathway.

Almost all newborn babies can be easily classified as male or female by simply looking at their genitals (penis and testicles for males; vulva for females). Occasionally these may be unusually shaped, or there may be some other indication that the reproductive system has not developed along standard lines. In these cases, medical tests may be needed to identify the child's sex and to work out if any treatment is needed.

Puberty is when children change to become reproductively mature, meaning that if all is well they will be able to have babies of their own. But puberty affects more than just the sex organs: it affects every part of the body. It does so in different ways for males and females.

These differences matter for medical diagnosis and treatment, in ways that are only starting to be understood. They show up in every part of the body: the skeleton and muscles, the thickness of body hair, the amount and location of body fat, the vocal cords and many other aspects of anatomy and physiology.

Once someone has gone through puberty it is usually easy to tell their sex even when they are fully dressed: people can [judge sex by gait](#) and [by faces](#), even without seeing the body parts that differ most between the two the two sexes, such as chests and genitals.

Can people change sex?

- For humans, as for all mammals, it is impossible to change sex.
- It is possible to look more like a member of the opposite sex by using cosmetic or prosthetic aids (temporary and reversible) or cross-sex hormones or surgery (permanent and irreversible).
- In some countries, it is possible to alter administrative and legal records of sex for some or all legal purposes.
- A person's actual sex remains important, even if they have taken measures to look like the opposite sex or changed their legal sex. This is especially true for their healthcare.

Why humans can't change sex

Sex is determined at fertilisation, and depends on the individual's genes. Those genes direct the body to grow in the womb, and later on in childhood and puberty, along either the male or the female developmental pathway.

Once a mammal's body has developed along either male or female lines, most of that development cannot be undone. Moreover, many of the distinctive features of an adult body of the opposite sex cannot be developed without genes that are possessed only by people of that sex. A male person cannot grow a uterus, for example, and a female person cannot grow a penis.

People can alter the appearance of their bodies in order to disguise or change some (but not all) of the bodily features that differ between males and females.

Superficial and temporary interventions include clothing, makeup, wigs and prostheses (for example, fake breast forms or a “packer”, which creates the impression of penis and testicles when placed in a female person’s underpants). A boy or man may “tuck” his penis and testicles between his legs using specialist underpants. A girl or woman may bind her breasts to give the appearance of a male chest underneath clothing (if this is done often, it can cause serious damage to breast tissue, ribs, lungs and breathing capacity).

Some changes intended to give the appearance of the opposite sex are permanent. These include cross-sex hormones and surgery to alter or remove reproductive organs. Such measures are often referred to as “medical transition” or “sex change”. However, they do not actually change a person’s sex and are incapable of creating functional reproductive organs of the opposite sex. (See “What is medical transition?”)

Further reading

[Sex and the law](#) (Sex Matters, 2022)

[‘What are sex and gender, and what is the difference?’](#) (CAN-SG, 2022)

Changing sex in the legal sense

In some countries, a person can ask to be classified as a member of the opposite sex for some or all legal purposes.

Many governments allow people to change the “sex marker” on official documentation, such as birth certificates, passports or medical records. This is what is known as a “legal fiction”.

Certain conditions may have to be satisfied before a person is allowed to change their documentation. In the UK, a person must have a medical diagnosis of gender dysphoria and “live in the acquired gender” for two years before a new birth certificate with the sex changed may be issued. There is no requirement to have undergone any medical treatment or surgery.

Some countries attach no conditions to legal sex change. This is known as “gender self-ID”. In Ireland, for example, anyone can get a birth certificate with their sex changed simply by filling in a form and signing a sworn declaration of firm intent. They will then be categorised for all legal purposes as a member of the opposite sex. They are not required to make any changes to their body at all.

Further reading

[Sex and the law](#) (Sex Matters, 2022)

[‘What are sex and gender, and what is the difference?’ \(CAN-SG, 2022\)](#)

What are DSDs?

(also known as disorders or differences of sex development, or intersex conditions)

- In 98–99 percent of all births, the baby’s genitals and internal reproductive organs have developed entirely normally. The baby’s sex is easy to tell from the external genitals: if there’s a penis it’s a boy; if there’s a vulva it’s a girl.
- In most other births, the baby’s sex is obvious from the genitals even though the reproductive system has not developed entirely normally; but in around 0.02 percent of births (two in 10,000), further investigation is needed to determine the infant’s sex.
- In that 0.02 percent of births, the baby is said to have a “DSD”, a disorder or difference of sex development. There are around 40 DSDs, some of them extremely rare.
- DSDs are sex-specific: each affects only people of one sex or the other. People with DSDs do not belong to a third sex, or both sexes.
- Diagnosis and treatment of DSDs is a highly specialised area of medicine. Many DSDs cause infertility, and some have other serious health impacts throughout a person’s life.

DSDs in detail

When an egg and sperm combine to create a new individual, the typical pattern is for the new individual to have 23 chromosomes each from the mother and father.

Each parent provides one “sex” chromosome. The mother’s is always an X chromosome; the father’s may be either an X or a Y:

- if it is an X, the embryo will have two X chromosomes and will typically follow the female reproductive pathway
- if it is a Y, the embryo will have one X and one Y, and will typically follow the male reproductive pathway.

The process by which a foetus develops is guided by chemicals called enzymes, which are in turn produced according to the instructions encoded in the foetus’s DNA. For each body part and organ – face, heart, bones, muscles, blood and so on – there are standard patterns, with some degree of individual variation. Many of these variations are “bimodal” for males and females. For instance, men are on average several inches taller than women, but some men are short and some women are tall.

Development of the sex organs is also guided by enzymes, but there is one big difference from other body parts: there are two quite different patterns, one for males and one for females.

In 99.98% of all births, sex differentiation leads to an individual who can easily be classified as one sex or the other (see “What is sex?”). Males have a penis and testicles; females have a vulva, uterus and ovaries.

Almost all newborn babies can easily be classified as male or female, simply by looking at their external genitals. If there’s a penis, it’s a boy, and if there’s a vulva, it’s a girl. This is one of the most accurate diagnostic tests in all of medicine, even though it requires no special equipment or training.

Sometimes, however, there is a variation in either the genes or the way they act through enzyme production. This variation is part of what drives evolution. But it can mean that an organ or body part does not develop along standard lines. The result may be a minor difference from normal development, or a major difference that leads to significant malfunction or health problems: examples include cleft palate (when the roof of the mouth does not close fully), thalassemia (a blood defect) and atrial septal defect (“hole in the heart”).

Sometimes, the reproductive organs fail to develop fully, or attempt to develop along the other sex’s pathway. Since there are only two genetic blueprints – male and female – such a variation cannot create an individual who is a third sex, or both sexes. The only possible outcomes are variations on one sex or the other.

Such a variation may be limited to an individual body part, and be minor enough that it is still easy to tell the baby’s sex. Two examples are cryptorchidism (when one or both of the testicles has not moved down into the scrotum) and hypospadias (when the opening of the penis is along the shaft, rather than at the tip). In both of these cases the baby is clearly male, even though his genitals look a little different from normal.

But very occasionally, in at most 0.02% (2 in 10,000) births, a baby’s sex cannot easily be identified. In these cases, the baby is said to have a “DSD”, a difference of sex development. (The terms disorder of sex development, variations in sex characteristics and diverse sex development are also used; the word “intersex” used to be common, but is now obsolete among medical professionals, because it inaccurately suggests a person who is between the sexes.)

Some DSDs are apparent at birth or shortly after. Others are diagnosed only in adolescence, when puberty does not progress as expected. Accurate diagnosis, and individualised care and support, are essential. This is a specialist area of medicine, since there are dozens of DSDs and some are extremely rare.

What is regarded as best practice has changed a lot over the decades, especially when it comes to surgery on the genitals for purely cosmetic reasons, with no medical purpose.

Further reading

[‘What are differences/disorder of sexual development or intersex conditions?’ \(CAN-SG, 2022\)](#)

[FAQ on the DSD Families website](#)

Examples of DSDs

These examples illustrate how varied, but still sex-specific, DSDs are:

Persistent Müllerian duct syndrome (PMDS)

The “Müllerian duct” is a part of the anatomy of a foetus:

- in females, it develops into the Fallopian tubes, uterus, cervix and upper third of the vagina
- in males, a hormone called “anti-Müllerian hormone” (AMH), which is produced by the testes, instructs the Müllerian duct to disappear so that the male reproductive anatomy can develop.

But some male babies have a faulty gene that means they lack either the hormone AMH or the ability to interpret its signals. The Müllerian ducts do not vanish, as they are supposed to. The result is an individual who is male, but has some female reproductive structures, such as uterus or ovaries, that do not work properly and can be harmful to health. Men with this condition are often incapable of producing sperm, meaning that they are infertile.

46XX testicular disorder

This DSD affects only females. It happens while the father’s sperm are being formed in his testicles, when a gene called SRY, which is normally found on the Y chromosome, is on the X chromosome instead.

It means that an embryo with XX chromosomes – the female pattern – has some genes that are usually only found in XY individuals. The result is that the embryo starts to develop along the male pathway, and grows into an overall male-appearing individual, with male or ambiguous genitalia. But without all the other genes normally found on the Y chromosome, the individual cannot develop a functioning male reproductive system.

People with this DSD are biologically female, and are infertile. Their sex registration in infancy will depend on the appearance of the genitalia, and when their condition is diagnosed.

5-alpha-reductase deficiency (5-ARD)

This condition affects only males: it is named for an enzyme that converts testosterone into dihydrotestosterone (DHT), which in turns triggers the development of a male foetus’s genitalia. Without the genetic instructions to create that enzyme, a baby with XY chromosomes will be

born with ambiguous genitalia: female-looking with an enlarged clitoris or male-looking with a micropenis. The testes will be either internal or in the labial folds.

If a female person (one with XX chromosomes) has this mutation, it has no effect, because DHT plays no role in female-pattern development.

People with 5-ARD have male levels of testosterone and the ability to use it. DHT plays no known role in puberty (apart from being part of the process whereby males grow thicker body hair). These individuals therefore grow up along male lines. They do not grow breasts. Their voices break, their muscles strengthen, their shoulders broaden and their hips stay narrow. Sometimes, their genitalia become more clearly male.

Whether a newborn with 5-ARD is registered male or female depends on the degree of genital ambiguity and local standards of medical care. The child is more likely to be registered female in rural parts of developing countries, where healthcare is rudimentary. Until recently, babies in Europe or North America who were diagnosed young with 5-ARD, and whose genitalia were ambiguous or broadly female in appearance, were often registered female and had their testes removed.

Recent research has shown, however, that 5-ARD males are usually psychologically more comfortable if registered as their biological sex, no matter how undervirilised their genitalia. A study that looked at nearly 100 children with XY intersex conditions in India found that all those diagnosed with 5-ARD and registered male at birth kept that designation, whereas nearly all those with the condition who were registered female at birth chose to change their legal sex to accurately reflect their biological sex as they grew up.

Male puberty shapes the body in ways that are far more advantageous for sporting purposes than does female puberty. As a result, athletes with 5-ARD are hugely over-represented in female sports. This is the condition that Caster Semenya has, and the male sporting advantage is the reason that the Court for Arbitration in Sport has ruled that 5-ARD athletes can be barred from women's competitions.

Further reading: Re 5-ARD: Shabir, I., Khuruna, M.L., et al., '[Phenotype, genotype and gender identity in a large cohort of patients from India with 5α – reductase 2 deficiency](#)', *Andrology*, 3:6 (2015), 1132–1139.

Partial or complete androgen insensitivity syndrome (PAIS or CAIS) —

These DSDs affect only male (XY) individuals. They involve mutations on the X chromosome that make the body partially or completely unable to respond to the signals sent by testosterone. The result is a body that looks partially or completely female on the outside, with underdeveloped male genitals (PAIS) or normal-looking female genitals (CAIS). But genes on the Y chromosome, and the lack of a second X chromosome, stop the body from developing fully along the female reproductive pathway. The individual will not have a uterus or ovaries, and will be infertile.

If a female person (one with XX chromosomes) has this mutation, it has no effect, because testosterone does not play a part in development along the female reproductive pathway.

CAIS individuals typically are registered as female at birth and retain that classification throughout their lives. They grow up to have a female appearance because their bodies convert the testosterone produced by their internal testes into oestrogen. In puberty they develop female secondary sex characteristics (such as breasts) and do not develop male ones (such as thick facial and body hair and a deep voice).

Ovotestes

This is the rarest of all DSDs. People with this condition have both ovarian and testicular tissue, sometimes within the same gonad (this is the joint term for both ovaries and testicles). The condition is caused by a number of genetic variations, and requires individual assessment.

People with ovotestes usually have XX chromosomes. Their reproductive organs are usually affected, and their genitalia may appear ambiguous. Most are infertile. The very small proportion of people with this condition who are fertile produce either eggs or sperm, but never both.

What is gender?

- The word “gender” is often used as a synonym for “sex”, but it has more than one meaning, and this can cause confusion.
- In much feminist theory, gender is a value system that places maleness above femaleness; a hierarchy that places men and their needs ahead of women and their needs.
- “Gender roles” refers to the behaviour expected of and imposed on the two sexes, which vary across time and cultures and are often referred to as masculinity and femininity.
- “Gender expression” refers to ways of expressing yourself that are related to your society’s gender roles.

Gender in detail

The word “**gender**” came from a Latin word that means “type”. In some languages, such as French and Spanish, words have “genders”, which is a grammatical classification. Modern English has no gender in this sense, except when referring to individual people or animals whose sex is known. But the word itself has evolved to have several different meanings.

Sometimes it is used as a synonym for “sex” (for example, in the “gender pay gap”: the difference between men’s and women’s average pay).

Some feminists use the word to refer to the hierarchy imposed in a sexist society, whereby women and everything associated with women are regarded as inferior to men and everything associated with men. In this sense, gender refers to men's interests and needs being prioritised, and women's being sidelined.

The expression "**gender roles**" refers to rules and expectations about how men and women should behave. Sometimes the words "masculine" and "feminine" are used for these. What counts as masculine or feminine varies a bit from one place and time to another, but there are overall patterns. Being aggressive and interested in sport, letting body hair grow and seeking a leadership role at work might count as "masculine". Being passive, doing lots of housework, wearing modest clothing or high heels, shaving your underarms, legs or pubic hair, and working in a "caring" job like nursing or school-teaching might count as "feminine".

Whatever the words mean in a given culture, nobody is entirely masculine or feminine. "Gender non-conformity" may be largely tolerated, or it may be harshly punished, as when the Taliban force women to cover their entire bodies.

A related idea is "**gender expression**". This means ways of expressing yourself that are related to your society's ideas about masculinity and femininity, for example clothing, hairstyles and behaviours.

Yet another use of the word "gender" is as short for "**gender identity**". For more on this use of the word, see "What is gender identity?".

So the word **gender** has several meanings, none of which is clearly defined or measurable. This is true both for cultural meanings (though social-science methods can give broad outlines of sex-related stereotypes and behavioural patterns) and for gender identity (which is entirely individual and subjective).

It is thus very different from the word **sex**, which refers to two separate, objectively defined biological categories. Sex can be determined and described using things that others can observe and measure, such as genes and genitals.

Further reading

['What are sex and gender and what is the difference?'](#) (CAN-SG, 2022)

What is gender-identity ideology?

Gender-identity ideology, or gender-identity theory, is the claim that everyone has an inner "gender identity", and that when a person's beliefs about their gender identity conflict with their biological sex, it is the gender identity that determines the person's "true self".

People who believe this use the word "trans" for people in whom body and gender identity are misaligned. They have coined the word "cis" to refer to everyone who is not trans.

How gender-identity ideology developed

People who believe in gender-identity ideology generally describe sex as “assigned at birth” – a doctor’s best guess at how the person may later feel, to be set aside if desired by the person themselves when they are old enough to declare their own identity. Insisting on recognising an individual’s sex then becomes, in the words of some influential British gender clinicians, “reductionist” and acting to “privilege biology over lived and felt identity”.

This belief system grew out of the claim, first made by some scientists who studied sexual behaviour in the 1960s, that everyone has a “gender identity”: an inner, gender-related awareness of who they are that is separate from their knowledge of their biological sex. Those scientists believed that this awareness usually aligns with bodily sex, but occasionally differs from it. It might be described as a preference for being read by others as more masculine or feminine, or as androgynous – neither masculine nor feminine – or as a specific mixture of the two. No one can know someone’s gender identity without being told: it is invisible and subjective.

The theory that gender identity is fluid

Among those who find the idea of gender identity meaningful, some think that it is fluid. This idea originates in postmodern philosophy, in particular the work of two French philosophers, Michel Foucault and Jacques Derrida, and in later interpretations of their work by the American philosopher and gender theorist Judith Butler.

Postmodern philosophy is very hard to write about for non-specialists. The ideas are unintuitive and often self-contradictory, in part because the language is confusing. But roughly, postmodernists regard language as playing a decisive role in shaping what we experience as being reality. They regard subjective experience as more important than objective statements, and emotional responses as more authentic than rational ones. And they think that conventional understandings of the world need to be “deconstructed” in order to reveal how traditional knowledge structures, including science and medicine, are supposedly inherently oppressive.

According to Butler, gender is “performative”, by which she means that it is not an objective fact about a person, but is created by their actions. For example, she argues that a person becomes feminine by acting in a feminine way, which means that other people see that person as feminine. A woman, then, is “someone who does womanly things”. In this sense Butler sees gender as socially constructed rather than innate.

One piece of evidence in favour of the idea that gender identity is fluid is that some people experience themselves as having a gender identity that is not stable. They may describe themselves as “gender-fluid” or say that their gender identity has changed over time (for example, that they used to feel very masculine and now feel more androgynous).

The theory that gender identity is fixed

Some believers in gender identity – confusingly, including some who quote Butler frequently – think it is innate. These people usually think it is fixed at a young age, perhaps even at or before birth.

These people often posit the existence of a biological marker of gender identity (a “brain sex” that usually aligns with the body’s sex but occasionally does not). For evidence, they point to a handful of studies that have attempted to show differences between the brains of people who identify as transgender and those who do not, which they think help explain why a small minority of people say they have always experienced a deep-seated feeling of having a gender identity different from their sex.

But studies that purport to show brain differences in trans people are generally very weak in at least one way:

- the differences they find are small and inconsistent with each other
- they do not take account of sexual orientation (that is, they may be picking up differences between the brains of straight and gay people, for which there is a fair bit of evidence, rather than those of “cis” and trans people)
- they do not control for the use of cross-sex hormones (exactly how these affect the brain is not known, but it is very likely that they do).

Moreover, even if there were brain differences this would not necessarily mean they *cause* the transgender identification. They could be as a *result* of that identification. Or they could indicate something else that causes gender dysphoria and hence a trans identification, such as a tendency to dissociate from one’s body.

The consequences of gender-identity theory

The claim that gender identity is innate sits oddly with the postmodern approach out of which it grew. The reworking of ideas of gender from fluid to fixed seems to have happened during the early 21st century, as postmodern ideology evolved online and went mainstream.

The key to understanding it is postmodernism’s emphasis on subjective experience and opposition to fixed, objectively delineated categories. If bodies cannot be classified according to clearly defined characteristics, and if beliefs trump observations, then anyone can say “I am a man” or “I am a woman”, and no one else has authority to overrule that statement, or supply criteria against which it can be assessed.

This reasoning has political, legal and clinical consequences. For doctors, the biggest is when patients seek life-changing medical and surgical interventions because they feel that their bodies do not represent who they feel themselves to be. This is not a situation that healthcare professionals are trained to handle.

The whole aim of modern medicine is to use objective symptoms and research evidence to diagnose and treat diseases and disorders. But now the body is supposed to take second place to a sense of identity, and what is wanted is help in manipulating it with hormones and surgery to make it conform to an inner sense of what is “real”. This may be called “medical treatment”, but there is no evidence-based link between cause and consequence, and no expectation of the usual sorts of health benefits.

What is “gender-affirming” care?

If gender identity supplants sex, then any psychological therapy for discomfort related to someone’s sense of gender identity must “affirm” that identity, rather than investigate its basis or origin.

The rationale for gender-affirming care

When clinicians accept gender-identity theory, they may see no problem in giving people with healthy, fully functional bodies hormones and surgery that will make them less healthy, with the declared aim of bringing their bodies in line with what patients have declared their “natural” inner sense of gender.

This reverses the usual clinical significance of objective and subjective information. The scientifically measurable and observable feature (biological sex) is overridden by the intangible, verbal assertion of inner self-perception.

This casual approach to the body is especially concerning in the absence of high-quality research evidence about the benefits, risks and harms of the desired interventions. Since gender identity is subjective and therefore self-determined, it can never be measured, quantified or challenged. That leaves no grounds for refusing any request for medical intervention on the basis of a declared gender identity.

Rather than seeking to create an evidence base for these interventions, advocates for gender-identity theory instead seek to persuade political parties and other institutions to make subjective gender identity, rather than objective biological sex, the sole criterion for whether a person is male, female, both or neither. They demand that everyone should specify how they wish to be described with “preferred pronouns” (not just he/him and she/her but also they/them or “neopronouns” such as zie/zir) and describe failure to use these as “misgendering”.

Gender identity no longer then sits alongside sex, but instead supplants it. Any psychological therapy for discomfort related to someone’s sense of gender identity must “affirm” that identity, rather than investigate its basis or origin, even in an empathetic manner.

The risks of gender-affirming care

The rationale for gender-affirming care departs completely from mainstream, evidence-based models of psychotherapy. Any exploration of the thoughts, emotions and motives that might be linked with a

patient's behaviour and self-image then risks being characterised as abusive and labelled "conversion therapy". Healthcare professionals investigating evidence about gender-identity theory and associated medical practices may be labelled as bigoted and hateful.

Ruling out supportive, even-handed interactions like this runs counter to the principles of good psychological therapy. It deprives patients with gender-identity issues of much-needed support. The result is poorer healthcare for trans-identifying patients, as the fear of being accused of wrongdoing deters clinicians from applying the usual principles of ethical healthcare, or even from working in the field.

This is particularly concerning for patients who have experienced trauma, such as childhood sexual abuse, and later develop complicated emotions about their bodies and identities. Compassionate clinicians need to accept such complexity, listening carefully and building a relationship with their patients rather than blindly "affirming" a single, unquestioned interpretation of their thoughts and feelings.

What is gender dysphoria?

Gender dysphoria is the misery caused when someone feels that their sex is mismatched with their gender identity. But the definition has changed over time: in 1978 the *International Classification of Diseases* included "transsexualism" in a section for sexual deviations and disorders; in 1992 a group of "gender-identity disorders" were defined as adult personality and behaviour disorders; in 2022 "transsexualism" became "gender incongruence", and was redefined as a condition relating to sexual health.

Definitions of gender dysphoria

The word "dysphoria" comes from Greek, and means the opposite of euphoria: a state of misery that is hard to bear. Gender dysphoria is misery caused by a person's sex, and their sense that it is mismatched with their gender identity. It is an inner sense of unease, distress, or disgust towards oneself, made up of thoughts, emotions and sensations, and can vary from low-level to incapacitating. The quality and conviction of the accompanying thoughts also vary.

The words used by clinicians for this sort of feeling have changed over time. In 1978 the *International Classification of Diseases*, an authoritative handbook of conditions and diagnoses, included "transsexualism" in a section entitled "Sexual deviations and disorders". An update in 1992 included a group of "gender-identity disorders" in a section entitled "Adult personality and behaviour disorders". The most recent update, published early in 2022, has replaced the term "transsexualism" with "gender incongruence", which has been moved out of the chapter on mental disorders to a new one entitled "Conditions relating to sexual health". This chapter also includes sexual dysfunctions, which are also no longer classified as mental disorders.

When it comes to relatable symptoms, such as pain, clinicians are expert at unpicking what their patient is experiencing. They ask about the type, location and intensity of the pain, whether it radiates and what makes it better or worse. They learn during training that 80% of diagnoses are made on the

basis of a case history, and as they gain expertise, they learn to understand nuances in what is being described.

Gender dysphoria, by contrast, can be hard to relate to, since a person's inner sense of themselves cannot be seen or measured, and many people report not having any gender-identity feelings at all. In a clinical setting, such ambiguity is unusual. It will take time for a clinician to understand what a patient with gender dysphoria is feeling, and to start to understand why. Clinicians should take a careful history as they usually would, and use it to explore what a patient means by "gender", and how they experience dysphoria. While supporting the patient, they must keep an open-minded and dispassionate approach to diagnosis and treatment.

Further reading

['What is gender dysphoria?'](#) (CAN-SG, 2022)

Similarities with body dysmorphia

In seeking to understand how gender dysphoria may arise, whether in childhood or adulthood, it is helpful to consider the related concept of body dysmorphia. In this condition, the miserable feelings are directed at the body, or a part or attribute of it.

Some people experience body dysmorphia as mild, and can quickly soothe or ignore the accompanying distressing thoughts. Someone who dislikes their chin, for example, may have frequent but fleeting thoughts about it, but find it relatively easy to reassure themselves that the shape of their chin doesn't really matter, and start thinking about something else.

For someone else, such thoughts may become a major preoccupation. They may ruminate for hours and spend a lot of time in front of a mirror, inspecting their chin from different angles. Their feelings about their chin grow more negative and hostile, and affect their mood. They may try to conceal its supposed flaws with makeup, consider cosmetic surgery and browse websites seeking the "perfect" chin. When they go out they may worry that other people are staring at their chin, and thinking negative thoughts about it. Their thoughts become fixed, and friends and doctors saying their chin looks fine cannot persuade them that it is not deformed.

A person whose life is seriously affected by such feelings, for example by being unable to go out or to work, may be diagnosed with body dysmorphic disorder (BDD). This debilitating condition leads many sufferers to seek cosmetic surgery. But research shows that relief may be short-term, and the condition can return, sometimes shifting to another feature. The result can be a series of expensive, risky and ultimately futile surgeries.

What is generally more helpful is a course of cognitive behavioural therapy (CBT). The sufferer learns to re-evaluate their thoughts and modify their behaviours so they become less concerned about perceived imperfections. SSRIs (a type of antidepressant medication), often in combination with CBT, have also been shown to be useful.

The disorder shows how paying attention to and focusing on a bodily feature or idea about ourselves makes us more aware of it. That in turn magnifies our sensations and makes our thoughts more intense and intrusive, and more time-consuming and harder to ignore. Whether the thing that feels wrong is your chin, weight or thinning hair, attention begets attention.

The same can happen with a person's ongoing examination of their internal sense of gender. Some people say they do not have any such sense, or if they do, they ascribe no importance to it. (This is not the same as being ignorant of gender roles or unaware of sex differences, which are among the first things that children notice about others and themselves.) People with gender dysphoria, by contrast, are preoccupied with what they feel and how others perceive them with regard to their sexed body or gender role.

How does gender dysphoria develop? —

All children notice early that boys and girls have different body parts. But the games, clothes and so on associated with the two sexes vary widely from place to place, and are affected by socialisation and environment. In a class of infant schoolchildren, some girls will be drawn to football and running around, and some boys to dressing up and playing shop. From a clinical perspective, all of this is normal.

A person's feelings about and experiences of gender will be influenced in part by nature (research suggests that a large part of personality is innate), but also by nurture. Will a two-year-old who refuses to put their shoes on be called naughty or resolute? Will a three-year-old girl playing with a truck be told it is a boy's toy or encouraged? Will a four-year-old boy who wants to wear a dress be mocked and called a "poofter", or allowed to wear what he wants? If a child is made to feel ashamed of how they like to play or dress, this can harm the development of their sense of self.

A child with gender dysphoria experiences a profound and intense distress directed towards their gender (the prescribed social role for their sex), and a wish to be or a belief that they are the opposite sex. The gender dysphoria can be associated with early adverse events, or with other psychological problems, such as depression, anxiety or thoughts of suicide.

As they grow up, people use signals received from family, friends, teachers, colleagues and so on to co-construct their personality and inner sense of self. The former can be understood as related to how others view a person, and the latter to how they view themselves. Personality and sense of self interact with each other, and with societal ideas of gender and a person's own comfort with engaging in "gendered" behaviours.

Any sense of gender an individual experiences will interact with other aspects of their personality and the ideas about gender they are exposed to in their social environment. As with other aspects of their identity, this sense will evolve throughout their lifetime, as they react and adapt to their environment and gain life experience, and as their values and beliefs develop. The idea that a person can have a single, "authentic self" is therefore a strange one. It might be more accurate to say that every person

has “true selves”, which will change as they mature from infant to child to adolescent and young adult, and pass through middle and old age.

People commonly feel discontented or uncomfortable with some aspect of themselves, or misunderstood by others, and these feelings can be fleeting or long-held. Adolescence, in particular, can be turbulent, consumed by the psychological task of separating and individuating. As we learn more about ourselves and how others perceive us, we discover how complicated others are, and how easy it is to misread and misunderstand them. Splitting the idea of gender from strands of identity and conceptualising it as a standalone, innate and permanent aspect of a person, especially when young, is unlikely to be helpful, either to a person’s self-understanding or to a clinician’s investigations.

Gender dysphoria can arise when confusing and complicated developmental processes get stuck, and a person’s attention becomes fixated on an inner self that is difficult to define and therefore to describe. The idea that people should have an instinctive understanding of this one aspect of themselves, understood as entirely separate from every other part of their personality or self-concept, is very new. Many professionals think this presents their patients with a pretty much impossible task. This may help explain the proliferation of labels used to define this essence.

What clinicians do know is that people develop in diverse ways. No one should feel put in a box, especially during youth, when opportunities should be opening up rather than becoming more restrictive. Adolescence is a time for exploring and expressing different aspects of selfhood. Pushing back against societal expectations of women and men may be part of that.

How is gender dysphoria diagnosed? —

The diagnostic criteria for gender dysphoria (previously known as gender-identity disorder) can be found in the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*, an American psychiatric guide widely used in the UK. This book is regularly updated, and diagnostic descriptions reflect societal and cultural change.

The latest edition, DSM-5, defines gender dysphoria in adolescents and adults as **a marked incongruence between experienced/expressed gender and assigned gender, lasting at least six months, as manifested by at least two of:**

- a marked incongruence between one’s experienced/expressed gender and primary and/or secondary sex characteristics (or in young adolescents, the anticipated secondary sex characteristics)
- a strong desire to be rid of one’s primary and/or secondary sex characteristics because of a marked incongruence with one’s experienced/expressed gender (or in young adolescents, a desire to prevent the development of the anticipated secondary sex characteristics)
- a strong desire for the primary and/or secondary sex characteristics of the other gender
- a strong desire to be of the other gender (or some alternative gender different from one’s assigned gender)

- a strong desire to be treated as the other gender (or some alternative gender different from one's assigned gender)
- a strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's assigned gender).

In order to meet criteria for the diagnosis, the condition must also be associated with clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Gender dysphoria in children is defined as a **marked incongruence between experienced or expressed gender and assigned gender, lasting at least six months**, as manifested by the first of these criteria, plus at least five of the others:

- a strong desire to be of the other gender or an insistence that one is the other gender (or some alternative gender different from one's assigned gender)
- in boys (assigned gender), a strong preference for cross-dressing or simulating female attire; or in girls (assigned gender), a strong preference for wearing only typical masculine clothing and a strong resistance to the wearing of typical feminine clothing
- a strong preference for cross-gender roles in make-believe play or fantasy play
- a strong preference for the toys, games or activities stereotypically used or engaged in by the other gender
- a strong preference for playmates of the other gender
- in boys (assigned gender), a strong rejection of typically masculine toys, games, and activities and a strong avoidance of rough-and-tumble play; or in girls (assigned gender), a strong rejection of typically feminine toys, games, and activities
- a strong dislike of one's sexual anatomy
- a strong desire for the physical sex characteristics that match one's experienced gender.

As with the diagnostic criteria for adolescents and adults, the condition must also be associated with clinically significant distress or impairment in social, occupational, or other important areas of functioning.

As clinicians assess a child against these criteria, they must consider what is known about child development, and how the sense of incongruence might have arisen. They should also consider the reactions of the family and others around the child to the gender incongruence, any adverse events in the child's life, the child's personality and any neurodevelopmental or psychiatric conditions.

Co-occurring issues for minors with gender dysphoria

Clinicians often note that many children and young people presenting with gender dysphoria have significant difficulties in their lives, including mental-health problems. Common challenges include

obsessional thinking and rumination, autism and autistic traits, homophobia and sexual aggression. More research is needed, using sound methodology and data analysis, to put such observations on a better footing and improve the treatment of gender-dysphoric patients.

We will briefly discuss four such issues here: obsessional thinking; autism; homophobia and sexual victimisation.

Obsessional thinking and rumination

This pattern of thinking may lead to a diagnosis of obsessive compulsive disorder, or may be a feature of people with an obsessional style of personality.

Such people believe there is a perfect way of being or doing things, and will keep going until they feel they have got things right. In small doses this trait can be useful, but once it reaches the level described as “clinical perfectionism” it can harm a person’s life. As their thoughts return over and over to the focus of their obsession, it becomes a debilitating preoccupation.

Interventions that “fix” things and enable them to achieve their desired outcome generally bring only temporary relief, and the obsessional thoughts return, perhaps with a different focus. People with gender dysphoria may display this sort of thinking, and may benefit from specialist therapy to address it.

Autism

Clinical observation suggests that autism, autism spectrum disorder (ASD) and autistic traits are unusually common among people who have gender dysphoria, and among those who identify as transgender. Symptoms include difficulties in social communication, restrictive and repetitive interests and behaviours, and sensory issues.

The reason for the elevated rates of autism and related conditions among people with gender dysphoria is not fully understood, and more research is needed. But there are plausible hypotheses for how certain autistic traits might make gender dysphoria more likely.

- **Not fitting in.** This can be the result of difficulty understanding and keeping up with social communication, which becomes more complex during puberty. Teenagers are expected to quickly learn new rules about how to behave as they and their peers embark on romantic relationships. Status competition within friendship groups, and communications that have multiple meanings, can be difficult for autistic people to navigate.
- **Odd or awkward social behaviours.** People with ASD may have unusual preoccupations, and can be experienced as blunt, intrusive or bossy. Rather than accepting that this is just how they are, or setting and explaining clear, simple boundaries, their peers may bully or ostracise them.

- **Sensory differences.** These may lead to experiences that a young person interprets as to do with their gender. For example, asexuality is more common in ASD. Sensations related to their pubertal development may be distressing.
- **Rumination and unusual interests.** Young people with ASD may follow chat boards on platforms such as Tumblr or Reddit and become influenced by ideas they read about or videos they watch. Gender can become an obsession, and can lead them to spend a lot of time online as they research every aspect of it. Certain popular assertions in these internet spaces, such as “If you think you may be trans, then you are”, may suggest to young people with ASD that they should adopt a trans identity.
- **Literal, black-and-white thinking.** Rigidity is frequent in people with ASD. They find change and flexibility difficult, including changing their minds. It can be very hard for them to see things from other people’s perspectives. They may struggle to understand metaphors or analogies, which will hinder them in exploring abstract ideas.
- **Anxiety and depression.** People with ASD have higher rates of mental-health difficulties than neurotypical people do.
- **Friendship difficulties.** Many people with ASD long for peers who are like them and who “get them”. But the stereotype of the autistic person as a loner means their need for social interaction may go unrecognised. They may find the acceptance and companionship they crave in the trans community.

Homophobia

In the past, most children referred to clinics for gender dysphoria were boys. Most ceased to experience gender dysphoria by the end of adolescence and grew up to be happy as men, very often bisexual or homosexual. This indicates the importance of differentiating between emergent sexual orientation and gender dysphoria in children and adolescents.

Research suggests that the development of sexual orientation is affected by a combination of biological and social factors. If a young person is struggling to accept their sexuality, or experiencing overt or covert hostility at home or elsewhere, this can be explored in counselling, with action and support provided where necessary. Such support may include investigating concerns about safeguarding, or getting others, such as schools, involved in case of bullying.

Internalised homophobia has been identified as one cause of gender dysphoria. Young lesbian, gay or bisexual people may find it crushing to grow up in a homophobic environment. The experience of stigma, aggression and disgust may lead to depression, anxiety, self-hatred, and self-harming behaviours. This is evident from the accounts of some detransitioners (people who socially or medically transitioned and later return to identifying as members of their sex).

Lesbian and gay people often do not conform with stereotypes for their sex. If others find their non-conformity unacceptable, they may be bullied and teased. A young person who behaves in ways more typical of the opposite sex maybe be told that they “should have been” or “truly are” a

member of that sex. A lesbian may feel, consciously or unconsciously, that she is somehow unacceptable because she doesn't fit the feminine and highly sexualised caricature of how a woman is "supposed to be".

For an extreme example of an interaction between homophobia and gender dysphoria, consider Iran, where homosexual behaviour is a capital crime. Lesbians and gay people are reportedly coerced into changing their legal sex, and undergoing hormonal and surgical interventions in order to look more like the opposite sex. This allows them to be socially reconceptualised as "heterosexual".

Despite legal and societal progress, homophobia is still a considerable issue. Mental-health professionals are trained to consider each person's internal and contextual experiences. It is essential to ask about bullying at school and attitudes at home, and seek to address problems directly or support the individual to do so themselves.

Sexual victimisation

Experience of sexual aggression, sexual assault and rape rise sharply with the onset of puberty. These experiences are pervasive, even between students in educational settings. The great majority of victims are female, and the perpetrators male. A helpline set up to support victims noted that "incidents reported include sexual name-calling, unwanted sexual touching, sexual assault and rape by other pupils, as well as online abuse such as sharing nude images without consent." Girls may be affected even when the victim is a close friend or relative, rather than themselves.

A girl (indeed, any child or young person) may feel self-conscious, aware of being stared at and afraid of being groped or assaulted. This may come on top of dealing with a history of sexual violence and trauma. This discomfort can then become directed inwards, making her feel, consciously or unconsciously, that she wants her emerging bodily features to disappear. This pattern plays a part in eating disorders. It may also lead girls to experience dysphoria directed towards their growing breasts, and may account for at least part of the desire of many trans-identifying girls to wear breast binders or undergo mastectomies.

What is medical transition?

Clinicians may prescribe cross-sex hormones: the male hormone testosterone for females desiring to look more like men; the female hormone oestrogen for males seeking to look more like women. But:

- sex hormones do not have the same effect on people of the opposite sex
- the long-term impacts of taking cross-sex hormones are unknown

- many of the physical changes they produce are irreversible
- in both sexes, fertility may be permanently impaired.

Surgery might include cosmetic facial surgery; the removal of reproductive organs; and plastic surgery to mimic the appearance – but not the functionality – of the genitals of the opposite sex.

Cross-sex hormones

Clinicians may prescribe testosterone for females desiring to look more like men, or oestrogen for males seeking to look more like women. The aim is to raise the level of these hormones to around that naturally seen in the opposite sex.

A female person who takes testosterone will experience:

- lowered fertility
- growth of facial and body hair
- voice deepening, as the vocal cords thicken
- clitoral enlargement
- irregular or no periods
- bigger muscles and greater strength
- redistributed body fat, and less body fat overall
- an increase in the number of red blood cells.

Testosterone may also lead to:

- hair loss
- acne
- aggressive behaviour
- higher blood pressure
- cardiovascular disease.

A male person who takes female-typical quantities of oestrogen will experience:

- weight gain and increased body fat
- growth of breast tissue
- decreased sex drive
- lowered fertility
- enlarged prostate gland

- mood changes (depression, anxiety, irritability, tiredness).

Oestrogen may also lead to:

- impotence (inability to get an erection)
- a higher risk of blood clots and stroke
- swollen hands and feet
- type 2 diabetes.

Differences in male and female DNA mean that sex hormones do not have the same effect on people of the opposite sex. That is, testosterone taken by a female person will not have exactly the same effects as either the natural testosterone produced by a male person, or extra testosterone prescribed for a male person with unusually low natural levels. And similarly for oestrogen taken by a male person.

The long-term impacts of taking cross-sex hormones for many years, especially when started as an adolescent, are largely unknown.

If someone decides to “detransition” (re-identify as their biological sex after medical transition), many of the changes they have experienced will be irreversible. Males who have taken oestrogen will continue to have breast growth. Females who have taken testosterone will continue to have facial hair, clitoral enlargement, and a deepened voice. In both sexes, fertility may be permanently impaired.

Surgical interventions

Those for females include:

- double mastectomy (the removal of both breasts, with or without nipple removal)
- oophorectomy (removal of the ovaries)
- vaginectomy (removal of the vagina)
- hysterectomy (removal of the womb)
- cosmetic facial surgery (options include implants to make the brow, nose or jaw more prominent).

Those for males include:

- orchiectomy (“castration”, removal of the testicles)
- penectomy (removal of the penis)
- tracheal shaving (surgery to make the Adam’s apple less prominent)

- cosmetic facial surgery (options including shaving bones to make the brow, nose and jaw less prominent).

There are also a number of cosmetic procedures that seek to mimic the genitals of the opposite sex. These may achieve a satisfactory aesthetic result, but medical science is not able to construct functioning sex organs.

The two main operations for men who seek the genital appearance of a woman are “vaginoplasty” and “vulvoplasty”.

The most common type of vaginoplasty is a surgery in which the testicles and internal parts of the penis are removed. The scrotum, penile skin and nerves are used to create a simulacrum of a vagina and labia in a newly made cavity in front of the rectum.

If the man took “puberty blockers” when younger in order to avoid the usual changes of puberty, such as his voice breaking and beard growing, his genitals will still be child-sized. There will probably not be enough skin to create a neovagina. In this case, part of the stomach or bowel lining may be used to give greater depth.

In a vulvoplasty, only the external female genitalia are mimicked, without creating a neovaginal cavity.

Surgery to give women the appearance of men is harder, and done less often. The two main options are:

- **metoidioplasty:** this operation takes advantage of clitoral growth caused by taking testosterone. Internal ligaments are cut to allow the clitoris to stick out more, so that it looks like a small penis (the woman will still urinate from the original opening, called the urethra, not from the end of the enlarged clitoris).
- **neophalloplasty:** this requires a series of operations, with a very high rate of complications. The first step is to cut flesh from another part of the body, usually the forearm, thigh or abdomen, and craft it into a cylinder. This is attached to the genital region, perhaps with a neoscrotum containing prostheses that look like testicles. If the neophallus is to be used for urination, the woman’s urethra will have to be extended into it, which takes more operations. Enabling it to become erect requires a mechanically controlled implant.

People who have had any of these surgeries are likely to need ongoing care. This must be provided by specialists in transgender surgery, rather than specialists in the care of either male or female sex organs.

For example, the vagina is a self-cleaning and self-lubricating organ with a muscular lining that is capable of stretching enough to allow a baby to pass through it at birth. The medical specialists in care of this organ are called gynaecologists. They will not know anything about the care of a surgically constructed neovagina, which will require regular dilation and careful cleaning. The doctors

best placed to advise on any problems are probably the surgeons who specialise in performing those genital operations.

How do puberty blockers work?

Puberty is the process of physical development that turns children into adults capable of reproduction. Puberty blockers are powerful drugs – developed and tested for other uses – that disrupt this process by stopping the ovaries producing oestrogen or the testicles producing testosterone. Their risks are not yet known, and their benefits are not clear: there are increasing concerns over their side effects, and disagreement over whether children can consent to their use.

What is puberty?

Puberty is the physical process that turns a child into an adult capable of reproduction. It is a crucial developmental period, during which cognitive processes and every part of the body change and mature. This is when secondary sex characteristics appear, such as breasts for girls and facial hair for boys. It is also when girls start to menstruate, and when boys decisively outstrip their female peers in size and strength. Once people have gone through puberty their sex will almost always be discernible by others, instinctively and at a glance, even when they are fully clothed.

Puberty is a transitional period during which children stop depending on adults and start to live independently. Societies around the world mark this transition with a variety of “rites of passage”, which may involve a solitary journey, test of strength, bonding with peers and in some places painful genital procedures.

How a young person feels about puberty can vary a lot, depending on both personal and societal factors. One may welcome being seen as mature and independent; another may dread this. The arrival of periods is often difficult for girls, as menstrual blood is often regarded as dirty and even taboo.

Oestrogen is normally described as the “female sex hormone”, and testosterone as the “male sex hormone”. In fact, both are normally present in both sexes, but in very different amounts. Levels of sex hormones also vary throughout life. They are usually low in young children, and increase a lot during puberty as the ovaries or testes mature. It is this big increase that causes the very visible changes of puberty, including reproductive maturity, secondary sex characteristics and fast growth to reach eventual adult height, as well as invisible changes such as increased bone density and important changes to the brain.

What are puberty blockers?

Puberty blockers are a powerful class of drugs that disrupt the normal process whereby puberty starts. They do this by interfering with the normal release of two chemicals – luteinising hormone

(LH) and follicle stimulating hormone (FSH) – from the pituitary gland (a part of the brain). It is the release of these two hormones that kickstarts puberty, sending the signal to a girl's ovaries or a boy's testicles to start producing sex hormones (oestrogen for girls, testosterone for boys).

The way these drugs work is a little complicated. Normally, the brain releases another hormone, gonadotropin-releasing hormone (GnRH), in short pulses, and it is these pulses that stimulate the pituitary gland to make LH and FSH. Puberty blockers deliver this same GnRH signal, but they do so continuously rather than intermittently. This overwhelms the pituitary gland so that it no longer responds by producing LH and FSH, and the ovaries or testicles no longer get the signal to ramp up production of oestrogen or testosterone.

The technical name for puberty blockers is gonadotropin-releasing hormone agonists or analogues (GnRHa). Drug manufacturers have run clinical trials on them for the treatment of adults with certain cancers. They have also been tested and approved for delaying puberty by a year or two when it starts abnormally early (before age eight for a girl, or nine for a boy), to bring it closer to the normal timing.

Their use by gender clinics to stop normal puberty, however, has never been subjected to clinical trials. There are no robust studies, either published or under way, of their use as a treatment for gender dysphoria. What is known from data released by some gender clinics is that nearly every child who takes puberty blockers for gender issues will go on to take cross-sex hormones.

Risks and benefits of puberty blockers

Although puberty blockers are often described as merely a “pause button” for children with gender dysphoria – extra time to grow out of the condition before the irreversible changes of puberty – there is growing evidence that instead they permanently alter the child's future path. In the UK, it appears that 98% of children started on GnRHa in early puberty go on to take cross-sex hormones; before puberty blockers started to be used by gender doctors, every study found that most such children recovered from gender dysphoria without any drugs.

Every medical treatment will have different risks and benefits. These depend not only on the treatment itself, but on the person taking the drug, and the condition for which they are taking it. GnRHa drugs have been judged sufficiently safe and sufficiently useful to be considered as a treatment for certain adult cancers and for precocious puberty. But this does not mean they are either safe or beneficial when used to block normal puberty as a prelude to cross-sex hormones.

Their use in gender medicine presents some risks unlike those related to any other medical treatment. One is that puberty normally occurs during adolescence, meaning that the body, brain and social role all mature together. Delaying puberty means these **developmental strands are no longer synchronised**. The child remains physically, and in some respects mentally and emotionally, immature while their peers are growing up and the world around them is moving on. People's lives do not have a pause button. Developmental processes and experiences that are foregone cannot simply be caught up later on.

Another is **harm to the child's future sex life and fertility**. It is during puberty that ovaries and testes start to produce mature eggs and sperm. A child whose ovaries or testes are kept in a childhood state, especially one who goes straight to cross-sex hormones (as most puberty-blocked children do), is likely to be permanently sterile. They may also be unable to experience sexual pleasure when they have grown up.

A third is **skeletal problems in adulthood**. Puberty is a critical time for strengthening bones. Disrupting or delaying it is likely to result in lower peak bone density, and to greatly increase the risk of osteoporosis (brittle bones) and fractures later on.

And finally, there are worries about the impact of puberty blockers on **brain development**, which continues into the third decade of life. One study in sheep found that blocking puberty worsened memory and cognition. GnRHa may harm learning, memory, mood, and psychosexual maturation. Among the known side-effects of these drugs, when used for their licensed indications, are depression and suicidal thoughts.

Consent to the use of puberty blockers

Some clinicians think it is impossible for a child to consent to such drugs, in part because their long-term effects are not well understood and in part because no child can possibly fully comprehend what it would mean to spend the rest of their life unable to have children or enjoy sexual pleasure. There have been legal cases concerning such matters, notably a judicial review brought by Keira Bell against the Tavistock and Portman Trust in the UK in 2020. The initial findings – that valid consent would be impossible to get from a child under 13, and very hard to get from a child under 16 – was overturned on appeal in 2021. But the evidence given revealed serious questions about the lack of data on long-term outcomes in gender medicine, and safeguarding and ethical issues with puberty blockers. Such problems may lead patients to sue clinicians in the future.

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