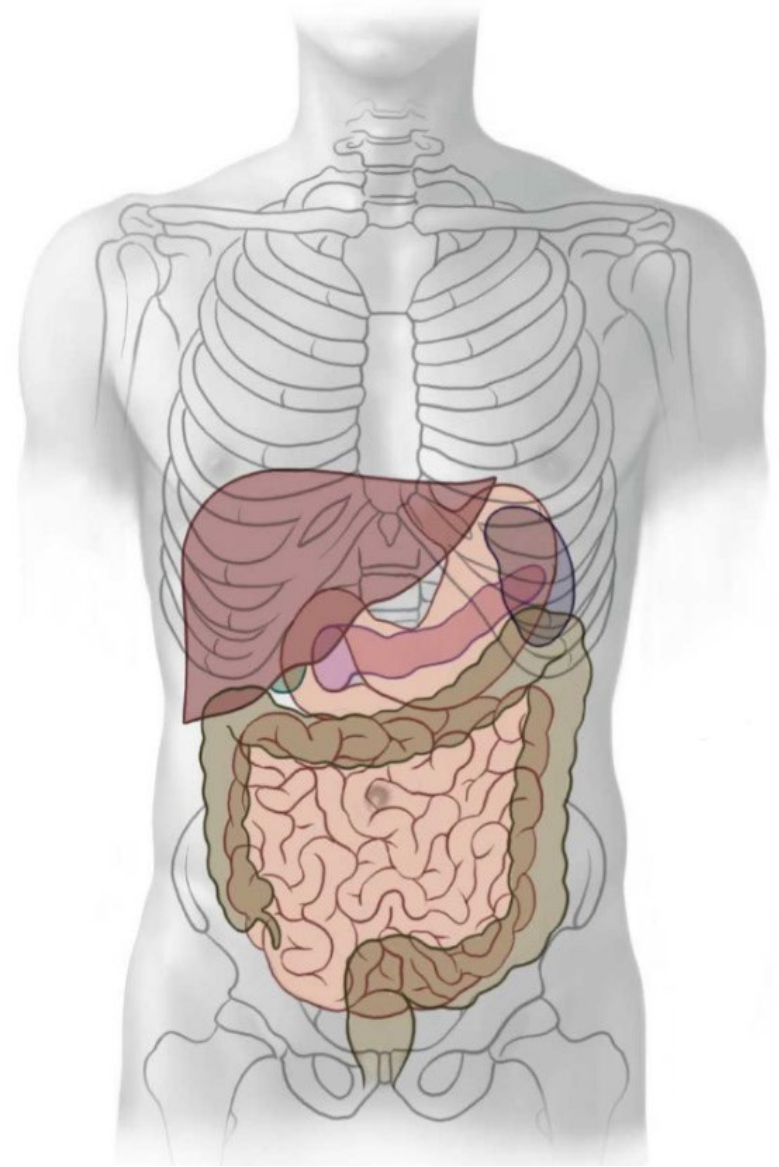


Sex and Gender Primer

Human Structure
Dr. Jessica Byram
Indianapolis

Dr. Valerie O'Loughlin
Bloomington



Session Learning Objectives (SLOs)

1. Compare and contrast the terms sex and gender.
2. Explain how both sex and gender fall along a continuum, rather than being binary constructs (understand that sex and gender are frequently presented as binary constructs).
3. Describe the use of inclusive terminology as it relates to anatomy and patient care and recognize that the terminology is nuanced and continuously evolving.
4. Explain how a nuanced understanding of sex and gender and the use of inclusive terminology may positively affect healthcare of all individuals.

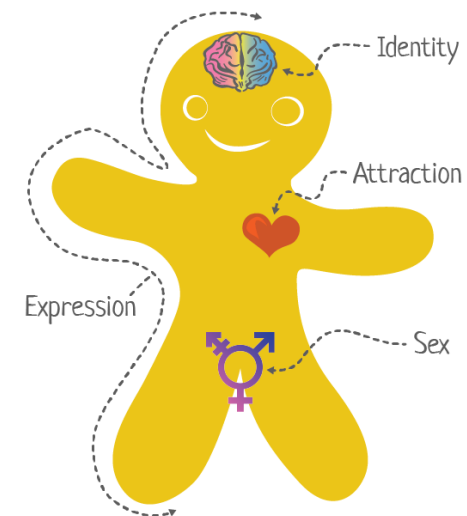
Sex: a set of biologic attributes in an organism determined by chromosomal pattern, gene expression, and hormones

- Genetic (genotypic) sex: sex of the individual based on **chromosomal pattern**
 - The two most common chromosomal patterns are:
 - XX = genetic female
 - XY = genetic male
 - (but there are others!)
- Phenotypic sex: based on the **APPEARANCE** of the internal/external genitalia
 - Testes and/or male-like external genitalia = phenotypic male
 - Ovaries and/or female-like external genitalia = phenotypic female
 - Phenotypic sex based on influence of both chromosomes and hormones (androgens vs. estrogen and progesterone)

Gender is a social construct – refers to how an individual identifies as and whom they are attracted to, based on socially constructed roles, norms and relationships

- **Gender Identity:** do you perceive yourself as man, woman, nonbinary?
 - **Cisgender:** alignment of a person's sex assigned at birth and their gender
 - e.g., genetic XX, gender identity is woman
 - **Transgender:** do not identify with their sex assigned at birth
 - e.g., genetic XY, gender identity is woman
- **Gender Expression:** do you express yourself as more masculine, feminine, gender-neutral?
- **Sexual Orientation:** to whom are you sexually attracted to?
 - Gay, lesbian, straight, bisexual, pansexual, asexual

The Genderbread Person v4 by its pronounced METROsexual.com



⊖ means a lack of what's on the right side

Gender Identity

Woman-ness
 Man-ness

Gender Expression

Femininity
 Masculinity

Anatomical Sex

Female-ness
 Male-ness

Identity ≠ Expression ≠ Sex
Gender ≠ Sexual Orientation

Sex Assigned At Birth
 Female Intersex Male

Sexually Attracted to... and/or (a/o)

Women a/o Feminine a/o Female People
 Men a/o Masculine a/o Male People

Romantically Attracted to...

Women a/o Feminine a/o Female People
 Men a/o Masculine a/o Male People

Genderbread Person Version 4 created and uncopyrighted 2017 by Sam Killermann

For a bigger bite, read more at www.genderbread.org

<https://www.genderbread.org>

Sex ≠ Gender

Sex

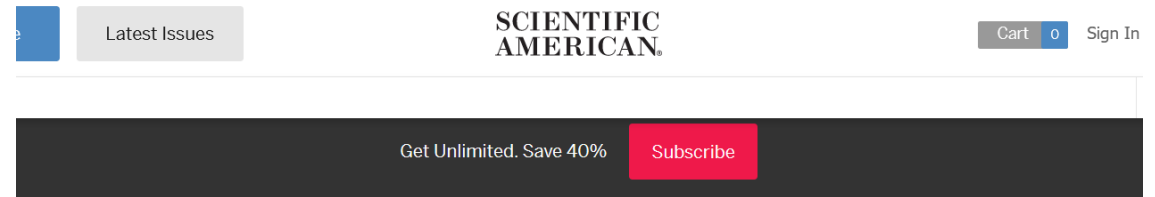
- Mostly **BIOLOGICAL** construct
- Patterns of chromosomes, genes, and hormones produce common phenotypes but variations exist
- Some societies established binarized sex as male/female even though not everyone fits into those categories

Gender

- Mostly **SOCIAL** construct
- Most identify with their sex assigned at birth
- Recent evidence suggests there may be a biological basis of gender
 - Prenatal and prepubertal sex hormones may play a role in determining gender identity

Gender AND Sex are NON-binary

- "Male" and "female" are the typical sex types assigned at birth
- “Man” and “woman” are common gender types
- These are oversimplifications and **BOTH** exist on a continuum.



The screenshot shows the top navigation bar of the Scientific American website. On the left, there is a blue square icon and a grey button labeled "Latest Issues". In the center, the "SCIENTIFIC AMERICAN." logo is displayed. On the right, there is a grey button labeled "Cart 0" and a "Sign In" link. Below the navigation bar is a dark grey banner with the text "Get Unlimited. Save 40%" and a red "Subscribe" button.

nature

SEX & GENDER

Sex Redefined: The Idea of 2 Sexes Is Overly Simplistic

Biologists now think there is a larger spectrum than just binary female and male

By Claire Ainsworth, Nature magazine on October 22, 2018

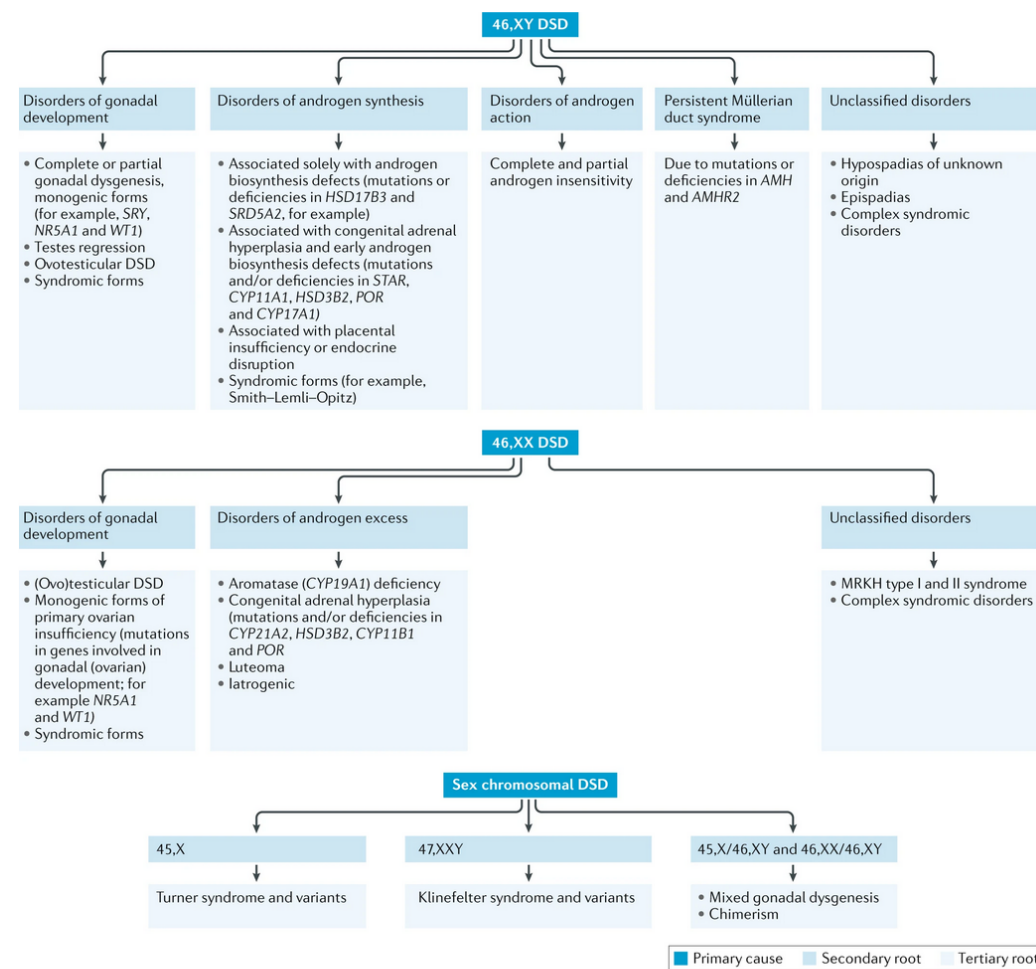
<https://www.scientificamerican.com/article/sex-redefined-the-idea-of-2-sexes-is-overly-simplistic1/>

Sex is Determined Along a Continuum

- Chromosomal (genetic) sex may be 46 XX/XY OR:
 - 45 X: Monosomy X (Turner Syndrome)
 - 47 XXY (and more): (Klinefelter Syndrome)
- Gene mutations may influence Y chromosome/SRY gene expression
- Hormone levels (during fetal period, childhood, adolescence) and/or sensitivity of tissues to hormones can affect phenotypic sex
 - Androgen excess: masculinizes external genitalia
 - Androgen insufficiency or insensitivity
- Differences of Sex Development (DSDs): genetic sex does not align with phenotypic sex
 - Also known as intersex disorders, intersex differences, and disorders of sex development

Fig. 1: Classification of DSDs.

From: Caring for individuals with a difference of sex development (DSD): a Consensus Statement



Disorders of sex development (DSDs) are classified into three main groups on the basis of the karyotype of the affected individual (primary cause). Each main group encompasses several subgroups (secondary root) that orient towards a specific diagnosis (tertiary root). MRKH, Mayer–Rokitansky–Küster–Hauser syndrome.

[Back to article page >](#)

The Gender Spectrum

A transgender woman is a person who was assigned male at birth based on her anatomy but who identifies as a woman.

A cisgender woman is a person who was assigned female at birth based on her anatomy and who also identifies as a woman.

A nonbinary person is someone who identifies as neither completely female nor completely male. Such an individual may identify with both genders or neither gender, or they may be gender fluid, meaning their gender fluctuates between female and male.

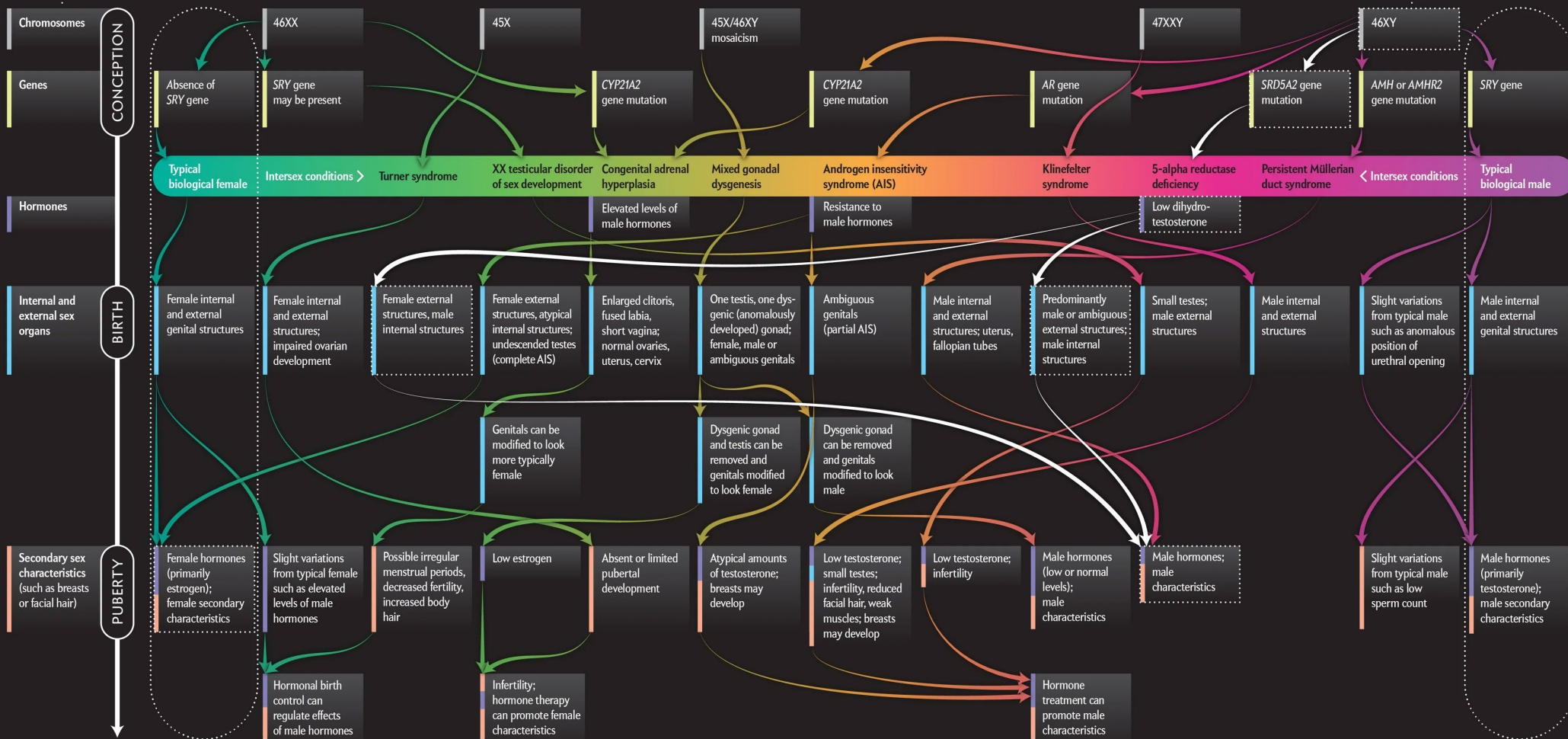
A transgender man is a person who was assigned female at birth based on his anatomy but who identifies as a man.

A cisgender man is a person who was assigned male at birth based on his anatomy and who also identifies as a man.

Sexuality refers to an individual's sexual orientation or to the kind of person to whom they are attracted. Sexuality is also a spectrum but is separate from both sex and gender.

5-alpha reductase deficiency is an intersex condition that can follow multiple pathways throughout development. Affected individuals have a chromosomal makeup of 46XY, like a typical biological male, but a genetic mutation causes a deficiency of the hormone dihydrotestosterone. Patients' external anatomy can vary, so an individual might be assigned to either sex at birth, but at puberty a surge of testosterone promotes male characteristics. As a result, patients who are raised as girls often end up identifying as male.

FACTORS THAT DETERMINE SEX



The Gender Spectrum

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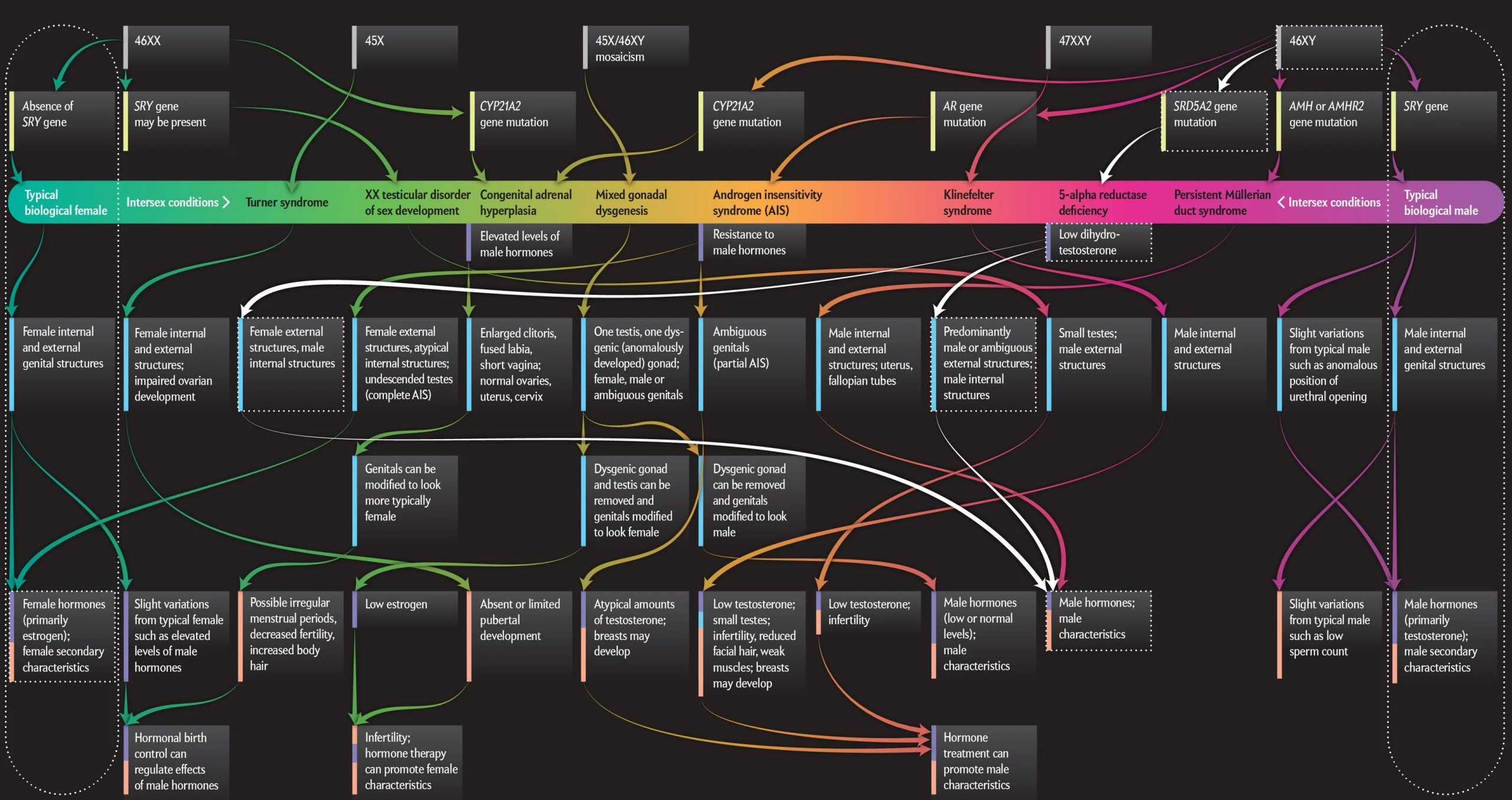
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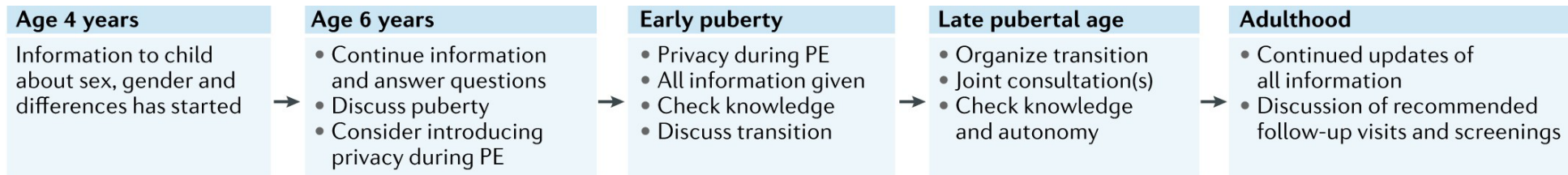
As future physicians, follow these guidelines for care of patients with a Difference of Sex Development (DSD)

EXPERT CONSENSUS DOCUMENT

Caring for individuals with a difference of sex development (DSD): a Consensus Statement

Martine Cools , Anna Nordenström, Ralitsa Robeva, Joanne Hall, Puck Westerveld, Christa Flück, Birgit Köhler, Marta Berra, Alexander Springer, Katinka Schweizer & Vickie Pasterski on behalf of the COST Action BM1303 working_group_1

Nature Reviews Endocrinology **14**, 415–429 (2018) | [Cite this article](#)



Timing and topics might vary largely between individuals

Information provided to parents

Information provided to affected individual

<https://doi.org/10.1038/s41574-018-0010-8>

How can you, as future healthcare professionals, be inclusive of sexual and gender diverse patients?

Sex and Gender Inclusive Terminology

- ~1-3% of the high school students identify as trans and/or non-binary
- ~1.7-4% of the population have intersex variations or differences in sexual differentiation (DSDs)
 - Health disparities linked to stigma, discrimination, and denial of services
- Trans and non-binary people may not identify with the binary labels of man/woman or male/female
- Language is foundational to transgender and non-binary inclusiveness
 - Use appropriate pronouns (default to they/them)
 - Use non-gendered, person-first and anatomy-specific language

Inclusive Terminology

Person-First Language

- Places the person before a trait, condition, or diagnosis
- Example: women need to undergo yearly cervical cancer screening.
 - *People with cervixes need to undergo yearly cervical cancer screening.*

Anatomy-Based Language

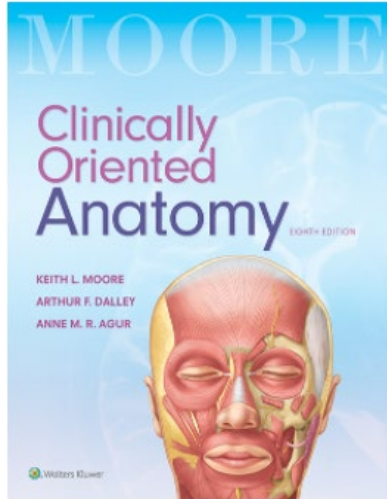
- Focuses on the organs, tissues, and structures themselves and in relation to each other, and not as “typical” person of any one sex assigned at birth.
- Example: the male gonad produces sperm.
 - *The testes produce sperm.*

Inclusive Terminology

- Linguistic practices are open to change as LGBTQIA+ advocates refine their perspectives on language
- Ensures gender is not associated with having or not having an organ
 - Uteruses are typically associated with women
 - What about a woman who's had a hysterectomy?
- Trans persons may have organs that do not align with their gender
 - Gender affirming surgery
 - Prostate gland is often left in situ in trans women

Terminology in Resources

- Most textbooks present sex as binary.
 - Calls for anatomy texts to discuss sex on a spectrum
- Sexual, reproductive, and genital system content is highly gendered
- Will take time to update



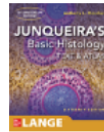
The term *perineum*¹ refers both to the area of the surface of the trunk between the thighs and the buttocks, extending from the coccyx to the pubis, and to the shallow compartment lying deep (superior) to this area but inferior to the pelvic diaphragm. The perineum includes the anus and external genitalia: the penis and scrotum of the male and the vulva of the female.

CLINICAL CORRELATES

Disorders of Sex Development

Because sexual development of males and females begins in an identical fashion, it is not surprising that abnormalities in differentiation and sex determination occur. **Ambiguous genitalia** (Fig. 16.36) may appear as a large clitoris or a small penis. Thus, a child may be born with a typically female appearance, but with a large clitoris (clitoral hypertrophy) or typically male with a small penis that is open on its ventral surface (hypospadias). In some cases, these abnormalities result in individuals with characteristics of both sexes. Advances in molecular genetics has allowed rapid and accurate diagnoses of the varying conditions caused by **disorders of sex development (DSD)**, but assigning gender is a more controversial issue.

In cases of **ovotesticular disorders of sex development** (formerly called true hermaphroditism), both ovarian and testicular tissues are present. Thus, gonadal tissue may be any combination of ovary, testis, or ovotestis, which is present in two-thirds of cases. Genitalia are always ambiguous, but there is a tendency toward masculinization. In 70% of cases, the karyotype is 46,XX.



Chapter 21: The Male Reproductive System

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Full Chapter Figures Tables

+ SUMMARY OF KEY POINTS

- INTRODUCTION



The male reproductive system consists of the testes, genital ducts, accessory glands, and penis (Figure 21-1). Testes produce sperm but also contain endocrine cells secreting hormones such as **testosterone**, which drives male reproductive physiology. **Testosterone** is important for spermatogenesis, sexual differentiation during embryonic and fetal development, and control of gonadotropin secretion in the pituitary. A metabolite of **testosterone**, dihydrotestosterone, also begins to act on many tissues during puberty (e.g., male accessory glands and hair follicles).

Affirmation of Identity

- Gender affirmation represents the social processes where individuals receive recognition and support for their gender identity.
- Inclusive language affirms and validates trans and non-binary identities.
 - Affirmation in across psychological, medical, and social domains is a significant predictor of positive health outcomes and self-esteem.
 - Inclusive sex education significantly reduces depression and suicidality in lesbian, gay, and bisexual adolescents.

Goals

1. Reduced gendered language and instead use person-first and/or anatomy-specific language.
2. If gender or sex is necessary, be cautious of generalizations and/or use an assigned sex/gender phrase.
3. Engage in self-directed learning to apprise yourself of inclusive language practices as they evolve over time.
4. Human Structure faculty will update local materials to meet Goals 1 & 2

To Learn More, check out these resources:

NOVA

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SEX: UNKNOWN

Share Your Story
My Life As An Intersexual
Fausto-Sterling:
Two Sexes Are Not Enough

How Is Sex Determined?
Hot Science

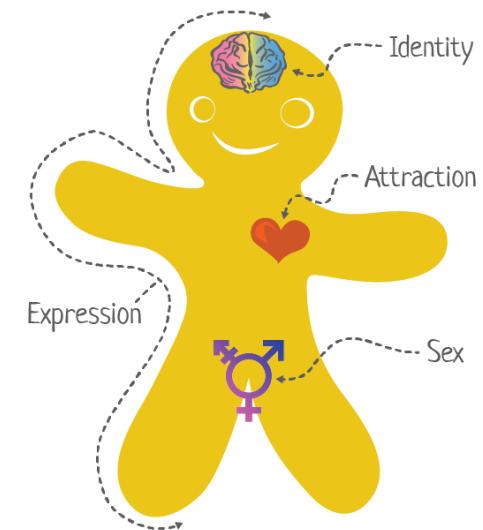
The Intersex Spectrum Resources

Welcome to the companion Web site to "Sex: Unknown," originally broadcast on Tuesday, October 30, 2001. The film investigates the complicated world of gender identity. Here's what you'll find online:

- My Life as an Intersexual**
Listen in as Max Beck, a man who was raised as a woman, talks about his experience as an individual of ambiguous gender.
- Share Your Story**
Do you have a personal story to share about a struggle with gender identity? In this confidential forum, relate your experience, or read the stories of others.
- Two Sexes Are Not Enough**
In this excerpt from her recent book *Sexing the Body: Gender Politics and the Construction of Sexuality*, Brown University biologist and historian Anne Fausto-Sterling argues for a redefinition of our two-sex-only world. She also offers new guidelines on how doctors should handle intersex babies.
- The Intersex Spectrum**
Intersex conditions have daunting names like androgen insensitivity syndrome and congenital adrenal hyperplasia. In this feature, we translate and describe the full range of conditions.
- How Is Sex Determined? (Hot Science)**
The sex of an egg cell is set as soon as it is fertilized, but what happens to that cell and the cells it divides into to make a baby boy or a baby girl? Find out here.

<http://www.pbs.org/wgbh/nova/gender/>

The Genderbread Person v4 by its pronounced METROsexual.com



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Woman-ness
 Man-ness

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Anatomical Sex

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Identity ≠ Expression ≠ Sex
Gender ≠ Sexual Orientation

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<https://www.genderbread.org/>


Learn more about how the complex interaction of sex, genes and gender affects many aspects of life!

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Sex Verification Testing of Athletes






Summary

This interactive explores the biology of sex determination and development in humans, set against the backdrop of the different sex testing policies implemented throughout sports history.

 [Start Click & Learn](#)

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Ongoing debates about the eligibility of certain female athletes to participate in women's events provide an entry point for students to learn the processes involved in human reproductive development. Students apply what they have learned to evaluate the results of different tests that have been used throughout sports history to qualify female athletes to compete.

The content is appropriate for general biology, anatomy and physiology, and introductory biology classes at the high school and college level.

(This interactive is an updated version of an older interactive that was called "Gender Testing of Athletes.")

Date Created 07/06/2018
Date Modified 07/06/2018

<https://www.hhmi.org/biointeractive/testing-athletes>

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