Scottish Council on Human Bioethics

15.06.2021 **Position Statement on:**

Gender Reassignment in Scotland

The Scottish Council on Human Bioethics (SCHB) recognises that discussions relating to gender reassignment are very sensitive in nature, meaning that a lot of compassion and understanding are necessary. However, because of the importance of the subject, it believes positions should not be based on emotions or subjective inclinations but should, instead, be built on informed evidence-based research.

The SCHB also recognises that very rare but genuine intersex conditions exist, in which different parts of a person's body may manifest different biological sexes. Thus, mismatches may occur between the chromosomal sex, the anatomical and physiological sex, the production of sexual hormones, as well as the biological brain sex of individuals which may give rise to gender dysphoria. Such mismatches, which require further research, should be examined on a case-by-case basis with a lot of sympathy. However, the SCHB remains deeply concerned about the possibility of gender reassignment outside of these rare and complex intersex conditions for the following reasons:

1. Definitions of sex and gender are not well understood in society

The SCHB notes that the way sex and gender are understood remains confusing. Questions can thus be asked, including:

- Whether the gender of a person is just the result of a subjective choice of this individual with respect to socially constructed characteristics of masculinity and femininity. If this is the case, any person could just choose to have any gender they want and be able to change this gender any number of times without any medical interventions. This would, to some extent, reduce the biological body, including the brain, to just a support for a person's gender decisions. In this case, the concept of the biological sex of a person would become unimportant. Biomedicine would have nothing to say about gender nor gender transitioning.

- Whether gender has a biological component. This would include genetic, anatomical, physiological and neurological aspects. In this case a physical body becomes an important part of who the person really is, in their very identity.

Sex determines which of the two biological categories of the original male-female dyad is present in a person. Gender, on the other hand, represents the way these biological differences between the sexes are lived-out in society. The challenge does not lie in the distinction between the two terms, but in *the separation of sex from gender*. However, the sheer fact that puberty suppression drugs and artificial cross-sex hormones are being considered in the treatment of gender dysphoria, means that biomedicine is seen as having a part to play in understanding the concept of gender. Thus, for many people, gender cannot just be considered as a social construct and is related to biological characteristics of one sex or another.

The SCHB also accepts that no specific all-encompassing gender characteristics (such as the way a person dresses) can be determined since these may vary, for example, throughout history and geographically. However, this does not mean that clear gender distinctions do not exist between men and women at a specific time and place in the way a man and woman relate to each other and in society.

2. Greater acceptance and recognition should be shown to all peoples and sub-groups

The SCHB believes that each person should be accepted and recognised for who they are. Thus, it supports a greater acceptance and recognition of all peoples and sub-groups as citizens equally deserving of full human rights. Society should be more tolerant towards differences; otherwise people may rebel or feel frustrated. Everyone should be respected regardless of their sexuality and gender. If it is

immediately obvious that someone is behaving differently, especially if a person has some characteristics usually attributed to persons of the opposite sex, toleration should be exercised by others in a free society unless this behaviour infringes on somebody else's rights.

3. Research into adolescent mental health should continue

The SCHB believes that the Scottish Government should undertake a thorough and wide-ranging review of all the latest published, peer-reviewed, research on the topic of gender dysphoria and gender transitioning with the assistance of leading academic experts. This is because the SCHB recognises that mental health care for adolescents is continually evolving, especially with respect to mood and anxiety disorders. Moreover, the distress experienced should be fully explored.

Psychological therapies using coercive tactics to force a change in gender identity have no place in health care. But 'affirmative' psychotherapy for gender dysphoria (which affirms the young person in another chosen gender) may also be harmful. The notion that all therapy interventions for gender dysphoria can be classified into 'conversion' to another gender or 'affirmation' of another chosen gender betrays a misunderstanding of the complexity of psychotherapy. It should also be noted that a number of persons affected by gender dysphoria have poor underlying mental health - a situation which should continue to be examined. In addition, the outcomes of psychotherapeutic treatments and biomedical interventions should be monitored so that evidence-based standards of care, that allow patients and clinicians to make fully informed decisions about how best to alleviate gender dysphoria, can be developed and put into practice.[1]

The SCHB notes that between the time the *Gender Recognition Act 2004* came into force and 2018, a total of 4,910 persons have been issued a Gender Recognition Certificate[2] representing about one person in 13,500 in the UK.

4. Informed consent and gender reassignment

The SCHB is of the opinion that appropriate informed consent should always be given by persons wanting to legally change their gender in order to protect the important concept of autonomy and voluntarism. This will ensure that individuals are fully aware of the possible risks and consequences of the procedure and that they are capable of understanding the nature of a change in gender. Thus, all the following elements are required:

1. **Competence**: Persons' capacity for decision making.
2. **Disclosure**: The content and format of what persons are told during the consent discussion.
3. **Comprehension**: How much given information persons understands.
4. **Voluntariness**: The ability for persons to make a choice without being unduly pressured or influenced to make a particular choice.
5. **Implementation**: The ability for persons to implement their decisions.

The very fact that some adult transsexual persons have undergone gender reassignment treatments, which they have regretted, may indicate that the principle of informed consent may not always be properly implemented.

5. Applicants for legal gender recognition should produce medical evidence that they have lived in their acquired gender for a defined period of time

The SCHB believes that before a person can be considered for gender reassignment, this individual should be 18 years old or over and have been living for a least two years in the opposite gender. Moreover, medical and psychological evidence should be presented to satisfy an independent Gender Recognition Panel that these adults have lived in their acquired gender throughout the period required.

[1] D'Angelo, R., Syrulnik, E., Ayad, S. *et al.* 'One Size Does Not Fit All: In Support of Psychotherapy for Gender Dysphoria', *Arch Sex Behav* (2021) 50, 7–16.

[2] https://www.ons.gov.uk/economy/environmentalaccounts/articles/whatisthedifferencebetweensexandgender/2019-02-21; https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/721642/GEO-LGBT-factsheet.pdf;
https://www.citizensadvice.org.uk/law-and-courts/discrimination/protected-characteristics/gender-reassignment-discrimination/; https://www.equalityhumanrights.com/en/advice-and-guidance/gender-reassignment-discrimination.

Furthermore, caring, non-judgemental and holistic psychological support should be available to help with the identification and management of any eventual mental health challenges.

Risk factors for regret, such as a lack of support from relatives, concerning gender reassignment are well-known,[3] meaning that a thorough assessment is required at the very beginning of the reassignment process with follow-up counselling during and after the process. This is important since some gender reassignment biomedical procedures are irreversible.

6. A self-declaratory system of legal gender recognition does not sufficiently protect the individual wanting to transition

The SCHB opposes the introduction of a self-declaratory system for legal gender recognition because such a system is insufficient to protect individuals who want to transition as they address the momentous medical and psychological aspects involved in a change in gender identity. In other words, the only way applicants can demonstrate that they have appropriately thought through and understand the procedure is to show that they:

- Are of sound mind and able to make their own decisions about treatment;
- Have a settled and solemn intention of living in the preferred gender for the rest of their lives;
- Understand the consequences of the transition;
- Make the application of their own free will.

This means that they would have to satisfy an independent Gender Recognition Panel that they do indeed want to transition.

7. Young persons below 18 years of age should not be able to reassign their gender

It has been suggested that young persons below the aged of 18 should be able to apply for legal recognition of their acquired gender using a proposed self-declaration process. This, it is proposed, would be consistent with the age at which young people can exercise other rights under Scottish law. For example, at age 16 an individual can:

- Leave home without the consent of his or her parent or guardian;
- Get a full-time job and pay National Insurance;
- Consent to surgical, medical or dental procedures and treatments;
- Marry or register a civil partnership;
- Consent to lawful sexual activity;
- Apply for a UK passport;
- Vote in elections to the Scottish Parliament and Scottish local authorities;
- Get a skin piercing;
- Record a change of name.

In response the SCHB notes that:

Questions about whether and how to treat young persons with gender dysphoria are particularly contentious. Some seem to go through a natural and temporary phase of wanting to live in the other gender but appear to naturally 'grow out of it' to develop a congruent gender identity.

Rates of persistence of gender dysphoria from childhood into adolescence or adulthood vary. In those identified to be male at birth, persistence has ranged from 2 to 30 percent. In individuals identified as female at birth, persistence has ranged from 12 to 50 percent.[4] Follow-up studies indicate that, overall,

[3] Landén M, Wålinder J, Hambert G, Lundström B. Factors predictive of regret in sex reassignment. *Acta Psychiatr Scand*. 1998, 97(4):284-9. See also: https://en.wikipedia.org/wiki/Detransition.

[4] DSM-5. American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, 5th edn. Washington DC: American Psychiatric Publishing, 2013, p. 455.
A 2019 clinical assessment found that 9.4% of patients being treated with adolescent-emerging gender dysphoria either ceased wishing to pursue medical interventions or no longer felt that their gender identity was incongruent with their assigned sex at birth within an eighteen-month period, See: Anna Churcher Clarke, Anastassis Spiliadis, 'Taking the lid off the box': The value of

the distress experienced by about 85% of young people affected by gender dysphoria disappears either before or early in puberty.[5] However, the rates in the individual studies vary widely.[6] Thus, for the majority of young persons, gender dysphoria desists over time as they enter and progress through adolescence,[7] though a significant proportion of them go on to identify as bi-sexual or same-gender attracted.[8]

Moreover, because the brains of adolescents and young adults are continuing to develop with the associated behavioural changes,[9] it is unlikely that they have the same capacity for decision making, voluntariness, and the ability to make balanced decisions as more mature adults. This means that they may not be able to give appropriate informed consent for certain momentous decisions requiring mature reflection such as with a change of gender. Accordingly, individuals under 18 years of age in Scotland cannot:

- Vote in General Elections in the UK.
- Stand for election as a local councillor, MP or MSP.
- Serve as a juror.
- Buy alcohol in licensed premises and consume alcohol in a bar.
- Buy cigarettes and tobacco.
- Buy a lottery ticket.
- See, rent or buy any film.
- Buy or possess fireworks.
- Place a bet.
- Get tattooed.
- Hire or buy a sunbed.
- Hold a licence to drive a medium-sized goods vehicle.
- Become a policeman or policewoman
- Train to become an army officer

In addition, a person must wait until they are:

21 years old to:

- Hold a license to drive large goods vehicles and minibuses.
- Supervise a learner driver.
- Be sent to an adult prison.

24 years old to:

- Drive very large vehicles if no other exceptions apply.

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extended clinical assessment for adolescents presenting with gender identity difficulties, *Clinical Child Psychology and Psychiatry*, Volume: 24 issue: 2, pp 338-352.

[5] Ristori, J and Steensma T.D 'Gender dysphoria in childhood' in *International Review of Psychiatry, Gender dysphoria and gender incongruence*, 2016, Vol 28, Issue 1.

[6] For instance, a 2008 study indicated that, in 39% of children, the feelings did continue beyond the onset of puberty whereas older studies from before 2000 had very much lower rates for children continuing to experience distress after the onset of puberty. It is thought that pre-2000 studies included children who would not now be considered to be experiencing gender dysphoria. The studies may also be affected by the small clinical population of children with gender dysphoria – studies looking at whether gender dysphoric feelings persisted had a total population of 317 people, See: Wallien and Cohen-Kettenis. Psychosexual outcome of gender-dysphoric children. *Journal of the American Academy of Child and Adolescent Psychiatry,* 2008, 47, 1413–1423.

[7] Zucker KJ. 'Measurement of psychosexual differentiation', *Arch Sex Behav*, 2005, 34(4):375-388.

[8] DSM-5. American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, 5th edn. Washington DC: American Psychiatric Publishing, 2013, p. 455.

[9] Barbalat G et al., Risk-taking in adolescence: A neuroeconomics approach, *Encephale*, 2010, 36(2):147-54.
Anonymous, 'The adolescent brain: Beyond raging hormones', *The Harvard Health Blog,* March 2011, https://www.health.harvard.edu/mind-and-mood/the-adolescent-brain-beyond-raging-hormones

In other words, just because people want more rights under the age of 18 does not mean that they have the maturity to understand the responsibility that goes with them.

As a result, the SCHB does not agree that persons below the age of 18 should be able to apply for, and obtain, legal recognition of their acquired gender. Their social development, while at a very important formative phase, can be affected by the many experiences relating to self-confidence, academic achievement and peer pressure. In other words, it is impossible to be certain that the young person is capable of understanding the momentous consequences of such a change which is required for all the protective elements included in the principle of informed consent to be fulfilled.

8. Puberty suppression in children is inappropriate

In order to suppress puberty, it has been suggested that children between the ages of 10 and 13 may be given monthly injections of hormone blockers. These would then prevent the ovaries in females and testes in males from making the required concentrations of male and female hormones in order to delay puberty and allow time for the gender-conflicted child to enter adolescence and make a more considered decision. They can then affirm either their biological birth sex or their cross-gender identity. In this way, it is proposed that if they do decide to change their gender identity, they can begin taking cross-sex hormones.

In response, the SCHB notes that:

Given that gender dysphoria will desist naturally in the majority of children as puberty progresses with the development of the relevant hormones without active intervention, puberty suppression should only be given in exceptional circumstances. Indeed, puberty blockers may result in long-term physical and psychological effects.

This means that the SCHB agrees with the judges in the *Bell v Tavistock [2020]* UK high court decision with respect to puberty blockers and their concern relating to the protection of young persons from any rash or ill-informed decisions relating to complex and serious life-long consequences. The judges indicated that given the experimental nature of the treatment provided: [10]

- It is highly unlikely that a child aged 13 or under would be competent to give consent to the administration of puberty blockers.

- It is doubtful that a child aged 14 or 15 could understand and weigh the long-term risks and consequences of the administration of puberty blockers.

- A child under 16 may only consent to the use of medication intended to suppress puberty where he or she is competent to understand the nature of the treatment.

- For a child aged 16 and over, the legal position is that there is a presumption that they have the ability to consent. However, given the significance of the treatment proposed, the court recognised that clinicians may also regard these as cases where the authorisation of the court should be sought prior to commencing the clinical treatment.

Moreover, the SCHB is concerned about the unregulated availability of certain puberty blockers online.

9. Cross-sex hormones in children are inappropriate

Because of the risks and the irreversibility of some of the effects of cross-sex hormones (such as growth of breast tissues), these should not be used on children under the age of 16 for the same reasons as those presented for puberty blockers.

[10] Paragraph 151, https://www.judiciary.uk/wp-content/uploads/2020/12/Bell-v-Tavistock-Judgment.pdf

10. Psychological support for the parents of young people with gender dysphoria

A strong ethical basis exists for including parents and guardians of young people in a transparent decision-making processes with regard to gender matters. Much of the focus has been on young people as autonomous individuals instead of viewing them as part of familial and domestic contexts in which the help and support of parents is an important (although too often lacking) aspect.

11. Non-binary persons

It has been suggested that a non-binary person's gender identity is not that of a man or a woman. In this regard, the UK's Equality and Human Rights Commission noted that 0.4% of persons, who responded to a survey about their gender identity, reported that they did not identify themselves as men or women.[11]

A further survey of persons who identify themselves as non-binary indicated that since their gender identities have no legal recognition, they are sometimes refused services and that their lack of inclusion and visibility may have adverse impacts, for example, on their self-esteem and mental health.[12] It is thus suggested that ensuring non-binary persons are not excluded could increase their acceptance and reduce the levels of discrimination experienced.

In response, the SCHB notes that:

Insufficient evidence-based research exists relating to the psychological circumstances of non-binary individuals.[13] It is thus impossible for the SCHB to discuss the recognition of non-binary individuals because of the very limited peer-reviewed evidence relating to the psychology of such persons.

The SCHB would also like to obtain further evidence relating to the lack of inclusion and recognition in society of persons who define themselves as non-binary.

12. Protection of women

The SCHB notes that a range of exceptions may exist in the UK *Equality Act 2010* which may be used to protect women, that might in some specific cases require the exclusion of some individuals identified as males at birth, if the conditions within the exception are met - cases which must be clarified by government. The SCHB would also like to question whether any of these rights for women will be upheld. For example, a loophole may exist for the trans-person to impose their demands.

13. Possibility of persons to change their minds

The SCHB would like to question the outcomes for young persons, who may undergo gender reassignment at a young age through full reassignment / surgery but who then change their minds at a later date when they become more mature. Would they then be:

- Prosecuted for making a false declaration?
- Able to transition back?
- Able to pursue a legal claim for damages in relation to a procedure that has failed?

[11] At https://www.equalityhumanrights.com/sites/default/files/technical_note_final.pdf.

[12] Source is a survey of 895 non-binary people in 2015, available at: http://www.scottishtrans.org/non-binary/.

[13] American Psychological Association, 'Guidelines for Psychological Practice With Transgender and Gender Nonconforming People', *American Psychologist*, 2015, 70(9), 832–864.

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Gender Reassignment in Scotland

1. Definitions and general information

Sex: refers to whether a person is considered biologically male or female. This includes biological aspects relating to the body and whether an individual generally has:

- Male (XY) or female (XX) sex chromosomes in all their cells.
- Male testes or female ovaries secreting sex hormones.[14]
- Male or female anatomical and physiological aspects (interacting with the hormones secreted by the testes or ovaries).
- A male or female biological brain (which interacts with the hormones secreted by the testes or ovaries).[15]

Intersex: a general term used to describe a person who may have biological attributes of both sexes. A number of intersex conditions exist including when a mismatch may exist between the sex chromosomes, brain sex and the anatomical body.

Disorders of sex development: comprise a heterogenous group of congenital conditions including chromosomal, hormonal, and anatomic abnormalities.

Non-binary: an umbrella term for people who do not identify themselves as male or female.

Gender: refers to those roles and behaviours typically associated with masculinity and femininity in society.[16] It is the outcome of the interaction of factors and processes that operate on a variety of biological and psychosexual levels. A person's gender is always based on a person's sex which includes his or her chromosomal, anatomical, and neurobiological constitution.

Gender identity: relates to how persons see themselves in terms of being male, female or somewhere in between or beyond these categories.

Acquired gender: the gender in which an applicant is living and seeking recognition.

Sexual identity: a generic term for people's self-categorisation in accordance with their physical sex, feelings and biography (including how they were brought up as children).

Gender Dysphoria (also known as gender identity disorder or gender incongruence): refers to discomfort or distress caused by a discrepancy between a person's gender identity and that person's sex assigned at birth.

Cisgender or Cis: gender identity which corresponds to the biological sex they were assigned at birth.

[14] Italian National Bioethics Committee, Minor's Sexual Differentiation Disorders: Bioethical Aspects, 25th February 2010, http://bioetica.governo.it/media/3287/p86_2010_minor-sexual-differentiation_en.pdf

[15] Generally, male and female brains are biologically different from a cellular (all neurones have their sex chromosomes), hormonal, structural, and functional perspective (see the following section 2.2 'Biological differences between male and female brains').

[16] WHO defines 'gender' as "the socially constructed characteristics of women and men", http://www.who.int/gender-equity-rights/knowledge/glossary/en/

Transgender (or Trans): umbrella terms used to describe a diverse range of people who believe that their gender does not fully correspond with the biological sex they were assigned at birth. Transgender people can also identify themselves as heterosexual, homosexual, bisexual[17], pansexual[18], polysexual[19], asexual, or non-binary.

Transsexual: someone who transitioned to live in the opposite biological sex to the one assigned at birth.[20]

Genderfluid: term used by persons who believe that their experience of gender is not fixed as male or female but may fluctuate along a continuum and/or encompass aspects of both gender identities.

Gender bending: intentionally crossing or 'bending' gender roles.

Transvestism: dressing or adopting the presentation of the other biological sex. Not generally associated with gender dysphoria and may not identify as transgender.

Gender reassignment: legal intervention and changes which reassign gender to what is believed it should be.

Transitioning: steps transgender persons take to live in the gender with which they identify.

Sex reassignment surgery: an often-irreversible surgical procedure by which the physical appearance and function of persons' sexual characteristics are altered to resemble those socially associated with their identified gender.[21] These include:

Feminization surgeries, such as:

- construction or reconstruction of the vagina
- feminizing augmentation mammoplasty
- testicular removal
- facial feminization surgery
- voice feminization surgery

Masculinization surgeries, such as:

- double mastectomy
- phalloplasty
- surgical removal of the uterus

Neuroplasticity: The ability of the brain to adapt to its environment and change with experience. These physical changes range from individual neuron pathways making new connections to a whole systematic remapping.

2004 Act: the UK *Gender Recognition Act 2004*.

[17] A literal dictionary definition of bisexuality, due to the prefix bi-, is sexual or romantic attraction to two sexes (males and females), or to two genders (men and women).

[18] Pansexuality, composed with the prefix pan-, is the sexual attraction to a person of any sex or gender.

[19] People who refer to themselves as polysexual may be attracted to transgender people, third gender people, two-spirit people, genderqueer people, plus people who are intersex. However, polysexuality does not have to be the exclusive attraction towards non-binary genders or sexes, though it can be.

[20] http://www.medicaldaily.com/what-difference-between-transsexual-and-transgender-facebooks-new-version-its-complicated-271389

[21] In addition, patients may need to follow a lifelong course of masculinising or feminising hormone replacement therapy.

Gender Recognition Certificate: Under the *2004 Act*, a Gender Recognition Certificate provides legal recognition of an applicant's acquired gender. When this is issued, the applicant's legal sex also changes.

Gender Recognition Panel: deals with applications for legal gender recognition made under the *Gender Recognition Act 2004*.

2. Principles and purpose

2.1. Causes of Gender Dysphoria

Most people experience congruence between their biological sex and their sense of gender identity, but for a small number of persons this is missing, sometimes from an early age, giving rise to a degree of distress, or 'dysphoria'. Prevalence studies indicate that fewer than 1 in 10,000 adult natal males and 1 in 30,000 adult natal females meet the criteria for gender dysphoria, but estimates vary widely.[22]

One unifying theory or reason accounting for gender dysphoria seems unlikely. Moreover, the cause and mechanism may be multifactorial with contributions from both nature and nurture including genetic, neurodevelopmental, psychosocial, and environmental factors. In other words, gender dysphoria is very likely to be caused by a combination of elements and most people with the condition will be on a spectrum.[23] However, more research is required to understand the exact pathways.[24] It is also worth recognising that the manner in which brain structure and function (together with the effects of sex hormones on the brain) may direct towards male or female dispositions or behaviours is still not well understood and requires further research.[25]

Gender dysphoria is, therefore, a complex condition and may be influenced by:

- The way sex is based on different biological factors, such as the chromosomes, the anatomy, the effects of sex hormones, and the brain.
- How biological mismatches may occur between the chromosomes, the anatomy and the brain;
- The manner in which the sex of a person is determined when a sexual mismatch exists between the chromosomes, the anatomy and the brain;
- How the concept of gender is understood in society;
- The way gender is influenced by sexual attributes;
- The way gender is influenced by social and environmental factors.

2.2. Biological differences between male and female brains

All human beings begin embryonic life in a similar manner in that, for the first 5-6 weeks of gestation, only the genes on the X chromosome of the embryo are generally expressed. This means that a developing human embryo has no anatomical nor hormonal sex until the sex-determination process begins at about 6 weeks. After this stage, for an embryo with X and Y chromosomes some genes on the X chromosome are repressed and some on the Y chromosome are expressed. Amongst other effects, this releases male hormones, such as testosterone, which begins to interact with many organs (including the brain causing neurological differences at about halfway through gestation). If an embryo

[22] Zucker KJ et al. Gender Dysphoria in Adults, *Annu Rev Clin Psychol.* 2016;12: 217-47.
For natal adult males, prevalence ranges from 0.005% to 0.014%, and for natal females, from 0.002% to 0.003%. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, 2013: p.454.

[23] Claire Ainsworth, Sex redefined: The idea of two sexes is simplistic. Biologists now think there is a wider spectrum than that, *Nature* 518, 288–291 (19 February 2015).

[24] Saleem F, Rizvi SW (December 2017). "Transgender Associations and Possible Etiology: A Literature Review". *Cureus*. 9 (12): e1984.

[25] See for example:
- Zhou JN et al. A sex difference in the human brain and its relation to transsexuality. *Nature*.1995; 378:68-70.
- Savic I et al. Sexual differentiation of the human brain in relation to gender identity and sexual orientation. *Prog Brain Res.* 2010;186:41-62.
- Shawna Williams, 'Are the Brains of Transgender People Different from Those of Cisgender People?', *The Scientist,* 1 March 2018.
- Gooren L. The biology of human psychosexual differentiation. Horm Behav. 2006 Nov;50(4):589-601.

does not have a Y chromosome, on the other hand, significant male hormone concentrations do not occur. This process is called biological sexual differentiation.[26]

An increasing number of sexual differences between the brains of men and women are being discovered at all levels, from structural, functional, genetic and epigenetic differences to synaptic, cellular and system differences which have been demonstrated on large scale cohorts.[27] This research, however, is controversial and some experts disagree with the findings[28] because of the difficulty in determining maleness and femaleness and the significant spectrum that exists relating to these characteristics in society. With time, however, it is likely that better and more conclusive results will be available.

Neuroplasticity

It should be noted that the brain can also adapt, physically, to its environment and change with experience which is defined as neuroplasticity. These physical changes range from individual neuron pathways making new connections, to a whole systematic remapping. It is then possible to ask whether a certain brain-wiring caused a person to behave in a certain way or whether the behaviour caused this person's brain-wiring to change.[29]

Innate differences in the wiring of the brain

Whether or not the eventual brain-wiring of sex is inborn has been a matter of debate and no agreement exists either way. This also means that it is uncertain whether some cases of gender dysphoria may be cases of intersex (as discussed later). Interestingly, other kinds of brain-wiring also proved controversial in the past such as with handedness which was just seen (mistakenly) as being a learned behaviour. In fact, handedness can already be determined (with an accuracy ranging from 89-100%) in 18-week-old foetuses by looking at the manner in which they move their hands and arms.[30] For example, ultrasonographic evaluations of the frequency of thumb-sucking may be used as a sign for postnatal hand dominance.[31]

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[26] http://www.soc.ucsb.edu/sexinfo/article/sex-determination-and-differentiation; http://genderedinnovations.stanford.edu/case-studies/genetics.html#tabs-3

[27] See for example:
- Miller DI, Halpern DF (January 2014). "The new science of cognitive sex differences". *Trends in Cognitive Sciences*. 18 (1): 37–45.
- Prager E. 'Addressing Sex as a Biological Variable', *Journal of Neuroscience Research*. 2017; 95(1-2):11.
- Ritchie SJ, *et al.* 'Sex Differences in the Adult Human Brain: Evidence from 5216 UK Biobank Participants', *Cereb Cortex*. 2018. 28(8):2959-2975.
- Gennatas ED, *et al.* 'Age-related effects and sex differences in gray matter density, volume, mass, and cortical thickness from childhood to young adulthood', *J Neurosci,* (2017) 37:5065–5073.
- Cahill L., 'Why sex matters for neuroscience', *Nature Reviews. Neuroscience*. 2006, 7 (6): 477–84;
- Ingalhalikar M. *et al.* 'Sex differences in the structural connectome of the human brain', *Proc Natl Acad Sci USA*. 2014, 111(2): 823-8;
- Ruigrok, A.N., *et al.* 'A meta-analysis of sex differences in human brain structure', *Neurosci Biobehav Rev,* 2014, 39, 34-50;
- Daphna J. *et al.* 'Sex beyond the genitalia: The human brain mosaic', *Proc Natl Acad Sci USA*. 2015,112 (50): 15468–15473.
- McCarthy MM. 'Multifaceted origins of sex differences in the brain', *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences.* (2016) 371 (1688): 20150106.
- Mathew, J., Masson, G.S. & Danion, F.R. 'Sex differences in visuomotor tracking', *Sci Rep* (2020) 10, 11863.
- Siyuan Liu, et al., 'Integrative structural, functional, and transcriptomic analyses of sex-biased brain organization in humans', *Proceedings of the National Academy of Sciences* 2020, 117 (31) 18788-18798.

[28] See for example:
- Rippon G, Jordan-Young R, Kaiser A, Joel D, Fine C. Journal of neuroscience research policy on addressing sex as a biological variable: Comments, clarifications, and elaborations. *Journal of Neuroscience Research*. 2017; 95(7):1357-9.
- Rippon G, *The Gendered Brain: The New Neuroscience that Shatters the Myth of the Female Brain*, The Bodley Head (2019).

[29] This may happen, for example, in the case of gender behaviour or even with left or right handedness. Nurture versus Nature: Long-Term Impact of Forced Right-Handedness on Structure of Pericentral Cortex and Basal Ganglia, Stefan Klöppel, Jean-Francois Mangin, Anna Vongerichten, Richard S. J. Frackowiak and Hartwig R. Siebner, Journal of Neuroscience, 3 March 2010, 30 (9) 3271-3275.

[30] Parma, V., Brasselet, R., Zoia, S. *et al.* The origin of human handedness and its role in pre-birth motor control. *Sci Rep* **7,** 16804 (2017).

[31] Hepper, P. G., Wells, D. L. & Lynch, C. Prenatal thumb sucking is related to postnatal handedness. *Neuropsychologia* **43**, 313–

In the past, because of cultural and social pressures, many left-handed children were forced to write and perform other activities with their right hands – a requirement which, it has been suggested, resulted in a number of problems in the developing left-handed child. These included learning disorders, dyslexia,[32] stuttering,[33] and other speech disorders.[34]
Conversion from left-handedness to right-handedness can be successful with consistent daily practice in a variety of manual activities but this does not generally change the underlying and inborn left handedness brain-wiring of the person.[35] Until some decades ago, left-handed children who attended German schools were often forced to use their right hand for writing. Because of life-long practice, these converted left-handers became as proficient at right-hand writing as innate right-handers. Yet most of these converted left-handers continued to use their left hand for other manual skills, which were less subject to social control. Thus, a forced change in the brain pattern does not take place completely.[36]

About 10% of the population is left-handed[37] and a very large study has found that men are 23% more likely to be left-handed than women.[38] The causes are poorly understood and are likely to be a combination of genetics, biology and the environment. For example, studies have indicated that individuals who had in-utero exposure to certain sex hormones (such as the synthetic estrogen: diethylstilbestrol) used between 1940 and 1971 were more likely to be left-handed compared to a clinical control group. It was suggested that such hormones may affects the developing brain of the foetus, including the parts that may result in left-hand dominance.[39]

Moreover, it has been shown that individuals diagnosed with autism spectrum disorder are significantly more likely to be left-handed than right-handed individuals.[40] Some studies also indicate that individuals with gender dysphoria are more likely to be on the autism spectrum than non-dysphoric individuals.[41]

Postnatal hormonal effects on the brain

Changes to the brain could also be dependent on the quantity and manner in which the different sex hormones produced in certain part of the body affect the brain. Indeed, not only do hormones influences the physiology of the sexual body but they also alter how the body functions. It is a very complex system, and it is important not to reduce the sex of a person to just some characteristics, such

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315 (2005).

[32] Orton, S.T (1937). *Reading, writing, and speech problems in children*. *Nature*. **141**. London: Chapman and Hall. p. 997.

[33] Lewis, Ruth (May 1949). "The psychological approach to the preschool stutterer". *Can Med Assoc J*. **60** (5): 497–500.

[34] Ballard, PB (1912). "Sinistrality and speech". *Journal of Experimental Pediatrics*. **1**: 298–310.

[35] Kloppel, S.; Vongerichten, A.; Eimeren, T. v.; Frackowiak, R. S. J.; Siebner, H. R. (2007). "Can Left-Handedness be Switched? Insights from an Early Switch of Handwriting". *Journal of Neuroscience*. **27**(29): 7847–53.

[36] Hartwig R. Siebner et al. Long-Term Consequences of Switching Handedness: A Positron Emission Tomography Study on Handwriting in “Converted” Left-Handers, Journal of Neuroscience 1 April 2002, 22 (7) 2816-2825;

[37] Papadatou-Pastou, Marietta, et al. ‘Human handedness: A meta-analysis’, *Psychological Bulletin* (2020) 146 (6): 481–524.

[38] Papadatou-Pastou M, Martin M, Munafò MR, Jones GV ‘Sex differences in left-handedness: a meta-analysis of 144 studies’, *Psychological Bulletin* (2008) 134 (5): 677–699.

[39] Titus-Ernstoff, Linda; Perez, Kimberly; Hatch, Elizabeth E.; Troisi, Rebecca; Palmer, Julie R.; Hartge, Patricia; Hyer, Marianne; Kaufman, Raymond; Adam, Ervin; Strohsnitter, William; Noller, Kenneth; Pickett, Kate E.; Hoover, Robert (March 2003). "Psychosexual Characteristics of Men and Women Exposed Prenatally to Diethylstilbestrol". *Epidemiology*. **14** (2): 155–160.

[40] Rysstad, A. L. & Pedersen, A. V. Non-right-Handedness within the autism spectrum disorder. *Journal of Autism and Developmental Disorders.* **46**, 1110–1117 (2015).
Casasanto, D. Sleight of hand. *Science* **357**, 1246 (2017).

[41] Warrier, V., Greenberg, D.M., Weir, E. *et al.* ‘Elevated rates of autism, other neurodevelopmental and psychiatric diagnoses, and autistic traits in transgender and gender-diverse individuals’, *Nat Commun* (2020) 11, 3959.
de Vries, A.L.C., Noens, I.L.J., Cohen-Kettenis, P.T. *et al.* Autism Spectrum Disorders in Gender Dysphoric Children and Adolescents. *J Autism Dev Disord* **40,** 930–936 (2010);
VanderLaan, D.P., Leef, J.H., Wood, H. *et al.* Autism Spectrum Disorder Risk Factors and Autistic Traits in Gender Dysphoric Children. *J Autism Dev Disord* **45,** 1742–1750 (2015).

as their chromosomes or anatomy. Instead, it may be more prudent to see the sex of a person in a holistic physical manner.

2.3. Brain Development in Young Persons

Adolescence and young adulthood are characterised by pronounced changes in motivated behaviour, which may result in an increased tendency to approach novel experiences thereby enabling positive reinforcement, but which may also result in risky behaviour. Brain regions can actually be identified which are involved in processing rewards in adolescents and functional changes in reward-related brain activity can be examined. As a result, adolescents and young adults are generally less averse to risk than more mature adults and have different cognitive control.[42]

Two important neurodevelopmental mechanisms are thought to play a role in the genesis of risk-taking behaviours in adolescence and young adulthood: the significant secretion of sex hormones at the beginning of puberty (which also affects the brain) and the delayed maturation of cognitive control. In addition, total cerebral volume peaks during early adolescence, and neural networks are radically restructured in ways that impact on emotional, physical and mental ability. Changes occur more rapidly in certain areas of the brain, which are responsible for pleasure seeking, reward processing, and emotional response. Other changes take place at a somewhat lower rate in adolescents in the area of the brain responsible for decision-making, organization, impulse control and planning for the future. This is evidenced by the tendency of many adolescents to act impulsively and to be uncritical in their thinking.

Whilst this does not suggest that adolescents are incapable of decision-making or planning for their futures, caution may be required when implementing policy – especially in early adolescence. Whilst this is an area of scholarly debate, it is suggested that by late adolescence, young people are more capable of abstract thinking, analysis, reflection, and rational judgement.

3. Treatment of Persons with Gender Dysphoria

3.1. Treatment of those under the age of 18

For young persons whose gender dysphoria does not desist naturally, several treatment options have been recommended by various therapists:

1. 'Watchful waiting' approach in which cross-gender behaviour is permitted but not encouraged. This approach allows children to explore various gender activities without the imposition of rigid gender stereotypes and allows them to gravitate towards their own interests.

2. Intervention to decrease cross-gender identification using behavioural therapy approaches. This may also include coaching parents to ignore cross-sex behaviour while encouraging gender-appropriate activities and play. Furthermore, psychotherapeutic approaches aimed at intervening more 'within' the child can be considered. In this way, assistance may be provided to the majority of children affected by gender dysphoria.

3. Facilitating social transition to the other gender by using affirmative approaches with, for example, the adoption of a new name, preferred gender hairstyle, clothing, and play.

Use of Puberty Blockers

The Gender Identity Development Service clinic in London (the Tavistock Centre), began prescribing puberty blockers (generally, gonadotrophin releasing hormone (GnRH) analogues) to under-16s in 2011. However, there has been growing concern about the irreversible, life-changing risks of such a procedure.[43] A wide gap between clinical practice and research seems to also exist, at least as far as

[42] van Duijvenvoorde AC et al. What motivates adolescents? Neural responses to rewards and their influence on adolescents' risk taking, learning, and cognitive control, *Neurosci Biobehav Rev*. 2016, 70: 135-147.
Barbalat G et al., Risk-taking in adolescence: A neuroeconomics approach, *Encephale*, 2010, 36(2):147-54.

[43] https://www.dailymail.co.uk/news/article-9130157/The-physicians-testimony-led-High-Court-judge-ban-child-puberty-blocker-drugs.html

child and adolescent transgender health is concerned. Astonishingly, despite the enormous media discussion of transgender issues, little research has taken place on the effects of transgender treatment on children and teenagers.[44]

GnRH analogues suppress puberty by delaying the development of secondary sexual characteristics. The intention is to alleviate the distress associated with the development of secondary sex characteristics, thereby providing a time for on-going discussion and exploration of gender identity before deciding whether to take less reversible steps.

Often, however, the puberty suppression medicine used is 'experimental' and off-label. Though puberty blocking medication has been used for decades to relieve distress in young people who have entered puberty unusually early (onset before 8 years in girls and 10 years in boys), this medication has not been scientifically established as a safe and effective intervention in the short or long term as a puberty blocker.[45,46] Thus, a real concern exists about the number of children being given puberty blockers at an extremely vulnerable and uncertain age in their lives and it is unclear what the long-term effects of early suppression may be.[47]

Overall, however, by examining all the studies published so far (March 2021) concerning the use of puberty blocker hormones for children and adolescents with gender dysphoria, results indicated that any (positive or negative) changes (including any limitations in the expected increase in bone density) are either of questionable clinical value, or the studies themselves are not reliable and changes could be due to confounding, bias or chance. Moreover, the results of the studies that reported an impact of the use of hormones on the critical outcomes of gender dysphoria and mental health (depression, anger and anxiety), and the important outcomes of body image and psychosocial impact (global and psychosocial functioning), in children and adolescents with gender dysphoria were of very low certainty.[48]

As a result, the SCHB agrees with the judges in the *Bell v Tavistock [2020]* UK high court decision which identified the following elements of information that a child would need to understand, retain and weigh up in order to have the requisite competence in relation to puberty blockers:[49]

1. The immediate consequences of the treatment in physical and psychological terms;
2. The fact that the vast majority of patients taking puberty blockers go on to cross-sex hormones and therefore that he or she is on a pathway to much greater medical interventions;
3. The impact that taking this step on this treatment pathway may have on future and life-long relationships;
4. The unknown physical consequences of taking puberty blockers;
5. The fact that the evidence base for this treatment is as yet highly uncertain.

Use of Artificial Hormones

As already noted, evidence indicates that practically all young people who start with puberty blockers progress to the use of cross-sex hormones.[50] Thus an argument exists that, for some children at least,

[44] https://www.bioedge.org/bioethics/does-transgender-medicine-for-kids-need-more-bioethical-scrutiny/13035

[45] https://www.dailymail.co.uk/news/article-9130157/The-physicians-testimony-led-High-Court-judge-ban-child-puberty-blocker-drugs.html

[46] https://www.familylawweek.co.uk/site.aspx?i=ed215789

[47] Polly Carmichael, et al. 'Short-term outcomes of pubertal suppression in a selected cohort of 12 to 15 year old young people with persistent gender dysphoria in the UK, medRxiv, https://www.medrxiv.org/content/10.1101/2020.12.01.20241653v1.full.

[48] National Institute for Health and Care Excellence – NICE, Evidence review: Gonadotrophin releasing hormone analogues for children and adolescents with gender dysphoria, 11 March 2021, p.13.

[49] Paragraph 138, https://www.judiciary.uk/wp-content/uploads/2020/12/Bell-v-Tavistock-Judgment.pdf

[50] Paragraph 56 and 136, https://www.judiciary.uk/wp-content/uploads/2020/12/Bell-v-Tavistock-Judgment.pdf

the use of puberty blockers may affirm and confirm the child's chosen gender identity at the time and may then increase the likelihood of some children moving on to cross-sex hormones.[51]

As a minimum it seems that the child is not undergoing the normal physical and consequential psychological changes which would contribute to the understanding of a person's identity. There is also the likelihood of lifelong monitoring for those taking artificial hormones with the risk of serious side effects. Cross-sex hormones may also trigger 'irreversible changes' such as hair growth and a deepening voice in females and the growth of breasts in males. [52] In addition, patients receiving hormone therapy as part of their gender-transition treatment may have an elevated risk for cardiovascular events, including strokes, heart attacks and blood clots.[53]

As a result, the SCHB agrees with the judges in the *Bell v Tavistock [2020]* UK high court decision which identified the following elements of information that a child would need to understand, retain and weigh up in order to have the requisite competence in relation to the use of cross-sex hormones:[54]

1. The relationship between taking cross-sex hormones and subsequent surgery, with the implications of such surgery;
2. The fact that cross-sex hormones may well lead to a loss of fertility;
3. The impact of cross-sex hormones on sexual function;

3.2. Treatment of young adults

Understanding all the different aspects of gender reassignment may be challenging even for 18- to 25-year-olds. This is because development psychologists consider identity development as a process that continues long after adolescence. It has even been suggested that the term 'emerging adulthood' can designate an important and distinct period from a demographic perspective where 18- to 25-year-olds take part in a significant exploration of their own identity. As already mentioned, brain regions can actually be identified which are involved in processing risks and rewards in young adults. Amongst other reasons, it is because of such risk factors that car insurance for young adults is so expensive. As indicated by the Australian expert on adolescent health, Susan Sawyer, in 2018:

> *An expanded and more inclusive definition of adolescence is essential for developmentally appropriate framing of laws, social policies, and service systems. Rather than age 10–19 years, a definition of 10–24 years corresponds more closely to adolescent growth and popular understandings of this life phase and would facilitate extended investments across a broader range of settings.*

Thus, serious concerns have been raised about the manner in which young people are sometimes considered for gender reassignment.[55] In 2015, researchers conducted a retrospective matched-pair cohort study of mental health outcomes for 180 transgender subjects aged 12-29 years, matched to non-transgender controls based on gender identity. They found that transgender young people were associate (but causation was not proved) to:

A study in the Netherlands of the outcomes of 70 children given puberty blockers showed that apparently 100% went on to get hormonal treatment and continued with transition. See: de Vries et al. 'Puberty suppression in adolescents with gender identity disorder: a prospective follow-up study', *J Sex Med*, 2011, 8:2276-83.

[51] Paragraph 137, https://www.judiciary.uk/wp-content/uploads/2020/12/Bell-v-Tavistock-Judgment.pdf

[52] https://www.dailymail.co.uk/news/article-9130157/The-physicians-testimony-led-High-Court-judge-ban-child-puberty-blocker-drugs.html

[53] Nienke M. Nota, et al. Occurrence of Acute Cardiovascular Events in Transgender Individuals Receiving Hormone Therapy, *Circulation,* 2019;139:1461–1462.

[54] Paragraph 138, https://www.judiciary.uk/wp-content/uploads/2020/12/Bell-v-Tavistock-Judgment.pdf

[55] Gender identity clinic accused of fast-tracking young adults, *The Observer*, 3 November 2018, https://www.theguardian.com/society/2018/nov/03/tavistock-centre-gender-identity-clinic-accused-fast-tracking-young-adults
Governor of Tavistock Foundation quits over damning report into gender identity clinic, *The Observer*, 23 February 2019, https://www.theguardian.com/society/2019/feb/23/child-transgender-service-governor-quits-chaos
Dr Faye Kirkland, Transgender teen care 'needs urgent regulation', *BBC Panorama*, 6 March 2019, https://www.bbc.co.uk/news/health-47456938.

- an elevated risk of depression (51% vs 21%)
- an elevated risk of anxiety (27% vs 10%),
- a higher risk of suicidal ideation (31% vs 11%),
- a higher risk of suicide attempts (17% vs 6%)
- a higher risk of self-harm without lethal intent (17% vs 4%).

In addition, a greater proportion of transgender young people accessed:

- inpatient mental health care (23% vs 11%)
- outpatient mental health care services (46% vs 16%).[56]

Research on the outcome of biological sex reassignment surgery indicates that, for the majority of adults (about 75%), the outcome is positive.[57] Predictors of a positive outcome include good pre-reassignment psychological adjustment, family support, previous psychological treatment, at least one year of living in the desired role, and consistent use of hormones.

A 2014 review of 324 people who completed biological sex reassignment treatment in Sweden over a 50-year period reported high levels of satisfaction and low levels (2.2 %) of regret,[58] but also considerably higher risks for mortality, suicidal behaviour, and psychiatric morbidity than the general population.[59] For example, the long-term study reveals that there is an association between reassignment surgery and increased suicide risk in later life[60] but this does not prove causation.

This implies that a number of transexuals express regret after irreversible surgery and some may choose to revert back to living in their original biological sex.[61] Risk factors for regret are the presence of psychiatric problems, dissatisfaction with the results of surgery and poor socializing. Three patients in Belgium, who underwent anatomical sex reassignment interventions have already asked for their lives to be ended through euthanasia because they believed that their situation was one of constant and unbearable mental or physical suffering.[62] In this way, a 44-year-old transsexual person, who was identified as a girl at birth, was given voluntary euthanasia in 2013 by doctors in Belgium after a series of failed sex-change operations resulting in permanent depression.[63]

4. The Biological Intersex Condition

In rare cases, as in all biophysical processes which are prone to anomalies and irregularities, a permutation of some of the biological sex attributes may take place making it very difficult for the sex of the child to be determined at birth. Thus, as human beings develop, a wide spectrum of biological influences and dysfunctions may sometimes affect the sexual development of the embryo/foetus including its brain. In this context, many elements relating to the causes of gender identity are still not well understood and conflicting articles have been published in academic journals. In addition, if mismatches are possible between the different body parts such as the chromosomes, the anatomy and the brain it is unclear which parts should prevail in ascribing sex and recognising gender.

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[56] Reisner SL, Vetters R, Leclerc M, et al. Mental health of transgender youth in care at an adolescent urban community health center: a matched retrospective cohort study. *J Adolesc Health*. 2015;56(3):274-279. 4

[57] Carroll R. Outcomes of Treatment for Gender Dysphoria. *Journal of Sex Education and Therapy*, 1999; 24(3):128-136

[58] Dhejne C et al. An analysis of all applications for sex reassignment surgery in Sweden, 1960-2010: Prevalence, incidence and regrets. *Archives of Sexual Behaviour* 2014; 43,8:1535-45

[59] Dhejne C et al. Long-Term Follow-Up of Transsexual Persons Undergoing Sex Reassignment Surgery: Cohort Study in Sweden. PLoS One 2011; 6(2): e16885

[60] Sex-reassigned individuals were 4.9 times more likely to attempt suicide compared to a control group.

[61] See for example, *Sex Change Regret*, http://www.sexchangeregret.com/

[62] Heylens G, Elaut E, Verschelden G, Cuypere GD, Transgender Persons Applying for Euthanasia in Belgium: A Case Report and Implications for Assessment and Treatment. *J Psychiatry* , 2016, 19:347

[63] BBC News, 2 October 2013, Belgian helped to die after three sex change operations, http://www.bbc.co.uk/news/world-europe-24373107

In this context, the term ‘intersexuality’ was coined at the beginning of the twentieth century, covering a large number of ill-defined and quite varied manifestations of ambiguous sexual development, most of which were seen as pathological. Parents of children with intersex conditions often face difficult decisions about whether to raise their child as a boy or a girl.[64] However, because society is increasingly becoming aware of these difficult cases, it may now be easier for parents to not assign the sex of the child at birth but let the child decide in later years.

Some researchers suggest that as many as 1 person in 100 has some form of disorder of sexual development.[65] Intersex mismatches include the following:

4.1. Possible Chromosomal Challenges

Sometime, children are born with cells in their bodies which do not contain chromosomes who are either XX or XY. This happens, for example, with Turner's syndrome where a single X chromosome is present and Klinefelter's syndrome where XXY chromosomes are present in all the cells of the individual.[66] A normal XY embryo may also combine naturally with an XX embryo resulting in a chimeric child with a percentage of XY and XX cells.[67]

4.2. Possible Anatomical-Chromosomal Intersexuality

Some individuals may have sex chromosomes in all their cells that are contrary to the observable biological sex characteristics of their bodies.[68] In this way, gene mutations affecting testis or ovary development can result in a person with XY chromosomes developing typically female sexual characteristics,[69] whereas changes in hormone signalling can result in individuals with XX chromosomes developing along male lines.[70] For example, a gene that leads to the development of male phenotypes, such as testes (the SRY gene) may move to an X chromosome in a reproductive cell so that the resulting child has XX chromosomes but can code for the protein that initiates the gene cascade for a male phenotype.[71] It appears that about 1 of every 20,000 to 30,000 men have XX chromosomes.[72]

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[64] Some commentators believe, for example, that external sexual genitalia are proper accidents, not the essence, of sex (they could for example be cut off in a war etc…).

[65] Claire Ainsworth, Sex redefined: The idea of two sexes is simplistic. Biologists now think there is a wider spectrum than that, *Nature*, 18 February 2015, https://www.nature.com/news/sex-redefined-1.16943

[66] Departures from these typical chromosomal distinctions sometimes occur. For example, some people may have the karyotypes 47,XXY (Klinefelter syndrome); 47,XXX (triple X syndrome); 45,X0 (i.e. only one X – Turner syndrome); and Y polysomies: 47,XYY, 48,XXYY, 48,XYYY (very rare) and 49,XYYYY (very rare). In these special cases, an embryo is as a rule classified as chromosomally male provided that there is at least one Y; otherwise it is deemed to be female. Individuals born with such atypical karyotypes often exhibit physical particularities in their organs, including their sex organs, or in the functions of those organs, but as a rule do not present intersexual characteristics.

[67] Freiberg AS, Blumberg B, Lawce H, Mann J. ‘XX/XY chimerism encountered during prenatal diagnosis’, *Prenat Diagn*. 1988, 8(6):423-6.
Dewald, Gordon, *et al.* ‘Origin of chi46, XX/46,XY Chimerism in a Human True Hermaphrodite’, *Science*, vol. 207, no. 4428, 1980, pp. 321–323.

[68] For example, with ‘XX male syndrome’ the person has a male phenotype but XX sex chromosomes; with ‘Androgen insensitivity syndrome’ the person has a female phenotype and XY sex chromosomes.
Galani A, Kitsiou-Tzeli S, Sofokleous C, Kanavakis E, Kalpini-Mavrou A. "Androgen insensitivity syndrome: clinical features and molecular defects". *Hormones* (Athens), 2008, 7 (3): 217–29.

[69] Editorial, US proposal for defining gender has no basis in science,Nature 563, 5 (2018), https://www.nature.com/articles/d41586-018-07238-8

[70] Claire Ainsworth, Sex redefined: The idea of two sexes is simplistic. Biologists now think there is a wider spectrum than that, *Nature*, 18 February 2015, https://www.nature.com/news/sex-redefined-1.16943

[71] Strain L, Dean JC, Hamilton MP, Bonthron DT. A true hermaphrodite chimera resulting from embryo amalgamation after in vitro fertilization. *N Engl J Med*. 1998 , 15;338(3):166-9.

[72] https://www.sciencedirect.com/topics/medicine-and-dentistry/xx-male

4.3. Possible Anatomical-Brain Intersexuality

Since sexual differentiation of the foetal body begins after six weeks of pregnancy and sexual differentiation of the brain starts in the second half of pregnancy, these two processes may be influenced independently.[73] This means, for example, that the degree of masculinization of the body may not always reflect the degree of masculinization of the brain. As a result, a rare biological incongruence may arise between the biological sex of the brain and that of the rest of the body, which may be considered as a form of intersexuality giving rise to aspects of gender dysphoria in the born child. For example, individuals exist (classified as transsexual) who describe themselves as intersexed, attributing this to the hormonal situation of their bodies, and specifically to the effects this has on their brains.[74]

However, data on the prenatal biological influences on gender identity are presently divergent and do not always provide convincing information, either way, about the underlying causes of cisgender and gender dysphoria. For example, even the extent of embryonic and foetal neurological influences on heterosexuality is a matter of discussion.[75] Moreover, science does not really understand the neuro-psychological make-up of a person controlling the attraction of a person towards another gender. For example, science does not understand how most heterosexual persons' brains are 'wired' to:

(1) Be attracted to another person as opposed to not being attracted to anyone;

(2) Only be attracted to specific kinds of persons without being conscious of (or even understanding) the manner in which this 'falling in love' or attraction takes place. For instance most persons are unconsciously attracted (amongst other traits) to:

- Another human person (as opposed to a nonhuman animal);
- A person of the opposite gender (as opposed to the same gender);
- A young person (as opposed to a very old person).

As already indicated, it may be possible, that prenatal influences on the sexual brains of persons may be as significant as those affected by handedness.[76]
This all means that conclusions about a person's sex are sometimes extremely difficult to make from a scientific perspective.[77]

5. History

5.1. Gender Reassignment in History

All ancient mythologies include examples of people wanting to change sex; the earliest probably being that described by the Jewish philosopher Philo, in around 20 B.C. of men wishing to be women. Moreover, the Roman emperor Nero, full of remorse after murdering his wife, apparently arranged for a male slave who resembled her to be transformed into a female, though no record survives as to how this was achieved. Indian society has a long history of male eunuchs who love as women. They are highly regarded and are often believed to possess supernatural powers.[78]

Another case is that of the Chevalier d'Eon who supposedly rivalled Madame de Pompadour for the

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[73] Savic I, Garcia-Falgueras A, Swaab DF. Sexual differentiation of the human brain in relation to gender identity and sexual orientation. *Prog Brain Res*. 2010;186:41-62.
Bao AM, Swaab DF. Sexual differentiation of the human brain: relation to gender identity, sexual orientation and neuropsychiatric disorders. *Front Neuroendocrinol*. 2011, 32(2):214-26.

[74] German Ethics Council, Intersexuality, 2012, p. 25

[75] Savic I, Garcia-Falgueras A, Swaab DF, Sexual differentiation of the human brain in relation to gender identity and sexual orientation. *Prog Brain Res.* 2010, 186:41-62.

[76] https://theconversation.com/theres-no-single-gene-for-left-handedness-at-least-41-regions-of-dna-are-involved-146765

[77] As witnessed by the International Olympic Committee, which have struggled with this for decades.

[78] Mark Dainton & Keith Tiller, Male & Female He Created Them, Watford: Parakaleo Ministry, p. 4.

favours of Louis XV. With no possibility of surgery, d'Eon's deception was soon discovered, but the king was fascinated by his story and made him a diplomat, after which he lived in retirement as a woman.[79]

Only in recent years, has it been realistically possible for sexual reassignment surgery to be attempted. The earliest recorded sex reassignment operation was performed in the 1930s by the German Dr. F.Z. Abraham on a male Danish painter who took the name of Lili Elbe. Abraham's technique involved transplanting female organs into Elbe, a unique approach, which the patient did not eventually survive because of the inevitable tissue rejection.[80]

The first successful sex reassignment was a female to male operation carried out by the plastic surgeon Sir Harold Gillies in 1948, when Laura Maud Dillon from Folkestone in Kent became Lawrence Michael Dillon, who later qualified as a doctor. Dillon successfully lived in the male role, mostly employed as a ship's doctor until the story was broken by the *Sunday Express* in 1958. Dillon died, bitter and emaciated, in a Tibetan monastery, in 1962.[81]

The first transexual case to excite real media attention was that of American GI George Jorgenson, who became Christine Jorgenson following sex reassignment by Dr. Christian Hamburger in Casablanca in 1952. Jorgenson's story was widely published both in America and Europe and, in its aftermath, many transexuals who had probably resigned themselves to remaining in their original gender began to seek similar treatment.[82] In the UK, the case of the transsexual phenomenon came to prominence in 1970 when the (male to female) transsexual model April Ashley fought a case for her marriage to a man to be legally recognised. But she lost, with the legal precedent being set that sex is irrevocably fixed by chromosomes at birth.[83]

5.2. The Case of Bruce Reimer

One of the most famous researchers who sought to change the gender identity of persons was the New Zealand - American psychologist John Money (1921 – 2006) who was amongst the first to publish theories on the influence of societal constructs on a person's gender identity. In fact, it was Money who introduced the suggested difference between biological sex and 'gender role' in 1955.[84] He was also well known for his views that gender was learned rather than innate. In other words, he considered that individuals are born without any built-in mental content with respect to sex and gender. Thus, Money believed that all heterosexual, homosexual, cisgender and transgender experiences generally come from perception and societal influences. That is to say, the malleability of human beings resulting from social factors was predominantly regarded as outweighing any biological aspects.

At the time, the feminist movement in particular drew on Money's writings, which were presented as proof that the behavioural differences between men and women were reflections of social expectations and prejudices and did not have any strong biological components. In this climate, Money became a celebrated scientist.[85]

With the aim of developing a stable sexual identity, Money also postulated that a child born with a sexual disorder should be surgically aligned with the 'optimum' sexual norm for the individual as early as possible. Indeed, the operation should be carried out in the first years of life because, in his view, sexual identity did not develop until a child was about three years' old. Testes or ovaries inconsistent with the sex as determined at birth were surgically removed, partly to prevent hormonal influences on the body at puberty. The external appearance would then be matched to the given sexual identity, although sexual sensation was frequently destroyed in the process. Owing to technical difficulties with the surgical

[79] Mark Dainton & Keith Tiller, Male & Female He Created Them, Watford: Parakaleo Ministry, p. 4.

[80] Mark Dainton & Keith Tiller, Male & Female He Created Them, Watford: Parakaleo Ministry, p. 4.

[81] Mark Dainton & Keith Tiller, Male & Female He Created Them, Watford: Parakaleo Ministry, p. 4.

[82] Mark Dainton & Keith Tiller, Male & Female He Created Them, Watford: Parakaleo Ministry, p. 4-5

[83] Mark Dainton & Keith Tiller, Male & Female He Created Them, Watford: Parakaleo Ministry, p. 5

[84] Money, J. (1955). Hermaphroditism, gender and precocity in hyperadrenocorticism: Psychologic findings.Bulletin of the Johns Hopkins Hospital, 96, 253–264.

[85] German Ethics Council, *Intersexuality*, 2012, p. 45-47,

construction of a penis, it was mostly feminizing operations that were carried out.[86] Money also recommended that no mention should ever be made of the sex reassignment treatment to the individual (even as an adult) in order not to endanger his or her personality development.[87]

Doubts relating to Money's theory were exposed, however, especially in relation to his 'showpiece' example, which was the case of the Canadian boy Bruce Reimer (1965–2004), the identical twin brother of Brian Reimer. In 1966, because of a botched circumcision on eight-month-old Bruce, Money persuaded his parents that sex reassignment surgery would be in his best interest. As a result, at the age of 22 months, his testicles were surgically removed and Bruce became Brenda. Money also persuaded his parents to raise him as a girl, subjecting Brenda to psychological conditioning[88] at the same time as hormone treatment. For Money, the twin experiment became the touchstone of his thesis on sexual identity which he published as clear evidence of the correctness of his theory which became very influential.[89]

However, the raising of the male child as a girl failed and Bruce Reimer (who had changed his name to David) later reported that he never considered himself a girl, was told that he was really a boy by his parents in his early teens, and reverted to living as a boy at 15 years of age. Predictably, Reimer suffered psychologically throughout his life despite returning to live as a male and committed suicide at 38 years of age.

This story indicates that Bruce Reimer was probably not born without some built-in mental content with respect to sex. In other words, it is not just the social conditioning that influences the gender of a child but a number of other factors such as the manner in which the body of the child develops (including the brain).

6. Gender Reassignment and Philosophy

Concern exists that a form of Gnosticism may be returning with the concept of transgender conditions. This was strongly condemned by Saint Irenaeus who was a Second century Christian Bishop of Lyon in France. He argued that because Gnosticism only valued the mind or the soul, it was possible to (1) let the body do whatever it wanted morally or (2) mistreat the body in complete austerity. But Irenaeus and the Christian church condemned this body-mind dualism in which the body and the mind were seen as being unconnected. This means that a person's gender identity could not be separated from his or her biological sex. But this then gives rise to difficulties with certain intersex conditions. In other words, in denying that the biological brain can also influence the mind, or more specifically that the gender identity of the person is totally independent from the sex of the biological brain, another form of brain-mind Gnosticism may be developing and accepted, including by those who condemn chromosomal-mind Gnosticism.[90]

7. United Kingdom of Great Britain and Northern Ireland – Legislation and Case Law

7.1. Present Situation

Transgender persons were first given legal recognition in their new gender under the terms of the UK *Gender Recognition Act 2004*. To acquire Gender Recognition Certificates, individuals must be medically diagnosed with significant dysphoria. Moreover, the minimum age at which persons can make an application is 18 and they must have lived successfully in the opposite gender for at least two years.

Generally, applicants must include two medical reports with their application. One must be from a practitioner in the field of gender dysphoria who is either a registered medical practitioner or a registered

[86] German Ethics Council, *Intersexuality*, 2012, p. 45-47,

[87] German Ethics Council, *Intersexuality*, 2012, p. 45-47,

[88] John Colapinto, *As Nature Made Him: The Boy Who Was Raised as a Girl*. New York: Harper, 1997

[89] German Ethics Council, Intersexuality, 2012, p. 45-47,

[90] In this regard, transgender challenges are probably one of the first conditions to be discussed in a number of future brain-mind Gnostic challenges.

psychologist. This report must include details of the applicant's diagnosis of gender dysphoria. The second report must be provided by a registered medical practitioner who may, but need not, practise in the field of gender dysphoria.

Where an applicant has undergone or is undergoing treatment for the purpose of modifying their sexual characteristics or such treatment has been prescribed or planned for them, then one of the reports must include details of that treatment. Guidance issued by the Gender Recognition Panel advises that if an applicant has not had surgery then the second report must explain why.[91]

The independent Gender Recognition Panels are generally minded to grant applications, wherever legally possible, which is why directions are given rather than making final decisions which might not be in favour of the applicant. This means that despite the high rate of requests for further information very few applications actually fail outright.

Sometime, a misunderstanding exists as to the role of the independent Gender Recognition Panel, part of Her Majesty's Courts & Tribunals Service, which assesses applications from trans people to provide legal recognition of gender change. Indeed, they are not appointed to discriminate or prevent individuals changing their legal status with respect to gender. Instead, the tribunals exist to ensure that these individuals make well informed and careful decisions, taking into account all the different aspect of the legal change in gender. Of course, as with all legal panels, their decisions are not always perfect, but they do generally support and assist persons seeking to make this momentous decision. In this regard, it may be appropriate for the tribunals to include a variety of professionals and even individuals who have transitioned or detransitioned, so that it can bring a breadth of knowledge and experience on the subject.

7.2. Proposed changes to gender reassignment legislation

- 2016: *Women and Equalities Select Committee's Report on Transgender Equality*
The UK Parliament's 2016 Women and Equalities Select Committee's Report on Transgender Equality[92] recommended that: *"In place of the present medicalised, quasi-judicial application process, an administrative process must be developed, centred on the wishes of the individual applicant, rather than on intensive analysis by doctors and lawyers".*

- 2019: *R (on the application of TT) -v- The Registrar General for England and Wales*
In this case, the president of the family division court examined the case of a woman who had transitioned into a man who wanted to be considered as a father on his child's birth certificate. After hearing the case, the Judge refused stating:

> *At common law a person whose egg is inseminated in their womb and who then becomes pregnant and gives birth to a child is that child's 'mother' … The status of being a 'mother' arises from the role that a person has undertaken in the biological process of conception, pregnancy and birth.*

This decision was then upheld in the Appeal Court in 2020.[93] Interestingly, it appears to be the first time that English common law defined the word 'mother' (the biological father was an anonymous sperm donor). [94]

- 2020: *Bell -v- Tavistock judgment - Courts and Tribunals Judiciary*
As already noted, the High Court ruled that children under 16 with gender dysphoria are unlikely to be able to give informed consent to undergo treatment with puberty-blocking drugs.[95]

[91] At http://formfinder.hmctsformfinder.justice.gov.uk/t452-eng.pdf.

[92] At https://publications.parliament.uk/pa/cm201516/cmselect/cmwomeq/390/390.pdf.

[93] https://www.theguardian.com/society/2020/nov/16/trans-man-loses-uk-legal-battle-to-register-as-his-childs-father

[94] https://www.bioedge.org/bioethics/uk-high-court-defines-motherhood-in-controversial-transgender-case/13236

[95] https://www.bbc.co.uk/news/uk-england-cambridgeshire-55144148
https://www.judiciary.uk/wp-content/uploads/2020/12/Bell-v-Tavistock-Judgment.pdf

8. Scotland – Legislation and Case Law

8.1 Developments

In 2006 the Scottish Government published *Delivering a Healthy Future: An Action Framework for Children and Young People's Health* aimed at promoting health and well-being, increasing access, quality and sustainability as well as developing the workforce, such as with mental health specialists. Furthermore, it ensured performance management and quality assurance whilst utilising information technology.

It is noted that gender dysphoria in individuals is associated with an elevated prevalence of mental health issues, especially mood disorders, anxiety disorders, and suicidality. In the 2012 Scottish Trans Mental Health Survey, most participants, 84%, had thought about ending their lives at some point (N=581) though no direct cause could be proven. Moreover, media reports indicate that the number of children being treated for gender identity disorder in Scotland is increasing quickly.[96]

8.2. Present Situation

The present legal situation is the same as that of England and Wales since the *Gender Recognition Act 2004* also applies to Scotland.

Moreover, it is possible for persons to change their names in Scotland without changing the content of their Birth Register. However, if persons desire that their birth certificates reflect their name change, they can only do so on a limited number of occasions.
A person aged 16 or over is permitted to record a change of forename on one occasion and their surname on three occasions in the Register of Births. With respect of a surname change, five years must elapse after one change is recorded before another may be recorded.[97] There are different rules for people under 16.

9. Legislation and Case Law – International

9.1. International

In 2015, *Resolution 2048* of the Parliamentary Assembly of the Council of Europe[98] (which is just advisory) expressed concerns that requiring someone seeking legal recognition of their acquired gender to have been medically treated or diagnosed is a breach of their right to respect for their private life under Article 8 of the ECHR. The resolution calls on all Member States to: "*[D]evelop quick, transparent and accessible procedures, based on self-determination, for changing the name and registered sex of transgender people on birth certificates, identity cards … and other similar documents*".

9.2. Other countries

Republic of Ireland
In the Republic of Ireland, people aged 16 and 17 can received a Gender Recognition Certificate[99] after obtaining a court order permitting them to apply under their self-declaration system. The court in the Republic of Ireland is required to consider evidence about the young person's transition to their acquired gender.

[96] Treatments for gender identity issues among Scottish children are soaring, The Herald, 2 October 2017, https://www.heraldscotland.com/news/15569221.treatments-for-gender-identity-issues-among-scottish-children-are-soaring/

[97] Registration of Births, Deaths and Marriages (Scotland) 1965, section 43(5) at http://www.legislation.gov.uk/ukpga/1965/49/section/43.

[98] At http://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=21736&lang=en.

[99] Source is the Department of Social Protection.