

Policy Document

Sex and Gender Equity in the Medical Curriculum and Medical Research (2022)



Position Statement

Policy Details:

AMSA believes that:

1. Women and people of diverse sexes and genders, including transgender, gender-diverse and intersex people, are under-represented in medical research and education. There is inequity in medical research and education relating to disease manifestations in women, transgender, gender-diverse and intersex people, with a strong focus on patterns of disease identified in cisgender males.
2. The existing inequities in sex and gender in medical education and research have negative consequences on the health outcomes of the broad female, gender-diverse and intersex populations.
3. There needs to be a deliberate and concerted effort from all stakeholders to counteract historical and ongoing biases against women, intersex, transgender, and gender-diverse people, including their erasure and exclusion from medical research and medical education.
4. All medical research should aim to eliminate inequities between all sexes and genders, by designing projects that address research gaps affecting women, gender-diverse and intersex people, and by disaggregating results by sex and gender wherever possible and appropriate.
5. All levels of medical education should make a conscious and deliberate effort to acknowledge the differences between gender and sex, with a particular emphasis on providing high-quality healthcare to people of all genders and sexes. This should be done with a focus on the longitudinal development of students' attitudes, knowledge, experiences and skills.

Policy Points

AMSA calls upon:

1. Australian federal, state and local governments to:
 - a. Increase and allocate funding supporting community-led research focused on the health needs of women, intersex, transgender and gender-diverse people;

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- b. Fund health organisations seeking to improve health outcomes for transgender, gender-diverse and intersex people, with specific funding allocated for community-developed training and education resources for medical students, doctors and other healthcare professionals (including training modules and educational websites like Transhub, Wavelength, etc.);
 - c. Introduce legislation which affirms and aligns with the Darlington Statement, including specific calls to action regarding research and education pertaining to intersex health and wellbeing;
 - d. Develop, implement and evaluate an evidence-based and community-led national 10 year LGBTQIA+ health and wellbeing action plan, including specific focus on LGBTQIA+ research, and LGBTQIA+ education and training within the medical workforce, especially for transgender and gender-diverse people.
2. Australian Research Council and National Health and Medical Research Council to:
- a. Recognise the gender disparity among leaders and researchers by:
 - i. Collating, with consent, and publicising statistics of the genders of all applicants, and successful applicants, for research grant funding, in accordance the the Australian Bureau of Statistics' Standard for Sex, Gender, Variations of Sex Characteristics and Sexual Orientation Variables;
 - ii. Publicly acknowledging the challenges that may prevent or discourage women, transgender and gender-diverse people from applying for research funding;
 - iii. Actively identifying and rectifying the challenges faced by women, transgender and gender-diverse people through support and consultation with community leaders;
 - iv. Providing follow-up on gender-based statistics and experiences within the workforce, particularly around the results of implemented actions;
 - v. Upskilling journal reviewers and editors to reduce explicit and implicit biases against women, intersex, transgender and gender-diverse people;
 - b. In research funding applications and selection processes, work to:
 - i. Introduce clear and consistent research guidelines regarding the inclusion of diverse and representative cohorts, including specific mention of including transgender, gender-diverse and intersex people;
 - ii. Allocate and increase funding for research on health issues specific to women, intersex, transgender, and gender-diverse people, as a research priority, particularly those from intersectional backgrounds, including Aboriginal and Torres Strait Islander peoples;
 - iii. Consult with transgender, gender-diverse and intersex communities, to develop research agendas relevant to their needs;

- iv. Encourage and fund research into the differences in presentations, risk factors, diagnostic criteria, prognoses and treatment regimens for women, intersex, transgender and gender-diverse people; and
 - v. Upskill research grant reviewers to reduce explicit and implicit biases against women, intersex, transgender and gender-diverse people.
- 3. Medical journals and their editorial teams to:
 - a. Collate, with consent, and publicise anonymous data regarding the genders and sexes of authors who submit manuscripts for approval, and those who are successfully published, in accordance with the Australian Bureau of Statistics' Standard for Sex, Gender, Variations of Sex Characteristics and Sexual Orientation Variables;
 - b. Ensure accepted manuscripts adhere to the Sex and Gender Equity in Research (SAGER) guidelines;
 - c. Upskill editors and reviewers with unconscious bias training, to reduce explicit and implicit biases against women, intersex, transgender and gender-diverse people in the reviewing process.
- 4. Australian research institutes and universities to:
 - a. Implement initiatives to increase the proportion of female, intersex, transgender and gender-diverse researchers, especially those from intersectional backgrounds, including Aboriginal and Torres Strait Islander people;
 - b. Provide training and opportunities for female, intersex, transgender and gender-diverse researchers to upskill;
 - c. Provide sex- and gender-equity training for all researchers, including training to encourage adherence to the SAGER guidelines in published research;
 - d. Encourage and fund research into conditions that typically affect women and people of diverse sexes and genders;
 - e. Encourage and fund research into the differences in presentations, risk factors, diagnostic criteria, prognoses and treatment regimens for women, intersex, transgender and gender-diverse people.
- 5. Australian Medical Council to:
 - a. Include knowledge and clinical competence in providing culturally safe care to transgender, non-binary, gender-diverse and intersex people as a specific requirement for credentialing within all medical courses in Australia;
 - b. Ensure that accreditation standards require medical schools to:
 - i. Educate students about the concepts of sex and gender, and the use of correct and appropriate terminology regarding sex, gender, and gender identities, particularly regarding intersex, transgender and gender-diverse identities;
 - ii. Educate medical students on the effects of gender and sex on health outcomes, and the unique health needs of women, transgender, gender-diverse and intersex people;

- iii. Present teaching material featuring equitable representations of all sexes and genders, including transgender, gender-diverse and intersex people; and
 - iv. Educate students about the provision of gender affirming care, in a culturally safe manner.
6. Australian universities' medical schools and Australian specialist medical colleges to:
- a. Integrate education and skills training into medical education, regarding women, transgender, gender-diverse and intersex people, including:
 - i. Correct gender and sex terminology;
 - ii. Cultural safety and communication skills; and
 - iii. Improved skills training (e.g. to conduct appropriate physical examinations on women, transgender, gender-diverse and intersex people);
 - b. Ensure that education regarding women, intersex, transgender and gender-diverse people in the curriculum:
 - i. Is developed in consultation with stakeholders of lived experience specific to the content being taught, including transgender, gender-diverse and intersex community representatives;
 - ii. Highlights social determinants of health pertinent to transgender, gender-diverse and intersex people, emphasising that it is the social context in which sex and gender-diverse people live that leads to poor health due to intrapersonal, interpersonal, institutional and societal stigma, prejudice and discrimination;
 - iii. Extends beyond isolated lectures or training sessions, and is interactive, longitudinal and clinically-oriented in nature (including being tested in written and clinical assessments);
 - iv. Utilises up-to-date resources (e.g. LGBTQIA+ glossary of common terms published by the Australian Institute of Family Studies) which use inclusive and scientifically-accepted terminology to describe all sexes and genders; and
 - i. Is taught by teaching staff who undergo ongoing cultural safety training for LGBTQIA+ health content, including the use of appropriate terminology when describing sex and gender issues;
 - c. Improve teaching around intersex patients by:
 - i. Depathologising intersex variations, and
 - ii. Increasing awareness of healthcare barriers and disparities faced by intersex people; and
 - iii. Adhering to the Darlington Statement;

- d. Incorporate inclusive pronouns (e.g. they) in teaching materials, if individuals' pronouns are unknown, rather than binary pronouns (e.g. he or she), where appropriate;
 - e. Provide teaching and training to students regarding physical exams performed on women, transgender, gender-diverse and intersex patients, incorporating trauma-informed care and patient-guided language;
 - f. Educate students on the importance of identifying and addressing unconscious biases;
 - g. Avoid tokenistic case representations and the pathologization of people intersex, transgender and gender-diverse people, including when their gender identity is not directly related to their health presentation, as well as cases where it may be related;
 - h. Ensure teaching prioritises intersectionality as it relates to gender and sex, including the challenges faced by older people of diverse sexes and genders (e.g. normalising the complex end-of-life care decisions and the legal experiences of women, intersex, transgender and gender-diverse patients with chosen families; and ageing issues specific to Indigenous elders);
 - i. Perform regular reviews to determine whether existing teaching in the area of sex and gender are adequate, and whether students feel confident providing healthcare services to all genders and sexes on the basis of this teaching;
 - j. Conduct further research into the presence of people of diverse sexes and genders in medical leadership and the medical workforce; barriers to their representation; and solutions to address this gap;
 - k. Building upon AMSA's Gender Equity in Leadership and the Workforce Policy (2021) to:
 - i. Establish incentives for the hiring and promotion of faculty members who are women, intersex, transgender and gender-diverse people;
 - ii. Initiate training programs for existing staff, healthcare professionals and medical students to learn about and combat their own biases
 - l. Abide by the policy points of AMSA's LGBTQIA+ Health Policy (2019).
7. Medical teaching resource publishers (including textbook publishers) and editors to:
- a. Update anatomy illustrations and images to include bodies of all sexes, including those of intersex people; and
 - b. Revise language used to ensure inclusivity of people of diverse genders and sexes, especially in anatomy and endocrinology texts.
8. Researchers and research students to:
- a. Collaborate and consult with women, intersex, transgender and gender-diverse people, to identify gaps in existing research and ensure research outcomes benefit all participants;

- b. Adhere to the SAGER guidelines, by using study cohorts with an appropriate diversity of sexes and genders and analysing data by sex/gender wherever possible;
 - c. Endeavour to include transgender, gender-diverse and intersex participants in studies;
 - d. Conduct research into conditions that typically affect women and people of diverse sexes and genders;
 - e. Conduct research into the variances of presentations, risk factors, prognoses and treatment regimens for conditions in women, intersex, transgender and gender-diverse people; and
 - f. Not conflate intersex, transgender and gender-diverse people with other members of the LGBTQIA+ community, and acknowledge the unique needs of different minority groups.
9. Medical students and healthcare professionals to:
- a. Ensure knowledge and skills associated with culturally-safe healthcare for women, intersex, transgender and gender-diverse patients are kept up to date, including being actively aware of the effect of gender and sex on health outcomes;
 - b. Continue to reflect on individual biases and remain informed on current best practices and research on women and people of diverse sexes and genders; and
 - c. Engage with feedback channels to reflect and provide feedback on the teaching of sex and gender, provided that the student or healthcare professional feels comfortable and safe doing so.

Glossary

- **LGBTQIA+:** an acronym which stands for Lesbian, Gay, Bisexual, Transgender, Intersex, Queer, Asexual/Agender and plus communities.
- **Queer:** an umbrella term that encapsulates any identity that is not cisgender or heterosexual. It is important to note that the use of the word “queer” has been reclaimed by many, but not all, community members. Due to the historically derogatory use of the word, or for other reasons, some may not identify with the term queer.
- **Sex:** a classification that is often made at birth as either male or female based on a person's external anatomical characteristics. However, sex is not always straightforward, as some people may be born with an intersex variation, and anatomical and hormonal characteristics can change over a life span.
- **Intersex:** an umbrella term describing anatomical, chromosomal and hormonal characteristics that differ from the normative binary understanding of biological sex. There are at least 40 different variations that may be apparent at different life stages or may remain unknown to the individual and their medical practitioners. Some intersex people identify as part of the LGBTQIA+ community, and many intersex people are cisgender.

- **Gender or gender identity:** one's sense of whether they are a man, woman, non-binary, agender, genderqueer, genderfluid, or a combination of one or more of these definitions. Gender can be binary (either a man or a woman), or non-binary (including people who have no binary gender at all and people who have some relationship to binary gender/s).
- **Gender binary:** something that is binary consists of two things or can refer to one of a pair of things. When talking about genders, binary genders are male and female, and non-binary genders are any genders that are not just male or female, or aren't male or female at all.
- **Gender-diverse:** an umbrella term encompassing a range of genders expressed in different ways, including, but not limited to genderfluid, genderqueer, agender, and gender non-conforming individuals.
- **Cisgender:** someone whose gender identity corresponds with their sex assigned at birth.
- **Transgender or trans:** umbrella terms used to describe people whose gender does not exclusively align with the gender they were assigned at birth.
- **Transition:** A term used to describe the process a person undergoes in order to live in the gender they identify with. Each transition is highly unique to the individual.
- **Non-binary:** an umbrella term for gender identities that sit within, outside of, across or between the spectrum of the male and female binary.
- **Sistergirl and Brotherboy:** terms used for trans people within some Aboriginal or Torres Strait Islander communities. The usage of Sistergirl and Brotherboy can differ between locations, countries and nations. Sistergirls and Brotherboys have distinct cultural identities and roles. Sistergirls are Indigenous people assigned male at birth but who live their lives as women, including taking on traditional cultural female practices. Brotherboys are Indigenous people assigned female at birth but are men or have a male spirit.
- **Deadnaming:** referring to a transgender or gender-diverse person by a name they no longer identify with, which they may have used prior to transitioning or affirming their gender.

Within this policy, “woman” and “female” are used to refer to all those identifying as women, including both trans and cis women. Where this is specifically in reference to trans or cis women, these adjectives will be used.

Background

The Australian Medical Students’ Association (AMSA) is the peak representative body for medical students in Australia. AMSA is committed to promoting sex and gender equity in medical research and education and recognises its importance in ensuring safe and effective healthcare for women, transgender, gender-diverse

and intersex people. AMSA seeks to advocate on issues arising from sex and gender inequity in research and education resulting in health disparities.

It is necessary to consider the definitions of sex and gender used in this policy, while at the same time acknowledging that definitions of these continuums are dynamic and may change with time. A glossary containing working definitions with respect to their meaning as defined by the Australian Institute of Family Studies and AMSA's LGBTQIA+ 101 Booklet is included above [1].

Gender and sex are key determinants of health and often overlooked, despite gender and sex inequalities being major drivers of morbidity and mortality globally [2,3]. Acknowledging the persistence of these inequities within medical research and teaching is vital to improve healthcare outcomes, particularly for women, intersex, transgender and gender-diverse people.

Many of these concerns can be traced back to how gender and sex are taught in medical education, which aims to prepare future doctors for a wide variety of patient interactions [2]. However, there is increasing recognition that traditional medical research and training has focused heavily on disease manifestations within cisgender male and perisex populations, leading to disparities in health outcomes for those who do not identify with this group [2]. It has been shown that medical schools in Australia and New Zealand lack content on healthcare for people of diverse genders and sexes, and what does exist mostly focuses on sexuality [4]. This results in negative outcomes for both medical students, who feel underprepared for treating women, intersex, transgender and gender-diverse patients, and the patients themselves, who experience negative interactions with healthcare providers, inadequate care, and consequently poor health outcomes [5]. For example, a 2021 study noted that 26% of transgender Australians self-reported discrimination when seeking healthcare [6]. Conducting inclusive research and providing robust, respectful, and accurate medical education about gender and sex is therefore essential for appropriate patient-centred healthcare.

Medical Research

All sexes and genders must be adequately represented in medical research to inform evidence-based and effective care for women, intersex, transgender and gender-diverse people. In medical research, gender and sex have been historically considered binary, with most studies relying on cisgender, perisex male cohorts [7]. As a result, the applicability of research findings to women, intersex, transgender and gender-diverse people has been limited [8]. This section considers shortcomings in current research guidelines, the resultant gaps in current research relating to conditions affecting women, intersex, transgender and gender-diverse people, and the effects of inadequate diversity amongst researchers.

Internationally, research funding guidelines typically call for inclusive and representative research, but do not specify the inclusion of people from diverse

sexes and genders, which limits their enforceability [9,10]. A study reviewing the guidelines of 45 research funding agencies from 36 countries, including Australia's National Health and Medical Research Council and Australian Research Council, identified that there was no consistency across these guidelines regarding sex or gender inclusivity. In a majority of countries' research funding agencies, including Australia, the sex and gender-related content of research is not considered, neither was the intersectionality [11]. Updates to these guidelines continue to frame sex as a binary, including the National Institute of Health in the USA's 2016 Policy on Sex as a Biological Variable [12]. With clearer and more enforceable guidelines from research funding bodies, researchers would have greater impetus to focus on sex and gender in their research and to use appropriately-representative research models and cohorts.

This issue also extends to the reporting and publication of research, which does not encourage researchers to specify the sexes/genders of participants. The SPIRIT, CONSORT and PRISMA statements are considered as the standard guidelines internationally for clinical trial protocols and reporting, and systematic reviews respectively [13-15]. Unfortunately, none of these guidelines specifically mention recruiting participants of diverse sexes and genders for trials, disaggregating data according to sex and gender, or examining results by sex and gender in systematic reviews [13-15]. As an example of this problem, a 2018 survey of 709 anaesthesia primary research papers that were published during 2016 revealed that only 83% reported the sex of participants, and only 17% split the primary outcome by sex [16]. Without having this information published, it is difficult to, firstly, know if existing literature is inclusive, and, secondly, to extrapolate results to patients who are not of the same sex and/or gender as the majority of participants.

These issues drove the introduction of the Sex and Gender Equity in Research (SAGER) guidelines in 2016, which encourage journal editors to ask, firstly, whether sex and gender are relevant to the research question, and, secondly, whether the authors have adequately incorporated sex and gender into design and analysis (or justified the absence of such analysis) [17]. While several journals have adopted these guidelines, they are not mandatory, and editors and reviewers are responsible for interpreting the guidelines [18]. They also do not specify any requirements relating to the inclusion of participants of diverse sexes and genders. Adherence to the SAGER guidelines is therefore limited: as an example, two recent large systematic reviews identified that most published COVID-19 studies did not meet the SAGER requirements [19,20]. The underrepresentation of gender diversity is particularly pertinent in this example, as women seem more likely to suffer from long-term COVID-19 and experience negative social and economic impacts, which may be overlooked in research [21].

A key consequence of sex and gender bias in research is that conditions typically affecting people who are not perisex, cisgender males are poorly understood. Endometriosis, which affects around 10% of Australian people with uteruses, is a salient example of a condition which has been historically under-researched [22].

Despite patients with endometriosis experiencing symptoms which can markedly affect quality of life, including severe pain, heavy menstrual bleeding, and changes to fertility and cancer risks, no clear mechanism has been identified, and diagnosis still relies on invasive biopsies [23]. Social normalisation of pain amongst people with uteruses, and stigma associated with menstrual health, are likely contributors to this research gap [23]. Furthermore, most endometriosis research has historically excluded transgender males and gender-diverse participants, meaning that endometriosis in transgender men is poorly understood, despite a recent systematic review suggesting that endometriosis' prevalence is higher in transgender men than cisgender women [24]. Similarly, the pathogenesis of polycystic ovarian syndrome (PCOS) is poorly understood, despite affecting up to around 20% of Australian people with ovaries and increasing the risk of several metabolic and hormonal conditions [25]. Transgender men appear to have higher rates of PCOS than cisgender women, but have also been traditionally excluded from PCOS research [26]. Research into these conditions is therefore vital, and should involve reconsideration of participant inclusion and exclusion criteria.

Additionally, diversifying research cohorts would improve our understanding of how common conditions present with unique symptoms, risk factors and prognoses in patients who are not cisgender males. The presentations of conditions like myocardial infarction, pulmonary emboli and ischaemic strokes in women appear to vary from the 'traditional' symptoms often reported by men, and no attempts appear to be made to evaluate the symptoms reported in patients who do not conform to this sex binary [27-29]. Without adequate research in diverse cohorts to better understand these different presentations, critical mis-diagnoses can occur - for example, women presenting with minor neurological symptoms are more likely to be diagnosed with a stroke-mimic than a stroke, despite having a similar rate of stroke recurrence as men [30]. With women making up only 40% of participants in stroke clinical trials, and no appreciable increase from 2008 to 2018, strokes in women are poorly understood, in comparison to cisgender, perisex men [31].

Moreover, the relative importance of risk-factors for some conditions (e.g. ischaemic stroke and myocardial infarction) appear to vary with sex, which may affect the utility of public health interventions targeted to these risk-factors [32,33]. Sex may also influence prognosis and outcomes for a variety of conditions and interventions. As an example, a recent analysis of surgical mortality rates in the US indicates women have higher morbidity rates than men after cardiovascular surgeries, and higher rates of central nervous system-related post-operative complications, but the underlying cause remains unclear [34]. Accordingly, adequate research focussed on how sex and gender affect risk factors, prognoses and outcomes, alongside appropriate reporting of this information will be vital to prevent these complications.

Beyond general failures to include representative cohorts, there are calls from intersex, transgender and gender-diverse people for more research exploring their

unique health challenges. The Darlington Statement, authored by Australian and Aotearoa/New Zealand intersex communities, calls for “more research, including clinical, sociological and psychological research, led by community input,” noting that “clinical research, including longitudinal research, requires true, non-medicalised controls” [35]. A recent consensus paper from transgender and gender-diverse researchers called for more research into gender-affirming surgery and hormone therapies, in addition to routine healthcare for transgender and gender-diverse people, in addition to fertility and reproductive health research [36].

Historically, HIV/AIDS and mental health have been the predominant focus of research in transgender and gender-diverse populations, much of which has been performed in the context of broader LGBTQIA+ populations [37]. Even within HIV research, the erasure of transgender participants, especially from racial minorities, mitigates the meaningfulness of existing data and compromises intersectional healthcare [38]. To address these limitations and ensure transgender and gender-diverse communities can provide input into research agendas, Transform Health Arkansas, in the USA, organised summits for transgender and non-binary people to voice their opinions on healthcare research priorities [39]. This program received positive reviews from participants and generated qualitative and quantitative results for policy-makers, suggesting that similar approaches could be considered in Australia.

The inadequacy of research regarding the effects of gender-affirming hormone therapies, which many transgender people use to affirm their gender, exemplifies the current knowledge gap in members of the transgender and gender-diverse community [36]. Gender-affirming hormone therapies, which many transgender people use to affirm their gender, including oestrogen and testosterone, may increase the risks of venous thromboembolism and polycythemia, respectively [40,41]. Other key side-effects of hormone therapies, including changes to cancer risks, cardiovascular disease risks, and bone health remain unelucidated [37]. For example, transgender patients may be at greater risk of myocardial infarction, compared to cisgender populations, but results are not stratified by gender-affirming hormone therapy, making it difficult to contextualise these findings for individual transgender patients, to enable better patient care [42].

These research gaps reinforce the the use of binary diagnostic criteria and reference ranges (e.g. male and female haemoglobin reference ranges) in clinical care for transgender, gender-diverse and intersex patients [43]. For example, limited attempts have been made to quantify PSA levels in intersex people, or transgender women on gender-affirming hormone therapy, adding complications to prostate cancer surveillance, since established reference ranges reflect cisgender, perisex men [44-46]. Designing research focussed on health outcomes amongst transgender and gender-diverse populations is therefore vital to improve clinical recommendations, and reduce the current reliance on sex-binary reference categories, for diagnosis and management in transgender, gender-diverse and intersex patients.

Emphasising intersectionality within research into healthcare issues specific to transgender and gender-diverse communities is also essential. As an example of this current research gap, there have been limited studies specifically exploring the physical and mental health of Aboriginal and Torres Strait Islander people of diverse genders and sexes, including Sistergirls and Brotherboys [47]. A recent South Australian study examined the attitudes and experiences of Aboriginal Sistergirls and Brotherboys regarding HIV and sexual healthcare, which can assist in designing culturally safe healthcare and education for these populations [47,48]. Further targeted research addressing the health needs of these communities would be valuable. In doing so, the need for research agendas to be codesigned with Aboriginal communities has been identified [49], to ensure Aboriginal people and communities benefit from their contributions to such research.

In addition to providing more funding for research focusing on the unique health challenges affecting women, intersex, transgender and gender-diverse people, researcher diversity has also been identified as a key priority [36]. An analysis of biomedical research patents filed in the US over the past 30 years suggests that female researchers are more likely to make medical discoveries targeting women's health, but females represent only 13% of patent holders, leading the authors to conclude that the populations who benefit from these innovation reflect those who are given the opportunity to research and invent [50]. Additionally, female authors appear more likely to consider sex and gender when analysing data, based on a review of over 1.5 million medical research publications [51]. However, studies which feature female participants are less likely to be accepted for publication by reviewers, which likely disproportionately affects female researchers (who are more likely to use participants who are not cisgender males) [52]. Additionally, female principal investigators are evaluated less favourably than their male-presenting counterparts in research funding applications [53]. While there is no clear data on the proportion of researchers who identify as intersex, transgender or gender-diverse, it would be reasonable to assume that these pervasive biases are barriers to publication and career development amongst researchers of diverse sexes and genders.

Medical Education

To ensure students can provide culturally safe care for intersex, transgender and gender-diverse people, integrated and thorough teaching of sex and gender within medical education is required. The principle that medicine is and should be 'gender-blind' overlooks the influence of sex and gender on health, and perpetuates health disparities [2]. It is recognised that medical education has the power to improve the competence, awareness and willingness of medical students to support transgender, gender-diverse and intersex patients, which in turn improves outcomes for patients [54]. Therefore, in addition to understanding essential basics like terminology and pronouns, students must understand how

sex and gender influence health, and should possess sufficient skills to provide gender-affirming care, including during history taking and physical examinations. Adequate medical education must address the attitudes, knowledge and skills of medical students regarding sex and gender.

Attitudes:

Engaging with women, intersex, transgender and gender-diverse patients is a frequent occurrence for most healthcare workers, which requires socially and culturally-competent care, as noted by the Medical Board of Australia in Good Medical Practice [55, 56]. While recent studies report that medical students possess generally positive attitudes towards transgender patients' care [57-59], students are less comfortable with transgender patient care than with lesbian, gay and bisexual patient care [57]. Additionally, limited literature has attempted to quantify medical students' biases towards intersex, transgender and gender-diverse patients [60]. Explicit biases and discrimination based on sex and gender, which could include refusal of gender-affirming care, present a significant threat to inclusive medical care, and are increasingly condemned [61,62]. In contrast, implicit biases reflect students' underlying beliefs and attitudes about sex and gender. Examples could include assumptions that autism spectrum disorder affects largely men, coronary heart disease is unlikely to present with the atypical symptoms reported by women, or that the presenting complaint of a transgender patient relates to their gender – all of which could compromise patient care [63-67]. These unaddressed biases can also manifest as microaggressions, which could include inadvertently referring to patients with incorrect pronouns or by their deadname, or inappropriately questioning their decisions regarding gender expression [68]. Compounding on top of each other, these invalidations can have deleterious effects on the quality of care administered to transgender, gender-diverse, and intersex people and may discourage them from accessing healthcare [69].

Medical education focussed on reflexivity has the potential to improve this, by helping students to recognise their implicit biases, and providing tools to address them, in a supportive and individualised environment, to minimise student defensiveness [64]. This attitude-based training, which is the most common form of teaching in medical curricula, must also be supplemented with clinical experience [70]. Several studies suggest that medical students' self-reported attitudes towards transgender and gender-diverse patients are correlated with their clinical exposure to transgender patients, which affirms the important role of exposure in medical education [55,57-59]. Another American study suggests a minimum of 35 LGBTQIA+ patient encounters and 35 LGBTQIA+ curricula hours during medical training is required for students to experience a significant increase in confidence and preparedness to provide services to the LGBTQIA+ community [71]. It should be noted that this study did not consider what proportion of this exposure was dedicated specifically to intersex, transgender and gender-diverse patients. Greater clinical exposure to lesbian, gay and bisexual patients, compared to transgender patients, has been previously offered



as an explanation for disparities in students' comfort [57]. To rectify this, sufficient clinical experience with intersex, transgender and gender-diverse patients is necessary to ensure medical students cultivate inclusive attitudes towards intersex, transgender and gender-diverse patients.

In addition to better patient care, inclusive teaching regarding sex and gender may also improve the medical school and workplace experiences of students who identify as women, intersex, transgender and gender-diverse people. While no Australian data appears to be available, an American study amongst transgender and non-binary doctors and medical students reported that 69% of participants reported hearing derogatory comments about transgender and gender-diverse patients in medical school or practice [72]. Additionally, Australian, American, German and Canadian studies have noted that a significant portion of medical students self-report being exposed to sexual harassment during their education, with survivors being disproportionately women [73-76]. This culture of gender-based discrimination and harassment extends beyond medical schools, with harassment and unequal opportunities affecting women in specialties like surgery [77]. Addressing implicit and explicit gender biases through adequate and appropriate teaching may therefore assist in creating future generations of doctors who are capable of recognising and reforming these cultures [61,78].

Knowledge:

Even when medical students possess positive attitudes towards transgender, gender-diverse and intersex patients, many do not feel prepared with adequate knowledge to care for patients of diverse sexes and genders, due to inadequate education [58].

A notable example of deficits in teaching materials includes anatomy images, which are often sourced from textbooks and atlases. According to a 2017 article, perisex male anatomy predominates in visual representations given by medical textbooks, with intersex bodies being frequently excluded [79]. This echoes the findings of a 2016 American study, which reported that the majority of anatomy images shown in preclinical medical lectures reflected white, male bodies [80]. This affects student attitudes: a 2018 Australian randomised controlled trial reported that biased anatomy imagery significantly increased implicit biases amongst students [81].

A less sex-binary-focussed approach to anatomy imagery and information in medical schools has been suggested as a strategy to reduce the prevalence of problematic practices like non-consensual "normalizing" surgeries [82], which can inflict physical and psychological trauma on intersex people, as discussed in AMSA's Pregnancy, Perinatal and Infant Health Policy (2022) [83]. Additionally, many Australian universities have affirmed the Darlington Statement, authored by intersex communities from Australia and Aotearoa/New Zealand, which calls for greater recognition of the rights and autonomy of intersex people [84]. As an

example, the Darlington Statement calls for the removal of pathologising terms for intersex people, like 'disorders of sexual development' [35], and thus by ensuring that terminology in medical teaching reflects current best practice, medical schools are more likely to provide students with adequate knowledge to care appropriately for intersex patients, and understand the healthcare barriers they face [85,86].

Teaching regarding transgender and gender-diverse patient care is mostly composed of one-time attitude and awareness-based interventions, which provide only short-term improvement, and do not address knowledge deficits [70,87]. A 2022 systematic review identified a "lack of educational materials, lack of faculty expertise, time/costs constraints, and challenges in recruiting and compensating transgender guest speakers," as frequent barriers to the inclusion of detailed transgender health teaching in medical schools [88]. Additionally, teaching may be tokenistic, and feature 'stereotypical' presentations based on patients' genders or sexes: for example, transgender patients may present with gender-related issues in teaching cases. As a consequence, most American medical students believed that their knowledge on treating gender-diverse patients came from learning outside of their medical school curriculum, based on a recent study [89]. Similarly, Tasmanian students and healthcare practitioners in a recent study reported feeling ill-prepared to treat transgender patients, due to limited exposure, a lack of educational opportunities, and inappropriate referral pathways [90].

To address these teaching deficits, a US study showed a significant improvement in second year medical students' competency, knowledge and skills around transgender medicine after completing a five module gender-affirming curriculum [91]. Similarly, undergraduate medical students who completed a half-day program, which included a visit from a transgender patient and an applied clinical seminar, showed significant improvement in confidence using appropriate terminology and conducting clinical examinations of gender-diverse patients [92], echoing the findings of an interactive blended classroom project trialled at Western Sydney University's medical school in 2015 [93]. Students report that clinical communication skills classes, focus groups and education from gender-diverse people are effective learning tools [59]. These opportunities can combat existing tokenistic teaching representations of intersex, transgender and gender-diverse patients, and have been incorporated in some medical schools: for example, the University of Washington School of Medicine designed a four-year non-compulsory LGBTQ Health Pathway for students, which emphasises clinical experience, including with gender-diverse patients and educators [94].

Skills:

Inclusive teaching of clinical, communication, and sensitivity skills has been identified as a priority in medical education [88]. As an example, the under-diagnosis of coronary heart disease in women may be partly explained by

inadequate education surrounding proper cardiac examination skills in patients with breast tissue [2]. A 2013 American study noted that junior doctors were less likely to perform a correct cardiac examination on female simulated patients presenting with chest pain, compared to male simulated patients, with the greatest differences involving auscultation and palpation around the breast tissue [95]. Beyond these diagnostic issues, patients may be more likely to experience discomfort or feel unsafe when students lack experience. It is therefore important that all doctors are able to perform all examinations in patients with a variety of anatomical features (including breast tissue), requiring medical school teaching to incorporate a range of bodies. A 2016 Australian study observed that female medical students have a preference for examining same-sex peers, whilst male medical students had significantly lower rates of examining female students across multiple body parts [96]. Alternative methods to teach examination skills include using models (e.g. simulated model torsos with breasts) [97], simulated patients, or simulated patient-teachers, who can provide students with unique feedback on the patient experience and are associated with greater student comfort than simulated patients [98]. Medical schools may therefore need to supplement peer examination with alternative teaching methods for physical examinations, to ensure that students can perform these essential skills accurately and sensitively in all bodies.

Additionally, there is a large gap in education regarding skills required when supporting transgender and gender-diverse patients. A 2017 survey of medical students from the United Kingdom reported that 84.9% of participants lacked basic skills relevant to healthcare for gender-diverse people, including gender terminology and pronoun clarification [58]. This has been identified as a contributor to the adverse experiences reported by transgender and gender-diverse patients in the healthcare system [99]. A 2020 study suggests that good patient-doctor rapport improves care for sexual minorities, and that further training should be provided in the form of communication and sensitivity skills for this to occur [100].

Additionally, gender-based violence (including domestic, family and sexual violence) disproportionately affects women, transgender and gender-diverse people, and can have significant effects on survivors' physical, mental, economic and sexual health [101], as noted in AMSA's Sexual Harassment Policy (2021) [102] and Pregnancy, Perinatal and Infant Health Policy (2022) [83]. In Australia, 23% of women, and 14% of transgender people report experiencing sexual or domestic violence [6,103]; from 2010-2018, 68% of Australians who stayed in hospital as a result of domestic and family violence were women [104]. The prevalence of gender-based violence is higher amongst Aboriginal women [105], and Sistergirls and Brotherboys [106]. Teaching students skills to support domestic violence patients, through the lens of sex and gender, has been incorporated into some medical curricula internationally [107], with discussions with victims highlighted as a preferred teaching strategy, instead of didactic lectures [108]. A UK survey of medical schools' teaching teams noted that all agreed domestic violence teaching should be included in curricula, but in the

majority of universities which included some teaching on the topic, there was less than 2 hours teaching throughout the entire degree [109]. In a 2015 study, 12 of 18 Australian medical schools provided some teaching on intimate partner violence, with the median teaching time on the topic being 2 hours, and only two medical schools using an integrated, comprehensive teaching strategy [110]. In an American medical school, the introduction of integrated, longitudinal teaching relating to domestic, sexual and family violence increased students' understanding, based on exam results [111]. Students require skills to identify patients who may be vulnerable to gender-based violence, to proactively and sensitively ask patients about any exposure to gender-based violence, and to provide appropriate support and referrals [112]. Gender-based violence teaching may therefore improve the ability of medical students to support women, intersex, transgender and gender-diverse patients, particularly if teaching is longitudinal and intersectional in its focus.

Additionally, gender-affirming approaches to physical examination have been identified as important in medical practice, with doctors needing to consider patients' potential prior negative or abusive experiences, both within and outside the healthcare system [113]. For example, pelvic exams may be traumatic for transgender male patients [114], and as a result, transgender men are less likely to be up-to-date with cervical cancer screens [115]. Medical education should therefore equip students with adequate communication and examination skills, including the use of patient-guided language [116], and trauma-informed care [117, 118], to ensure students can provide supportive, affirming and comfortable healthcare environments for intersex, transgender and gender-diverse people.

Intersectionality

Care for transgender, gender-diverse and intersex elders

With Australia's ageing population, medical students will be faced with an increase in the population of older patients of diverse sexes and genders [119]. While these patients will share healthcare concerns with their cisgender and sex-binary peers, they also have unique healthcare needs, and face additional barriers to accessing high-quality, culturally-competent and evidence-based healthcare.

Older LGBTQIA+ adults, including transgender, gender-diverse and intersex people, are more likely to rate their health as poor and report more chronic conditions, while having less social support [120]. Older transgender patients have "significantly higher risk of poor physical health, disability, depressive symptomatology, and perceived stress," relative to cisgender peers, according to an American study [121]. Additionally, transgender and gender-diverse older adults can face additional barriers during end-of-life care including legal complications associated with recognition of their chosen families [122,123]. This can create anticipatory fear of ageing amongst some individuals of diverse genders and sexes, which, in some cases, can manifest as suicidal ideation [124].

AMSA's Healthy Ageing and Aged Care Policy (2022) contains further discussion of these issues.

As a result, training and education for medical students is necessary to ensure transgender, gender-diverse and intersex elders feel safe in healthcare settings, and aged-care facilities [125]. The Kinfolk Project provides several recommendations for aged-care facilities, including staff and family education, respect for patients' gender identities and privacy, and advocacy for transgender people with dementia [126]. Providing medical students with an understanding of how dementia affects transgender, gender-diverse and intersex elders therefore allows students to deliver appropriate gender-affirming care [127].

Care for culturally and linguistically-diverse transgender, gender-diverse and intersex people

An American study noted significantly higher rates of discrimination experienced by transgender people of colour based on their gender, relative to white transgender people, when accessing emergency rooms, interacting with doctors, and in interactions with ambulances [128]. Additionally, transgender women of colour in Australia are more likely to report being assaulted by a stranger than cisgender women [129]. In general, culturally and linguistically diverse (CALD) patients of all genders and sexes face heightened barriers when accessing healthcare: culturally and linguistically-inappropriate care may deter CALD people from attending appointments or engaging in treatment [130]. Culturally competent care requires practitioners to understand how their own cultural backgrounds, and the values implicit within healthcare systems, intersect with patients' unique identities, beliefs and lived experiences [131,132]. Additional consideration of the intersectional identities possessed by women, transgender, gender-diverse and intersex people belonging to CALD communities is required [132].

Poor understanding of key cultural concepts relating to sex and gender, including terminology, gender roles, and patient values (e.g. privacy and modesty) may impair the doctor's ability to provide culturally safe healthcare to women, transgender, gender-diverse and intersex people from CALD communities. Healthcare teams' inadequate understanding about the importance of modesty in some Islamic communities has been identified as a barrier to cervical cancer screening amongst Muslim women, for example [133]. Furthermore, women who are survivors of female genital mutilation also require trauma-informed and culturally sensitive healthcare [134,135], but an American study suggested most healthcare workers lack an understanding of the cultural implications of these practices [136]. Finally, unique cultural identities which do not conform to Western binaries of gender and sex, including *fa'afafine* (Samoa), *kathoey* (Thai) and *waria* (Indonesia), may be poorly understood by healthcare providers, thereby perpetuating discrimination and trauma [137,138].

Medical students require cultural competency training to appropriately treat transgender, gender-diverse and intersex CALD individuals, which would optimally be co-designed with members of CALD communities, as undertaken in a recent Australian study [139]. Several cultural competency models, including the LEARN model (Listen, Explain, Acknowledge, Recommend, Negotiate) proposed by Ladha et al, offer tools for students to develop cultural competency [131]. However, a 2019 systematic review noted that in medical schools in several countries (including the USA, Australia and New Zealand), cultural competency training targeting racial and ethnic minorities was frequently less than 3 hours in total, and often run as a lecture, with only several medical programs providing longitudinal experiences [140].

Additionally, improving students' patient-focussed communication skills, including their willingness to work with translators, family members and multicultural health services where necessary, can reduce the trauma experienced by women, transgender, gender-diverse and intersex patients from CALD backgrounds, particularly during intrusive examinations (e.g. pelvic exams) [141]. Where possible, teaching should also endeavour to highlight culturally-specific terminology for transgender or gender-diverse people, to ensure students can recognise, understand and use patients' preferred language for their identities [119]. Finally, medical students should appreciate that some women, transgender, gender-diverse or intersex patients from CALD backgrounds may have preferences for receiving care from providers of specific genders, and should facilitate patients' autonomy in this regard wherever possible [142]. Overall, medical curricula should emphasise that women, transgender, gender-diverse and intersex patients from CALD backgrounds each present with unique identities, values and lived experiences, and should be provided with culturally appropriate care which recognises the specific intersectional barriers they face.

Care for Aboriginal and Torres Strait Islander transgender, gender-diverse and intersex people

Cultural safety education during tertiary health science degrees, especially when coupled with interactions with Aboriginal and Torres Strait Islander patients, has been associated with increased student confidence and improved health outcomes among Aboriginal and Torres Strait Islander people [143]. From a gender perspective specifically, Aboriginal and Torres Strait Islander people have long held rich, nuanced and diverse understandings of gender, beyond the binary model, with transgender and gender-diverse people being part of Aboriginal and Torres Strait Islander communities since time immemorial [106,144]. Accordingly, instilling cultural sensitivity among medical students, specifically regarding care for transgender, gender-diverse and intersex Aboriginal and Torres Strait Islander patients, is necessary.

Students firstly require an understanding of the terminology, concepts and roles which relate to gender and sex within Aboriginal and Torres Strait Islander cultures, including men's business, women's business, Brotherboys and

Sistergirls [145]. Understanding the separation between men's business and women's business, for example, can facilitate culturally safe care: some Aboriginal and Torres Strait Islander people may consider it inappropriate for male carers to support Aboriginal patients who are women, for example [146].

Secondly, teaching should emphasise how the intersection of these identities is associated with higher rates of poor physical and mental health among Aboriginal and Torres Strait Islander transgender and gender-diverse people, as consequences of colonialism, racism and transphobia [146,147]. An intersectional lens emphasises the unique barriers faced by Aboriginal and Torres Strait Islander transgender and gender-diverse people, including heightened rates of homelessness, serious assault, psychological distress and suicidality [148]. Some Indigenous transgender or gender-diverse people are forced to move off Country to access gender-affirming care or find support, for example, while other Indigenous transgender and gender-diverse people are excluded from traditional women's or men's business, which can invoke unique health harms [149,150]. The inclusion of trauma-informed care as part of this cultural safety teaching has been identified as a priority, to allow healthcare professionals to understand the health consequences of the intergenerational trauma inflicted on Aboriginal and Torres Strait Islander peoples, including transgender, gender-diverse and intersex people [151]. Practical strategies which could be taught and modelled in medical schools, like displaying both pride and Aboriginal flags in healthcare spaces, asking patients' gender, sex and Aboriginal and Torres Strait Islander status appropriately where necessary, and establishing mechanisms for Aboriginal and Torres Strait Islander patients who identify as transgender or gender-diverse to provide feedback on their healthcare experiences, have also been identified as meaningful steps to improve cultural safety [148]. Overall, cultural safety teaching can allow medical students to best support Aboriginal and Torres Strait Islander patients who are women, transgender, gender-diverse or intersex people.



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