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Addressing surgical inequity for Aboriginal and Torres Strait Islander people in Australia's universal health care system: a call to action

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Title: Addressing surgical inequity for Aboriginal and Torres Strait Islander people in Australia's universal health care system – A call to action

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Abstract

Aboriginal and Torres Strait Islander people in Australia continue to experience health inequity within the Australian health care system. Little research has examined how disparities in surgical care access and outcomes contribute to Aboriginal health. In this narrative review and call to action, we discuss five care points along the journey to high quality surgical care; health care seeking, primary health care services, specialist services, surgery and surgical outcomes. We highlight barriers and disparities that exist along this journey, drawing examples from the field of joint replacement surgery. Finally, we present opportunities for change at the health system, health service and clinician level, calling upon researchers, clinicians and policy makers to confront the surgical disparities experienced by Aboriginal and Torres Strait Islander people.

Introduction

Aboriginal and Torres Strait Islander people in Australia (respectfully referred to as Aboriginal people herewith) continue to experience health inequity within the Australian health care system.^{1, 2} Often Aboriginal people experience systematic barriers to accessing appropriate and affordable high-quality health care including elective surgery.^{3, 4} ~~because health care may be inappropriate, unaffordable or unavailable.~~ With the exception of more recent work,^{5, 6} little research has examined disparities in surgical care and outcomes that include Aboriginal patients. Timely access to equitable, high-quality surgical care is an integral component of Australia's universal health care system.⁷ In this narrative review and call to action, we call upon researchers, clinicians and policy makers to confront the surgical disparities experienced by Aboriginal people. Surgical disparities experienced by Aboriginal people include inequitable access to surgical services (including at the nexus of primary and secondary care) as well experiencing higher rates of post-operative morbidity and mortality. By addressing systemic barriers along the pathway to surgery, there is the opportunity to improve the health of Aboriginal people and communities. We will illustrate these opportunities by drawing examples from the field of joint replacement

surgery, a high demand, high volume, clinically effective means of treating disabling osteoarthritis which over 100,000 Australians access each year.⁸

The pathway to high quality surgical care

Starting with the recognition of a symptom or health issue that may require surgery, we will discuss five care points along the surgical journey (see Figure 1).⁹ Barriers to accessing care at each of these points have been identified and presented alongside a discussion of how these barriers may be addressed. Each step along the pathway is supported with examples taken from the experience of osteoarthritis patients and the pathway to total joint replacement.

Step 1: Perception of need and health care seeking

While there is no single 'Aboriginal perception of health',^{10,11} many Aboriginal people adopt a more holistic view of health than a Western biomedical approach.⁴ This holistic view encompasses a person's physical wellbeing, spirituality, connection to land and culture; as well as the community's social, emotional and cultural wellbeing.¹² The first step in the patient's health care access journey is marked by a recognition that their health or symptoms require care.³ Not only the perception of 'health' and 'ill-health', but also the need for care and health seeking behaviour is influenced by social and cultural determinants especially expectations and trust.³ While few studies have explored Aboriginal peoples' perception of the need for health care, delays in seeking care have been associated with a lack of trust in the health care system.^{3, 13} Many Aboriginal peoples' experience is that Western health services do not understand, nor incorporate an understanding of Aboriginal values and beliefs.⁴ These cultural factors, an ageing population and socioeconomic circumstances often lead to Aboriginal people presenting to care as a last resort or when needs become urgent.^{14, 15}

Perception of need and health care seeking in relation to osteoarthritis

It has been estimated that half of non-Aboriginal patients do not seek medical help even when their knee pain from osteoarthritis is severely debilitating,^{16, 17} This may be due, in part, to patients not prioritising a discussion about their joint pain in their medical consultations when they have a diagnosis of other comorbid conditions.¹⁶ Such relegating of joint pain may be particularly relevant in an Aboriginal context where approximately 90% of Aboriginal peoples over the age of 55 report at least one chronic disease¹⁸ and 38% of Aboriginal adults have two or more of heart disease, diabetes or chronic kidney disease.¹⁹ It is important to note that not only do Aboriginal people experience rates of osteoarthritis 1.2 to 1.5 higher than non-Aboriginal Australians²⁰, their burden of disease is greater (31 Disability-Adjusted Life Years per 1000 people for Aboriginal people versus 22 per 1000 people for non-Aboriginal Australians).²¹ **Despite this, Aboriginal people and their health care practitioners may not prioritise joint pain in the presence of multiple chronic diseases nor be aware of effective treatments that are available. Furthermore, unconscious practitioner bias may contribute to underestimating Aboriginal people's experience of joint pain, leading to less comprehensive musculoskeletal pain assessments, underdiagnosis and therefore treatment and management of osteoarthritis^{10, 22}.** Pain, stiffness and impaired movement mean that osteoarthritis of the hip and knee are the most common causes of physical activity limitation²³ and this impacts on quality of life, participation in work, sport, family, daily function, emotional wellbeing, cultural participation and one's ability to self-manage co-morbid chronic conditions. In this regard, osteoarthritis contributes indirectly to disparities in life expectancy and the 'health gap' and more importantly, people with osteoarthritis also die younger than those without osteoarthritis²⁴. There is a need to view osteoarthritis and mobility limitations as the missing piece in the chronic disease puzzle and therefore chronic joint pain should not go unnoticed.

Step 2: Access to primary health care

The 2014-15 National Aboriginal and Torres Strait Islander Social Survey found that 22% of Aboriginal people over the age of 15 living in non-remote areas experienced difficulty accessing health care services¹⁸ which was almost 10 times higher than the wider population (2.6%).²⁵ Primary health care services are accessible when they are available and geographically accessible, affordable, known and acceptable to the

community which they aim to serve.^{26, 27} Concepts such as cultural security are often poorly understood or ignored by health care providers, despite being an essential component of health services for Aboriginal people.²⁸ Cultural security in health care occurs when services are offered by the health system in a way that will not compromise the cultural rights, values, beliefs, knowledge systems and expectations of Aboriginal people.^{28, 29} Such values must be embedded in the structures, policies and workforce of services. Improving the cultural security of care is widely understood to improve Aboriginal health care access.^{28, 29} Disparities in health care utilisation and access by Aboriginal people are underscored by a history of negative health care experiences, mistrust and suspicion of the health care system and practitioners.³⁰⁻³² Cultural differences between Aboriginal people and non-Aboriginal health care providers have been recognised since the 1970s³² but little appears to have changed in terms of ensuring cultural safety, reducing racism or promoting better understanding by health providers over the ensuing five decades.^{27, 34} Aboriginal communities in Australia have long argued for the vital role that Aboriginal Community Controlled Health Services (ACCHS) play in improving the health of Aboriginal people.³⁵ ACCHS contribute to improving health through ensuring community-controlled governance and the provision of comprehensive Aboriginal-specific primary health care services.

Access to primary health care for osteoarthritis

Treatment guidelines for osteoarthritis currently recommend self-management and non-surgical interventions such as exercise, nutritional education and physical therapy, as a first step which also is beneficial for managing other chronic health conditions.^{36, 37} **Aboriginal people experience barriers to accessing preventative self-management and first line therapies for osteoarthritis which are also influenced by the social determinants of health, for example food security and nutrition, social stigma of participating in exercise, and having the financial means access to healthy choices.**²⁰ Despite experiencing a greater burden of osteoarthritis, Aboriginal people are half as likely to access primary care for osteoarthritis.³⁸ A national study of Australian General Practice, The Bettering the Evaluation and Care of Health (BEACH) study, reported that Aboriginal people had substantially lower rates of primary care access compared to

non-Aboriginal Australians for knee osteoarthritis (3.2 vs 6.5 per 1000 encounters), and hip osteoarthritis (1.2 vs 2.3 per 1000 encounters).³⁸ **Aboriginal people seeking care for musculoskeletal pain are often confronted by ineffective communication with health practitioners, experiences of stigma and lack of trust in the health system.**³⁹ An important strategy with the potential to improve health care access would be to integrate osteoarthritis care into ACCHS. Evidence from Canada suggests that incorporating focused, musculoskeletal disease assessments into existing Aboriginal health centres can facilitate diagnosis and access to arthritis care and is acceptable and culturally secure from the perspective of Aboriginal patients.⁴⁰

Step 3: Access to specialist services

Aboriginal people have lower access to specialist medical care, and hence surgery than non-Aboriginal people.^{41, 42} Accessing specialist services is an essential component to the timely diagnosis and referral of patients who may benefit from a surgical procedure. In 2015-16, access to specialist services was 43% lower for Aboriginal people than for non-Aboriginal Australians.⁴³ Lower Medicare claim rates for specialist services have been attributed in part to differences in the relative population of Aboriginal and non-Aboriginal people across metropolitan, regional and remote areas. In rural and remote areas where the proportion of Aboriginal people in the population is higher, access to specialist services is lower.⁴⁴ However 79% of Aboriginal people live in metropolitan areas and specialist care access is still low, suggesting geography is not the primary barrier.^{45, 46} Barriers to accessing specialist care include affordability, travel arrangements, poor communication by ~~the~~ health professionals, lower satisfaction rates²⁷ and insufficient numbers of Aboriginal doctors/specialists **all of which are exacerbated by many specialist services being located within hospitals.**⁴⁷⁻⁴⁹ Conversely, providing specialist health care in primary care settings or ACCHS is reported to improve patient satisfaction, accessibility and access to these services by Aboriginal people.⁵⁰

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Access to musculoskeletal specialist services

The Victorian Model of Osteoarthritis Care has made a number of recommendations to improve access to musculoskeletal specialist services.³⁷ Strategies include establishing multidisciplinary specialist outreach services to metropolitan Aboriginal medical services and rural and regional areas (including physicians, rheumatologists, sport and exercise medicine physicians, orthopaedic surgeons and allied health professionals) and wider implementation of programs shown to be effective, such as the NSW Osteoarthritis Chronic Care Program⁵² or the Victorian Osteoarthritis Hip and Knee Service (OAHKS) to be delivered in a variety of community based settings. Although these strategies have been proven in mainstream settings, they currently lack the cultural lens that is required to facilitate uptake of such services by Aboriginal people. Specialist outreach services may be better placed within ACCHS, other Aboriginal community organisations, or within general practice settings, ~~an approach that fosters partnerships between specialist and Aboriginal services, and one that is also~~ an approach which is supported and recommended by ACCHS.⁵³

Step 4: Access to surgery

One million Australians and New Zealanders do not have access to adequate surgical care and Aboriginal people are overrepresented in these subsets of the trans-Tasman population.⁵⁴ Whilst Aboriginal people are more likely to be hospitalized than non-Aboriginal people, the reverse is true for admission to hospital for surgical procedures.⁵⁵⁻⁵⁷ Aboriginal people are half as likely to be admitted for an elective surgical procedure compared to non-Aboriginal Australians but twice as likely to be admitted for emergency surgery and spend longer on surgical waiting lists.^{5, 55, 57, 58} This compounds an already overburdened public elective surgery service.⁵⁹ Median wait times for Aboriginal people on the wait list for elective surgery are longer (50 days) compared to other Australians (41 days),⁵⁸ which may be partly attributed to Aboriginal people more commonly utilising public health care services over privately insured health care.²⁷ Disparities in waiting times for elective surgery may also be underestimated, considering that many Aboriginal people are not offered surgical interventions as a treatment option and therefore do not make it onto the waiting list.

In public hospitals in Australia, patients who identify as Aboriginal and/or Torres Strait Islander are significantly less likely than other patients to have a principal procedure recorded.⁵⁶ This phenomenon known as ‘the treatment gap’ can be defined by differences in the quality of care received that are not explained by clinical need, patient preference or the appropriateness of the intervention.^{22,60} Patient preferences and the prevalence and severity of comorbidities are often cited as reasons for lower rates of surgical procedures among Aboriginal people.^{22,56, 57} However, even after adjusting for relevant patient characteristics, such as diagnosis, age, sex and place of residence, research demonstrates that Aboriginal people in public hospitals still receive less therapeutic procedures than non-Aboriginal patients.^{55, 56} Whether this is the result of systemic or decision-making biases remains speculative.^{22,56} However, surgeons at the coalface are in an ideal position to acknowledge the existence of this discrepancy and therefore, can and should actively advocate for changes within surgery. **Surgeons should be encouraged to exercise reflective practices to explore their own assumptions and better understand their potential unconscious biases.**

Access to total joint replacement

Current guidelines recommend total joint replacement surgery for the treatment of end stage osteoarthritis which is no longer responding to non-surgical care. Total joint replacement is considered the gold standard treatment for end-stage osteoarthritis, as a safe and cost-effective intervention which achieves significant improvements in symptom control, physical function and quality of life for many people who undergo this procedure.⁶¹ Among Aboriginal people, access and utilisation of total joint replacement for osteoarthritis is low. Total joint replacements are accessed by Aboriginal people at approximately half the expected rate based on incidence (RR=0.49 for men, RR=0.44 for women).⁶² For those that do make it to the wait list for total joint replacement, Aboriginal people wait longer for surgery than non-Aboriginal people. In 2017-18 Aboriginal peoples’ median wait time for total knee replacement was 278 days compared to 196 days for

non-Aboriginal Australians and the median wait time for total hip replacement was 188 days compared 120 for non-Aboriginal Australians respectively.⁵⁸

Step 5: Surgical outcomes

Aboriginal people that undergo surgical treatment, are younger, present at more advanced stages of disease and experience higher rates of post-operative morbidity and mortality.^{5, 6, 41, 64, 65} **These poor health outcomes can reinforce distrust in clinicians and services and further hamper a willingness to seek health care.**

Although the evidence is limited, Aboriginal surgical patients have higher rates of readmission, longer length of hospital stays, increased risk of surgical site infection (for caesarian and appendicectomy and post-operative pneumonia, increased need for prolonged ventilation and poorer long-term survival.⁶³⁻⁶⁶ The majority of literature exploring disparities in surgical outcomes come from the field of cardiac surgery^{63, 64, 67, 68} and there is a lack of studies investigating disparities other surgical specialties. In a recent systematic review exploring postoperative mortality in Indigenous populations, seven Australian studies were identified all of which addressed cardiac procedures.⁶ There is an urgent need for a better understanding of outcomes for Aboriginal people in all surgical specialties, to identify whether such disparities exist, and if so, how these may be mitigated to allow more effective and efficient deployment of surgery in Aboriginal communities.

Surgical outcomes for total joint replacement

There is a lack of evidence exploring surgical outcomes for Aboriginal people who undergo total joint replacement **in Australia. To date, no studies have described the demographic and clinical characteristics of Aboriginal people undergoing total joint replacement or compared preoperative and postoperative outcome data between Aboriginal and non-Aboriginal patients undergoing total hip or knee replacement surgery. Data from New Zealand suggests that** Māori present with higher prevalence of surgical disease, have lower access to surgical services and worst post-operative outcomes more broadly after adjusting for patient factors.⁶⁹ Māori who undergo joint replacement surgery for osteoarthritis are younger and have

worse preoperative function and postoperative functional improvements than non-Māori.⁷⁰ When comparing surgical outcome data between Aboriginal and non-Aboriginal patients, the influence of comorbid conditions needs also to be considered. Investigating baseline clinical characteristics of Aboriginal people undergoing total joint replacement and measuring functional and quality of life improvements will help us to understand the value of joint replacement within the Aboriginal population. ~~The issue of health inequity for Aboriginal people in total joint replacement at all levels of the patient journey requires further exploration.~~ Next steps should include utilising existing clinical registry data such as the Australian Orthopedic Association National Joint Replacement Registry⁸ to better describe demographic and clinical characteristics of Aboriginal people undergoing total joint replacement as well as surgical and postoperative outcomes.

Call to action

The issue of inequity in surgical care for Aboriginal people calls for urgent attention and action. Gaps in the literature such as the lack of evidence describing the demographic, clinical and surgical outcome data of Aboriginal people undergoing total joint replacement compromise our ability to understand and, where present, address disparities in surgical care for Aboriginal people. There is a compelling need to address these gaps through culturally secure research which engages Aboriginal voices, prioritises Aboriginal ways of knowing, and addresses community priorities.⁷¹ For example, by telling the story of the surgical care journey from the perspective of Aboriginal people through qualitative investigations, we can further our understanding of the determinants of disparities as they arise along that journey. Identifying and investigating such determinants will lead to strategies that can improve surgical access and outcomes, and ultimately help to develop culturally secure models of care for Aboriginal people requiring surgery.

A culturally secure pathway to surgery

A comprehensive approach to improving the pathway to surgery and surgical care for Aboriginal people requires consideration of opportunities for improvement at the health system, health service and clinician

level.⁷² Within these considerations, understanding the sociocultural context of Aboriginal people seeking care and addressing the social determinants of health and discrimination is key to delivering a culturally secure pathway to high quality surgical care.

System-level considerations

System-level considerations relate to the broader environment in which health care is delivered. These include health policy and regulation, financial and payment factors, the health workforce and mechanisms to optimize service delivery.^{72, 73} An overarching commitment to cultural security is required at the system level so that health care services are supported by policies that will not compromise the cultural rights, values, beliefs, knowledge systems and expectations of Aboriginal people.²⁷⁻²⁸ Such and such policies should ensure that there is Aboriginal representation in health care from leadership to delivery and that health care is shaped and improved by ongoing Aboriginal consumer input and evaluation.²⁸ The Royal Australasian Colleges of Surgeons (RACS) have started on this journey, incorporating both equity of access and Indigenous health into strategic planning^{49, 59} and states the vision of 'building the workforce and increasing services to better meet the needs of Aboriginal, Torres Strait Islander and Māori populations'. These systemic changes are underpinned by the RACS Indigenous Health Position Paper and reinforced by the introduction of cultural competence and cultural safety into the RACS Surgical Competence and Performance guidelines in February 2020.^{49, 74}

Addressing the underrepresentation of Aboriginal health professionals in the health workforce is recognised as an essential component of an integrated response to overcoming Aboriginal health inequities. Although the enrollment of medical students who identify as Aboriginal and/or Torres Strait Islander is increasing, significant shortfalls in the health workforce remain. The health workforce should aim to match the needs of Aboriginal people in every health discipline; mechanisms to support Aboriginal doctors throughout their training journey with particular focus on specialisation should also be implemented. Currently, in Australia there is only one Aboriginal specialist surgeon who is a Fellow of

the RACS.⁵⁹ Further to expanding the Aboriginal health workforce, greater efforts are required to ensure adequate cultural curricula is included in our training and education systems, to prepare our future clinicians to deliver care that is culturally secure.

Health service-level considerations

Health service level considerations should aim to increase access and improve health outcomes for Aboriginal people. ~~ACCHS provide comprehensive Aboriginal-specific primary health care services that are more accessible to Aboriginal people.~~ Aboriginal specific health services should be expanded and funded to improve the coordination between primary, secondary and tertiary services, to enable Aboriginal people to access culturally secure referral pathways to surgical care when they are needed. Enabling as many steps in the surgical care pathway to take place ‘under one roof’ may also support Aboriginal people to access specialist services and prevent patients from falling through the transition gaps that exist within this care pathway.¹³ If Aboriginal specific health services are unable to provide specialist services within them, meaningful partnerships should be fostered between Aboriginal health services and mainstream health services. Barriers to accessing existing mainstream health services should also be addressed through widespread workforce cultural training. By doing this, mainstream health services may be better placed to offer care in a way that will not compromise the cultural values of Aboriginal patients.

Clinician-level considerations

Responsibility for reducing Aboriginal disparities in surgery rests primarily with the health system and its services, yet clinicians must identify opportunities and advocate for change within these structures. While the priority for surgeons will always be to deliver best practice clinical care, surgeons must also begin to **reflect on and** acknowledge the diverging world-views about illness and treatment that Aboriginal patients and their families may face along the surgical care journey. Surgeons through the RACS, specialist societies and professional bodies contribute significantly in community and workforce leadership. Therefore, they have real role beyond the operating theatre in reframing both education and training

activities and the way that health care is delivered to better meet the needs of Aboriginal patients.

Surgeons must **reinforce at the clinician-level that** providing culturally secure care **must be** a best practice attribute of surgery in Australia.

Practical approaches include encouraging clinicians to learn about the impact of culture on health and health care and to recognise that clinician biases may contribute to inequities in health care.^{22,75} Whilst providing care, clinicians should take the time to develop relationships with patients to learn about their individual sociocultural context, needs, knowledge, values and goals and engage in effective communication to do so.⁷⁶ Developing strong and trusting relationships with Aboriginal patients is one of the most powerful ways clinicians can facilitate **meaningful communication and** engagement of Aboriginal people in health care over time.⁷⁷ ~~Poor communication is the most commonly reported barrier to satisfactory health care for Aboriginal people.⁷⁸⁻⁸⁰ Therefore, clinicians need to recognise when communication is not effective and develop skills and capabilities to improve upon this.~~

Conclusion

~~Reducing the barriers that Aboriginal people experience in accessing high quality surgical care is a complex and important issue. System level changes are required to address cultural security and the underrepresentation of Aboriginal people in the health workforce. Integrating specialist surgical services within Aboriginal Medical Services improves the interface between primary, specialist and surgical services and in turn expedites secure referral pathways. Surgeon champions are fundamental for change and are needed to hold each other accountable to cultural competency and communication. Addressing these issues sets the health system up to improve not only the care and outcomes for the Aboriginal community, but indeed, for all Australians.~~

Authorship Statement

PO and PC were responsible for the concept of this narrative review and call to action. PO led and drafted the first version of the manuscript. SB, IL, DB, JC, MD and PC all provided significant contribution and

feedback on drafts. SB, IL, DB, JC, MD and PC also provided PhD supervision of PO in the writing of this piece. DB and JC provided additional cultural guidance in the drafting of this paper. All authors have read and approved the final version of this manuscript for submission.

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References

1. Dudgeon P, Wright M, Paradies Y, Garvey D, Walker I. The social, cultural and historical context of Aboriginal and Torres Strait Islander Australians. In *Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice*. Australian Institute of Health and Welfare: Canberra. 2010; p25-42.
2. Sherwood J. Colonisation–It’s bad for your health: The context of Aboriginal health. *Contemp Nurse*. 2013;**46**(1):28-40.
3. Levesque JF, Harris MF, Russell G. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. *Int. J. for Equity Health*. 2013;**12**(1):18.
4. Davy C, Harfield S, McArthur A, Munn Z, Brown A. Access to primary health care services for Indigenous peoples: a framework synthesis. *Int. J. for Equity Health*. 2016;**15**(1):163.
5. De Jager E, Gunnarsson R, Ho YH. Measuring the quality of surgical care provision to Aboriginal and Torres Strait Islander patients. *ANZ J. Surg*. 2019;**89**(12):1537-8.
6. McLeod M, Signal V, Gurney J, Sarfati D. Postoperative Mortality of Indigenous Populations Compared With Nonindigenous Populations: A Systematic Review. *JAMA Surg*. 2020;**155**(7):636–656. doi:10.1001/jamasurg.2020.0316.
7. McQueen KA, Ozgediz D, Riviello R, Hsia RY, Jayaraman S, Sullivan SR, et al. Essential surgery: Integral to the right to health. *Health Hum. Rights*. 2010;**12**(1):137-52.
8. Australian Orthopaedic Association National Joint Replacement Registry. Hip, Knee & Shoulder Arthroplasty: 2019 Annual Report. Adelaide: AOA; 2019.
9. Australian Institute of Health and Welfare. Review and evaluation of Australian information about primary health care: a focus on general practice. Canberra: AIHW. Contract No.: Cat. no. HWI 103.
10. Baba JT, Brolan CE, Hill PS. Aboriginal medical services cure more than illness: a qualitative study of how Indigenous services address the health impacts of discrimination in Brisbane communities. *Int. J. for Equity Health*. 2014;**13**:56-.
11. Kingsley J, Townsend M, Henderson-Wilson C, Bolam B. Developing an exploratory framework linking Australian Aboriginal peoples’ connection to country and concepts of wellbeing. *Int. J. Environ. Res. Public Health*. 2013;**10**(2):678-98.
12. Australian Government Department of Health. National Aboriginal and Torres Strait Islander Health Plan 2013–2023. Canberra: Australian Government Department of Health: 2013.
13. Penrose L, Roe Y, Johnson NA, James EL. Process redesign of a surgical pathway improves access to cataract surgery for Aboriginal and Torres Strait Islander people in South East Queensland. *Aust. J. Primary Health*. 2018;**24**(2):135-40.
14. Dixon-Woods M, Cavers D, Agarwal S, Annandale E, Arthur A, Harvey J, et al. Conducting a critical interpretive synthesis of the literature on access to healthcare by vulnerable groups. *BMC Med. Res. Methodology*. 2006;**6**(1):35.
15. Richards HM, Reid ME, Watt GC. Socioeconomic variations in responses to chest pain: qualitative study. *BMJ*. 2002;**324**(7349):1308.
16. Bedson J, Mottram S, Thomas E, Peat G. Knee pain and osteoarthritis in the general population: what influences patients to consult? *Fam. Pract*. 2007;**24**(5):443-53.
17. Prasanna SS, Korner-Bitensky N, Ahmed S. Why do people delay accessing health care for knee osteoarthritis? Exploring beliefs of health professionals and lay people. *Physiother Can*. 2013;**65**(1):56-63.
18. Australian Bureau of Statistics. Aboriginal and Torres Strait Islander Social Survey 2014-15. Canberra; 2016. Contract No.: cat. no. 4714.0.

19. Australian Institute of Health and Welfare. Cardiovascular disease, diabetes and chronic kidney disease—Australian facts: Aboriginal and Torres Strait Islander people. Canberra: AIHW; 2015. Contract No.: Cat. no. CDK 5.
20. Australian Institute of Health and Welfare. Australia's Health 2014. Canberra: AIHW; 2014.
21. Australian Institute of Health and Welfare. The Burden of Musculoskeletal conditions in Australia. AIHW; 2017.
22. Cunningham J, Cass A, Arnold PC. Bridging the treatment gap for Indigenous Australians. *The Med J Aust.* 2005;**182**(10):505-6.
23. Cross M, Smith E, Hoy D, Nolte S, Ackerman I, Fransen M, et al. The global burden of hip and knee osteoarthritis: estimates from the global burden of disease 2010 study. *Ann Rheum Dis.* 2014;**73**(7):1323-30.
24. Nuesch E, Dieppe P, Reichenbach S, Williams S, Iff S, Juni P. All cause and disease specific mortality in patients with knee or hip osteoarthritis: population based cohort study. *BMJ.* 2011;**342**:d1165.
25. Australian Bureau of Statistics. Year Book Australia 2012. Australian Bureau of Statistics; 2012.
26. Australian Institute of Health and Welfare. Access to health and services for Aboriginal and Torres Strait Islander people. Canberra AIHW; 2011. Contract No.: Cat. No. IHW 46.
27. Scrimgeour M & Scrimgeour D. Health care access for Aboriginal and Torres Strait Islander people living in urban areas, and related research issues: a review of the literature: Cooperative Research Centre for Aboriginal Health; 2008.
28. Coffin J. Rising to the challenge in Aboriginal health by creating cultural security. *Aborig Isl Health Work J*:**31**(3):22.
29. Northern Territory Department of Health. Northern Territory Health Aboriginal Cultural Security Framework 2016-2026. Darwin: Department of Health 2016.
30. Thurston WE, Coupal S, Jones CA, Crowshoe LF, Marshall DA, Homik J, et al. Discordant indigenous and provider frames explain challenges in improving access to arthritis care: a qualitative study using constructivist grounded theory. *Int. J. for Equity Health.* 2014; **13**(1):46.
31. Tugwell P, de Savigny D, Hawker G, Robinson V. Applying clinical epidemiological methods to health equity: the equity effectiveness loop. *BMJ.* 2006;**332**(7537):358-61.
32. Shahid S, Finn L, Bessarab D, Thompson S. Understanding, beliefs and perspectives of Aboriginal people in Western Australia about cancer and its impact on access to cancer services. *BMC Health Serv. Res.* 2009;**9**(1):132.
33. Downing R, Kowal E, Paradies Y. Indigenous cultural training for health workers in Australia. *Int. J. Health. Care Qual. Assur.* 2011;**23**(3):247-57.
34. Wain T, Sim M, Bessarab D, Mak D, Hayward C, Rudd C. Engaging Australian Aboriginal narratives to challenge attitudes and create empathy in health care: a methodological perspective. *BMC Med. Educ.* 2016;**16**(1):156.
35. Campbell MA, Hunt J, Scrimgeour DJ, Davey M, Jones V. Contribution of Aboriginal Community-Controlled Health Services to improving Aboriginal health: an evidence review. *Aust Health Rev.* 2018;**42**(2):218-26.
36. The Royal Australian College of General Practitioners. Guideline for the management of knee and hip osteoarthritis. East Melbourne, Victoria.: RACGP; 2018.
37. Victorian Musculoskeletal Clinical Leadership Group. Victorian Model of Care for Osteoarthritis of the Hip and Knee. Melbourne MOVE muscle, bone & joint health.; 2018.
38. Brand CA, Harrison C, Tropea J, Hinman RS, Britt H, Bennell K. Management of osteoarthritis in general practice in Australia. *Arthrit Care & Res.* 2014;**66**(4):551-8.
39. Lin IB, Bunzli S, Mak DB, Green C, Goucke R, Coffin J, et al. Unmet Needs of Aboriginal Australians With Musculoskeletal Pain: A Mixed-Method Systematic Review. *Arthrit Care & Res.* 2018;**70**(9):1335-47.
40. Barnabe C, Lockerbie S, Erasmus E, Crowshoe L. Facilitated access to an integrated model of care for arthritis in an urban Aboriginal population. *Can Fam Physician.* 2017;**63**(9):699-706.

41. Gruen RL, Tesimale L, Kong K, Clarke M, Jacobs S, Jacob O, et al. The surgical care of indigenous Australians: a structured orientation programme. *ANZ J. Surg.* 2007;**77**(11):925-9.
42. Australian Institute of Health and Welfare. Australia's Health 2018 Canberra: AIHW; 2018.
43. Australian Institute of Health and Welfare. Australia's Health 2016. Canberra: AIHW; 2016.
44. Angell B, Muhunthan J, Eades A-M, Cunningham J, Garvey G, Cass A, et al. The health-related quality of life of Indigenous populations: a global systematic review. *Qual. Life. Res.* 2016;**25**(9):2161-78.
45. Young C, Tong A, Gunasekera H, Sherriff S, Kalucy D, Fernando P, et al. Health professional and community perspectives on reducing barriers to accessing specialist health care in metropolitan Aboriginal communities: A semi-structured interview study. *J Pediatr Health Car.* 2017;**53**(3):277-82.
46. Australian Bureau of Statistics. Census of Population and Housing: Australia Revealed, 2016. 2017.
47. Gruen RL, O'Rourke IC, Bailie RS, d'Abbs PH, O'Brien MM, Verma N. Improving access to specialist care for remote Aboriginal communities: evaluation of a specialist outreach service. *Med. J. Aust.* 2001;**174**(10):507-11.
48. Carson PJ. Providing Specialist Services in Australia Across Barriers of Distance and Culture. *World J. Surg.* 2009;**33**(8):1562-7.
49. The Royal Australasian College of Surgeons. The RACS Indigenous Health Position Paper. Melbourne RACS; 2013.
50. Hayman NE, White NE, Spurling GK. Improving Indigenous patients' access to mainstream health services: the Inala experience. *Med J Aust.* 2009;**190**(10):604-6.
51. Gruen RL, Weeramanthri TS, Bailie RS. Outreach and improved access to specialist services for indigenous people in remote Australia: the requirements for sustainability. *J Epidemiol Commun H.* 2002;**56**(7):517.
52. Innovation NAfC. Osteoarthritis Chronic Care Program Model of Care. Sydney: NSW Agency for Clinical Innovation 2012.
53. Marles E, Frame C, Royce M. The Aboriginal Medical Service Redfern Improving access to primary care for over 40 years. *Aust Fam Physician.* 2012;**41**:433-6.
54. Alkire BC, Raykar NP, Shrimel MG, Weiser TG, Bickler SW, Rose JA, et al. Global access to surgical care: a modelling study. *Lancet Glob. Health.* 2015;**3**(6):e316-23.
55. Australian Health Ministers' Advisory Council. Aboriginal and Torres Strait Islander health performance framework 2017 report. Australian Department of Health: Canberra; 2017.
56. Cunningham J. Diagnostic and therapeutic procedures among Australian hospital patients identified as Indigenous. *Medical J Aust.* 2002;**176**(2):58-62.
57. Ishak M. Differences in the surgical admissions to hospital between the indigenous and non-indigenous populations of Australia. *ANZ J. Surg.* 2003;**73**(4):200-4.
58. Australian Institute of Health and Welfare. Elective surgery access Canberra AIHW; 2019 Available from: <https://www.aihw.gov.au/reports-data/myhospitals/intersection/access/eswt>.
59. The Royal Australasian College of Surgeons. Equity of Access to Surgical Care. Melbourne: RACS; 2017.
60. Smedley BD, Stith AY, Nelson AR. Institute of Medicine. Unequal treatment: confronting racial and ethnic disparities in health care. Washington, DC: National Academies Press; 2003.
- ~~60. Cunningham J, Cass A, Arnold PC. Bridging the treatment gap for Indigenous Australians. The *Med J Aust.* 2005;**182**(10):505-6.~~
61. Higashi H, Barendregt JJ. Cost-effectiveness of total hip and knee replacements for the Australian population with osteoarthritis: discrete-event simulation model. *PLoS One.* 2011;**6**(9):e25403.
62. Dixon T, Urquhart DM, Berry P, Bhatia K, Wang Y, Graves S, et al. Variation in rates of hip and knee joint replacement in Australia based on socio-economic status, geographical locality, birthplace and indigenous status. *ANZ J. Surg.* 2011;**81**(1-2):26 -31.

63. Wiemers P, Marney L, Muller R, Brandon M, Kuchu P, Kuhlur K, et al. Cardiac surgery in Indigenous Australians—how wide is ‘the gap’? *Heart Lung Circ.* 2014;**23**(3):265-72.
64. Prabhu A, Tully PJ, Bennetts JS, Tuble SC, Baker RA. The morbidity and mortality outcomes of indigenous Australian peoples after isolated coronary artery bypass graft surgery: the influence of geographic remoteness. *Heart Lung Circ.* 2013;**22**(8):599-605.
65. Henman K, Gordon CL, Gardiner T, Thorn J, Spain B, Davies J, et al. Surgical site infections following caesarean section at Royal Darwin Hospital, Northern Territory. *Healthc. Infect.* 2012;**17**(2):47-51.
66. Thong DW, Kim J, Dobson B, Cheung H, Arthur T, Collaboration Q, et al. Variation in anti-microbial prescription and complications post emergency appendicectomy in Australia: do we follow recommended guidelines? *ANZ J. Surg.* 2020;**90**(3):251-6.
67. Lehman SJ, Baker RA, Aylward PE, Knight JL, Chew DP. Outcomes of cardiac surgery in Indigenous Australians. *Med J Aust.* 2009;**190**(10):588-93.
68. O'Brien J, Saxena A, Reid CM, Tran L, Baker RA, Newcomb A, et al. Thirty-day outcomes in Indigenous Australians following coronary artery bypass grafting. *J. Intern Med.* 2018;**48**(7):780-5.
69. Rahiri JL, Alexander Z, Harwood M, Koea J, Hill AG. Systematic review of disparities in surgical care for Māori in New Zealand. *ANZ J. Surg.* 2018;**88**(7-8):683-9.
70. Hurd K, Barnabe C. Systematic review of rheumatic disease phenotypes and outcomes in the Indigenous populations of Canada, the USA, Australia and New Zealand. *Rheumatol Int.* 2017;**37**(4):503-21.
71. Prior D. Decolonising research: a shift toward reconciliation. *Nurs. Inq.* 2007;**14**(2):162-8.
72. Lin IC, J. Bullen, J. Barnabe, C. Opportunities and challenges for physical rehabilitation with indigenous populations [in press]. *Pain Rep.* 2020.
73. Briggs AM, Slater H, Hsieh E, Kopansky-Giles D, Åkesson KE, Dreinhöfer KE, et al. System strengthening to support value-based care and healthy ageing for people with chronic pain. *Pain.* 2019;**160**(6):1240-4.
74. **The Royal Australasian College of Surgeons. Surgical Competence and Performance – A guide to aid the assessment and development of surgeons. Melbourne: RACS; 2020.**
75. Gruen RL. Injury in indigenous communities: a call for enlightened action. *ANZ J. Surg.* 2007;**77**(11):930-1.
76. Dwamena F, Holmes-Rovner M, Gaulden CM, Jorgenson S, Sadigh G, Sikorskii A, et al. Interventions for providers to promote a patient-centred approach in clinical consultations. *Cochrane Database Syst. Rev.* 2012;**12**:Cd003267.
77. Davy C, Cass A, Brady J, DeVries J, Fewquandie B, Ingram S, et al. Facilitating engagement through strong relationships between primary healthcare and Aboriginal and Torres Strait Islander peoples. *Aust NZ J Publ Heal.* 2016;**40**(6):535-41.
- ~~78. Artuso S, Cargo M, Brown A, Daniel M Factors influencing health care utilisation among Aboriginal cardiac patients in central Australia: a qualitative study. *BMC Health Serv. Res.* 2013;**13**(1):83.~~
- ~~79. Lin IB, Ryder K, Coffin J, Green C, Dalgety E, Scott B, et al. Addressing disparities in low back pain care by developing culturally appropriate information for aboriginal australians: “My Back on Track, My Future”. *Pain Med.* 2017;**18**(11):2070-80.~~
- ~~80. Jennings W, Bond C, Hill PS. The power of talk and power in talk: a systematic review of Indigenous narratives of culturally safe healthcare communication. *Aust. J. Prim. Health.* 2018;**24**(2):109.~~

Figures

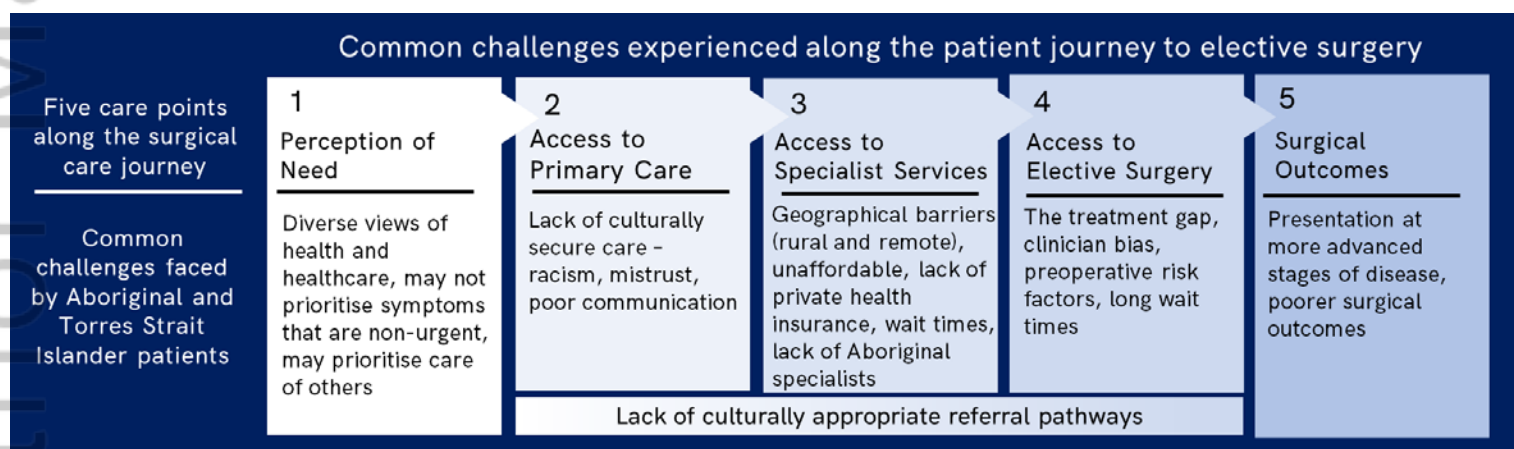
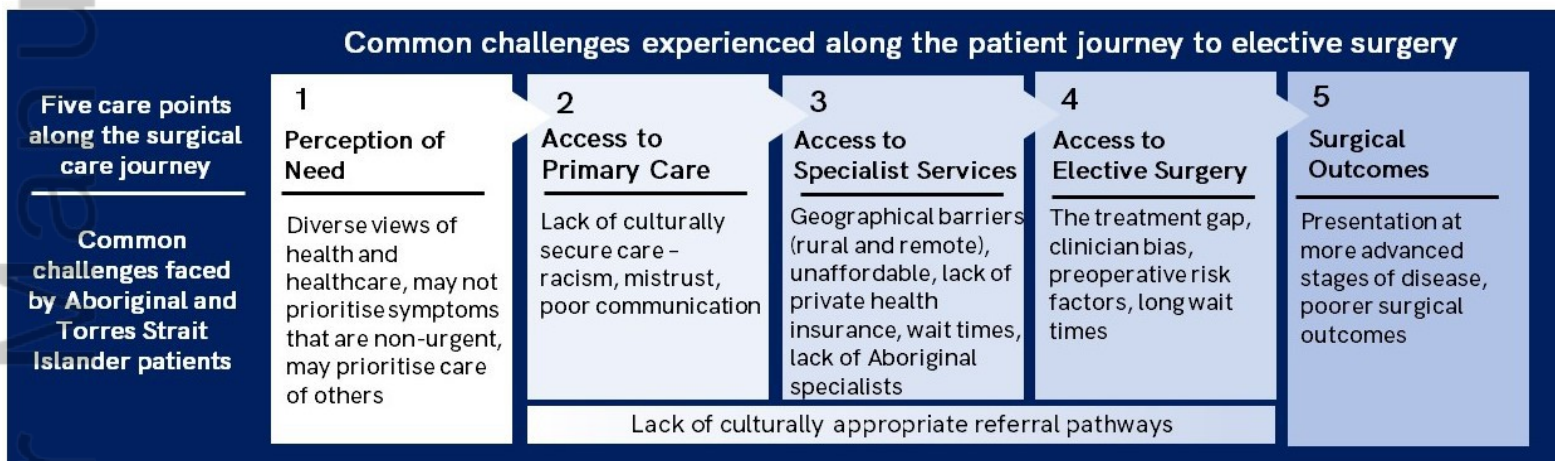


Figure 1: Common challenges experienced by Aboriginal and Torres Strait Islander patients on the journey to elective surgery



ANS_16557_Surgery journey figure without OA v2.jpg