



Supporting Information

Supplementary methods and results

**This appendix was part of the submitted manuscript and has been peer reviewed.
It is posted as supplied by the authors.**

Appendix to: Ryan HY, Sun GY, Monuja M, et al. Adherence by orthopaedic surgeons to AHPRA and Australian Orthopaedic Association advertising guidelines. *Med J Aust* 2022; doi: 10.5694/mja2.51490.

Table 1. Deviations from the published protocol for our study (<https://osf.io/67gav>)

1. The Australian Orthopaedic Association (AOA) advertisement guidelines were published after registration of the study protocol, and were included in this study but not included in the initial protocol methodology.
2. The search strategy for the AOA Google sample was changed from the first page of results to “first eight results” to maintain consistency in the number of webpages evaluated for each search.
3. The search strategy for the AOA Google sample was changed from the “ten largest population areas in Australia” to the “major city in each of the eight Australian states and territories”.
4. We restricted the AOA Google sample to AOA members, as orthopaedic surgeons who are not AOA members are not obliged to adhere to AOA advertising guidelines

Table 2. Advertising types included in this study

Characteristic	AOA random sample	AOA Google sample	Total number
Number of surgeons	81	59	140
Website	81 (100%)	59 (100%)	140 (100%)
Personal website	51 (63%)	39 (66%)	90 (64%)
Group practice website	35 (43%)	26 (44%)	61 (44%)
Social media	23 (28%)	34 (58%)	57 (41%)
Facebook	23 (28%)	33 (56%)	56 (40%)
Twitter	1 (1.2%)	4 (7%)	5 (4%)
News articles	16 (20%)	10 (17%)	26 (19%)
Online videos	24 (30%)	22 (37%)	46 (33%)

Table 3. Examples of violations by Australian Orthopaedic Association member surgeons of Australian Health Practitioner Regulation Agency and Australian Orthopaedic Association advertising guidelines

Criteria	Description
Australian Health Practitioner Regulation Agency guidelines	
1. Advertisement is false, misleading, or deceptive, or likely to be so	Violations to this guideline were mostly found in the surgeon's biography. Advertising including unverifiable claims of reputation and skill were deemed misleading. Claims of experience were deemed compliant if comparisons with other surgeons were not made. Advertising that described procedures and their benefits without listing risks were deemed non-compliant.
2. Offers a gift, discount, or other inducement to use the health service without stating the terms and conditions of the offer	Rarely violated. Example: a seniors' discount was promoted without disclosing the terms and conditions of the offer.
3. Cites testimonials or purported testimonials	Most violations were on surgeon Facebook pages that allowed reviews by others. Some surgeons cited patient reviews on their personal websites.
4. Arouses unreasonable expectation of beneficial treatment	Violations were on surgeon webpages detailing the treatments available. Although the health information on the webpage was consistent with current medical literature, it was often presented without listing risks. The relative advantages of certain treatments (most frequently computer navigation, robotic surgery, minimally invasive surgery types, and anterior hip replacements) were often exaggerated and without adequate scientific referencing.
5. Encourages the indiscriminate or unnecessary use of health services	Violations were phrases such as "Don't delay", usually on surgeon website homepage.
Australian Orthopaedic Association guidelines	
1. Makes claim to superior performance	
i. Claims that particular implant/device/technique is the newest, so it is the best	Similar to AHPRA guideline 4; violations were non-impartial information about new treatments and sensationalist phrasing
ii. Claims the use of robotics will achieve a superior clinical result	Specific robotic surgery systems were most frequently mentioned, primarily for hip and knee replacements. Violations were for non-impartial information on the clinical efficacy of robotic surgery. Disadvantages and risks were rarely described.
iii. Equates anecdotal experience with validated evidence	Reported outcomes based on clinical experience rather than published research.
iv. Claims excellence by assertion (eg, "I am an internationally renowned surgeon")	Similar to AHPRA guideline 1; violations usually identified in the surgeon biography. Unverifiable claims of excellence were deemed to violate this guideline.
v. States they is first or only person who can perform a particular operation	Violations were frequent for robotic surgery, anterior hip replacements, and minimally invasive surgery.
vi. Optimistic assessments of outcome presented as a guaranteed	Claims of consistently excellent results
vii. Misuse of AOANJRR data	Using AOANJRR data for advertising purposes.
2. Uses journalistic material for advertising	
	Common advertising media included online articles and online news reports. Violations were for advertising with the purpose of self-promotion and use of sensationalist phrasing.
3. References specific brand names	
	Brands frequently referenced were for robotic surgery systems and implants.
4. Fails to declare commercial relationships	
	A brand was mentioned and the advertisement did not clarify whether a commercial relationship existed. Only one surgeon declared no commercial relationship when a brand was mentioned. Two surgeons declared some form of commercial relationship.

AOANJRR = Australian Orthopaedic Association National Joint Replacement Registry.

Table 4. Australian Health Practitioner Regulation Agency (AHPRA) and Australian Orthopaedic Association (AOA) guideline non-compliance scores

Characteristic	Mean (standard deviation)	
	AHPRA non-compliance scores (range: 0–5)	AOA non-compliance scores (range: 0–4)
Sample		
AOA random	1.16 (1.04)	1.21 (1.22)
AOA Google	1.69 (1.13)	1.81 (1.35)
State of practice		
New South Wales	1.42 (1.18)	1.21 (1.17)
Victoria	0.89 (0.89)	0.96 (1.13)
Queensland	1.29 (1.06)	1.10 (1.18)
Western Australia	1.11 (1.08)	1.00 (0.91)
South Australia	2.46 (0.88)	2.85 (0.99)
Tasmania	1.22 (0.83)	2.44 (1.33)
Australian Capital Territory	1.67 (1.22)	2.11 (1.54)
Northern Territory	2.20 (0.84)	2.80 (1.10)
Geographic location		
Regional	1.38 (1.06)	1.13 (1.36)
Metropolitan	1.39 (1.12)	1.48 (1.30)
Subspecialty		
Hip/knee	1.45 (1.12)	1.60 (1.35)
Shoulder/elbow	1.33 (1.37)	0.83 (1.19)
Spine	0.67 (0.82)	1.17 (1.47)
Hand/wrist	1.00 (0.89)	0.91 (0.83)
Foot/ankle	1.50 (1.05)	1.67 (1.51)
Group practice	1.62 (1.04)	1.62 (1.12)