

# Appraising The Quality Of Material On Joint Replacement Surgery On The Internet

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## Abstract

**Background:** Internet usage continues to increase, as does the quantity of information and misinformation on the Internet. We wanted to assess the quality of information readily available to patients on common elective orthopaedic operations.

**Methods:** We scanned the web using three common search engines for information on knee and hip replacements. We scored the quality of information on a scale.

**Results:** The most readily accessed individual sites scored disappointingly.

**Conclusion:** The quality of information on the Internet for elective joint replacement surgery ought to be more regulated for the benefit of the information hungry modern patient population. Moreover the surgeon is hereby made aware of the insight today's patient brings to the professional relationship.

## INTRODUCTION

There is a steady increase in the use of Internet to access health related information in the general population (1). It is predicted that there will be more than 720 million Internet users by year-end 2005 (2). Being unregulated, as the volume of information on the Internet continues to explode, there is a need to assess and validate this information. Although there are specialized search engines and databases for health professionals, the lay population accesses information on the internet using general search engines, such as Google, Yahoo and MSN. Information on the Internet is not necessarily presented to the patient in a manner that reveals the most useful information first. The number of matched keywords or date of publication usually determines the order of web sites "hit" by the search engine. We set out to evaluate the information available in this manner to the general population.

We selected total hip replacement and total knee replacement as representative of common elective orthopaedic operations. The 2003 Annual Report of the Australian Orthopaedic Association National Joint Replacement Registry (3) reveals that 52788 primary total hip and knee replacement procedures were performed in the

year to the first of July, 2002, with an incidence of hip replacements of 137.7 per 100000 population, and an incidence of knee replacements of 134.6 per 100000 population. These figures support the selection of these procedures as representative of elective orthopaedic surgeries in this study.

## MATERIALS AND METHODS

The search parameters 'total hip replacement', 'hip replacement', 'total knee replacement' and 'knee replacement' were entered into three common search engines, Google, Yahoo and MSN. Using these search engines, 284000, 388000, and 70389 sites were found respectively for 'total hip replacement'; 736000, 950000, and 179458 were found respectively for 'hip replacement'; 245000, 384000, and 63629 were found for 'total knee replacement'; and 602000, 828000, and 157095 were found for 'knee replacement'. The first 20 addresses from each search were pooled to form our database. 35 websites were then analysed as the set of most readily available relevant websites after eliminating duplicate or irrelevant sites.

The analysis was performed using a 10-point website information scale, drawn up by one of the authors. (Table 1).

No partial points were to be given in applying the scale.

**Figure 1**

Table 1: Website information scale

Potential patient as target of website (one point): Websites aimed at a lay audience who are potential patients score 1 point.
Alternatives to surgery (one point): Any mention of non-surgical therapies scores 1 point.
Indications for surgery (one point): The website needs to state the indication for surgery to score 1 point. Mere mention of disease name such as osteoarthritis is acceptable.
Contraindication for surgery (one point): Contraindications to surgery must be mentioned to score 1 point.
Clinical evaluation (one point): Appropriate clinical evaluation (history and examination) must be mentioned to score 1 point.
Radiology (one point): The website must mention need for x-ray/radiology to score 1 point.
Surgery (one point): There must be some description of the surgery to score 1 point.
Risk/potential complications (one point): Any complications should be mentioned to score 1 point.
Rehabilitation (one point): The website must mention postoperative physiotherapy or exercise regimen to score 1 point.
Appropriate referral/disposal of the patient (one patient): The website must direct the potential patient to a medical practitioner (primary care physician or orthopaedic surgeon) to score 1 point.

The scoring system was evaluated for inter- and intra-observer validity. To assess intra-observer validity, 4 observers scored 3 websites on 2 occasions with an interval of one week. Comparing the scores between observers then assessed the inter-observer validity (Table 2). The high correlations with only one intra-observer and one inter-observer variance confirm the soundness of the scoring method.

**Figure 2**

Table 2: Validity of the scale

	Site 1		Site 2		Site 3	
	Week 1	Week 2	Week 1	Week 2	Week 1	Week 2
Observer 1	8	8	7	7	7	7
Observer 2	8	8	8	8	7	7
Observer 3	7	8	7	7	7	7
Observer 4	8	8	7	7	7	7

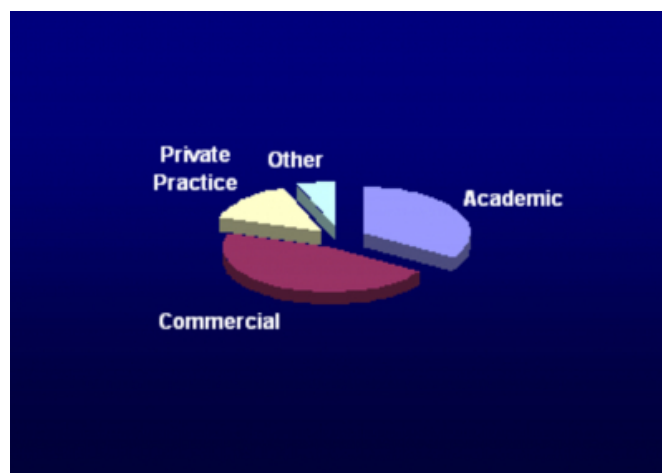
Each of the 35 websites was then scored according to the website information score as shown, and the results correlated. The sponsors of the websites were also determined to be either “academic” including governmental or higher education institutions, “commercial” being websites maintained by for-profit bodies with financial bias or otherwise featuring advertising, or “private practice” websites promoting single or groups of surgeons. Analysis was performed within these groups and as a whole.

## RESULTS

Commercial and academic websites were the largest groups, with commercial websites being almost one half of the whole set. There were a small number of sites maintained by private practices and two of the 35 were maintained by entities not categorised in any of the other groups (private individuals) (Fig 1).

**Figure 3**

Figure 1: Website sponsor



The websites classed as being from “academic” sponsors had an average score of 6.75; websites endorsing “private practices” scored on average 6.20; and “commercial” sites averaged 5.69. The total mean was 5.55 (Table 3, Figure 2).

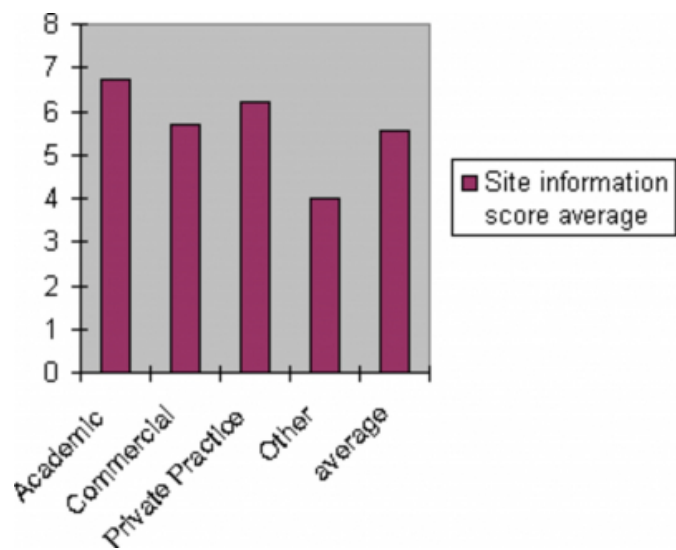
**Figure 4**

Table 3: Score by Sponsorship

Category	Number (%) of sites	Site information score
Academic	12 (34.3%)	6.75 +/- 2.74 SD
Commercial	16 (45.7%)	5.69 +/- 2.75 SD
Private practice	5 (14.3%)	6.20 +/- 0.98 SD
Other	2 ( 5.7%)	4.00 +/- 1.00 SD
Total	35 (100%)	5.55 +/- 2.97 SD

Figure 5

Figure 2: Site Information Score Averages

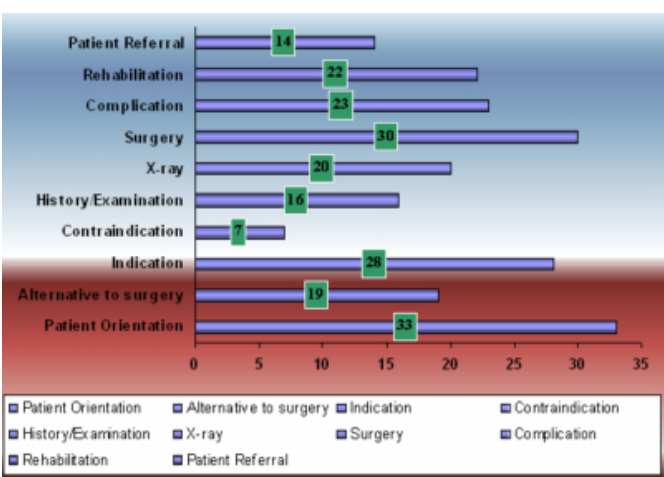


Interestingly, two of the websites featured animations of the proposed surgery and one featured a recorded telecast of actual surgery. Three veterinarian websites were excluded from analysis (although the authors concluded they would have scored highly for the owners of canine pets).

Addressing individual scoring parameters (Figure 3), most websites were directed towards prospective patients, with only two of the 35 directed at health professionals. The indications for surgery, and some detail of the surgery itself were included in most websites. Contraindications unfortunately were not at all specified in 28 of the 35 websites. More disconcerting was the majority of websites that did not directly refer the patient to suitable medical review (although it should be noted that there was often a multitude of cyber links, see discussion).

Figure 6

Figure 3: Score Parameters



## DISCUSSION

Today's patient is more information hungry than ever and the Internet is the principal source of information. We have become aware that as patients surf health-related websites they are faced with a tremendous amount of unregulated information. As health care professionals, it behoves us to provide accurate information to our patients or guide them to sources thereof. To do this, we ourselves need to be aware of the contents of the Internet.

There is a major difference between the information a patient finds on the Internet and the surgeon's knowledge of the same disease entity and its management. Furthermore, the patient may be overwhelmed by the vast amount of information on the Internet, while the qualified doctor has the skill to filter the information. It is therefore necessary to guide patients to good quality easily understood information on the Internet.

It is disappointing that the overall average score for all the websites is only 5.55, although removing the sites maintained by lay individuals the mean becomes 6.16. This reflects the inadequacy of detail in most web sites according to our reproducible scale. Our scale may have been limited, but the authors feel the criteria therein reflect the minimum information an interested person should be given in some detail.

The websites maintained by the 'academic' institutions tended to score higher reflected in an average score of 6.75. As orthopaedic surgeons more often author these sites, this higher score is to be expected. However the difference is not substantial. Our overall results are consistent with older studies, which have attempted to analyse similar

information, but we note somewhat higher average scores. (4, 5) This suggests the quality, though unregulated, is improving with time, but more needs to be done. Only three websites scored nine or ten out of ten (table 4).

**Figure 7**

Table 4: Recommended sites (score 9-10/10)

Site URL	Organisation
<a href="http://www.niams.nih.gov/hi/topics/hip/">www.niams.nih.gov/hi/topics/hip/</a>	National Institutes of Health of America
<a href="http://Orthoinfo.aaos.org">Orthoinfo.aaos.org</a>	American Academy of Orthopaedic Surgeons
<a href="http://orthopedics.about.com/cs/hipreplacement">orthopedics.about.com/cs/hipreplacement</a>	Commercial information site

Most websites that we evaluated contained internal and external links to sites containing further information. Though these may increase the completeness of the information, the complexity of the links was disorganized in the main, and would likely confuse or mislead rather than edify a lay population.

The authors concur with Mabrey (6) who some years ago offered that although abundant information is available on the Internet, two factors are missing being a central reference site for available links, and a referee agency to oversee the quality of the information. Unlike journals in the highly checked and monitored field of academic orthopaedics or medicine in general, the proliferation of web sites devoted to this topic shows that anyone can put anything out on the web without regard to validity of content. The Health on the Net Foundation (HON) (7) attempts to redress this situation by guiding the growing community of healthcare consumers and providers on the Internet to sound, reliable medical information and expertise. This group recognises the need for systematic and stringent peer review, and endeavours to improve and standardize the quality of medical information on the Internet. Despite this, this website or any with similar mission did not appear at all in the top twenty websites "hit" by our search engines in doing this study.

**CONCLUSION**

In summary, the Internet is progressively more the main information source. There is an increasing abundance of data on joint replacements on the Internet, substantiated by the considerable number of total websites found by each search engine. These websites include some information we consider essential for the instruction of laypersons, but are on the whole deficient. The surgeon ought to be acquainted with the quantity and quality of material the patient all the time more retrieves from the Internet. Importantly, guidelines in this area are wanting. Some organisations are trying to rectify this dilemma, but the task is massive. Surgical societies need to be more active in maintaining or monitoring these websites for the benefit of their patients, and to ensure that patients bring relevant information to the professional relationship, and not misinformation obliging the surgeon to set straight.

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