

Lumbar Spinal Stenosis: Evaluation of Information On the Internet

Ross J. Feller, MD, Ariel Cohen, BA, Mark A. Palumbo, MD, and Alan H. Daniels, MD

THE EXPLOSION OF HEALTH CARE INFORMATION on the Internet mirrors the continued rapid expansion of electronic communication and related Internet industries. The supply is composed of a wide range of resources, from academic and evidence-based to personal and anecdotal. It is decentralized in nature: any individual with an Internet connection can now contribute to and retrieve online health information as demonstrated by blogs, testimonials and open forum.¹ Although this makes for a dynamic model of knowledge dispersion, there are no guidelines for evaluation of accuracy, currency, readability and scope of information. On the demand side, broadband/wireless connection in particular has allowed rapid, minute-to-minute access of information in a way never before experienced. It is reported that 80% of people with access to the Internet have performed health-related searches in the last month, and 81% of searches are performed through a search engine.¹ On a daily basis, 6 million Americans are seeking answers to healthcare queries on the Internet.²

It has been suggested in several studies that this rapid evolution of supply and demand has not necessarily been matched by an equal increase in quality. Several orthopaedic topics, including cervical and lumbar disc herniation, carpal tunnel syndrome, back pain, and scoliosis have been examined to identify trends in the breadth and depth of information available.^{1, 3-7} Most investigations have shown the available content to be of incredibly varied quality.

Chronic orthopaedic conditions are ideal topics of study in this forum. Unlike acute musculoskeletal trauma which typically leads to early presentation to an emergency care facility or physician office, people with long-standing orthopedic disease will often engage in their first "consultation" online. In a recent patient survey, 55% of respondents stated that during the past twelve months they had consulted a physician for a health-related issue while 59% stated they had accessed the Internet for this information.⁹ In addition, many

will continue to research topics on the Internet even after establishing direct care with a physician; only one third of these patients disclose that they are gathering information from the Web.⁸

Lumbar spinal stenosis (LSS) is a common cause of back pain and neurogenic claudication in elderly individuals. The presentation of LSS is variable, and it can be confused with pathology affecting other organ systems (e.g. peripheral vascular disease). As such, LSS is a commonly searched topic on the Internet. The goal of this study was to assess the overall quality of online information regarding LSS. The degree of correlation between authorship and website quality score was examined. We also sought to identify deficiencies and/or strengths in the body of knowledge on LSS available to the standard Internet user.

METHODS

The phrase "lumbar spinal stenosis" was entered as a search item using the popular search engine www.google.com during the month of July, 2011. A disease-based search rather than a symptom-based search was employed in order to more easily isolate the body of information specific to one disease process. This search method was employed instead of using a search term that produces a "differential diagnosis" of web listings related by a common symptom (ex. lower back pain or sciatica). The first 50 web sites listed were classified according to authorship and individually analyzed using a 25-point scale (Informational Quality Score, IQS) based on "Disease Summary", "Treatment Options", "Pathogenesis", and "Complications/Results" (Table 1).³ Points were awarded in the category if the web site

Table 1: Information Quality Score (IQS) Tabulation Sheet

I. Disease Summary

1. Neural/disc/vertebral anatomy _____
2. Risk factors (at least 2 mentioned) _____
3. Symptoms: leg weakness _____
4. Symptoms: leg discomfort _____
5. Symptoms: leg numbness/tingling/decreased sensation _____
6. Signs: bowel/bladder dysfunction _____
7. Signs: sensation or motor deficit _____
8. Dx studies (MRI, CT myelo, or EMG/NCS) _____

II. Treatment Options

9. Bed rest/activity modification _____
10. Exercise therapy/physical therapy _____
11. Pharmacologic Rx _____
12. Other modalities (ice/heat/e-stim, etc) _____
13. Corticosteroid epidural injection _____
14. Physical treatments (chiro, trxn, acupuncture) _____
15. Surgery: decompression _____
16. Surgery: fusion _____
17. Surgery: other _____

III. Pathogenesis

18. Disc herniation _____
19. Spondylosis/disc degeneration _____
20. Neural compression _____
21. Central/lateral recess/foraminal stenosis _____

IV. Complications/Results

22. Results: non-operative Rx _____
23. Results: operative Rx _____
24. Complications: non-operative Rx _____
25. Complications: operative Rx _____

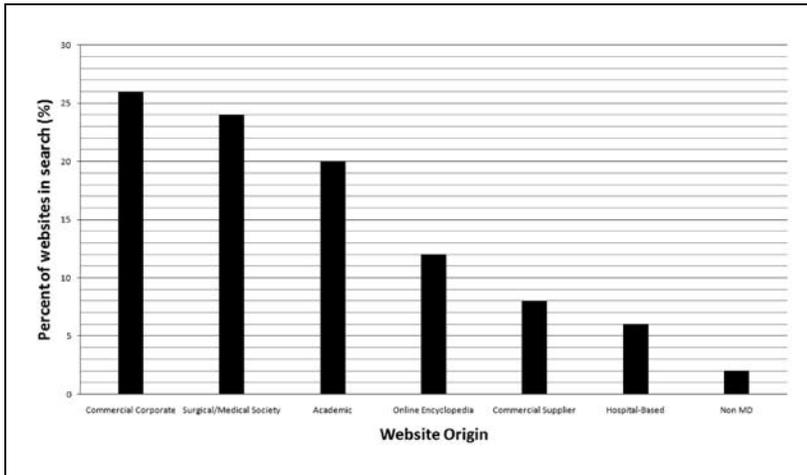


Figure 1. Website Origin classification results.

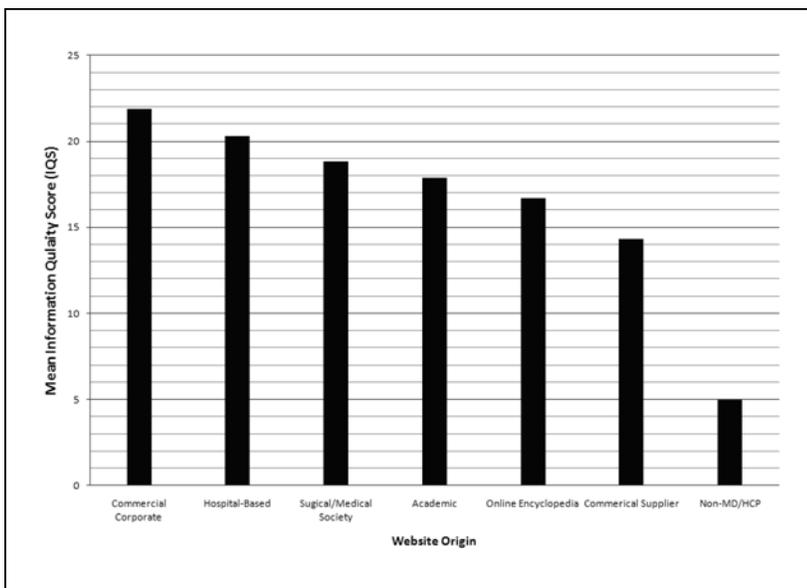


Figure 2. Mean Information Quality Score (IQS) based on website classification.

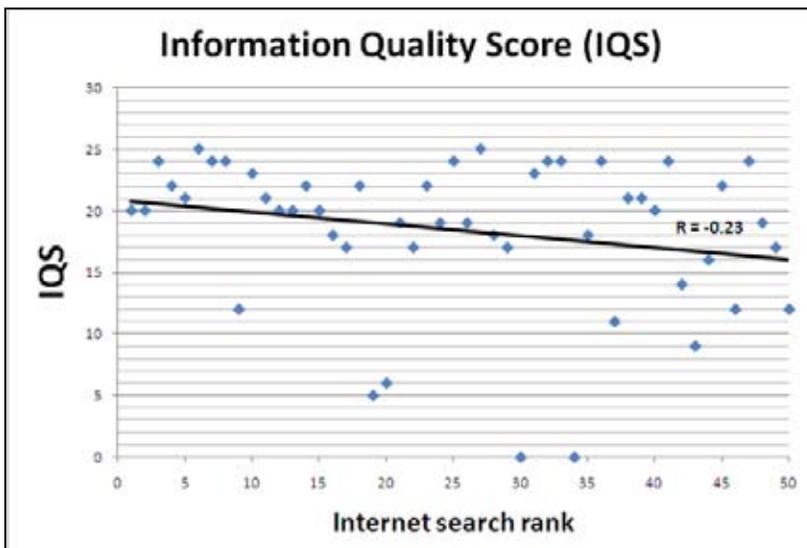


Figure 3. Information Quality Score as related to Internet search rank.

of interest covered the topic. An IQS of greater than 20 was used to denote information of “high quality”. The presence of advertising and marketing were also noted. Two independent observers scored each website utilizing the IQS datasheet. Statistical analysis was performed to evaluate the effect of website origin, search rank, and presence of advertising on IQS.

RESULTS

Of the 50 web sites evaluated, six (12%) were online encyclopedias, three (6%) were hospital sponsored, 12 (24%) were surgical/medical society, ten (20%) were academic, 13 (26%) were commercial corporate and four (8%) were commercial supplier; only one website (2%) was identified as individual/non-healthcare provider (Figure 1). In addition to the 8% of commercial supplier sites marketing their own product for secondary commercial gain, 42% of websites were involved in advertising.

The mean IQS among all sites analyzed was 18.4. The authorship category associated with the highest mean IQS was commercial corporate (21.9), followed by hospital (20.3), surgical/medical society (18.8), academic (17.9), online encyclopedia (16.7), commercial supplier (14.3), and non-healthcare provider (5) (Figure 2). Only 22 (44%) of websites had an IQS >20, reflecting “high quality” medical information. The Pearson correlation coefficient of IQS to Internet search rank was $R = -0.23$, signifying a skew towards lower IQS for the websites further down the Internet search list (Figure 3). The IQS did not vary significantly between sites that advertised and those that did not (18.05 vs. 18.69, $p = 0.72$). The websites with IQS of 23 or greater in the initial 25 search results are listed in Table 2.

DISCUSSION

This study suggests that the quality of on-line health information related to LSS is highly variable. Only 44% of the identified websites were of “high quality”. These results mirror prior studies that reported low overall quality of health information available to the Internet user. It is notable that our study results indicate a higher overall quality of content (average IQS of 18.4) compared to previous investigations. In 2005 Greene and colleagues calculated an average IQS of 9 out of 25 for **online health information (OHI)** related to lumbar disc herniation.³ Similar to the current study, commercial websites demonstrated a higher mean IQS than any other category. Using a symptom-based search design, Butler found the quality of information regarding “low back pain” to be limited.⁶ Similarly,

Table 2: Websites amongst the top 25 Internet search results with an IQS of 23 or greater:

<http://www.lumbarstenosis.com/>
<http://www.webmd.com/back-pain/tc/lumbar-spinal-stenosis-topic-overview>
<http://www.mayoclinic.com/health/spinal-stenosis/DS00515>
<http://www.aafp.org/afp/980415ap/alvarez.html>
<http://www.spinalstenosis.org/lumbar.php>

Morr et al generated a mean quality score of 10.9 out of a possible 28 for websites related to cervical disc herniation.⁴

Although different search engines and evaluation systems have been utilized in these studies, it is clear that the body of health-related literature currently available on the Internet is variable. It is also noteworthy that the previous studies available for comparison use data from as many as five to ten years ago. This point highlights the rapid turnover and expansion of information on the Internet. Thus, some suggest that the real problem may relate to an overload of information rather than to a dearth of it. The data utilized in this study was gathered in 2011 and represents a more current snapshot of online information regarding a specific orthopaedic condition. Whether our higher overall quality score represents a true advance in online health information is unclear and will need to be supported by other up-to-date investigations.

The physician-patient relationship is also important in directing an individual to relevant, high quality information. Of patients that do present to a physician's office, 70% would like a website recommendation but only 4% receive such information.⁹ Healthcare providers must realize this shifting paradigm in the distribution of healthcare information and modify their practice accordingly. As Sechrest suggests, the "information component" of practice is "important and demands competency and skill, just as diagnosis and treatment do".¹⁰ The data provided by this study may help physicians in guiding their patients towards reliable information on LSS.

There are several limitations to our study. The search engine Google was the single portal employed to assess the body of online information on LSS. It was decided that using a single search engine would closely approximate search behavior on the part of the patient. In addition, the website evaluators utilized in this study (two Orthopaedic Surgery residents) have a

very different knowledge base than that of a typical patient. This study did not examine the readability of information provided, which includes whether the information is presented in a way that enables swift and easy website navigation. A recent study suggested that less than 2.5% of spine-related patient education websites used a reading level at or below the sixth grade, the recommended readability level for adult patients in the US.¹¹ Even if information is improving, it must be coupled with an attention to the characteristics of the audience being provided information.

CONCLUSION

The quality of Internet information on lumbar spinal stenosis is variable. Less than 50% of relevant web sites were determined to be of high quality. More than one-half of the websites sought secondary commercial gain. The higher overall scores generated in this study may reflect a trend towards improvement in online health information. The list of high quality sites generated from our study should prove useful to both patients and physicians who wish to utilize online health information pertaining to lumbar spinal stenosis.

It is without doubt that information on the Internet *can* help to empower patients and reduce healthcare costs. Patients now have access to information on symptom recognition and diagnosis, chronic disease management, and the latest available treatments and their associated complications. The major goal now needs to be identifying ways to organize quality information so that it can be rapidly accessed, evaluated and comprehended by the general population.

REFERENCES

1. Beredjickian PK, Bozentka DJ, Steinberg DR, Bernstein J. Evaluating the source and content of orthopaedic information on the Internet. The case of carpal tunnel syndrome. *J Bone Joint Surg Am.* 2000 Nov;82-A(11):1540-3.
2. Lorence DP, Greenberg L. The zeitgeist of online health search. Implications for a consumer-centric health system. *J Gen Intern Med.* 2006

Feb;21(2):134-9. Epub 2005 Dec 7.

3. Greene DL, Appel AJ, Reinert SE, Palumbo MA. Lumbar disc herniation: evaluation of information on the internet. *Spine (Phila Pa 1976).* 2005 Apr 1;30(7):826-9.
4. Morr S, Shanti N, Carrer A, Kubeck J, Gerling MC. Quality of information concerning cervical disc herniation on the Internet. *Spine J.* 2010 Apr;10(4):350-4.
5. Mathur S, Shanti N, Brkaric M, Sood V, Kubeck J, Paulino C, Merola AA. Surfing for scoliosis: the quality of information available on the Internet. *Spine (Phila Pa 1976).* 2005 Dec 1;30(23):2695-700.
6. Butler L, Foster NE. Back pain online: a cross-sectional survey of the quality of web-based information on low back pain. *Spine (Phila Pa 1976).* 2003 Feb 15;28(4):395-401.
7. Qureshi SA, Koehler SM, Lin JD, Bird J, Garcia RM, Hecht AC. An evaluation of information on the internet about a new device: the cervical artificial disc replacement. *Spine (Phila Pa 1976).* 2012 May 1;37(10):881-3.
8. Greenberg L, D'Andrea G, Lorence D. Setting the public agenda for online health search: a white paper and action agenda. *J Med Internet Res.* 2004 Jun 8;6(2):e18.
9. Ullrich PF Jr, Vaccaro AR. Patient education on the internet: opportunities and pitfalls. *Spine (Phila Pa 1976).* 2002 Apr 1;27(7):E185-8.
10. Sechrest RC. The internet and the physician-patient relationship. *Clin Orthop Relat Res.* 2010 Oct;468(10):2566-71. Review.
11. Vives M, Young L, Sabharwal S. Readability of spine-related patient education materials from subspecialty organization and spine practitioner websites. *Spine (Phila Pa 1976).* 2009 Dec 1;34(25):2826-31.

Ross J. Feller, MD, is a Resident in the Department of Orthopaedic at the Warren Alpert Medical School of Brown University.

Ariel Cohen, BA, is a Resident in the Department of Emergency Medicine, at Metro-Health Medical Center in Cleveland Ohio.

Mark A. Palumbo, MD, is an Associate Professor and Chief of the Division of Spine Surgery in the Department of Orthopaedic Surgery at the Warren Alpert Medical School of Brown University.

Alan H. Daniels, MD, is Chief Resident in the Department of Orthopaedic Surgery at the Warren Alpert Medical School of Brown University.

Disclosure of Financial Interests

The authors and/or their spouses/significant others have no financial interests to disclose.

CORRESPONDENCE

Alan H. Daniels, MD
Department of Orthopaedic Surgery
Warren Alpert Medical School of Brown University
2 Dudley Street, Suite 200
Providence, Rhode Island 02905