

# Twitter as a Communication Tool for Orthopedic Surgery

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**Abstract:** Twitter is a social networking Web site that has changed the way information is communicated. This study involved identifying, categorizing, and reviewing orthopedic Twitter profiles. A total of 412 profiles were identified. Of those, 176 (50.3%) were surgeons; 89 (50.5%) were based in the United States and 77 (43.8%) were not (10 unclassified). Most surgeons were young; 66% of surgeons were board certified within the past 10 years. Only a small percentage of orthopedic surgeons and practices currently use Twitter, but the use of social networking for orthopedic communication is likely to play an increasing role in future clinical practice.

Twitter is a social networking and microblogging Web site established in 2006 that has changed the way information is communicated in mass quantities. Not surprisingly, its influence has spread to the field of medicine and resulted in a policy from the American Medical Association (AMA) regarding professionalism and social media, as well as several publications exploring the emergence of social networking in medicine.<sup>1-4</sup> Within the field of orthopedics, 1 study has reported that 38% of patients in an orthopedic hand practice use social networking sites and concluded that physicians should consider expanding their use of social networking to reach patients.<sup>5</sup> However,

no study has yet examined the extent of orthopedic surgery's presence on Twitter.

According to Twitter's Web site ([www.twitter.com](http://www.twitter.com)), it is "a real-time information network that connects you to the latest information about what you find interesting. Simply find the public streams you find most compelling and follow the conversations." Twitter subscribers can be individuals, such as patients and providers, or groups such as businesses, organizations, and medical practices. Subscribers identify themselves with a "bio" and can send "tweets," which are 140-character messages that may include links to Web sites or media. Individuals can then choose to follow tweets from subscribers they find interesting. Thus, the ability to rapidly send information serves as a new model for disseminating public information.

The use of Twitter in orthopedic surgery is prevalent. Typing "orthopedic surgery" into Twitter's search box will yield a continuous stream of tweets from organizations

and individuals, ranging from updates about an individual's medical care to orthopedic job postings, news articles about new techniques and developments, and communication between providers and patients. In addition, the American Academy of Orthopaedic Surgery's (AAOS) Twitter profile (@AAOS1) is followed by 4069 subscribers and is on 157 lists at the time of this writing, suggesting an interest from the public. Although most orthopedic surgeons are aware of Twitter's existence, it is currently unknown how Twitter is used by orthopedic surgeons, practices, organizations, and businesses.

This study was designed to analyze the type and prevalence of orthopedic surgery-related profiles on Twitter in regard to self-identified surgeons, residents, medical centers, businesses, and associations.

## MATERIALS AND METHODS

This study was performed between April 15 and May 2, 2011, and involved surveying self-identified orthopedic pro-

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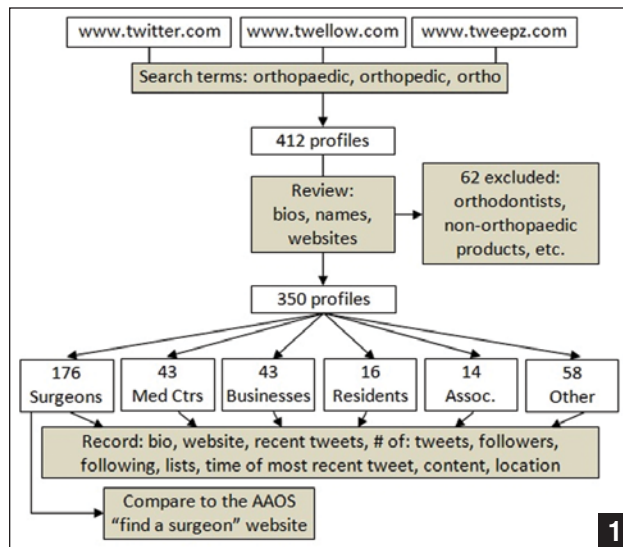


Figure 1: Flow chart representing the sequence of data collection events.

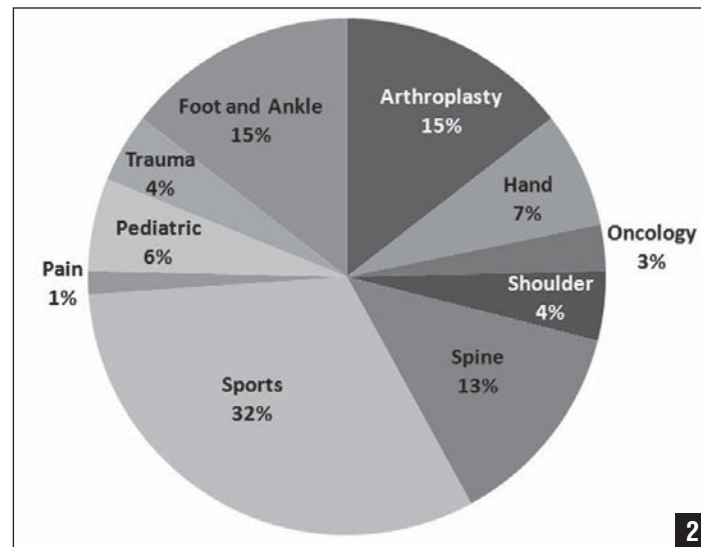


Figure 2: Percentage of self-identified specialties among orthopedic surgeons on Twitter.

files on Twitter. The search engines www.tweez.com, www.tweez.com, and www.tweepz.com were used based on their abilities to filter and return search results according to specific words within an individual profile. Search terms included “orthopaedic,” “orthopedic,” and “ortho.” All bios were reviewed and categorized as either surgeon, resident, medical center, business, association, or other (Figure 1). Profiles that were not related to orthopedic surgery were discarded, and data were collected from the remaining group, including username, real name, location, Web site, number of tweets, number following, number of followers, and number listed.

Further analysis of the results was performed by cross-matching the names on Twitter with the AAOS “find a surgeon” function. Thus, it was determined whether profiles of individuals claiming to be orthopedic surgeons could be confirmed as members of the AAOS.

Statistical analyses were performed to compare the percentages of categorical profile factors using chi-square test. Continuous variables were compared using *t* test. The null hypothesis was that equal percentages of each factor were evenly distributed among different groups. SPSS software (SPSS, Inc, Chicago, Illinois) was used to perform all statistical analyses, and Microsoft Excel (Microsoft Corp, Redmond, Washington) was used to summarize the data.

### RESULTS

A total of 412 profiles resulted from the various search parameters on the 3 Web sites. After reviewing each profile individually, 350 were confirmed to be related to orthopedic surgery. Profiles excluded from the analysis consisted of orthodontists and nonorthopedic products such as mattresses and shoes. Of the included profiles, there were 176 (50.3%) surgeons, 43 (12%) each of medi-

cal centers and medical businesses, 16 (4.6%) residents, 14 (4%) associations, and 58 (16.6%) other (Figure 1). Profiles categorized as other included orthopedic nurses, students describing themselves as “future orthopedic surgeons,” physical therapists, and orthopedic administrative staff.

Analysis of the surgeon classification demonstrated that 89 (50.5%) were based in the United States and 77 (43.8%) were not (10 unclassified). Sixty-nine surgeons (39.2%) identified a specialty: sports (32%), arthroplasty (15%), and foot/ankle (15%) accounted for the 3 most represented specialties (Figure 2). Ninety-two (52.3%) profiles were associated with Web sites comprising 61 US surgeons (68.5%) and 28 non-US surgeons (36.3%) ( $P < .001$ ). When the US surgeons were further grouped as having either a professional or personal profile (based on bio, Web site, and recent tweets), 32 were

deemed to be personal with 18 associated Web sites (52.9%), and 33 were considered to be professional with 32 associated Web sites (96.9%) ( $P < .001$ ). Four were classified as both and 20 could not be classified.

When the names of all US-based surgeons were cross-matched against the AAOS database, 60 (67.4%) were confirmed board-certified surgeons. Of those, 7 were candidate members and the remaining members had an average membership duration of 10.4 years (range, 0-27 years). In total, 66% of surgeons were board certified or eligible for board certification within the past 10 years. Of the non-US surgeons, 9 (11.6%) were confirmed international affiliate members of the AAOS. Profile and tweet data were further summarized for US and non-US surgeons (Table 1). In regard to the 16 resident profiles, all were in the United States, 9 had a personal focus, and the remaining 7 were private.

Results from orthopedic medical centers, businesses, and associations demonstrated that most were in the United States and had high rates of professional content, associated Web sites, and numbers of followers (Table 2). Among the 14 associations identified were the AAOS, the British Orthopaedic Association, and the *Journal of Bone and Joint Surgery*.

**DISCUSSION**

The prevalence of social networking, and specifically Twitter, is growing and will likely play an increasing role in clinical practice. Prior studies have suggested that, despite potential limitations,<sup>1-3,6-8</sup> social networking can act as a novel and unique form of open communication among patients and providers.<sup>5,7,9</sup> This study was performed to characterize the extent of Twitter as a communication tool for orthopedic surgery.

The results from this study suggest that 176 Twitter users identify themselves as orthopedic surgeons, that 89 of those are based in the United States, and that 61 use Twitter for professional purposes. Based on the AAOS estimate of 20,400 orthopedic surgeons in the United States,<sup>10</sup> this amounts to small percentage (0.3%) of board-certified orthopedic surgeons using Twitter for professional purposes. Of those, approximately two-thirds are within 10 years of board certification or eligibility. Regarding self-identified residents, 16 were found to have personal profiles, accounting for 2.3% of the estimated 650 resident

Table 1

| Twitter Profile and Tweet Characteristics for US and Non-US Surgeons |             |                 |         |
|--|-------------|-----------------|---------|
| Characteristic   | US Surgeons | Non-US Surgeons | P Value |
| Profile emphasis, %  | N=89        | N=77            |         |
| Professional   | 37.0        | 5.1             | <.001   |
| Personal   | 38.2        | 42.8            | .54     |
| Professional + personal  | 4.4         | 1.3             | .81     |
| Private  | 10.1        | 15.5            | .29     |
| Indeterminate/non-English  | 10.1        | 35.0            | <.001   |
| Web site listed, %   | 68.5        | 36.6            | <.001   |
| Professional focus   | 96.7        | 37.9            | <.001   |
| Confirmed by AAOS search, %  | 67.4        | 11.6            | <.001   |
| Profile characteristics  |             |                 |         |
| Mean no. of followers (median)                                       | 219 (42)    | 76 (33.5)       | .014    |
| Mean no. they follow (median)  | 194 (39)    | 152 (53)        | .43     |
| Mean no. of posts (median)   | 433 (36)    | 394 (89.5)      | .83     |
| Mean no. of lists (median)   | 13 (3)      | 5 (1)           | .06     |
| Last 10 tweets (English only), %                                     | N=64        | N=43            |         |
| News   | 71.8        | 16.2            | <.001   |
| Personal   | 56.2        | 72.1            | .09     |
| Medical information  | 46.8        | 14.0            | <.001   |
| Professional   | 37.5        | 4.7             | <.001   |
| Opinion/comments   | 12.5        | 9.3             | .60     |
| Product promotion  | 7.8         | –               | –       |
| Sports   | 6.3         | –               | –       |
| Other  | 9.4         | –               | –       |
| >1 tweet, %  | N=69        | N=55            |         |
| Within 1 week  | 34.7        | 38.1            | .70     |
| Within 1 month   | 46.3        | 63.6            | .06     |
| Within 1 year  | 71          | 96.3            | <.001   |

positions. The predilection toward young surgeons is not surprising; however, the number of surgeons using Twitter as a platform for networking and patient communication may be low when considering the nearly 200 million Twitter accounts worldwide.<sup>11</sup> In addition, a recent study in 1 orthopedic practice suggests that 38% of patients use social networking regularly.<sup>5</sup> With

these numbers, one might expect more orthopedic surgeons to be using Twitter due to its broad target population and short message format.

In addition to orthopedic surgeons and residents, 100 orthopedic medical centers and practices, businesses, and organizations/associations appear to be using Twitter to convey news and medical information, communicate with pa-

tients, and promote products in a public forum. Although no analysis was performed to evaluate how Twitter profiles affect these individuals groups, the high number of followers suggests that they are connecting with a relevant number of individuals. These connections among patients and providers can serve as a useful and novel form of modern-day communication.<sup>12</sup>

Table 2

Twitter Profile and Tweet Characteristics for Orthopedic Medical Centers, Businesses, and Associations

| Characteristic                 | Medical Center | Business    | Association |
|--------------------------------|----------------|-------------|-------------|
| Profile emphasis, %            | N=43           | N=43        | N=14        |
| Professional                   | 93.0           | 95.3        | 100         |
| Indeterminate                  | 7.0            | 4.7         | –           |
| Web site listed, %             | 95.3           | 93          | 100         |
| Located in US, %               | 95.3           | 76.7        | 71.4        |
| Profile characteristics        |                |             |             |
| Mean no. of followers (median) | 434 (202)      | 389 (252)   | 494 (241)   |
| Mean no. they follow (median)  | 312 (63)       | 442 (257)   | 104 (82.5)  |
| Mean no. of posts (median)     | 175 (95)       | 528 (120.5) | 297 (100.5) |
| Mean no. of lists (median)     | 18 (12)        | 43 (8.5)    | 24 (13)     |
| Last 10 tweets, %              | N=38           | N=39        | N=14        |
| News                           | 89.5           | 51.2        | 92.9        |
| Personal                       | 21.1           | 25.6        | 7.7         |
| Medical information            | 68.4           | 35.8        | 61.5        |
| Professional                   | 34.2           | 30.7        | 30.8        |
| Opinion/comments               | 5.2            | 23.0        | –           |
| Product promotion              | 13.2           | 51.2        | 15.4        |
| Other                          | 10.5           | 10.2        | 15.4        |
| >1 tweet, %                    | N=39           | N=40        | N=13        |
| Within 1 week                  | 48.7           | 42.5        | 53.8        |
| Within 1 month                 | 61.5           | 55.0        | 76.9        |
| Within 1 year                  | 84.6           | 82.5        | 100         |

This study has limitations. Data collection was based on various search queries using Internet search engines limited by their profile indexing technique; thus, the potential to miss some profiles existed. For this reason, 3 separate search engines were used to minimize the possibility of excluding relevant profiles. In addition, it is likely that there are many more orthopedic surgeons using Twitter who have chosen not to identify their profession online. This must be considered

when interpreting these results, which are limited to self-identified orthopedic surgeons and those using Twitter for professional purposes. Lastly, Twitter boasts >65 million tweets per day, and the number of users, tweets, and followers is constantly changing. Although the data reported here are likely to change over time, this is the first report to examine the current orthopedic surgery presence on Twitter.

Although all profiles identified in this study appear to

function as an adjunct to a traditional medical practice or business, some medical centers have found ways to embrace social networking and use emerging technology to their advantage.<sup>7</sup> Thus, the increasing use of social networking and mobile technology, as well as its use among younger surgeons and residents, suggests that physicians will continue to find creative avenues for implementing this new technology into their practice. □

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