

**Title**

#colorectalsurgery; analysis of a novel international surgical collaborative initiative on social media.

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**Mini-abstract “blurb”**

The “#colorectalsurgery” twitter campaign created a specialty-specific online social media network of international coloproctologists. This paper details initial experiences of the early adoption, engagement and utilization of this pilot initiative. #colorectalsurgery has been used to successfully unify social media posts, scientists, surgeons and authors who have an interest in Coloproctology but also has translational lessons for all surgical subspecialties.

**Abstract (word count 249)**

**Background;** The utilization of social media platforms amongst healthcare professionals is increasing. A Twitter social media campaign promoting the hashtag “#colorectalsurgery” was launched with the aim of providing a specialty-specific forum to collate discussions and science relevant to an engaged, global community of coloproctologists. Here, we review our initial experiences of the early adoption, engagement and utilization of this pilot initiative.

**Methods;** The hashtag #colorectalsurgery was promoted via the online micro-blogging service Twitter across a 180-day period. Data on all ‘tweets’ containing the #colorectalsurgery hashtag were analyzed using online analytic tools. Data included total number of tweets, number of views, and user engagement since registration and launch of the campaign. Further, content of tweet and user demographic analysis was undertaken.

**Results;** The number of tweets using #colorectalsurgery grew rapidly following the launch on 24<sup>th</sup> April 2016. #colorectalsurgery was used in 15,708 tweets, which resulted in 65,398,696 impressions and involved 1,963 individual Twitter accounts. Increased volumes of #colorectalsurgery tweets were noted in association with the timing of 3 major international colorectal surgical conferences and geographic trends were noted. Eighty eight percent of all posts were by male users. The top 25 users by volume of #colorectalsurgery tweets had considerable influence and posted 8,023 (50.4%) tweets.

**Conclusion;** Online global communities formed via healthcare-related hashtags, such as #colorectalsurgery, unify social media posts, scientists, surgeons and authors who have an interest in coloproctology. Furthermore, it allows geographically separate users to connect.

## Introduction

The pervasive integration of social media (SM) into modern society has become a contemporary global phenomenon<sup>1</sup>. There are more than 2 billion social media users globally, including: 1.59 billion global Facebook users; 320 million Twitter users and 100 million unique LinkedIn accounts<sup>2,3</sup>. Current healthcare-related SM applications include: live-tweeting at medical events/conferences<sup>4,5</sup>; online journal clubs<sup>6</sup>; online patient groups<sup>7</sup>; transmission of news from professional societies; coordination of research collaborative groups<sup>8</sup>; recruitment to research and medical trials<sup>9</sup>; dissemination of new research from peer-reviewed journals, obtaining information and learning required for medical practice<sup>10,11</sup>; and social and medico-political campaigns<sup>12</sup>.

Twitter (<http://www.twitter.com>) is a free, social networking and micro-blogging service with an estimated 6000 “tweets” per second. Hashtags” (#) are a method of denoting keywords or phrases, allowing collation of tweets with common themes, and the dissemination of content to relevant audiences. Recent studies have identified Twitter as the most commonly used smartphone application by surgeons<sup>13</sup>, but the rate of engagement is variable between medical specialties, with colorectal surgeons engagement levels lagging behind other disciplines. In 2014, only 3.1% of UK consultant colorectal surgeons were found to have Twitter profiles<sup>14</sup> compared to higher engagement rates within other surgical sub-specialities such as urology (33%)<sup>15</sup>, plastic surgery (22%)<sup>16</sup> and vascular surgery (5%)<sup>17</sup>.

Recently, a global online campaign to use the Twitter hashtag “#plasticsurgery” in tweets which were of relevance to the field of plastic surgery<sup>18</sup> has proved highly successful in enhancing interaction and encouraging better quality communication between Twitter-active professionals in the field of plastic surgery.

To foster online interaction within colorectal surgery, a group of international Twitter-active colorectal surgeons agreed to develop a similar campaign. The #colorectalsurgery initiative aims to collate and identify individuals, institutions and groups with an interest in colorectal surgery on Twitter and encourage them to identify specialty-specific content of interest using

the hashtag “#colorectalsurgery”. The objective was to build an international community with an interest in colorectal disease and encourage global digital collaboration and discussion. In this report, we describe our early experiences of the #colorectalsurgery pilot, with a view to guiding future developments to further strengthen SM engagement in colorectal surgery.

## Methods

### *Study Design*

This cross-sectional study measured the impact of a novel intervention to build an online community of coloproctologists utilizing the Twitter platform. Ethical approval was not indicated or sought for this study; however, consideration to ethical principles was incorporated.

### *#Colorectalsurgery Hashtag*

#colorectalsurgery hashtag was launched on 24<sup>th</sup> April 2016 and disseminated according to a multi-modal strategy. First, influential coloproctologists who were highly active on Twitter were encouraged to use the hashtag in tweets relating to colorectal surgery. Secondly, the use of #colorectalsurgery was encouraged alongside live tweeting at key, international conferences in coloproctology. Third, an education video was produced and disseminated widely on social media to describe the potential benefits and applicability of digital communication platforms such as Twitter ([www.vimeo.com/170602709](http://www.vimeo.com/170602709)). The principle objective was to increase global awareness for #colorectalsurgery among surgeon subspecialists.

### *Analysis*

The #colorectalsurgery hashtag was registered via the online analytic tool 'Symplur' ([www.symplur.com/hashtags](http://www.symplur.com/hashtags)) on 24<sup>th</sup> April 2016. This online analytics tool is integrated into the Twitter micro-blogging service and assimilates data on specific health-related hashtags.

Data on the number of tweets containing the hashtag #colorectalsurgery were extracted up to 20<sup>th</sup> October 2016 (180 days). Using the online social media analytical program 'CREATION Pinpoint', we tracked original tweet creation using the hashtag phrase "#colorectalsurgery" and the number of tweets which were "retweets". Retweets are akin to direct quotations of other users' tweets and thus retweeting is a near-instantaneous method of digitally broadcasting and/or disseminating the content of another user and this directly widens the scope of the audience. Data relating to the number of "impressions" (views) of all tweets and the number

of users who had used the hashtag at least once, were also extracted. Data on demographics and geolocation for #colorectalsurgery Twitter posts were recorded. CREATION Pinpoint analyses tweets on the basis of gender of the user, location of the user, and common keywords within the content of the tweet. In relation to user interactions, CREATION Pinpoint uses machine learning to identify social media users, demographics ( i.e. gender) and digital behaviours most like those of other known healthcare professionals (HCPs); these users are manually reviewed and classified by a team of data analysts to populate a growing global database of HCP social media activity which currently comprises more than 300,000 verified HCP profiles and hundreds of millions of HCP SM posts.

## Results

During the 180-day pilot period, 15,708 tweets containing the #colorectalsurgery hashtag (including re-tweets) were posted (figure 1), by 1,863 unique Twitter account users. User number increased progressively throughout the study period. .

Eighty-eight percent (10,355/11,719) #colorectalsurgery posts originated from accounts (in which it was possible to identify the owners gender) belonging to a male. 66% (805/1202) of user accounts (in which it was possible to identify owner's gender) posting #colorectalsurgery posts belonged to males.

As a marker of readership and impact, #colorectalsurgery tweets received a total 65,398,696 impressions over the trial period, the cumulative and weekly trend of impressions is seen in figure 2. The development of a multimedia video to educate surgeons on the role of #colorectalsurgery was undertaken during this period. This video was launched on the 14<sup>th</sup> June 2016. While a discernable or immediate impact on trend of uptake was not initially observed, the individual tweet heralding its' release proved highly popular and was favorited 49 times, retweeted 43 times and had 11,217 impressions with 150 users clicking on the multimedia video as a link from the tweet.

During this period, three major international colorectal surgery conferences took place - the American Society of Colon and Rectal Surgeons annual scientific meeting (30<sup>th</sup> April to 4<sup>th</sup> May 2016, Los Angeles, USA), the Association of Coloproctologists in Great Britain & Ireland 2016 annual general meeting (4-6<sup>th</sup> July 2016 in Edinburgh, UK) and the 11<sup>th</sup> annual scientific meeting of the European Society of Coloproctology (28-30<sup>th</sup> September, Milan, Italy). These events had their own event hashtags "#ASCRS16", "#ACPGBI2016" and "ESCP2016" respectively. We evaluated whether these events would impact activity on the #colorectalsurgery hashtag positively or negatively. Compared baseline on the hashtag, colorectal surgery conferences had a demonstrable positive effect on the tweet activity levels and impressions on the #colorectalsurgery hashtag. The increased volume of



#colorectalsurgery activity was most obvious during #ESCP2016 conference but also noted with the other conferences (figure 2).

The top 25 Twitter users who posted #colorectalsurgery tweets had a large impact on the total number of generated #colorectal tweets, generating 50.4% (8,023/15,908) of the total #colorectalsurgery tweets. The number of followers that each of these accounts had ranged widely, but a single outlier (@juliomayol), accounted for 35.2% (16,009/45,487) of the total follower number of the top 25 users. These authors formed a strong interconnected network, with frequent interactions, influencing a much wider network of users interacting with the hashtag and each other (Figure 3).

A geographic map of the location of posted tweets is seen in Figure 4. There was predominance in tweets originating from users from western Europe and North America, with high levels also observed in India, Scandinavia, South America and Australia. There was little or no recorded engagement from users located in Eastern Europe, Russia, China or Africa (of note, access to Twitter is officially blocked in some countries). The geographic distribution of posted tweets on the #colorectalsurgery came from a diverse range of mostly developed countries, with high levels noted from the UK (3132/8023; 39.0%), Spain (2540/8023; 31.7%) and US (1527/8023; 19.0%). It should be noted that 14 of the top 25 #colorectalsurgery account's authors are based in the UK, 5 based in Spain, and 3 in the US (figures 3 and 4).

## Discussion

Social media, particularly Twitter, has emerged as an important resource for medical professionals in a variety of settings. The advantages include immediacy of communication, dynamic digital discussions, high quality educational content, instant global reach and minimal or no cost.

This study identifies a strong set of early adopters leading a campaign for #colorectalsurgery and a much larger group of Twitter-active global coloproctologists who have engaged in using this hashtag to form a digitally connected colorectal community. In just a short time, #colorectalsurgery has grown to involve several thousand members, and over 15 thousand tweets. Tweets using this hashtag have had measurable impact with more than 65 million impressions, enriching the colorectal surgeon's ability to communicate and share ideas with one another effectively and rapidly on a global scale.

The rise of live Twitter engagement at scientific conventions has also become increasingly advocated<sup>5</sup> although it poses unique challenges. Essentially, conference organizers are faced with the task of balancing attendee-initiated dissemination of the meeting developments (such as summarizing key study findings) in real time, against the need to keep attendance and participation at conferences vibrant. In turn, this creates value for delegates and sponsors, protects intellectual pre-publication property and prevents the dissemination of non-peer reviewed findings of data from plenary sessions as fact<sup>4,19</sup>. When correctly balanced, micro-blogging via platforms such as Twitter during live conferences can potentially enrich surgeon-engagement and positively impact its overall value without creating a proxy medium that usurps the need for attendance.

The positive impact of the concurrence of major coloproctology conferences on the #colorectalsurgery hashtag activity was particularly interesting. In essence, the use of #colorectalsurgery seemed to flourish around live events and may be a marker of the level of scientific interest pertaining to new findings, debate of issues discussed, and updates from

the activities of those who have attended the conference.

Indeed some colorectal conferences are now primarily created for a SM audience and aim to be interactive on digital media and are actively promoted almost exclusively online. The AIS Channel (@AISChannel), is a purely digital platform which provides surgical education aimed a global colorectal surgery community and is spearheading the move towards hosting international digital events in surgical training. The recent “AIS Winter Event” (<https://aischannel.com/congress/winter-event-2016/>) was almost exclusively marketed through twitter, email and LinkedIn. The winter event had the hashtag #TME16challenge and was broadcast live online to a live interactive audience of over 26,000 viewers from over 7600 IP addresses in 102 countries. The success of such events highlights the pivotal role in social media to eliminate geographical restrictions in attending educational conferences.

A recent report has suggested that SM is a key component of modern-day surgical practice<sup>20</sup> and Twitter has been found to be the most popular app on surgeon’s mobile phones<sup>13</sup>. Colorectal surgeons have traditionally been less engaged in SM than those form other specialties, although a recent study has found that within gastroenterology alone there are over 65 recognised hashtags within 10 broad groups (cancer, endoscopy, functional disorders, inflammatory bowel disease, liver, motility disorders, pancreas, pediatrics, small bowel disease, and “other”)<sup>21</sup>.

Recently, there has been much greater SM endorsement from key surgical societies and event organizers. In 2016, both ASCRS (@fascrs\_updates) and the ESCP (@ESCP\_tweets) have promoted workshops and/or keynote sessions devoted to SM at their 2016 annual conferences. The ESCP and ASCRS have also created a specific sub-committees or campaigns, which promote the mission of the respective society via SM.

The geographic distribution of posted tweets on the #colorectalsurgery came from a diverse range of mostly developed countries, with highest levels noted from the UK, Spain, and US, One objective of the #colorectalsurgery campaign as it matures is to engage a wider base of

surgeon-users to aid diversity in discussion topics and geographical distribution of tweet origins. There was a large gender disparity in the output from accounts of users, with just over 10% from female accounts, in keeping with previous reports<sup>14</sup>, and which may also reflect the current background demographics of the senior colorectal workforce.

The #colorectalsurgery initiative was focused on the Twitter platform. However, other SM channels are also popular, for instance, 37% of colorectal surgeons possess a LinkedIn profile<sup>14</sup>. LinkedIn posts are typically longer and aimed at the business to business market and the platform may be judged as less risky than others, accordingly, a future #colorectalsurgery-based LinkedIn group is planned. A weakness of this study is that we have not captured data in relation to the LinkedIn platform or indeed others, such as WhatsApp, Instagram and Snapchat, which have played such key roles in the co-ordination of recent international collaborative studies<sup>8</sup> and are favoured by a younger population. Unfortunately, due to security settings, these platforms and their accounts could not be analysed within this study but they are a growing area of interest for the next generation of surgeons.

Recent analysis of the plastic surgery (#plasticsurgery) hashtag has suggested marked differences with our experience<sup>18</sup>. 70.6% of posts containing the words “plastic surgery” were published by the public, with only 5% of tweets containing the hashtag #plasticsurgery. Within the hashtag, it was noted that the public generated around half of tweets. Our experience suggests that it was rare for the public to use the #colorectalsurgery hashtag in their tweets. All of the top 25 tweeters were professional coloproctologists or organisations that catered for them and none were identified as being part of the general public. Whilst an early focus has aimed to gather health care professionals to the hashtag, inevitably, engagement with patients, carers and charities will allow a broader based approach to colorectal education, but will require encouragement.

All progress, however, brings with it potential challenges. Previous research has found that a high proportion of medical students post inappropriate content within public SM posts and

there have been patient privacy breaches<sup>7,22</sup>. The encouragement of non-Twitter surgeons onto SM must therefore be tempered with adequate education to prevent those new to the platform experiencing any professional difficulties. Therefore, whilst the creation of #colorectalsurgery raises the profile of the specialty online, those who advocate or encourage participation share a responsibility to protect those who are naive to social media and ensure new members have adequate education. There is therefore an obvious role for the colorectal surgery specialty organizations and societies to provide useful education for members but future education programs should perhaps start before physicians matriculate into medical school.

Previous reviews have commented on the importance of education, research and networking possibilities provided by SM in colorectal practice<sup>23-26</sup>. These **activities are enhanced by** such an initiative as #colorectalsurgery, in that a connected, instant, free and global colorectal surgical community can harness the collective expertise of members to address contemporary challenges, which can ultimately impact patient quality of care, research and education.

### **Conclusion**

This pilot study has reported on the success of engaging those interested in coloproctology within a SM campaign and has had experienced sustained use throughout the study-period. In an era of restricted access to education and global knowledge, #colorectalsurgery defines an innovative method for bridging barriers and strengthening collaboration among global coloproctologists but also has translational lessons for all surgical subspecialties.

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## Figures

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Figure 1. #colorectalsurgery associated tweets and unique user numbers throughout the trial period

Figure 2– #colorectalsurgery tweet cumulative and weekly impressions throughout the trial period. Timing of three major colorectal surgery conferences during this period is annotated.

Figure 3 - The top 25 twitter users posting on the #colorectalsurgery hashtag during the study period and their interactions

Figure 4 Global heat map of the location of users.