Supplement 4: Descriptions of Included Studies

Author(s), Publication Year, and Study Design	*Response Rate and Participant Characteristics*	*Social Media Platforms Included*	*Social Media Use Patterns Reported*	*Description of Social Media Intervention*	*Reported Learning Outcomes (Organized by MEOF)*
Bozkurt & Chaurasia, 2021 Cross-sectional survey study	- Response rate: 1119 out of ~5000 (22.4%) - Career stage: six years median experience - Specialty: neurosurgery - Location: 104 countries; highest response rates from India, Turkey, Brazil - Practice type: 704 (63.8%) academic, 400 (36.2%) non-academic	Facebook Twitter Instagram YouTube LinkedIn WhatsApp Telegram Viber imo ResearchGate	- All used at least one platform - WhatsApp (92.2%) and Facebook (87.2%) were most used - Mainly to exchange knowledge (77.9%) with and observe cases (57.6%) of colleagues - Time spent on social media was lower for men, older respondents, and those in non-academic settings	Any neurosurgery social media platform. Included Neurosurgery Cocktail (NC), a private community for exchange of knowledge and experience among neurosurgeons. NC originally founded on Facebook and expanded to Twitter, Telegram, WhatsApp, Instagram, LinkedIn, Viber, and imo. NC sees 50+ cases posted and discussed daily, plus input from globally recognized	**L2**: Social media facilitated communication with colleagues (n = 605, 54.7% agreed), networking opportunities (n = 620, 56.1% agreed), learning of events/conferences (n = 944, 84.4% agreed), and rapid and widespread information transfer (n = 775, 69.3% agreed). Overall effect of social media on neurosurgery was beneficial (n = 700, 64.3%). **L3**: Social media improved knowledge of best evidence-based practices (50.6% agreed). **L4**: 736 (67.4%) felt they could change practice based on learnings from social media. **L5**: Surgeon self-reported that social media improved their level of care (n = 517, 46.6% agreed), ability to consider alternative management plans (n = 512, 46.3% agreed), ability to improve patient

				figures in neurosurgery.	outcomes (n = 489, 44.4% agreed).
Dong *et al.*, 2015 Cross-sectional survey study + profile review	- Response rate: 500 out of 2360 for demographics (limited by LinkedIn); 19 survey responses (unspecified invites) - Career stage: consultants (n = 319, 63.8%), residents (n = unknown, ~11%) - Specialty: plastic surgery, orthopedic surgery, hand surgery, other unspecified - Location: UK (n = 105, 21%), US (n = 40, 8%), other countries including Italy, Singapore, Scotland - Practice type: N/A	LinkedIn	- Common discussion themes included management of difficult patients (n = 48, 31.8%), seeking consensus (n = 47, 31.1%), and finding general information or promotion of content (n = 37, 24.5%)	Hand Surgery International, a LinkedIn community of practice for developing, sharing, and maintaining knowledge in hand surgery. Sign up is voluntary. Any LinkedIn user in the healthcare profession interested in hand surgery may join. All posts are moderator-approved. Users get copy of community rules upon joining. Chat room formats for discussions on topics posted by a member.	**L2**: Social media facilitated networking with beneficial professional contacts (n = 13, 68% agreed), professional support in practice (n = 13, 68% agreed), case-based discussions (n = 19, 59% agreed), and learning and teaching of hand surgery (n = 10, 53% agreed). Hand Surgery International was rated as overall easy to use by 15 (79%). **L5**: Social media allowed for adding/sharing/using skills in hand surgery practice (n = 12, 63% agreed), affected practice (n = 9, 47% agreed), and affected surgeon-reported outcome of patients (n = 7, 37% agreed).
Elkhayat, Amin, & Thabet, 2018	- Response rate: 83 out of ~1000 (8.3%) - Career stage: 7% residents, others staff/unspecified - Specialty: 36% cardiothoracic surgery, 17% cardiac surgery,	Facebook Twitter Instagram YouTube LinkedIn ResearchGate	- Beside personal use, most (84.4%) used social media for advertising and patient education - 17% had official account beside personal one	General social media.	**L2**: Social media was perceived as relevant or helpful for work by 25% of surgeons “sometimes” and by 25% of surgeons “most of the time.” This was mainly due to

Cross-sectional survey study	30% thoracic surgery, perfusionist, other non-surgical/residents - Location: 50.6% Egyptian, other unspecified - Practice type: N/A		- Facebook used most (91.6%), then YouTube (68.7%) - 86.7% subscribed to interest groups discussing cases or medical problems among surgeons		increased communication with colleagues (84.3%).
Fuoco & Leveridge, 2015 Cross-sectional survey study	- Response rate: 229 out of 504 (45.4%) - Career stage (years in practice): >20 (36.2%), 11-20 (33.5%), 5-10 (18.6%), <5 (12.0%) - Specialty: Urology - Location: Canada - Practice type: 54.8% community-based, 45.2% academic	Facebook Twitter YouTube LinkedIn	- 26% reported frequent or daily personal social media use - 8% reported frequent or daily professional use - Services used frequently or daily: YouTube (33.3%), Facebook (19.6%), Twitter (7.6%), blogs (7.1%), and LinkedIn (2.7%)	General social media.	**L2**: 67% agreed social media may have merit in interprofessional discussion/teaching. 58.8% accepted social media for use as a simple repository of information. 45.7% felt social is appropriate for discussion of patient cases.
Haberle *et al.*, 2020 Cross-sectional survey study + interview	- Response rate: 92 interviews (unspecified invites); 59 out of 61 surveys responses (96.7%) - Career stage: surgeons (n = 72, 78.3%), residents (n = 18, 19.6%), other unknown - Specialty: plastic surgery, ENT, head/neck surgery, oral & maxillofacial surgery, ophthalmology, neurosurgery - Interviewee location: Africa (n = 9, 9.8%), Asia-Pacific (n = 22, 23.9%), Latin America (n = 19, 20.7%), Middle East (n = 22, 23.9%), Europe (n = 12, 13.0%), North America (n = 8, 8.7%)	Facebook YouTube WhatsApp Viber imo	- US surgeons were less likely to have used online resources for professional insights vs. non-US surgeons - Surgeons from Africa, Asia, Latin America, and the Middle East (but not the US or Europe) commonly used WhatsApp professionally	General social media.	**L2**: Surgeons from Africa, Asia, and Latin America had difficulty accessing resources due to poor connections and/or language barriers. These surgeons desired more downloadable and subtitled resources. US and European surgeons had reduced need for online resources given institutional access to case conferencing, literature search, and surgical consultation systems. Participants agreed that online courses and peer-to-peer consulting (presumably

	- Practice type: teaching hospitals, private clinics, other unspecified				via social media) would benefit their professional education.
Laurentino *et al.*, 2020 Cross-sectional survey study	- Response rate: 219 responses (unspecified invites) - Career stage: practicing (n = 162, 74.0%), residents (n = 43, 19.6%), medical students (n = 14, 6.4%) - Specialty: mostly laparoscopic, robotic, and general surgeons - Location: South America (n = 190, 86.7%), North America (n = 15, 6.8%), Europe (n = 10, 4.6%), Central America (n = 3, 1.4%), Asia (n = 1, 0.5%) - Practice type: N/A	Facebook Instagram YouTube LinkedIn WhatsApp	- 90.9% used social media to watch surgical lectures or engage in surgical discussions during COVID-19	General social media.	**L2**: Preferred social media *platforms* for surgical education were YouTube (n = 73, 33.3%), other/webinars (n = 49, 22.4%), WhatsApp (n = 46, 21.0%), Instagram (n = 30, 13.7%), Facebook (n = 19, 8.7%), LinkedIn (n = 2, 0.9%). Preferred online *formats* for online surgical education were live webinars with chat (68.5%), streaming videos (17.3%), Instagram Live (6.4%), and other, less popular formats.
Lucatto *et al.*, 2022 Single-group posttest-only	- Response rate: 54 out of 75 (72.0%) - Career stage: 6.81 years mean career length; fellows (n = 21, 38.9%), young surgeons (n = 21, 38.9%), senior surgeons (n = 12, 22.2%) - Specialty: vitreoretinal surgery - Location: Brazil (n = 39, 72.2%), Dominican Republic (n = 3, 5.6%), Mexico (n = 3, 5.6%); France, Colombia, Argentina, Japan, Canada, Iraq, Chile, Turkey, US (each n = 1, 1.9%) - Practice type: N/A	YouTube	- N/A	English videos posted to YouTube between 2011-2021 regarding treatment of vitreoretinal diseases, shorter than 10 min, created by professionals for professionals, with minimum 1000 views.	**L2**: Utility of videos as an educational tool was rated 3.83 ± 1.16 (mean $\pm$ SD) on the Likert scale (1-5). Utility scores differed significantly by group: fellows (3.99), young surgeons (3.87), senior surgeons (3.47). **L3**: Surgeons learned something new by watching a video in 29.6% of all evaluations. 34.8% of fellows reported learning something new as compared to only 19.2% of senior surgeons ($p < 0.05$).

Mota *et al.*, 2018 Cross-sectional survey study	- Response rate: 141 out of 256 (55.1%) - Career stage: junior residents (1-3 years), senior residents (> 3 years), early specialists (1-3 years), specialists (> 3 years) - Specialty: general surgery, orthopedic surgery, neurosurgery, plastic surgery, urology, vascular surgery, ophthalmology, otorhinolaryngology, obstetrics and gynecology - Location: Portugal - Practice type: N/A	YouTube	- 139 (98.6%) reported using videos to prepare for surgery. - The most used video sources were YouTube (n = 114, 80.9%), society webpages (n = 86, 61.0%), and commercially available videos (n = 57, 40.4%).	YouTube videos and videos from other sources (e.g., society websites).	**L2**: Videos were helpful for preparing for surgical cases; median helpfulness rating (Likert scale from 1-5) was 4 among specialists and 5 among residents ($p < 0.001$). Videos were preferred method for surgical preparation (n = 80, 56.7%) among all participants. Among specialists, watching videos (n = 29, 38.7%) was preferred preparation method after reading (n = 35, 46.7%). Most valued characteristics in videos were surgeon's technical skill, didactic illustrations, tips and tricks, and narration.
Nathaniel & Adio, 2016 Cross-sectional survey study	- Response rate: 87 responses (unspecified invites) - Career stage: resident (n = 23, 26.4%), diplomate (n = 3, 3.4%), fellow (n = 3, 3.4%), consultant (n = 58, 66.7%) - Specialty: ophthalmology - Location: Nigeria - Practice type: N/A	Facebook Twitter Instagram LinkedIn WhatsApp	- 82 (94.3%) used social media - Facebook (n = 72, 82.8%) and WhatsApp (n = 72, 82.8%) most used - Of professional social media uses, interacting and collaborating with colleagues was most frequent (n = 43, 49.4%)	General social media.	**L5**: Social media enhanced surgeons' practices (n = 52, 59.8%), especially through collaboration and exchange of ideas.
Rapp *et al.*, 2016 Cross-sectional survey study	- Response rate: 78 out of 86 (90.7%) - Career stage: 9 medical students, 33 residents, 37 faculty - Specialty: general surgery - Location: University of Iowa	YouTube	- Most used videos to prepare for surgical cases (n = 70, 89.7%) - Videos used mostly from YouTube (n = 60, 85.7%) - Compared to learners, faculty significantly more	YouTube videos and videos from other sources (e.g., society websites)	**L2**: Videos were helpful in preparing for surgical cases, with average helpfulness rating being 3.7 on Likert scale from 1-5.

	- Practice type: academic		likely to use society webpages and commercially available videos - Faculty used videos to prepare for laparoscopic / thoracoscopic (73%), open (53%), robotic (10%), and endoscopic cases (3%)		
Redmann, Willging, & Roby, 2020 Cross-sectional survey study	- Response rate: 37 out of 84 (44.0%) - Career stage: 26 fellows and 11 fellowship directors - Specialty: pediatric ENT - Location: US - Practice type: academic	YouTube	- Fellows (n = 25, 96.2%) and fellowship directors (n = 6, 54.5%) used videos to prepare for surgical cases - Most common source of videos was YouTube; used by 26 (100.0%) fellows and 7 (63.6%) fellowship directors	YouTube videos and videos from other sources (e.g., society websites)	**L2**: Videos were helpful in preparing for surgical cases (overall helpfulness = 3.41 on Likert scale from 1-5). Fellows rated helpfulness as 3.62 compared to 2.90 for fellowship directors (p = 0.09). Videos were most helpful for illustrating technical portions of case (51%), visualization (27%), and reviewing anatomy (24%). Most common drawbacks of videos were poor content quality (59%), irrelevance to institutional surgical approach (19%), and lack of discussion of complications (12%).
Schmidt, Shi, & Sethna, 2016 Cross-sectional	- Response rate: 202 out of 2700 (7.5%) - Career stage (years in practice): 0-10 (n = 72, 36.1%), 11-20 (n = 58, 28.7%), >20 (n = 71, 35.1%) - Specialty: facial plastic surgery - Location: US	YouTube	- 89.9% of respondents indicated likeliness to use an online video library, and 60.0% expressed willingness to pay for such a service - Length of experience had significant inverse	YouTube videos and videos from other sources (e.g., society websites)	**L3**: 64.1% of respondents indicated use of social media at least once to learn a new technique, especially for rhinoplasty and injectable procedures. **L5**: 83.1% of those who used social media at least once to

survey study	- Practice type: private (n = 149, 73.8%), academic (n = 52, 25.7%)		correlation with prior use of online streaming media		learn a new technique subsequently applied said technique(s) to their practice.
Wagner *et al.*, 2018 Cross-sectional survey study	- Response rate: 208 out of 645 (32.2%) - Career stage: practicing (n = 132, 63.5%), fellows (n = 2, 1.0%), residents (n = 74, 35.6%) - Specialty: all surgeons - Location: US - Practice type: academic public (n = 120, 57.7%), academic private (n = 71, 34.1%), community teaching (n = 10, 4.8%), community private (n = 7, 3.4%)	Facebook Twitter LinkedIn WhatsApp Doximity	- 46 (22.1%) preferred social media vs. all other means to keep in touch with professional contacts - 83 (39.9%) had participated in online discussion forums on surgery - Respondents younger than 55 years more likely to have positive opinion of social media (p = 0.02)	General social media.	**L2**: Overall effects of social media on professional development was perceived as very beneficial (15.6%), somewhat beneficial (54.0%), neutral or irrelevant (21.0%), somewhat detrimental (4.5%), very detrimental (1.0%), or other (4.0%).
Waqas *et al.*, 2021 Cross-sectional survey study	- Response rate: 178 out of 1160 (15.3%) - Career stage: fellows (n = 25, 14.0%), residents (n = 153, 86.0%) - Specialty: neurosurgery - Location: North America - Practice type: academic	Facebook Twitter Instagram YouTube LinkedIn Reddit Tumblr Pinterest	- Most used social media platforms: Facebook (87.1%), YouTube (84.3%), Instagram (81.5%), Twitter (74.7%) - Most common uses: personal social (89.3%), networking (65.2%), academic resources (64.6%) - 113 (63.5%) reported less than 25% of their time on social was for academic purposes	General social media.	**L2**: Social media was not essential to workflow (n = 91, 51.1%). Academic social media use correlated with increased essence to workflow ($p < 0.001$). **L5**: Respondents had neutral views toward influence of social media on patient care and job performance (median = 3/5). Respondents who used social media for academic purposes believed it improved workflow, patient care, and job performance.