# Surgical mesh information on YouTube™: Evaluating the usage and reliability of videos for patient education

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Appendix available at *cuaj.ca*

## Abstract

**Introduction:** Patients in search of answers to health-related questions often seek out information on the internet. The current study aimed to evaluate the quality of videos on the topic of mesh pertaining to its use in the treatment of stress urinary incontinence or pelvic organ prolapse.

**Methods:** A total of 100 videos on the topic of mesh on YouTube™ were screened in this study. From that, a further 30 were selected for review. Five experts in the medical field reviewed each video anonymously, using two video assessment tools. Video characteristics were collected and evaluated. Videos were assessed based on a Global Assessment Score (GAS) and Patient Education Tool for Audiovisual Materials (PEMAT-A/V) scale for ease of patient access and comprehension. The overall correlation between raters and videos was also compared.

**Results:** The GAS and PEMAT-A/V ratings correlation across multiple raters demonstrated excellent inter-rater reliability. We found that the overall GAS score and recommendation was substandard, and the median PEMAT-A/V understandability score was 70% (poorly understandable). Most videos contained some form of marketing, and a scarce number had reliable sources of information. Evidence of neutrality was low.

**Conclusions:** Through the expert assessment of videos using quality assessment tools, this study demonstrated the overall variable quality of mesh videos on YouTube™ and the need for further education regarding patient resources.

## Introduction

Access to health information is evolving rapidly, with patients having increasing access to online resources before and after they see any health provider.[1] And the use of technology by patients to gain control of their health will only grow. While access to abundant health information is valuable, there is little data on the use of online tools for mesh education. To our knowledge, there is no comprehensive evaluation of online patient education materials on mesh as it pertains to our patient population. This study examined the quality of available mesh video content and user engagement.

Recent controversy surrounding the use of mesh and reports of increased adverse outcomes and lawsuits have caused many changes in the way it is perceived. Mesh has become a popular health-related internet search topic, in particular, regarding its use in pelvic organ prolapse (POP) and stress urinary incontinence (SUI) surgeries. One study found that 93% of patients had heard of surgical mesh from media sources, and 60% were motivated to conduct research on the internet due to media exposure.[2] Another study evaluating surgical trends and changes in mesh usage showed a significant decrease in use following several lawsuits and mainstream media controversy.[3] The explosion of patients enquiring about mesh on the internet makes it an interesting topic for which to evaluate the quality of educational videos.

The appeal of video information to patients is obvious: an entertaining summary that is easily accessible and free. Recent publications have suggested that YouTube™ content, which has the potential to reach a vast audience, could be used for educational purposes.[4-6] Patient education is powerful and can form the attitudes of patients prior to seeing a clinician in person.

This study aimed to evaluate the accuracy and comprehensiveness of vaginal mesh videos on the social media and video-sharing platform, YouTube™.

## Methods

Five clinical reviewers evaluated the quality of educational mesh videos on YouTube™. The reviewing team was comprised of two urologists, two gynecologists, and one fellow/trainee in female urology/urogynecology. The reviewers' identity and their responses to the video analysis tools were anonymous and confidential. The individuals who reviewed the videos in this study remained the same throughout. Each reviewer screened and evaluated the same videos for comparison.

On YouTube™, the following search terms were evaluated: mesh, mesh procedure, mesh complication, mesh erosion, and mesh prolapse. The first 20 consecutive results for each search term were sorted by relevance and video option and then included for further evaluation. We felt that assessing 20 videos per search term was adequate, as most people will not view more than 10 videos on a particular topic. Videos were excluded from the study if there was no mention of mesh, no audio, and incomplete content.

The validation tools used by reviewers were a Global Assessment Score (GAS) and a Patient Education Materials Evaluation Tool for Audiovideo Materials (PEMAT-A/V).[7,8] Each rater recorded the GAS as an integer from 0–6, while the PEMAT-A/V understandability score was recorded as a percentage. As per the PEMAT-A/V user guidelines, an item was rated as "agree" when the respective characteristic occurred throughout the material 80–100% of the time. Conversely, an item was rated as "disagree" when the respective characteristic could have been better met throughout the material (Supplementary Table 1; available at *cuaj.ca*).[7]

On the GAS scoring system, scores of 0–2 (lowest) represent "no useful/biased information and very unlikely to recommend to patients"; 3 represents "some useful information but unlikely to recommend to patients"; 4 represents "some useful information and neutral to recommend to patients"; 5 represents "useful information and likely to recommend to patients"; and 6 (highest) represents "very useful information and very likely to recommend to patients" (Supplementary Table 2; available at *cuaj.ca*). The key questions on the GAS were questions 3 and 5, recommendation to patients and general recommendation overall, respectively. The higher the GAS score, the more likely the video could be used as a quality educational resource.

The overall correlation between raters and videos was compared by calculating the intraclass correlation coefficients (ICCs) between GAS rating and PEMAT-A/V ratings. Because the reviewers remained the same throughout the study, the coefficients could, therefore, be calculated as a two-way mixed-effects ICC, measuring for consistency, and basing off the mean of multiple raters and measurements. The inter-rater reliability for ICC values was defined based on the current literature, with <0.40 as poor, 0.40–0.59 as fair, 0.60–0.74 as good, and 0.75–1.0 as excellent.[9] For statistical analysis, we used StataIC v15.1 (College Station, TX, U.S.). Statistical significance was set at an alpha value of 0.05.

In addition, the following video characteristics were recorded during the assessment of the videos: video title, duration, owner, target audience, purpose, length, release date, total views, likes, dislikes, and search rank. Clarification of the type of video ownership was also recorded where clarification could be made (physician, industry, hospital, or patient).

Institutional research ethics board approval was obtained but was not required as per institutional policy. The study was exempted, as there was no patient contact and only public access data was used. This study was self-funded.

## Results

Search criteria revealed a total of 100 videos, and a total of 30 videos from YouTube™ were included for comprehensive evaluation after exclusion criteria. All videos analyzed by the five reviewers were published between 2005 and 2020. The median number of views was 977 500 (interquartile range [IQR] 19 250–85 750). Most of the videos targeted the general population (56.7%), and 26.7% of the videos had the main purpose of being informative (Table 1).

Law firms (23.3%) and hospitals (36.7%) were responsible for uploading half of the videos reviewed. Of the 30 videos, 11 included patient testimonials and 14 were based on someone's opinion (patient or narrator). Over half of the videos contained marketing content (60%) and 6.6% of the videos included ads in their content (lawsuit ad or other).

The mean GAS ratings across reviewers were analyzed and the ICC value was calculated at 0.90 (95% confidence interval [CI] 0.82–0.95), indicating an excellent inter-rater reliability. The same procedure was followed for the PEMAT-A/V ratings, which resulted in an ICC value of 0.96 (95% CI 0.93–0.98), also indicating an excellent inter-rater reliability (Figure 1).

Overall educational value was variable. The median GAS score for all the videos was 3 (IQR 0–6). The average GAS recommendation for patients was less than 50%, with reviewers recommending only a range of 11–16 videos. The overall GAS recommendation (GAS question 5) was congruent with this score. The median PEMAT-A/V understandability score was 70% (IQR 20–90). Of the videos comprehensively evaluated, 10/30 had an understandability score of 50% or lower (Figure 2).

## Discussion

Concerns about the effect of unregulated and uncensored content for patient health education cannot be overstated.

Our study showed that the overall quality of educational videos about mesh on YouTube™ is not strong. In fact, only 50% of the videos reviewed were factually based; many of these so-labelled "educational" videos were based solely on opinion,

**Table 1. Video characteristics**

| Characteristic | Data |
|---|---|
| Number of views, median (IQR) | 977 500 (19 250–85 750) |
| Length, in min:sec, median (IQR) | 2:59 (2:15–2:45) |
| Number of likes, median (IQR) | 57 (18–240) |
| Number of dislikes, median (IQR) | 13 (3–22) |
| Target audience, n (%) | |
| General population | 17 (56.7) |
| Patients | 9 (30) |
| Medical professionals | 4 (13.3) |
| Purpose of video, n (%) | |
| Informative | 8 (26.7) |
| Lawsuit | 6 (20) |
| General awareness | 6 (20) |
| Education/information | 6 (20) |
| Education/information/technique | 2 (6.7) |
| Lawsuit/ad | 1 (3.3) |
| Information/ad | 1 (3.3) |
| Owner/uploader, n (%) | |
| Hospital | 11 (36.7) |
| Law firm | 7 (23.3) |
| Surgeon | 6 (20) |
| Media | 3 (10) |
| Patient | 1 (3.3) |
| Industry | 1 (3.3) |
| Patient testimonial, n (%) | |
| No | 19 (63.3) |
| Yes | 11 (36.7) |
| Factual vs. opinion, n (%) | |
| Factual | 15 (50) |
| Opinion | 10 (33.3) |
| Opinion patient | 3 (10) |
| Opinion patient/factual | 1 (3.3) |
| None | 1 (3.3) |
| Marketing, n (%) | |
| Yes | 18 (60) |
| No | 12 (40) |
| Postoperative instructions, n (%) | |
| No | 27 (90) |
| Yes | 3 (10) |

which can spark the spread of inaccurate health information. With YouTube™ boasting approximately 122 million active users a day, health misinformation can be quick to disseminate.[10,11]

YouTube™ has an extensive misinformation policy when it comes to COVID-19, for example, but the platform makes no mention of how they combat the spread of *general* health misinformation, such as in the case of mesh.[12] We feel the internal review process should include examining author credentials and content validity, noting any misinformation, and completely removing videos that violate set standards.

In particular, the expertise of the author is an important part of gauging the veracity of the content.[13] All videos

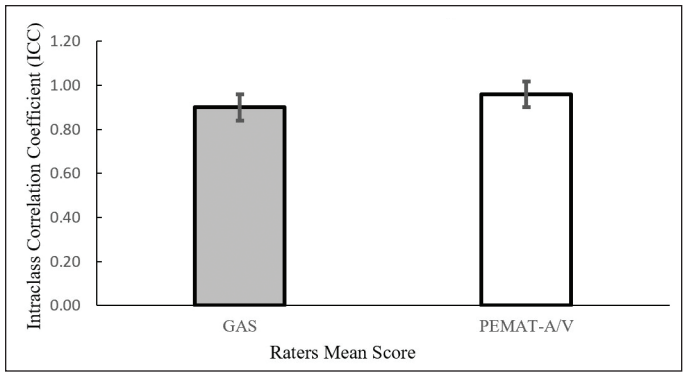


**Figure 1.** Inter-rater reliability based on intraclass correlation coefficient (ICC) values, with 95% confidence intervals. ICC values were defined as: <40=poor; 0.40–0.59=fair; 0.60–0.74=good; and 0.75–1.0=excellent. ICC values represent the mean scores the reviewers recorded for Global Assessment Score (GAS) and Patient Education Tool for Audiovisual Materials (PEMAT-A/V), respectively.

should clearly cite the names of the healthcare professionals involved in their creation, as well as all accreditations and affiliations. A 2020 annual public health review proposed that an online system hosted by universities could allow for viewers to quickly background check the video author.[13]

We noted that only 20% of the videos reviewed were owned/uploaded by surgeons — experts with the best understanding of the risk/benefit of using mesh for POP or SUI surgery. Furthermore, our study found that 60% of the videos contained marketing materials, and this high proportion raises the concerns of bias and lack of impartiality. If the quality of health education videos on the internet is to be improved, increased involvement of unbiased experts, such as medical doctors and allied healthcare professionals, will be highly critical.

In addition to establishing content validity requirements that videos must meet, they should also be assessed for general understandability to the public using standardized

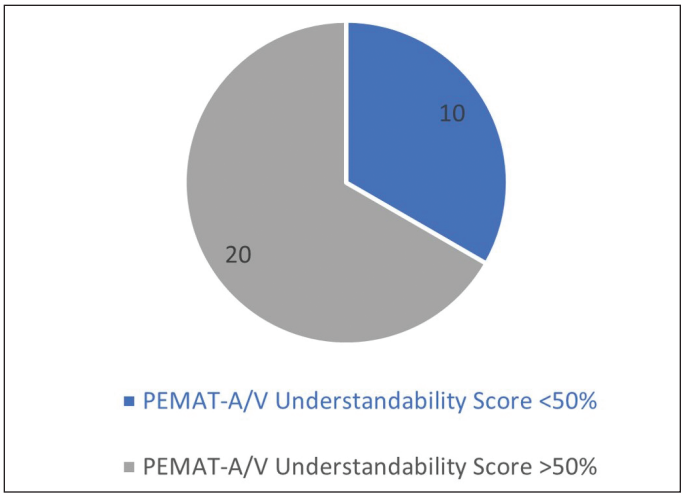


**Figure 2.** The PEMAT-A/V understandability score for the 30 videos reviewed. Understandability is defined as: "patient education materials are understandable when consumers of diverse backgrounds and varying levels of health literacy can process and explain key messages."[7]

assessment tools such as PEMAT-A/V and GAS. These results could potentially be cited in the description of the video, in patient-friendly language.

The median GAS score of the videos reviewed in this study was only 3, indicating their overall insufficient quality, and the overall GAS recommendation of all videos was low. Additionally, the median PEMAT-A/V understandability score was 70%, indicating a video is poorly understandable.[7]

As an alternative to mainstream platforms such as YouTube™, which have the potential for spreading misinformation, we propose the creation of a centralized location for credible health videos. This would allow for more effective monitoring of content, relieve patients/learners from the confusion of finding quality information, and ultimately reduce the potential for negative consequences arising from health misinformation.

Patients performing their own research in adjunct to a clinician's counselling may benefit the patient-physician relationship by aiding the patient's understanding of their health and care. However, this also has the potential to hinder the patient-physician interaction, as preconceived notions built on misinformation may challenge the physicians' recommendations.

With the use of mesh in POP and SUI surgeries becoming a controversial topic in recent years — leading to over 100 000 lawsuits filed stemming from complications[14] — it's not surprising that we found 23.3% of the videos we reviewed were aimed at mesh lawsuits. One study found that 27% of patients became concerned about the use of mesh after using the internet as a source of information.[2] With patients' increasing use and access to the internet, physicians must navigate patient questions and concerns stemming from internet-based information.

Some physicians have expressed a need for training regarding health information on the internet, so they know which websites to recommend to patients.[15] In identifying useful resources, we will empower patients in their health journey to navigate the turbulent online noise and avoid misinformation that may negatively impact them.

### Limitations

A potential limitation to this study was the relatively small number of videos included for review (n=30). However, with a median of 977 500 views (IQR 19 250–85 750), the videos that were reviewed had reached many people. Therefore, we feel this study provides valuable insight into the quality of information that many people see in their search for mesh information.

## Conclusions

The quality of patient education videos on YouTube™ regarding the topic of mesh use in POP and SUI surgery is overall highly variable. The consensus of this finding was strong among the five reviewers, and the videos were generally rated "poorly understandable" and "unlikely to recommend to patients." Although the PEMAT-A/V score was not significantly greater in inter-rater reliability, both GAS and PEMAT-A/V scores produced excellent inter-rater reliability for scoring videos. Patients and healthcare learners/professionals who use YouTube™ for educational purposes must be aware of the quality of these videos and think critically about their reliability. Physicians should advise patients to find quality resources, as healthcare misinformation may adversely affect their health decisions.

**Competing interests:** The authors do not report any competing personal or financial interests related to this work.

This paper has been peer-reviewed.

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