

2016

Assessing Readability of Online Patient Education Materials for Spine Surgery Procedures

William Long OMS-I

Marian University - Indianapolis

William W. Long BA1

Marian University - Indianapolis

Krishna D. Modi BS1

Dustin H. Massel BS1

Benjamin C. Mayo BA1

See next page for additional authors

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Recommended Citation

Long, William OMS-I; Long, William W. BA1; Modi, Krishna D. BS1; Massel, Dustin H. BS1; Mayo, Benjamin C. BA1; and Singh, Kern MD1, "Assessing Readability of Online Patient Education Materials for Spine Surgery Procedures" (2016). *MU-COM Research Day*. 28.

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Authors

William Long OMS-I, William W. Long BA1, Krishna D. Modi BS1, Dustin H. Massel BS1, Benjamin C. Mayo BA1, and Kern Singh MD1

Assessing Readability of Online Patient Education Materials for Spine Surgery Procedures

William W. Long BA¹, Krishna D. Modi BS¹, Dustin H. Massel BS¹, Benjamin C. Mayo BA¹, Kern Singh MD¹

Disclosures: KS – [Board Membership] VitaS LLC, TruVue Surgical, Avaz Surgical, Bijali; [Consultant] Depuy, Zimmer, Stryker, Globus; [Royalties] Zimmer, Stryker, Pioneer, Lippincott Williams & Wilkins, Thieme, Jaypee Publishing, Slack Publishing; [Grant] Cervical Spine Research Society
BCM – [Grant] Cervical Spine Research Society
DHM, WML, KDM – Nothing to disclose

¹Department of Orthopaedic Surgery, Rush University Medical Center, Chicago, IL, 60612

BACKGROUND INFORMATION

- Context:** Increased patient reliance on Internet-based health information has amplified the need for comprehensible online patient education articles.
- As suggested by the AMA and NIH, spine fusion articles should be between a 4th and 6th grade readability level to increase patient comprehension, which may contribute to improved postoperative outcomes.
- Objective:** To determine the average readability level of online healthcare education information relating to anterior cervical discectomy and fusion (ACDF) and lumbar fusion procedures.
- Design:** Online Health-Education Resource Qualitative Analysis

METHODS

- Three popular search engines were utilized to access patient education articles for common cervical and lumbar spine procedures.
- Relevant articles were analyzed for readability using Readability Studio Professional Edition software (Oleander Software, Ltd).
- Articles were stratified by organization type as follows: General Medical Websites (GMW), Healthcare Network/Academic Institutions (HNAI), and Private Practices (PP).
- Thirteen common readability tests were performed with the mean grade level for each readability test compared between subgroups using ANOVA analysis.

	GMW (n=16)	HNAI (n=13)	PP (n=50)	p-value	All ACDF (n=79)
MSMOG	8.4	8.4	8.2	0.908	8.3
NFC	8.0	8.6	8.5	0.737	8.4
NARI	9.7	9.5	9.2	0.744	9.3
FK	10.3	10.2	10.0	0.896	10.1
ARI	10.5	10.4	10.1	0.811	10.2
FOR	10.8	10.7	10.7	0.785	10.7
RE	11.5	10.8	11.3	0.829	11.0
CL	11.8	11.4	11.3	0.659	11.5
NDC	12.1	11.3	11.6	0.717	11.7
FRY	12.1	11.9	11.9	0.986	12.0
GF	12.6	12.7	12.7	0.994	12.7
SMOG	12.9	12.8	12.8	0.940	12.8
Mean ± SD	10.9 ± 2.9	10.7 ± 2.8	10.7 ± 2.5	0.652	10.7 ± 1.5

	GMW (n=61)	HNAI (n=44)	PP (n=126)	p-value	All Lumbar (n=231)
MSMOG	8.1	8.0	8.6	0.022	8.4
NFC	8.2	8.4	9.1	0.078	8.7
NARI	9.9	9.4	10.2	0.208	10.0
FK	10.5	10.3	11.0	0.128	10.7
ARI	10.5	10.2	11.1	0.112	10.8
FOR	11.3	11.1	11.2	0.711	11.2
RE	11.4	11.9	12.9	0.026	12.0
CL	12.1	11.6	12.2	0.194	12.1
NDC	12.3	11.6	13.2	0.001	12.7
FRY	12.7	12.5	13.1	0.233	12.9
GF	12.1	12.1	13.5	0.011	13.0
SMOG	12.7	12.6	13.2	0.053	13.0
Mean ± SD	10.9 ± 3.0	10.8 ± 2.9	11.6 ± 2.7	<0.001	11.3 ± 1.6

GMW = General Medical Website, HNAI = Healthcare Network/Academic Institutions, PP = Private Practice, MSMOG = Modified SMOG, NFC = New Fog Count (Kincaid), NARI = New Automated Readability Index (Kincaid), FK = Flesch-Kincaid, ARI = Automated Readability Index, FOR = FORCAST RE = Raygor Estimate, CL = Coleman-Liau (grade levels), NDC = New Dale-Chall, GF = Gunning Fog, SD = Standard deviation

	GMW (N=16)	HNAI (N=13)	PP (N=50)	All ACDF (N=79)
Below 7 th Grade	6.25% (1)	0.00% (0)	4.00% (2)	3.80% (3)
7 th -10 th Grade	37.50% (6)	30.77% (4)	28.00% (14)	30.38% (24)
Above 10 th Grade	56.25% (9)	69.23% (9)	68.00% (34)	65.82% (52)

	GMW (N=61)	HNAI (N=44)	PP (N=126)	All Lumbar (N=231)
Below 7 th Grade	4.92% (3)	0.00% (0)	0.00% (0)	1.30% (3)
7 th -10 th Grade	27.87% (17)	38.64% (21)	23.81% (30)	29.44% (68)
Above 10 th Grade	67.21% (41)	52.27% (23)	76.19% (96)	69.26% (160)

GMW = General Medical Website, HNAI = Healthcare Network/Academic Institutions, PP = Private Practice

RESULTS

- 79 ACDF and 231 lumbar fusion articles were determined to have a mean readability level of 10.7 ± 1.5 and 11.3 ± 1.6, respectively (Tables 1 and 2).
- GMW, HNAI, and PP subgroups had mean readability levels of 10.9 ± 2.9, 10.7 ± 2.8, and 10.7 ± 2.5 for ACDF and 10.9 ± 3.0, 10.8 ± 2.9, and 11.6 ± 2.7 for lumbar fusion articles (Tables 1 and 2).
- Of 310 total articles, only 6 (3 ACDF and 3 lumbar fusion) were written below the 7th grade reading level (Tables 3 and 4).

CONCLUSIONS

- Current online literature from medical websites containing information regarding ACDF and lumbar fusion procedures are written at a grade level higher than the suggested guidelines.
- Therefore, current patient education articles should be revised to accommodate the average readability level in the United States and may result in improved patient comprehension and postoperative outcomes.

FRE Scoring Scale	Readability	Category	Average FRE
0-29	Very Difficult	GMW ACDF	50
30-49	Difficult	HNAI ACDF	51
50-59	Fairly Difficult	PP ACDF	52
60-69	Standard	All ACDF	51
70-79	Fairly Easy	GMW Lumbar	48
80-89	Easy	HNAI Lumbar	49
90-100	Very Easy	PP Lumbar	46
		All Lumbar	47

FRE = Flesch Reading Ease, GMW = General Medical Website, HNAI = Healthcare Network/Academic Institutions, PP = Private Practice