

# Readability of Trauma-Related Patient Education Materials from the American Academy of Orthopaedic Surgeons and Orthopaedic Trauma Association Websites

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## INTRODUCTION:

Web-based resources serve as a fundamental educational platform for orthopaedic trauma patients; however, they are frequently written above the recommended 6<sup>th</sup>-grade reading level and prior studies have demonstrated this for the AAOS web-based articles. In this study, we perform an updated assessment of the readability of AAOS trauma-related educational articles as compared to injury-matched education materials developed by the OTA.

## METHODS:

All forty-six AAOS trauma-related web-based (<https://www.orthoinfo.org/>) patient education articles were analyzed for readability. Two independent reviewers used the 1) Flesch-Kincaid Grade Level (FKGL) and the 2) Flesch Reading Ease (FRE) algorithms to calculate readability level. Mean readability scores were compared across body part categories. One-sample t-test was done to compare mean FKGL with the recommended 6<sup>th</sup>-grade readability level and the average American adult reading level. Two-sample t-test was used to compare the readability scores of the AAOS trauma-related articles to those of the OTA.

## RESULTS:

The average (SD) FKGL and FRE for the AAOS articles were 8.9 (0.74) and 57.2 (5.8), respectively. All articles were written above the 6<sup>th</sup>-grade reading level. The average readability of the AAOS articles was significantly greater than the recommended 6<sup>th</sup>-grade reading level ( $p < 0.001$ ). The average FKGL and FRE for all AAOS articles were significantly higher compared to those of the OTA articles ( $8.9 \pm 0.74$  vs.  $8.1 \pm 1.14$ ,  $p < 0.001$  and  $57.2 \pm 5.8$  vs.  $65.6 \pm 6.6$ ,  $p < 0.001$ , respectively). Excellent agreement was observed between raters for the FKGL 0.956 (95% CI 0.922 - 0.975) and FRE 0.993 (95% CI 0.987 - 0.996).

## DISCUSSION AND CONCLUSION:

Our findings suggest that, after almost a decade, the readability of the AAOS trauma-related articles remains unchanged. The AAOS and OTA trauma patient education materials have high readability levels and may be too difficult for patient comprehension. A need remains to improve the readability of these commonly used trauma education materials.

Figure 1. Flesch-Kincaid Grade Level (FKGL) comparison between AAOS and OTA articles.

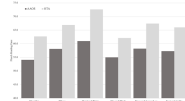


Figure 2. Flesch Reading Ease (FRE) comparison between AAOS and OTA articles.

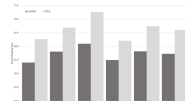


Table 1. Distribution of AAOS Articles by Flesch-Kincaid Grade Level and Sub-Section.

Sub-section	Average Grade	Grade 7	Grade 8	Grade 9	Total Articles
Neck	8.9	0	0	0	2
Elbow	8.5	1	4	0	5
Forearm and Wrist	8.8	1	2	0	3
Hand and Wrist	8.4	0	2	0	2
Hip and Thigh	8.2	0	2	0	2
Knee and Lower Leg	8.9	0	4	0	4
Neck	8.9	0	0	0	2
Overall	8.9	2	12	0	14

Table 2. Distribution of AAOS Articles by Flesch Reading Ease and Sub-Section.

Sub-section	Flesch Reading Ease	Total Articles
Neck	58.2	2
Elbow	62.5	5
Forearm and Wrist	59.2	3
Hand and Wrist	65.8	2
Hip and Thigh	63.4	2
Knee and Lower Leg	59.2	4
Neck	58	2
Overall	61.1	14

Table 3. Flesch-Kincaid Grade Level (FKGL) readability comparison of AAOS versus OTA patient education articles by category.

AAOS Category	Articles	Average Grade	Articles	Average Grade	P-value
Shoulder	4	8.55	4	8.20	0.582
Elbow	5	8.50	5	7.82	0.082
Hand and Wrist	3	8.38	2	8.76	0.881
Hip and Thigh	2	8.10	2	8.80	0.281
Knee and Lower Leg	2	8.75	4	7.88	0.021
Forearm and Wrist	3	8.68	4	8.22	0.281
Neck	2	8.95	0	-	-
Elbow	1	8.50	0	-	-
Overall	23	8.9	18	8.1	0.001

Table 4. Flesch Reading Ease (FRE) readability comparison of AAOS versus OTA patient education articles by category.

AAOS Category	Articles	Average FRE	Articles	Average FRE	P-value
Shoulder	4	54.1	4	62.7	0.107
Elbow	5	59.1	5	68.8	0.019
Hand and Wrist	3	63.9	2	72.0	0.188
Hip and Thigh	2	59.0	2	62.1	0.582
Knee and Lower Leg	2	58.2	4	67.4	0.017
Forearm and Wrist	3	59.2	4	66.8	0.481
Neck	2	57.0	0	-	-
Elbow	1	62.5	0	-	-
Overall	23	57.2	18	65.6	0.001

AAOS: American Academy of Orthopaedic Surgeons; OTA: Orthopaedic Trauma Association; FKGL: Flesch-Kincaid Grade Level; FRE: Flesch Reading Ease; P-value: Probability value.

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