1. Does the Thomson Message Mapping SystemSM (TMMS) reflect a doctor’s perception of the credibility of information in the medical literature?

Yes. Doctors ranked the articles similarly to the TMMS; they identified a statistically significant difference between two test articles based on their ranking of 1) how the article would influence their approach to therapy and 2) how the article would influence their clinical practice.

2. How does the TMMS scoring of messages reflect a doctor’s own approach to assessing information in medical articles?

Among the seven factors rated by the participants, the top four were congruent with the four factors used by the TMMS to rate messages:

- Quality of Information Presented (Astrolytix™ Source score)
- How Well Key Concepts are Supported by Data (Message score)
- Quality of the Journal (JIF®)
- Format of Presentation (TMMS ranking of format)

3. How do I know that the TMMS identifies the same messages as a physician?

The study found that the top messages identified by the readers were 100% consistent with the top three messages identified independently by the Astrolabe analysts using the TMMS message identification algorithm.

4. Will a strong message change behavior?

Yes. The article that was rated with the higher Astrolytix™ Source Score was also the article with the highest scores regarding impact on approach to therapy and influence on clinical practice. Therefore, a message from a strong article will have a greater impact that one from a weak article and supported poorly by the data.

5. Do clinicians use published literature to learn about therapies?

Yes. In this sample of 299 doctors, most allocated up to 4 hours per week to read scientific journals.
Physician Appraisal of the Published Literature: Assessment of Clinical Relevance and Identification of Key Messages


Background: This study was designed and conducted by the University of Alabama at Birmingham (UAB), School of Medicine, along with Outcomes, Inc. (Birmingham, AL) on behalf of Astrolabe Analytica, Inc.

Purpose: To determine 1) how physicians use their time to read medical literature, 2) the factors that influence their perceptions of the literature, 3) how they rate the quality and influence of medical literature, 4) if they can consistently identify key concept messages in the literature, and 5) whether there is a correlation between their assessment of article strength/value and message identification with the results obtained from similar analyses using the Thomson Message Mapping System™ (TMMS), at the time of this study known as Astrolabe Message Mapping System™ (AMMS).

Methods: Two articles previously evaluated and included in the TMMS were selected for this study. The articles were matched for therapeutic area, indication, approximate publication year, length, etc., but differed widely in their TMMS rating score (Article 1: JAMA, 96/100; Article 2: Int J Clin Pract, 63/100). The UAB constructed a web-based survey tool for this program. Physicians who accessed the UAB CME program site participated in this CME-accredited study (1 CEU) during the period of January 16, 2004 through April 30, 2004. Participants answered questions characterizing their demographics, reading habits, and rated seven factors that may influence their interpretation of the medical literature (1=least important to 5=most important). The physicians were randomly assigned to read one of the two articles (JAMA n=73; Int J Clin Pract n=92), provided as an Acrobat PDF, as part of the CME program. A third group of physicians (n=134) did not read any articles and was used as a control for a case study assessment of the influence of the test articles on treatment outcomes (analysis underway). Those assigned an article ranked (scale: 1=no impact to 10=definitely impacts) its influence on their approach to and understanding of the prevention and management of osteoporosis. In addition, they rated the article according to the READER literature rating system for clinicians. Six messages for each article previously identified by the TMMS (three of which were scored as the key concepts of the article, and three which were considered to be related to the study) were provided to UAB. Readers in the JAMA group were asked to identify the three key concepts for the article from the list provided. The study was powered to detect a difference between groups at the p <0.05 level. Statistical analyses were conducted by the UAB.
Results:

Demographics: Participants (total n=299) were all physicians, primarily in private practice (65%); specialties included internal medicine (47%), family practice (38%), or general practice (15%). They had active practices (mean visits, 92 per week) with a mean of 27% of their patients who are postmenopausal women. Practices spanned urban, suburban, and rural locations. Most (53%) had been in practice for >20 years.

Reading Habits: Most participants (65%) reported spending 4 hours or less per week reading medical journals or other scientific publications. For this study, 58% of respondents spent more than 10 minutes reviewing their respective article. Physicians described the order in which they typically read a medical article. The most common reported order in which they read the components of an article was:

Title
Abstract
Results or Background
Discussion
Methods

Factors Influencing Interpretation of Literature: These factors were ranked in the following order of importance by the readers (n=290).

<table>
<thead>
<tr>
<th>Influence</th>
<th>Mean ± SD</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Quality of Information Presented</td>
<td>4.6 ± 0.68</td>
<td>1</td>
</tr>
<tr>
<td>B. How Well Key Concepts are Supported by Data</td>
<td>4.3 ± 0.77</td>
<td>2</td>
</tr>
<tr>
<td>C. Quality of the Journal</td>
<td>4.2 ± 0.82</td>
<td>3</td>
</tr>
<tr>
<td>D. Format of Presentation</td>
<td>3.8 ± 0.91</td>
<td>4</td>
</tr>
<tr>
<td>E. Reputation of Sponsor</td>
<td>3.6 ± 1.02</td>
<td>5</td>
</tr>
<tr>
<td>F. Reputation of Investigators</td>
<td>3.6 ± 1.02</td>
<td>6</td>
</tr>
<tr>
<td>G. Commercial Sponsorhip</td>
<td>2.7 ± 1.01</td>
<td>7</td>
</tr>
</tbody>
</table>

All comparisons significantly different (p = 0.01) except for E vs. F (p=0.4058).
Influence of the Article on the Reader’s Approach to and Understanding of the Prevention and Management of Osteoporosis:

Readers scored the *JAMA* article higher (mean: 7.2) compared with the *Int J Clin Pract* article (mean: 6.3). Consolidating response ranges indicated that the *JAMA* article was significantly more likely to have a definite impact on the reader’s therapeutic approach.

| Answer Choices | Score Range | JAMA  
|                | N=41 | Int J Clin Pract  
<table>
<thead>
<tr>
<th></th>
<th>Count (%)</th>
<th>Count (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Impact</td>
<td>1-3</td>
<td>1 (2)</td>
<td>4 (9)</td>
</tr>
<tr>
<td>May Impact</td>
<td>4-7</td>
<td>18 (44)</td>
<td>27 (61)</td>
</tr>
<tr>
<td>Definitely Impacts</td>
<td>8-10</td>
<td>22 (54)</td>
<td>13 (30)</td>
</tr>
<tr>
<td>Group Mean</td>
<td></td>
<td>7.2</td>
<td>6.3</td>
</tr>
</tbody>
</table>

* Scored from 0-100 using the Thomson Message Mapping System algorithm; key factors scored numerically include study design, appropriateness of endpoints, data presentation, use of statistics, discussion, generalizability of results, and limitations of study.

Assessment of Articles Using READER Method:

Readers scored the *JAMA* article significantly higher (mean: 3.0) compared with the *Int J Clin Pract* article (mean: 2.5). Consolidating response ranges indicated that the *Int J Clin Pract* article was significantly more likely to NOT influence practice, while *JAMA* article was more likely to alter the reader’s practice.

| Answer Choices                        | Score Range | JAMA  
|---------------------------------------|-------------|--------------|-----------|
|                                      | N=41        | Int J Clin Pract  
|                                      | Count (%)   | Count (%) | P value |
| Would certainly not influence practice| 1           | 0            | 5 (12)    | 0.0555   |
| Could possibly/would influence practice| 2-3        | 27 (66)     | 28 (65)    | 0.1809   |
| Would probably/definitely alter practice | 4-5       | 14 (34)     | 10 (23)    | 0.1053   |
| Group Mean                            |             | 3.0          | 2.5       | 0.0245   |

* Article Score*  

96 | 63
Identification of Key Message Concepts: Readers of the *JAMA* article selected their choices from the following list of messages. Highlighted messages are those that were identified by the TMMS as the most well-supported messages. Complete congruence was observed between the physicians’ top-rated messages and the key messages previously identified using the TMMS algorithm.

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Count</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alendronate plus HRT effectively decrease bone loss in elderly postmenopausal women</td>
<td>29</td>
<td>25.7%</td>
</tr>
<tr>
<td>Alendronate plus HRT is better than either drug alone for increasing BMD</td>
<td>27</td>
<td>23.9%</td>
</tr>
<tr>
<td>Increases in BMD are correlated with decreases in fracture rate</td>
<td>18</td>
<td>15.9%</td>
</tr>
<tr>
<td>Alendronate should be used as 1st line management of osteoporosis of elderly postmenopausal women</td>
<td>16</td>
<td>14.2%</td>
</tr>
<tr>
<td>Alendronate plus HRT is a cost-effective therapy for osteoporosis</td>
<td>12</td>
<td>10.6%</td>
</tr>
<tr>
<td>GI side effects of alendronate are often treatment-limiting</td>
<td>10</td>
<td>8.9%</td>
</tr>
</tbody>
</table>

Conclusions:

- Most physicians allocated 4 hours or less/week for reading medical literature.
- They typically read the elements of articles in a non-sequential manner.
- Several factors influence the interpretation of an article.
- Physicians could discriminate between a well-written article with good science and a weaker article.
- The stronger article (*JAMA*) had a statistically significantly greater impact on the reader’s approach to the management of the target disease.
- The stronger article (*JAMA*) had a statistically significantly greater influence on clinical practice based on the READER Education component score.
- Physicians consistently identified the key, well-supported messages.
- The article identified as having the greatest impact on prescribing habits by the readers (*JAMA*) also had the higher Astrolytix™ Article Score, as determined by the TMMS.
- The most common messages identified by physicians were identical to the strongest key messages identified using the TMMS.
- The physician rating of the literature and message identification was strongly correlated with the results obtained by the TMMS. This indicates that literature rating and message identification algorithms used by the TMMS are a valid proxy for the assessment practices and conclusions drawn from the medical literature by practicing physicians.
References:


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