Systematic reviews: Evidence-based searching to improve recall and precision

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SYSTEMATIC REVIEWS:
Evidence-Based Searching to Improve Recall and Precision

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The authors have **no** financial disclosures that would be a potential conflict of interest with this presentation.
I’m going to have to science the s#*@ out of this.

**Recall:**
The number of relevant documents a search retrieves out of all the relevant documents available in a database.

**Precision:**
Proportion of documents retrieved by a given search query that is relevant to the search question.

**Step 1**
Create smaller database for hand review

All articles from the top five oncology journals 2012-2014*
=5,521 Total

**Step 2**
Identify relevant documents (Rd) about breast cancer
=647 Total

**Step 3**
Test each search strategy

**Simplified Search Examples**

**MeSH:**
exp Breast Neoplasms/

**Proximity:**
breast* adj8 cancer*

**Phrase:**
“breast cancer”

**AND:**
breast* AND cancer*

**Step 4**
Calculate effectiveness

**Search Results for MeSH**

\[
\begin{align*}
Rr &= 562 \\
Rd &= 647 \\
Rs &= 740 \\
5,521 \text{ Documents}
\end{align*}
\]

Recall = \[
\frac{Rr}{Rd}
\]

Precision = \[
\frac{Rr}{Rs}
\]

Relevant missed: 85
Non-relevant retrieved: 178

*As ranked by InCites Journal Citation Reports*
### RESULTS

**Average number of missed relevant citations.**

- Proximity: 30
- Phrase: 5

### DISCUSSION

**Small Pool Size**

- Documents in Journal Set 2012-2014: 5,521
- Documents in Medline 2012-2014: 3,128,246

### Search Method Effectiveness

<table>
<thead>
<tr>
<th>Method</th>
<th>Precision</th>
<th>Recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>MeSH Alone</td>
<td>76</td>
<td>87</td>
</tr>
<tr>
<td>Proximity Alone</td>
<td>79</td>
<td>99</td>
</tr>
<tr>
<td>Phrase Alone</td>
<td>78</td>
<td>95</td>
</tr>
<tr>
<td>AND alone</td>
<td>77</td>
<td>99</td>
</tr>
<tr>
<td>Proximity w/ MeSH</td>
<td>98</td>
<td>99</td>
</tr>
<tr>
<td>Phrase w/MeSH</td>
<td>99</td>
<td>97</td>
</tr>
<tr>
<td>AND w/MeSH</td>
<td>97</td>
<td>97</td>
</tr>
</tbody>
</table>

**I found it... using proximity with MeSH!**

NASA/Pat Rawlings, SAIC