The Boolean AND operator

**Venn Diagram**  
(The gray shading represents the outcome of the Boolean operation)

- Hip
- Fracture
- Eldery

**Description**

When terms are combined with the **AND** operator, retrieved records must contain all terms.

Multiple AND operators may be used to combine more than two terms. Only records containing all the terms will be retrieved.

The Boolean OR operator

**Venn Diagram**  
(The gray shading represents the outcome of the Boolean operation)

- Renal
- Kidney
- Child
- Girl
- Boy

**Description**

When terms are combined with the **OR** operator, retrieved records may contain one or more of the search terms.

The terms may occur anywhere in the record.

Multiple OR operators may be used to combine more than two terms. Records must contain at least one of the terms to be retrieved.

**Notes:**

1. Rather than combining variations of the same term with the OR operator, consider using truncation or wildcard characters instead:

   - mouthwash* in place of
   - mouthwash OR mouthwashes OR mouthwashing
The Boolean NOT operator

Venn Diagram
(The gray shading represents the outcome of the Boolean operation)

NOT finds records containing one term but not another.

Notes:
1. The NOT operator excludes some records which contain the desired search term. Don't use NOT unless you are confident the excluded term always results in the retrieval of irrelevant records.

For example: If the topic being searched may yield articles about infants and children, but the searcher isn't interested in the literature on infants, he should resist the temptation to search children NOT infants. Some papers may focus on the subject in children but note that the subject also occurs in infants. Papers of this sort could be eliminated by this use of the NOT operator.

The following record from the Medline database illustrates this problem. The paper is about children, but the author uses the word infants when mentioning other studies:

TI: Crossing the midline: a study of four-year-old children.
AU: Screws-DP; Eason-BL; Surburg-PR
AB: Midline crossing refers to behavior that results in reaching, stepping, or looking, across the body's midline. Several studies have indicated that infants, young children, and individuals with disability make more errors on midline-crossing tasks than on similar tasks placed at the ipsilateral side. Until recently, assessment of midline crossing has used a spatial protocol and has been criticized for not having a temporal component. The purpose of this study was to assess midline crossing by 9 4-yr.-old children within an information processing context. Analysis indicated that contralateral tasks required more processing time than similar tasks placed ipsilaterally.

2. A common use of NOT is to remove duplication between sets. The purpose in this case is to avoid printing or viewing duplicate records:

<table>
<thead>
<tr>
<th>Set</th>
<th>Records</th>
<th>Search Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>16</td>
<td>ochratoxin AND coffee</td>
</tr>
</tbody>
</table>
Mixed Boolean operations

Mixing operators is allowed. Use parentheses to specify the proper combination. The order in which operations are processed varies between systems. For example, one system may process search statements from left to right while another system may process ANDs before ORs.

Without the parentheses the AND operation is done first

This strategy will retrieve records containing either the pair of words renal & failure or any record with the word kidney.