Deciding Between Pre-Coordinating and Post-Coordinating Data

Overview

The choice between how to model grouped data often boils down to choosing between a pre-coordinated and post-coordinated approach. Pre-coordinated data entails defining concepts such that they are comprised of multiple terms with a very specific definition (think: Severe Left Knee Pain). Post-coordinated data involves creating granular individual concepts that are then grouped together to create responses to questions, with each concept otherwise not making sense on its own (think: Severe + Left + Knee + Pain).

In theory, post-coordinating data is the better (more flexible/powerful) option. However, in a real world setting, post-coordinated is much harder to do for not just data entry, but also data re-use in reporting, decision support, research, etc. It is critical to understand how the data is going to be used and, based on that, deciding whether it makes more sense to pre or post coordinate data.

Some Examples:

<table>
<thead>
<tr>
<th>Pre-Coordination</th>
<th>Post-Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Complicated Measles</td>
<td>Severe + Complicated + Measles</td>
</tr>
<tr>
<td>Left Upper Lobe Scarring</td>
<td>Left + Upper + Lobe of Lung + Scarring</td>
</tr>
<tr>
<td>Recurrent intravascular papillary endothelial hyperplasia of the right middle finger</td>
<td>intravascular papillary endothelial hyperplasia + middle finger structure + right</td>
</tr>
</tbody>
</table>

Red Flags:

- When pre-coordinating leads to an explosion of concepts ("combinatorial explosion")
- When post-coordinating leads to creating concepts that are more granular than practically needed
- Be careful with rule out, unconfirmed, suspected items; something that puts a diagnosis into question or negates it should be handled carefully

Additional helpful information:

The goal of Obs Groups is to logically group related observations. See more information on Obs Groups at this wiki page.

The goal of Value Groups is to answer a single question with multiple answers (post-coordination). See more information on Value Groups at this wiki page.

Best Practices Employed by AMPATH

AMPATH realizes that there’s no “right” or “wrong” way to deciding when to lump concepts together (pre-coordinate) vs. slit them apart (post-coordinate). Our implementation has found that the best decider is pragmatism. In other words, how the concepts are going to be used both clinically and for reporting. For example, the number of times that a group will need to study all gram stains independent of specimen type (post-coordination) is small compared to the benefits of reliably identifying a urine gram stain as something clinically distinct from an effusion gram stain (pre-coordination). As a general rule, make concepts no more granular than needed.

Take-home message: It is critical for the concept dictionary manager(s) to understand how the clinicians and/or researchers will use the data in order to understand how the concepts should be modeled.