Proposed Requirements

1. The overall goal is to be able to model panels, which are collections of independent discreet observations where each observation in the collection has “specific context” (qualifiers, modifiers, protocol, etc.), and where there is also shared or “general context” that is shared by the whole collection (subject of the observation (patient), information source, observation time, instrument, etc.). Also, for something to be a panel it has to be orderable, otherwise it is just an ad hoc collection of results.  
     
   Panels are different than sections. Panels have specified and fixed content, which is what provides their value when used in ordering. Sections can contain anything that is appropriate to the section heading, and the contents change from instance to instance.  
     
   The idea of “independence” of the observations is important. It means that the meaning of the observation is not changed by what panel contains it. As an example of things that are not panels: a “drug name” element could be contained in a drug order model, or in a drug administration model. The meaning of “drug name” in each of these compositions has a different meaning. In one model it means the drug is being ordered, and in the other model it means the drug is being administered to the patient. The clinical meaning of the element changes based on the model that contains it. In these examples, the clinical meaning of the “drug element” changes based on the container. In these cases “drug name” is not independent, and the compositions “drug order” and “drug administration” are not panels.
2. We want to be able to model panels that contain other panels, for example: CBC with Diff panel, which contains a CBC panel and a Differential panel.
3. We need to allow for data elements that are data about the panel, and not just shared context for the contained items. That is, some panels have indicators of whether the whole panel is complete or final. This is data that describes the panel as a whole and is not specific or derivable from a single element in the panel.
4. A given observation can be modeled as part of many different panels. For example, a creatinine level could be part of a renal panel, an electrolytes panel, a creatinine clearance panel, etc. Or a serum sodium could be part of an electrolytes panel, a chem 7 panel, a metabolic panel, a renal panel, etc.
5. Recognize indivisible units of information: Especially for non-clinical users of the models, it is helpful to recognize the indivisible pieces of information that you can sensibly query for and use in clinical applications. That is, recognize elements that can sensibly be the subject of a query that returns a useful statement about the patient.
   1. Proposal: Indivisible elements should be recognizable by always being assigned the same type, i.e. always identified as an “entry”. This is the “thing” that can be queried along with its associated context. Or, the indivisible things could contain a tag or annotation that identifies it as an “entry”.
   2. Panels are collections of indivisible clinical statements.
6. Consistent query paths: Ensure query paths to these indivisible items can be consistent. This is really the same idea that query paths always start with “Entry”. The goal is that I can use the same query statement to find serum sodiums regardless of the fact that sodiums can be part of many different panels. Also, I should not need to change my query if sodium is added to a new panel, or if it exists as an item in a panel in another panel.
7. Simple navigation: It should be as simple as possible for a query to navigate from a panel to the test results.
   1. Panels could be modeled as collections of contained observations, or as collections of references (pointers) to the contained observations. If items are modeled as collections of pointers then the query language must have a mechanism for asking for pointers to de-reference the pointer(s) so that the actual observation is returned to the user.
8. It would be best if the strategy (pattern) for representing lab panels was the same as the strategy (pattern) for representing patient observations. All panels should be represented using a common pattern.

Principles

1. The reference model should be able to support new use cases.
   1. If there is no operational criterion for this, we might remove it from the list.
2. The reference model should have no semantics that are specific just to healthcare. (e.g. Observation). The motivation for this principle is that for the broad range of use cases that we are trying to serve, there are NO healthcare related attributes that are common to every model. Models that are meant for a restricted set of use cases, such as storage of data in an HER, DO contain elements that must be same in each observation model.
   1. Proposal: “Reference model elements represent generic knowledge structures, and should not be specific to any domain. Container types (‘cluster,’ ‘section’) and concepts corresponding to parts of speech (‘thing,’ ‘action,’ ‘modifier’) are permissible; domain-specific kinds of those terms are not (‘patient,’ ‘procedure’).” Healthcare semantics should be represented in “reference archetypes” that specialize the classes in the reference model. The reference archtypes contain health care semantics.