

Modelling Content Using More Than Proximal Primitives

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Background

There are a variety of approaches to defining concepts within SNOMED CT, and the classification product can vary depending on the approach used.

The SNOMED CT editorial guide explains a method of only selecting the closest proximal primitive concepts to be supertypes when authoring content and is currently the preferred modelling approach within SNOMED International.

The Australian extension has adopted an approach of stating super-types that are as close to the focus concept as possible, regardless of definition status, along with all the necessary defining attributes for the concept. There are demonstrable quality benefits to this approach.

Method

Each content request for SNOMED CT-AU is assessed independently by two authors. During the evaluation, each author proposes a concept definition. Ideally, all necessary attributes will be stated and the concept designated sufficiently defined. Additionally at least one stated parent concept will also be identified. This parent concept will be what the author expects the new concept to be immediately subsumed by after classification. The two main criteria for determining this are:

- The new concept is an obvious refinement;
e.g., An *Acute infection* is a specific type of *Infection*.
- Existing concepts that are expected to be siblings will share this supertype;
(*Sibling concepts* often differ by a single attribute).
e.g., *Acute infection* and *Chronic infection*.

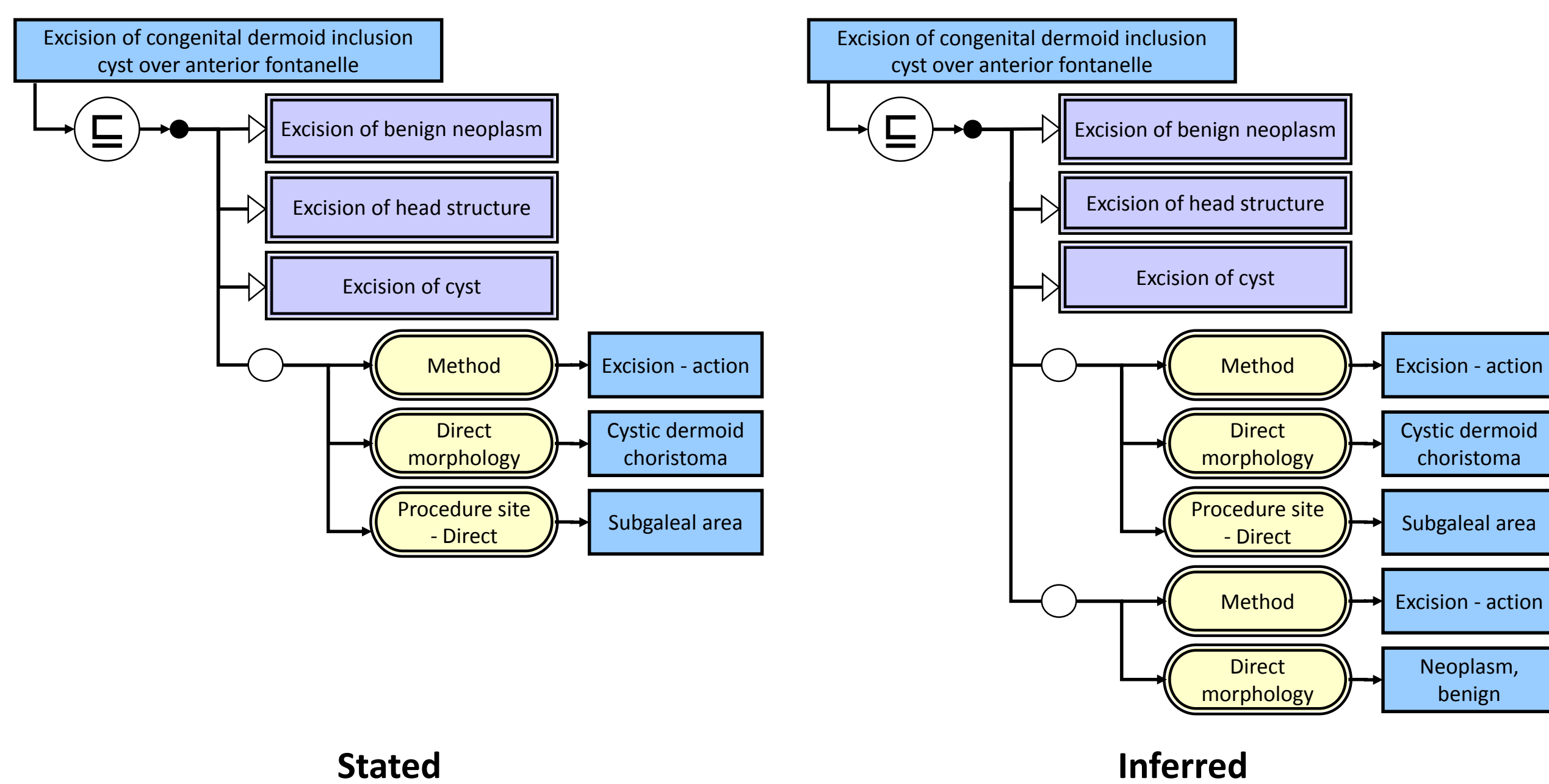
The two proposals are evaluated together by the authoring team, and a final concept definition is agreed. All proposed supertypes that are true are accepted. If the concept is unable to be sufficiently defined, stated sub-types might also need to be identified.

After authoring the new solution, all new inferred relationships are dual reviewed.

Results

The inferred attributes for new concepts are expected to be the same as those that were stated. Any new inferred relationships for existing concepts are expected to complement or improve the existing definition. Occasionally anomalous inferences are observed.

Excision of congenital dermoid inclusion cyst over anterior fontanelle



Upon classification an extra role group, describing an excision of benign neoplasm was inferred, courtesy of the stated parent |Excision of benign neoplasm|. Upon investigation it was discovered:

- The morphology 416529009 |Cystic dermoid choristoma| is not a subtype of 3898006| Neoplasm, benign|.
- Another concept 123151001 |Dermoid cyst| exists, is a subtype of | Neoplasm, benign|, but not currently used to define anything in the international release.

Resolving this duplicate morphology would eliminate the extra role group inferred above, as well as improve some existing concepts.

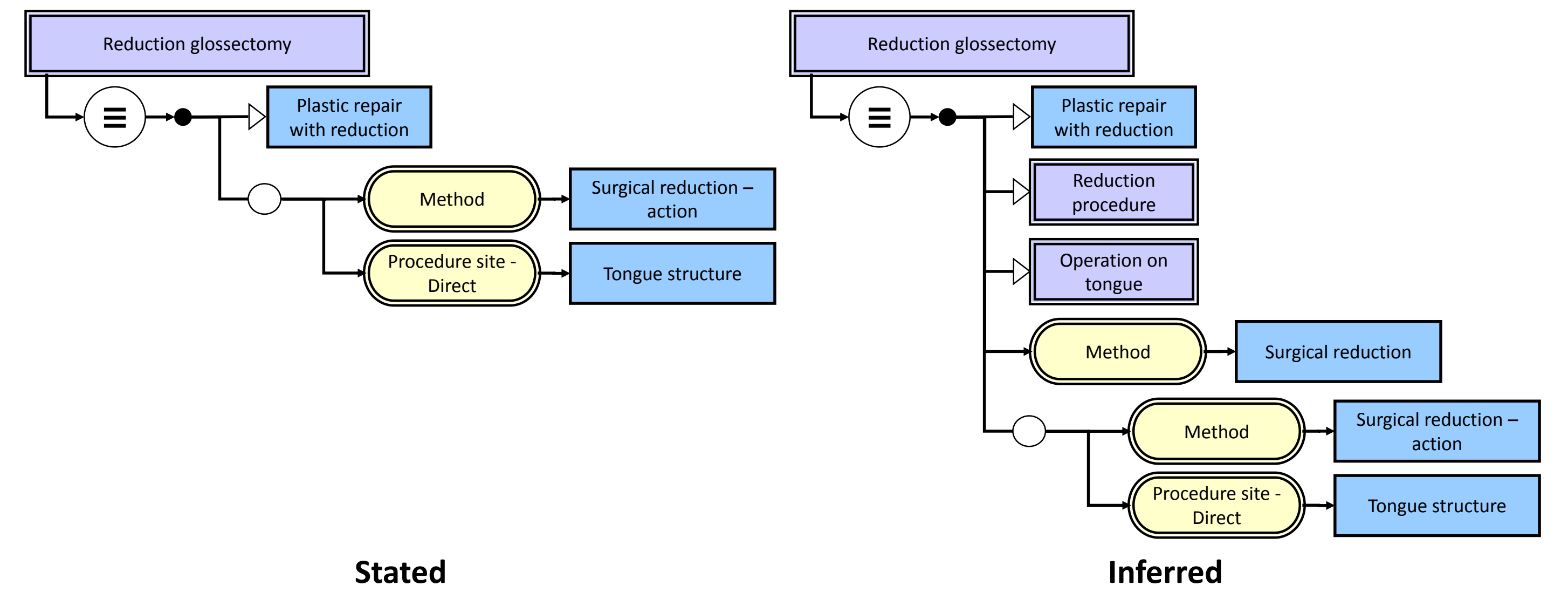
Repair of anal fistula by ligation of intersphincteric fistula tract

During the initial analysis for this request it was found that there are a number of modelling patterns used to define ligations:

- Method = Ligation -action;
- Using Device = ligation;
- A combination of the above.

Repair of anal fistula by ligation of intersphincteric fistula tract is obviously a type of *Repair of anal fistula*, however it may not classify as such depending on the modelling approach taken if only the proximal primitive parent 71388002 | Procedure | is stated.

Reduction glossectomy



When this concept was initially authored, an extra ungrouped method was inferred. Upon further investigation three similarly named concepts were discovered:

Concept ID	Preferred Term	Fully Specified Name
410814006	Surgical reduction - action	Surgical reduction - action
289928003	Surgical reduction	Reduction plasty (qualifier value)
439513008	Surgical size reduction - action	Surgical size reduction - action (qualifier value)

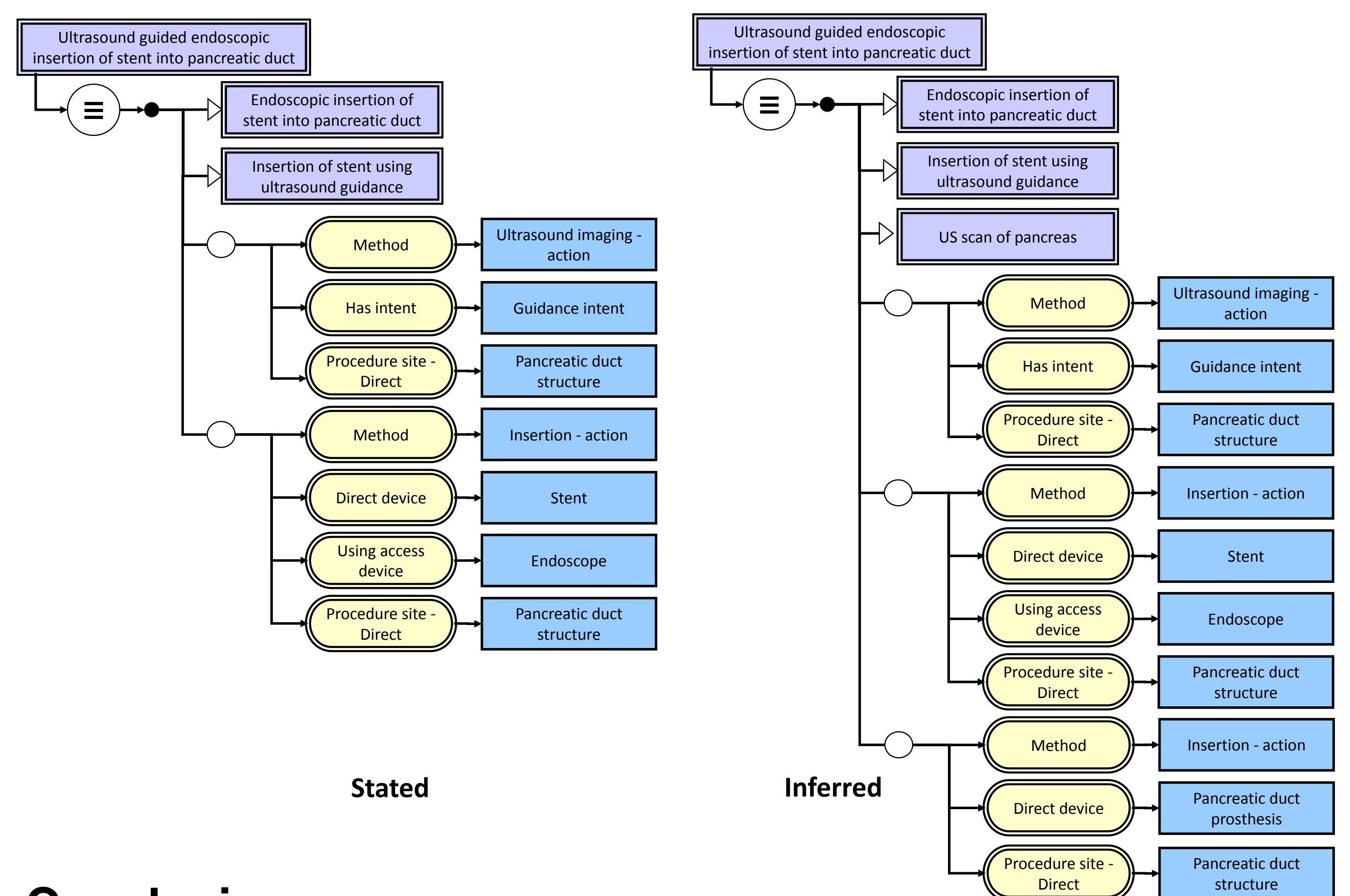
Although the preferred terms can be revised, there's still a question of ambiguity to the fully specified names and potential duplication. The new concept, *Reduction glossectomy*, was inadvertently modelled with a different *method - action* to the stated parent. Changing the method from 410814006 to 289928003 resolved the erroneous inference.

In this instance, the stated parent is primitive. However, it could be defined, and the same problem would exist.

Ultrasound guided endoscopic insertion of stent into pancreatic duct

An extra group for the *insertion of a Pancreatic duct prosthesis* is inferred. This role group is inherited from the parent 112886009 |Endoscopic insertion of stent into pancreatic duct|; which itself has a stated parent 235486003 |Insertion of pancreatic duct prosthesis|.

Stents are not classified as prosthetics within SNOMED CT (currently, it's arguable if they should). The resolution in this instance is to either remove the 235486003 |Insertion of pancreatic duct prosthesis| ancestry or classify Stents as prosthetics within the terminology.



Conclusion

Stating only primitive supertypes places a high dependency on the consistency and quality of rest of the terminology. Any variations in modelling patterns may result in the terminology not classifying as expected. Primitive concepts are often minimally modelled and unlikely to introduce surprises to the classified definition. Stating more specific supertypes, regardless of definition status, provides an opportunity for modelling issues to be revealed in both the new concept and existing concepts:

- In hierarchies used as attribute ranges, particularly the primitive hierarchies like qualifier value, substance or organism;
- Use of relationship groups;
- Inconsistent modelling patterns.

It is possible for terminologists to identify such issues during analysis however the poly-hierarchical structure of SNOMED CT makes this a difficult prospect. Leveraging the classifier is a more efficient and reliable approach.

The approach described provides a mechanism for identifying issues in the terminology and the opportunity to proactively address these, contributing to a higher quality terminology product.