Definition of pair-wise TLINK annotation

Source of document:

* THYME Clinical Cross-document Coreference Annotation Guidelines: https://clear.colorado.edu/compsem/documents/THYME\_guidelines.pdf

for competition, only consider relations between an EVENT and a TIMEX3:

1. BEFORE: an EVENT happens before the TIMEX3
2. CONTAINS: an EVENT is completely contained within the temporal span of the TIMEX3 it’s related to. If annotation that X CONTAINS Y, it’s assumed that there’s also an OVERLAP relation between the two. Should only use CONTAINS when you’re sure that the nature of the overlap is one of the complete containment, eg:
   1. {March 2005} - Patient underwent [appendectomy]
      1. {March 2005} CONTAINS [appendectomy]
   2. [Levaquin] 750 mg p.o. q. day will [restart] {today}
      1. {today} CONTAINS [restart]
   3. [Comparison] is made with prior MRI head [examination] without and with gadolinium from {10-23- 03}.
      1. {10-23-03} CONTAINS [examination]
   4. An ENT performed the [myringotomy] during {Friday}’s [surgery]
      1. [surgery] CONTAINS [myringotomy] -> not considered in shared task
      2. {Friday} CONTAINS [surgery]
   5. NOTEs:
      1. There are many relations which seem like a sort of semantic containment (things like part/whole, cause/effect, disorder/symptoms). However, the CONTAINS relation should only be used when there exists strict temporal containment (the temporal span of the container fully encompasses those of the contained)
      2. we can still temporally link negated EVENTs to other TIMEX3s, via CONTAINS or other relations:
         1. Ms. Patton [recovered] from her surgery without any [complications]NEG -> not considered in shared task

[recovered] CONTAINS [complications]NEG

1. OVERLAP: a single temporal relation that encompasses all the different notions of two things happening at the same time, but is less specific than CONTAINS. This can refer to two simultaneous events, an EVENT that occurs during another, larger EVENT or time reference (but where containment is not entirely sure), or any other sense in which two events are occurring in the same timeframe. In short, OVERLAP is meant for situations where two events overlap in some way, but where you’re not sure (or don’t have enough information to tell) whether there is containment. [under only considering relations between an EVENT and a TIMEX3 setting as well], eg:
   1. The patient had some rectal [itching] and mild [pain] {today}, mostly {this morning}.
      1. {today} CONTAINS [itching]
      2. {today} CONTAINS [pain]
      3. {this morning} OVERLAP [itching]
      4. {this morning} OVERLAP [pain]
   2. We’ll keep her on rate-control [medications] 100 mg {twice daily}
      1. {twice daily} OVERLAP [medications
2. BEGINS-ON: the EVENT begins on the TIMEX3 it’s related to. This type of TLINK will only occur with EVENTs which have a non-trivial temporal span. Relations with punctual EVENTs will usually be marked with BEFORE instead. eg:
   1. She has had Abdominal [Cramping] since {January}
      1. Cramping] BEGINS-ON {January})
   2. He reports intermittent chest [pain] since his prior [MI]
      1. [pain] BEGINS-ON [MI]
3. ENDS-ON: the EVENT ends on the EVENT or TIMEX3 it’s related to. As with BEGINS-ON, this type of TLINK will only occur with EVENTs which have a non-trivial temporal span. Relations with punctual EVENTs will usually be marked with BEFORE instead. Note that ENDS-ON can be used in concert with BEGINS-ON to mark a duration. Eg:
   1. She was on [chemo] from {March} through {July}
      1. [chemo] BEGINS-ON {March}
      2. [chemo] ENDS-ON {July}

Some important ideas help them to annotate the data:

* A narrative container can be thought of as a temporal bucket into which an EVENT or series of EVENTs may fall. These narrative containers are often represented (or "anchored") by dates or other temporal expressions, but may also be anchored by a reference to an EVENT capable of containing another EVENT – a surgery might contain an incision, or a war may contain battles. By focusing on placing events in progressively larger temporal buckets, you eliminate the need for most relationships between individual events – if container A is BEFORE container B, we know that all events inside A are before the events in B, without needing to make those annotations manually. In the example above, if you crashed your car before Tuesday (therefore forcing you to do all of Tuesday’s errands by bike), you wouldn’t have to say that you crashed your car BEFORE getting milk, and BEFORE the trip to the store, and BEFORE running errands; we can infer all those temporal relations simply by knowing that you crashed your car BEFORE Tuesday, the narrative container in this case. As such, rather than marking every possible temporal relation (TLINK) between each EVENT, we instead try to link as many EVENTs as possible to a narrative container, and then link those containers so that the contained EVENTs can be linked by inference. Here’s a clinical example:

{December 28th}: The patient experienced a [stroke] at {approximately 9:30am}, during her [surgery].

* {December 28th} CONTAINS [surgery]
  + (i) [surgery] CONTAINS [stroke]
  + (ii) [surgery] CONTAINS {approximately 9:30am}
    - aa. {approximately 9:30 am} CONTAINS [stroke]
    - Note there is no need to say {December 28th} CONTAINS [stroke], because it is clearly contained within it by virtue of its container being contained within it.
* Choosing the anchors of narrative containers: When creating narrative containers as discussed above, you will need to choose either a TIMEX3 or an EVENT to be the "anchor" of the container, the temporal span which all of the other EVENTs fall within (or begin/end on). Choosing which temporal span to be the anchor of a given narrative container can be difficult, so here are a few ground rules to help make these decisions easier and more consistent:
  + The majority of TIMEX3 annotations will be narrative container anchors.
  + If you have a choice between using an EVENT or a TIMEX3 as the narrative container anchor, you should pick the TIMEX3.
  + If you use an EVENT as a narrative container anchor, try to TLINK it to a few other container anchors to avoid it being stranded. (Note this will not always be possible.)
  + If stuck between two possible containers, use the one with the larger temporal span.
* Ordering within narrative containers. .If a patient undergoes a preoperative [evaluation], and that [evaluation] CONTAINS a [CT] and an [x-ray], but the text doesn’t specify the order of the two tests, it’s fine to leave the two unlinked (and in fact you should leave them unlinked, rather than guessing).
* When to TLINK: TLINKs themselves are relatively straightforward, and in fact, the more difficult part of annotating TLINKs is to know when to stop. Without any constraint, one could see making TLINKs between every EVENT in the document, which leads to exponential growth of TLINKs and a tangle of relations which nobody, let alone a machine, would like to unpack. So, to constrain this process a bit, we have developed a few rules to govern TLINKing:
  + TLINK only when it captures more information than just marking DocTimeRel. Because the DocTimeRel attribute of EVENTs expresses the relation of the event to the time the document or section was written, you will never need to TLINK to the DOCTIME annotations. Marking an EVENT as “after” in the DocTimeRel field gives us the same information as making an BEFORE TLINK between the EVENT and DOCTIME, so you need not explicitly mark that. Similarly, if one EVENT has a DocTimeRel of OVERLAP and another has a DocTimeRel of AFTER, there’s no need to make a TLINK between those two EVENTs.
  + TLINK all EVENTs to their narrative container, if possible. As previously discussed, most EVENTs will fall into a narrative container of some kind. If a given EVENT is in a narrative container (like "August 22nd" or "during her recovery"), you should always TLINK that EVENT to the TIMEX3 or EVENT which represents that narrative container, using the appropriate link. Once again, though, this should only be done if the result will be more informative than just analyzing the DocTimeRels. See the following example sentence and the TLINKs required to annotate it. Eg:
    - {December 19th}: The patient underwent an [EKG] as well as emergency [surgery]. During the [surgery], the patient experienced another [MI], and repeated [tachycardia].
    - a. {December 19th} CONTAINS [EKG]
    - b. {December 19th} CONTAINS [surgery]
    - c. [surgery] CONTAINS [MI]
    - d. [surgery] CONTAINS [tachycardia]
  + Try to only link EVENTs and TIMEX3s within the same sentence. In a perfect world, nearly all TLINKs would occur across two EVENTs or TIMEX3s in the same sentence. That said, often you need to link to an EVENT or TIMEX3 in a previous sentence to put an EVENT in the proper narrative container. In these situations, you may do so, but you should double-check to ensure that there’s no other way of going about it, and remember that coreference annotation will be done to link pronouns and subsequent mentions, so linking an EVENT to a subsequent reference to the narrative container is acceptable as well. That said, because of the nature of the notes, TLINKs should never link items in different sections.
  + ACTUAL or HEDGED EVENTs should never be linked to HYPOTHETICAL or GENERIC EVENTs, and vice versa. This may seem quite specific, but HYPOTHETICAL and GENERIC EVENTs aren’t really on the same timeline as other EVENTs dealing with the patient’s actual care. Because of this, it can be quite tricky to link them to the overall timeline, and we need to take care to avoid having non-real EVENTs showing up on patient timelines. To avoid the complications and potential broken relations when non-real EVENTs are pruned from timelines, ACTUAL or HEDGED EVENTs should never be linked to HYPOTHETICAL or GENERIC EVENTs, and vice versa. In this way, "real" EVENTs are never linked to non-real ones. Eg
    - Adjuvant [chemotherapy] following her upcoming [surgery] would generally be recommended, but given her poor [health], this is not an option.
    - Here, because the [chemotherapy] is HYPOTHETICAL, it cannot be TLINKed to [surgery], even given the explicit mention.