AMR + RED – causal and temporal sequencing of events

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DTRA virtual site visit - eTASC

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C L E A R

Outline

- AMRs
- RED
- AMR + RED

Fighters described being targeted by mortars that exploded to unleash clouds of toxic chemicals.

```
(m2 / multi-sentence
    :snt1 (t3 / target-01
        :ARG1 (p2 / person
            :ARG0-of (f / fight-01))
        :ARG2 (m / mortar
            :ARG1-of (e / explode-01
                :ARG0-of (c / cause-01
                    :ARG1 (u / unleash-01
                        :ARG0 m
                        :ARG1 (c2 / cloud
                            :consist-of (c3 / chemical
                                :mod (t2 / toxin))))))))))
```

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Several are now being treated as recently as last week for severe burns and blisters.

```
:snt2 (t / treat-03
    :ARG1 (p / person
        :mod (s / several))
    :ARG2 (a2 / and
        :op1 (b / burn-01
            :ARG0
            :ARG1 p
            :extent (s2 / severe))
        :op2 (b2 / blister-01
            :ARG0
            :ARG1 p)))
```

Several are now being treated as recently as last week for severe burns and blisters.

Also can recognize "persons treated" as a subset of "fighters"

```
:snt2 (t / treat-03
      :ARG1 (p / person
            :mod (s / several))
      :ARG2 (a2 / and
            :op1 (b / burn-01
                  :ARG0 c3
                  :ARG1 p
                  :extent (s2 / severe))
            :op2 (b2 / blister-01
                  :ARG0 c3
                  :ARG1 p)))
```

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Richer Event Descriptions (RED) led by Tim O'Gorman, CU

- Event and entity annotation:
  - an ontology-free approach: annotate all events, entities and times, with features like polarity and modality

- Temporal, causal, subevent, coreference and bridging relations

- 95 discussion forum documents(54k tokens) with double annotation and adjudication

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Large Relation Inventory

- Temporal, aspectual , causal, subevent, identity, and reporting relations.

Before	before/cause, before/precondition
Overlap	continues, overlap/cause, overlap/precondition
contains	contains-subevent
begins-on	initiates, re-initiates
ends-on	terminates
simultaneous	identity
	set/subset, bridging, reporting

RED and CaTeRS are very similar

■ Temporal, aspectual , causal, subevent, identity, and reporting relations.

Before	**before/cause, before/precondition**
Overlap	**continues, overlap/cause, overlap/precondition**
contains	**contains-subevent**
begins-on	**initiates, re-initiates**
ends-on	**terminates**
simultaneous	**identity**
	set/subset, bridging, reporting

CaTeRS
CAUSE_BEFORE, ENABLE_BEFORE, PREVENT_BEFORE
CAUSE_OVERLAP, ENABLE_OVERLAP, PREVENT_OVERLAP…
DURING
CAUSE_TO_END
IDENTITY

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Event-Event Relations (based on RED)

- **has_precondition**
  - Dying has_precondition Alive
- **has_result**
  - Killing has_result Death
- **has_subevent**
  - Trial has_subevent Verdict
- **Temporal links**
  - Before
  - Contains

Fighters described being targeted by mortars that exploded to unleash clouds of toxic chemicals.

(m2 / multi-sentence
   :snt1 (t3 / target-01
      :ARG1 (p2 / person
         :ARG0-of (f / fight-01))
      :ARG2 (m / mortar
         :ARG1-of (e / explode-01
            :ARG0-of (c / cause-01
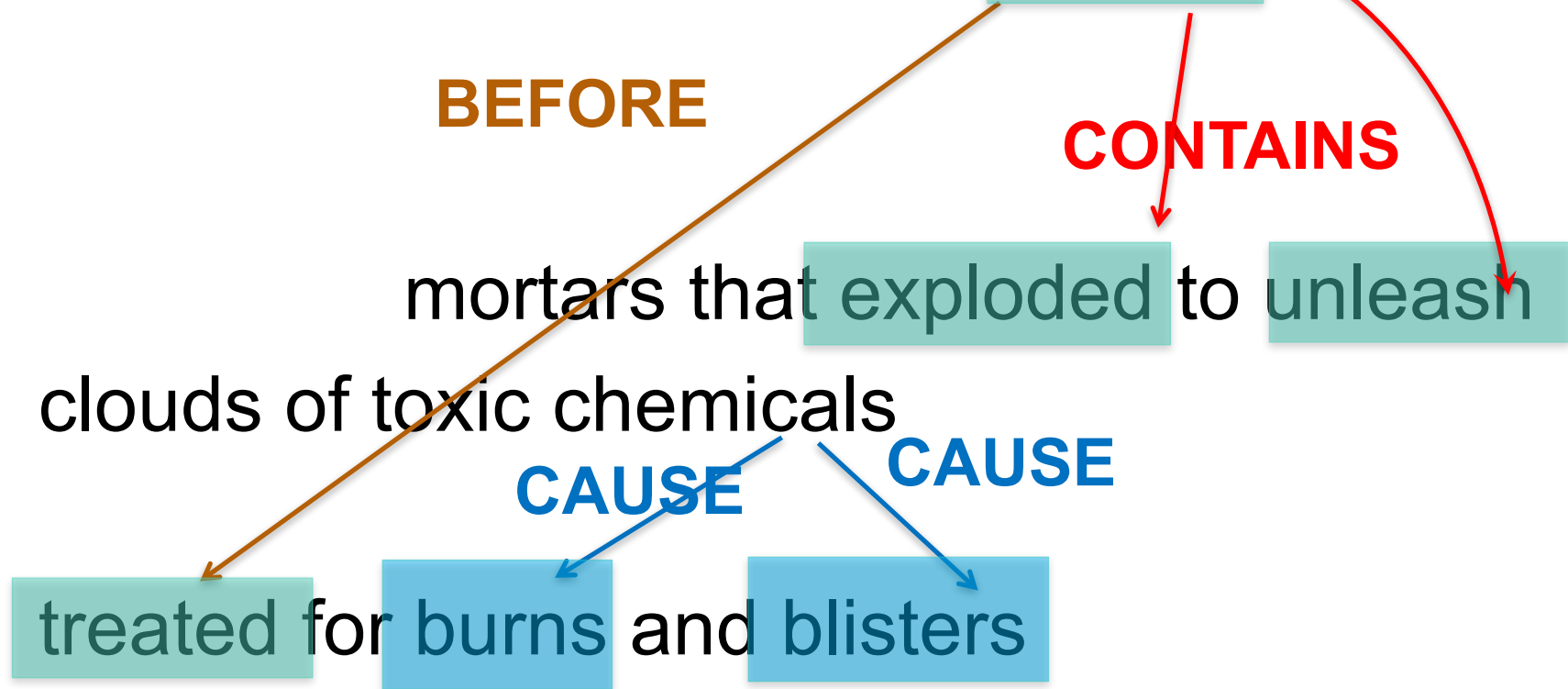   :ARG1 (u / unleash-01
                  :ARG0 m
                  :ARG1 (c2 / cloud
                     :consist-of (c3 / chemical
                       :mod (t2 / toxin))))))))

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RED relations

- Fighters described being targeted by

BEFORE

CONTAINS

mortars that exploded to unleash clouds of toxic chemicals

CAUSE

CAUSE

treated for burns and blisters

RED

:red-amr (a / and

    :op1 (i2 / include-91

        :ARG1 p

        :ARG2 p2)

    :op2 (e2 / event-container

            :before "document-time"

            :modality "actual"

        :event t3

        :contains-subevent e

        :contains-subevent u)))

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