

# The Journey of NegEx: A Simple Algorithm's Travels Around the World

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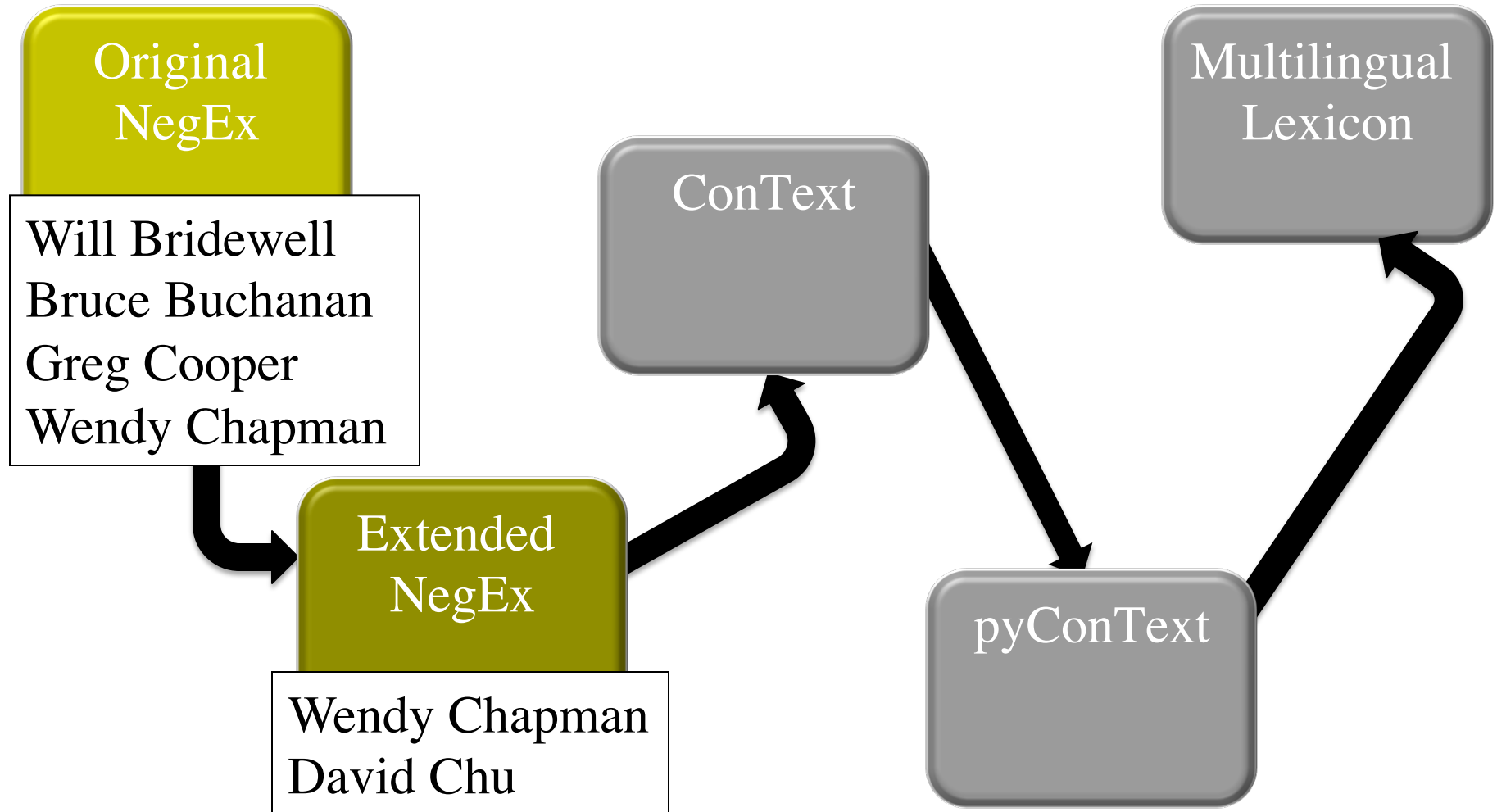
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# NegEx's Journey



|                     |         |
|---------------------|---------|
| Clinical condition: | Cough   |
| Negation:           | Negated |

|                     |            |
|---------------------|------------|
| Clinical condition: | Headache   |
| Negation:           | NotNegated |

Patient denies cough but complains of headache.

modifier

termination  
term

target

Scope: to end of sentence  
unless encounter termination term

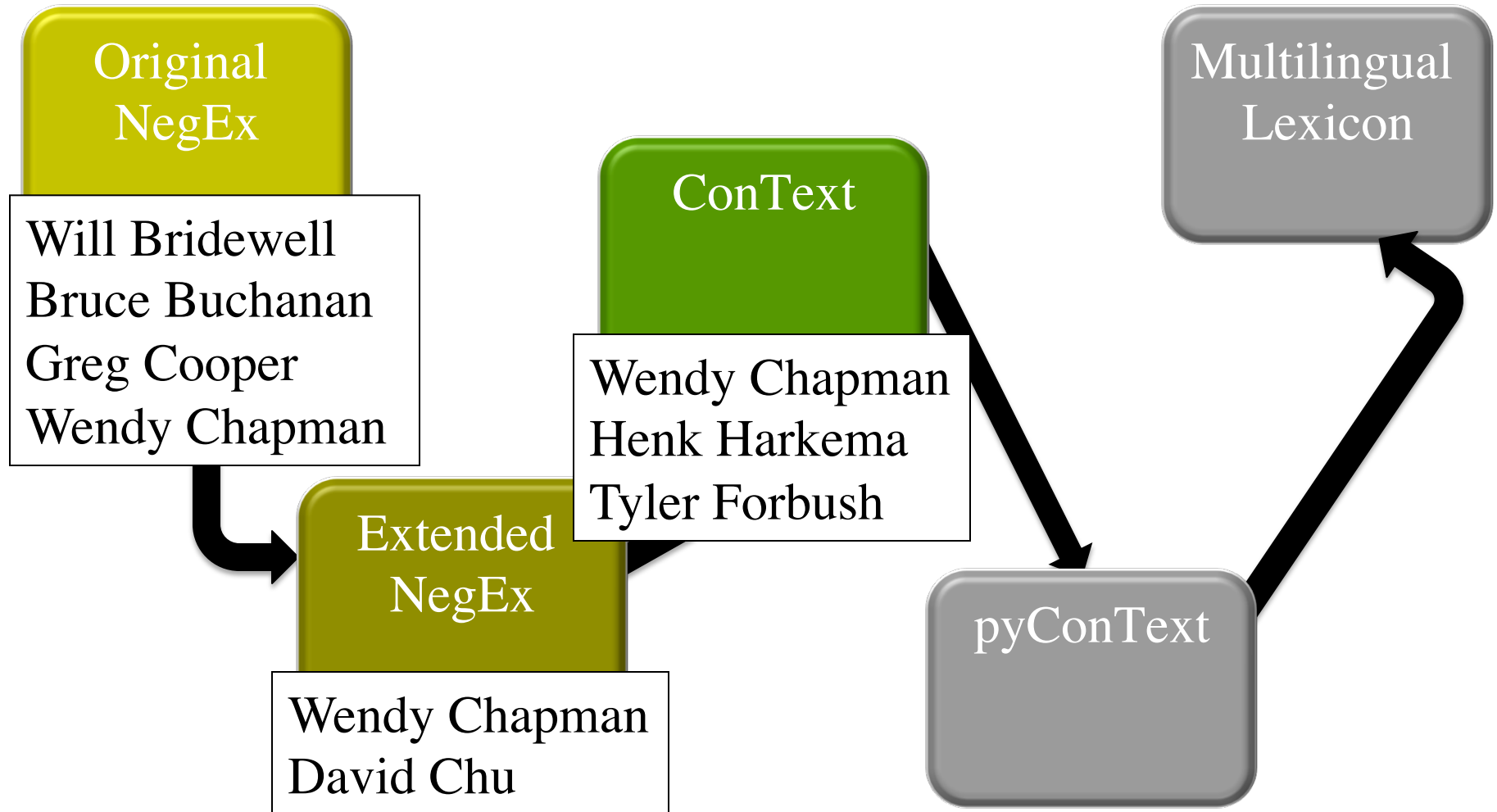
Patient denies cough but complains of headache.

modifier

termination  
term

target

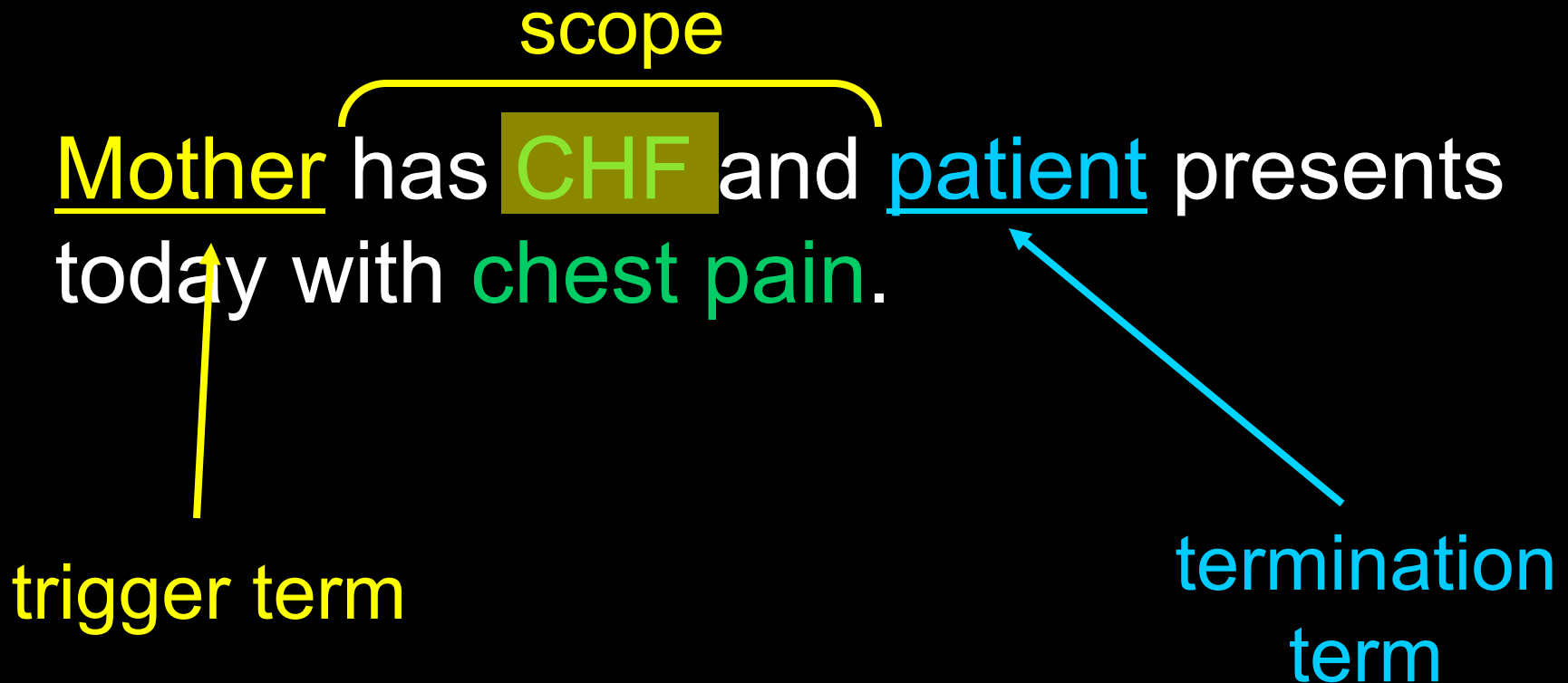
# NegEx's Journey



# ConText

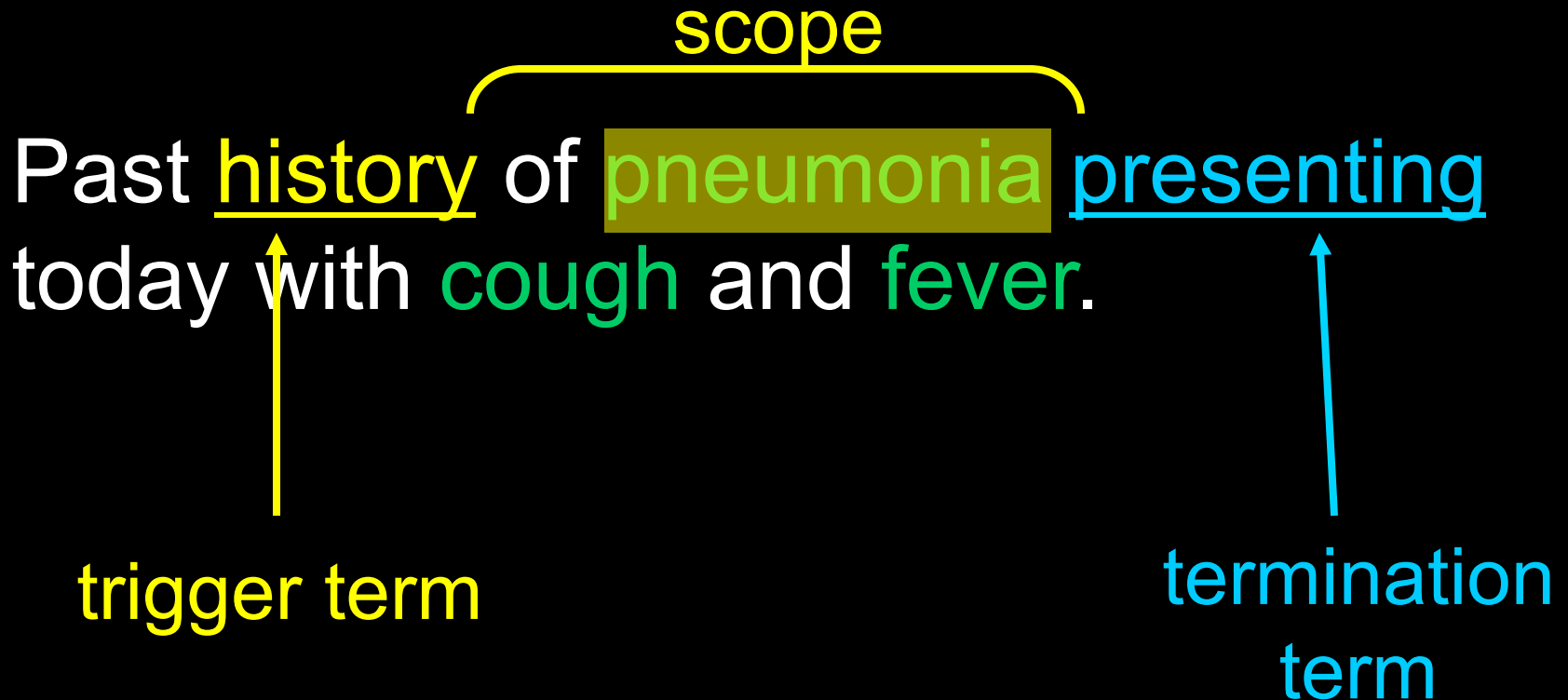
- Same algorithm should work for other modifiers
  - Experienter
  - Historical
  - Conditional
- Semantic groups of termination terms
  - Map termination groups to trigger groups

# ConText: Patient Experience



|                     |       |
|---------------------|-------|
| Clinical condition: | CHF   |
| Experiencer:        | Other |

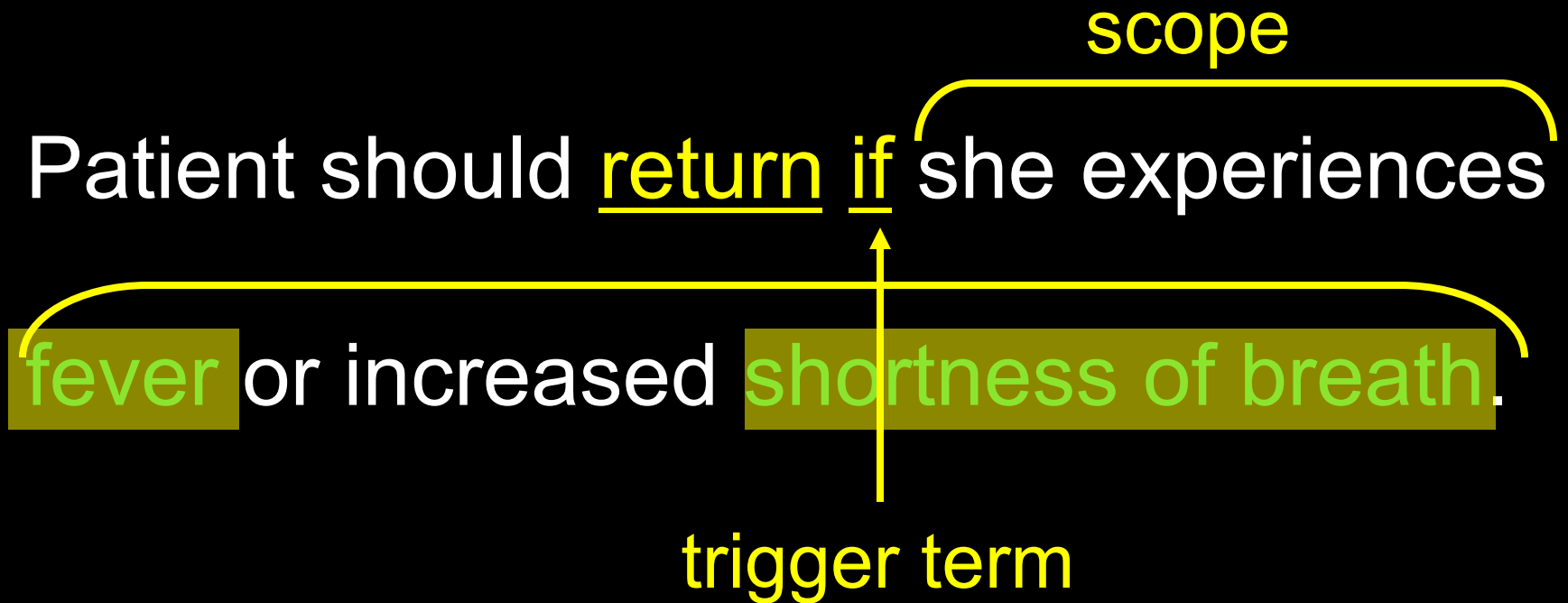
# ConText: Historical



|                     |            |
|---------------------|------------|
| Clinical condition: | Pneumonia  |
| Temporality:        | Historical |



# ConText: Conditional



Clinical condition: Fever  
Temporality: Hypothetical

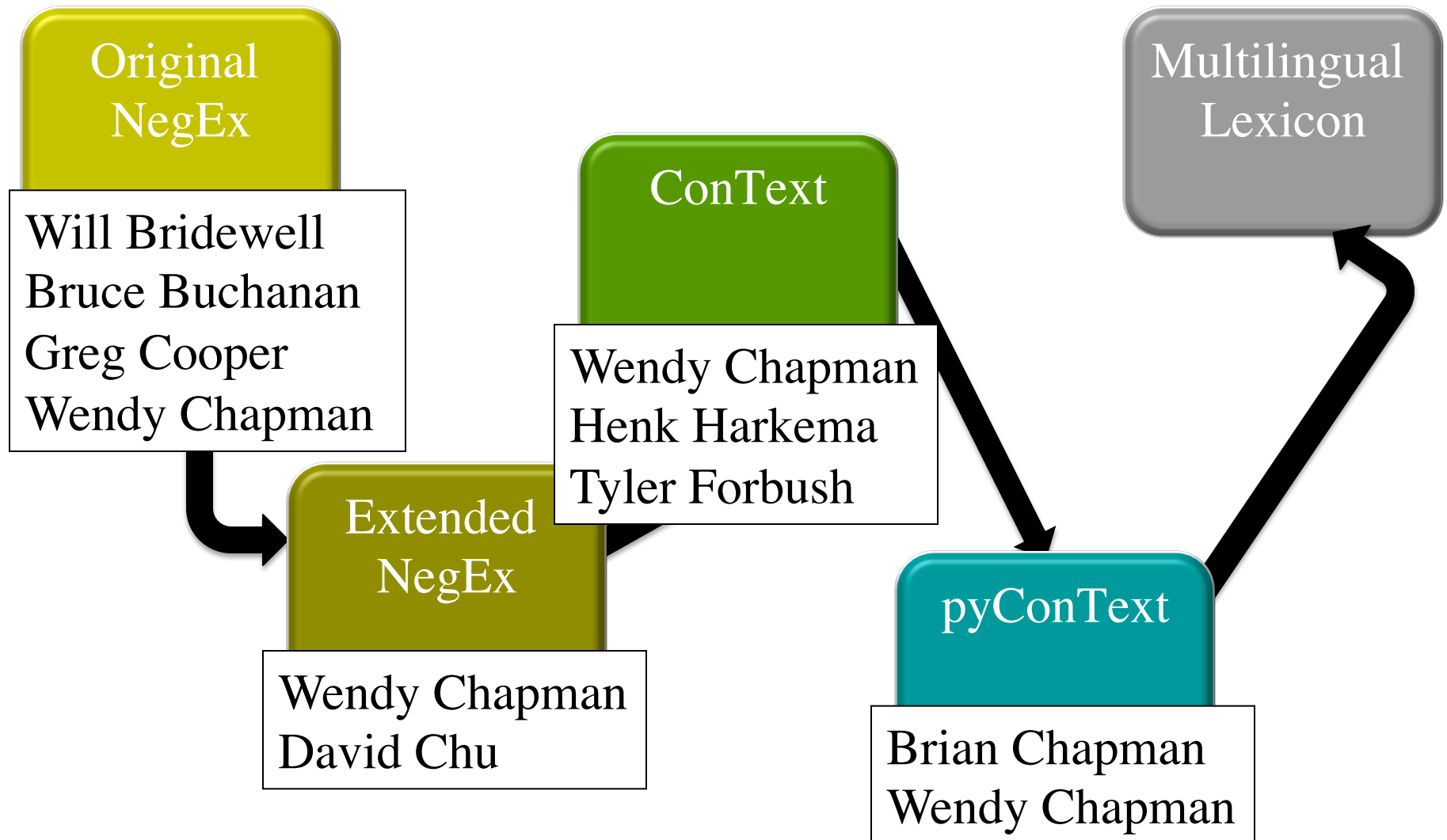
Clinical condition: Dyspnea  
Temporality: Hypothetical

# Termination Terms

| Type of Term | Examples                           |
|--------------|------------------------------------|
| Patient      | Patient, patient' s, who           |
| Presentation | Presents, complains, states, today |
| Because      | Since, because                     |
| Which        | Which                              |
| ED           | ED, emergency department           |
| But          | But, however, yet, though          |

NegEx

# NegEx's Journey



- User defines
  - Modifiers
  - Targets
  - Terminators
- Regular expressions for targets

- Suggestive of pe although evaluation of the right lower lobe vessels is somewhat limited

What contextual value should be applied to PE?

What contextual value should be applied to evaluation?

# Example of additional modifiers

## Limited (exam)

Suggestive of pe although evaluation of the right lower lobe vessels is somewhat **limited**

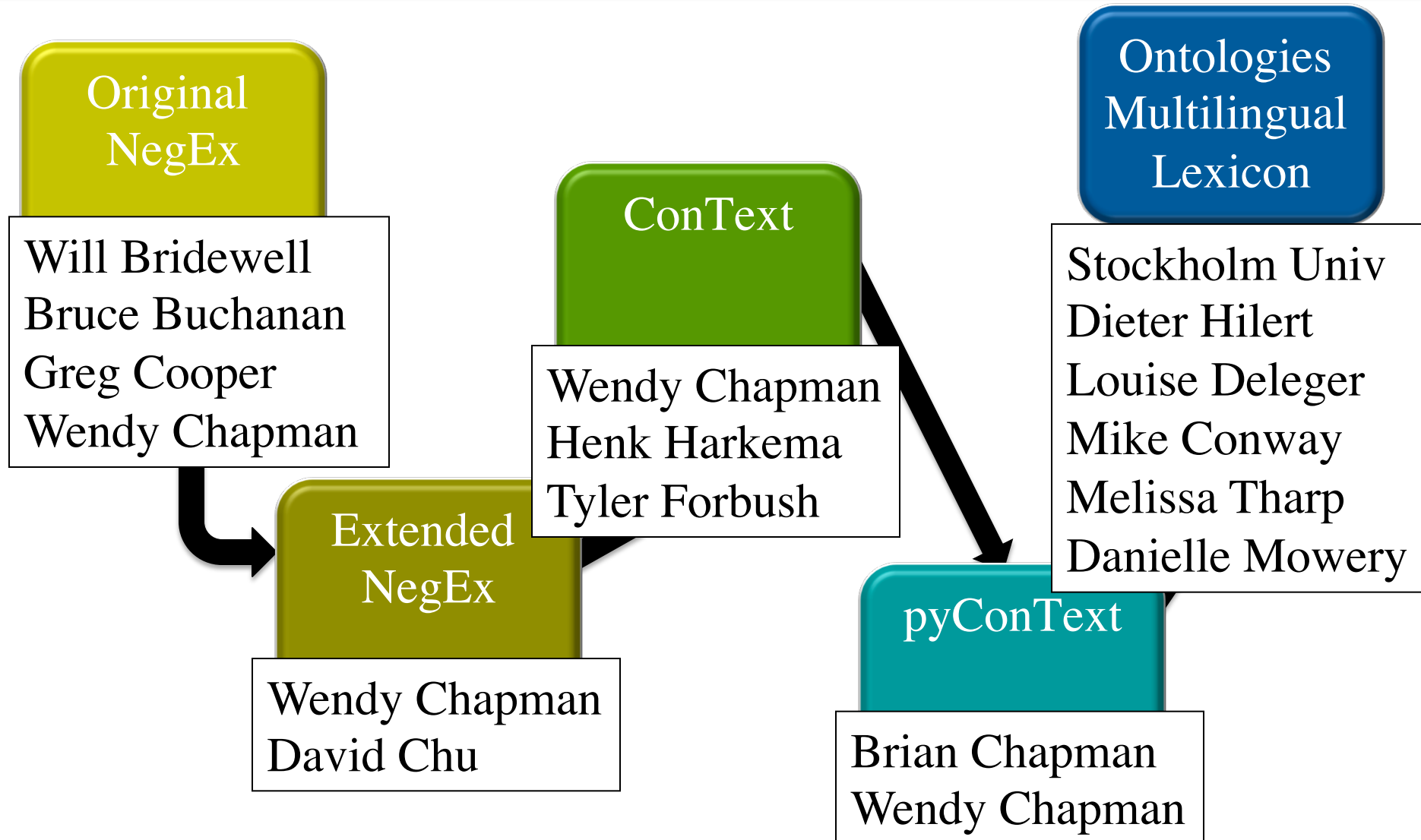
## Reason for exam

**Reason for exam:** pulmonary embolism

## Uncertainty

**Suggestive** of pe although evaluation of the right lower lobe vessels is somewhat limited

# NegEx's Journey



# Conclusion

- NegEx is imperfect
- NegEx is simple
  - Broad use
- NegEx relies on lexical cues
  - Can be machine learning features
- NegEx's modifier-target pattern useful for other modifiers as well
- Some other languages can use the pattern
  - Others may not be so amenable