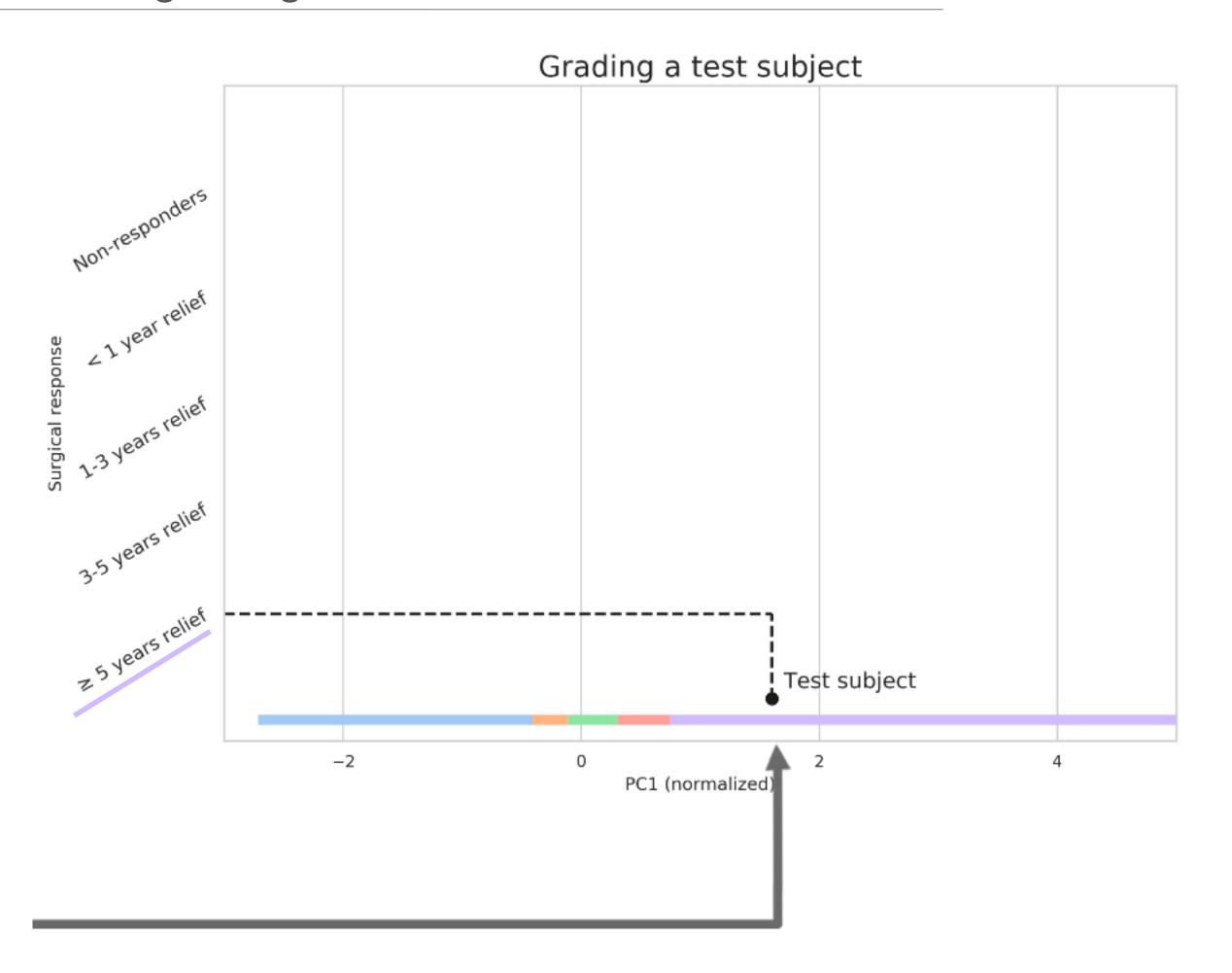
Results

Example of the grading

- Subject is graded based on the clinical expression of pain
- Total score determines the position of subject on a scale
- Scale sections correspond to different levels of surgical response
- Final grade is being confirmed with Supervised ML task and presurgical imaging data

| Feature (factors -1 and 1) | PC | | |
|------------------------------|--------|------------------------------|---------|
| | Weight | Test subject scoring | Scoring |
| Medication relief | 0.58 | 1 (Medication helps) | 0.58 |
| Rare pain attacks | 0.44 | -1 (Seasonal pain) | -0.44 |
| Seasonal pain attacks | 0.38 | 1 (Seasonal pain - winter) | 0.38 |
| Multiple attacks daily | -0.25 | -1 (Seasonal pain) | 0.25 |
| Sex | 0.23 | 1 (Female) | 0.23 |
| Hypothyroid (on medication) | 0.22 | -1 (No thyroid problems) | -0.22 |
| Type 2 diabetes | -0.19 | -1 (No diabetes) | 0.19 |
| Constant pain | -0.18 | -1 (No constant pain) | 0.18 |
| Spontaneously triggered pain | -0.17 | -1 (Pain triggered by wind) | 0.17 |
| Cancer history | -0.13 | -1 (No history of cancer) | 0.13 |
| Shock-like pain | 0.13 | 1 (Electric shock-like pain) | 0.13 |
| | | Total score | 1.58 |



Methods

Summary

Outcome

• Potential framework to provide a foundation for future development of ML-driven, clinical tools for TN assessment and surgical outcome prognostication.

Key takeaways

- Comparably to imaging data, clinical data may also be applied in ML to better understand and treat TN.
- TN-related features were largely prioritized by unsupervised
 ML
- TN classes defined based on the duration of surgical response are distinguishable by ML algorithms and express specific clinical symptoms, identified by PC1 (Pain grade).

Future directions

- Supervised ML utilizing advanced imaging data (objective measure) and novel pain grade metric (from subjective reports) to develop a surgical outcome prognostication tool. Exploring deep learning architectures
- A novel classification of TN which will reflect the potential surgical outcome and allow for better patient selection for surgery

