Duke University School of Medicine
Doctor of Physical Therapy

The Predictive Value of Within-Session and Between-Session Findings for Long Term Outcomes for Patients Receiving Manual Therapy

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Background

- The patient response to the short-term effects of manual therapy must be considered:
  - If patient improves, s/he would be considered a candidate for manual therapy treatment.
  - If patient worsens, the intervention would be altered/abandoned.
- Immediate effects from manual therapy interventions have traditionally been used to determine treatment success, but early change (i.e. between-session change) has been less researched.
- The predictive abilities of within- and between-session changes with long term improvements should be assessed for clinical use.

Purpose

- Purpose: To determine if early change leads to improved outcomes in patients who receive a manual therapy-oriented intervention.
- Hypothesis: Early change carried over to a subsequent visit (between-session effects) will be more predictive of longer-term improved outcomes than immediate effects (changes within session).

Methods

Inclusion Criteria:
1. Use of manual therapy defined as thrust or non-thrust manipulation
2. Longitudinal design
3. Dedicated outcome measure of 96 hours
4. Outcome construct of pain, range of motion, function, disability, or global rating of change
5. Cohort studies or RCTs with covariate control
6. Predictor variable of pain, ROM, or GRoC after administration of treatment

Exclusion Criteria:
1. Associational, imaging based or immediate effect studies
2. Clinical prediction rule studies

Study Selection: Four authors (CU, AK, AD, ME) reviewed all titles and abstracts from the electronic search.

Assessments:
- Risk of Bias
  - The tool assessed ten individual items, four of which evaluated external validity while the remaining six evaluated internal validity.
  - Response options for each item were low or high risk of bias.
- Treatment Fidelity
  - Modified version of Borelli's tool that we felt best-represented important items for manual therapy studies

Conceptual Depiction
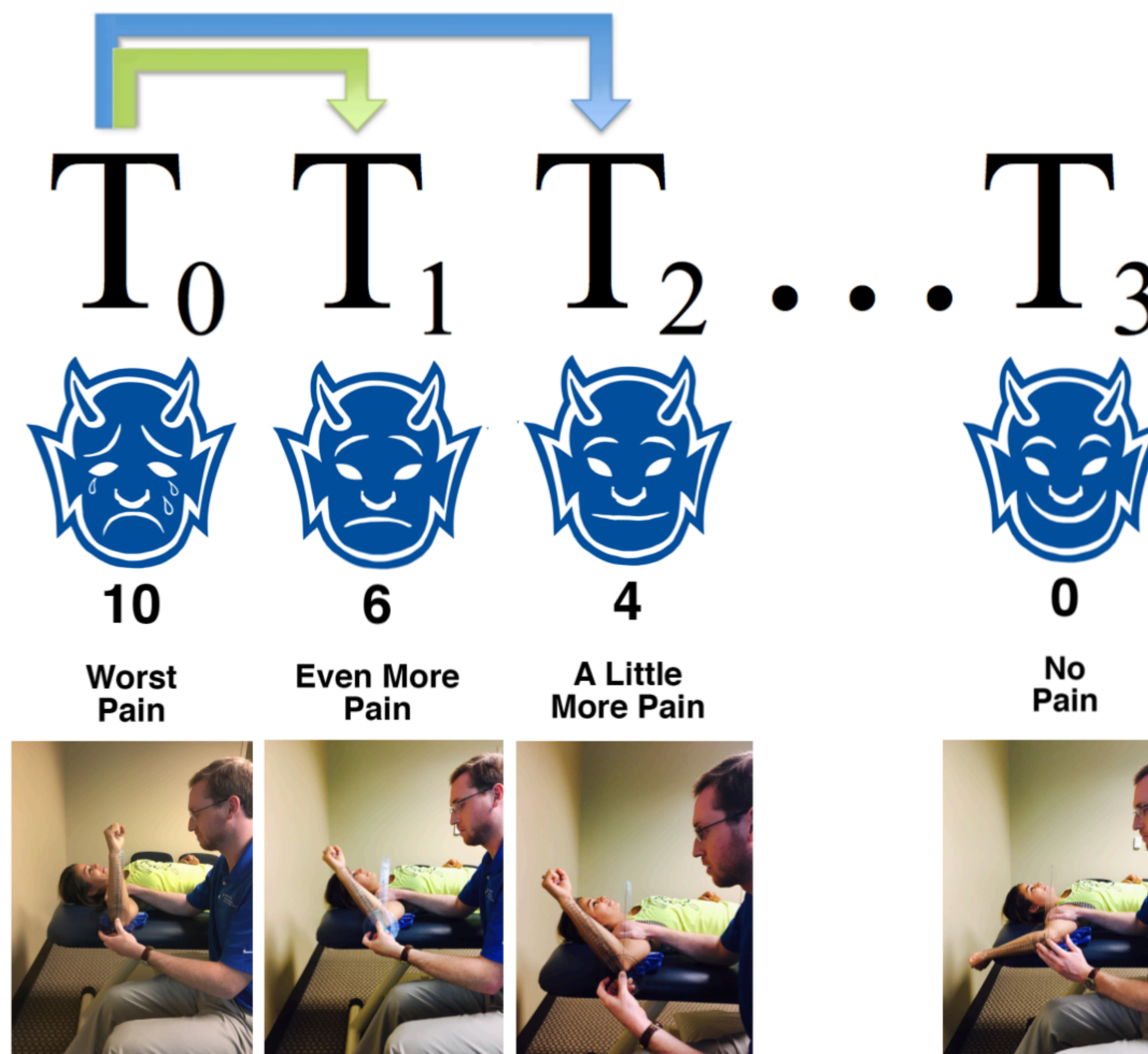
The various time periods used to identify and define measures of early change during treatment using manual therapy:
- T_0 – the baseline measurement of the patient prior to the 1st treatment session.
- T_1 – the change that occurs within the 1st session as a result of manual therapy.
- T_2 – the measurement taken at the next treatment session, used to determine the presence of early change resulting from the selected intervention, otherwise known as between-session change.
- T_3 – the long-term effect resulting from the treatment plan.
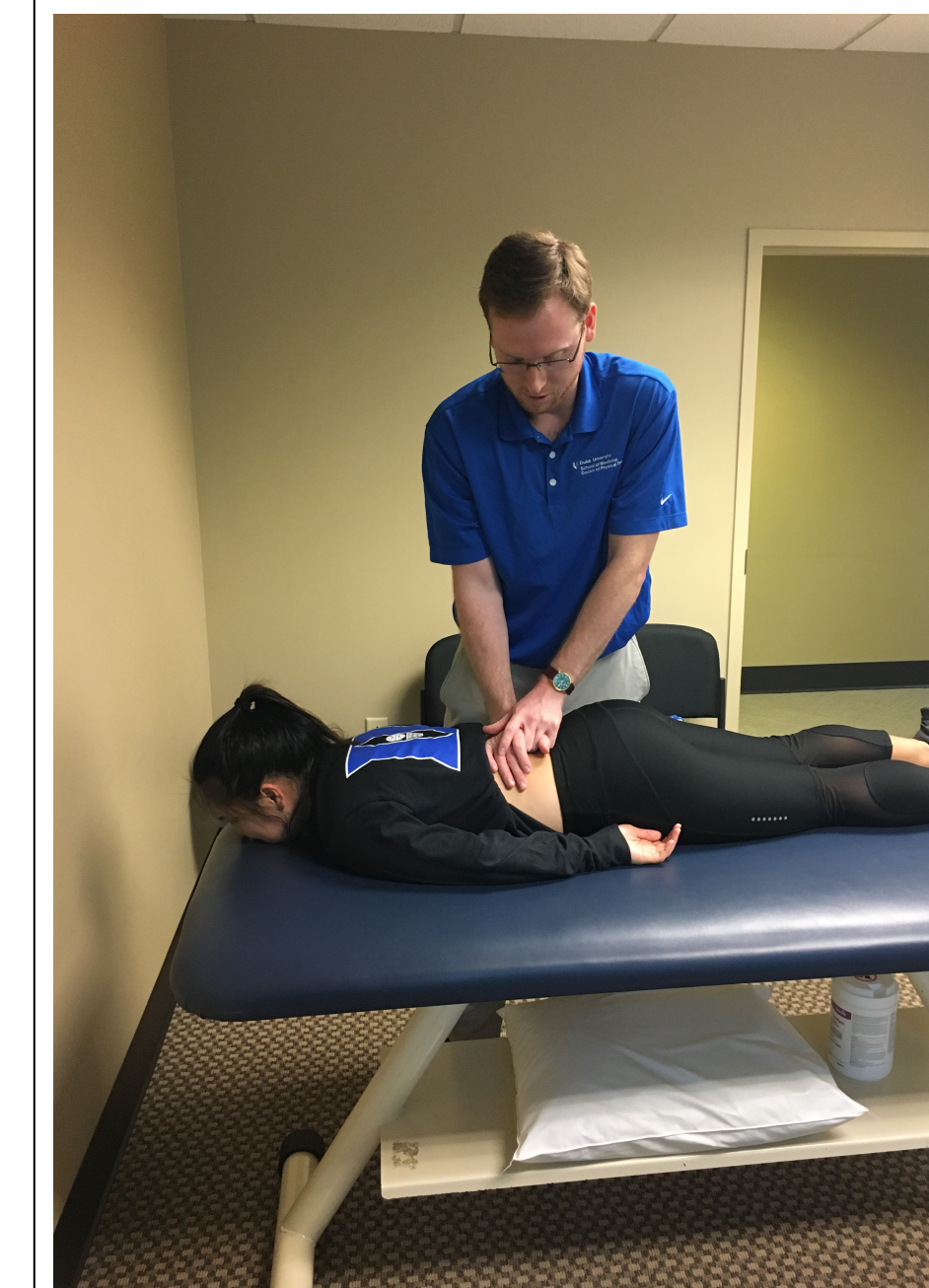
Results

- **Risk of Bias**:
  - All 7 studies had an overall low risk of bias.
  - Studies had low risk of bias for internal validity.
    - Causal relationship exists between intervention and results.
  - Studies had high risk of bias for external validity.
    - Many of these studies were from private clinics or academic settings, hindering generalizability.
- **Fidelity**:
  - Studies had high internal validity.
  - Consistent with Risk of bias, external validity was not strong.
  - Limits the ability to extrapolate data to other populations.

Results

- **PRISMA Results:**
  - A PubMed search and Google Scholar hand-search identified 456 articles. Title screening identified 57 articles. Abstract search yielded 20 articles. A full text review was conducted, and 7 articles were included in our qualitative synthesis.
- **Pain**:
  - All studies included pain as an outcome measure.
  - Early improvements in pain could help in predicting long-term improvements in pain levels.
- **ROM**:
  - Within-session change in knee flexion ROM and cervical ROM were predictive of between-session changes.
  - Between-session change in the most limited cervical ROM was a better predictor of improvement than change in pain intensity.
- **GRoC/Global Perception of Change**:
  - 3 studies found between session changes in GRoC/Global Perception of Change were correlated with improvements in final patient reported scores.
  - Wright et al. concluded within-session changes are not associated with 9 week changes in GRoC for hip OA.
- **Function Outcome Measures**:
  - NDI: Lacking within- or between- session improvement in NDI score was predictive of not being a manual therapy candidate.
  - ODI: Pain reduction was associated with within- and between-session changes in ODI scores.
  - No specific within or between session relationships could be made for WOMAC, KOS-ADLS, or ASES.

Conclusions

- Between-session findings are an important form of early change, and can predict treatment success, particularly for the spine.
- Within-session changes are not as strong of a clinical predictor for patient progress as patient's between-session changes.
- Between-session changes are a more effective tool for determining patient plan of care.

Clinical Relevance

- There is a need for an adequate tool or predictor that can effectively identify patients who will be strong responders to manual therapy.
- A more effective tool for prediction should include between-session changes in treatment rather than immediate changes and/or patient characteristics at baseline.
- Future research should focus on the prediction value of between-session changes over CPR and immediate effect studies.