The Therapeutic Alliance Between Clinicians and Patients Predicts Outcome in Chronic Low Back Pain

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Background. The impact of the relationship (therapeutic alliance) between patients and physical therapists on treatment outcome in the rehabilitation of patients with chronic low back pain (LBP) has not been previously investigated.

Objective. The purpose of this study was to investigate whether the therapeutic alliance between physical therapists and patients with chronic LBP predicts clinical outcomes.

Design. This was a retrospective observational study nested within a randomized controlled trial.

Methods. One hundred eighty-two patients with chronic LBP who volunteered for a randomized controlled trial that compared the efficacy of exercises and spinal manipulative therapy rated their alliance with physical therapists by completing the Working Alliance Inventory at the second treatment session. The primary outcomes of function, global perceived effect of treatment, pain, and disability were assessed before and after 8 weeks of treatment. Linear regression models were used to investigate whether the alliance was a predictor of outcome or moderated the effect of treatment.

Results. The therapeutic alliance was consistently a predictor of outcome for all the measures of treatment outcome. The therapeutic alliance moderated the effect of treatment on global perceived effect for 2 of 3 treatment contrasts (general exercise versus motor control exercise, spinal manipulative therapy versus motor control exercise). There was no treatment effect modification when outcome was measured with function, pain, and disability measures.

Limitations. Therapeutic alliance was measured at the second treatment session, which might have biased the interaction during initial stages of treatment. Data analysis was restricted to primary outcomes at 8 weeks.

Conclusions. Positive therapeutic alliance ratings between physical therapists and patients are associated with improvements of outcomes in LBP. Future research should investigate the factors explaining this relationship and the impact of training interventions aimed at optimizing the alliance.

Interpersonal relationships have fascinated humankind for centuries, perhaps because the quality of interpersonal relationships is one of the most significant predictors of future levels of happiness.[1] In the medical profession, it is widely accepted that the treatment regimen alone cannot fully account for patient outcome.[2] Abundant research has focused on the impact of the relationship between patients and health providers, particularly physicians and psychologists, on treatment outcome.[3–8] This relationship concept usually is referred to as *therapeutic alliance* or *working alliance.*[9]

The therapeutic alliance refers to the sense of collaboration, warmth, and support between the client and therapist.[10,11] Contemporarily, Bordin[12] determined the 3 main components of the therapeutic alliance construct as being: (1) the therapist-patient agreement on goals, (2) the therapist-patient agreement on interventions, and (3) the affective bond between patient and therapist. Consistently, studies have shown that higher levels of therapeutic alliances are associated with better health outcomes in medicine[5,13,14] and psychology.[15–19]

In rehabilitation, however, the therapeutic alliance concept has not been extensively explored. A few studies in neurological[20,21] and cardiac[22] rehabilitation have shown that positive alliances are associated with better treatment outcomes, such as improved physical functioning. To date, no study has investigated the influence of the therapeutic alliance in the rehabilitation of people with low back pain (LBP).

Low back pain is a common and costly condition. The annual cost of health care utilization for LBP is substantial worldwide, and in Australia it reaches A$1 billion a year.[23] Unfortunately, conservative treatments commonly used in the management of LBP, such as exercises and spinal manipulative therapy, appear to offer only moderate effects.[24–27] A recent systematic review investigating the analgesic effects of treatments for LBP found that these effects were less than 10 points on a 100-point scale in 47% of placebo-controlled trials researched.[28] Researchers have discussed the possibility of identifying subgroups of patients who respond best to different treatment approaches and optimizing available outcome measures as potential paths to improve the outcomes associated with treatment. A parallel line of research is to better understand the mechanisms by which different approaches work.

In a recent consensus panel, the effect sizes of different forms of exercise in LBP were found to be similar and consistent across different studies, suggesting that these interventions could share common nonspecific mechanisms or effects.[29] The therapeutic alliance has been considered to be part of the nonspecific effects associated with interventions in health care; if the outcomes of common conservative interventions used in LBP are influenced by nonspecific effects, it is important to investigate whether the therapeutic alliance affects clinical outcomes.

The aim of this study was to investigate, in a randomized controlled trial, whether the relationship between physical therapists and patients with LBP (assessed by the therapeutic alliance) predicts the clinical outcomes of function, perceived effect of treatment, pain, and disability after the implementation of common conservative treatments for LBP, such as exercises and spinal manipulative therapy.

Method

The study sample consisted of patients who had participated in a randomized controlled trial that investigated the outcomes of 3 common interventions for chronic LBP: general exercises, spinal manipulative therapy, and motor control exer-

The Bottom Line

What do we already know about this topic?

The quality of the interactions between patients and clinicians predicts the outcome of treatment for a variety of diseases.

What new information does this study offer?

The prognosis for patients with low back pain who are seeking conservative treatment is significantly better if they rate their interaction with their treating clinicians higher.

If you're a patient, what might these findings mean for you?

In order to have a more precise idea of the improvements that you will have when receiving treatment for your low back pain, you should consider how much you and your clinician agree on treatment goals and consider the level of trust and bond you have established with your clinician.

cises. The main results of the trial have been published previously.[30] In summary, patients receiving motor control exercises and spinal manipulative therapy showed slightly better short-term function and perceptions of effect than general exercises, but not better medium or long-term effects.

Participants

Participants were patients with chronic LBP from outpatient physiotherapy departments at 3 teaching hospitals in Sydney, Australia. To be eligible for inclusion, patients had to have had nonspecific LBP for at least 3 months and be between the ages of 18 and 80 years. Potential participants were excluded prior to randomization if they had known or suspected serious low back pathology (eg, cancer, infection, fracture) or contraindications to exercise or spinal manipulative therapy. Participants gave written informed voluntary consent prior to study commencement.

Physical Therapists

A total of 7 experienced physical therapists appointed by the physiotherapy outpatient departments of 3 public hospitals in Sydney, Australia, were responsible for treating the participants. Training and monitoring were provided to ensure best practice administration of general exercise, motor control exercise, and spinal manipulative therapy. Although the same physical therapist could be involved in the application of motor control exercise and spinal manipulative therapy, a predetermined clinician administered the general exercise program. Patients had the same interventionist throughout the treatment period.

Randomization

Baseline measures were taken of the outcomes prior to randomization. Subsequently, each participant was allocated to 1 of the 3 treatment groups via sealed opaque envelopes containing the allocation code. The randomization schedule was generated in Microsoft Excel (Microsoft Corporation, Redmond, Washington) with randomly permuted blocks of sizes 6, 9, and 15.

Interventions

Participants in the general exercise group received the program described by Klaber Moffet and Frost.[31] The main aims of the program were to improve physical function and confidence in using the spine and to teach participants how to cope with their back problems. It included strengthening and stretching exercises for the main muscle groups of the body and was implemented in groups of up to 8 patients. Participants allocated to the motor control exercise group were prescribed exercises individually aimed at improving the coordination of trunk muscles thought to control intersegmental movement of the spine, including transversus abdominis, multifidus, diaphragm, and pelvic-floor muscles.[32] Participants allocated to the spinal manipulative therapy group received individual joint mobilization or manipulation techniques applied to the spine or pelvis.[33] Physical therapists were allowed to choose the dose and techniques based on each participant's clinical features.

Participants attended up to 12 treatment sessions over an 8-week period. Participants in both exercise groups were encouraged to exercise at home at least once a day, and those allocated to the spinal manipulative therapy group were advised to avoid pain-aggravating activities.

Outcome Measures

There were 2 primary outcome measures: a patient-specific measure of function (Patient-Specific Functional Scale [PSFS], score ranges from 3 to 30)[34] and global perceived effect of treatment (Global Perceived Effect Scale [GPE], current back pain status compared with when back pain episode first started, score ranges from −5 to +5). The secondary outcome measures were pain (visual analog scale, score ranges from 0 to 10)[35] and disability (Roland-Morris Disability Questionnaire [RMDQ], score ranges from 0 to 24).[36] Measures of outcomes were obtained during the follow-up appointment at the end of the intervention (8 weeks following the commencement of the trial). Participants' outcomes were collected by a trial physical therapist blinded to allocation.

Therapeutic Alliance

We measured alliance between patients and physical therapists with the Working Alliance Theory of Change Inventory (WATOCI) (score ranges from 16 to 112).[37] The WATOCI is a version of the well-established Working Alliance Inventory[38] with well-accepted clinimetric properties and has been translated from English to Spanish, French, Finish, Dutch, Chinese, and Portuguese.[39] In a recent study by Hall et al,[40] clinimetric and Rasch analyses showed that even though some items could be improved in the original scale, the WATOCI holds its unidimensional characteristic when used with patients with LBP. A researcher (P.H.F.), blinded to group allocation, administered the WATOCI questionnaire at the end of the second session of treatment. The second session of treatment was chosen to allow for an interaction between physical therapists and patients to form and to assess the alliance early in the study to minimize contamination associated with effects of interventions.

Data Analysis

Separate linear regression models were used to investigate whether the therapeutic alliance was a nonspecific predictor of outcome (main

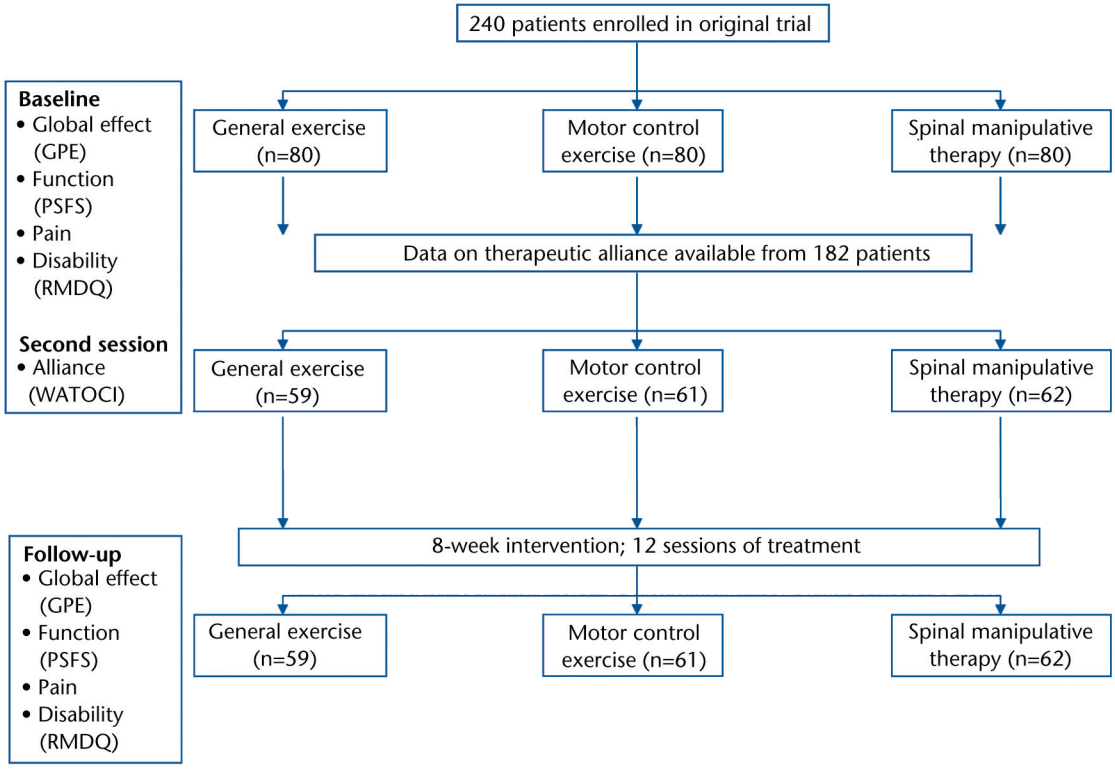

Figure.
Flow of participants through the trial. GPE=Global Perceived Effect Scale, PSFS=Patient-Specific Functional Scale, RMDQ=Roland-Morris Disability Questionnaire, WATOCI=Working Alliance Theory of Change Inventory.

Table 1.
Baseline Characteristics of the Study Sample[a]

Variable	General Exercise (n=59)	Motor Control Exercise (n=61)	SMT (n=62)
Age (y)	54.2 (15.4)	52.0 (15.7)	53.6 (14.3)
Female, n (%)	56.0 (70.0)	53.0 (66.3)	56.0 (70.0)
Low back pain duration (mo), median (IQR)	60 (24–206)	36 (15–120)	84 (12–162)
Height (cm)	164.6 (9.2)	166.1 (9.7)	162.7 (8.6)
Weight (kg)	75.4 (15.9)	79.3 (18.3)	71.5 (13.7)
Therapeutic alliance (WATOCI)	99.0 (11.5)	98.6 (15.3)	96.6 (14.2)
Outcomes			
Function (PSFS)	9.9 (4.0)	11.1 (4.4)	10.5 (3.7)
Global perceived effect (GPE)	−2.7 (1.8)	−2.5 (2.3)	−3.1 (1.9)
Pain	6.5 (2.1)	6.3 (2.0)	6.2 (2.0)
Disability (RMDQ)	13.9 (5.4)	14.0 (5.3)	12.4 (5.8)

[a] Data are means (SD) except where indicated. SMT=spinal manipulative therapy, IQR=interquartile range, WATOCI=Working Alliance Theory of Change Inventory scale (16–112), PSFS=Patient-Specific Functional Scale (scores range from 3 [unable to perform activities] to 30 [able to perform activities at preinjury level]), GPE=Global Perceived Effect Scale (−5 [vastly worse] to 0 [unchanged] to 5 [completely better]; pain, 0 [no pain] to 10 [worst pain]), RMDQ=Roland-Morris Disability Questionnaire (0 [no disability] to 24 [severe disability]).

Table 2.
Results of Linear Regression Models for the Ability of Therapeutic Alliance to Predict Outcome and Response to Treatment[a]

Outcome and Pair Contrast	Prediction Model	Adjusted Coefficient (95% CI)	*P*
Global perceived effect			
Main effect (all participants included)	Outcome	.050 (.024 to .076)	<.000*
Motor control exercise vs general exercise	Response to treatment	−.071 (−.134 to −.007)	.029*
Motor control exercise vs SMT	Response to treatment	−.062 (−.110 to −.014)	.013*
General exercise vs SMT	Response to treatment	−.008 (−.080 to .064)	.834
Function (PSFS)			
Main effect (all participants included)	Outcome	.095 (.028 to .161)	.005*
Motor control exercise vs general exercise	Response to treatment	.028 (−.151 to .206)	.758
Motor control exercise vs SMT	Response to treatment	−.116 (−.266 to .034)	.130
General exercise vs SMT	Response to treatment	.128 (−.040 to .295)	.134
Pain			
Main effect (all participants included)	Outcome	−.044 (−.070 to −.017)	.001*
Motor control exercise vs general exercise	Response to treatment	.002 (−.068 to .073)	.947
Motor control exercise vs SMT	Response to treatment	.035 (−.031 to .091)	.328
General exercise vs SMT	Response to treatment	−.032 (−.101 to .037)	.366
Disability (RMDQ)			
Main effect (all participants included)	Outcome	−.113 (−.166 to −.060)	<.000*
Motor control exercise vs general exercise	Response to treatment	.069 (−.077 to .216)	.349
Motor control exercise vs SMT	Response to treatment	.045 (.076 to .167)	.440
General exercise vs SMT	Response to treatment	.045 (−.090 to .180)	.370

[a] PSFS=Patient-Specific Functional Scale, RMDQ=Roland-Morris Disability Questionnaire, SMT=spinal manipulative therapy; 95% CI=95% confidence interval. Asterisk denotes significance. Adjusted covariates in the outcome models included the baseline value of the outcome, low back pain duration and therapeutic alliance at baseline. Adjusted covariates in the response to treatment models included the baseline value of the outcome, low back pain duration, therapeutic alliance at baseline, and treatment contrast.

effect of therapeutic alliance) and whether it moderated the effect of treatment (interaction of treatment group and therapeutic alliance). The models to evaluate nonspecific prediction of outcome included the baseline value of the outcome as a covariate and therapeutic alliance measured at baseline. The models to evaluate moderation of treatment effect included the baseline value of the outcome as a covariate, therapeutic alliance measured at baseline, treatment contrast, and the interaction between treatment and therapeutic alliance. Analyses were carried out separately for each treatment contrast (eg, general exercises versus motor control exercises).

Results

Of the original 240 patients with chronic LBP enrolled in the original trial, data on the therapeutic alliance questionnaire were available from 182 participants (Figure). There was no statistically significant difference between participants who completed the therapeutic alliance questionnaire and those who did not on baseline demographic (eg, age, working status) and clinical (eg, duration of LBP, pain, global perceived effect, function, disability) variables (*P* values ranged from .40 to .97).

The treatment groups were similar for most baseline characteristics (Tab. 1). Alliance between patients and physical therapists, measured by the WATOCI, was similar for the general exercise and motor control exercise groups (means of 99.0 and 98.6, respectively), but was slightly lower in the spinal manipulative therapy group (mean of 96.6). Low back pain duration was not similar across the groups (median duration in months: general exercise group=60, motor control exercise group=36, spinal manipulative therapy group=84); we decided to add this measure as a covariate in all the regression models.

The therapeutic alliance at baseline was a nonspecific predictor of outcome for the 4 measures of treatment outcome (ie, global perceived

effect, pain, disability, function) (Tab. 2). For example, the effect of a 1-unit increase in therapeutic alliance reduced pain by 0.044 units (95% confidence interval [CI]=0.070 to 0.017). To appreciate the size of this effect, it needs to be borne in mind that the scale range of the WATOCI is 16 to 112 and a 1–standard deviation increase in therapeutic alliance would reduce pain (measured on a 0 to 10 scale) by approximately 0.6 units.

The treatment effect moderation analyses showed that therapeutic alliance at baseline was slightly more positively associated with the final scores of global perceived effect when participants received general exercises or spinal manipulative therapy compared with motor control exercises (Tab. 2). For example, the effect of a 1-unit increase in WATOCI score increased the effect of spinal manipulative therapy (versus motor control) on global perceived effect by 0.062 units (95% CI=−.110 to −.014). A 1–standard deviation increase in therapeutic alliance moderated the effect of spinal manipulative therapy (versus motor control) on global perceived effect pain by approximately 0.8 units. No significant prediction of response to treatment was identified for the other 3 outcomes (Tab. 2).

Discussion

It is becoming apparent to researchers and clinicians working with patients with LBP that the common treatments seem to have only moderate effects. In a recent consensus panel on primary care of LBP, researchers outlined policies that needed to be implemented so that larger effects associated with treatment can be achieved.[29] Essentially, these policies state that research in LBP should attempt to refine the clinical outcome tools used, detect subgroups of patients with LBP who respond differently to different interventions, and maximize the use of nonspecific effects of treatment, particularly the interaction between patients and treatment providers. In this context, the therapeutic alliance emerges as a concept that needs to be considered if interventions in LBP are to be more effective. The results of the present study support this point.

The alliance between physical therapists and patients with LBP predicted all the final clinical outcomes measured at 8 weeks: global perceived effect of treatment, function, pain, and disability. Higher levels of therapeutic alliance (more positive interactions) were associated with greater improvements in perceived effect of treatment, function, and reductions in pain and disability. Assessing the magnitude of these associations and how clinically important they are represents a challenging task. Unlike the minimal clinical worthwhile effect associated with the implementation of treatments for conditions such as LBP,[41–43] research on the clinical significance of prediction coefficients is scarce.

In the present study, among all the clinical outcomes measured, therapeutic alliance was most strongly associated with disability (adjusted coefficient=−.113, 95% CI=−.166 to −.060). Given the standard deviation of 11.5 for the WATOCI at baseline, 1 unit of standard deviation of therapeutic alliance represents a 1-point improvement or reduction in disability (of a total of 24 points on the RMDQ). Clinically, the difference in disability between a patient with LBP with a low therapeutic alliance (score of 50/112, lower bound of CI) and a patient with a high therapeutic alliance (score of 100/112, upper bound of CI) would be 5 points (20%) in the RMDQ, a difference commonly considered as clinically worthwhile in the LBP field. Beyond the complex issue of assessing clinically important effects, it is expected that even small effects associated with a predictor could have important clinical impact in high prevalent conditions such as LBP, particularly if the predictor has the potential of being modified by training interventions. One of the limitations of this study is that we have restricted our analyses to the primary and secondary outcomes at the end of treatment follow-up at 8 weeks to reduce the chance of falsely claiming a statistically significant interaction or prediction effect (type 1 error) because of the significant number of analyses involved. Designing studies to analyze the long-term prediction ability of therapeutic alliance in LBP would be important to further explore whether this relationship is sustained over time.

Measures of therapeutic alliance, including the WATOCI questionnaire used in the present study, assess qualitative therapist-patient interactional factors such as the affective bond between them.[12] It is expected that self-reported clinical outcome measures that involve judgments of satisfaction with therapists and treatment, such as global perceived effect, are sensitive to the effect of interactions between patients and treatment providers,[44,45] whereas function and disability, more quantitative measures of clinical status in LBP, are more strongly associated with predictors such as pain levels and duration of symptoms.[46,47] Interestingly, in the present study, therapeutic alliance was more strongly associated (ie, greater regression coefficients) with final outcomes of disability and function than with global perceived effect and pain (Tab. 2).

The findings of our present study are consistent with those of other

studies in rehabilitation, particularly in the fields of geriatrics[2] and neurology,[20,21] that show measures of the perceived quality of interaction between clinicians and patients predict measures of physical functioning.[2,20,21] Potential explanations concerning why patients who interact more positively with their clinicians have better outcomes are intriguing. Higher levels of adherence to treatment have been reported in those patients undergoing brain rehabilitation who exhibit good alliances with treatment providers.[48] Investigating whether the mechanisms that account for the relationship between therapeutic alliance and patients' improvements are increases in treatment adherence, levels of trust, or other unexplored factors would help clinicians to maximize the effect of the therapeutic alliance.

One of the limitations of the current study is that we did not collect extensive data on therapists' behaviors or interpersonal skills and, therefore, could not explore how these factors affect patients' ratings of alliance. Additionally, data on patients' ratings of therapeutic alliance were collected at the end of the second session of treatment only. We chose the second session of treatment to allow for an initial interaction between physical therapists and patients and minimize confounding of the therapeutic alliance ratings due to the effects of time and treatment. If data on therapeutic alliance had been collected continuously and closer to the end of the intervention period, we could have investigated not only the behavior of the alliance in time but also whether a longer period of interaction would result in a more precise assessment of therapeutic alliance and greater effects in the final clinical outcomes.

Interestingly, in the present study, the only interactions (response to treatment) between therapeutic alliance and treatment were found for the outcome of global perceived effect. When patients with LBP receiving general exercises and motor control exercises were compared, therapeutic alliance was found to influence more strongly those patients receiving general exercises than motor control exercises (adjusted coefficient=−.071, 95% CI=−.134 to −.007). This finding is in accordance with a recent study showing that therapists' effects are greater in interventions that use a biopsychosocial approach such as the general exercise program used in the present study.[49]

When patients with LBP receiving spinal manipulative therapy and motor control exercises were compared, therapeutic alliances influenced more strongly the patients receiving spinal manipulative therapy than motor control exercises (adjusted coefficient=−.062, 95% CI=−.110 to −.014). Treatment effects from motor control exercise appear to be more dependent on patients' physiological variables, such as the recruitment levels of deep trunk muscles,[50] whereas the effects of general exercise and spinal manipulative therapy are more strongly associated with psychosocial predictors, such as treatment expectancy and credibility.[51] One of the constructs of the WATOCI scale is the agreement between patients and therapists on interventions. This construct could explain the response of patients with LBP to a positive alliance with their respective therapists when receiving general exercise or spinal manipulative therapy. These findings should be tested and replicated in a study with a larger sample size so that more robust conclusions could be drawn.

Medical educators continue to affirm the connection between healing and human relationships. The future challenges for researchers in the field are twofold: to identify the factors expressed by patients and clinicians that are associated with positive therapeutic alliances and to investigate whether these factors can be altered so that they better affect patients' outcomes. The high scores on the WATOCI scale shown in this study, demonstrating high levels of therapeutic alliance between patients and physical therapists, were likely to be partially due to a ceiling effect. Although data on the WATOCI were available from a significant percentage of the original trial sample (76%) and no differences in baseline variables were identified, it could be hypothesized that patients with a poorer alliance were less motivated to provide data and contribute to a possible ceiling effect. Data from a broader spectrum of quality of interactions would help to further elucidate the significance of therapeutic alliance in LBP and whether the relationship between clinicians and patients can be optimized. Although extensively researched in medical fields such as cancer management, these questions have not been investigated as yet in LBP and are one of the current focuses of our research group.

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The study protocol was approved by the human research ethics committees of the (blinded).

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