Annals of Internal Medicine | ARTICLE

Manual Therapy, Physical Therapy, or Continued Care by a General Practitioner for Patients with Neck Pain

A Randomized, Controlled Trial

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Background: **Neck pain is a common problem, but the effectiveness of frequently applied conservative therapies has never been directly compared.**

Objective: **To determine the effectiveness of manual therapy, physical therapy, and continued care by a general practitioner.**

Design: **Randomized, controlled trial.**

Setting: **Outpatient care setting in the Netherlands.**

Patients: **183 patients, 18 to 70 years of age, who had had nonspecific neck pain for at least 2 weeks.**

Intervention: **6 weeks of manual therapy (specific mobilization techniques) once per week, physical therapy (exercise therapy) twice per week, or continued care by a general practitioner (analgesics, counseling, and education).**

Measurements: **Treatment was considered successful if the patient reported being "completely recovered" or "much improved" on an ordinal six-point scale. Physical dysfunction, pain intensity, and disability were also measured.**

Results: **At 7 weeks, the success rates were 68.3% for manual therapy, 50.8% for physical therapy, and 35.9% for continued care. Statistically significant differences in pain intensity with manual therapy compared with continued care or physical therapy ranged from 0.9 to 1.5 on a scale of 0 to 10. Disability scores also favored manual therapy, but the differences among groups were small. Manual therapy scored consistently better than the other two interventions on most outcome measures. Physical therapy scored better than continued care on some outcome measures, but the differences were not statistically significant.**

Conclusion: **In daily practice, manual therapy is a favorable treatment option for patients with neck pain compared with physical therapy or continued care by a general practitioner.**

Ann Intern Med. 2002;136:713-722. www.annals.org

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See editorial comment on pp 758-759.

Neck pain is a common problem in the general population, with point prevalences between 10% and 15% (1–3). It is most common at approximately 50 years of age and is more common in women than in men (1, 2, 4–6). Neck pain can be severely disabling and costly, and little is known about its clinical course (7–9). Limited range of motion and a subjective feeling of stiffness may accompany neck pain, which is often precipitated or aggravated by neck movements or sustained neck postures. Headache, brachialgia, dizziness, and other signs and symptoms may also be present in combination with neck pain (10, 11). Although history taking and diagnostic examination can suggest a potential cause, in most cases the pathologic basis for neck pain is unclear and the pain is labeled nonspecific.

Conservative treatment methods that are frequently used in general practice include analgesics, rest, or referral to a physical therapist or manual therapist (12, 13). Physical therapy may include passive treatment, such as massage, interferential current, or heat applications, and active treatment, such as exercise therapies. Physical therapists can specialize in passive manual (or "hands-on") techniques, including mobilization or manipulation (high-velocity thrust techniques), also referred to as manual therapy (14–19). According to the International Federation of Orthopedic Manipulative Therapies, "Orthopedic manipulative (manual) therapy is a specialization within physical therapy and provides comprehensive conservative management for pain and other symptoms of neuro-musculo-articular dysfunction in the spine and extremities" (unpublished data). Today, many different manual therapy approaches are applied by various health professionals, including medical doctors, physical therapists, massage therapists, manual therapists, chiropractors, and osteopathic doctors. Reviews of trials involving manual therapy or physical therapy show that most interventions in these categories are characterized by a combination of passive and active components (20–23). Although a combination of manual therapy or physical therapy that includes exercises appears to be effective for neck pain, these therapies have not been studied in sufficient detail to draw firm

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Context

Neck pain is common among primary care patients.

Evidence on the effectiveness of therapies for neck pain is limited.

A previous randomized, controlled trial suggested benefits from manual therapy and physical therapy.

Contribution

This randomized, controlled trial of manual therapy, physical therapy, and continued care by a doctor confirms the superiority of manual therapy and physical therapy over continued care.

At 7 weeks, 68.3% of patients in the manual therapy group reported resolved or much improved pain, compared with 50.8% of patients in the physical therapy group and 35.9% of patients in the continued care group.

Clinical Implications

Primary care physicians should consider manual therapy when treating patients with neck pain.

–The Editors

conclusions, and the methodologic quality of most trials on neck pain is rather low (20–23).

Koes and colleagues (24, 25) performed a randomized trial on back and neck pain and found promising results for manual therapy and physical therapy in subgroup analyses of patients with neck pain. In our randomized, controlled trial, we compared the effectiveness of manual therapy, physical therapy, and continued care by a general practitioner in patients with nonspecific neck pain.

METHODS

Patients

Patients with nonspecific neck pain whose clinical presentation did not warrant referral for further diagnostic screening were referred to one of four research centers by 42 general practitioners for study selection. We excluded patients whose history, signs, and symptoms suggested a potential nonbenign cause (including previous surgery of the neck) or evidence of a specific pathologic condition, such as malignancy, neurologic disease, fracture, herniated disc, or systemic rheumatic disease. Two research assistants who were experienced physical therapists and were blinded to treatment allocation performed physical examinations at baseline and follow-up. They used standardized inclusion and exclusion criteria and performed a short neurologic examination (**Appendix Table 1**, available at www.annals.org) and range-of-motion assessment. The eligibility criteria were age between 18 and 70 years, pain or stiffness in the neck for at least 2 weeks, neck symptoms reproducible during physical examination, willingness to adhere to treatment and measurement regimens, no physical therapy or manual therapy for neck pain during the previous 6 months, no involvement in litigation, and written informed consent. Patients with concurrent headaches, nonradicular pain in the upper extremities, and low back pain were not excluded, but neck pain had to be the main symptom for all patients.

Random Assignment and Data Collection

All patient data were collected before randomization. Patients were assigned to a treatment group on the basis of block randomization after prestratification for symptom severity (severity scores <7 points or ≥ 7 points on a scale of 0 to 10); age (<40 years or ≥ 40 years); and, mainly for practical reasons, research center (four local centers). Randomized permuted blocks of six patients were generated for each stratum by using a computer-generated random-sequence table. A researcher who was not involved in the project prepared opaque, sequentially numbered sealed envelopes that contained folded cards indicating one of the three interventions.

Interventions

The intervention period lasted 6 weeks. Patients were allowed to perform exercises at home and to continue medication prescribed at baseline or use over-the-counter analgesics. Other co-interventions were discouraged but were registered if they occurred. Within the boundaries of the protocol, treatment could be reassessed and adapted to the patient's condition. The specific treatment characteristics were registered at each visit. A maximum number of visits was set for each intervention group; however, the patients did not have to complete this maximum number if symptoms had resolved.

Manual Therapy

Our approach to manual therapy was eclectic and incorporated several techniques used in western Europe,

North America, and Australia, including those described by Cyriax, Kaltenborn, Maitland, and Mennel (15, 16, 19). In our trial, manual therapy (defined as the use of passive movements to help restore normal spinal function) included "hands-on" muscular mobilization techniques (aimed at improving soft tissue function), specific articular mobilization techniques (to improve overall joint function and decrease any restrictions in movement at single or multiple segmental levels in the cervical spine), and coordination or stabilization techniques (to improve postural control, coordination, and movement patterns by using the stabilizing cervical musculature) (26). Joint mobilization "is a form of manual therapy that involves low-velocity passive movements within or at the limit of joint range of motion" (27). Manual therapists must undergo extensive training to be able to skillfully perform mobilization techniques (15, 19). Spinal manipulations (low-amplitude, high-velocity thrust techniques) were not included in this protocol. Forty-five minute treatment sessions were scheduled once per week, for a maximum of six treatments. Six experienced manual therapists acknowledged by the Netherlands Manual Therapy Association performed the treatment.

Physical Therapy

The physical therapists used a combination of several treatment options, but active exercise therapies were the cornerstone of their strategy. Active exercise therapy involves participation by the patient and includes active exercises (to improve strength or range of motion), postural exercises, stretching, relaxation exercises, and functional exercises.

Manual traction or stretching, massage, or physical therapy methods, such as interferential current or heat applications, could precede the exercise therapy. Specific manual mobilization techniques were not included in this protocol. Thirty-minute treatment sessions were scheduled twice per week for a maximum of 12 treatments. The treatment was performed by five experienced physical therapists. We prevented cross-contamination with manual therapy by choosing physical therapists who were not manual therapy specialists.

Continued Care by a General Practitioner

Each patient in this group received standardized care from his or her general practitioner, including advice on prognosis, advice on psychosocial issues, advice on self-care (heat application, home exercises), advice on ergonomics (for example, size of pillow, work position), and encouragement to await further recovery. The treatment protocol was similar to the practice guidelines for low back pain issued by the Dutch College of General Practitioners (28). Patients received an educational booklet containing ergonomic advice and exercises (29). Medication, including paracetamol or nonsteroidal anti-inflammatory drugs, was prescribed on a time-contingent basis if necessary. Ten-minute follow-up visits, scheduled every 2 weeks, were optional, and referral during the intervention period was discouraged.

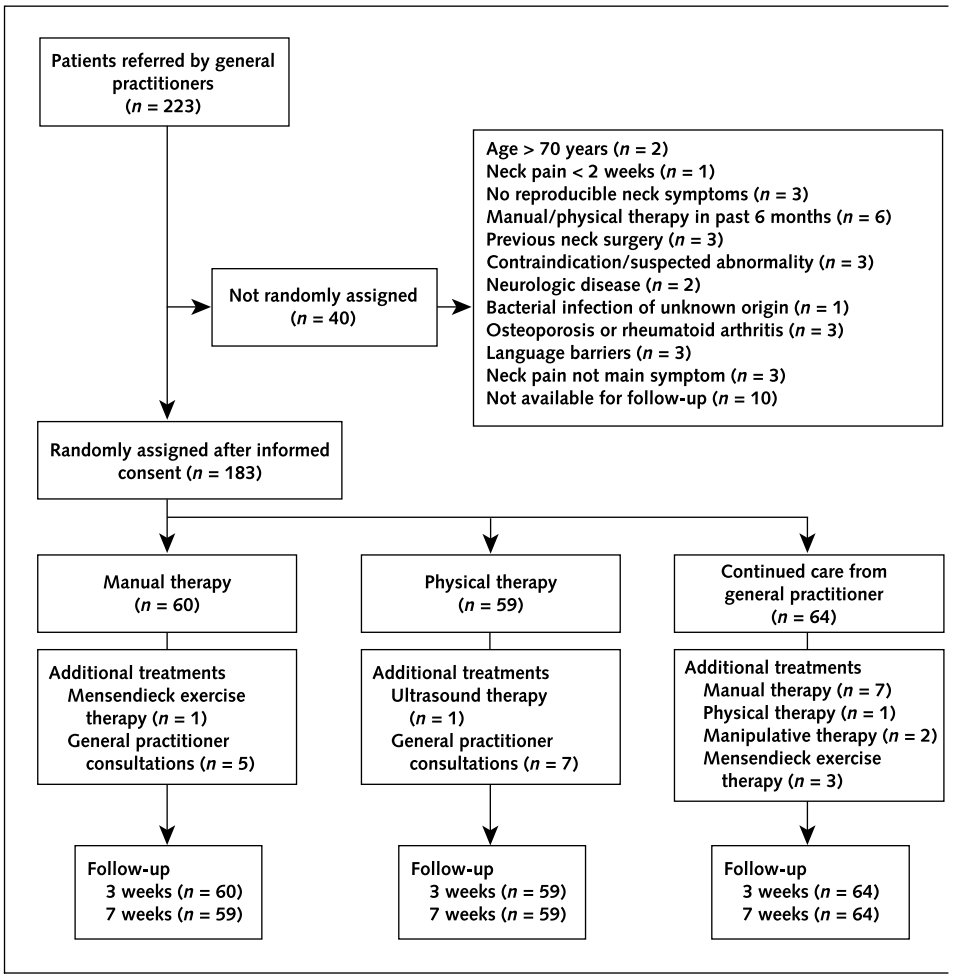
Outcome Measures

Data were collected at the research center after 3 and 7 weeks. At 7 weeks, treatment results were expected to be maximal. The patients were repeatedly asked not to reveal any information about their treatment allocation to the research assistants. The success of blinding was evaluated at 7 weeks.

Primary outcome measures focused on perceived recovery, pain, and functional disability. Patients rated perceived recovery on a 6-point ordinal transition scale, ranging from "much worse" to "completely recovered." Success was defined a priori as "completely recovered" or "much improved" (30). In addition, on the basis of the systematic assessment of spinal mobility, palpation, and pain reported by the patient, the research assistant rated the severity of physical dysfunction on a numeric 11-point scale ranging from 0 (no physical dysfunction) to 10 (maximal dysfunction). Likewise, the patient measured pain severity in the previous week in three ways on a numeric 11-point scale (higher scores indicate more severe pain): "bothersomeness" of pain (affective pain), average pain, and most severe pain (31, 32). Functional disability was measured according to the Neck Disability Index (33), which scores 10 activities of daily living on a scale of 0 to 5. Higher scores indicate more disability (maximum score, 50 points). Other studies have shown that the reliability and validity of the Neck Disability Index are acceptable (34, 35).

Secondary outcome measures included the severity of the most important functional limitation, rated by the patient on a numeric 11-point scale. Range of motion of the cervical spine was measured by using the Cybex Electronic Digital Inclinometer 320 (Lumex,

Figure 1. **Flow chart describing the progress of patients through the trial.**



Inc., Ronkonkoma, New York) (36). General health was measured according to the self-rated health index (scale, 0 to 100) of the Euro Quality of Life scale (37, 38). Patients recorded absences from work and analgesic use in a diary.

Statistical Analyses

We calculated sample sizes on the basis of the dichotomized score of the primary outcome measure "perceived recovery." A difference of 25% or more in success rate was considered to be clinically significant. With a power of 0.8 and a significance level of 0.05, a minimum of 60 patients per treatment group was required (39). Analyses were performed according to the intention-to-treat principle, using SPSS statistical software (SPSS Inc., Chicago, Illinois) (40). We also performed an alternative analysis that excluded patients who had received any interventions other than the allocated treatments.

The differences in success rates for perceived recovery (risk differences) were analyzed by applying chi-square tests (univariate analysis). Likewise, differences in improvement rates for absence from work and use of analgesics were analyzed. For the continuous outcome measures, univariate analyses of variance were applied to the differences between the baseline measurement and each of the follow-up measurements (the mean improvement).

Multivariate analyses (multiple logistic regression and analyses of covariance) were performed to examine the influence of the following covariates: baseline value of an outcome measure, therapist, age, severity, research

center, sex, duration of the current episode, previous episodes of neck pain, headache of cervical origin, radiating pain below the elbow, and patient preference for treatment. For all comparisons, a two-tailed *P* value of 0.05 was considered statistically significant. A statistician who had no knowledge of the randomization code performed all analyses.

The Scientific Committee and Medical Ethical Committee of the Vrije Universiteit Medical Center in Amsterdam, the Netherlands, approved the protocol.

Role of the Funding Sources

The two grant agencies approved the design of the trial but had no influence on the conduct and reporting of the study.

RESULTS

Patient Selection and Follow-up

During a period of 21 months (February 1997 to October 1998), 223 patients were referred by their gen-

Table 1. **Prognostic Indicators and Baseline Values of Outcome Measures**

Variable	Manual Therapy Group (*n* = 60)	Physical Therapy Group (*n* = 59)	Continued Care Group (*n* = 64)
Prognostic indicator			
Mean age ± SD, *y*	44.6 ± 12.4	45.9 ± 11.9	45.9 ± 10.5
Women, %	56.7	69.5	56.3
Duration of neck pain, %			
2–6 wk	48.3	45.8	50.0
7–12 wk	21.7	25.4	31.3
≥13 wk	30.0	28.8	18.8
Previous episodes of neck pain, %	63.3	59.3	71.9
Assumed cause of neck pain, %			
Unknown	38.4	42.4	37.5
Trauma	18.3	16.9	14.1
Not trauma	43.3	40.7	48.4
Previous treatment for neck pain, %	70.0	57.6	67.2
Radiating pain below elbow, %	15.0	15.3	17.3
"Pins and needles" sensation below elbow, %	23.3	20.3	18.8
Concomitant symptoms, %			
Headache of cervical origin	50.0	59.3	64.1
Dizziness	26.7	42.4	40.6
Concentration problems	26.7	32.2	28.1
Nausea	21.7	37.3	20.3
Low back pain	20.0	33.9	18.8
Waking up because of neck pain, %			
No	53.3	44.1	50.0
Sometimes	30.0	32.2	23.4
Every night	16.7	23.7	26.6
Employed, *n (%)*	47 (78.3)	42 (71.2)	46 (71.9)
Baseline values of outcome measures			
Mean score for severity of general physical dysfunction ± SD (scale, 0–10)*	6.0 ± 1.7	6.1 ± 2.0	6.4 ± 2.0
Mean score for pain severity in the previous week ± SD (scale, 0–10)			
"Bothersomeness" of pain	7.6 ± 1.9	7.3 ± 2.2	7.8 ± 2.2
Average pain	5.9 ± 1.7	5.7 ± 1.8	6.3 ± 2.1
Most severe pain	8.0 ± 1.8	7.6 ± 1.8	8.1 ± 1.9
Mean disability score ± SD			
Neck Disability Index (scale, 0–50)	13.6 ± 7.0	13.9 ± 6.8	15.9 ± 7.1
Main functional limitation (scale, 0–10)	7.1 ± 1.8	6.5 ± 1.9	7.3 ± 2.1
Mean cervical range of motion ± SD, *degrees*			
Flexion–extension	101.8 ± 21.7	102.2 ± 21.4	105.1 ± 21.5
Lateral flexion	70.5 ± 20.6	68.1 ± 18.2	66.3 ± 17.2
Rotation	132.9 ± 32.9	141.8 ± 28.6	137.6 ± 27.2
Mean self-rated general health ± SD (Euro Quality of Life index, 0–100)	69.3 ± 17.2	75.3 ± 15.4	69.1 ± 16.1
Use of analgesics in the previous 2 weeks, %	56.7	55.9	53.1
Absence from work, %†	12.8	9.5	19.6

* Scored by a research assistant.
† Patients employed at baseline who reported absenteeism from work on 1 or more days in the previous 2 weeks.

Table 2. **Frequency of Adverse Reactions in the Three Treatment Groups**

Adverse Reaction	Manual Therapy Group (n = 60)	Physical Therapy Group (n = 59)	Continued Care Group (n = 64)
	← *n (%)* →		
Increased neck pain for >2 d	11 (18.4)	4 (6.8)	3 (4.7)
Headache	17 (28.3)	19 (32.2)	11 (17.2)
Pain or paresthesia of the arms	8 (13.3)	9 (15.3)	4 (6.3)
Dizziness	6 (10.0)	7 (11.9)	4 (6.3)

eral practitioners. Of these, 40 did not meet the selection criteria (**Figure 1**). A total of 183 patients were randomly assigned: 60 to manual therapy, 59 to physical therapy, and 64 to continued care. One patient withdrew from the manual therapy group because of lack of time and also missed the baseline pain measurements. Values were occasionally missing for some variables in a few other patients.

Patient Characteristics and Baseline Similarity

All patients had multiple symptoms and signs (**Table 1**). Mean patient age was 45 years, and approximately 60% were women. Most patients had had neck pain for 12 weeks or fewer, and many had had previous episodes of neck pain. Patients rated the "bothersomeness" of their pain, on average, as 7.6 on a numeric 11-point scale. The mean score for the Neck Disability Index was 14.5 points ("minimally disabled," according to Vernon and Mior [33]). Only minor baseline differences were found among the three groups (**Table 1**).

Interventions

The study design allowed the manual therapists, physical therapists, and general practitioners to vary the number of treatments up to a maximum, to perform their own evaluations, and to treat individual patients according to their own findings. However, the specific treatment options were limited to those listed in the protocol and the specific treatment characteristics were recorded (**Appendix Table 2**, available at www.annals.org). The median number of visits was 6 (interquartile range, 5 to 6) in the manual therapy group, 9 (interquartile range, 7 to 12) in the physical therapy group, and 2 (interquartile range, 1 to 4) in the continued care group. **Figure 1** shows the protocol deviations and additional treatments in each group.

Adverse Reactions

Minor, benign, short-term adverse reactions were reported (**Table 2**). Headache, pain and tingling in the upper extremities, and dizziness occurred more frequently in patients who received manual and physical therapy than in those who received continued care. Patients in the manual therapy group were more likely to report a temporary increase in neck pain that lasted more than 2 days after receiving therapy.

Evaluation of Blinding

Research assistants remained unaware of the allocated treatment for 93.4% of patients (n = 170). At 7 weeks, blinding was not successful in 12 patients (2 in the manual therapy group, 3 in the physical therapy group, and 7 in the continued care group). In most of these 12 cases, the patient accidentally mentioned the treatment.

Intention-to-Treat Analysis

In general, the outcome measures showed distinct differences both within groups (compared with baseline) and among groups. These differences usually favored manual therapy more than physical therapy and physical therapy more than continued care (**Figure 2**). Adjustment for covariates (research center, severity, age, sex, headache, duration of neck pain, previous episodes, and baseline outcomes of the outcome measure) did not greatly influence the results. Because only small differences in outcome were seen among the manual therapists and among the physical therapists, multilevel analysis was not necessary. For the continuous outcomes, we present the adjusted means and confidence intervals. We did not adjust the percentages of binary outcomes (**Table 3**) because we preferred to present risk differences instead of odds ratios.

The success rate at 7 weeks was twice as high for the manual therapy group (68.3%) as for the continued care group (35.9%) (difference, 32.4 percentage points [95% CI, 15.8 to 49.0 percentage points]). Physical dysfunction, pain, and functional disability were less severe in the manual therapy group than in the continued care and physical therapy groups. Some differences in outcome measures were already statistically significant at 3 weeks.

At 7 weeks, the success rate was higher for physical therapy (50.8%) than for continued care (35.9%), but this difference was not statistically significant. For the other outcome measures, small but mostly nonsignificant differences were found in favor of physical therapy compared with continued care by a general practitioner. At 3 weeks, more patients worsened with continued care ($n = 9$) than with physical therapy ($n = 3$) or manual therapy ($n = 0$). The success rates for manual therapy were statistically significantly higher than those for physical therapy. Manual therapy scored better than physical therapy on all outcome measures, although not all differences were significant.

Although disability on the Neck Disability Index improved in all three groups by at least 5.9 points (continued care group), the differences among groups were not statistically significant. Range of motion improved more markedly for those who received manual therapy or physical therapy than for those who received continued care. General health perception on the self-rated health index of the Euro Quality of Life scale showed a statistically significant difference in favor of manual therapy compared with continued care and physical therapy.

Patients receiving manual therapy had fewer absences from work than patients receiving physical therapy or continued care. Respectively, 13% (6 of 47), 29% (12 of 42), and 26% (12 of 46) of patients were absent due to neck pain; differences among groups were

Figure 2. **Results of primary care outcome measures during the 7-week follow-up.**

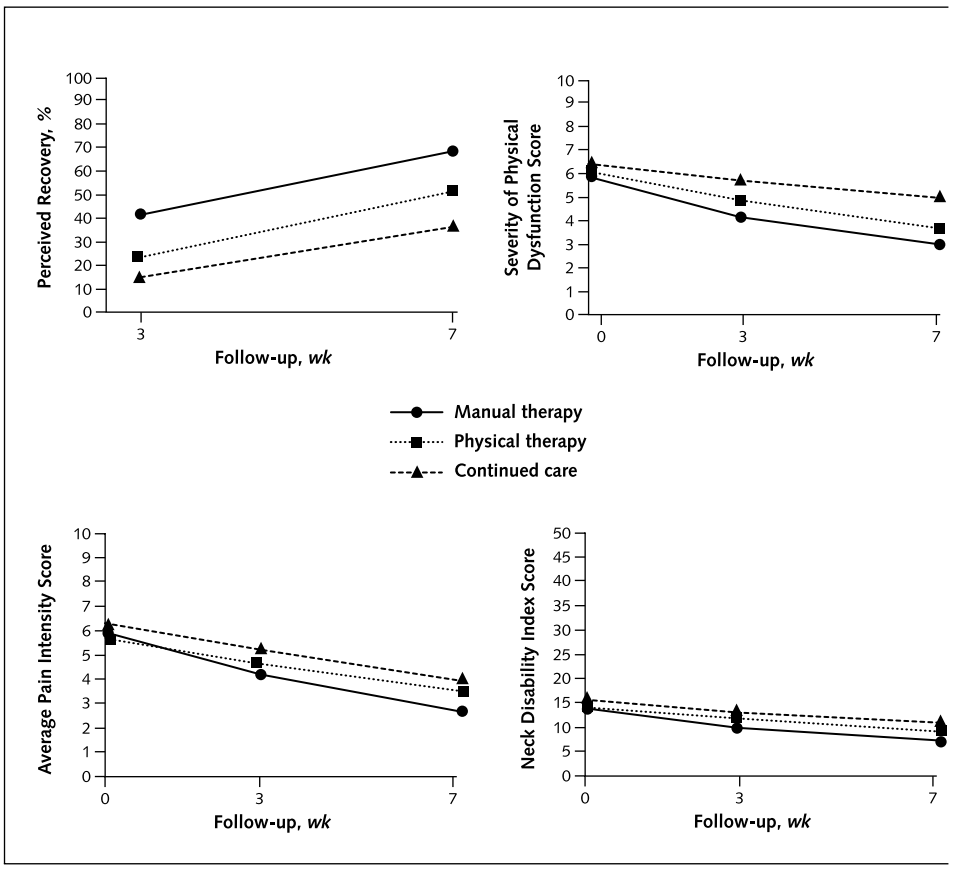


Table 3. **Mean Improvement from Baseline and Difference of Mean Improvement between Groups after 7 Weeks (Intention-to-Treat Analysis)***

Variable	Manual Therapy Group*	Physical Therapy Group*	Continued Care Group*	Manual Therapy vs. Continued Care (95% CI)	Physical Therapy vs. Continued Care (95% CI)	Manual Therapy vs. Physical Therapy (95% CI)
General improvement from baseline						
Perceived recovery, %	68.3	50.8	35.9	32.4 (15.8 to 49.0)†	14.9 (−2.4 to 32.3)†	17.5 (0.1 to 34.8)†
Severity of physical dysfunction (scale, 0–10)	3.4 ± 2.3	2.9 ± 2.3	1.8 ± 2.4	1.7 (0.9 to 2.5)	1.1 (0.3 to 1.9)	0.6 (−0.2 to 1.4)
Improvement in pain severity from the previous week (scale, 0–10)						
"Bothersomeness" of pain	4.8 ± 3.1	3.7 ± 3.1	3.3 ± 3.2	1.5 (0.4 to 2.5)	0.4 (−0.6 to 1.4)	1.0 (−0.02 to 2.1)
Average pain	3.5 ± 2.3	2.8 ± 2.3	2.6 ± 2.4	0.9 (0.1 to 1.7)	0.1 (−0.7 to 0.9)	0.8 (−0.03 to 1.6)
Most severe pain	4.5 ± 3.1	3.3 ± 3.1	3.1 ± 3.2	1.4 (0.4 to 2.4)	0.2 (−0.9 to 1.2)	1.2 (0.2 to 2.3)
Improvement in disability from baseline						
Neck Disability Index (scale, 0–50)	7.8 ± 7.0	6.0 ± 7.0	5.9 ± 7.2	1.9 (−0.3 to 4.1)	0.1 (−2.1 to 2.3)	1.8 (−0.4 to 4.0)
Main functional limitation (scale, 0–10)	4.4 ± 3.8	3.4 ± 3.1	3.4 ± 3.2	1.0 (−0.1 to 2.0)	0.02 (−1.0 to 1.1)	0.9 (−0.1 to 2.0)
Improvement in range of motion from baseline, *degrees*						
Flexion–extension	15.3 ± 20.2	11.0 ± 20.9	6.7 ± 20.8	8.6 (2.3 to 14.9)	4.3 (−2.0 to 10.6)	4.3 (−2.0 to 10.7)
Lateral flexion	13.4 ± 16.3	8.8 ± 16.3	6.8 ± 16.8	6.6 (1.6 to 11.6)	2.0 (−3.0 to 7.0)	4.6 (−0.5 to 9.6)
Rotation	21.8 ± 21.7	13.1 ± 22.5	8.9 ± 22.4	13.0 (6.3 to 19.6)	4.2 (−2.5 to 10.9)	8.8 (2.0 to 15.5)
Improvement in general health from baseline according to the Euro Quality of Life self-rated health index (scale, 0–100)	15.0 ± 15.5	8.8 ± 15.5	7.0 ± 15.2	8.0 (3.4 to 12.7)	1.8 (−2.8 to 6.5)	6.2 (1.4 to 11.0)

* Values presented with a plus/minus sign are the mean ± SD. Continuous outcome variables were adjusted for design, location, sex, headache, duration of neck pain, previous episodes, and baseline outcomes of the outcome measure.
† Values are in percentage points.

not statistically significant. A similar trend was seen for patients who used analgesics (51% [30 of 59] in the manual therapy group, 53% [31 of 59] in the physical therapy group, and 80% [51 of 64] in the continued care group). Manual therapy and physical therapy each resulted in statistically significantly less analgesic use than continued care.

Alternative Analysis

We performed an alternative analysis that excluded 14 patients who received treatment other than that allocated. Results were similar to those of the intention-to-treat analyses. For example, at 7 weeks, the success rates were 70.7% for manual therapy, 50.8% for physical therapy, and 34.6% for continued care.

Discussion

We compared the effectiveness of frequently used treatments for nonspecific neck pain in general practice. We found that manual therapy was more effective than continued care, and our results consistently favored manual therapy on almost all outcome measures. Although physical therapy scored slightly better than continued care, most of the differences were not statistically significant. In addition, although manual therapy seemed to be more effective than physical therapy, differences were small for all outcome measures except perceived recovery and were not always statistically significant. The magnitude of the differences between manual therapy and physical therapy, but also between manual therapy and continued care, were most pronounced for perceived recovery. Because perceived recovery combines other outcomes, such as pain, disability, and patient satisfaction, it may be the most responsive outcome measure. For pain intensity, statistically significant differences among the treatment groups ranged from 0.9 to 1.5 on a scale of 0 to 10. Although smaller differences could have been detected with larger sample sizes, they would not have been clinically relevant.

It is of interest that the postulated objective of manual therapy, that is, the restoration of normal joint motion, was achieved, as indicated by the relatively large increase in the range of motion of the cervical spine. The differences among groups in scores on the Neck Disability Index were small (<2 points) and are not considered clinically important (35). The low disability

scores on the Neck Disability Index at baseline may have left only a small margin for improvement. Other studies using the Neck Disability Index have also found that function may not be severely limited in patients with nonspecific neck pain (8, 41). We recommend further investigation of disease-specific outcome measures for neck pain. Only Koes and colleagues (24, 25) have compared the effectiveness of manual therapy (manipulation and mobilization) and physical therapy (exercise, traction, and other methods) with that of continued care and a placebo treatment. Our study confirms their findings that manual therapy and physical therapy are superior to continued care.

The general practitioners performed a routine examination, which is common in general practice. Although we tried to enroll all eligible patients who consulted their general practitioner with a new episode of neck pain during the recruitment period, the numbers of patients recruited by each general practitioner suggest that potential participants were lost at this point. However, we feel that our study sample reflects patients with nonspecific neck pain who were seen in everyday practice.

The natural course of neck pain in everyday practice might best be reflected by the progress in the continued care group. Borghouts and colleagues (9), in a systematic summary of the available evidence, found that patients with chronic neck pain who received a variety of common interventions experienced between 37% and 95% improvement when assessed from 3 weeks to 1 year. In the physical therapy and manual therapy groups, the "hands-on approach," frequent visits, and opportunities for intensive patient–therapist interaction may have contributed to the observed effects. The differences in effect between the physical therapy and manual therapy groups, however, suggest that the superiority of manual therapy cannot be explained by nonspecific effects alone.

In this trial, manual therapy was performed by physical therapists with formal training. We believe that manual therapy has added value because therapists are knowledgeable about spinal problems, are skilled in performing specific manual techniques, and are educated about the potential risks. (42). Active treatment components, such as those used in the physical therapy strategy, tend to become more dominant over time as the patient improves (41, 43). In our study, mobilization, the passive component of the manual therapy strategy, formed the main contrast with physical therapy or continued care and was considered to be the most effective component.

Our results suggest that in everyday practice, for every 3 patients referred to manual therapy and every 7 patients referred to physical therapy, 1 additional patient will completely recover within 7 weeks than would have recovered after continued care by a general practitioner (number needed to treat on the basis of perceived recovery). Although differences were not particularly large for all outcome measures, manual therapy seems to be a favorable treatment option for patients with neck pain.

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Acknowledgments: The authors thank Anita Gross for critical review of the manuscript; Eva Stokx, Luite van Assen, Vera Veldman, and Ingeborg Korthals-de Bos for data collection and data entry; Frans Krapels for advice on usual care; and Brigitte Kapteijn and Raymond Swinkels for advice on physical and manual therapy. They also thank the participating physical therapists, manual therapists, general practitioners, and patients.

Grant Support: By Netherlands Organization for Scientific Research (904-66-068) and the Fund for Investigative Medicine of the Health Insurance Council (OG95-008).

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