

Low Back Pain in Men Receiving Workmen's Compensation

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In Ontario, only about 10% of compensation patients with low back pain are disabled more than six weeks and hence tend to have chronic complaints. Six hundred and twenty-three such patients were studied to determine the distribution of diagnoses and to test the effectiveness of various programs of conservative therapy.

Two hundred and thirteen patients were assigned in rotation to one of four treatments. The results were inconclusive. In 70% of these, the pain was due to intervertebral disc degeneration with added trauma.

Two hundred and sixteen patients were assigned randomly to a treatment involving mild exercise, or one with vigorous exercise. Neither was found to be superior. In 76% of these, the pain was due to disc degeneration with added trauma.

Using 194 patients, the results of treatment in the Compensation Board Rehabilitation Centre were compared with those obtained by treatment at home. Satisfactory improvement was achieved in 15 of 95 treated at home, and in 42 of 99 in the Centre. The failure of treatment in six of each 10 cases indicates that present-day methods of management of such patients are unsatisfactory.

LOW back pain caused by or precipitated by industrial accidents, often minor and not otherwise noticed, accounts annually for about 12,000 claims accepted by the Workmen's Compensation Board of Ontario. In more than one-half of these the condition does not cause interruption of the patient's regular work. Only about 10% are disabled longer than six weeks, but in these the disability is likely to be very prolonged, and in spite of treatment by orthodox methods during this time and often for a much longer time, a disabling degree of pain tends to continue, with little or no improvement. It is this small proportion of compensation patients with low back pain that we refer to as "problem cases". They constitute about one-third of the total patient population of the Hospital and Rehabilitation Centre of the Workmen's Compensation Board of Ontario, Downsview, Ontario.

This Centre is an institution of 500 beds. Its purpose is to achieve as complete restoration as possible of capabilities lost to patients as a result of industrial accidents, and to assist in the placement of these patients in suitable employment.

In 1959 a study of a representative group of these "problem" cases in the Centre was instituted. Only this special group was the subject of the study, and the findings are related only to cases within it. This investigation was not concerned with the great majority of "low back" compensation cases, because these patients do not become "problems" and are not admitted to the Centre.

En Ontario, 10% seulement du nombre des cas de compensation (lombalgie) n'ont été estropiés que pendant plus de six semaines et sont sujets à des malaises chroniques. On a étudié 623 malades, en vue de déterminer la distribution des diagnostics et d'évaluer l'efficacité de divers traitements conservateurs.

On a affecté 213 malades à des traitements (un à quatre) à tour de rôle. Les résultats n'ont pas été concluants. Chez 70% de ces cas, la douleur relevait d'une luxation du disque intervertébral avec traumatisme surajouté.

On a appliqué au hasard à 216 malades un traitement comportant de légers exercices ou des exercices plus énergiques. Aucun des deux modes de traitement ne s'est révélé supérieur à l'autre. Chez 76% des malades, la douleur provenait d'une dégénérescence discale avec traumatisme surajouté.

Chez 194 malades, les résultats du traitement appliqué au Centre de réadaptation du Bureau de Compensation ont été comparés à ceux que donnait un traitement à domicile. Sur 95 malades traités à domicile, 15 ont été améliorés de façon satisfaisante, contre 42 sur 99 au Centre. L'échec du traitement constaté chez six malades sur 10 permet de conclure que les méthodes thérapeutiques actuelles sont insuffisantes.

PURPOSE AND DESIGN OF THE STUDY

The extensive medical, social and economic problems created by these patients were the primary reason for this study. An additional stimulus was the pessimistic outlook of many members of the medical staff toward the treatment of these "problem" cases, and our impression that this outlook is shared by the medical profession generally.

TABLE I.—DESIGN OF THE STUDY:
THREE GROUPS OF PATIENTS—ADMITTED AND STUDIED CONSECUTIVELY

Group I (213 patients)	Group II (216 patients)	Group III (194 patients)				
<i>Purpose:</i> Comparison of effectiveness of four different types of treatment	<i>Purpose:</i> Comparison of effectiveness of treatment by two dissimilar types of treatment in this Centre	<i>Purpose:</i> Comparison of effectiveness of two markedly different types of treatment				
<i>Result:</i> Failure to achieve purpose. Learned some causes of failure and how to avoid them. Learned the proportion of patients in each diagnostic group.	<table border="0"> <tr> <td>Group IIA Moderate progressive exercises</td> <td>Group IIB Vigorous progressive exercises</td> </tr> </table> <i>Result:</i> Suggested the effectiveness of the two types of treatment is similar.	Group IIA Moderate progressive exercises	Group IIB Vigorous progressive exercises	<table border="0"> <tr> <td>Group IIIA At home</td> <td>Group IIIB In Centre</td> </tr> </table> <i>Result:</i> Treatment was disappointing in both, though the rate of improvement was higher in the Centre.	Group IIIA At home	Group IIIB In Centre
Group IIA Moderate progressive exercises	Group IIB Vigorous progressive exercises					
Group IIIA At home	Group IIIB In Centre					

The study was intended to provide more definite knowledge concerning: (1) the anatomical source of low back pain in these patients, (2) the results of current methods of treatment of such cases at the Centre, and (3) the relative value of the various treatments.

GROUP I

Purpose

In this group of 213 patients, an attempt was made to compare the effectiveness of four treatment programs, bed rest, moderate exercises, vigor-

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ous exercises, and a control period at home with no treatment. A uniform routine of treatment was designed for the three programs carried out at the Centre.

Materials and Methods

The patients were taken into the study in the order in which they were admitted to the Centre, up to six per week. The chief criterion determining their acceptance into the study was that each had been given one of the diagnoses shown in Table II.

TABLE II.—DISTRIBUTION OF DIAGNOSES IN PATIENTS, GROUP I

Diagnostic classification	No.
1. Spondylolysis	4
2. Spondylolisthesis	7
3. Herniated intervertebral disc with neurological signs	61
4. Herniated intervertebral disc with subjective symptoms	58
5. Facet syndrome	16
6. Osteoarthritis	8
7. Disc degeneration and strain	50
8. Primary psychogenic pain	9
Total	213

The clinical diagnosis was assigned in each case by a diagnostic team, made up of an orthopedic surgeon and either a neurologist or neurosurgeon. Unless the two members of a team agreed upon the diagnosis, the patient was excluded from the study. Patients with fractures or soft-tissue injuries and those seen postoperatively were also excluded.

An attempt was made to assign patients in each diagnostic class in rotation to one of the four treatment programs: bed rest, moderate exercise, vigorous exercise, or a period at home.

Results

There was no substantial evidence that one treatment program was more effective than another. The separation of the patients in each of the eight diagnostic classes into four treatment programs divided the patient population into groups too small for profitable comparison. Also, the assignment of a treatment program by rotation was frequently impossible because in some patients vigorous exercise was prohibited owing to the severity of symptoms and in others bed rest was unwarranted because the symptoms were so mild.

However, the study of the 213 patients in Group I was valuable, in that it guided us in the preparation of the protocol for the study of the later groups.

Of particular interest is the distribution of diagnoses in these 213 cases (Table II). In 70% of the patients in this group, the diagnosis was (a) herniated intervertebral disc with positive neurological signs, (b) herniated intervertebral disc with only subjective symptoms, or (c) disc disease with strain.

Thus, in a high proportion of our cases, the pain was "discogenic", that is, it was the result of trauma to a degenerated intervertebral disc. The use of this term also implies that an abnormality of the disc preceded the pain and caused it, as in these three conditions.

GROUP II

Purpose

This group of 216 patients was studied in order to compare the effectiveness of two markedly different types of treatment: Program A—mild exercises along with physiotherapeutic measures to relieve pain, and Program B—vigorous exercises. No medication was given to patients in either group.

Materials and Methods

Patients with low back pain were again selected in the order of their routine admission, up to six per week. Criteria for their acceptance into the study were the same, i.e. the diagnostic team had agreed upon and assigned one of the diagnoses listed in Table II.

Two hundred and sixteen patients were assessed clinically and, after the diagnosis was made, were classified according to the severity of the condition, into various levels of physical impairment. Most of the patients in this group were in the second disability status, that is, "mildly incapacitated". This term is defined in Table III.

TABLE III.—CRITERIA FOR CLASSIFYING PATIENT "MILDLY INCAPACITATED" USED IN PATIENTS IN GROUP II

Has discomfort in back or leg for a significant part of the day, and occasionally this amounts to real pain.
Ordinary, mild activity is not prevented.
Certain activities, repeated bending, lifting, digging, provoke real pain.
Is comfortable in bed.
Does not take more than four tablets of acetylsalicylic acid phenacetin, and codeine, grain 1/8, per day.
Spinal tilt due to spasm is absent.

Treatment

Patients who were considered to be "mildly incapacitated" were assigned, in a strictly random manner, to one of two programs in which active treatment was given for seven hours each day.

Program A consisted of mild exercises, progressing to moderate exercises with *avoidance of aggravation of pain*. The patients went to the physiotherapy department where they had short-wave diathermy, posture training and static trunk exercises. In the gymnasium they took part in back exercise classes prescribed on the basis of their symptoms, and had general calisthenics in the pool. No resistance exercises were allowed. In the occupational therapy department, their activities were those of general work.

In Program B, patients were encouraged to perform vigorous exercises in spite of aggravation of

the pain. They did not go to the physiotherapy department. In the gymnasium, flexion and extension exercises were performed against resistance and games of the heavy remedial type were used. In the occupational therapy department, their activities were those of heavy occupation but with instruction in correct use of the back. They practised, for example, wood chopping, shovelling, bending and lifting.

On each program, treatment was continued until the patient showed improvement or deterioration, or the clinician had satisfied himself that no change was likely to occur.

Results

1. Of 216 patients in this group, 175 (76%) were assigned one of the following diagnoses: herniated intervertebral disc with neurological signs, herniated intervertebral disc with subjective symptoms, or disc degeneration and strain. As in Group I, the pain in most of the cases was "discogenic".

2. Of the 175 patients assigned one of these three diagnoses, 148 were "mildly incapacitated" as defined in Table III. Of these, 76 were treated according to Program A, and 72 according to Program B. Improvement occurred following each program in almost equal proportions—38% after Program A (light) and 35% after Program B (heavy). The duration of treatment ranged from 10 to 49 days on Program A and from three to 49 days on Program B. The records suggest that a definite decision regarding the results of treatment was reached earlier in Program B, whether the patient showed improvement, no change or deterioration. As expected, of those who failed to improve, a larger number developed increased pain on Program B than on Program A.

3. Of the 148 patients in the two programs, improvement occurred in about 38%. There was no change in about 54%, and the clinical condition deteriorated in about 8%. It should be noted that improvement is not synonymous with cure. Indeed, complete loss of pain almost never occurred. Improvement was measured by clinical assessment only, and the relationship between improvement and subsequent ability to work was not investigated.

4. No relationship was demonstrated between the rate of improvement and the length of time between the accident and admission to the Centre.

GROUP III

Purpose

The 194 patients in Group III were studied in an attempt to answer the following questions:

1. Do the results of treatment of problem "low back" patients in the Ontario Workmen's Compensation Board Hospital and Rehabilitation Centre justify the time, effort and expense involved?

2. Are there any factors which have a definite prognostic significance in the individual case?

Materials and Methods

Criteria for admission to the study

Up to eight patients each week were accepted in the order of their routine admission to the Centre, provided only that the following criteria were met:

(a) They were men with accepted claims for compensation for low back pain.

(b) They had significant back disability on admission as judged by clinical assessment.

(c) They must be over 19 and under 60 years of age at the time of the accident which led to the disability.

(d) Not less than six weeks and not more than 12 months had elapsed between the date of accident and the date of admission to the Centre.

(e) The patient must not have worked for more than two weeks continuously between the accident and the time of admission.

(f) The diagnosis must be that of "discogenic" pain in the low back, with or without sciatica; and it must be one of the three diagnoses used in analysis of results in Group II, namely intervertebral disc herniation with objective neurological signs, intervertebral disc herniation with only subjective neurological symptoms, or disc degeneration with strain.

While these criteria were necessary for admission to the study, cases with previous spinal surgery, significant co-existing trauma or disease, or fractures of the spine were excluded.

Details of assessment

On admission to the Centre the patients were first assessed briefly by the admitting Medical Officer. If the findings suggested that the criteria might be satisfied, the patients were referred, in the order of their admission, to the "back study" clinician. He assessed the case more carefully and if, in his opinion, the criteria had been met, the patients were accepted conditionally into the study. Each patient so selected was then examined by one of several diagnostic teams—an orthopedic surgeon and either a neurologist or neurosurgeon. If the team agreed that the diagnosis was one of the three named above, the patient was accepted into the study. Each patient had the following investigation:

1. Medical history and physical examination recorded on a standard form.

2. Assessment of severity of the condition as mild, moderate, or severe, according to definite criteria.

3. Radiologic examination of the lumbar and lumbosacral spine, including anteroposterior and oblique views of the spine in neutral position and

lateral views in flexion and extension. All views were taken with the patient standing.

4. Sedimentation rate and urinalysis.

5. Assessment of the general psychological adjustment by an experienced and well-trained psychologist.

6. Report by a Rehabilitation Officer detailing the work history and the educational and social background. All reports were compiled by one senior Rehabilitation Officer.

7. Estimation of physical demand of job at the time of the accident, according to the following classification: Class 1, in which the heaviest of physical requirements were demanded, gradually through decreasing physical requirements to Class 12, the very lightest. Again, all these reports were prepared by one Rehabilitation Officer.

Treatment

Random sampling number tables were used to assign the patients to one of two treatment programs.

Program A (Group IIIA, Table I): On this program, after the above investigation, the patient was discharged from the Centre to the care of his own doctor. By telephone and by letter, the doctor was requested to treat the patient in whatever manner he thought advisable. The patient was readmitted to the Centre at the end of six weeks and the investigative procedures noted above were repeated. If the patient was judged fit to return to work before six weeks had passed, he was still readmitted to the Centre for this assessment.

Program B (Group IIIB, Table I): The patient remained on this program in the Centre for six weeks unless he became fit for work earlier. The aims of treatment were to relieve pain and to restore the capacity for physical exercise to the level demanded by the requirements of the the man's job. Treatment was divided roughly into four stages, namely, hospital bed rest, light progressive, moderate progressive, and heavy progressive activities. The demands of treatment were kept within the tolerance of the individual. Any of the facilities of the departments of physiotherapy, occupational therapy and remedial gymnastics were used, when, in the opinion of the "back study" clinician, they were indicated. Treatment was carried out by a team of therapists from the three departments working in close co-operation with each other and with the clinician.

Principles and techniques of treatment were described in detail in the protocol of the study, and were similar to those used in the Centre for cases not on this study. It was a program tailored to the particular needs of the individual.

Comparability of Patients in Group III on Programs A and B

The 95 patients in Group IIIA, and the 99 patients in Group IIIB were treated in radically

TABLE IV.—DISTRIBUTION OF VARIOUS FACTORS IN PATIENTS ON THE TWO TREATMENT PROGRAMS

Variable	Program A		Program B		Total	
	Cases	%	Cases	%	Cases	%
Origin:						
Canadian.....	36	37.9	46	46.5	82	42.3
Italian.....	27	28.4	28	28.3	55	28.3
Others.....	32	33.7	25	25.2	57	29.4
Diagnosis:						
No. 3.....	23	24.2	27	27.3	50	25.8
No. 4.....	17	17.9	20	20.2	37	19.1
No. 7.....	55	57.9	52	52.5	107	55.1
Age:						
20 - 29 years.....	15	15.8	18	18.2	33	17.0
30 - 39 ".....	38	40.0	38	39.4	77	39.7
40 - 49 ".....	29	30.5	30	30.3	59	30.4
50 - 59 ".....	13	13.7	12	12.1	25	12.9
Seniority:						
Less than 1½ years.....	44	46.3	42	42.4	86	44.3
1½ years to less than 5 years	23	24.2	28	28.3	51	26.3
5 years and over.....	28	29.5	29	29.3	57	29.4
Job at time of accident:						
Heavy.....	24	25.3	13	13.1	37	19.1
Medium.....	37	38.9	55	55.5	92	47.4
Light.....	34	35.8	31	31.3	65	33.5
Employing industry:						
Construction.....	19	20.0	13	13.1	32	16.5
Mining.....	10	10.5	4	4.4	14	7.2
Transport.....	5	5.3	11	11.1	16	8.2
Others.....	61	64.2	71	71.7	132	68.0
Modified work assured.....	29	30.5	39	39.4	68	35.0
Modified work not assured...	66	69.5	60	60.6	126	64.9
Economic status stable.....	84	88.4	90	90.9	174	89.7
Economic status unstable....	11	11.6	9	9.9	20	10.3
General adjustment psychologically:						
(137 tested) Normal.....	24	36.4	40	56.3	64	46.7
Equivocal.....	24	36.4	15	21.1	39	28.5
Abnormal.....	18	27.2	16	22.5	34	24.8
English:						
Adequate.....	67	70.5	69	69.7	136	70.1
Inadequate.....	28	29.5	30	30.3	58	29.9
Radiograph finding in spine:						
Negative.....	13	13.7	15	15.1	28	14.4
Degenerative changes present.....	70	73.7	80	80.8	150	77.3
Instability present.....	49	51.6	44	44.4	93	47.9
Developmental abnormality present.....	17	17.9	10	10.1	27	13.9
Admission symptoms:						
Nil to mild.....	—	—	—	—	—	—
Moderate.....	15	15.8	13	13.1	—	—
Severe.....	80	84.2	86	86.9	—	—

different ways, as described in the two preceding paragraphs. In order to be as sure as possible that the difference in treatment in these two groups produced the difference in degree of improvement, it seemed important to determine whether or not the groups differed in any other important respect. For this reason the patients in the two groups were compared according to nationality, diagnosis, age, seniority at job, physical demands of job, type of industry in which employed, assurance of modified work at their place of employment if required, stability of economic status, general psychological adjustment, ability to communicate in English, and severity of symptoms. It was found that the two groups were reasonably comparable with respect to all of these characteristics, none of the differences being of statistical significance (Table IV).

Measurement of Effectiveness of Treatment

We had found in the previous groups in the study that clinical assessment of the man's ability to work frequently did not correspond to his actual work performance after discharge. Therefore assessment of effectiveness of treatment in the

TABLE V.—CRITERIA FOR CLASSIFICATION OF RESULTS OF TREATMENT ON BASIS OF WORK RECORD DURING FIRST 90 DAYS AFTER DISCHARGE FROM BACK STUDY

<i>Clinical result</i>			
<i>Satisfactory</i>		<i>Unsatisfactory</i>	
<i>Excellent</i>	<i>Good</i>	<i>Fair</i>	<i>Poor</i>
1. Working full time at pre-accident job	1. Working at pre-accident job but with up to 20% time loss	1. Working at pre-accident job but with 20 - 50% time loss	1. Working at pre-accident job with more than 50% time loss
or	or	or	or
2. By own statement is able for 1 (above)	2. Working at modified work with no time loss	2. Working at modified job with up to 20% time loss	2. Working at modified job with 20 - 50% time loss
	or	or	or
	3. By own statement is able for 1 or 2 (above) but not more	3. By own statement is able for 1 or 2 (above) but not more	3. By own statement is able for 1 or 2 (above) or for less
			or
			4. Has had back surgery in the first follow-up period

Note: All limitation of ability to work is caused by "low back" symptoms.

patients in Group III was based on the records of the actual accomplishment at work during the first three months after discharge from the study. Obviously there is much possible variation in levels of accomplishment at work in any group of patients during this three-month period. We arbitrarily divided these possible levels into four groups: "excellent", "good", "fair" and "poor". These terms are defined in Table V. This classification affords a practical measure of the success of the Centre in achieving its purpose, which is the rehabilitation of its patients.

Results

In Table VI the "excellent" and "good" results have been combined as "satisfactory", and the "fair" and "poor" as "unsatisfactory".

1. In Program A satisfactory results were obtained in about 15% of patients and in Program B in about 42%.

TABLE VI.—RESULTS ON BASIS OF WORK HISTORY (TABLE V) DURING THE 90 DAYS FOLLOWING PROGRAM A (UNDER OUTSIDE DOCTOR) AND PROGRAM B (IN THE CENTRE)

	<i>Program A</i> <i>95</i>	<i>Program B</i> <i>99</i>	<i>Total</i> <i>194</i>
Judged clinically fit for work after six weeks.....	31 = 32.6%	59 = 59.5%	90 = 46.4%
Proved "unsatisfactory".	16 = 16.8%	17 = 17.1%	33 = 17.0%
Proved "satisfactory"	15 = 15.8%	42 = 42.4%	57 = 29.4%

With respect to the first question posed before the study of Group III was started, namely "Do the results of treatment of problem 'low back' cases in the Ontario Workmen's Compensation Board Hospital and Rehabilitation Centre justify the time, effort and expense involved?", treatment for six weeks in the Centre produced satisfactory results two and one-half times more often than a comparable period of treatment outside. Nevertheless, satisfactory results were obtained in only

four of 10 patients by treatment in the Centre, a disappointing result indeed. It is important to note that for each four patients in whom satisfactory results were obtained, there were six failures.

2. At the end of six weeks, of the 95 patients on Program A, 31 were discharged as "fit to go to regular or modified work", but subsequently only 15 proved to be fit in terms of work accomplishment in the first 90 days after discharge. Of 99 on Program B, 59 were discharged at six weeks as fit to return to regular or modified work, and only 42 proved actually capable of this. Thus clinical assessment of ability to work proved inaccurate in 33 of 90 cases.

3. Prolonging Program B beyond six weeks yielded only nine additional satisfactory results in 40 patients.

4. In the study of the patients in Group III, we examined 14 factors that were considered to have a possible effect on the result obtained from treatment. These factors and their distribution in the "satisfactory" and "unsatisfactory" groups are shown in Table VII. Surprisingly, only the last two, co-operation and accomplishment on treatment, seemed to have a relationship to the final outcome. However, this may have been due simply to the fact that many of those who co-operated well and carried out more of the prescribed treatment program had a less severe back pain.

Thus, in answer to the second question, "Are there any factors which have a definite prognostic significance in the individual case?", it appears that none of the various associated factors had any prognostic significance when applied to the entire group. It seems that the results of treatment cannot be predicted by routine consideration and weighing of these factors. Nevertheless, it is possible that some of these factors may be of value in prognosis, in an individual case, if applied carefully by an experienced clinician.

In the mass of accumulated data there were many findings which seemed sufficiently interesting to record, although they have questionable or no

TABLE VII.—DISTRIBUTION OF VARIOUS FACTORS IN "SATISFACTORY" AND "UNSATISFACTORY" CASES

Result	Satisfactory		Unsatisfactory		Total	
	75 cases		119 cases		194 cases	
Factor	Cases	%	Cases	%	Cases	%
Origin:						
Canadian	38	50.7	44	37.0	82	42.3
Italian	21	28.0	34	28.6	55	28.3
Others	16	21.3	41	34.5	57	29.4
Diagnosis:						
Number 3	21	28.0	29	24.4	50	25.8
Number 4	12	16.0	25	21.0	37	19.1
Number 7	42	56.0	65	54.6	107	55.1
Age group:						
20 - 29 years	12	16.0	21	17.6	33	17.0
30 - 39 "	31	41.3	46	38.6	77	39.7
40 - 49 "	24	32.0	35	29.4	59	30.4
50 - 59 "	8	10.7	17	14.3	25	12.9
Seniority at accident:						
Less than 1 month	2	2.7	12	10.1	14	7.2
1 month to less than 1½ yrs.	26	36.7	46	38.6	72	37.1
1½ years to less than 5 years	21	28.0	30	25.2	51	26.3
5 years and over	26	36.7	31	26.0	57	29.4
Job at time of accident:						
Heavy	13	17.3	24	20.2	37	19.1
Medium	33	44.0	59	49.6	92	47.4
Light	29	38.7	36	30.2	65	33.5
Employing industry at accident:						
Construction	9	12.0	23	19.3	32	16.5
Mining	6	8.0	8	6.7	14	7.2
Transport	8	10.7	8	6.7	16	8.2
Others	52	69.3	80	67.2	132	68.0
Modified work assured	36	48.0	32	26.9	68	35.0
Modified work not assured	39	52.0	87	73.1	126	64.9
Economic status stable	68	90.7	106	89.1	174	89.7
Economic status unstable	7	9.3	13	10.9	20	10.3
General adjustment psychologically of 137 tested:						
Normal	28	50.0	36	44.4	64	46.7
Equivocal	15	26.8	24	29.6	39	28.5
Abnormal	13	23.2	21	25.9	34	24.8
English spoken:						
Adequate	60	80.0	76	63.9	136	70.1
Inadequate	15	20.0	43	36.1	58	29.9
Radiographic findings L.S. spine:						
Negative	9	12.0	19	16.0	28	14.4
Degenerative change present	60	80.0	90	75.6	150	77.3
Instability present	34	45.3	59	49.6	93	47.9
Developmental abnormality present	8	10.7	19	16.0	27	13.9
Assessment of motivation at end of treatment in 180 recorded:						
Above average	24	35.8	17	15.0	41	22.8
Average	34	50.7	61	54.0	95	52.8
Below average	9	13.5	35	31.0	44	24.4
Co-operation at treatment of 173 recorded:						
Above average	41	64.1	34	31.2	75	43.4
Average	16	25.0	47	43.1	63	36.4
Below average	7	10.9	28	25.7	35	20.2
Accomplishment on treatment of 125 recorded:						
Above average	35	58.3	18	27.7	53	42.4
Average	16	26.7	25	38.5	41	32.8
Below average	9	15.0	22	33.8	31	24.8

practical application in the solution of the original questions. Some of these findings are shown in Table VIII.

DISCUSSION

The possibility that compensation payment *per se* has an unfavourable effect on the result of treatment of industrial injuries is often suspected. In this study all of the patients received compensation. However, the rate of successful treatment was more than two and one-half times higher among those who were kept in the Centre than among those sent back to the care of their personal physicians. It is reasonable to assume that this difference would not have been so marked if payment

TABLE VIII.—INTERESTING INCIDENTAL FINDINGS

Country of origin:	
Canada	44%
Italy	28%
Others	28%
Time of accident:	
47% between 9:30 and 11:30 a.m., or 1:30 and 3:30 p.m.	
Mechanism of injury:	
Strains in flexion, rotation and with lifting—87.7%	
Type of job:	
Labourers	21.8%
Truck drivers	10.2%
Carpenters	6.3%
Miners	5.3%
Physical requirement of job:	
Heavy	18.7%
Medium	47.6%
Light	33.4%
Average age:	
37.5 years	
Seniority:	
Less than 1 month	7.2%
1 month to 1½ years	37.1%
1½ to 5 years	26.3%
Over 5 years	29.4%
Compensation per week:	
Lowest	\$22.00
Highest	\$84.56
Average	\$64.17
Education:	
Lowest	No formal education
Highest	Grade 13
Average	Grade 7
English-speaking:	
No English	12.1%
Poor	17.0%
Fair	42.2%
Satisfactory	28.7%
Economic state:	
Stable	90.3%
Precarious	9.7%
Onset: Sudden	99.1%
Previous history:	26.7%
Physical evidence of improvement:	
Most useful is increased range of spinal motion.	
Overweight:	28.2%
Sedimentation rate and urinalyses:	
No abnormalities	
Radiological findings:	
Normal	14.1%
Degeneration	76.2%
Instability	49.0%
Developmental abnormalities	18.9%
Jugular compression test:	
Positive in 5% of cases with nerve root involvement	

for being disabled delayed recovery to a significant degree.

Our experience suggests that continuing the treatment in the Centre for longer than six weeks is relatively unrewarding, because the increase in satisfactory results is very small. It is well known

that continuing any type of treatment, the results of which are unsatisfactory, can have a detrimental effect because it causes the patient to become pessimistic and his morale to deteriorate. Frequently, ineffective treatment is actually harmful.

We have not been able to demonstrate that any particular type of physical therapy has special merit over other types. This, coupled with the low overall rate of success, raised the doubt whether physical therapy *per se* has any beneficial effect in these cases. However, some factor must be operating at the Centre which accounts for the larger number of patients reaching a satisfactory work tolerance during their stay here. There are, undoubtedly, influences, other than treatment, acting on patients in the Centre. These, though unmeasurable, may be responsible for the improvement in those who achieve a satisfactory result. For example, does the doctor's insistence that the patient continue to be as active as his condition warrants, lead him to discover that he can exert himself sufficiently to return to work in spite of his discomfort? This possibility is suggested by the fact that all of those followed up, to the present, and who are working, report that their low back pain persists. It appears that they have learned to accept this continuing pain as inevitable and, ignoring it as much as possible, have returned to work, even though they lacked the stimulus of economic necessity, which often forces those who receive no compensation to return to work.

The findings in this study raise doubt concerning the efficacy of conservative medical treatment in general for patients in the common "problem low back" category, namely those in whom the diagnosis is herniated intervertebral disc or disc degeneration and strain, and who continue to be disabled longer than six weeks. Perhaps it would be wiser, in cases where there is no definite indication for surgical intervention, to recognize the inadequacy of our present methods of treatment and to search for a completely new approach. Perhaps effective placement of these unfortunate workmen in jobs which are within the limitations imposed by the pain would maintain morale, avoid con-

centration of their attention on their complaints, and, while keeping up reasonable bodily activities, allow passage of sufficient time for the condition to subside. A scientific study of such a plan might be enlightening and rewarding.

SUMMARY

A study of certain aspects of chronic low back pain in compensation cases, at the Workmen's Compensation Board Hospital and Rehabilitation Centre, Downsview, Ontario, is described.

In the great majority of these patients, the symptoms were due to intervertebral disc degeneration with superadded trauma, usually occurring during a routine type of lifting strain, and with no external violence.

A significantly higher percentage of cases achieved a satisfactory level of improvement after six weeks' treatment in this Centre than after treatment outside. Nevertheless, the proportion who achieved this satisfactory result was disappointingly small.

Analysis of 14 personal factors such as the physical, mental and environmental factors peculiar to the individual, failed to reveal any that were helpful in predicting the result of treatment.

Six weeks' treatment in the Centre appeared to be the maximum time advisable. A shorter period might be as effective.

The efficacy of conservative medical treatment in these cases, as commonly carried on with the help of physical therapy, is questioned.

The need for study, to improve or create new methods of management for these cases, is emphasized.

It may be that the emphasis in management should be transferred from medical treatment to suitable job placement.

Full acknowledgment is made to the many persons within the Workmen's Compensation Board organization for the valuable co-operation, advice and help which were so freely given. Especially, the author would like to mention Mr. Harry Worling, Chief Rehabilitation Officer, and his staff. The Research Fellows, Drs. Michael Kugler, M. J. Smythe and the late S. A. Khan, performed most of the arduous and detailed work of this study. Dr. R. A. Young's faithful efforts as "back study clinician" were noteworthy. Finally, the approval and co-operation of the Workmen's Compensation Board of Ontario is cheerfully acknowledged.

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PAGES OUT OF THE PAST: FROM THE JOURNAL OF FIFTY YEARS AGO

AS A CONSEQUENCE . . . THE PHYSICIAN FAILS

The profession as a whole, while using drugs freely, often too freely, gives too little study to our gradually increasing knowledge of the exact physiological action of drugs and too little study to the dosage in which they should be employed. Drugs are to-day often prescribed with an erroneous idea of their power to influence special conditions or symptoms, and are often used in unsuitable doses. In many prescriptions that I have seen the amount given is too small to secure the greatest benefit. To obtain results from the use of strychnine as a respiratory stimulant larger doses than the 1/50th or 1/60th grain in which it is often prescribed, are necessary. The strength of tincture of nux-

vomica in the last edition of the *Pharmacopœia* was reduced 50% to make it correspond with the strength of this tincture in other countries. I have asked several druggists whether physicians had made any difference in the amount of this tincture ordered in their prescriptions before and after the change went into effect and have been told that very few have done so. Physicians cannot expect that ten minims of the new tincture will have the same result as ten minims of the old. As a consequence of this indifference, or ignorance, the physician fails to get results, and his confidence in the official drugs, and perhaps his confidence in himself as a prescriber, is impaired.—Drugs and Medical Agents from the Professional, Economic and National Standpoints, *Canad. Med. Ass. J.*, 6: 579, 1916.