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The assessment of pain: an audit of physiotherapy practice

This study concerned the adoption of scientific method by the physiotherapy profession, with pain measurement as the research focus. It involved an audit of 1010 patient records from four hospital physiotherapy departments in England, to determine how pain was assessed and recorded. The results show that while pain assessment was recorded in most of the cases audited, there was no record of reassessment in 29 per cent of cases. In the initial assessment, only 21 per cent of cases involved quantified methods, reducing to less than 2 per cent during reassessment. These results indicate that the use of recognised quantified methods for pain assessment was not standard practice amongst the physiotherapists audited. Implications for the adoption of scientific method are discussed.

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In his 1975 paper (p.1) Research or Retrench, Basmajian said of physiotherapy that "the science behind the therapeutic measures is not as strong as the faith". For more than two decades, physiotherapists have been criticised for their failure to adopt scientific method, and to engage in and utilise research. It has been strongly argued that these deficits need to be corrected in order to secure the future of the profession (Basmajian 1975, Riddoch 1991, Sim 1985). In support of this argument, a number of authors claim that it is the responsibility of practising physiotherapists to critically evaluate the effectiveness of treatment, based on scientific evidence (Campbell 1970, David 1985, Riddoch 1991). If the effectiveness of treatment is to be reliably and scientifically evaluated, then patient assessments must involve accurate measurements and recording of data. Furthermore, if the level of measurement applied to, for example, strength, range of movement or pain, is only descriptive or at best ordinal, then, as Bork (1993) and Krebs (1987) point out, it is almost impossible to assess or document changes resulting from physiotherapy treatment. The latter authors also argue that the use of reliable and valid measurement is essential in order to justify and validate what the physiotherapist contributes to patient care. If measurement is erroneous, then incorrect and even harmful clinical conclusions can be reached. The study described in this paper was conceived within the context of this argument. Its broad focus is on the use of scientific method within

physiotherapy practice, and its specific focus is upon pain assessment.

Pain assessment

Many patients requiring physiotherapy have pain as a symptom. To instigate appropriate therapy, it is necessary for the physiotherapist to be able to accurately and scientifically assess the pain, in order to evaluate the effectiveness of the treatment regime. The need for such assessment and reassessment of pain would seem self-evident, and has been argued strongly by many authors (Finch and Melzack 1982, Liggins 1982, Scudds 1983, Smith 1989, Wallenstein 1984).

Pain is a complex phenomenon that can be approached from both a phenomenological and a physiological standpoint. The term is widely used to describe a variety of sensations both emotional and physical, which can exist in many forms and have many causes (Melzack 1984). Because of the large emotional component, pain is a subjective experience and, for the physiotherapist, it is the patient's perception of pain that must be taken into account (French 1989). The experience of pain will change according to the background physiological or psychological state existing at the time (Bromm 1984, French 1989), and patients may not always recall pain or recognise its reduction during treatment. As emphasised by Finch and Melzack (1982), pain relief may be slow or incomplete, so that knowing the rate of its relief and the amount, is essential.

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However, pain cannot be directly measured in the clinical sense. Therefore the techniques that are available provide what can be described as only indicative measures. According to Liggins (1982) and Scudds (1983), they fall into two main groups – *subjective methods*, where the patient directly reports the pain experience which is then rated or scored, and *objective methods*, where an indirect measure such as analgesic intake is used. A common feature of both sets of methods is that a record is made containing quantifiable information.

Types of pain measurement in frequent use**Subjective methods**

Global Methods: The McGill Pain Questionnaire (MPQ) (Finch and Melzack 1982) is probably the best known instrument for the global assessment of pain. The Arthritis Impact Measurement Scale (AIMS) (Hill et al 1990) is another example of a method designed to evaluate different components of pain, or pain related to other problems.

Rating Scales: These are used to quantify subjective information concerning pain intensity, or the extent of pain relief. They include the simple descriptive scale (Liggins 1982), the Verbal Rating Scale (VRS) (Echternach 1987), the Graphic Rating Scale (GRS) (Scudds 1983) and the well-known Visual Analogue Scale (VAS) (Wallenstein 1984).

Pain Charts: These vary from graphs or charts which patients complete at home (Meade et al 1990) to the well-known "Maitland" type of body chart (Echternach 1987, Maitland 1986). The body chart can be used to record not only the site of the pain but also its extent, intensity, type, periodicity and behaviour. Additional information can also be recorded on the chart and this information is of value when patients are reassessed.

Objective methods

Objective methods involve recording the quantity and frequency of analgesic intake, range of movement, end of

range pain (ERP), or activities like walking distance (McCulloch 1987), and relating them to the onset or intensity of pain. Echternach (1987) describes a "pain profile" which combines several of these measures in a table. Such information can be recorded on pain charts in order to provide a baseline measurement of pain for future evaluation of the effectiveness of treatment.

The pain measurement techniques described above are accepted as reliable and valid (Echternach 1987, Melzack 1984), and are widely available for use by physiotherapists. According to Scudds (1983), pain assessment should be carried out by physiotherapists for all patients who have pain as one of their main symptoms, and not just when it is the dominant symptom. Liggins (1982) and Smith (1989) maintain that while the assessment and quantification of pain is not yet routine amongst physiotherapists, the trend towards such assessment is becoming apparent.

In order to test this assumption – and thereby to determine whether the plea for more scientific method and measurement in physiotherapy practice is being heeded – a study was carried out in several teaching hospitals in the north-east of England. This involved an audit of physiotherapy records to determine whether, when pain was recorded as a problem or was being treated, it was assessed and quantified. It was also decided to use the audit to determine (a) whether physiotherapists reassess pain during the treatment period as part of an evaluation of the effectiveness of treatment and (b) which types of pain measurement are used.

Method**Procedure**

An audit of physiotherapy records was used. This is an acknowledged method of evaluating the effectiveness and efficiency of practice, and the accuracy of record keeping (Kaye 1991). The audit questionnaire was designed to establish:

1. Whether pain was listed as a problem or was being treated.
2. Whether physiotherapists recorded pain assessment.
3. Whether physiotherapists recorded the reassessment of pain over the treatment period.
4. How physiotherapists measured pain when it was assessed, reassessed and recorded.

Information was also obtained on a number of variables including the patient's age and gender, department, diagnostic category, and whether physiotherapy staff were qualified or students. Anonymity was agreed upon, both for the hospitals involved and for the physiotherapy clinicians and students.

Sample

Four hospitals in the north-east of England were selected for the study. This was a convenience sample, reflecting the locations of the hospitals and their provision of suitable departments. Permission to carry out the audit was sought, and granted, by hospital and physiotherapy managers for each of the hospitals.

A total of 1010 patients' case notes were selected for audit, covering 423 male (42 per cent) and 587 female (58 per cent) patients. The patients ranged in age from nine to 93 years (mean 56.6 years), of whom 523 (51 per cent) were hospital in-patients and 487 (49 per cent) were hospital out-patients. Of these, 896 (89 per cent) were assessed or treated by qualified physiotherapy staff and 114 (11 per cent) by physiotherapy students. To arrive at this sample, approximately 2400 case notes were screened from physiotherapy records for 1993 in the four hospitals. Selection for the audit required that at least one of the following criteria was met:

1. Pain was listed on the problem list.
2. Pain was being treated.
3. Pain was included in the initial assessment.

The ongoing physiotherapy treatment notes for each patient were further audited to establish whether

Table 1.
Initial assessment and reassessment of pain (A) when treated or not by physiotherapy and (B) by hospital department.

		(A) Pain Treated		(B) Department	
		Yes	No	In-patient	Out-patient
Pain Initially Assessed	Yes	620	301	439	482
		62%	30%	43%	8%
	No	22	67	84	5
		2%	7%	8.5%	0.5%
		$\chi^2_{(1)} = 63.59, p < 0.001$		$\chi^2_{(1)} = 71.26, p < 0.001$	
Pain Re-assessed	Yes	518	205	306	417
		52%	21%	31%	42%
	No	109	162	201	70
		11%	16%	20%	7%
		$\chi^2_{(1)} = 83.58, p < 0.001$		$\chi^2_{(1)} = 81.84, p < 0.001$	

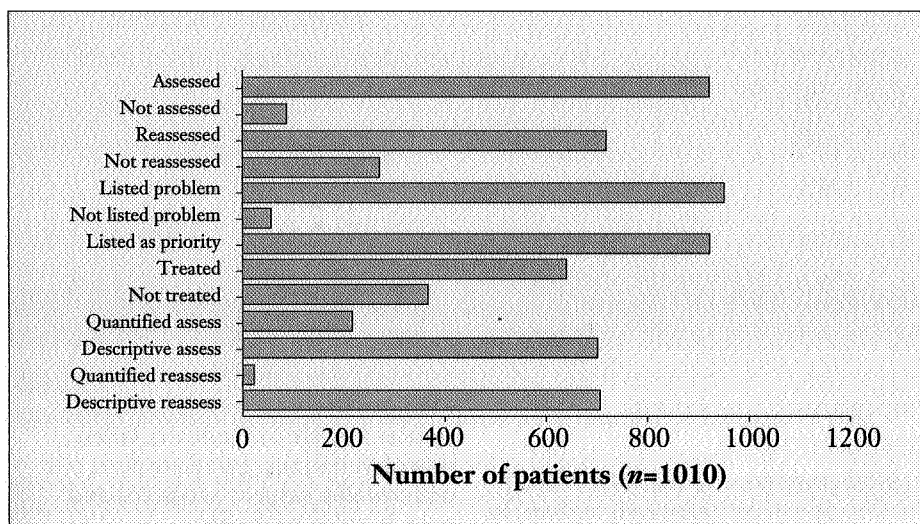


Figure 1.
The recorded assessment of patients' pain.

there was recorded reassessment of pain over the treatment period, and by what method any such re-evaluation was performed. It may be noted that the original intention was to use cases where pain was listed as a problem. However, it was found that a number of physiotherapists did not use the Problem Oriented Medical Recording

(POMR) system, which is an accepted scientific method of recording patient assessment and the results of treatment (Bromley 1978). The criteria were therefore widened. Case notes from the elderly care day hospitals and paediatric departments were not audited.

Statistical analyses

The Statistical Package for the Social Sciences (SPSS) was used for the analysis. A range of techniques was employed involving both descriptive and inferential statistics. Given the extent of multiple statistical inference involved in the study, the $p < 0.01$ level was pre-selected as denoting statistical significance.

Results

Assessment of pain

From Figure 1 it can be seen that in more than 90 per cent of the cases audited, pain was listed as a problem and, in most cases, as a priority problem. In 64 per cent of cases, pain was treated by physiotherapy. Pain was assessed in some way in almost all cases. However, 89 cases (9 per cent, of which 83 had pain listed as a problem; 81 as a priority problem) had no recorded assessment. The remaining six cases had pain treated by physiotherapy means.

Analysis of the data (Table 1) revealed a significant association between the assessment of pain and its treatment by physiotherapy ($\chi^2_{(1)} = 63.59, p < 0.001$). There was no significant association between the listing of pain as a problem and assessment. However, 94 per cent of those 921 initially assessed had pain listed as a problem. It is notable that although pain was assessed in 921 cases, in only 217 of these (21 per cent) was it quantified by any method, the remaining 79 per cent being assessed by descriptive methods only (Figure 1).

Reassessment of pain

Reassessment of pain during the treatment period occurred in 73 per cent of the 921 cases where pain was initially assessed (Table 1). Of these, 27 per cent (271) had no recorded reassessment, despite 254 of them having pain listed as a problem. Of the 723 cases reassessed, 94 per cent had pain listed as a problem and 63 per cent were treated by physiotherapy. It is of interest that there was a

Table 2.
Number of cases audited in in-patient and out-patient departments.

In-patients <i>n</i> =523				Out-patients <i>n</i> =487			
Surgical <i>n</i> = 302		Non-surgical <i>n</i> = 221		Orthopaedic <i>n</i> = 215		Rheumatology and other <i>n</i> = 272	
Orthopaedic Surgery	General Surgery	Rheumatology	Other	Vertebral Problems	Peripheral Joint Problems	Rheumatology	Other
180	122	126	95	98	117	73	199

Table 3.
Assessment, reassessment and treatment of pain in in-patient and out-patient departments.

		Department				
		In-patient		Out-patient		
		Surgical	Non-Surgical	Orthopaedic	Rheumatology & other	
Pain Assessed (A) Treated (T)	Yes	A	81%	89%	98%	100%
		T	10%	67%	94%	97%
	No	A	19%	11%	2%	0
		T	90%	33%	6%	3%
Pain Reassessed	Yes	54%	69%	77%	93%	
	No	46%	31%	23%	7%	

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significant association ($\chi^2_{(1)} = 83.58$, $p < 0.001$) between the recorded reassessment of pain and treatment by physiotherapy (Table 1), but not between reassessment and listing as a problem.

A further interesting feature of the data is that only 18 (2.5 per cent) of the 723 cases reassessed had pain quantified on re-evaluation (Figure 1). This represents 1.8 per cent of the total sample. Of these 18 cases, 16 were treated by physiotherapy. Pain was reassessed by descriptive means only in the remaining 705 cases.

Department (in-patient and out-patient)

Table 2 provides a breakdown of the number of patient case notes audited in the different diagnostic categories of in-patient and out-patient departments. The greatest number of case notes were from surgical in-patients (302 or 29 per cent), 60 per cent of whom had undergone orthopaedic surgery. Out-patients were mainly patients with musculoskeletal disorders. Only 3 per cent of those in the "rheumatology and other" category (Table 2) had respiratory or similar problems. The remaining patients in this "other"

category had a variety of problems, such as muscle or tendon injuries, ligament injuries, gait disorders, post-orthopaedic surgery problems and post-fracture problems.

From Figure 2 it can be seen that there are clear differences between in-patient and out-patient departments. Records indicated that pain was assessed, reassessed and treated more frequently in out-patients. Of the 99 per cent of out-patients who were initially assessed, 95 per cent had pain treated, and the reassessment of pain was recorded in 86 per cent of case notes. Of the 15 per cent fewer in-patients whose cases were initially

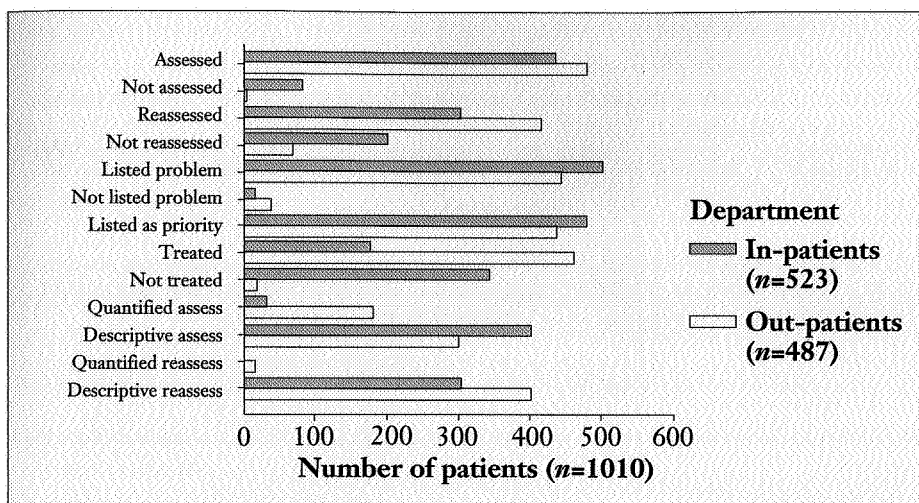


Figure 2. Differences between departments in the recorded assessment of pain.

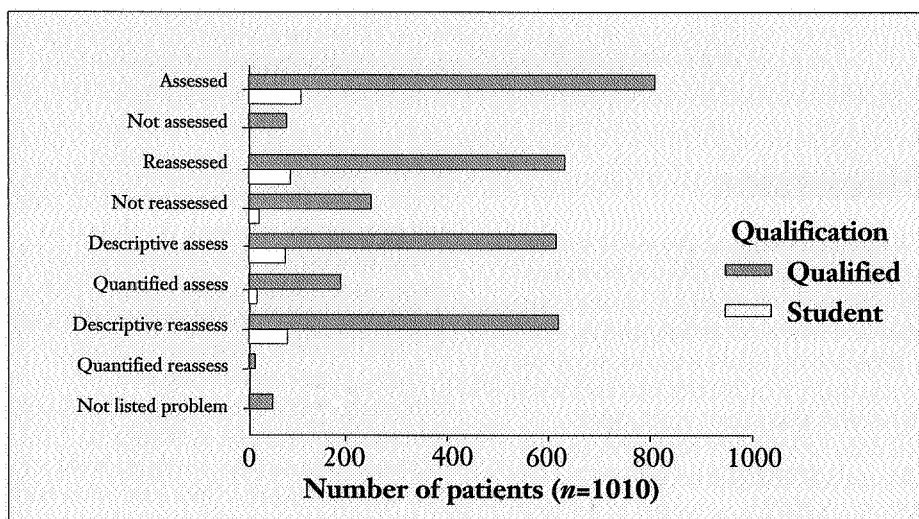


Figure 3. Differences between qualified staff and students in the recorded assessment of pain.

assessed, only one third had pain treated, while 26 per cent fewer in-patient case notes revealed reassessment of pain. Table 1 reveals that the difference in assessment was statistically significant ($\chi^2_{(1)} = 71.26, p < 0.001$). Only five out-patient case notes (0.5 per cent) had no record of initial pain assessment, compared with 84 in-patient cases (8.5 per cent); and of the 271 cases (27 per cent) with no recorded reassessment of pain, 201 (20 per cent) were in-patients. The reassessment difference was also significant ($\chi^2_{(1)} = 81.84, p < 0.001$).

Table 3 provides a comparison of the treatment of pain and its recorded assessment and reassessment in the different diagnostic categories. Pain was least likely to be treated by physiotherapy or have recorded assessment and reassessment in surgical in-patients. Recorded initial assessment of pain ranged from 100 per cent of cases in the out-patient "rheumatology and other" category, to 81 per cent of cases in surgical in-patients. The treatment of pain by physiotherapy occurred in only 10 per cent of the surgical in-patients, as

against 97 per cent of the rheumatology out-patients, a significant difference ($\chi^2_{(1)} = 408.89, p < 0.001$). The greatest difference was revealed in the recorded reassessment of pain: only 7 per cent of "rheumatology and other" out-patients had no reassessment, compared with 46 per cent of surgical in-patients. This was statistically significant ($\chi^2_{(1)} = 81.84, p < 0.001$).

Method of assessment and reassessment

The results indicate that significantly more patients who had their pain assessed by a quantified method were out-patients ($\chi^2_{(1)} = 184.02, p < 0.001$) (Table 4). Pain was quantified in four times as many out-patient as in-patient cases. Only 35 (8 per cent) of in-patient cases (4 per cent of the total sample) had pain quantified, compared with 182 (38 per cent) of out-patients. Nearly half of these 182 out-patients were found to be in the "orthopaedic" category, and it is interesting that 66 per cent of them had vertebral problems, while the remaining 34 per cent had peripheral joint disorders.

Of the 18 cases that were reassessed by quantified means, 16 were out-patients (eight orthopaedic and eight rheumatology). The significant association between the treatment of pain by physiotherapy and the method of assessment ($\chi^2_{(1)} = 53.33, p < 0.001$) is shown in Table 4. A similar relationship exists for pain reassessment. Quantified methods were more likely to be employed when pain was treated by means of physiotherapy, with the exception of surgical in-patients. Of the 35 in-patients with quantified assessment, 26 were surgical cases.

Patient gender and age

No significant differences were found between male and female patients in the assessment, reassessment or method of assessment of pain. However, there was an association between age and both pain assessment and its treatment. Patients > 55 years of age were less likely to have pain

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assessed ($\chi^2_{(1)} = 7.01, p < 0.01$) or treated by physiotherapy ($\chi^2_{(1)} = 34.71, p < 0.001$) than younger patients.

There were some interesting features demonstrated in the distribution of age and gender between departments. As shown in Table 5, the mean age of females was greater in each department sub-category and this difference was significant for non-surgical inpatients ($Z = -2.731, p < 0.01$).

Physiotherapy staff

Student physiotherapists recorded only 11 per cent (114) of the case notes audited. Eighty-nine of these cases (78 per cent) were hospital in-patients and the remainder were out-patients. It is notable that a greater percentage of cases assessed by qualified staff (10 per cent) had no form of pain assessment recorded, compared with only 1 per cent of cases assessed by students (Figure 3).

Quantified forms of pain assessment were recorded in 21 per cent of cases by qualified staff and in 25 per cent of cases by students. There were no significant differences between the two staff groups in the reassessment of pain during treatment. Qualified staff failed to re-evaluate 29 per cent of cases, compared with 23 per cent of cases for students. In addition, 4 per cent of the student cases were re-evaluated using quantified methods, compared with 2 per cent by qualified staff.

Type of quantified assessment employed

The different types of measurement employed when pain was quantified on assessment and reassessment are shown in Table 6. The most frequently used were the body chart and end of range pain (pain related to range of movement). The VAS was used on only six occasions. The body chart, although used often, was used correctly in only 90 of the audited cases. Mostly it merely indicated the site of pain, and not its extent, periodicity or intensity. The body chart was not employed in any reassessments of pain.

Table 4.

Method of pain assessment (A) when treated or not treated by physiotherapy and (B) by hospital department.

		(A) Pain Treated		(B) Department	
		Yes	No	In-patient	Out-patient
Method of Assessment	Quantitative	190 20%	27 3%	35 4%	182 20%
	Descriptive	429 47%	295 30%	404 44%	300 32%
		$\chi^2_{(1)} = 53.33, p < 0.001$		$\chi^2_{(1)} = 184.02, p < 0.001$	
Method of Reassessment	Quantitative	16 2%	2 0.3%	2 0.5%	16 2%
	Descriptive	503 70%	202 28%*	303 42%	402 55%*

* Cell sizes for quantitative are too small to permit a meaningful test of association.

Discussion

The primary aim of the audit was to determine whether physiotherapists use scientific method when assessing pain and when recording the results. It is possible that pain was assessed and reassessed verbally, but not recorded. However, this is not employing scientific method. The Problem Oriented Medical Records (POMR) system, which is accepted as being a scientific method of recording patient assessment and the results of treatment, was clearly used in the majority of the patient records audited. However, the remainder of the results were not in keeping with this positive finding. Four key points emerge which give cause for concern.

1. Assessment and treatment of pain

Pain is considered to be a treatable symptom and, as indicated earlier, most patients are referred for physiotherapy directly because of pain, or because pain is a component of the condition being treated. In the present audit, more than 60 per cent of patients had their pain treated by

physiotherapy. However, as 9 per cent of the audited case notes revealed, pain was not always assessed. As shown in Table 1, a significant proportion of those assessed had pain treated. The link between the treatment of pain and its physiotherapy assessment is most evident when considering the differences between in-patient and out-patient departments, as shown in Figure 2. Those least likely to have pain assessed were in-patients who had undergone surgery. These patients were also less likely to have pain treated by physiotherapy, although pain was often listed as a priority problem. This is probably because the pain impeded respiratory performance or active mobilisation. There was no record of any consideration being given to such pain during physiotherapy treatment - that is, in terms of planning the physiotherapy to coincide with analgesic administration, altering the patient's posture or any other treatment that could modify the pain.

2. Reassessment of pain

The audit revealed a disappointing number of cases where no reassessment of pain, by any means, was recorded

Table 5.
Patient age and gender distribution by department.

	Mean Ages (Year) by Department			
	Department			
	In-patient		Out-patient	
	Surgical	Non-surgical	Orthopaedic	Rheumatology and Other
Male	60	55	44	48
Female	63	63	48	51

	Age Categories by Department				
	Age				
	9 - 24	25 - 39	40 - 54	55 - 69	70+
In-patient	31	51	84	163	194
Department	3%	5%	8%	16%	19%
Out-patient	33	117	154	138	45
Department	3%	12%	15%	14%	5%

Table 6.
Types of quantitative measurement by department.

	Types of Quantitative Measurement					
	End of Range Pain	Body Chart	McGill Pain Questionnaire	Numerical Scales	Verbal Rating Scale	Gait
In-patient	8	16	0	4	2	5
Out-patient	79	74	0	20	4	10
Total	87	90	0	24	6	15
Reassessment	11	0	0	4	1	2

during the physiotherapy program. Of those originally assessed, 22 per cent apparently were not reassessed in any way. This indicates a lack of scientific method, in that there is no recorded evidence supporting the effectiveness or otherwise of the physiotherapy treatment. This is in marked conflict with what is urged in the physiotherapy literature, which emphasises the critical need for

ongoing reassessment and recording.

As with the initial assessment of pain, its reassessment was significantly linked to whether or not the pain was treated by physiotherapy. This suggests that physiotherapy clinicians were less concerned with the effect that other physiotherapy interventions may have on pain, if the pain itself was not receiving direct treatment.

3. Level of measurement

The audit revealed (Figure 1) that, although pain was assessed and recorded in the great majority of cases, the level of measurement was merely descriptive in all but 23 per cent of cases. Even more disappointing is the fact that in only a very small percentage of cases was pain reassessed by any quantified method. These results are highly revealing, and suggest that not all physiotherapists had a precise record of their patients' symptoms or, it follows, a precise record of the extent of pain relief, which Finch and Melzack (1982) regard as essential in order to evaluate the effects of the physiotherapy treatment. According to Krebs (1987) and Bork (1993), these results indicate that in most of the cases audited there was no scientific justification for modifying the physiotherapy treatment.

As reported, there was a significant association between the treatment of pain by physiotherapy and whether or not it received any form of quantified assessment (Table 4). This is a further indication that less consideration may be given to pain in the treatment plan if it is not receiving direct physiotherapy treatment, which is a further cause for concern. Physiotherapists should assess and quantify pain in all patients where pain is a main symptom, in order to judge the effects of the physiotherapy regime upon the patient's symptoms.

The small number of cases reassessed by quantified means (Table 4) did not justify further analysis but it is notable that in 16 of the 18 cases where pain was quantitatively reassessed, it was treated by physiotherapy. The use of quantified pain reassessment in such a small number of the cases audited suggests that the most likely form of reassessment may well be a question along the lines of "How is the pain today?". This is unlikely to generate any meaningful, objective data of diagnostic value on which to base treatment modifications.

As Table 4 shows, there was a highly significant difference between in-

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patient and out-patient departments in the recorded use of quantified methods for assessment and reassessment. Only 4 per cent of in-patients had quantified pain assessment, while less than 0.5 per cent had quantified reassessment, and significantly fewer in-patients had pain treated by physiotherapy. This further reinforces the view that when pain is not directly receiving physiotherapy treatment, less consideration is given to this symptom, even though it may be a priority problem.

The fact that older patients were less likely to receive quantified pain assessment may be because more were in-patients, and thus pain was significantly less likely to be treated or assessed (Table 5). When pain was quantified, the most favoured methods were the body chart (Maitland 1986) and ERP (McCulloch 1987). It is surprising that the VAS was rarely used, even though it is found in frequent use by physiotherapists in research reports. It is also of interest that the body chart was used very frequently, but its use was almost always to record the site of pain and not to provide other objective or quantifiable information, as suggested by Melzack (1984) and Maitland (1986). The fact that there were no instances where the chart was used in the re-evaluation of pain during treatment suggests that physiotherapists may not be aware of its full potential.

4. Clinical education of physiotherapy students

Of major concern is the fact that the audit was conducted in hospitals which provide physiotherapy clinical training for student physiotherapists, and that qualified physiotherapy staff tended not to utilise quantifiable methods when assessing patients' pain. Of even greater concern is the fact that 10 per cent of the cases assessed by qualified staff did not include any form of pain assessment.

Conclusion

In the audit, the only really positive evidence of physiotherapists' employment of scientific method was that the majority used the POMR system of recording. The results of the audit were otherwise disappointing. It was surprising to find that more than a quarter of all the cases audited had no recorded evidence of reassessment of pain, and that quantified assessment and reassessment of pain were generally absent. These results clearly indicate that the wide range of uncomplicated techniques of pain measurement available to the profession were generally not employed, which is in direct conflict with what is urged in the physiotherapy literature. This could also have serious implications for physiotherapy clinical education, if similar practice occurs elsewhere.

While it is acknowledged that these results cannot be generalised, it would be informative to know to what extent they are representative of physiotherapy practice in the United Kingdom. It would also be of interest to determine to what extent physiotherapists are aware of the wide range of pain measurements that are available.

Given the results of this audit, it would seem that the optimism expressed by some authors that physiotherapists are progressing towards greater use of pain measurement may not be justified. Even more disturbing is the apparent support provided by this audit for Basmajian's view, expressed as far back as 1975, that "the science behind the therapeutic measures is not as strong as the faith" (Basmajian 1975, p.1)

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