

Non-steroidal anti-inflammatory drugs (NSAIDs): Physiotherapists' use, knowledge and attitudes

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This paper reports on a survey regarding physiotherapists' knowledge, use and attitudes to non-steroidal anti-inflammatory drugs (NSAIDs), some of which have recently been re-scheduled to non-prescription dispensing. A written survey instrument was developed and administered to 750 physiotherapists in South Australia, Tasmania and the Australian Capital Territory (50% of the registered physiotherapists). Responses were received from 285 physiotherapists. The survey identified opportunities for patient misuse and misadventures with NSAIDs in conjunction with physiotherapy management. Differences in physiotherapists' understanding of the dosage and actions of oral and topic administrations of NSAIDs were highlighted, as were the moral and ethical responsibilities of physiotherapists to patients considering taking NSAIDs. The study identified the need for regular professional updates on quality use of NSAIDs. [Grimmer K, Kumar S, Gilbert A and Milanese S (2002): Non-steroidal anti-inflammatory drugs (NSAIDs): Physiotherapists' use, knowledge and attitudes. *Australian Journal of Physiotherapy* 48: 82-92]

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Introduction

Australian community physiotherapists mostly operate as primary contact practitioners, with an estimated 90% of their contacts related to the musculoskeletal system (Grimmer et al 1998). Analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) are the most common pharmaceuticals for alleviating the pain and reduced function of musculoskeletal conditions (Moore et al 1998).

Concerns have been formally expressed in Australia regarding physiotherapists' role in drug administration since 1992 (New South Wales Physiotherapists Registration Board 1996 Policy Statement). As a result of these concerns, Lansbury and Sullivan surveyed practising NSW physiotherapists in 1996 regarding their knowledge of, and involvement with, patient medications (Lansbury and Sullivan 1998, Sullivan and Lansbury 1999). This study highlighted the need for better physiotherapy education regarding, among other medications, NSAIDs use, indications, contraindications, drug interactions and side effects. The result of this survey was a policy statement by the NSW Physiotherapists' Registration Board reminding physiotherapists of their responsibilities under the (then) legislation (New South Wales Physiotherapists' Registration Board Policy Statement 1996). The influence of this action was not evaluated in other states in Australia. Due to the independence of state physiotherapy registration boards in Australia, it is likely that the policy statement would have had very little influence on practice behaviours elsewhere.

A further reminder to physiotherapists of their responsibility under the legislation came in the form of a Letter to the Editor published in the members' newsletter of the South Australian Branch of the Australian Physiotherapy Association (APA) newsletter, written by a representative of the Drugs and Poisons section of the Department of Human Services following a patient complaint (McKellar 1999). This letter outlined the relevant scheduling of NSAIDs under the Controlled Substances Act 1984 and the Controlled Substances (Poisons) Regulations 1996, and the limitations this Act and Regulation placed on physiotherapists supplying NSAIDs to clients.

Recently, there has been a change in the scheduling in Australia of some NSAIDs, from medical prescription only to non-prescription status, which now allows these NSAIDs to be sold over the counter in supermarkets and pharmacies. Despite the recognition of the role of physiotherapists in quality medications use by patients (Lansbury and Sullivan, 1998, McKellar 1999, Sullivan and Lansbury 1999), the change in scheduling of NSAIDs has not been accompanied by concerted attempts to educate physiotherapists about how their responsibilities may have changed. Thus, the combination of more freely available NSAIDs being commonly used as adjuncts to physiotherapy treatment (Moore et al 1998), leads to an increased potential for medication misuse and misadventure.

This paper reports on findings from a study which

collected current information on knowledge, treatment behaviours and attitudes of Australian physiotherapists regarding the use of NSAIDs in clinical practice (Grimmer and Gilbert 2001). We intend to use this information to determine whether there is a need for specific education for physiotherapists on NSAIDs, and if so, what the focus of that education should be.

Method

Preliminary information Preliminary framing information was sought for this project. All Schools of Physiotherapy in Australia were contacted regarding the number of hours and content of pharmacological training offered to undergraduate and postgraduate students. The physiotherapists registration boards in each state were contacted regarding their interpretations of, and advice to, physiotherapists on the Standard for the Uniform Scheduling of Drugs and Poisons No 14 (Australian Health Ministers Advisory Council 1999).

Project support Steering and reference committees were convened to guide the conduct of the study and the interpretation of its findings. The Steering Committee comprised experienced physiotherapy practitioners from each of the three surveyed states and territory (South Australia, Tasmania and the Australian Capital Territory (ACT)). The Reference Committee comprised representatives of the APA and state registration boards, a consultant pharmacist, the head of a School of Physiotherapy, a health economist and a surveyor of the APA's Quality Endorsement Programme.

Development of the survey instrument In-depth semi-structured telephone interviews were conducted by one of the research team involving 30 physiotherapists in the participating states/territory. The participating physiotherapists were identified by members of the Steering and Reference Committees as having specific interests or experiences in NSAID use. This aspect of the research was conducted in the manner described by Rice and Ezzy (1999). The purpose of the interviews was to construct a conceptual framework of physiotherapists' knowledge and attitudes to NSAID use in clinical practice. Key themes, concepts and words were synthesised from these interviews and formed the basis for the development of a written survey instrument.

This aspect of instrument development highlighted the difficulties of interpreting practice behaviours that were collected using categorical (graded) responses, as discussions with physiotherapists indicated significant differences in interpretation of categories. As the purpose of this survey was to determine and define the education needs of physiotherapists regarding NSAIDs, binary responses to questions was considered to be more valid and useful than attempts to grade information elicited by the survey instrument.

Survey instrument (Appendix) A draft written survey instrument was subsequently designed from the interview

findings. Four sections were developed:

- physiotherapist demographics
- knowledge of NSAIDs and their quality use
- current use of NSAIDs in clinical practice
- attitudes to the use of NSAIDs in clinical practice.

The survey instrument consisted of free text and checklists (including correct and incorrect answers to questions), and was limited to two double-sided A4 pages to facilitate efficient completion. One of the research team provided the correct answers to the checklist questions in the survey that tested physiotherapists' knowledge on aspects of NSAID administration. The respondents' answers could then be compared with the correct responses, and the percentage that were correct, incorrect or unknown reported. Physiotherapists' knowledge of legislation regarding NSAID use in clinical practice was tested in a question with set responses. We were reluctant to suggest correct answers for these questions because of the differential interpretations of the words "use" and "recommendations" between the Poisons Act and registration boards' information to physiotherapists.

The instrument was tested for face, content and construct validity, using iterative processes outlined by Carmines and Zeller (1979) and Hunt et al (1982). The steps were:

1. Each member of the Steering Committee trialled the questionnaire on 20 practising physiotherapists in their own state, for usability, ease of completion and omissions.
2. On the basis of the responses from these physiotherapists, the research team made changes to question wording, layout, content and intent.
3. The revised survey instrument was returned to the Steering Committee for comment, again resulting in changes to question wording, layout, content and intent.
4. The resultant questionnaire was sent to the Reference Committee and to all members of staff and higher degree students in the School of Physiotherapy, University of South Australia for:
 - comment on design, usability and layout, and
 - completion to test usability and response range.

Further refinements were made to the instrument, with the resultant document being again circulated to the Steering Committee for comment. The final version of the questionnaire was agreed by the research team and the Steering Committee in early September 2000, and is provided as an appendix to this paper.

Subjects A random selection of 50% of the registered physiotherapists in South Australia, Tasmania and the ACT was surveyed by mail with this instrument. Randomisation was by computer generated selection from a list of all currently registered physiotherapists in the two states and

Table 1. Comparison between state workforce data and workplaces reported in our sample.

	Private practice	Hospital practice	Aged care
AIWH SA	47%	24%	21%
SA response	60%	29%	11%
AIWH Tas	44%	33%	14%
Tasmania response	48%	27%	25%
AIWH ACT	48%	31%	17%
ACT response	67%	16%	16%
AIWH (All Aus)	44%	33%	15%

one territory. This process, and the subsequent mail-out of the survey instrument, was conducted independently by the registration board clerical staff in each state and territory. As responses to the questionnaire were also anonymous, the research team thus remained independent of the sampling and recruitment process, and of who had responded in each state. Reply paid envelopes were used to facilitate questionnaire return directly to the Centre for Allied Health Research, University of South Australia.

The states of South Australia and Tasmania, and the ACT were chosen to reflect a range of practice locations. Physiotherapists in the ACT reflect generally urban or large rural practice, situated at several major sites, whilst physiotherapists in South Australia and Tasmania reflect a mix of urban, large and small rural and remote practice (AIHW Physiotherapy Workforce Document 2001). Table 1, in the Results Section, allows comparison of this data, with the respondent's workplace.

A total of 750 questionnaires were sent: 150 in Tasmania, 450 in South Australia, and 150 in the ACT. Responses were collated by state and major place of work.

Data analysis Quantitative data was analysed by frequency of response to each question, in most instances as a percentage of the total number of responses to each question. This accounted for multiple responses that could be provided by participants. Differences were tested between response locations by comparing proportions using the Chi square statistic, or differences between means, as appropriate. Qualitative data (the text responses) were analysed for key themes and concepts and the frequency of these was also reported. As described previously, differences were sought between the nature and the frequency of responses, between response locations.

The aim of analysis was to establish whether there was a need for the development of an education package for physiotherapists, and if so, which areas this package would need to address.

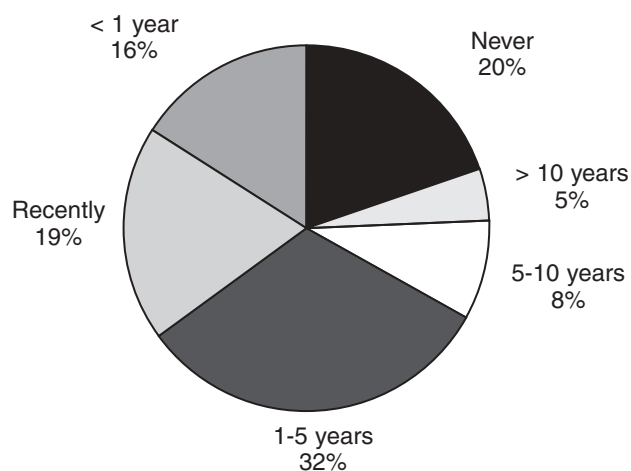


Figure 1. The frequency with which respondents had updated their knowledge on NSAID use.

Results

Preliminary investigations

Our survey of physiotherapy schools, the APA and state registration boards suggested that the up-to-date training in the quality use of medicines by physiotherapists in Australia is not comprehensively or standardly addressed at either tertiary training (undergraduate or postgraduate levels) or in professional continuing education following graduation. There is no competency standard for pharmaceutical education for graduating physiotherapists and there is no standard content of curriculum on pharmaceutical training at undergraduate, postgraduate or professional development levels. There are also variable interpretations between states of the Standard for the Uniform Scheduling of Drugs and Poisons No 14 (Australian Health Ministers Advisory Council 1999), highlighting a number of “grey” areas of interpretation within definitional contexts. Thus there appeared to be little guidance for physiotherapists in appropriately and correctly dealing with NSAIDs in clinical practice. This finding supported the need for our project to establish current practice and understanding by physiotherapists of NSAIDs in the clinical setting.

Response to survey and subject demographics

Responses to the survey instrument were obtained from 285 physiotherapists in total, representing an overall response rate of 38%. The response rate in each state was similar, and there were no differences between states/territory in proportion of responses to any of the questions reported in this paper. We compared our sample with physiotherapy workforce information (Australian Institute of Health and Welfare (AIHW) workforce data

Table 2. Physiotherapists' knowledge of the legislation regarding NSAIDs.

	Legislation allows	Answer left blank	Don't know
Physiotherapists to advise on the use of NSAIDs	50.6%	5.7%	43.7%
Physiotherapists to prescribe NSAIDs	51.0%	0.8%	48.1%
Physiotherapists to recommend NSAIDs	60.0%	6.3%	33.7%
Physiotherapists to supply oral NSAIDs	40.8%	5.4%	53.8%
Physiotherapists to supply topical NSAIDs	48.6%	11.6%	39.9%
Physiotherapists to use NSAIDs in patient treatment	54.5%	6.3%	39.2%

from 1998) to determine the generalisability of our sample responses. The AIHW physiotherapy workplace data is reported in more categories than were used in our study. Table 1 compares the responses from our study for primary place of work with the AIHW data. The hospital practice figures provided by AIHW were directly transferable to our study. This table indicates that the proportion in our sample were representative of the proportions in the 1998 physiotherapy workforce.

Knowledge about NSAIDs

Recent updating of knowledge on NSAIDs Only 16% of respondents reported updating their knowledge on NSAIDs within the past year, with 32% of respondents having updated their knowledge within the past one to five years. Given the recent change in scheduling of NSAIDs, this suggests that the majority of respondents were unlikely to have current knowledge on NSAID sale, use, contraindications or legislation pertaining to physiotherapists. The percentage of respondents in categories of time since update is provided in Figure 1. Of the respondents who had updated their knowledge over the last five years, 45% of respondents had actively sought this information. Multiple answers were provided to this question, and of the total number of responses, the most common sources of information were MIMS (34%), general medical practitioner (27%), local pharmacist (16%), training schools (15%), journal articles (15%), another physiotherapist (14%) and variably from advertising, drug company representatives and the registration board (7% or less).

Knowledge on NSAIDs Correct information on where/how to obtain a range of NSAIDs (reflecting drugs in Schedules 2, 3 or 4) was demonstrated by 84% of respondents, with incorrect answers provided by 6%, and the remainder of respondents indicating that they did not know the answer.

Respondents were asked to identify up to three conditions for which NSAIDs were appropriate, with 99% of the 451 responses being correct. The most common correct responses were osteoarthritis (29% of the total number of responses), musculoskeletal injury (11%), rheumatoid arthritis (11%), spinal pain (10%) and joint strain (10%).

When asked to identify up to four side effects of oral

NSAIDs, respondents expressed generally good knowledge, with 89% of the 664 text responses being correct. The most common correct side effects reported by respondents to this question were upper gastrointestinal tract problems (31%), ulcers (22%) and bleeding (15%). However, when asked the same question about the side effects of topical NSAIDs, respondents' knowledge was not as extensive or accurate. There were only 65 responses in total to this question, with 71% correct answers. The most common correct side effects reported by respondents to this question reflected the information provided for oral NSAIDs, being upper gastrointestinal tract problems (17%), ulcers (11%) and bleeding (9%).

Eighty per cent of respondents reported being aware of adverse reactions by at least one of their patients to NSAIDs. The most common adverse reactions reported by respondents were gastric disturbances (24%), nausea (17%) and stomach ulcer/bleeding (13%).

Knowledge of legislation Physiotherapists' knowledge of legislation regarding NSAID use in clinical practice is reported in Table 2. The high percentage of "don't know" answers and the incorrect ones for each of the items in the question indicates the need for more education for physiotherapists on the current legislative position regarding NSAIDs. As with knowledge of side effects and appropriate use of NSAIDs, any inaccuracies in the knowledge physiotherapists have about legislation could have potentially serious consequences. Thus this section provides the basis for education material that will ensure physiotherapists will have appropriate knowledge on NSAID use.

NSAID use in clinical practice

Approximately fifty-five per cent of the respondents reported that they regularly recommended NSAIDs directly to their patients, and often by brand name. Over-the-counter topical NSAIDs were the most popular recommendations (83%), followed by over-the-counter oral NSAID recommendations (78%). Recommendation that the patient consult a general medical practitioner regarding NSAID purchase and use was reported by 64% respondents. All of the physiotherapists who did not directly recommend NSAIDs to their patients referred patient enquiries to their general medical practitioner, and 81% of them also referred patients to a pharmacist.

Table 3. Who should take responsibility for providing updates on information to physiotherapists on NSAIDs?

Training schools	71.6%
Physiotherapists themselves	65.3%
Australian Physiotherapy Association	64.2%
Physiotherapy conferences	55.8%
Drug companies	39.6%
Physiotherapists registration board	28.8%
General practitioners	22.8%
Local pharmacists	18.9%

NB multiple answers are reflected in these response rates

Additional recommendations provided to patients by physiotherapists included warnings/advice (96%), contraindications for use (85%), precautions (96%), prescriptions (70%), drug interactions (26%), side effects (84%), dosage (44%) and brand names (61%). Discussions with patients regarding NSAIDs were regularly recorded on patient notes by 65% of respondents.

Approximately 20% of respondents reported regularly using topical NSAIDs as massage cream and/or as an electrotherapy contact agent. Although the question was not directly asked, text comments provided by 10% of respondents indicated that they discussed the application of topical NSAIDs prior to administration during treatment.

Attitudes to physiotherapist prescription and supply of NSAIDs Responses to the questions on physiotherapist prescription and supply of NSAIDs produced significant support (67% of respondents) for the current legal position (that is physiotherapists should not prescribe NSAIDs). This was counterbalanced by a strong case from a group of respondents who were in favour of change to the legislation to allow physiotherapists to prescribe and supply NSAIDs. These responses came from private practitioners in rural and metropolitan areas (18%). The remainder of respondents did not express an opinion.

Responses to the questions regarding whether current knowledge of NSAIDs was sufficient to allow physiotherapists to appropriately advise patients, indicated that 72% of respondents disagreed and 16% agreed. This figure reflected those physiotherapists who wanted the legislation changed to allow them to prescribe NSAIDs. The remainder did not express an opinion.

The question regarding who should take responsibility for providing information on NSAIDs to physiotherapists identified a number of possible sources of update information, probably reflecting the specifics of places and/or people from which physiotherapists currently obtain information. These are listed in Table 3.

Discussion

Response rate and polarisation The response rate to this survey was disappointing in light of that reported in the 1996 study of physiotherapist involvement with medications (Lansbury and Sullivan 1998). It was, however, of the same order of studies of practice behaviours conducted by the Australian Prescriber (Bloom 1993, Bloom and Associates 1997) and falls within the range of responses in other published surveys of physiotherapists (Butler and Sheppard 1999, Ladyshewsky et al 1996, Michaeli 1993, Turner and Whitfield 1997). The response rate also reflects the current expected response rate from general medical practitioners to surveys regarding quality of practice and practice behaviours (Clare and Hofmeyer 1998). We further suspect that a reason for our low response was that selection of our sample was from the complete list of registered physiotherapists in each state, which means that a proportion of the questionnaires would have gone to non-practising clinicians, or physiotherapists working overseas.

The proportional representation in this survey of physiotherapists practising privately, in hospital (inpatient or outpatient) or aged care does not differ substantially from the proportional workforce representation in the all-Australian data, or in the individual state data published by the AIHW from its 1998 survey (AIHW Workforce Data 1998). The small differences observed between the percentage of physiotherapists in these main categories of practice in our data and the AIHW data possibly relate to:

- Our survey request for information on participant's current "most time" activity (therefore not capturing information on secondary areas of practice);
- Our use of only four possible categories of workplace activities (private practice, hospital inpatients and outpatients, and aged care/community settings); and
- Change in workforce activities since the AIHW data was collected.

Despite these differences, we believe that our sample appropriately represents the major areas of clinical physiotherapy practice, and thus identifies the needs of physiotherapists in a range of clinical practice settings for education on NSAIDs.

We acknowledge the potential for bias in responses by physiotherapists to this survey, as responses were clearly polarised into two groups: physiotherapists who wanted no change from the status quo; and physiotherapists who desired significant changes in legislation to allow them to prescribe and sell NSAIDs. There were very few equivocal responses to the attitudinal questions, suggesting that respondents indeed had fixed views on NSAID use and their role in NSAID use by patients. Thus, our survey achieved its purpose, in that it elicited information that outlined the current educational needs of physiotherapists regarding NSAIDs in clinical practice, and highlighted a range of issues that need to be addressed in an education program.

The need for education of physiotherapists regarding medication

This study identified that little has changed since Lansbury and Sullivan undertook their survey in 1996 regarding physiotherapists' knowledge of the quality use of medicines (Lansbury and Sullivan 1998). Little time continues to be spent in undergraduate and postgraduate training programs in Australian universities in educating students about the quality use of medications, in particular NSAIDs as an adjunct to physiotherapy practice. Moreover, there have been few continuing education opportunities in this area provided in the past five years in the three states we surveyed, for practising physiotherapists. The recent change in scheduling of NSAIDs from prescription to over-the-counter purchase, and increased potential that this introduces for medication misadventure by physiotherapy patients, adds weight to the need for specific education programs targeted at physiotherapists' responsibilities in responding appropriately to patient queries on medications during treatment sessions.

Dilemmas in maintaining the status quo This study highlighted multi-dimensional dilemmas for physiotherapists. The recent rescheduling of NSAIDs means that any adult can now purchase a range of NSAIDs over the counter, for their own use. The descriptions of Schedules 2 and 3 in the Commonwealth Act deliberately use the word "safe", with an expectation that informed advice is provided at point of sale by a suitably licensed person (pharmacist or pharmacy assistant). It appears that the intention of Schedules 2 and 3 drugs are that the purchaser will be the user, and will use the drug in full knowledge of its effects, interactions, contraindications and side effects (informed use).

Thus, physiotherapists can purchase NSAIDs in the same way as any other individual, for *personal* use. The dilemma arises when physiotherapists extend the intention of the Controlled Substances Act (1984), and assume a role for which they are not adequately qualified. In this context, there are a number of opportunities for breaching the duty of care of physiotherapists to their patients. The three main opportunities that we have identified from this study are when physiotherapists:

1. Recommend NSAIDs to patients.

Patients, because of their respect for the role of physiotherapist in the community as an educated primary health care provider, could well take this recommendation as being provided by a suitably licensed person (which the physiotherapist is not, in the letter of the law). This recommendation could be taken by patients to be based on better information, than that provided by a neighbour or friend. Appropriate licensing assumes that the physiotherapist would be aware of the contraindications, interactions and indications for the use of NSAIDs, and could make safe and effective recommendations on NSAID use in the full knowledge of the patients' overall medical status. It thus assumes that the physiotherapist is in a position

to inform the patient adequately about drug use. We believe from the responses to our survey that few physiotherapists are in possession of this knowledge, and have minimum access to up-to-date information regarding quality use of NSAIDs that could be passed on appropriately to patients.

2. Purchase NSAIDs for use in patient care, therefore abrogating the intention of the NSAID scheduling that the purchaser is the user.

Responses to our survey indicate that the adjunct use of NSAIDs by physiotherapists in their clinical practice (in particular the application of topical NSAIDs for massage or electrotherapy) is on the understanding that the administration of the drug will enhance the effectiveness of other physiotherapy techniques. This may occur without patient consent. There is a lack of evidence in the literature of an enhancing effect of NSAIDs when coupled with other physiotherapy modalities, and therefore physiotherapist use or recommendation of NSAIDs in this capacity is without convincing foundation. The evidence for increased clinical efficacy of commonly available topical preparations of NSAIDs when used in conjunction with ultrasound (ie phonophoresis) remains unconvincing (Benson et al 1989, Klaiman et al 1998, Penderghest et al 1998, Sevier and Wilson 1999).

3. Sell NSAIDs in their clinics, therefore physiotherapy practices become a place of sale, and point-of-sale expert advice should be available. The issue of suitable licensing of the seller is highlighted in this instance, in conjunction with direct contravention of the Poisons Act and registration board recommendations.

Dosage and side effects We anticipated that the side effects for oral and topical NSAIDs would have been mentioned by respondents with the same frequency and accuracy. Side effects for both forms of NSAID administration are almost identical, as the same pharmacological mechanisms are at work with topical as with oral NSAIDs, although the risk is less with topical preparations because of dosage (Vaile and Davis 1998). The only significant difference in side effects is secondary to the transdermal application of topical preparations ie a greater risk of skin reactions with topical agents. However, we found significantly fewer responses, and a lower accuracy of responses for the question regarding side effects of topical NSAIDs, when compared with the question regarding oral NSAIDs. From this we inferred that physiotherapists required educating regarding the action of topical NSAIDs and the associated side effects that could be expected.

The dose of NSAIDs is relatively controlled when it is in oral format. The dose of topical agents is not as obvious, and depends on the frequency and amount of administration. As topical agents act in the same systemic pathways as ingested medication, topical NSAIDs do not

need to be applied to the local site of inflammation to be effective. Hence the treating physiotherapist is less able to control the dose provided to either the patient, or to him/herself, particularly when the topical agent is used as a massage cream. A number of text responses provided by respondents indicated that they believed that topical agents acted as a placebo only. This assumption was underpinned by the small number of responses to the question of risks associated with topical agency administration. This perception is contradicted by the findings of a recent systematic review of topically applied NSAIDs (Moore et al 1998), where "In acute conditions like strains and sprains, topical NSAIDs were significantly better than placebo over a one week period. In chronic conditions like arthritis and rheumatism, topical NSAIDs were significantly better than placebo over two weeks" (p. 338).

Physiotherapists' responses regarding their involvement with NSAID use in the future There were two clear views expressed in this study. One view, reflecting private metropolitan and rural practitioners, reflected a strong desire to be allowed to on-sell, actively recommend and even prescribe NSAIDs as part of their clinical practice. The rural practitioners particularly highlighted issues of non-availability of medical and other health services in the country, to provide the "back up" to physiotherapy practitioners regarding medications that would be routinely expected in the urban regions. Furthermore, many patients of private physiotherapists may not consult a medical practitioner for problems that they perceived to be best addressed by the physiotherapist. Such conditions were commonly sports injuries or spinal pain. The perception from physiotherapists responding to our survey was that patients desired a "one-stop shop" where the appropriate management for their condition could be provided in the one consultation.

The opposing view was expressed by respondents who wanted more involvement with NSAID use in clinical practice, but were comfortable being guided at all times by medical practitioners and/or pharmacists. This group commonly recognised the difficulties of understanding their patients' overall medical status and their lack of adequate knowledge and training in dealing with patients' medications, but identified that they often played a key role in assessment of patient needs and physical problems. For instance, there were a number of comments regarding difficulties in dealing with patients using multiple medications (particularly in the elderly population with multiple conditions, who were attending the physiotherapist for only one of these conditions).

Education package This study identified and clarified the need for a standard, independent and up-to-date education package on quality use of NSAIDs tailored to physiotherapy practice and patient type. Respondents to our survey indicated that they accessed variable sources of information on NSAIDs, with MIMS and general medical practitioners being the source of information for many physiotherapists. However, the most common source of

general medical practitioner knowledge of drugs has been reported to be drug company representatives (Roughhead et al 1998b, 1998c). Thus there appears to be a need for regular educational presentations on quality use of medicines at physiotherapy meetings, and also for regular publication in academic journals and professional newsletters of changes in scheduling of medications and the implications of this for physiotherapy practice.

Conclusions and recommendations

Our survey identified key areas for enhancing the education of physiotherapists at undergraduate, postgraduate and continuing (post graduation) professional practice levels in the quality use of NSAIDs. We are now completing an education package that can be used to update and maintain physiotherapy knowledge on quality NSAID delivery. Moreover we have made a number of recommendations from this survey that have not only educational but also moral and professional implications for the profession. These recommendations are that:

1. The opportunity be overtly recognised in physiotherapy undergraduate and postgraduate training for pharmaceutical misadventure in the use of NSAIDs by patients with musculoskeletal problems, particularly when:
 - these medications are purchased by patients over the counter in pharmacies and supermarkets, and self administered based purely on physiotherapists advice, or
 - administered in conjunction with physiotherapy treatment without patient consent or proper risk assessment.
2. There be recognition by physiotherapists, the APA, the state registration boards and physiotherapy training institutions, of the ethical and legal implications of physiotherapists recommending, selling and/or using NSAIDs in their clinical practice, under the current legislation. Even when NSAIDs are Schedule 2 or 3 drugs (and therefore the responsibility for purchase and use is the patient's), it is likely that patients consider physiotherapists to be more informed on NSAID use than neighbours, friends or pharmacy assistants, and thus may be more likely to act on physiotherapy advice without exercising due personal consideration of risks or contraindications which are outlined on the packaging of the drug.
3. There be overt recognition by medical specialists, general medical practitioners, pharmacists, drug companies and other agencies dealing with pharmaceutical administration of the role expected of physiotherapists by their patients in advising them appropriately on medications, and more support provided to physiotherapists by these personnel regarding access to current drug information.
4. Physiotherapists be educated in a more standard and comprehensive manner at undergraduate and

postgraduate training institutions regarding not just the mechanisms of action of oral and topical NSAIDs, but also in the quality use of these medicines, including their side effects and contraindications, appropriate dosage, interactions with other medications and appropriateness for particular conditions.

5. Physiotherapists be provided with the same access to updated information on NSAIDs as other health professionals currently licensed to prescribe and supply these drugs.
6. The particular issues of front-line sports physiotherapists and rural physiotherapy practitioners in supplying NSAIDs under specific conditions be considered by the APA, the registration boards and the relevant Commonwealth Government departments, with a view to limited license to prescribe and supply.
7. Discussions be held between the APA, the registration boards, Schools of Physiotherapy and relevant Commonwealth Government departments regarding responsibility and funding sources to support regular updates of physiotherapist knowledge on commonly used pharmaceuticals, in particular NSAIDs. These updates should pay particular attention to at-risk groups such as the elderly, and those patients with chronic and complex conditions.
8. Opportunities for widespread regular provision of information to physiotherapists be identified and utilised, such as the *Australian Journal of Physiotherapy*, APA newsletters and professional conferences. Opportunities for wide debate and information exchange should also be considered, particularly when a new NSAID is released, or when a NSAID is re-scheduled.
9. More research be undertaken to focus on such issues as:
 - action and penetration of topical NSAIDs under massage and phonophoresis delivery;
 - dose-response of topical NSAIDs for particular conditions, compared with oral administration, and with non-medication forms of physiotherapy;
 - risks for the physiotherapist associated with regular delivery of topical NSAIDs via massage; and
 - the educational approaches associated with sustainable behaviour change and knowledge uptake, for physiotherapists and patients.

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Appendix

DEMOGRAPHICS

(please tick ✓ the appropriate response)

- Please tick which state you are from
South Australia Tasmania ACT
- Where are you currently spending most of your working time?
Hospital inpatients Private practice
Hospital outpatients Aged and/or
Community setting
Other
(please describe) _____
- When did you last update your knowledge on NSAIDs?
Never 1-5 years Recently 5-10 years
< 1 year > 10 years
- Did you actively seek out this information?
Yes No
- How did you obtain this information?
(tick ✓ as many as you require)
Via another physiotherapist Journal (academic)
articles Direct from drug companies General
medical practitioner Via the Physiotherapy
Registration Board Local Pharmacist Via APA
MIMS Training schools (eg university)
Advertising campaign
Other (please describe) _____

CURRENT KNOWLEDGE

- Where are the following medications obtained?
(please put ticks ✓ in the appropriate boxes)

	Super-market	Pharmacy - over the counter	Pharmacy via Pharmacist	Doctors' prescription	Don't know
Indocid Suppository					
Asprin					
Voltaren Gel					
Feldene gel					
Neurofen					
ACT 3					
Celebrex					
Digestic					
Voltaren tablets					

- List the risks that you know are associated with the use of NSAIDs.

Oral	Topical

- Legislation allows: (please tick ✓ the appropriate response)
Physiotherapists to advise on the use of NSAIDs
Yes No Don't know
Physiotherapists to prescribe NSAIDs
Yes No Don't know
Physiotherapists to recommend NSAIDs
Yes No Don't know
Physiotherapists to supply oral NSAIDs
Yes No Don't know
Physiotherapists to supply topical NSAIDs
Yes No Don't know
Physiotherapists to use NSAIDs in patient treatment
Yes No Don't know
- List three conditions for which NSAIDs are recommended as part of management
1.
2.
3.
- List three common drugs with which NSAIDs interact
1.
2.
3.
- List three conditions for which NSAIDs may be contraindicated
1.
2.
3.
- List common adverse reactions to NSAIDs
- Do you know of any of your patients having had adverse reactions to NSAIDs?
Yes No

Briefly describe:

CURRENT PRACTICE

1. Does your practice/institution have a policy regarding physiotherapists recommending NSAIDs to patients?

Yes No Don't know

If Yes – Do you follow this policy? Yes No

If No or Don't know – Do you think such a policy would be beneficial? Yes No Don't know

2. Do you commonly recommend NSAIDs to your patients ?

Yes No

(tick as many as required)

Over the counter oral medication

Over the counter topical medication

Prescription oral medication

Prescription topical medication

Refer to GP

Refer to pharmacist

3. Do your recommendations on NSAIDs include?

Warnings/advice Yes No

Indications Yes No

Precautions Yes No

Contraindications Yes No

Drug interactions Yes No

Side effects Yes No

Dosage Yes No

Brand names Yes No

4. Which NSAIDs do you usually recommend?

5. Do you record any discussions on medications in your clinical records? Yes No

6. Which of the following sources have you used in the past six months to find out about NSAIDs?

Current MIMS

Drug company information

Drug company studies

Internet sources on drugs

Medical practitioner

Pharmacists

Research papers

Instructions on packets

Other

None

YOUR ATTITUDES TO NSAIDs

1. Do you believe that:

a) physiotherapists should be able to prescribe NSAIDs

Yes No Don't know

b) your current knowledge of NSAIDs is sufficient to allow you to advise patients on safe use?

Yes No Don't know

2. Whose responsibility do you think it is, to provide information on NSAIDs to physiotherapists *(tick ✓ as many as you wish)?*

Physiotherapists should seek it themselves

Drug companies

Physiotherapy Registration Boards

Australian Physiotherapy Association

Local pharmacists

General practitioners

Training schools (eg School of

Physiotherapy/Pharmacy in a university)

Physiotherapy conferences

Other *(please describe)*

3. Could you summarise your attitude towards the place of NSAIDs in physiotherapy practice?

Thank you for taking the time to complete this questionnaire. Please return it as soon as possible in the envelope provided.