

**Compliance to Verbal & Diagrammatic Patient Rehabilitation Advice  
(PRA) at the Victoria University Osteopathic Medicine Clinic  
(VUOMC)**

**Requirement for the degree Master of Health Sciences (Osteopathy)  
School of Health Sciences  
Victoria University  
2005**

**Student**

**Nathan Herman  
BSc (clin.sc.)**

**Supervisor**

**Cameron Gosling  
P.O Box 144 28, Melbourne, City MC 3000  
cameron.gosling@vu.edu.au**

**B. App. Sci (HM)  
Grad. Dip (Ex Rehab)  
M. App Sc**

**Compliance to Verbal & Diagrammatic Patient Rehabilitation Advice  
(PRA) at the Victoria University Osteopathic Medicine Clinic  
(VUOMC)**

**Requirement for the degree Master of Health Sciences (Osteopathy)  
School of Health Sciences  
Victoria University  
2005**

## **Abstract**

**Title:** Compliance to Verbal & Diagrammatic Patient Rehabilitation Advice (PRA) at the Victoria University Osteopathic Medicine Clinic (VUOMC)

**Authors:** Nathan Herman<sup>1</sup>, Cameron Gosling<sup>2</sup>

Affiliation:

1. Osteopathic Student, School of Health Sciences, Victoria University, Melbourne, Australia.
2. Centre for Aging, Rehabilitation Exercise and Sport Science, Victoria University, Melbourne, Australia.

**Introduction:** The prescription of patient rehabilitation advice (PRA) encompassing exercises or stretches prescribed for completion external to a manual therapy consultation time is often condition specific and varies in accordance to a patient's diagnosis in order to produce a more successful outcome over a shorter duration. Previous research has investigated this problem in physiotherapy fields, but as yet has not been undertaken in an osteopathic setting. This study attempted to compare verbal and diagrammatic PRA prescription in the Victoria University Osteopathic Medicine Clinic (VUOMC) to new patients at the clinic.

**Objectives:** To determine compliance rates when comparing the use of a verbal and demonstrative prescription method (verbal group) to a verbal, demonstrative and diagrammatic prescription method (diagrammatic group) at the VUOMC. The second aim of this study was to record the demographics of each participant; age, sex, educational level, occupation, marital status, residential zone and number of children, identifying any affect that they have on participant PRA compliance.

**Design:** Prospective randomised survey study.

**Methods:** New patient participants (N=34) returned the survey on their first return consultation and were included in the sample. These participants were randomly allocated to either the verbal or diagrammatic group, where the practitioner participant prescribed PRA if deemed clinically indicated. Four participants were excluded from the analysis leaving a study population of 30 who completed the compliance survey developed by the

researchers. Compliance was then determined for each prescription method and verified against the patient's case notes.

**Results:** Twenty-two participants were prescribed exercises and eight were not with fifteen participants prescribed PRA verbally and seven participants diagrammatically. A 29.17% discrepancy between methods was noted, with diagrammatic supplementation (75%) producing considerably greater compliance than verbal prescription (45.83%). Males (88.89%) were more compliant than females (44.44%), with the number of PRA prescriptions (e.g. 1,2 or 3) showing variable compliance results.

**Conclusions:** This study demonstrated that diagrammatic PRA prescription was more successful than verbal prescription when used at the VUOMC. The use of the diagrammatic PRA modality should assist the osteopathic practitioner to gain greater compliance and potentially better outcomes for the patient.

**Keywords:** Osteopathy; Exercise; Stretch; Compliance; Adherence; Verbal; Diagrammatic

(c) 2004  
Victoria University

## **Introduction**

Rehabilitation and preventative exercise prescription by Osteopaths is undertaken to enhance the effects of treatment, thereby potentially reducing a patient's recovery time and the potential cost to the patient or third party payer. The prescription of Patient Rehabilitation Advice (PRA), encompassing strengthening exercises and/or stretches prescribed for completion external to consultation time in an osteopathic setting is often condition specific. PRA varies in accordance to a patient's diagnosis in order to gain a more substantial effect post-treatment and achieve a conjoined goal between patient and practitioner.<sup>1</sup> Practitioners prescribe PRA with the belief that the patient in consultation will comply with their directions to enhance the benefit of treatment. There are several methods used to prescribe relevant PRA, ultimately culminating in varying levels of patient compliance.<sup>2,3,4,5</sup> Compliance to verbal and diagrammatic PRA prescription methods has not been thoroughly researched in an osteopathic setting, and this may result in a discrepancy between the outcomes from these prescription modalities.

It is essential that Osteopathic practitioners establish mutual trust with their patients. If the physician gains the patient's confidence they are considerably more likely to obtain compliance.<sup>6</sup> Furthermore compliance to PRA has other health benefits as indicated by Wallace et al.<sup>3</sup> in their study into modifiable coronary heart disease risk factors. They suggested that high adherence to PRA was more effective in increasing aerobic endurance, muscular endurance and flexibility than low-adherence or non-adherence. Compliance to PRA prescription is the successful completion of specific stretching, strengthening and stabilization exercises external to an osteopathic consultation. This in turn leads to an increased likelihood that a clinically based rehabilitation program will produce a more successful outcome for the patient when applied to a variety of musculo-skeletal conditions,<sup>2</sup> potentially reducing the length of time that the patient has to spend with the health care professional.

Osteopathic practitioners may be required to alter their prescription modality in order to enhance patient compliance for all sectors of the community. Negative compliance to PRA occurs for a number of reasons, potentially reducing the patient's rate of recovery. Demands such as work, school, domestic activities, children, partner, and social obligations reduce the available time for exercise completion and all present major barriers to exercise adherence.<sup>4</sup> Other factors that have to be taken into consideration include a combination of past exercise experience, health status at the time of prescription, lack of social support, temporal, attitudinal, economic, communicative barriers, which all impact on exercise compliance.<sup>7</sup> Therefore, when undertaking a PRA prescription it may be geared toward a patient's individual health needs, personal circumstances, beliefs and goals.<sup>8</sup> Osteopaths should consider these variables as well as treatment goals when providing PRA.

An understanding of exercise prescription by the practitioner is necessary to increase compliance. A study of physician prescribed exercises administered via a combination of electronic media, and verbal means, resulted in 3-month compliance of 55%.<sup>9</sup> A 4-week Physiotherapy study by Kolt et al.,<sup>2</sup> using verbal, demonstrative and diagrammatic means of PRA prescription, produced a compliance rate of 71.6% for home based rehabilitation. The discrepancy in compliance rates in these studies outlines the need for clarification to determine the most successful method of PRA prescription. There are distinct advantages and disadvantages to all methods of exercise prescription. Many practitioners favour verbal and demonstrative prescription alone as it is more time efficient and involves less paperwork; however it may be accompanied with a greater margin of patient error. Verbal, demonstrative and diagrammatic PRA is a more detailed method of prescription, as it permits the participant to refer back to the visual material, stimulating the memory process and enhancing information recall.<sup>5</sup>

The present study aimed to determine compliance rates when comparing the use of a verbal and demonstrative prescription method (verbal group) to a verbal, demonstrative and diagrammatic prescription method (diagrammatic group) at the Victoria University Osteopathic Medicine Clinic (VUOMC). The second aim of this study was to record the

demographics of each participant; age, sex, educational level, occupation, marital status, residential zone and number of children, identifying any affect that they may have on participant PRA compliance.

## **Method**

### **Study design/Type of research**

This research project was conducted as a quantitative longitudinal questionnaire study, over an eight-week period. It compared the two most common PRA prescription methods revealed from an extensive literature review, which were the verbal and demonstrative method and the verbal, demonstrative and diagrammatic method.<sup>2,4,5</sup> This study involved new patient participants from the VUOMC who were treated by student participant practitioners enrolled in the 4<sup>th</sup> or 5<sup>th</sup> year osteopathic clinical practicum subjects at Victoria University. This study was approved by the Victoria University of Technology Human Research Ethics Committee prior to its commencement, with written consent being obtained from all practitioner participants. Return of the questionnaire by the patient participants implied consent.

### **Questionnaire/Diagrams**

Prior to the testing period, the two-page questionnaire was piloted on five return patients who had received a PRA prescription in their previous treatment at the VUOMC. The questionnaire was also piloted on five registered treating osteopathic practitioners and experts in the field of exercise rehabilitation, who evaluated its comprehensibility, construct and face validity and structure. After the pilot phase, amendments to the questionnaire were made to improve its structure and validity. Any diagrams given to participants from 4<sup>th</sup> or 5<sup>th</sup> year treating student practitioners were from the exercise based software package, Exercise-Pro, available to all students to use at VUOMC under license.

## **Participants / Procedures / Group Allocation for Participants**

Student practitioner participants (N=98) that were enrolled in the subjects clinical practicum 4 or 5 were recruited by the way of in class announcement at Victoria University. An information to student participants seminar and subsequent one hour detailed training session was held for both the 4<sup>th</sup> and 5<sup>th</sup> year treating student participants. This allowed the investigating researchers to detail the study to prospective participants, obtain written consent and allocate the method of PRA prescription to be utilized, where the practitioner participants deemed it clinically indicated. This study assessed PRA compliance, not the appropriateness of PRA prescription which was determined upon the clinical presentation of the patient as assessed by the Osteopathic student practitioner in consultation with the registered Osteopath. Prior to the testing period, half the 4<sup>th</sup> and 5<sup>th</sup> year participants (halving the student role at midpoint- 4<sup>th</sup> years I-Z and 5<sup>th</sup> years A-K, n=48) were allocated to the verbal group, who used the method of verbal and demonstrative PRA prescription. The other half of the 4<sup>th</sup> and 5<sup>th</sup> year students (halving the student role at midpoint- 4<sup>th</sup> years A-H and 5<sup>th</sup> years L-Z, n=50) were allocated to the diagrammatic group, who used verbal, demonstrative and diagrammatic PRA prescription.

All new patients to the VUOMC were invited to participate in the study via convenience sample over an eight week period. Thirty-four patients consented to participate by return of the questionnaire. Inclusion criteria for patient participation included being; a new patient over the age of 18, literate, able to speak English and presenting to the VUOMC for their first treatment. New patients were selected, as they may have been unlikely to experience PRA prescription in an osteopathic setting and to eliminate previous exposure to exercise from the VUOMC's student participants. The patient participants were randomly allocated to a student treating participant, and therefore the verbal or diagrammatic group, according to their appointment time. PRA was prescribed to the new patient at the first consultation according to their allocated group, if it was clinically indicated during their consultation. At the patient's subsequent consultation the

VUOMC's administrative staff asked the patient to complete the two-minute questionnaire regarding compliance. Upon completion of the questionnaire, the patient handed it to the administrative staff who secured it in a locked box ensuring that their privacy was preserved. The name of the patient participant was then noted next to the number of the questionnaire to ensure questionnaire results could be analyzed against the prescription by the student participant in the case notes.

## **Statistics**

Data was obtained by questionnaire, from each patient participant in the study. The PRA prescription was also retrieved from the patient's clinical file by the researchers. The data was then manually collated, entered and stored Microsoft Excel. Analysis of the data occurred using descriptive statistics and percentages.

All compliance percentages (Table 2) were derived by following a previously described formula by Schneiders et al.<sup>5</sup> The number of PRA prescriptions in the subgroup (numerator) was divided by the total number of exercises for that group (denominator) and multiplied by 100 to produce the compliance percentage.

## **Results**

### **Participants**

Thirty-four new patients (participants) returned the compliance questionnaire over an eight-week testing period from June 2005 to mid-July 2005 at the VUOMC on their first return consultation. Over that period four patient files were unable to be located to correlate patient information with the questionnaire responses. Thus, four participants were excluded from the analysis leaving a study population of 30. The PRA prescription rate for the participants by the student practitioners was 73.33%. There were fifteen participants in the verbal group and seven in the diagrammatic group as the result of randomization of group allocation and patient description by the Osteopathic student practitioner. The questionnaire return rate from new patient participants was 18.40%.

## Demographics

Basic demographic characteristics of all participants were recorded (Table 1.). There were eight males in the sample population with a mean age of  $36.63 \pm 5.71$  years and twenty-two females in the sample population with a mean age of  $36.86 \pm 6.07$  years participating in the study. The 40-49 year group was 80% compliant to prescribed PRA, followed by the 20-29 year group with 58.33% and the 30-39 year group completing 54.54% of prescribed PRA (Table 2).

### Insert Table 1 Here

Family demographics revealed that most patients were either married (40%) or single (56.67%), with 66.67% of the population having no children (Table 1). The geographical distribution of participants indicated that 40% of participants resided in the inner city with 33.33% of participants residing in the northern suburbs (Table 1). This distribution is in accordance with the central locality of the Victoria University Osteopathic Medicine Clinic. The educational demographics of the sample population indicated that 32.25% of participants had completed a secondary education, with 38.71% of the population obtaining some form of tertiary education (Table 1).

### Insert Figure 1 Here

There was an overall compliance rate of 55.56% to the prescribed PRA amongst all participants. A large discrepancy between the percentage compliance obtained between the verbal and diagrammatic groups was observed (Figure 1.). The verbal group had fifteen of the twenty-two participants (68.18%) that were prescribed PRA. This verbal prescription group demonstrated 45.83% compliance to their prescribed PRA. This was disproportional to the diagrammatic prescription group, where seven out of the twenty-two participants (31.81%) were prescribed PRA, of which 75% were compliant to their home based PRA that was prescribed diagrammatically. Qualitative analysis of the

questionnaire revealed a recurrent theme, with 26.67% of participants who were in the verbal group requesting the aid of supplementary diagrammatic material.

### **Insert Figure 2 Here**

There was no percentage trend identified between an increasing number of PRA prescriptions allocated to a patient participant and compliance to that prescription. When a single prescription was made, there was 50% compliance in the verbal group and 100% compliance in the diagrammatic group. This was very similar to when three PRA prescriptions were made, with compliance occurring in 66.67% of the verbal group and 100% of the diagrammatic group. When two PRA prescriptions were allocated compliance was obtained in 33.33% of verbal prescription and 25% of diagrammatic PRA prescription (Figure 2). Compliance was consistently higher with diagrammatic PRA prescription, with 26.67% of the verbal group requesting their prescription contained diagrams.

### **Insert Figure 3 Here**

### **Insert Table 2 Here**

The affect of participant gender on PRA compliance revealed that 75% of males were prescribed PRA during this study with 88.89% overall compliance. The verbal group was compliant to 100% of prescription and the diagrammatic group compliant to 83.33% of PRA prescription (Figure 3). Females were prescribed PRA on 72.73% of occasions during the study with an overall compliance of 44.44% (Table 2). Females who were allocated verbal prescription completed 38.1% of prescribed PRA and those allocated diagrammatic PRA prescription completed 66.67% of prescribed PRA (Figure 3). Marital status also had some bearing on compliance with married participants completing 64.29% of PRA compared to single participants with 47.37% (Table 2).

### **Insert Figure 4 Here**

Data was obtained during the collecting period for this study from two sources. These sources comprised the questionnaire which the patient participant filled out on their subsequent consultation, and the case notes, which the practitioner participant had the responsibility of maintaining. Concordance between the two parties where PRA was prescribed in the file was 92.31%. Patient participants contended that 7.69% of PRA was not prescribed, but the practitioner had recorded it in the case notes (Figure 4). Parties agreed in 41.18% of cases that PRA was not prescribed in the case notes. On 58.82% of occasions PRA was not prescribed according to the case notes, with the patient contending that it was (Figure 4).

The main PRA prescription advice involved the use of a specific stretch which occurred in 79.49% of cases, whereas an exercise such as core stabilization or isometric strengthening was prescribed 20.51% of the time. The dose related specifics of the PRA revealed that the frequency of PRA occurred either twice (28.95%) or three times per day (28.95%) but in 18.42% of cases frequency was not specified. Over the week, 82.05% of participants were required to complete their PRA every day, with 10.26% of prescription to be completed three days per week. The duration that the PRA exercise was prescribed was most commonly 30 seconds (48.65%) followed by 10 seconds (18.92%), with it not being specified in 10.81% of prescriptions.

### **Insert Table 3 Here**

The most common site of complaint presentation was the neck (33.33%), with the lower back (22.92%) and upper back and shoulder (8.33%) representing other common sites. PRA was prescribed for the neck in 68.75% of occasions, with compliance occurring amongst 58.33% of participants. Participants who cited the lower back as their primary site had PRA prescribed 72.73% of the time with compliance taking place in 50% of participants. When the upper back was the primary site in question prescription and compliance took place on 100% of occasions. This was in direct contrast to when the shoulder was the primary site, with PRA prescription occurring in 75% of participants and compliance occurring 25% of the time.

## **Discussion**

The prescription of PRA by primary care practitioners is a widely used therapeutic mechanism that has significant benefits if adhered to by the patient.<sup>2,9</sup> There has been no published research completed on the specific modes of PRA that are currently implemented in a clinical osteopathic setting, possibly affecting the desired outcome and potentially prolonging the requirement for treatment. The current study has compared verbal and diagrammatic PRA prescription and shown a difference in patient compliance to exercise prescription, with trends in participant demographics also being identified as modifying factors in compliance behavior. Understanding the variables that modify a patient's behavior will permit PRA prescription to be tailored to the individual's personal preferences, resulting in an increase in patient compliance.<sup>1</sup>

PRA prescription using the diagrammatic method was most successful in the current study with 75% of participants being compliant. This finding is comparable to the compliance levels obtained in a study by Schneiders et al.<sup>5</sup> where 77.4% compliance to diagrammatic, verbal, written and practical exercise prescription was observed. Compliance to verbal PRA prescription in the present study occurred 45.83% of the time and these results are consistent with previous studies where participants were prescribed PRA verbally.<sup>5,9,10</sup> The mean percentage compliance difference between groups was 29.17%, in favor of diagrammatic PRA prescription. This finding is consistent with the finding by Schneiders et al.<sup>5</sup> who obtained a mean difference between groups of 39.3%, utilizing similar prescription methods. Swinburn et al.<sup>10</sup> contended that written exercise prescription provided a tangible reminder of the exercise goals jointly set by the practitioner and the patient, which was more effective (43%) than a verbal prescription alone (37%). Wilbur et al.<sup>4</sup> acknowledged that adherence to a 24-week home-based walking program was 66.5%, with the prescription being verbal. That result was considerably higher than the compliance percentage obtained by Schneiders et al.<sup>5</sup> (38.1%) comprising verbal, practical and demonstrative prescription, which was more comparable to our present study. Although verbal PRA prescription is a more convenient and time efficient mode of prescription, our results indicate that it obtains inferior

compliance when compared to diagrammatic PRA prescription, as acknowledged in previous physiotherapy research.<sup>4</sup>

There are multiple explanations for greater participant compliance to diagrammatic PRA prescription. Exercise prescription often involves a complex chain of sequenced events, actions and patient behavior that may be difficult to remember.<sup>5</sup> Our diagrammatic PRA compliance results indicate that this sequence may be aided by visual representation with a take home diagram, triggering the participant's memory to complete their PRA prescription. Secondly, supportive literature (e.g. diagrams, explanations of therapeutic regimen) acts as a means for augmenting compliance, with exercise or stretch sheets breaking the goals down into measurable steps so that the patient knows when they have successfully completed the PRA prescription.<sup>7</sup> Further patient knowledge and promoting the understanding of their particular exercise or stretch with the aid of diagrams, will only facilitate PRA compliance and communication between the Osteopath and patient.

An open question in our questionnaire enquired how PRA prescription could be improved. Our study revealed that 26.67% patients who received their PRA prescription verbally suggested that supplementary diagrammatic material would be beneficial. Embracing this patient input into the goal setting process will aid in compliance as the patient feels like they are playing an active role and taking ownership of their recovery. Visual (diagrammatic) representation of the prescribed exercises will provide the patient with better comprehension, thus increasing compliance levels.<sup>7</sup> The exercise prescription goals should be set so they are specific to the patient in order to obtain better strength, range of motion, quality of motion and endurance,<sup>1,11</sup> and hence a more desirable patient outcome. These goals should attempt to address and correct the structural or functional impairment that has been diagnosed and are essential in optimizing both recovery time and patient outcomes.

PRA prescription in the primary health care industry is a vital tool, potentially enhancing a patient's strength, endurance and flexibility.<sup>11,12</sup> It is important that patients receive specific and well-articulated information that clearly addresses their musculoskeletal,

neurological or visceral condition. Appropriate and technically correct PRA prescription, completed out of consultation time will contribute to a more positive outcome for the patient involved.<sup>7,13,14</sup> The prescription will reduce symptoms of pain, reduce anxiety related to the condition, and assist in obtaining therapeutic goals if compliance to the prescribed program occurs.<sup>7</sup> Our study revealed that 33.33% of participants presented with a primary neck lesion, with 68.75% receiving PRA and 58.33% combined compliance achieved for both verbal and diagrammatic groups. A primary lower back lesion was encountered in 22.92% of patients, with 73.72% of those participants being prescribed PRA and a combined 50% compliance was obtained for both verbal and diagrammatic groups. In a manual therapy setting, ensuring compliance to these PRA programs is necessary to facilitate an enhanced rate of recovery, rehabilitation and the prevention of neck and back pain.<sup>2,14</sup> Our study is comparable to a study carried out in the United Kingdom that compared Physiotherapy with advice for low back pain.<sup>13</sup> It revealed that PRA programs with good compliance that are graded to ensure improvements in cardiovascular or muscular strength are more beneficial than routine Physiotherapy alone.<sup>13</sup>

Compliance is generally increased when patients receive specific instructions, pertaining to the PRA prescription.<sup>15</sup> This is essential when treating certain anatomical regions as exercise has been shown to be an effective therapeutic intervention in the prevention of low back pain.<sup>14</sup> The researchers in the present study expected that as the frequency of PRA prescriptions increased, compliance would decrease. However, inconsistent results were obtained with no trend identified between the frequency of PRA prescription and compliance. When PRA prescriptions increased from 1 to 2, the verbal group's compliance fell by 16.67% with the diagrammatic group's falling by 75%. When comparing 1 PRA prescription to 3 PRA prescriptions the verbal group's compliance increased by 16.67%, with the diagrammatic group remaining constant at 100%. These inconsistent results may have been due to low numbers in the study, particularly as very few participants received three exercises.

Compliance to PRA prescription is more likely when it is tailored to a patient's daily routine, prescribed with correct technical instructions, or when appropriate and accurate feedback is available when required.<sup>15</sup> Our study revealed that participants were prescribed stretches on 79.49% of occasions, with other exercises in 20.51% of cases. Frequently, PRA was prescribed 7 days per week (82.05%), with the PRA to be completed 2 times per day (28.95%) and 3 times per day (28.95%) in the majority of prescriptions. The most common duration that an exercise or stretch was required to be completed was for 30 seconds in 48.65% of cases. These results demonstrate consistency of prescription in duration and frequency at the VUOMC, allowing them to be built into a daily routine, making it a habitual occurrence that was demonstrated by our high overall compliance rate of 55.56%.

Practitioner compliance in keeping accurate patient notes is an essential medico-legal requirement as all details of the treatment and general observations should be noted and dated for the first appointment, and each subsequent consultation thereafter.<sup>16</sup> In 58.82% of cases the patient contended that PRA prescription occurred, but there was no reference found in the patient's case notes. This data suggests greater attention to detail by the practitioner is required, as they are liable for their prescription and any advice given throughout the consultation. Apart from the medico-legal aspect, goal setting and base line levels have to be recorded and established prior to the PRA prescription and commencement of the exercises. In a clinical setting there are multiple variables (intrinsic/extrinsic motivation and self-efficacy) that may play an active role in establishing and maintaining adequate levels of compliance.<sup>7,17</sup> Therefore it is necessary that the practitioner establishes and records functional goals that are targeted in the PRA prescription. These patient records have to be accurately maintained as they may be required for future reference, to demonstrate functional gains that the patient or third party is not aware of, or for medico-legal matters.<sup>12,16</sup>

Persons who present to a primary practitioner may be from any sector within the community. Each participant's circumstances are different, as patients will have varying barriers to PRA compliance. Increasing awareness of obstacles to exercise and

developing appropriate techniques for coping with them will lead to greater exercise adherence.<sup>1</sup> Demographic characteristics that may lead to poor compliance have been identified in this study, with the view that an Osteopath may consider these and modify their PRA prescription or compliance expectations accordingly. Marital status was a demographic variable that displayed a trend, with married persons being 16.92% more compliant than single persons, which was similar to the view held by Dishman et al.<sup>18</sup> There was no identifiable trend between occupation or educational level and increased compliance in this study. Gender however was a demographic variable that demonstrated a large percentage compliance discrepancy. The mean percentage difference between groups revealed that males were 44.45% more compliant than females; however there was a smaller sample size in the male group, thus this result is limited to an observation as it is not a true representation of the gender balance within the population. Females were compliant to 66.67% of diagrammatic PRA prescription and 38.1% of verbal prescription, whereas males were compliant to 100% of verbal PRA prescription and 83.33% of diagrammatic prescription. These findings were contrary to the assumption made in another comparable study that patient compliance will be unrelated to a patient's sex.<sup>20</sup> Compliance varied greatly in relation to age with the 40-49 year group completing 80% of prescribed PRA, followed by the 20-29 year group with 58.33% and the 30-39 year group (54.54%). No percentage trends were obtained from analysis of educational level or occupation. A person's geographical base did not seem to considerably affect compliance. The present study established that having children should not be viewed as an obstacle to PRA compliance, rather perhaps greater organization combined with family support may be seen to increase compliance.<sup>7</sup>

There are other environmental factors and personal characteristics that also contribute to non-compliance such as access to facilities, temporal factors, cost and family/peer influence, self-motivation, past-program participation, current health status, exercise knowledge and attitude.<sup>7,18</sup> For instance, in athletes who require PRA prescription, adherence to the prescribed treatment protocols is considered by sports-medicine professionals to be an important contributor to successful rehabilitation. Athletes will have different barriers to compliance than an elderly person, or a single parent, but the

issues of compliance and how the practitioner will structure the prescription remain central to completion of PRA.<sup>19</sup> Future studies may wish to focus on identifying whether these factors have an influence on compliance.

There were two limitations encountered within this study. Firstly, a small sample size of patient participants was obtained N=30, which accounted for 18.40% of all new patients that attended the VUOMC throughout the research period. This was a lower than expected questionnaire return rate and in order to overcome this predicament, future research projects should be conducted over a longer duration, with fewer student participants who have a vested interest in the outcome of the research. Secondly, there may have been bias associated with patient participant response. Either the patient participant may have wanted to demonstrate to the practitioner how compliant they were by overstating their response in the questionnaire, or the patient may have wanted to demonstrate how poor they believed that the PRA prescription was, understating their compliance. Sluijs et al.<sup>20</sup> established that a participant is less likely to admit to non-adherence, thereby potentially producing inaccurate results. Previous studies have been prone to recall and bias problems as they also have relied on a truthful participant response from their questionnaire.<sup>2,5</sup> Greater accuracy in measuring compliance that does not rely on participants having to recall information, is warranted in future research into PRA prescription in order to produce less subjective compliance rates. As the overall percentage compliance figures in the verbal and diagrammatic groups were consistent with other studies<sup>2,5</sup>, this bias was assumed to be minimal with the patient population remaining truthful in their questionnaire responses.

## **Conclusion**

It is the joint responsibility of the Osteopath and patient to discuss barriers to PRA compliance. This will enable obstacles that hinder exercise compliance to be identified in the initial stages of the patient practitioner relationship, resulting in greater patient motivation to complete the PRA prescribed. The resultant greater self-efficacy in the ability to perform prescribed rehabilitation modalities, stronger beliefs in the treatment

efficacy, and higher value attached to rehabilitation will result in a more successful outcome for the patient as compliance will be improved.<sup>21</sup>

Osteopathic treatment encompasses PRA prescription external to consultation time, thus the expectation for patient compliance will continue. This study established that diagrammatic, verbal and demonstrative PRA prescription is more successful than verbal and demonstrative PRA prescription alone, enabling the osteopathic practitioner to utilize this method of prescription in clinical practice. In turn both patient and practitioner will achieve their desired conjoined goals at a greater rate and at less of a burden to all parties.

### **Acknowledgements**

Our thanks to Rochelle Wheller who assisted with the questionnaire generation/refinement process and data collection and to Jenny Hynes for her help in selecting appropriate exercises that were administered throughout the data collection period of this study.

(c) 2004  
Victoria University

## Reference List

1. Anthony J. Psychologic Aspects of Exercise, *Clinics in Sports Medicine* 1991. **10**(1):171-180.
2. Kolt GS, & McEvoy JF. Adherence to rehabilitation in patients with low back pain. *Manual Therapy* 2003; **8**(2):110-116.
3. Wallace ES, White JA, Downie A, Dalzell D, & Doran D. Influence of exercise adherence level on modifiable coronary heart disease risk factors and functional-fitness levels in middle-aged men. *British Journal of Sports Medicine* 1993;**27**(2):101-106.
4. Wilbur J, Miller AM, Chandler P, & McDevitt J. Determinants of Physical Activity and Adherence to a 24- Week Home-Based Walking Program in African American and Caucasian Women. *Research in Nursing & Health* 2003;**26**:213-214.
5. Schneiders AG, Zusman M, & Singer KP. Exercise therapy compliance in acute low back pain patients. *Manual Therapy* 1998;**3**(3):147-152.
6. Kuchera WA, & Kuchera ML. Osteopathic Principles in Practice. 2<sup>nd</sup> Edition. Missouri: KCOM Press Kirksville; 1992.
7. Milroy P, & O'Neil G. Factors affecting compliance to chiropractic prescribed home exercise: a review of the literature. *Journal of the Canadian Chiropractic Association* 2000;**44**(3):141-148.
8. Nied RJ, & Franklin B. Promoting and prescribing exercise for the elderly, *American Family Physician* 2002;**65**(3):419-426.
9. Reid EL, & Morgan RW. Exercise Prescription: A Clinical Trial. *American Journal of Public Health* 1979;**69**:591-595.
10. Swinburn BA, Walter LG, Arroll B, Murray WT, & Russell DG. The Green Prescription Study: A randomized Controlled Trial of Written Exercise Advice Provided by General Practitioners. *American Journal of Public Health* 1998;**88**(2):288-291.
11. Smith F, & Iliffe S. Exercise prescription in primary care. *British Journal of General Practice* 1997;**53**(4):272-273.
12. Sherman FT. Off-label use of prescription blanks. *Geriatrics* 2002;**7**(9):9.

13. Frost H, Lamb SE, Doll HA, Carver PT, & Stewart-Brown S. Randomized controlled trial of physiotherapy compared with advice for low back pain. *British Journal of Medicine* 2004;**329**:708-714.
14. Linton SJ, Tulder MWV. Preventive Interventions for Back and Neck pain Problems *SPINE* 2001;**26**(7):778-787.
15. Friedrich M, Cermak T, & Maderbacher P. The effect of brochure use versus therapist teaching on patients performing therapeutic exercise and on changes in impairment status. *Physical Therapy* 1996;**76**(10):1082-1087.
16. Australian Osteopathic Association. Record Keeping Guidelines for Osteopaths. 2005.
17. Dishman, RK. *Advances in exercise adherence*. USA: Human Kinetics; 1994.
18. Dishman RK, Sallis JF, Orenstein DR. "The Determinants of Physical Activity and Exercise". *Public Health Reports* 1985, 100:161, U.S Public Health Service.
19. Britton W, Avondoglio JB, Cornelius AE, Van Raalte JL, Brickner JC, Petitpas AJ, Kolt GS, Pizzari T, Schoo AMM, Emery K, & Hatten SJ. Construct Validity and Interrater Agreement of the Sport Injury Rehabilitation Adherence Scale. *J Sport Rehabilitation* 2002;**11**:170-178.
20. Sluijs EM, Kok JK, Van Der Zee J, Turk DC, & Riolo L. Correlates of exercise compliance in physical therapy. *Physical Therapy* 1993;**73**(11):771-782.
21. Taylor AH, & May S. Threat and coping appraisal as determinants of compliance with sports injury rehabilitation: An application of Protection Motivation Theory. *Journal of Sports Science* 1996;**14**:471-482.

## Appendices

(c) 2004  
Victoria University

**Table 1. Demographics of Participants.**

<i>Demographic</i>	<i>Division</i>	<i>Number of Participants</i>	<i>Percentage</i>
<b>Gender</b>	Male	8	26.67%
	Female	22	73.33%
<b>Age</b>	Male	Mean	32.63
		Range	(23,48)
		Standard Deviation	± 5.71
	Female	Mean	36.86
		Range	(20,63)
		Standard Deviation	± 6.07
<b>Marital Status</b>	Married	12	40%
	Single	17	56.67%
	De Facto	1	3.33%
<b>Occupation</b>	Manager & Administrators	2	6.67%
	Professionals	11	36.67%
	Associate Professionals	3	10.00%
	Tradespersons & Related Workers	1	3.33%
	Advanced Clerical & Service Workers	3	10.00%
	Intermediate Production and Transport Workers	0	0%
	Elementary Clerical, Sales and Service Workers	4	13.33%
	Labourers & Related Workers	2	6.67%
		0	0%
		4	13.33%
<b>Educational Level</b>	Secondary school	10	32.25%
	Certificate/Diploma	2	6.45%
	Tertiary	12	38.71%
	Graduate Diploma/Post Graduate Degree	3	12.90%
	Masters	2	6.45%
	PHD	1	3.33%
<b>Number of Children</b>	Zero	20	66.67%
	One	2	6.67%
	Two	2	6.67%
	Three	4	13.33%
	Four	2	6.67%
<b>Residential Zone</b>	Inner city	12	40.00%
	Northern Suburbs	10	33.33%
	Southern Suburbs	2	6.67%
	Eastern Suburbs	1	3.33%
	Western Suburbs	5	16.67%

**Table 2. PRA Prescription Details & Overall Compliance.**

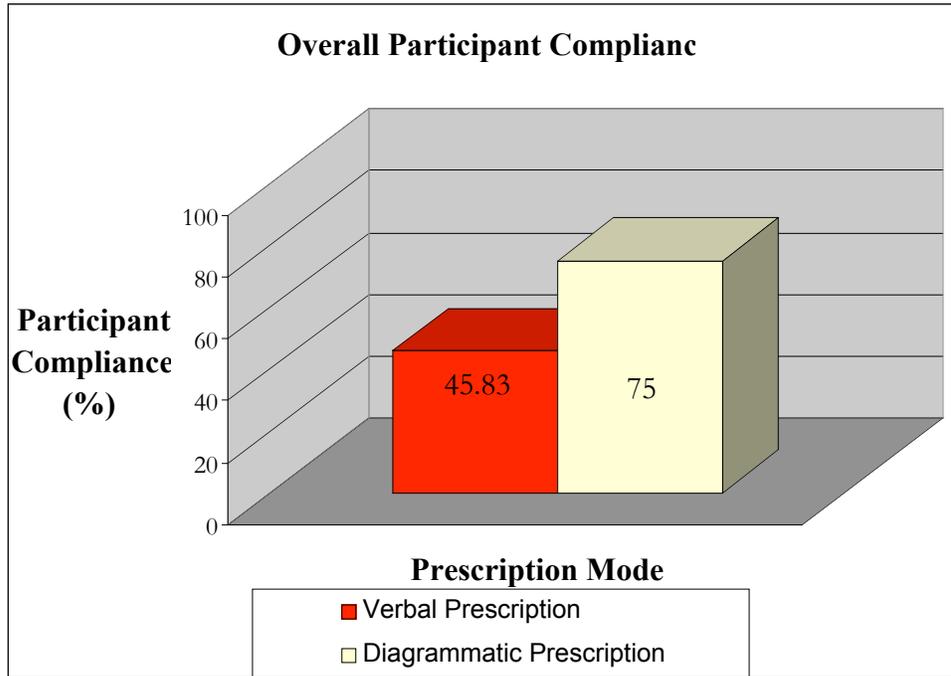
<i>Demographic</i>	<i>Division</i>	<i>Participants that received PRA</i>	<i>Compliance to PRA</i>
<b>Gender</b>	Male	6/8 (75%)	8/9(88.89)
	Female	16/22 (72.73%)	12/27(44.44%)
<b>Age</b>	<19yo	-	-
	20-29yo	7/22 (31.81%)	7/12 (58.33%)
	30-39yo	6/22 (27.27%)	6/11 (54.54%)
	40-49yo	4/22 (18.18%)	4/5 (80%)
	50-59yo	3/22 (13.63%)	2/5 (40%)
	60-69yo	2/22 (9.09%)	1/3 (33.33%)
<b>Marital Status</b>	Married	10/22 (45.45%)	9/14 (64.29%)
	De Facto	1/22 (4.54%)	3/3 (100%)
	Single	11/22 (50%)	9/19 (47.37%)
<b>Occupation</b>	Manager & Administrators	1/22 (4.54%)	1/1 (100%)
	Professionals	8/22 (36.36%)	4/12 (25%)
	Associate Professionals	3/22 (13.63%)	5/5 (100%)
	Tradespersons & Related Workers	-	-
	Advanced Clerical & Service Workers	3/22 (13.63%)	5/7 (71.43%)
	Intermediate Production and Transport Workers	-	-
	Elementary Clerical, Sales and Service Workers	4/22 (18.18%)	3/5 (60%)
	Labourers & Related Workers	1/22 (4.54%)	1/1 (100%)
		-	-
<b>Educational Level</b>	Secondary school	6/22 (27.27%)	3/9 (33.33%)
	Certificate/Diploma	2/22 (9.09%)	3/3 (100%)
	Tertiary	8/22 (36.36%)	8/14 (57.14%)
	Graduate Diploma/Post Graduate	3/22 (13.36%)	6/6 (100%)
	Degree	2/22 (9.09%)	0/3 (0%)
	Masters	1/22 (4.54%)	0/1 (0%)
	PHD		
<b>Number of Children</b>	Zero	14/22 (63.63%)	10/24 (41.67%)
	One	2/22 (9.09%)	2/4 (50%)
	Two	2/22 (9.09%)	0/3 (0%)
	Three	3/22 (13.63%)	2/2 (100%)
	Four	1/22 (4.54%)	3/3 (100%)
<b>Residential Zone</b>	Inner city	7/22 (31.82%)	5/10 (50%)
	Northern Suburbs	9/22 (40.90%)	9/16 (56.25%)
	Southern Suburbs	1/22 (4.54%)	1/1 (100%)
	Eastern Suburbs	1/22 (4.54%)	0/2 (0%)
	Western Suburbs	4/22 (18.18%)	5/7 (71.43%)

**Table 3. Clinical Data Presentation.**

<i>Region</i>	<i>Site of Presentation (%)</i>	<i>Percentage Prescribed PRA</i>	<i>Percentage Compliance</i>
<b>Neck</b>	33.33	68.75	58.33
<b>Upper Back</b>	8.33	100	100
<b>Lower Back</b>	22.92	72.73	50
<b>Pelvis</b>	4.17	100	0
<b>Hip</b>	4.17	100	83.33
<b>Thigh</b>	4.17	100	100
<b>Knee</b>	4.17	50	0
<b>Calf</b>	4.17	100	100
<b>Ankle/Foot</b>	2.08	100	0
<b>Shoulder</b>	8.33	75	25
<b>Upper arm</b>	2.08	100	50
<b>Wrist/Hand</b>	2.08	100	0

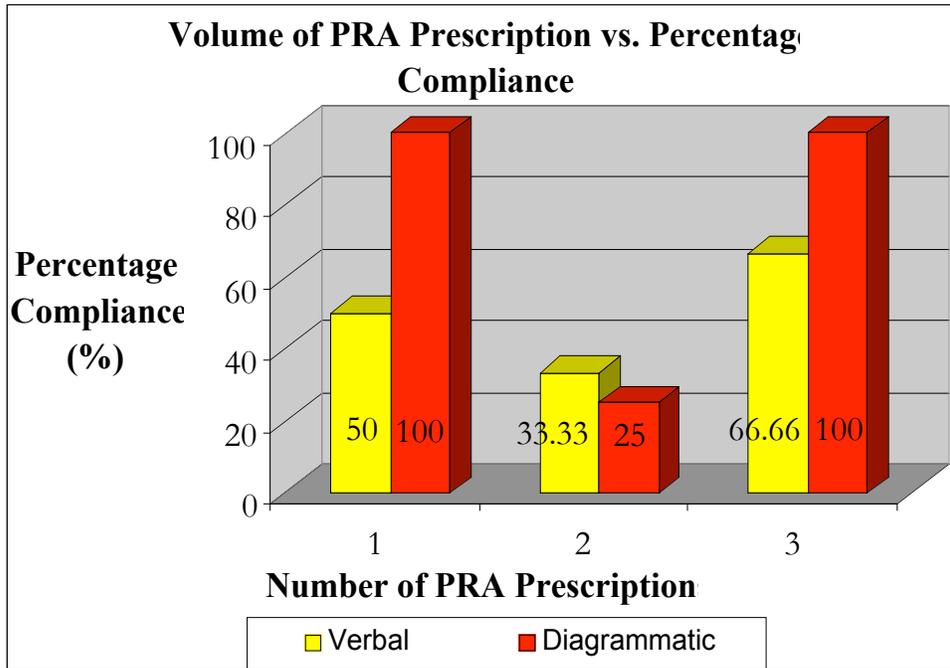
(c)  
Victoria U

**Figure 1. Participant Compliance to PRA Prescription.**



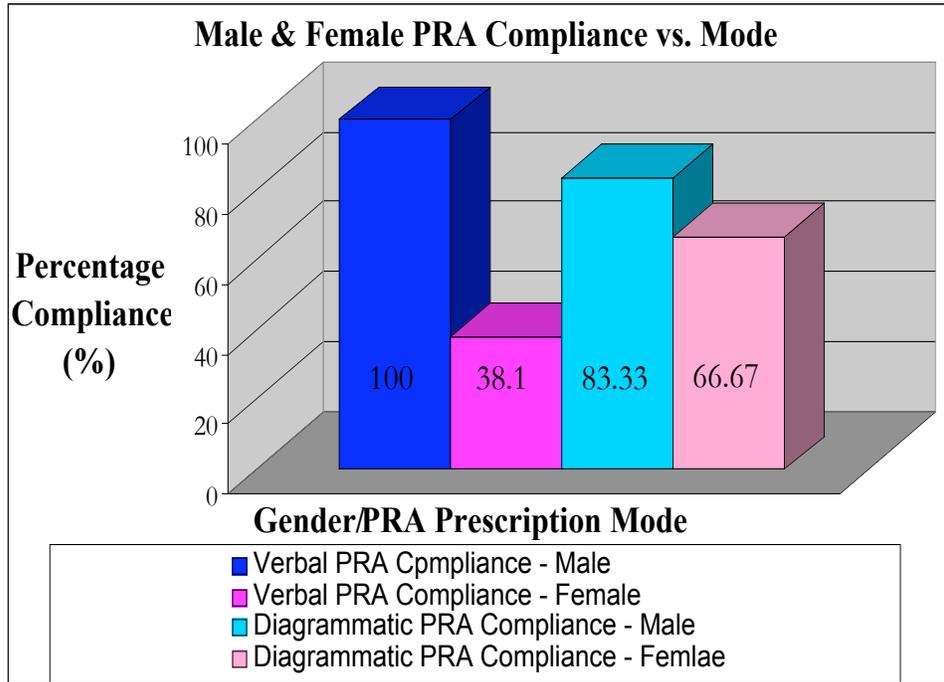
(c) 2000  
Victoria Unive

**Figure 2. Number of PRA Prescriptions vs. Percentage Compliance**



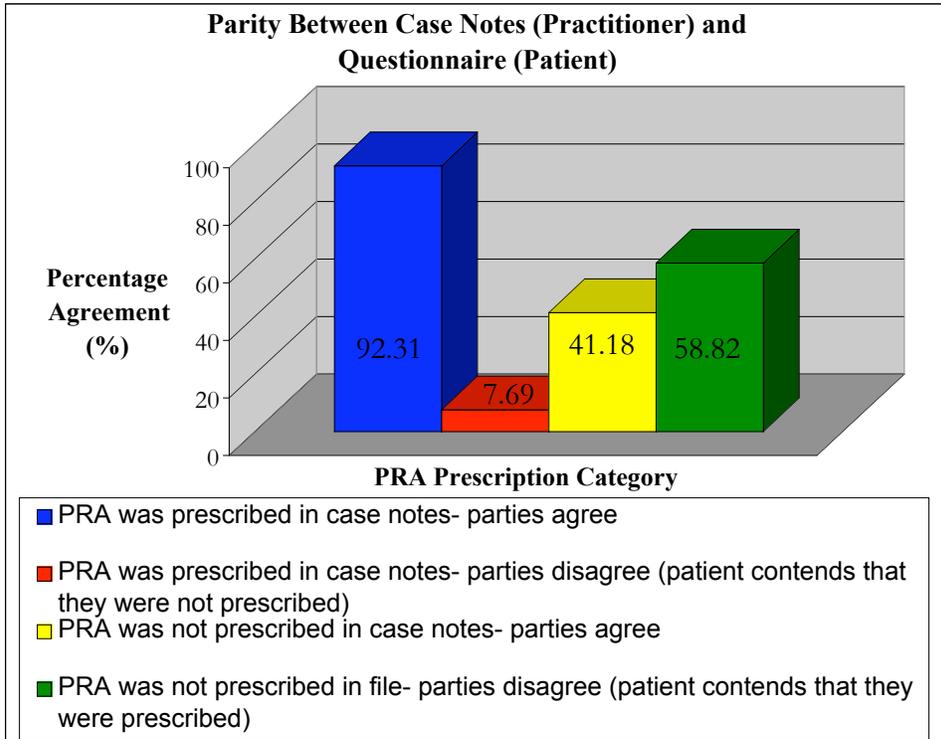
(c) 2000  
Victoria University

**Figure 3. Male & Female PRA Compliance.**



(c) 2014  
Victoria University

**Figure 4. Practitioner vs. Participant (Patient) Analysis.**



(c)  
Victoria U