Routine measurement of heart rate and blood pressure by physical therapy clinical instructors


(Abstract prepared by K.C. Peebles)

**Question:** Do physical therapy clinical instructors meet the recommended guidelines, documented by the American Physical Therapy Association (APTA), for measurement of heart rate (HR) and blood pressure (BP) in new and existing patients?

**Design:** A 26-item survey questionnaire of 597 physical therapy clinical instructors working throughout the United States from areas including rehabilitation, acute care, paediatrics and outpatient care. The instructor’s response to questions was retrospective (based on physiotherapy management in the week before the survey). Instructors were asked questions regarding their access to HR and BP monitoring equipment, whether they considered HR and BP monitoring to be important and how frequently they measured these variables. They were also asked to identify their practice setting, years of experience and types of patients seen in the week before the survey. Specifically, whether their patients had any cardio-pulmonary comorbidities.

**Main results:** Of the 387 respondents the majority were female, had practised physical therapy for one to 10 years and currently practised in the outpatient setting. The majority of respondents (59.5%) strongly agreed that vital signs should be measured but few reported measuring HR and BP in their new or existing patients in the week before the survey. Most respondents felt adequately prepared to measure these variables. Some of the reasons given for not measuring HR and BP included: 1) that it was not important in their patient population, 2) the information was obtained from patient chart or ICU monitor and 3) lack of time.

**Conclusion:** The authors concluded that results do not meet with the recommendations documented by the American Physical Therapy Association (APTA) in the *Guide to Physical Therapist Practice* (2001).

**Commentary:**

Before commenting on this article it is necessary to reiterate that this study surveys a population of Physical Therapy clinical instructors in America. It is acknowledged that the findings may not bear direct relevance to New Zealand physiotherapists’ practice. However, the article does raise the important issue of whether cardiovascular (CV) variables are considered and measured in all areas of physiotherapy practice.

While the authors comment that routine measurement of HR and BP may not be necessary after initial screening it is concerning that the study revealed instances where HR and BP measurements were omitted in patients who reported CV disease. This suggests the clinicians lacked awareness of the implications of HR and BP alterations on their patient’s pathology.

Perhaps a point that could also be highlighted is that even when measured, indirect measures of peripheral BP (e.g. sphygmomanometry) underestimate intra-arterial measures of systolic blood pressure (SBP) taken at rest, and during and after aerobic and isometric exercise. Further, the true CV stress imposed by isotonic exercise may be underestimated if blood pressure is only recorded post exercise since Wiecek et al. (1990) demonstrated there is a rapid decline in blood pressure immediately after isotonic exercise is stopped.

The potential for error may be further compounded in subsequent analysis. For example, the rate pressure product - an indication of CV load - is a product of SBP and HR. Underestimation of either of these variables will yield unreliable information about the true pressure imposed on the CV system.

2. Wiecek EM, McCartney N & Mc Kelvie RS. Comparison of direct and indirect measures of systemic arterial pressure during weightlifting in coronary artery
## Pelvic floor muscle training for prevention of female urinary incontinence


**Abstract prepared by Jean Hay-Smith**

### Design:
This was a randomised trial with two treatment arms, (a) intensive antenatal pelvic floor muscle training, and (b) standard antenatal care.

### Setting:
Three hundred and one women pregnant with their first child who were continent prior to pregnancy, attending a tertiary hospital for a ‘routine’ ultrasound scan at 18 weeks gestation, gave informed consent and were randomised.

### Interventions: Prior to randomization, all women received individual instruction in pelvic floor anatomy, and had a correct pelvic floor muscle contraction confirmed on vaginal examination.

Standard care comprised the usual antenatal care and information from midwives and/or general practitioners. Women who wished to exercise the pelvic floor muscles were allowed to do so.

Intensive training included pelvic floor muscle training twice daily at home and a 60 minute weekly exercise class attended between the 20th and 36th week of gestation. Classes of 10 to 15 women were supervised by physiotherapists. Class content included pelvic floor muscle contractions in lying, sitting, kneeling and standing positions (all with the legs apart), interspersed with body awareness, breathing and relaxation exercises, and strength training for abdominal, back and thigh muscles. At home, and in class, women were encouraged to perform sets of eight to 12 near maximal pelvic floor muscle contractions, held for six to eight seconds, with six seconds rest between contractions.

### Main Outcome Measures: The primary outcome measures were self-reported urinary incontinence at 36 weeks gestation and three months postpartum.

### Results: One hundred forty eight women were randomised to intensive training and 153 to standard care. The trial groups were comparable at baseline. Twelve women withdrew (five training, seven standard care). Women in the training group were 33% less likely to report urinary incontinence at 36 weeks (relative risk (RR) 0.76, 95% confidence interval (CI) 0.50 to 0.89), and 39% less likely to report urinary incontinence three months postpartum (RR 0.61, 95% CI 0.40 to 0.90).

### Conclusions: Intensive supervised pelvic floor muscle training during pregnancy, for women pregnant with their first child who were continent prior to pregnancy, reduced the risk of self-reported urinary incontinence by approximately a third at 36 weeks gestation and three months post-partum compared to standard antenatal care.

### Commentary
The methods and results of this trial were meticulously reported. The title states that the study investigated the effectiveness of pelvic floor muscle training for prevention of urinary incontinence, but the interpretation of the results depends on (a) one’s definition of prevention, and (b) consideration of the sample characteristics.

There are three ‘grades’ of prevention. Primary prevention aims to remove the cause of a disease, secondary prevention to detect and treat asymptomatic dysfunction to prevent symptoms appearing, and tertiary prevention to treat existing symptoms to prevent disease progression. Thus, tertiary prevention trials look at the efficacy of treatments for existing conditions, and primary and secondary prevention trials should recruit individuals who have not been exposed to the cause of a disease, or are asymptomatic. Because there are often practical problems with screening for causes of disease, it is common for people to be recruited to prevention studies based purely on absence of symptoms.

Mørkved et al. recruited women who had been continent prior to their first pregnancy, but when intervention began, 94 women reported symptomatic urinary incontinence. For those women (31% of participants) the trial investigated the effectiveness of pelvic floor muscle training for urinary incontinence, i.e. tertiary prevention or treatment. For the remaining 69% pelvic floor muscle training was a primary or secondary prevention strategy.

Nearly all trials addressing pelvic floor muscle training for prevention of urinary incontinence are potentially confounded by the inclusion of people with incontinence symptoms. To date, only Reilly et al. have reported a trial of pelvic floor muscle training for primary/secondary prevention of urinary incontinence. Reilly et al. recruited first time pregnant women with increased bladder neck descent, but without urinary incontinence symptoms, and randomised them to monthly visits with a physiotherapist for pelvic floor muscle training or standard care. Women in the training group were 43% less likely to experience urinary incontinence at three months postpartum, than women in the standard care group (RR 0.59 95% CI 0.37 to 0.92).

In summary, it seems that intensive, supervised antenatal pelvic floor muscle training, for first time mothers who were not continent prior to pregnancy, reduces the risk of urinary incontinence at three months postpartum. This might also be true for women who develop urinary incontinence symptoms early in pregnancy. We don’t know how long the protection lasts beyond three months. If clinicians decide it is worth advising women to train the pelvic floor muscles in pregnancy, we have to ask if the supervision and training we provide at present is intensive enough to see this effect.


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Vestibular contribution to combined arm and trunk motion.


(Abstract prepared by Joanna Knox)

The mechanisms of motor control are emerging as an exciting area in physiotherapy research. The ways in which the brain controls movement are vital to understanding the causes, and potential approaches to treatment, in numerous neuromusculoskeletal disorders. This study, conducted by Mars et al (2003), is an example of research following the motor control approach to investigate the contribution of vestibular information to an upper limb pointing task.

Summary

The control of accurate pointing is dependent on the interaction between trunk and arm movement. Previous studies have shown that the accuracy of pointing does not vary either when movement of the trunk is restrained, or induced unexpectedly during pointing. These studies indicate that movement control mechanisms compensate for relative changes in trunk and arm position. Sensory input regarding the position of the trunk may therefore be used in the planning of arm movement. The position of the trunk is determined using information from proprioceptors, the visual and vestibular systems. Earlier work has shown that when proprioceptive and visual information is removed, subjects are still capable of compensating for trunk movement during pointing. This suggests that any inaccuracy observed during a pointing task may be due to feedback from the vestibular apparatus.

This study uses a method of changing vestibular input called galvanic vestibular stimulation (GVS) during two different pointing tasks. Galvanic vestibular stimulation is an electrical stimulation applied using two small electrodes attached at the mastoid processes. This technique has been used widely in balance studies and consistently causes body sway, towards the anode electrode, during stimulation. The first pointing task used was analogous to every day activity and allowed arm and trunk movement during pointing to a target. In the second task, subjects placed their finger on the target and were asked to move the trunk forward while maintaining the target position—this second task was designed to focus specifically on the compensatory strategies used in pointing that allow for changes in trunk position. In both tasks vision was occluded, subjects being required to memorise the target position. In the experiment, nine healthy subjects performed both pointing tasks, five without stimulation, five with anode left GVS and five with anode right GVS for each task.

The results of this study show that GVS can significantly alter the final hand position in a pointing task. A significant deviation of the final position of the hand towards the anode was observed in both pointing tasks tested. The trunk showed lateral deviation with GVS, although this was only seen during the first task. The deviation of the hand was significantly greater than that of the trunk showing that pointing inaccuracy is not just a function of leaning. The disturbance of trunk movement and accuracy of pointing observed in this study are consistent with results seen in a similar pointing task study1 and in a walking study.2 These findings all suggest that vestibular information plays a role in movement control.

Commentary

The methods employed in this study are not familiar in physiotherapy. A small sample size is used to answer a discreet question in a laboratory setting. However, this approach allows investigation into basic mechanisms of human function, as such, the results of this study raise interesting questions.

Patients with disorders of the vestibular apparatus often complain of clumsiness in movement. In addition, it is unknown how many patients with traumatic head and neck injuries, have minor deficits in the integration of vestibular information. The question that must be posed is whether these vestibular changes are able to contribute to the explanation of any poor motor control experienced as a result of the injury. The combination of vestibular rehabilitation and manual therapy is already recommended in patients with neck pain who also complain of dizziness3. Furthermore, perhaps we need to consider sensory systems outside the neck when managing patients with difficult cervical pain, retraining them to utilise other systems when coordinating movement control would further improve their outcome.

References


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