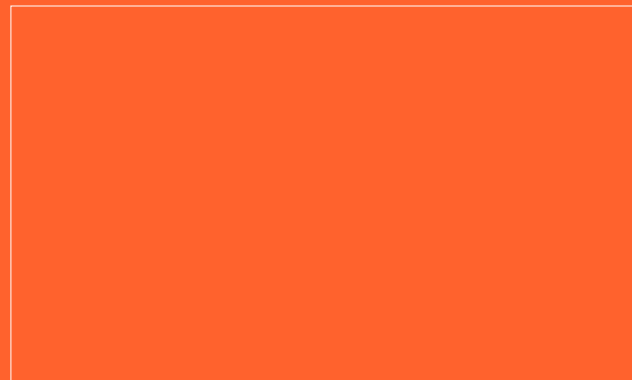




PHYSIO-LOGIC
neurological rehabilitation

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Staff Profile: Darryl C. Tracy BScPT

Darryl graduated with honors from Dalhousie University in 1989. He remained in the Maritimes practicing acute neurology and neuro rehabilitation and worked with the Parkinson's Foundation to develop their first home exercise video.

In 1991 Darryl moved to Toronto to work at Lyndhurst Hospital where he spent 11 years in the in-patient and out-patient spinal cord injury programs and developed the Lyndhurst Fitness Centre to provide fitness training for those with a neurological disorder.

Darryl is also a contemporary dance artist and choreographer and is the co-artistic director of The Four Chambers dance project. He is one the most sought after dance teachers in Toronto and teaches regularly at the Canadian Childrens Dance Theatre, Dance-Teq and The Teacher's Collective (professional). Darryl also teaches anatomy and injury prevention for dancers.

Darryl is a regular writer/contributer for the national publication "The Dance Current" writing "The Health Beat" and sits on the Steering Committee for the Artists Health Centre.

Darryl works out of our Yorkville clinic.

Physio-Logic is a practise of Physiotherapists who have a special interest in the treatment of neurologically impaired individuals.

If you have questions related to the rehabilitation of neurologically impaired individuals. Send them to us. We will research and answer them for you in our newsletter format so that everyone can benefit from the information.

Send your email address to receive Physio-Logic's newsletter, office@physio-logic.com in electronic format, or go to our web site www.physio-logic.com and download straight from there.

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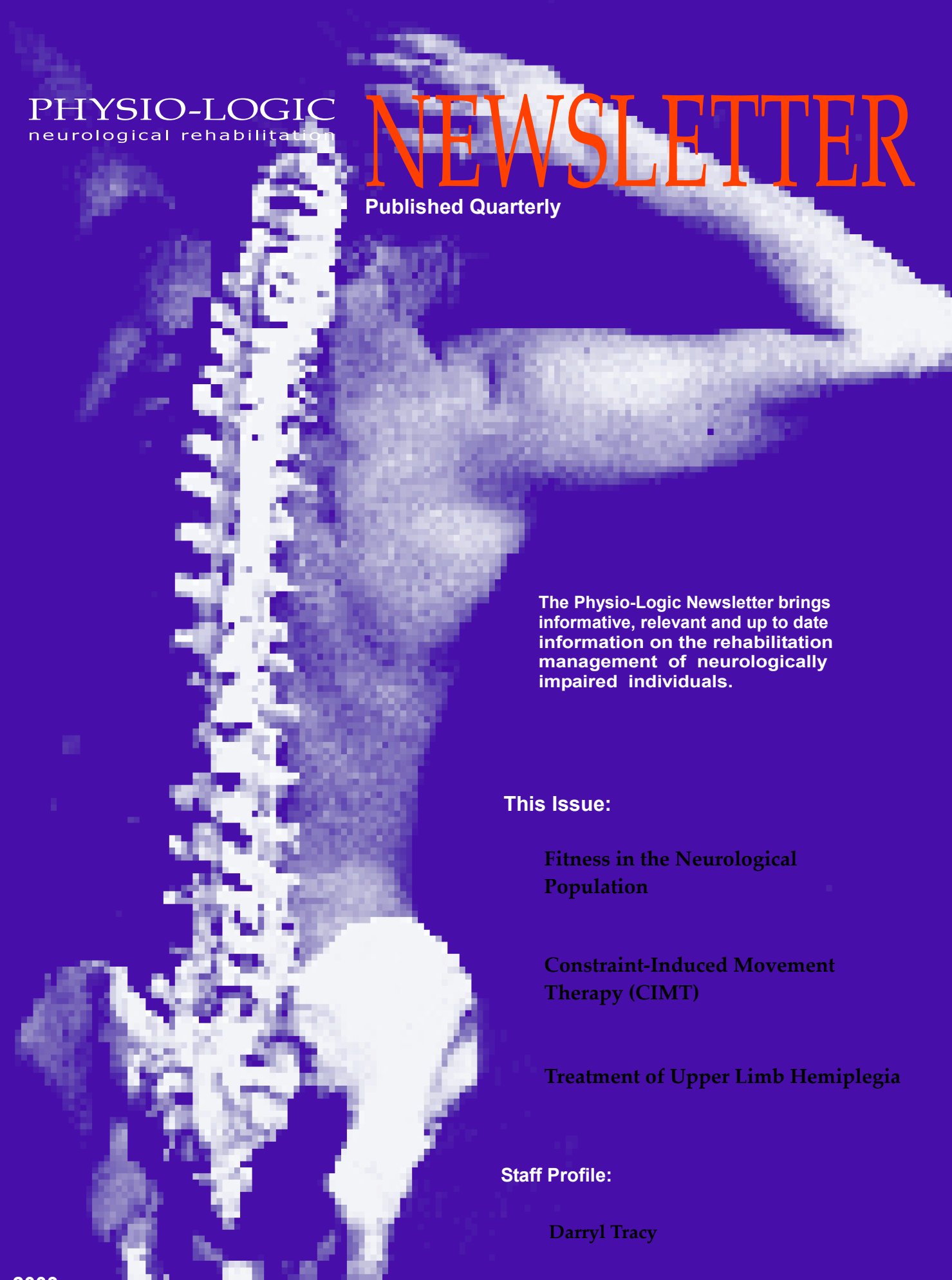
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NEWSLETTER

Published Quarterly



The Physio-Logic Newsletter brings informative, relevant and up to date information on the rehabilitation management of neurologically impaired individuals.

This Issue:

Fitness in the Neurological Population

Constraint-Induced Movement Therapy (CIMT)

Treatment of Upper Limb Hemiplegia

Staff Profile:

Darryl Tracy

Feature Article: Fitness in the Neurological Population.

By Darryl C. Tracy BScPT

In the early seventies, with the "Participation" craze, many individuals became increasingly aware of the importance of fitness in the role of their everyday life. Since then, with advanced research in medicine and physiology, it is evident and well known the wide ranging benefits fitness can have on an individual's life and lifestyle. The benefits from physical fitness may include physical conditioning, as well as emotional well-being, psychological, social, mental, and thus one's quality of life. This is no different for an individual with a neurological disorder.

What is Fitness?

Attempting to define fitness is difficult as many people consider various activities as "fitness". The Oxford Dictionary defines fitness as; "in good health or athletic condition" which is a very broad definition. Many individuals will hear from practitioners "You need to 'get in shape'!" or "become more fit". This can be very general and designing the appropriate program needs special thought and consideration.

Aspects of fitness may include:

- i) strength training
- ii) cardiovascular fitness (aerobic or anaerobic)
- iii) Endurance training (aspects of above)
- iv) Body composition
- v) Flexibility

Many practices recently attempt to target multiple aspects of the above i.e. in Pilates you are working on strength, endurance and flexibility. Also in many "aerobics" classes, one will have aerobic activity as well as some form of strength training. Many myths about the benefits of fitness and the neurological population are being dispelled with recent research and it is so important that practices of fitness and well-being are considered on an individual basis. Example: historically, it was thought that exercise was contraindicated for individuals with multiple sclerosis. This really needs to be properly assessed with the individual and this is often not the case depending on their manifestation of the disease.

Exercise prescription:

Should be performed by a professionally trained individual who is aware of the

needs of the individual with a neurological disorder. This professional should collaborate with any treating health care practitioner to ensure any goals of fitness align themselves with current rehabilitation goals. The individual must know the specifics for neurological populations using valid measuring tools i.e. pulse taking in an individual with a spinal cord injury may not be as accurate as with the non-SCI.

Program should include:

- ~Clients goals and areas of interest (motivation is key!!)
- ~ Principles of Overload, Specificity and reversibility should be considered.
- ~ May follow the F.I.T.T. principle:

F- Frequency (how often per week)

I-Intensity (how much or how hard)

T- Time (for how long does the activity occur to attain benefits)

T-Type (What type of activity needs to occur).

In the neurological population, the prescribing practitioner should:

- a) Screen to decrease risk of injury or exacerbation
- b) Prescribe precisely
- c) Supervise when needed
- d) Re-Evaluate
- e) Modify and Follow-up.

Additional note: many individuals may be partaking in neurological rehabilitation in addition to any fitness practice. With any movement dysfunction, compensations exist to allow movement for that individual. For this reason it is imperative that the treating physiotherapist be involved or made aware of choices in programs designed. For example, for some clients a treadmill may be better than a stationary bike as the therapist may be attempting to minimize time and activity spent in the flexed alignment. For others, this may not be the case.

Individuals with a neurological disorder obviously have issues with many of the systems of their body. Aspects of fitness can prevent unwanted complications from being sedentary or inactive.

Fitness can affect (depending on the type of activity and individual involved):

- a)Skeletal system- consider bone density
- b)Muscular system- increase strength in certain muscles makes activities of daily

living easier, makes rehabilitation easier.

c) Nervous system- improved physical fitness can improve attention, memory, mood, and efficiency of nerve firing

d) Endocrine system- may challenge thermoregulation, hormonal control. Additionally, may affect metabolic system and thus body mass (weight loss).

f) Cardiovascular- improved circulation, prevention of pressure sores with good circulation, improved cardiac function, prevention of heart disease, etc.

g) Respiratory- decrease effort in breathing with improved efficiency of oxygen transportation.

h) Lymphatic System- decrease swelling with improved efficiency

i) Urinary System- decrease in urinary tract infections

How and where- consult your treating physiotherapist for accessible facilities with programs suitable for you. At Physio-Logic, the therapists work with the client in the community as a resource and assessing appropriate programs.

This article hopefully highlights the wide range of benefits fitness can have on the neurological population. More and more research is being performed to determine the effects exercise has on this population. With the proper assessment and prescription involving the individual- a successful fitness program can be developed!

Constraint-Induced Movement Therapy (CIMT) Treatment of Upper Limb Hemiplegia

How does CIMT work?

The premise of Constraint-Induced Movement Therapy is based upon two inter-related ideas. The first is that there is a phenomenon referred to as learned non-use that occurs soon after a neurological lesion. Even when there is recovery of the CNS tissue, this recovery may not be expressed by an individual due to a learned effect. There may therefore be motor recovery in the individual that remains unexpressed.

The second and closely related concept is that the cortex (brain) may in fact still be able to plastically adapt to a change in the amount of sensori-motor information provided to it. Such a change may become permanent when the stimulus is high in intensity and sustained in frequency over a specific time period. This change seems to be due to cortical re-organization through a process known as plastic adaptation. (Liepert et al, 2000)

What is CIMT?

A comprehensive CIMT program should involve:

- Comprehensive education as to the expectations both of the therapist and of the individual performing CIMT.
- Wearing of a restraint on the "good" arm for up to 90% of the day.
- Intensive re-training of the "weaker" arm. This should involve both home and clinic-based programs. "Shaping" is a technique that has been shown to be quite successful in CIMT.
- Recording of activities and ongoing evaluation of functional abilities.

Each part of CIMT is essential and using only restraint or only re-training has been shown to be significantly less effective.

The amount of time spent wearing the restraint and the amount of time spent in re-training activities and exercises have both been the subject of recent studies in the literature. Initial studies (Taub 1993) advocated wearing the restraint for 90% of waking hours and performing 6 hours of exercises each day. This was carried out over a 2 week period.

More recent studies (Page et al 2002, Tremblay and Tremblay 2002) have found good, if not quite as large effects with modification of this protocol. Wearing the

restraint for 5 hours per day and attending therapy for 1 hour three days per week for 10 weeks is one of the modified protocols. The modified protocol makes it easier for individuals to comply with the program but places greater emphasis on home exercises and requires significantly longer program duration.

Who should do CIMT?

There have been several positive reports about the effects of CIMT for patients who have sustained an upper limb paresis, even years after the event.

Individuals who are likely to benefit from CIMT should have the following characteristics:

- Have suffered a neurological lesion of central origin (a stroke or brain injury)
- Some active movement of the affected wrist and fingers
- Able to walk safely with their "good" arm restrained
- Be able to understand the process of the program and
- Have support available at home to complete the home-based portion of the program.

Feedback about the Physio-Logic CIMT program

A program of CIMT has been put into practice on a trial basis at Physio-Logic during the spring of 2003. The feedback from that program is useful to modify future programs and to prepare individuals for the program.

A CIMT program was developed at Physio-Logic for a young traumatic brain injured male who had gained some motor recovery of the affected upper limb, but he was not using the upper limb for functional activities. The CIMT program consisted of:

- Attending daily for physiotherapy specific to the development of functional motor recovery of the 'weak' upper limb
- Wearing of a restraint (boxing glove) on the 'good' hand during all waking hours. The restraint was only removed for toileting purposes.
- A therapy support worker was educated in the program and facilitated use of the 'weak' upper limb for ??? hours/day.

As the "good" arm is restricted, there may

be a loss of independence for some activities during the program. This may be very frustrating at times. The program can be very challenging to individuals. Education and clearly defined expectations are essential.

The improvements made in function of the "weaker" arm are impressive and are worth the effort. There is a reported greater ease of movement and confidence in the ability of the weaker arm to carry out functional task.

Certainly the best results in treating an upper limb hemiplegia will be a program which takes into account the specific needs of each individual. These needs will vary from the amount of impairment or disability, the particular home environment and the goals and expectations of the individual.

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