# Successful Implementation of Constraint Induced Movement Therapy (CIMT): An International qualitative study

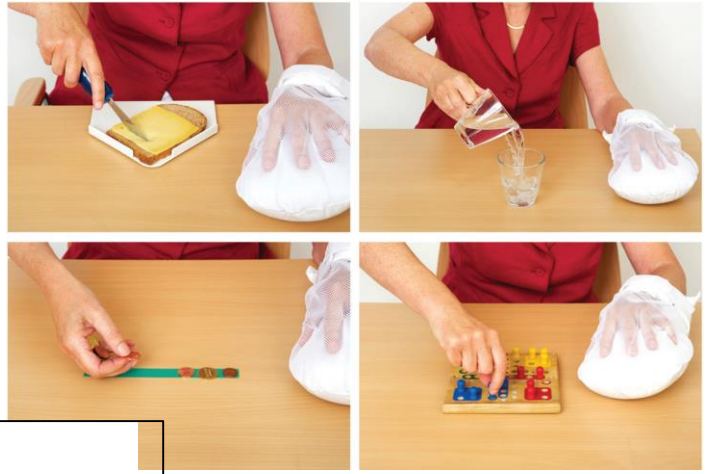
Lauren Christie[1,2,3] Annie McCluskey[1] & Meryl Lovarini [1]

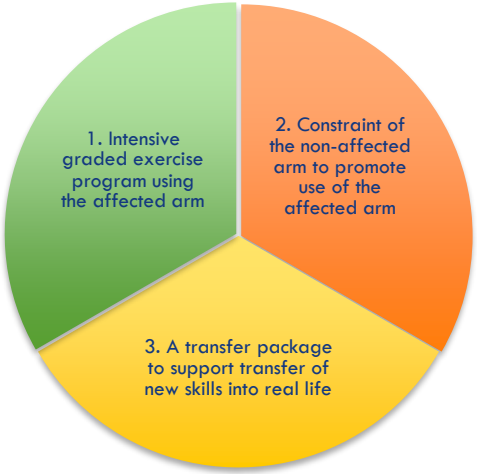
[1] The University of Sydney

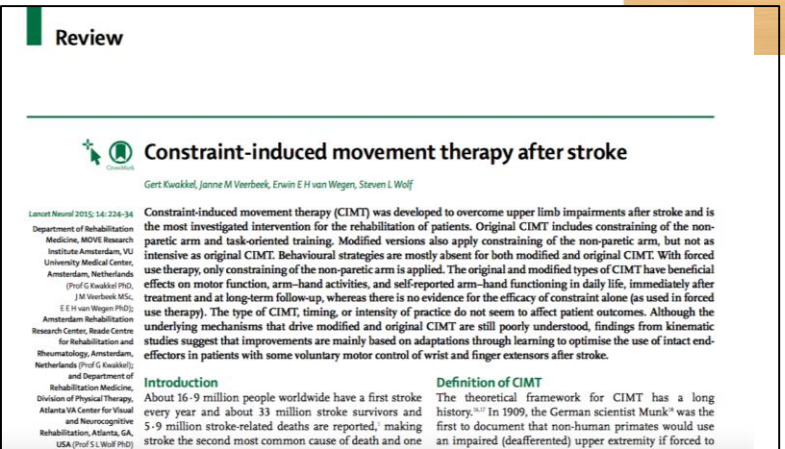
[2] Liverpool Brain Injury Rehabilitation Unit

[3] Brain Injury Rehabilitation Research Group, The Ingham Institute for Applied Medical Research

# Rationale





Review

## Constraint-induced movement therapy after stroke

Gert Kwakkel, Janne M Veerbeek, Erwin E H van Wegen, Steven L Wolf

Lancet Neurol 2015; 14: 224–34

Department of Rehabilitation Medicine, MOVE Research Institute Amsterdam, VU University Medical Center, Amsterdam, Netherlands (Prof G Kwakkel PhD, J M Veerbeek MSc, E E H van Wegen PhD); Amsterdam Rehabilitation Research Center, Reade Centre for Rehabilitation and Rheumatology, Amsterdam, Netherlands (Prof G Kwakkel); and Department of Rehabilitation Medicine, Division of Physical Therapy, Atlanta VA Center for Visual and Neurocognitive Rehabilitation, Atlanta, GA, USA (Prof S L Wolf PhD)

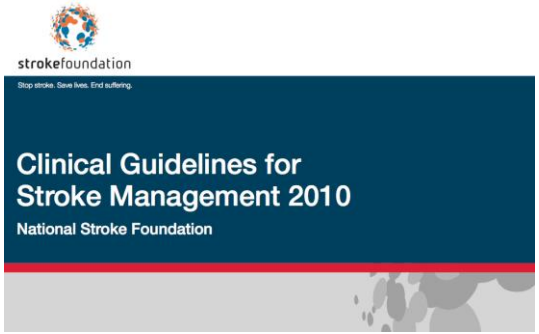
**Constraint-induced movement therapy (CIMT) was developed to overcome upper limb impairments after stroke and is the most investigated intervention for the rehabilitation of patients. Original CIMT includes constraining of the non-paretic arm and task-oriented training. Modified versions also apply constraining of the non-paretic arm, but not as intensive as original CIMT. Behavioural strategies are mostly absent for both modified and original CIMT. With forced use therapy, only constraining of the non-paretic arm is applied. The original and modified types of CIMT have beneficial effects on motor function, arm–hand activities, and self-reported arm–hand functioning in daily life, immediately after treatment and at long-term follow-up, whereas there is no evidence for the efficacy of constraint alone (as used in forced use therapy). The type of CIMT, timing, or intensity of practice do not seem to affect patient outcomes. Although the underlying mechanisms that drive modified and original CIMT are still poorly understood, findings from kinematic studies suggest that improvements are mainly based on adaptations through learning to optimise the use of intact end-effectors in patients with some voluntary motor control of wrist and finger extensors after stroke.**

### Introduction

About 16·9 million people worldwide have a first stroke every year and about 33 million stroke survivors and 5·9 million stroke-related deaths are reported,[1] making stroke the second most common cause of death and one

### Definition of CIMT

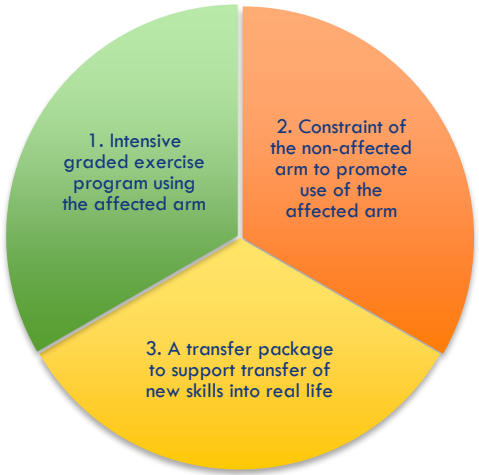
The theoretical framework for CIMT has a long history.[9,10] In 1909, the German scientist Munk[10] was the first to document that non-human primates would use an impaired (deafferented) upper extremity if forced to



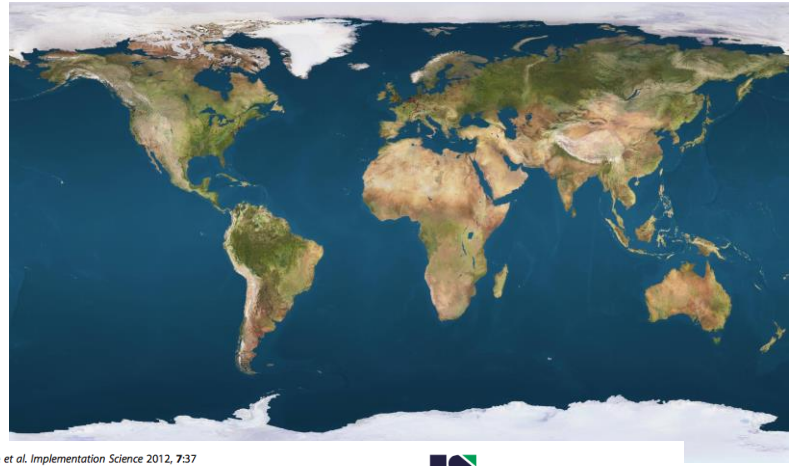

1. Kwakkel, G. et al. (2015). Lancet Neurology.
2. All photos courtesy of Google images

# Aim

To identify enablers to implementation and sustainable delivery of constraint induced movement therapy (CIMT) programs internationally.



# Methods



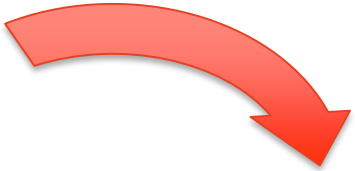
Cane *et al. Implementation Science* 2012, **7**:37
http://www.implementationscience.com/content/7/1/37

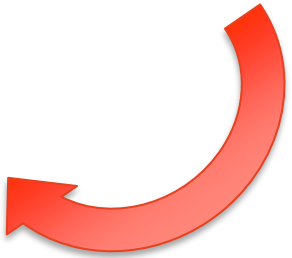
IMPLEMENTATION SCIENCE

RESEARCH Open Access

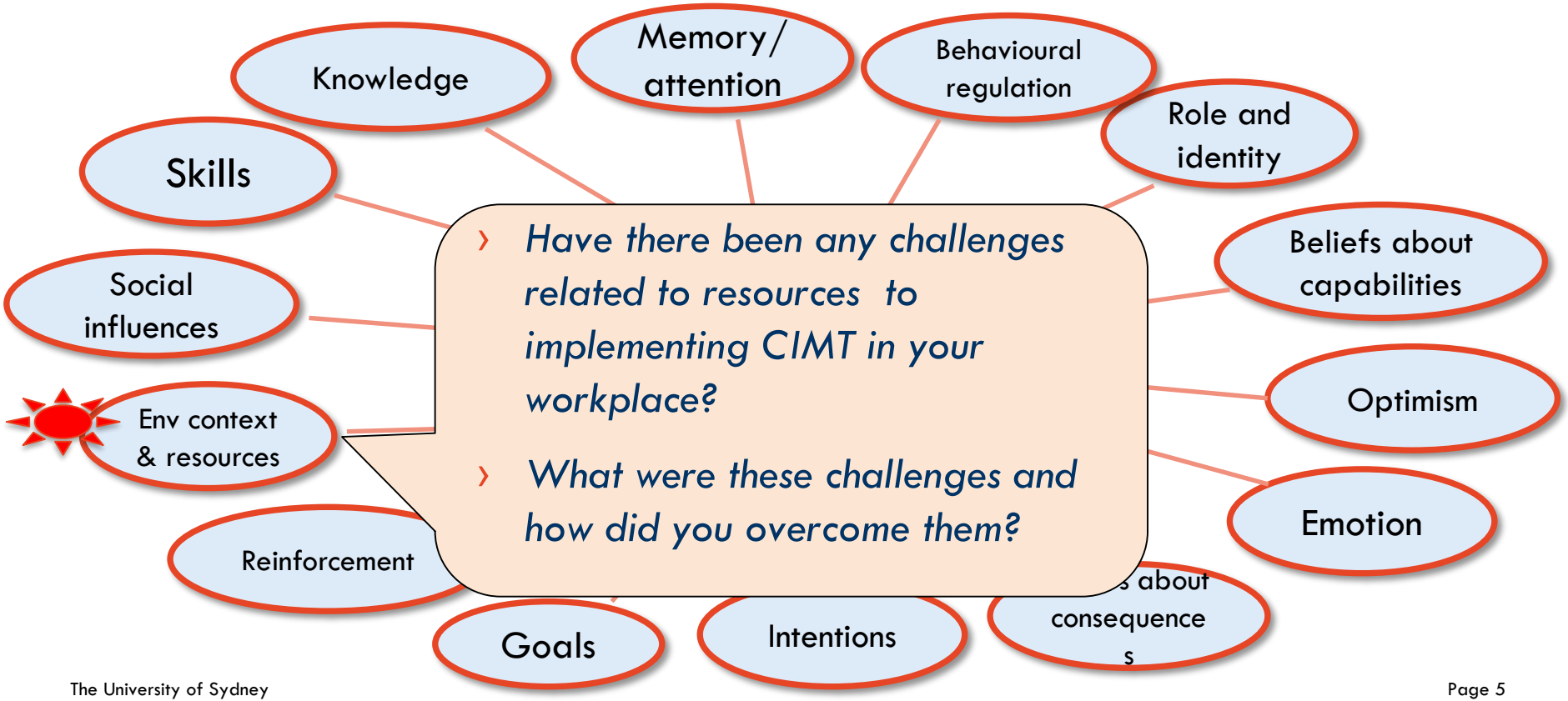
## Validation of the theoretical domains framework for use in behaviour change and implementation research

James Cane[1], Denise O'Connor[2] and Susan Michie[3*]



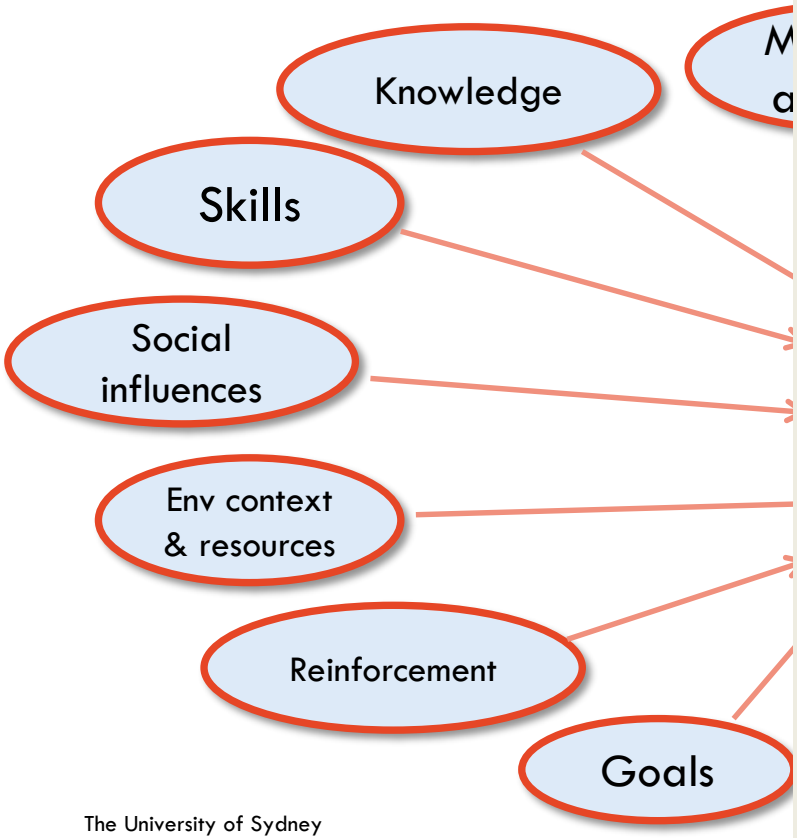
# 14 Domains of the Theoretical Domains Framework (TDF)






Michie et al (2005); Cane et al (2012)

# Preliminary results (n=8)




INT 4: *"I think we've got the support from both colleagues, so it's accepted from the colleagues and also from our leaders. So I think that's very important, the support, that we have been able to run it over these years"*
*because I expect change".*

INT 4: *"I see the results, I think most of the patients are satisfied after these two weeks, and that's motivating in itself I think."*
*only an understanding of why you're doing it but an understanding of why that has got more added value than that. So I would suggest that the biggest enabler of us setting up CIMT has been my ability to clinically say this is what we're going to do and I've got freedom to act."*



*Michie et al (2005); Cane et al (2012)*

# Discussion/ Clinical Implications

- Key enablers to successful CIMT implementation include:

- Therapist **knowledge** and **skills** developed through training
- **Social influences** including organisational support
- **Environmental context** and **resources**

- Importance of **reinforcement** through positive patient outcomes

**"Seeing is believing"**

# Conclusion

- Successful implementation of CIMT in practice is multifaceted
- The emerging findings have been used to inform the development of an implementation package for a CIMT translational research project in South Western Sydney, The ACTIveARM project

# Contact details

Email: lchr6636@uni.sydney.edu.au

Twitter: @LaurenJChristie

Lauren Christie

Inpatient Program Coordinator & Health Professional Educator

Liverpool Brain Injury Rehabilitation Unit

Ph: (02) 8738 5521

# Key references


1. Kwakkel, G., Veerbeek, JM., van Wagen, EEH., Wolf, SL. (2015). Constraint-induced movement therapy after stroke. Lancet Neurology; 14: 224-234.
2. Walker, J., Pink, MJ (2009). Occupational therapists and the use of constraint-induced movement therapy in neurological practice. Australian Occupational Therapy Journal; 56: 436-437.
3. Viana, R., Teasell, R. (2012). Barriers to the Implementation of Constraint-Induced Movement Therapy Into Practice. Top Stroke Rehabilitation, 19(2), 104-114
4. Fleet A, Che M, MacKay-Lyons M, MacKenzie D, Page S, Eskes G, McDonald A, Boyce J, & Boe S. (2014). Examining the use of constraint-induced movement therapy in Canadian neurological occupational and physical therapy. Physiotherapy Canada, 66(1), 60-70.
5. Cane J et al. (2012).Validation of the Theoretical Domains Framework for use in behaviour change and implementation research. Implementation Science, 7:37.