



THE UNIVERSITY
OF BIRMINGHAM

Stroke Rehabilitation Research

Dr Sue Kelly
School of Health Sciences



Health Maintenance and Rehabilitation Group



Introduction

- Birmingham School of Health Sciences
- New but rapidly expanding research centre
- Cath Sackley
Professor of Physiotherapy Research
Majority posts funded by project grants
- Focus on MOBILITY

Freedom



Activity



Maintaining health



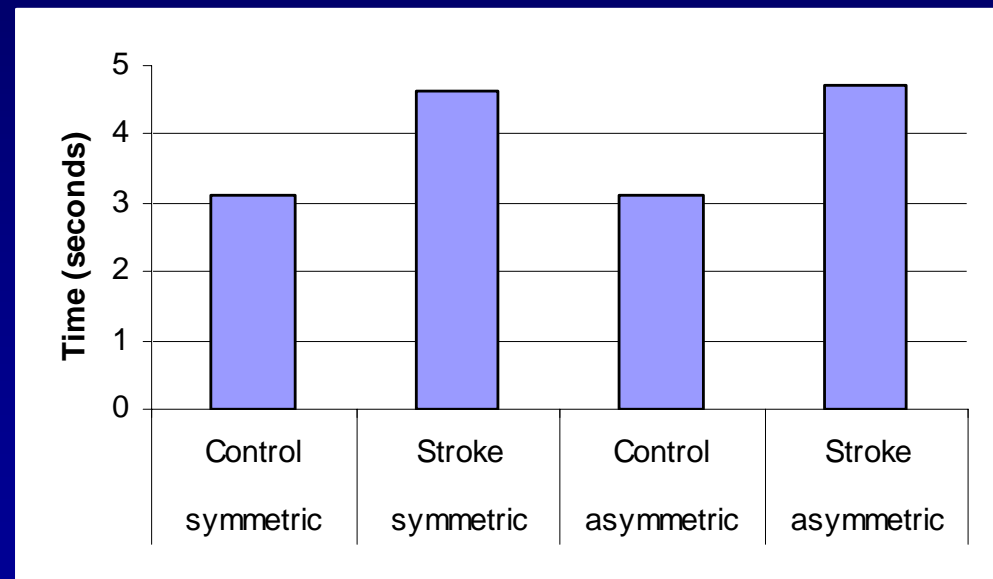
Research areas

- Laboratory based studies
 - Movement analysis / Motor control*
 - Development for clinical applications*
- Pragmatic trials of interventions
- Epidemiology of *stroke*

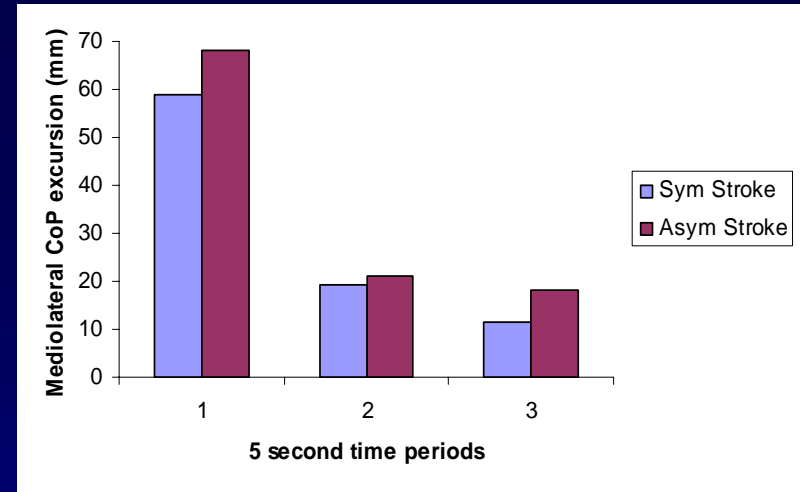
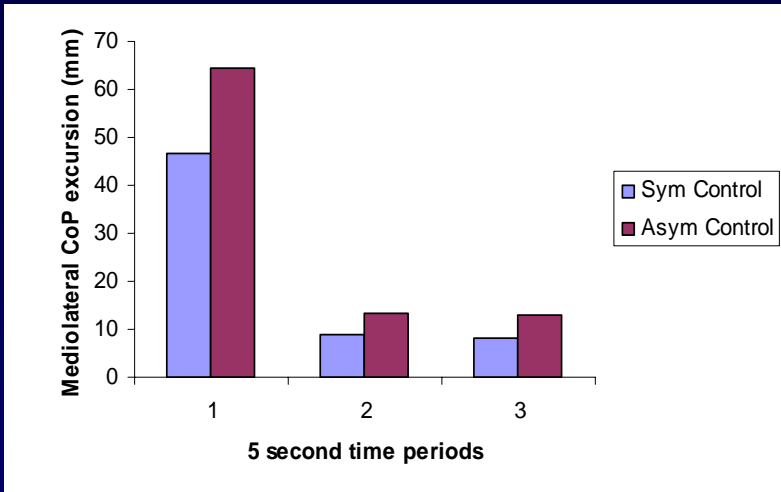
Sue Kelly, Kristen Clarke, Alan Wing

Sit to stand and stabilisation in stroke subjects v controls

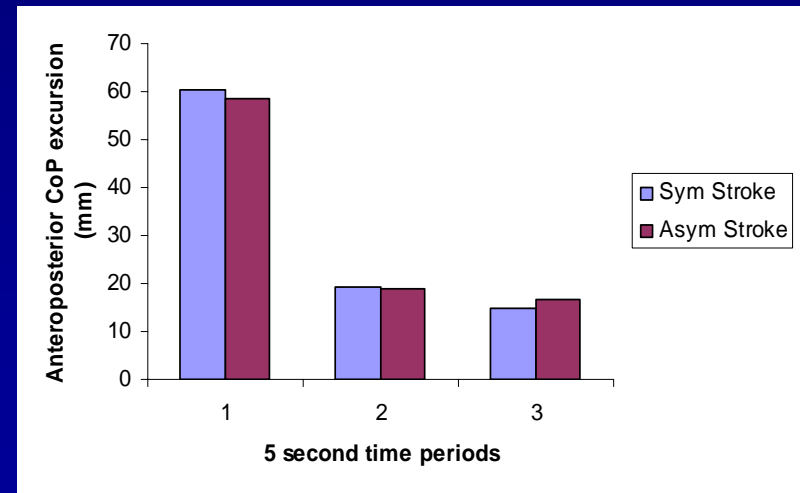
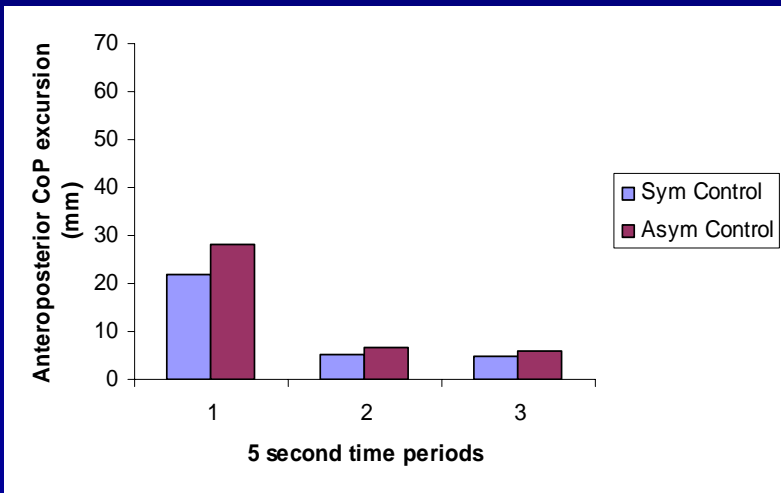
Symmetric and asymmetric foot positions



Time taken to stand



Mediolateral CoP excursions following StS



Anteroposterior CoP excursions following StS

Discussion:

Premise for stroke subjects in asymmetric stance that time to stand might decrease and velocity of movement increase due to larger anteroposterior base of support.

In stroke subjects time to stand and velocity of movement remained the same with no real difference between symmetric and asymmetric foot positions.

Subjects selected all living independently in the community and were able to stand without any assistance.

Need to find alternative measurement for less able subjects to evaluate sit to stand

Video profiling and characterisation of sit to stand in stroke and control subjects.

Sue Kelly, Mike Spann, Cath Sackley

Computer vision and image processing of moving profiles.

Aim of project is the utilisation of simple video recordings with complex automated analysis to provide outcome measure applicable to clinical trials.

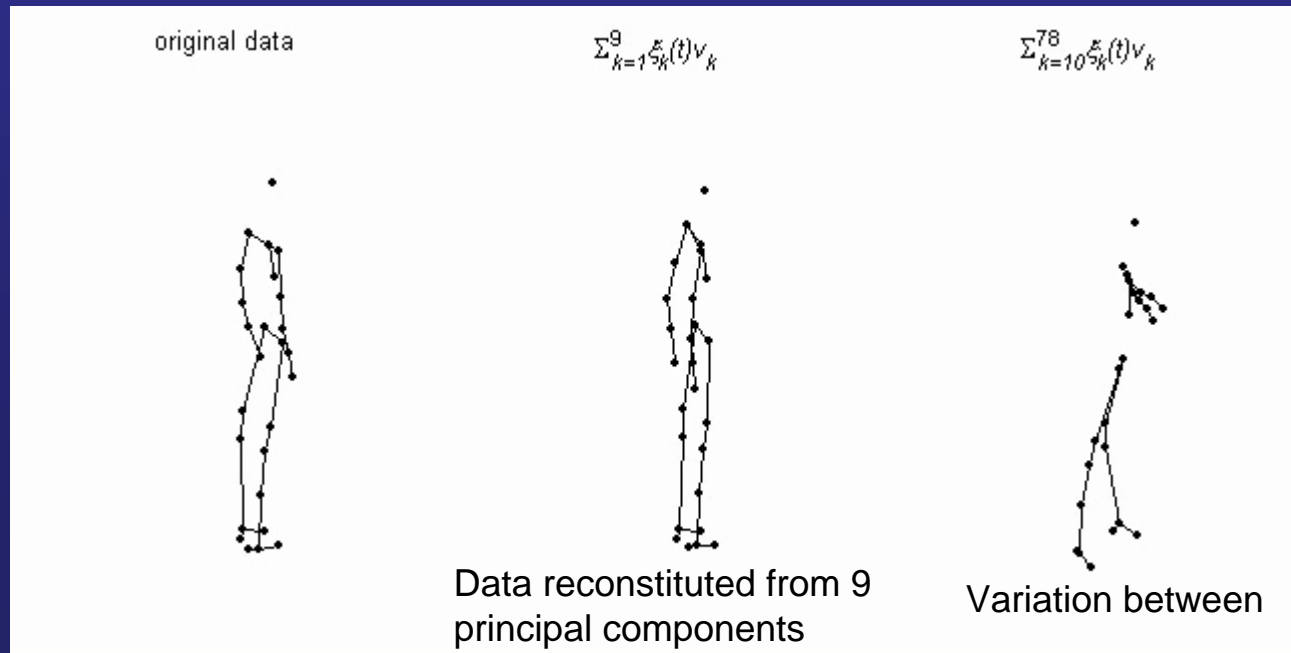
Anterior and lateral video images for sit to stand and stand to sit.

Kris Hollands, Alan Wing, Cath Sackley

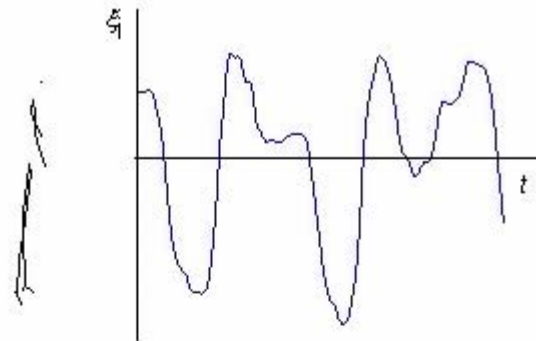
Identification & measurement of expert and pathological movement characteristics.

Can Principal Component Analysis (PCA) be used to quantify dance movements?

Movement data collected with a motion analysis system and then used for PCA, identifying 9 components to fully describe the movement



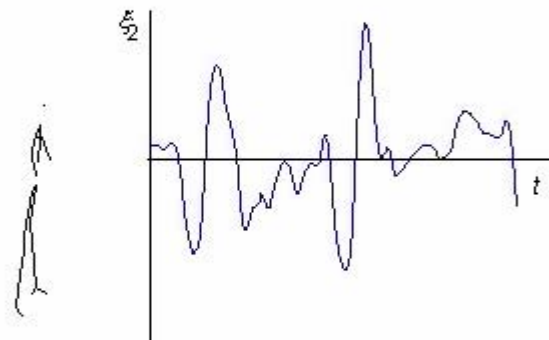
PC 1



PC's 1-3 describe 60% of whole movement

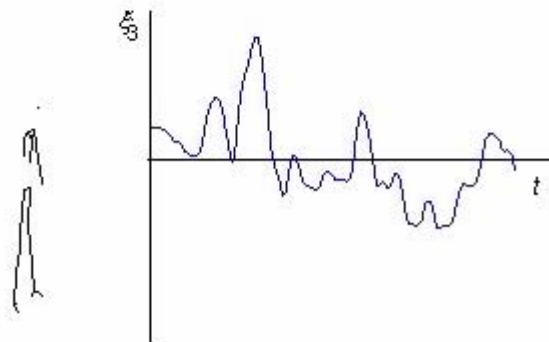
Strong coupling upper and lower limbs identified

PC 2



Development with PCA to identify how the mechanisms of movement control in stroke are altered

PC 3





Paulette van Vliet – Research Fellow

Temporal coordination of reach-to-grasp in patients with parietal stroke



Monitor performance with Proreflex motion tracking system.

Large and small objects in different positions

Hypothesis: Neural processes controlling expected durations of transport and grasp trajectories operate more independently than in healthy controls.

Paulette van Vliet, Cath Sackley,
David Punt, Alan Wing



External focus feedback in training
reach-to-grasp after stroke (Pilot RCT)

Internal focus – movement itself

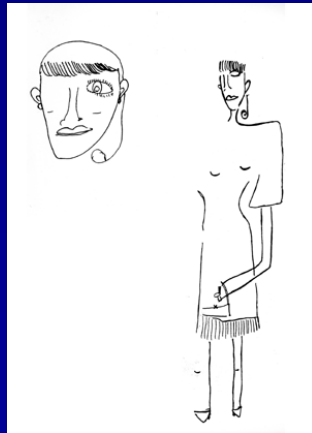
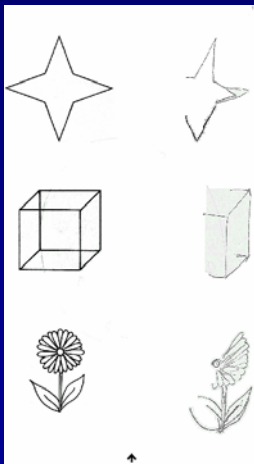
External focus – effect of movement on environment

Actual performance and retention shown to be improved
with intrinsic training in sport (external focus)

Stroke patients patients – internal v external feedback
Movement duration and peak velocity

David Punt - Research Fellow in Schools of Health Sciences and Psychology

Work centres around patients with neglect following stroke



Kinematics

Motor neglect (clinical diagnosis)

Motor extinction (affected limb performance unilateral v. bilateral)



Subject can perform task of picking up cup with each hand (quality not as good with hemiparetic arm). But cannot pick up cup with hemiparetic arm when task attempted bilaterally.

Unilateral v bilateral movements as means of understanding attentional/intentional deficits contributing to performance



Is the intervention of an Occupational Therapist effective in increasing independence in residents with a stroke living in residential or nursing homes?

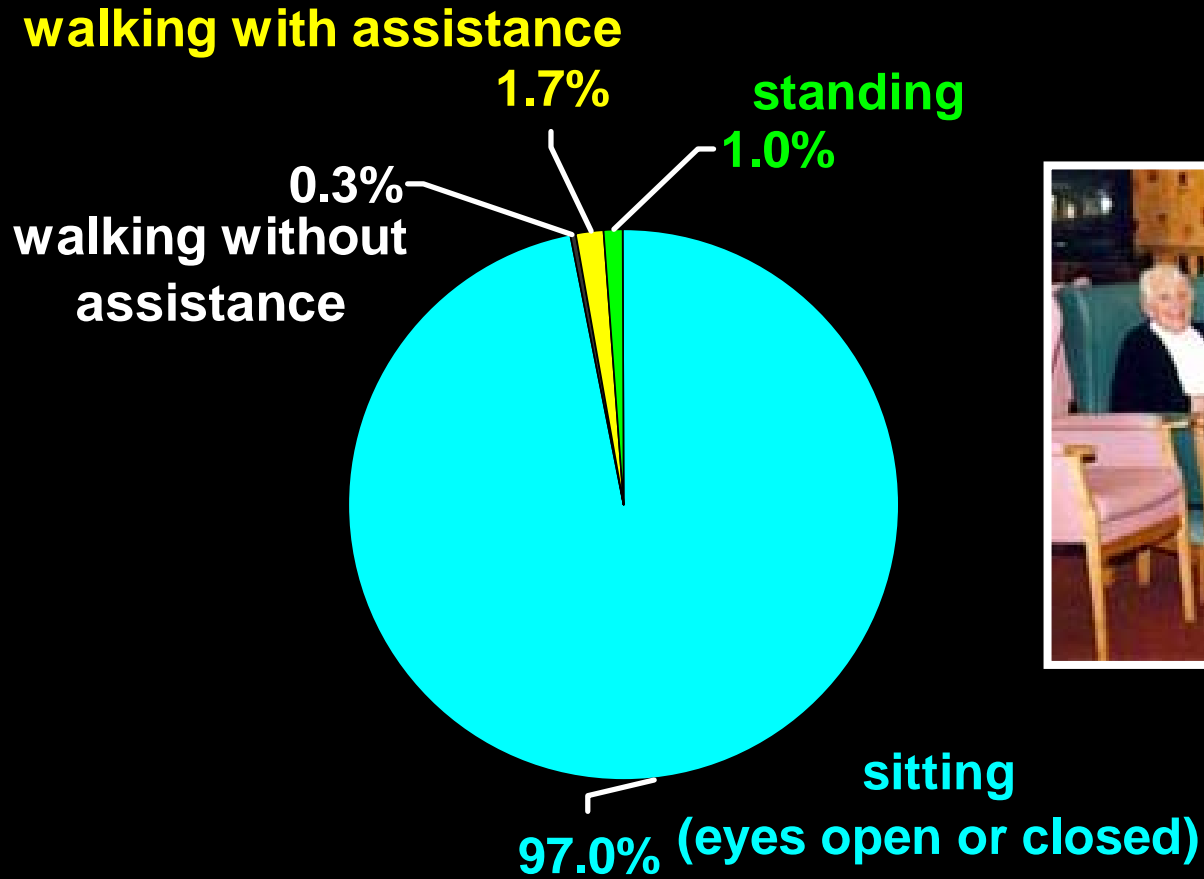
Cath Sackley* David Mant* Derick Wade‡

Jo Copley ‡*

*Department of Primary Health Care, University of Oxford

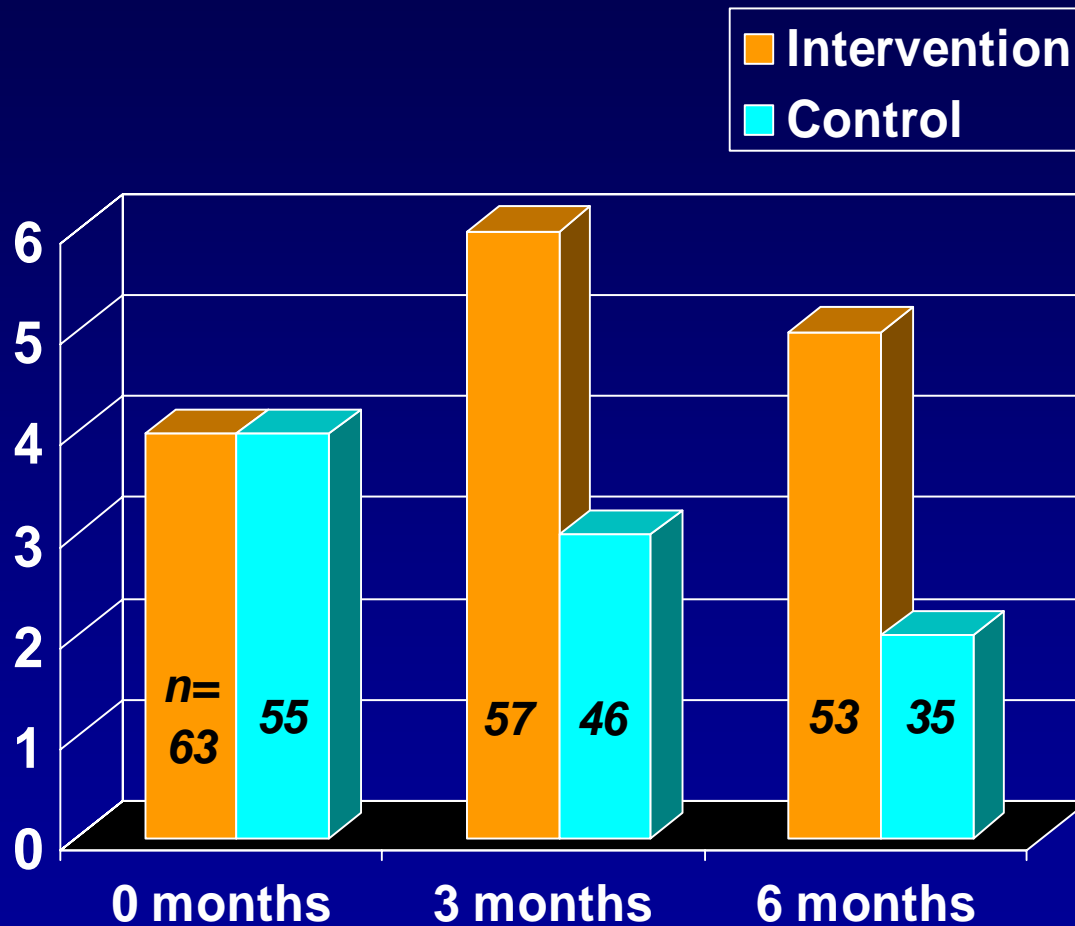
‡ Rivermead Rehabilitation Centre, Oxford

How do residents spend their day?



Mobility changes after OT

Rivermead
Mobility
Index



Discussion:

Population: Residents are deteriorating

Therapy:

- Function is slightly improved during intervention
- Reduced number of deaths (50%) in the intervention compared with control group
- Small trial but similar patterns seen with ADL and mobility improvement as in the other RCTs



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A randomised trial of Physiotherapy and Occupational Therapy in a care home setting

Cath Sackley David Mant# Derick Wade# Emma McIntosh# Rosa Legood# Kris Hollands* Tom Hoppitt* Karen Lett* Maayken Van den Berg**

* School of Health Sciences, University of Birmingham

University of Oxford



The Casson Trust





OXVASC- the Oxford Vascular Study

All new incident cases of acute coronary syndrome, myocardial infarction, transient ischaemic attack (TIA) and stroke in eight Oxfordshire GP practices

Recording ascertainment and measuring recovery 1, 3, 6 and 12 months.

Change in incidence-

Rothwell PM, Coull A, Giles M, Howard S, Silver L, Bull L, Gutnikov SA, Edwards P, D Mant D , **Sackley CM**, Farmer A , Sandercock PAG, Dennis MS, Warlow CP, Bamford J, Anslow P, for the Oxford Vascular Study Group.

‘ Changes in stroke incidence, mortality, case-fatality, severity, and risk factors in Oxfordshire from 1981-2004: the Oxford vascular study *Lancet* 2004 363 (9425) 1925-33 ‘

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