**JANICE JENNIFER ENG, BSc (PT/OT), PhD**
**CURRICULUM VITAE 2022**

## 1. CONTACTS

Janice Eng, University Killam Professor & Canada Research Chair, Department of Physical Therapy, University of British Columbia Phone: (604) 714-4105 E-mail: janice.eng@ubc.ca
Director, Rehabilitation Research Program, GF Strong Rehab Centre, Vancouver Coastal Health Research Institute www.rehabresearchprogram.com
Web-pages: https://neurorehab.med.ubc.ca https://fameexercise.com www.scireproject.com

## 2. EMPLOYMENT AND APPOINTMENTS

| Title | Dates |
|---|---|
| University Killam Professor | 2021- |
| Associate Dean, UBC Faculty of Graduate and Postdoctoral Studies | 2015-2018 |
| Acting Head, UBC Department of Physical Therapy, Faculty of Medicine | 2014 |
| Director, Rehabilitation Research Program, Vancouver Coastal Health Research Institute 11-faculty, 50 trainee research centre | 2008- |
| UBC Health Research Advisor, Office of the VP Research & International | 2008-2014 |
| University Delegate for the Canadian Institutes of Health Research | 2008-2014 |
| Professor, UBC Dept of Physical Therapy, Faculty of Medicine, University of BC | 2006- |
| Associate Professor, UBC School of Rehabilitation Sciences | 2002-2006 |
| Associate Director, International Collaboration on Repair Discoveries | 2002-2005 |
| Assistant Professor, UBC School of Rehabilitation Sciences, Faculty of Medicine | 1997-2002 |
| Lecturer, University of Toronto | 1989-1990 |
| Physical Therapist, Hospital for Sick Childrens, Toronto | 1986-1990 |
| Physical Therapist, Physiotherapy Associates, Toronto | 1985-1989 |
| Registered physical therapist | 1985- |

## 3. TRAINING

| University | Degree | Subject Area | Dates |
|---|---|---|---|
| University of BC | BSc Rehab | Physical & Occupational Therapy | 1981-1985 |
| University of Toronto | MSc | Biomedical Engineering | 1987-1989 |
| University of Waterloo | PhD | Kinesiology | 1990-1994 |
| Simon Fraser University | Post-doc | Neurophysiology | 1994-1996 |

## 4. AWARDS

| Name of Award | Award Organization | Year |
|---|---|---|
| Honorary Doctorate in Rehabilitation Sciences | Laval University | 2020 |
| Killam University Professor (highest honour conferred on a UBC faculty) | University of British Columbia | 2021 |
| Distinguished Lecturer in Rehabilitation Sciences Research | Edmonton, Alberta | 2019 |
| Greene Lecturer in Physical Therapy | Springfield College, USA | 2017 |
| Tier 1 Canada Research Chair in Neurological Rehabilitation | Government of Canada | 2016 |
| Distinguished Medical Lecturer | Faculty of Medicine | 2016 |
| UBC Excellence in Research Lecturer | Vancouver Institute | 2015 |

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| Distinguished Achievement Award for Overall Excellence | Faculty of Medicine | 2012 |
| Excellence in Mentoring Early Career Faculty | Faculty of Medicine | 2010 |
| Inducted Fellow | Canadian Academy of Health Sciences | 2009 |
| Jonas Salk Award (Lifetime Achievement in reducing physical disability) | March of Dimes | 2009 |
| Woman of Distinction (Lifetime Achievement) | YWCA | 2010 |
| Distinguished Accomplishment | Faculty of Medicine, University of BC | 2007 |
| Senior Scholar Award<br>Provincial Career Scientist Award | Michael Smith Foundation for Health Research | 2008-13 |
| Killam Research Prize | Killam Trust | 2006 |
| Health Research Foundation Research Award | Canadian Institutes of Health Research: For top standing in the New Investigator Competition – rank of 2/90 | 2004 |
| Scholar Award<br>Provincial Career Scientist Award | Michael Smith Foundation for Health Research | 2003-08 |
| New Investigator Award | Canadian Institutes of Health Research National Career Scientist Award | 2003-08 |
| Outstanding Young Alumnus | University of BC | 2002 |
| Recognition of Research | Physiotherapy Assoc BC | 2002 |
| Scholar Award<br>Provincial Career Scientist Award | BC Health Research Foundation | 1998-02 |

## 5. PEER-REVIEWED GRANTS

Lifetime operating grant total over $36 million and lifetime $65 million in infrastructure grants (Canadian Foundation of Innovation). Some select examples follow: Virtual Seated Exercise Program for Stroke, Canadian Institutes of Health Research (CIHR), ($615,825, 2022-2027); Foundation Grant, CIHR (2.5 million, 2015-2022); i-GRASP for upper limb assessment and treatment, Natural Sciences and Engineering Council/CIHR ($403,446, 2020-2023); Robotic Exoskeletons for Walking Recovery (Heart and Stroke Foundation of Canada ($220,000, 2016-2018).

## 6. RESEARCH HIGHLIGHTS

My research program aims to enhance the recovery from neurological conditions, particularly from stroke and spinal cord injury. My research span from clinical trials to implementation science. I have been a recipient of provincial or national career scientist awards from the start of my appointment. I have published over 290 peer-reviewed journal articles. I am listed in the top 1% of the most cited scientists in the world across all fields based on the 100,000 Citation Database (Ioannidis et al. PLoS Biol 2020.18(10)). My work has an H-index of 65 in Web of Science (14,041 citations) and 95 in Google Scholar (69,870 citations). I have managed a lifetime $37 million of peer-reviewed operating funds.

**Complete List of Published Work:** https://www.ncbi.nlm.nih.gov/pubmed/?term=Eng+JJ
(Trainees I directly supervised indicated by * in citations below)

### a) Implementation of upper extremity stroke programs world-wide

My team developed GRASP (Graded Repetitive Arm Supplementary Program) which is a novel treatment delivery model comprising a self-managed homework exercise program which provided an effective and inexpensive method for improving arm recovery after stroke. This multi-site RCT was published in the high impact journal Stroke (impact 6.0) in 2009. I also developed GRASP tools to increase the uptake of the intervention (https://neurorehab.med.ubc.ca/grasp/). This website hosts the manual and resources free for

download and tracks the sites and clinicians who implement the program. GRASP is now utilized in 8700 sites over 58 countries (and is now standard of care in BC). The use of an inpatient supplementary arm exercise program was added to the 2010 Canadian Stroke Clinical Practice Guidelines care based on my multi-site trial and the World Health Organizations Recommended Treatments for Stroke Rehabilitation. A published 2019 national survey (Stockley et al. 2019) found that 35% of UK stroke therapists now use GRASP with their patients. I also helped to move GRASP into local community centres which provides an inexpensive pathway for patients to improve their upper extremity function and these programs are now overseen by After Stroke BC. During the pandemic, I worked with the March of Dimes Canada to develop a virtual GRASP program, then published its effectiveness and helped to roll this program out in BC so people with stroke could receive services to improve their arm and hand when many in-person programs had shut down. The March of Dimes will be expanding this program nationally from BC to all provinces in 2022 because it provides a safe and an inexpensive pathway for patients to improve their upper extremity function after stroke. GRASP is used extensively by other groups as a means of intensive exercise while being coupled with modalities like brain stimulation.


Harris JE*, Eng JJ, Miller WC, Dawson AS. A self-administered graded repetitive arm supplementary program (GRASP) improves arm function during inpatient stroke rehabilitation: A multi-site randomized controlled trial. Stroke. 2009;40:2123-2128.

Connell LA*, McMahon NE*, Harris JE*, Watkins CL, Eng JJ. A formative evaluation of the implementation of an upper limb stroke rehabilitation intervention in clinical practice: a qualitative interview study. Implementation Science. 2014;9:90 (12 pages).

Simpson LA*, Eng JJ, Chan M. H-GRASP: the feasibility of an upper limb home exercise program monitored by phone for individuals post stroke. Disabil Rehabil. 2017;39:874-882.

Sadarangani GP, Jiang X, Simpson LA*, Eng JJ, Menon C. Force myography for monitoring grasping in individuals with stroke with mild to moderate upper-extremity impairments: a preliminary investigation in a controlled environment. Front Bioeng Biotechnol. 2017 Jul 27;5:42. (11 pages)

Simpson LA*, Mow A*, Menon C, Eng JJ. Validity and reliability of a new wearable device to capture dose of upper limb activity after stroke. Stroke. 2019;50:3643-3646.

Yang CL*, Waterson S, Eng JJ. Implementation and evaluation of the virtual Graded Repetitive Arm Supplementary Program (GRASP) for individuals with stroke during the COVID-19 pandemic and beyond. Phys Ther. 2021 Mar 4:pzab083.


### b) Implementation of lower extremity stroke programs in British Columbia and beyond

My team developed the Fitness and Mobility Exercise (FAME) Program (fameexercise.com) for stroke, which is a group community-based program. We showed in a series of randomized controlled trials (including a 11-site, 186 patient trial) that FAME improved cardiovascular fitness, bone density, postural reflexes, walking, balance, aspects of executive function and reduced falls over active controls (e.g., weight-bearing exercises, tai chi). Over 500 sites over 21 countries have reported implementing FAME with a variety of populations, including stroke, Parkinson's disease, and frail older adults. The actual use is likely larger given the free access to the manuals. We have worked with partners to implement FAME in all five BC health authorities in 12 community sites that now operate and sustain the program. FAME is accredited through the BC Parks and Recreation Association with an instructor certification program. FAME is implemented in several international sites, including Tasmania in Australia.

My team developed a high intensity inpatient protocol (DOSE Trial - Determining Optimal postStroke Exercise) that was a 6-site RCT over 3 provinces which demonstrated that high walking repetition and aerobic intensity progressed by wearable sensors to monitor heart rate and walking steps in the first months after stroke improved walking outcomes 12 months later. This study was published in Stroke. We are currently using this protocol (now called the Walk N Watch protocol) in a 12-site, 200 sample implementation RCT. I have undertaken numerous others studies to improve lower limb function after stroke, including functional electrical stimulation, robotic exoskeletons and pharmacologicals. I am a co-PI of an ongoing 8-site Health Canada regulated drug trial

to determine the combined effects of intensive exercise and fluoxetine on motor recovery (funded by Brain Canada).

Marigold DS*, Eng JJ, Dawson AS, Inglis JT, Harris JE*, Gylfadóttir S*. Exercise leads to faster postural reflexes, improved balance and mobility, and reduced falls in older persons with chronic stroke. J Am Geriatri Soc. 2005;53:416-423.

Pang MY*, Eng JJ, Dawson AS, McKay HA, Harris JE*. A community-based fitness and mobility exercise program for older adults with chronic stroke: a randomized, controlled trial. J Am Geriatr Soc. 2005;53:1667-74.

Rand D,* Eng JJ, Liu-Ambrose T, Tawashy AE*. Feasibility of a 6-month exercise and recreation program to improve executive functioning and memory in individuals with chronic stroke. Neurorehabil Neural Repair. 2010;24:722-9.

Bird ML*, Mortenson WB, Eng JJ. Evaluation and facilitation of intervention fidelity in community exercise programs through an adaptation of the TIDier framework. BMC Health Serv Res.2020;17:31

Klassen TD*, Dukelow SP, Bayley MT, Benavente O, Hill MD, Krassioukov A, Liu-Ambrose T, Pooyania S, Poulin MJ, Yao J, Eng JJ. Higher doses improve walking recovery during stroke inpatient rehabilitation. Stroke 2020;51:2639-2648.

Louie DR*, Mortenson WB, Durocher M, Schneeberg A, Teasell R, Yao J, Eng JJ. Efficacy of an exoskeleton-based physical therapy program for non-ambulatory patients during subacute stroke rehabilitation: a randomized controlled trial. J Neuroeng Rehabil. 2021;18(1):149.

Lui M*, McKellar K, Cooper S, Eng JJ, Bird ML*. Evaluating the impact of a training program to support transitioning from the hospital to the community for people after stroke: a community case study. BMC Health Serv Res. 2022;22:30

### c) Development of International Rehabilitation Clinical Practice Guidelines

I have been a core member and author of international teams for three different stroke practice guidelines sponsored by the American Heart Association or American Stroke Association. This information provides credible guidance to clinicians from leading clinician-scientists. My own research studies are cited in a number of international stroke guidelines including the Canadian (4 of my studies cited), Australian (5 cited), American (18 cited) and UK Stroke Guidelines (5 cited), demonstrating the high quality of my trials which provide evidence for changing practice. I have been a core member of the team developing the Paralyzed Veterans of America Guidelines which are one of the most respected and cited guidelines in the field of spinal cord injury. I am a co-author of the PVA Bowel Management and Bone Health Guidelines (2020). I was also a member of the World Health Organization Stroke Rehabilitation Committee which is developing a core set of rehabilitation interventions.

Billinger SA, Arena R, Bernhardt J, Eng JJ, Franklin BA, Johnson CM, MacKay-Lyons M, Macko RF, Mead GE, Roth EJ, Shaughnessy M, Tang A. Physical activity and exercise recommendations for stroke survivors: a statement for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2014;45:2532-53.

Winstein CJ, Stein J, Arena R, Bates B, Cherney LR, Cramer SC, Deruyter F, Eng JJ, Fisher B, Harvey RL, Lang CE, MacKay-Lyons M, Ottenbacher KJ, Pugh S, Reeves MJ, Richards LG, Stiers W, Zorowitz RD. Guidelines for Adult Stroke Rehabilitation and Recovery: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. Stroke. 2016;47:e98-e169.

Forman DE, Arena R, Boxer R, Dolansky MA, Eng JJ, Fleg JL, Haykowsky M, Jahangir A, Kaminsky LA, Kitzman DW, Lewis EF, Myers J, Reeves GR, Shen WK. Prioritizing Functional Capacity as a Principal End Point for Therapies Oriented to Older Adults With Cardiovascular Disease: A Scientific Statement for Healthcare Professionals From the American Heart Association. Circulation. 2017;135(16):e894-e918.

MacKay-Lyons M, Billinger SA, Eng JJ, Dromerick A, Giacomantonio N, Hafer-Macko C, Macko R, Nguyen E, Prior P, Suskin N, Tang A, Thornton M, Unsworth K. Aerobic Exercise Recommendations to Optimize Best Practices in Care After Stroke: AEROBICS 2019 Update. Phys Ther. 2020;100:149-156

### d) Leader of the Spinal Cord Injury Rehabilitation Evidence Project

Since 2005, I am leading an international team of over 70 faculty across 6 countries for the Spinal Cord Injury Research Evidence (SCIRE), a knowledge translation platform of evidence and outcome measures. SCIRE (https://scireproject.com) has received more than ¼ million download requests annually. In addition, over 70 peer-reviewed journal articles have been published from the project so far. A published evaluation of SCIRE showed that this web-based knowledge resource is a relatively inexpensive method to increase access to evidence-based information, increase knowledge of the evidence, inform changes to the health providers' practice, and influence their clinical decision making (Eng et al. J Med Internet Res 2014). Given SCIRE's credibility, a formal partnership was established with the Paralyzed Veterans of America (PVA) and the SCIRE team provides the search and extraction for the PVA Consortium for Spinal Cord Medicine clinical practice guidelines.

## 7. NATIONAL AND INTERNATIONAL SCHOLARLY LEADERSHIP

In 2018/19, I led a 10-person working group, informed by a 20-person international advisory, to develop international recommendations for moving stroke rehabilitation research evidence to practice with the following outputs:

Eng JJ, Bird ML, Godecke E, Hoffmann TC, Laurin C, Olaoye OA, Solomon J, Teasell R, Watkins CL, Walker MF. Moving stroke rehabilitation research evidence into clinical practice: Consensus-based core recommendations from the Stroke Recovery and Rehabilitation Roundtable. Int J Stroke. 2019;14:766-77.25.

Bernhardt J, Urimubenshi G, Gandhi DBC, Eng JJ. Stroke rehabilitation in low-income and middle-income countries: a call to action. Lancet. 2020 Oct 31;396(10260):1452-1462.

Gururaj S, Bird ML, Borschmann K, Eng JJ, Watkins CL, Walker MF, Solomon JM; SRRR2 KT working group. Evidence-based stroke rehabilitation: do priorities for practice change and feasibility of implementation vary across high income, upper and lower-middle income countries? Disabil Rehabil. 2021 Apr 13:1-8.

## 8. INCREASING RESEARCH CAPACITY

I am committed to increasing research capacity in rehabilitation in Canada and beyond. I have formally mentored over 20 junior faculty within my university (and many more informally) and was the recipient of the University Award for Excellence in Mentoring (2010) for contributions in mentoring early career faculty. I was the co-PI of a $2.1 million Strategic Training Program Grant (Training Program in Quality of Life in Rehabilitation) awarded from CIHR (2004-2010). Our program provided training to over 200 doctoral students, which increased the capacity of the Canadian health research community. I created the Rehabilitation Research Program and now direct this program which oversees 11 faculty and over 50 trainees.

I have supervised 11 MSc, 8 PhD and 11 post-doc students (total 30) as primary supervisor and 20 have attained university academic positions (e.g., A Tang is Assistant Dean, McMaster University; D Rand is Head, Occupational Therapy, University of Tel Aviv, Israel; B Sakakibara is Assistant Professor and Michael Smith Scholar, University of British Columbia; M Ashe is Canada Research Chair, University of British Columbia; M Pang is Professor, Hong Kong Polytechnic University). I have sat on an additional 33 thesis committees.

## 9. HIGHLIGHTS OF SERVICE ACTIVITY

I have held several key administrative roles including Associate Dean of UBC Graduate and Postdoctoral Studies; Health Research Advisor of the UBC VP Research; and Director, Rehabilitation Research Program (11 faculty, 50 trainee centre) of Vancouver Coastal Health Research Institute.

**University Service**

- Director, Rehabilitation Research Program (2008-). I developed and directed the Rehabilitation Research Program in the Vancouver Coastal Health Research Institute, growing it from just myself to now 11 interdisciplinary faculty, 17 staff and over 50 trainees while ensuring resources for this expanded program. It is a vibrant interdisciplinary training program located at the GF Strong Rehab Centre and faculty aims to discover innovative solutions to optimize the outcomes of rehabilitation and improve the lives of those with disabilities and their families. Current faculty include 1 Canada Research Chair, 3 Michael Smith Foundation for Health Research Scholars and 2 former CIHR New Investigators.
- Chair, Promotion and Tenure Committee, Dept. of Physical Therapy (2016-2021)
- Member, Canada Research Chair University Internal Review Committee (2018-current)
- Associate Dean, Faculty of Graduate and Postdoctoral Studies (2014-17) overseeing a portfolio of awards and funding of $34 million annually. In this position, I implemented a mandatory minimum funding policy for doctoral studies across the UBC campus which required extensive consultation across faculties, and formal approval by Senate. This was the first such university-wide policy to be implemented west of Ontario and has served to improve the quality of the student experience and provide a financially supportive environment.
- Health Research Advisor to the VP Research (2008-14) where I developed and implemented strategic plans to maximize health research productivity across the campus
- Associate Director, International Collaboration on Repair Discoveries (ICORD) (2002-2006)

**Professional Service**

- Local chair for the 2024 World Congress of Neurorehabilitation
- Health Standard Organization Spinal Cord Injury Technical Committee (mandate to develop standards for spinal cord injury practice in Canada), 2021-
- Co-Director, CanStroke Recovery Platform which is an 8-site national clinical trials platform to test new Canadian approaches in stroke recovery (2019-)
- Board of Directors of the Heart and Stroke Foundation Canadian Partnership for Stroke Recovery (2016-)
- Board of Directors, Heart and Stroke Foundation Canadian Partnership for Stroke Recovery (2016-current)
- Rick Hansen Institute Care Committee (2015-2020)
- Board of Directors, Canadian Academy of Health Sciences (2011-2015)
- Member, CIHR External Working Group on Training (2015-2018)
- Editorial Board, Physical Therapy Journal (2006-2016)
- CIHR Peer-review Committee, Movement and Exercise (2008-2016)

## 10. INVITED NATIONAL AND INTERNATIONAL PRESENTATIONS

Lifetime 122 invited presentations. Average of 3 national or international invited speaker presentations accepted per year. Selected presentations from the past 5 years are provided:

Invited speaker. UK Stroke Forum. What is the optimal dose of exercise for walking recovery after stroke? Dec 2, 2021.

Invited speaker "Practical virtual rehabilitation and self-management techniques during COVID-19 for people living with stroke and VCI". Heart and Stroke Foundation of Canada (virtual). April 7, 2020 (720 attendees)

Invited speaker "Canadian Clinical Trial Infrastructure for Stroke Rehabilitation." International Stroke Recovery and Rehabilitation Alliance Showcase. Melbourne, Australia. Oct 30, 2019

Opening keynote speaker "Interventions to improve mobility after stroke: A journey from mechanisms and clinical trials to implementation science". International Society of Posture and Gait Congress. Edinburgh, UK, July 3, 2019.

Invited keynote speaker "Interventions to improve rehabilitation intensity after stroke: From clinical trials to implementation science". Canadian Activity Based Therapy Summit. March 1, 2019. Toronto.

Invited keynote speaker “Practical methods to delivering higher intensity exercise to improve lower extremity function after stroke”. Brazil Neurophysiotherapy Congress. Oct 10, 2018

Opening keynote speaker "Making room in rehabilitation for secondary stroke prevention strategies". Australasia Stroke Congress. Sydney, Aug 8, 2018

Invited speaker “Practical lessons learned from the DOSE trial”. World Congress of Neurorehabilitation, Mumbai, India, Feb 7, 2018.

Invited speaker “An evidence-based Go-to Resource for SCI directed by people living with SCI”. International Spinal Cord Society Annual Meeting. Dublin, Ireland, Oct 25, 2017.

Invited Greene Lecturer in Physical Therapy “Opportunities to advance research in stroke rehabilitation “Springfield College, Massachusetts, April 6, 2017.

Invited speaker “Wearable sensors to challenge arm and hand use after stroke”. International Neurophysiotherapy Conference. London, UK, Mar 17, 2016