

# ICSET KEYNOTE LECTURES

September 6, 2023

## **The frozen shoulder: the past, present, and future perspective (Filip Struyf)**

The frozen shoulder has been described as a mysterious condition for many decades, which is typically defined as difficult to understand and manage. And although a frozen shoulder can be a frustrating condition and its exact pathophysiological mechanism is not fully understood yet, we have made giant steps in unraveling its obscure nature. A frozen shoulder is a medical enigma that is characterized by spontaneous onset of pain and stiffness of the glenohumeral shoulder joint, and which affects millions of people worldwide. Approximately 2-5% of the general population are affected by a frozen shoulder and it typically occurs between the ages of 40 and 60. It is more common in women and in people with certain medical conditions such as diabetes and thyroid disorders. The duration of a frozen shoulder ranges between 1 and 3 years, although there is an incomplete recovery a subset of patients. Interestingly, there is a large diversity among reported complaints and disease duration, which might be related to an incomplete understanding of this puzzling condition, but also the lack of evidence on what the best intervention is. It is indeed well possible that there are distinct subgroups of patients with different characteristics or clinical profiles. This knowledge about subgroups could change the treatment approach, resulting in a more effective approach. Research has indeed made large steps forward over the last decades, improving our knowledge on nervous, endocrine, autonomic, and immune system, all related to the release of proinflammatory and anti-inflammatory cytokines. This keynote presentation will address the frozen shoulder, starting from its conception by Duplay and Codman more than a century ago, up to our present knowledge on its pathophysiology, clinical assessment, and current evidence of its management. Finally, this presentation will shed light on new advances in research, that can help improve our understanding of the underlying causes, risk factors, and interventions for a frozen shoulder, leading to better diagnostic and treatment strategies.

### **Filip Struyf**



Filip Struyf is physiotherapist (MSc, PhD) and full-time professor (hoogleraar) at the University of Antwerp, Faculty of Medicine and Health Sciences, Department of Rehabilitation Sciences and Physical Therapy, Antwerp, Belgium. He has published over 100 international peer-reviewed articles on a broad variety of shoulder disorders, such as general shoulder pain, frozen shoulder, shoulder instability, rotator cuff related shoulder pain, chronic shoulder pain, etc. He has also expertise in a broad variety of research designs: reliability and validity, case-control, prospective cohort studies, RCT, clinical guidelines, prognostic studies, etc... He is co-founder and board member of the Flemish Shoulder Network.

## Defining Biomarkers of Recovery in Patients with Rotator Cuff Tendon Disorders (Lori Michener)

### Objectives

- 1- Describe a mechanistic model of treatment for rotator cuff tendinopathy
- 2- Identify tendon and neuromuscular factors related to recovery with exercise for patients with rotator cuff tendinopathy
- 3- Identify psychological along with brain level sensorimotor and pain processing factors related to recovery
- 4- Understand how peripheral and central biomarkers differentiate responders and non-responders to resistance exercise

### Synopsis

Rotator cuff tendinopathy, an abnormal of the tendon, is a frequent cause of shoulder pain. The current first-line treatment is resistance exercise. However, the outcomes of resistance exercise are highly variable, with ~40% developing chronic or recurrent pain. This keynote presentation will review current evidence and speculate on mechanisms of resistance exercise related to variability in outcomes of recovered, delayed and non-recovery. Specifically, this presentation will explore a mechanistic model for rotator cuff tendinopathy that includes tendon structure, neuromuscular factors, brain pain and sensorimotor processing deficits, and psychological factors. This mechanistic model will be used to explore biomarkers of recovery and non-recovery with resistance exercise in those with rotator cuff tendinopathy. Patient-specific approaches to improve outcomes of care will be described. Evidence and theoretical paradigms for stratified, stepped and matched care approaches will be presented. Use of biomarkers can enable the delivery of patient-specific treatment approaches that target the key drivers of the response to treatment for those with rotator cuff tendinopathy, and optimize outcomes of care.

### **Lori Michener**



Lori Michener, PT, ATC, PhD, FAPTA is a Professor, Director of Clinical Outcomes and Research, and Director of the COOR Laboratory in the Division of Biokinesiology and Physical Therapy at the University of Southern California in Los Angeles CA in the United States. She is a Board Certified Clinical Specialist in Sports Physical Therapy (SCS) and see patients at USC's clinical practice. She earned degrees in Athletic Training and Physical Therapy, and her PhD in Orthopedics and Biomechanics from MCP Hahnemann University in Philadelphia, Pennsylvania. The central theme of COOR lab's funded research is to define optimal treatment pathways for patients with musculoskeletal shoulder disorders by characterizing biomechanical and central (brain) mechanisms related to the presence of movement deficits and poor recovery, defining classification and management approaches, and determining optimal outcomes of care. COOR Lab: <https://sites.usc.edu/coorlab/>.

# ICSET KEYNOTE LECTURES

September 8, 2023

## Comprehensive management of throwing injuries in shoulder and elbow joints (Takayuki Muraki)

Throwing injuries often cause in the shoulder and elbow joints in the baseball players. For the shoulder joints, internal impingement, which can result in SLAP lesion and articular side injury of the rotator cuff, commonly occurs. For the elbow joints, the incidence of ulnar collateral ligament (UCL) injury is increasing and many players underwent UCL reconstruction.

These injuries are most likely attributed to repetition of tremendous loading (so-called “workload”) to the shoulder and elbow, which generated by throwing. Loadings to shoulder external rotation and elbow valgus reach the highest around the maximum shoulder external rotation in abduction with approximately 90 degrees of elbow flexion (i.e., end of the cocking phase) during throwing. It is important to establish strategies to tolerate the workload for obtaining successful rehabilitation and prevention of the throwing injuries. A potential strategy is to manage risk factors contributing to the throwing injuries because many risk factors were reported. Of the risk factors, physical dysfunctions such as restricted range of motion and muscle weakness in the shoulder and hip joints were identified. Management of the physical dysfunctions is a key to overcome the throwing injuries.

However, there are several controversies among the risk factors. For example, although deficit of shoulder internal rotation is well-known as a common risk factor, a previous study reported that decreased shoulder external rotation and flexion were greater predictors of the throwing injuries than the internal rotation deficit. In another recent report, “increased” shoulder external rotation was associated with pathologic internal impingement. Inconsistencies regarding risk factors still remain because of methodological differences such as generation, measurement method with/without removal of the humeral retroversion, and a wide range of pathologies including both shoulder and elbow injuries. For the differentiation of the pathologic condition, nerve pathologies such as thoracic outlet syndrome needs to be considered. Baseball players with thoracic outlet syndrome often complain medial elbow pain with the elbow valgus loading. This is a similar symptom with the UCL injuries. In addition, posterolateral shoulder pain can be provoked by forceful shoulder external rotation in abduction in players with quadrilateral space syndrome. In the same shoulder motion, the players with internal impingement also complain posterior shoulder pain. Differential evaluation and appropriate management for each pathologic condition are crucial for improving and preventing the symptoms and return to sports.

Another piece of successful management of the throwing injuries is controlling of whole-body movement and improving flow of kinetic chain. As dysfunction of the hip joint are recognized, many joints and parts other than the shoulder and elbow joint should be assessed. In addition, the idea to evaluate kinetic chain regarding throwing should be discussed. The author will introduce a novel concept and method to evaluate the kinetic chain.

### Takayuki MURAKI



Department head, Department of Rehabilitation, Tohoku University Hospital, Assistant Professor, Department of PM & R, Tohoku University Graduate School of Medicine, Visiting Professor, Tokyo Metropolitan University

#### EXPERIENCE

1998 Physical Therapist Department of Rehabilitation, Tokai University Hospital  
2003 Doctoral course in Physical Therapy, Sapporo Medical University Graduate School  
2007 Research fellow, Biomechanics laboratory, Mayo Clinic  
2009 Physical Therapist, Department of Rehabilitation, Tohoku University Hospital  
Assistant Professor, Graduate School of Medicine, Tohoku University

2018 Visiting Professor in Tokyo Metropolitan University, Tokyo, Japan

#### PROFESSIONAL MEMBERSHIP

Board Member:

International Confederation of Scientific Societies of Shoulder and Elbow Therapists Member

Japan Shoulder Society, Japanese Orthopaedic Society for Sports Medicine,

Japanese Society of Clinical Sports Medicine, Japan Elbow Society

Japanese Society of Orthopedic Ultrasonics

#### AWARD

2010 Ian Kelly Best Paper Award (at 3rd International Congress of Shoulder and Elbow Therapist, Edinburgh, UK)

## **The Sticky Elbow - how to prevent post-traumatic elbow stiffness, tips and tricks for physiotherapists (Val Jones)**

Elbow injuries are common, and can often result in debilitating post-traumatic stiffness. Elbow stiffness can be multifactorial in nature and have a devastating impact upon an individual's function. Rehabilitation following injury, whether conservatively or surgically managed, is therefore vital, to restore normal function, and to return an individual to activity as quickly and safely as possible. Rehabilitation needs to follow a phased individual approach, in order to ensure healing tissues are protected, whilst restoring functional motion with strength and neuromuscular control. This lecture outlines the principles of rehabilitation from immediately post-injury, through to return to work and sports, using current evidence to inform decision making. It will also encompass many practical tips and strategies to get the best for your patients from treatment.

### **Val Jones**



Val Jones is a Clinical Physiotherapy Specialist working at the Sheffield Shoulder and Elbow Unit at the Sheffield Teaching Hospital Foundation Trust and also works in private practice. She lectures nationally and internationally about the assessment and rehabilitation of the elbow joint. Val has published in peer reviewed journals, and written book chapters on elbow rehabilitation, and is a previous AHP representative on the British Elbow and Shoulder Society Council, as well as being the current UK national delegate for EUSSER, . She has organised and presented upon highly successful elbow courses, most recently the BESS elbow update symposium held in Sheffield in 2022. She was awarded the inaugural Copeland Fellowship from the British Elbow and Shoulder Society, travelling to Cape Town, to exchange ideas with surgical and therapy colleagues.