

# McMaster Musculoskeletal Clinical Skills Manual

## **Authors**

Samyuktha Adiga  
Dr. Raj Carmona, MBBS, FRCPC

## **Illustrator**

Jenna Rebelo

## **Editors**

Caitlin Lees  
Dr. Raj Carmona, MBBS, FRCPC

In association with the Medical Education Interest Group  
Narendra Singh and Jacqueline Ho (co-chairs)

## FOREWORD AND ACKNOWLEDGEMENTS

The McMaster Musculoskeletal Clinical Skills Manual was produced by members of the Medical Education Interest Group (co-chairs Jacqueline Ho and Narendra Singh), and Dr. Raj Carmona, Assistant Professor of Medicine at McMaster University. Samyuktha Adiga and Dr. Carmona wrote the manual. Illustrations were done by Jenna Rebelo. Editing was performed by Caitlin Lees and Dr. Carmona.

The Manual, completed in August 2012, is a supplement to the McMaster MSK Examination Video Series created by Dr. Carmona, and closely follows the format and content of these videos. The videos are available on **Medportal** (McMaster students), and also publicly accessible at **RheumTutor.com** and **fhs.mcmaster.ca/medicine/rheumatology**.

# McMaster Musculoskeletal Clinical Skills Manual

## TABLE OF CONTENTS

General Guide	1
Hip Examination	3
Knee Examination	6
Ankle and Foot Examination	12
Examination of the Back	15
Shoulder Examination	19
Elbow Examination	24
Hand and Wrist Examination	26
Appendix: Neurological Assessment	29

## GENERAL GUIDE

*(Please see videos for detailed demonstration of examinations)*

Always wash your hands and then introduce yourself to the patient. As with any other exam, ensure adequate exposure while respecting patient's modesty. Remember to assess gait whenever doing an examination of the back or any part of the lower limbs.

**Inspection** follows the format:

- S welling
- E rythema
- A trophy
- D eformities
- S cars, skin changes, etc.

**Palpation** assesses:

- Tenderness
- Effusion
- Swelling
- Temperature
- Crepitus
- Atrophy

**Range of Motion (ROM)**

- Always compare (or comment that you would compare) both sides
- During ROM, check for crepitus, clicking, and locking
- Start with active ROM
- If active ROM is limited, do passive ROM. For some joints, it may be best to integrate this with active ROM, rather than doing them as 2 separate "sections"
- If doing passive ROM, assess end-feel
  - Bony end-feel suggests bony pathology (eg. osteoarthritis, fracture)
  - Soft end-feel suggests soft-tissue pathology (joint capsule, ligaments, tendons, muscles)

**Power Assessment**

- Best to do resisted isometric testing
- Position the joint as required, then apply force while the patient resists

Score	Description
5	Movement against gravity with full resistance
4	Movement of the body part against gravity and some resistance
3	Movement of the body part against gravity only
2	Movement of the body part with gravity eliminated (supported)
1	Muscle contraction, but no joint movement
0	No muscle contraction

### Neurological and Vascular Assessment (see Appendix for details)

Depending on the clinical scenario, you should be prepared to perform a neurological and vascular assessment.

- Pulses, capillary refill
- Tone
- Power (above)
- Sensation according to dermatomes
- Reflexes

### Gait Assessment

Observe gait whenever asked to examine back or any part of the lower limb

- Symmetry, smoothness of movement (legs, arm swing, pelvic tilting)
- Normal stride length
- Ability to turn quickly
- **Stance phase**
  - Heel strike, to mid-stance, to toe-off
  - 60% of gait cycle
- **Swing phase**
  - Toe-off, to mid-swing, to heel strike
  - 40% of gait cycle
- **Antalgic gait**
  - Stance phase is shortened on affected side, typically indicating pain on weight-bearing
- **Trendelenburg gait** (Weakened abductor muscles)
  - During the stance phase, if the hip abductors are weak on the standing side, the pelvis will drop on the opposite side
  - The trunk compensates by lurching towards the side of the weakened abductor muscles
  - Bilateral hip abductor weakness produces a waddling gait