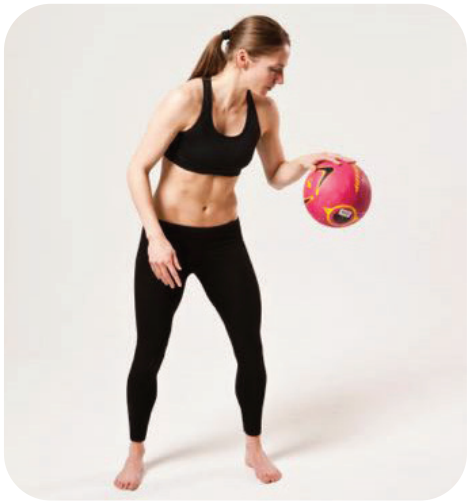
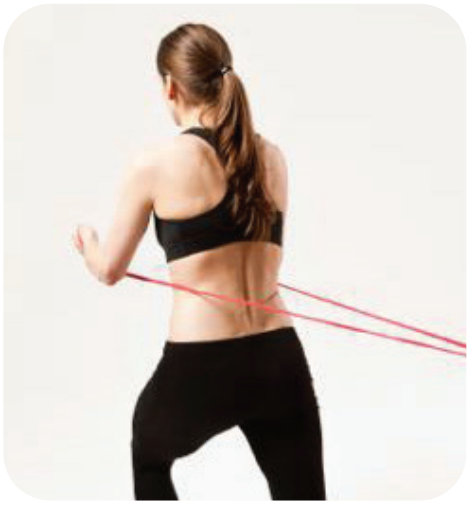
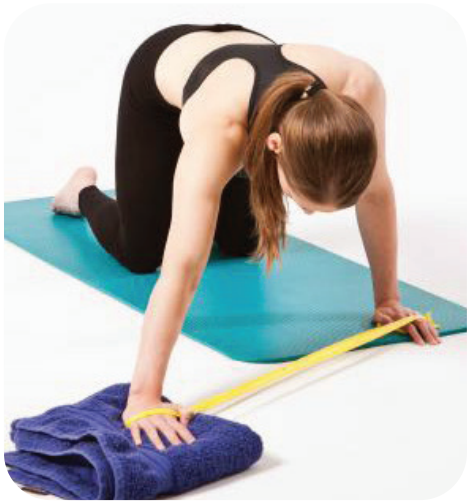
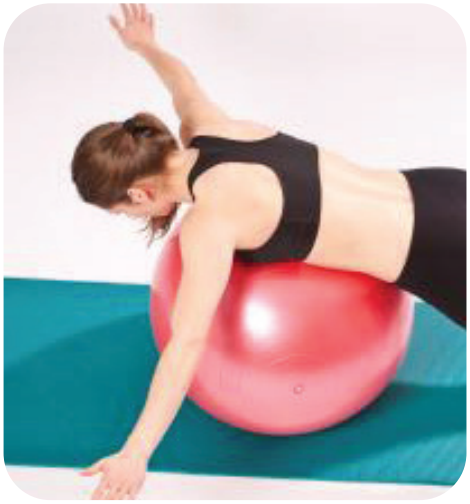
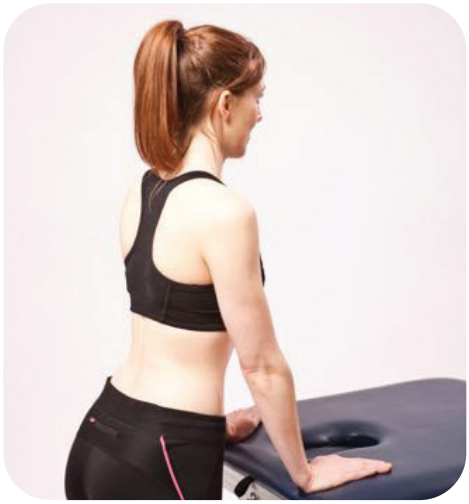
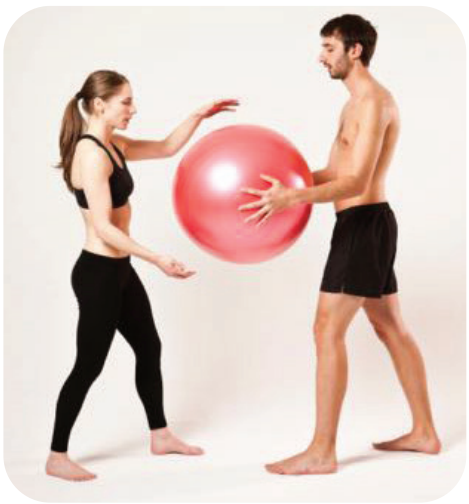
SHOULDER REHABILITATION

A COMPREHENSIVE GUIDE TO SHOULDER EXERCISE THERAPY



CATH LEFTLEY JULIA WALTON JO GIBSON CHRISTINE HOLMES ELEANOR RICHARDSON LENNARD FUNK

Lennard Funk

In 2007 we produced and published our first Shoulder Exercise Booklet. The premise was based on the emerging evidence of the benefits of early mobilisation on joints and tendons after surgery or injury. This was based on our own experience in practice that we applied from the work done in ACL rehabilitation and the EMG biomechanics studies of Professor Tim Uhl, along with the stress-response tendon studies. These all demonstrated that complete immobilisation after surgery or injury had detrimental effects on tissue healing. Return to sport and activities achieved earlier and effectively with a controlled, safe early rehabilitation programme. The emphasis being on safe and not dictated by 'traditional' timescales. We developed a 'phased' system of exercise progression based on the knowledge and evidence of the time.

At the time (2007), the rehabilitation exercises that our specialist shoulder therapists were implementing were not standard practice. These principles and exercises were not in any book format at all, so it was difficult for most therapists, surgeons and patients to apply them in practice. That was the idea for our booklet.

A lot has changed in ten years. We have a lot more knowledge and evidence to support the exercises we use and many more have been developed, taking into account the fact that not all patients can do the same exercises to achieve the same outcomes. Thanks to a larger team of young progressive shoulder physiotherapists, new exercises and an expansion of the principles and goals have been achieved. In this book we also include sections on sports-specific rehabilitation exercises, which we believe should be implemented as soon as possible.

Some of the exercises may look daunting and too difficult, they are only there as a guide and may not be appropriate for your patient at that particular stage and for that particular injury. Therefore, the exercises are simply a compendium and guide to assist the knowledgeable therapist. They are not for patients to attempt unsupervised.

Also, I cannot emphasise enough - do not do any exercise if it is painful. 'No pain, no gain' does not apply to a healing wound. Do not force or stretch during the healing phases after surgery or injury. If unsure, be guided by your surgeon and clinical team.

We hope this book is a useful aid to shoulder rehabilitation. We hope that it gives therapists confidence and support to try different exercises to achieve the best safe outcome for their patients. We welcome feedback.

Finally, this book would not have been possible without the extreme dedication of Julia Walton, Cath Leftley, Chrissy Holmes, Jo Gibson and Ellie Richardson. Each of them brought their own specialist skills and knowledge to the book. Jo is a legend and contributed her huge experience, evidence and educational abilities; Julia brought leadership, motivation and her skills and experience in managing complex shoulder cases; Cath contributed her large experience developing the previous book and brings perspectives from a practicing physiotherapist in a non-specialist clinical setting; Chrissy has a background in sports rehabilitation which was essential for the sports-specific exercises; Ellie started as our enthusiastic model, but soon became a great contributor, completing her Masters in shoulder rehabilitation during the writing of this book and with a background in sports. They all sacrificed 4 years of hard work, late nights, lost weekends and numerous gallons of tea, for which I am extremely grateful and humbled.

We hope you find this book a useful resource for your clinical practice

Len Funk

CATH LEFTLEY MCSP MSc BSc (HONS) PHYSIOTHERAPY

Cath is a specialist shoulder physiotherapist with expertise in non-operative management of shoulder disorders. She has developed physiotherapy guidelines for therapists managing shoulders after surgery. Cath has a Masters degree in musculoskeletal healthcare from Keele University and is a keen researcher having presented nationally and internationally.

Cath also runs a busy Physiotherapy and Sports Injury practice in Altrincham, Greater Manchester.

JULIA WALTON BSc (HONS) SPECIALIST SHOULDER PHYSIOTHERAPIST AND SHOULDER EXTENDED SCOPE PRACTITIONER

Julia has worked as a shoulder specialist physiotherapist since 2002.Working at The Wrightington Upper Limb Unit and at Manchester Shoulder Clinic, she continues her highly specialist practice. She works closely with her surgeon and therapy colleagues managing complex shoulder patients. She also lectures nationally and internationally on shoulder rehabilitation. Julia is actively involved in clinical research and is published. She has extensive experience treating all shoulder conditions from elite athletes, to shoulder complaints that trouble patients in their everyday life.

JO GIBSON MCSP MSc

Jo Gibson is a Clinical Physiotherapy Specialist working at the Liverpool Upper Limb Unit and in private practice. She has worked as a Shoulder Specialist since 1995 and lectures Nationally and Internationally about assessment and rehabilitation of the shoulder complex. Jo is a consultant to several elite sports teams regarding shoulder rehabilitation and is an Associate Lecturer at Liverpool University.

She has published in peer-reviewed journals, written several book chapters and co-authored National Guidelines regarding the treatment of common shoulder conditions. Jo is Associate Editor of the Shoulder & Elbow Journal.

CHRISTINE HOLMES GRAD.DIP.PHYS. MCSP SPECIALIST SHOULDER & SPORTS INJURY PHYSIOTHERAPIST

Chrissy is a specialist shoulder and sports injury physiotherapist. She works in a rehabilitation clinic treating North West Police Officers and at Manchester Shoulder Clinic.

Her vast experience in sport includes working at the 2002 Commonwealth games and 18 years in Rugby League at both Super League and International level.

She was Physiotherapist with England Academy Rugby League tour to Australia in 2012 and 2016.

Chrissy has also lectured in sports rehabilitation.

ELEANOR RICHARDSON MCSP MHCPC MSc (HONS) PHYSIOTHERAPY PG DIP ORTHOPAEDIC MEDICINE & ADVANCED MSK PRACTICE

Ellie is an experienced Musculoskeletal and Sports Physiotherapist with specific clinical expertise in shoulder pathology and rehabilitation. Alongside her varied clinical & sporting caseload, Ellie has completed Post Graduate Diplomas in Orthopaedic Medicine and Advanced Musculoskeletal Physiotherapy and has an MSc in Advanced Musculoskeletal Physiotherapy.

Ellie is a former GB International and Scottish Commonwealth Games track cyclist, lectures for The Sports and Exercise Medicine Society and is a member of The British Elbow and Shoulder Society. She is actively involved in research and is currently lead author on a systematic review investigating the effects of the kinetic chain on shoulder rehabilitation.

INTRODUCTION
Purpose of this book

This book resulted from our experience that early, protected mobilization after shoulder surgery results in a quicker reduction of post-operative pain and an earlier return to function. Importantly this is without any increased risk of surgical failure. There is an increasing evidence base to support this. However choosing the right exercise after surgery and knowing what is 'safe' can be a challenge.

The purpose of this book is firstly to enable clinicians is to select exercises for their patients based on their key purpose and the available evidence regarding levels of activation of the shoulder muscles during each exercise. Secondly it is a resource for patients to refer to once their physiotherapist has 'prescribed' the appropriate exercises to ensure they are doing the exercises correctly.

Exercises are divided into three phases; early, intermediate and late according to the percentage of maximum voluntary contraction (MVC) of the relevant muscles during each exercise.

- Early < 20%
- Intermediate 20-40 %
- Late > 40 %

It is important to appreciate that there is currently a lack of evidence showing a clear correlation between activation levels and force generated at the shoulder. However there are studies demonstrating activation levels in the shoulder muscles with the arm in a sling and also traditional passive post-operative exercises. Crucially the exercises we have recommended within the early phase are those that do not activate the rotator cuff muscles beyond the levels demonstrated in those studies.

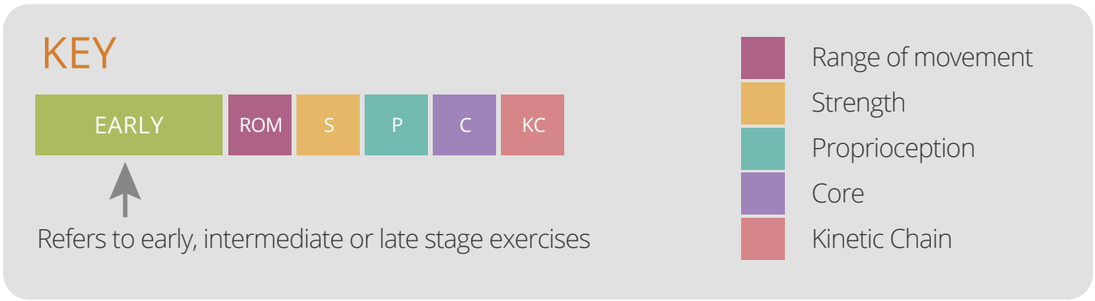
The classification of exercises into early, intermediate and late relates specifically to the postoperative situation however clearly all exercises within this text have application in general shoulder rehabilitation. In the absence of trauma or surgery, those exercises identified as intermediate or late stage may have relevance much earlier in the rehabilitation process. The key is to select exercises according to the individual patients main problems and ensure that the exercise is applied in the most effective way. This is entirely dependent on the physiotherapist and their clinical reasoning.

You will see within the key that the main aims of each exercise are also labelled e.g. range of movement, strength, proprioception etc. This sub classification is based on the available evidence base or in the absence of such evidence, expert consensus.

Clinicians Notes:

The purpose of the clinician notes is to highlight key treatment tips and specific findings from the evidence base that enhance the purpose or application of the exercises. In addition, where applicable, considerations that may impact the suitability of some exercises e.g. type of surgery are highlighted.

We have aimed to represent the current literature within this text but it is important to note that the methodological rigour of many EMG studies is questionable according to those who are expert in the field. Our aim has been to extrapolate what is most meaningful and clinically useful in the application of shoulder exercises. In the absence of any relevant evidence, treatment tips or comments are based on the clinical experience of the authors of this book.



MODEL ACKNOWLEDGEMENTS

Eleanor Richardson, Dean Matkin and Sarah Whitehead.

BEFORE YOU GET STARTED WITH YOUR EXERCISES...

Your therapist will individually tailor and modify your exercise regime to best suit you because no one is the same. However, please read our general hints and tips section below to ensure that you are getting the most out of your shoulder exercises.

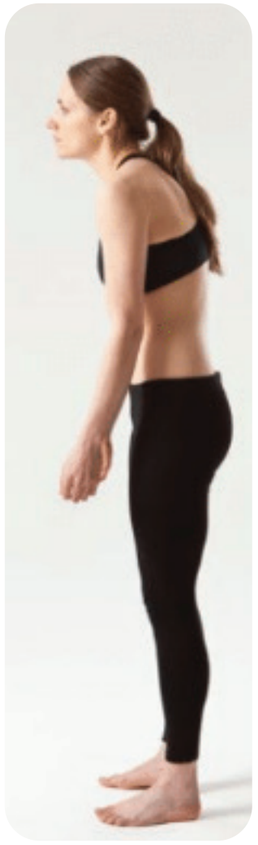
HINTS AND TIPS

The exercises you will find in this book, although specifically designed to rehabilitate your shoulder, are not isolated to the shoulder joint itself. Whether your goal is to achieve high level sporting function or simply to be able to carry out functional everyday activities without pain, it is crucial to ensure that your whole body is working together as effectively as possible. For this to happen it is essential that you are aware of how your whole body moves during your targeted shoulder exercises. The shoulder does not work in isolation. It is therefore important to incorporate functional movement patterns and reinforce good postural control throughout your rehabilitation.To help you with this we have provided some considerations when performing your exercises or general functional activities.

DO'S AND DON'TS
Good posture Guidelines

Standing posture

Poor



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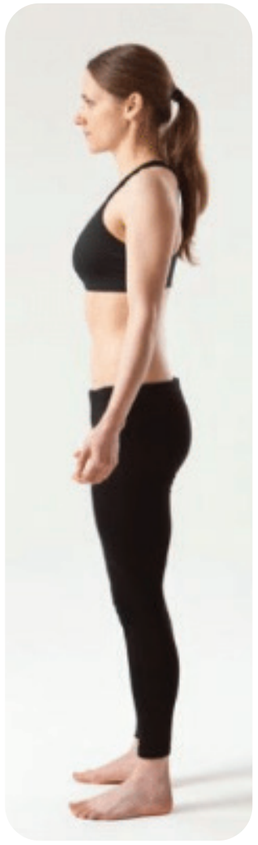


Head/neck
Lengthen your neck tucking your chin gently in ensuring your cheek bones are over your collar bones.

Shoulder girdle
Standing tall, gently open up across your collar bones. Keeping your shoulders relaxed.

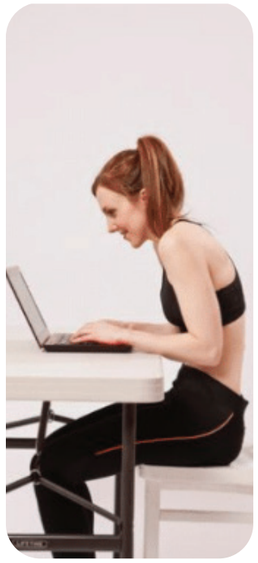
Ribcage
Gently lift your ribcage away from your waistline lengthening your abdominal muscles.

Pelvis
Pull in your lower stomach muscles to maintain a natural curve in your lower back.

Feet
Maintain equal weight through your feet, distribute the weight through your heels and forefeet. Keep your legs hip width apart and straight but knees relaxed

Sitting posture

Poor



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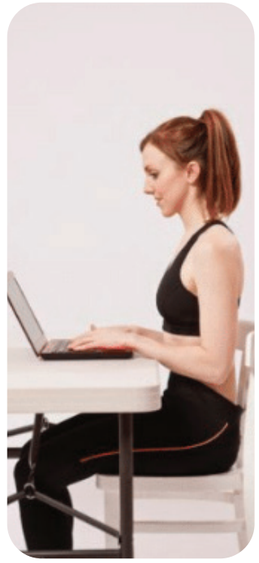


Head/neck
Lengthen your neck tucking your chin gently in ensuring your cheek bones are over your collar bones.

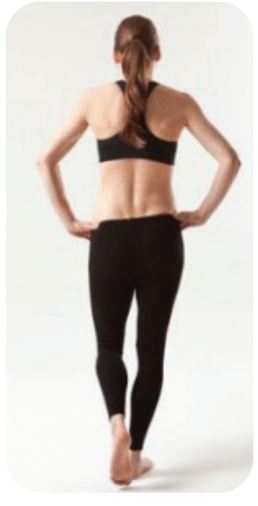
Shoulder girdle
Sitting tall, gently open up across your collar bones. Keeping your shoulders relaxed.

Back
Gently lift your ribcage away from your waistline lengthening your abdominal muscles. Ensure your back is supported, maintaining a natural curve in your lower back.

Legs
Ensure there is equal weight through your sitting bones, your thighs are fully supported and your feet are flat on the floor or foot rest.

Single leg stance

Poor



Good

Pelvis
Stand tall on the stance leg ensuring your bottom and stomach muscles are working to keep the pelvis level avoiding dipping the opposite hip.

4 point kneeling

Good

Pelvis
Maintain equal weight through your hands and knees keeping your arms straight but elbows soft. Ensure you stay open across the collar-bones. Pull in your lower stomach muscles whilst maintaining a natural curve in your lower back.

Bridge on swiss ball

Good

Pelvis
Head, neck and shoulders are supported on the swiss ball. Ensure you stay open across the collar-bones. Using your lower stomach and bottom muscles whilst maintaining a natural curve in your lower back, keeping your hips up.Keep the weight equally through your feet maintaining your legs hip width apart.

Low Plank

Good

Pelvis
Maintain equal weight through your forearms and feet. Ensure you stay open across the collar-bones. Pull in your lower stomach muscles whilst maintaining a natural curve in your lower back. Maintain a level profile keeping your hips down.

NECK RANGE OF MOTION

EARLY | ROM | S | P | C | KC

In standing, bend the elbow on your affected arm and place the opposite hand under the elbow to support your arm. Open up across your chest, then stretch your neck by taking your ear towards your shoulder and then repeat on the opposite side.

REPEAT (TIMES)

CLINICIAN NOTES:

Supporting the upper limb with the contra-lateral arm reduces load on the upper quadrant reducing the risk of compensatory muscle stategies in the early post-operative shoulder.

Refs: Jung et al 2015

ELBOW AND WRIST EXERCISES

EARLY | ROM | S | P | C | KC

1. Bend your elbow so fingers touch your shoulder, then straighten elbow as much as you can.

REPEAT (TIMES)

2. Stand maintaining good posture, elbow bent to 90° rotate turn your palm up so your hand faces the ceiling, then turn your palm down so your hand faces the floor. Return to starting position.

REPEAT (TIMES)

3. Extend the wrist backwards as far as you can, then flex the wrist forwards as far as you can. Return to start position.

REPEAT (TIMES)

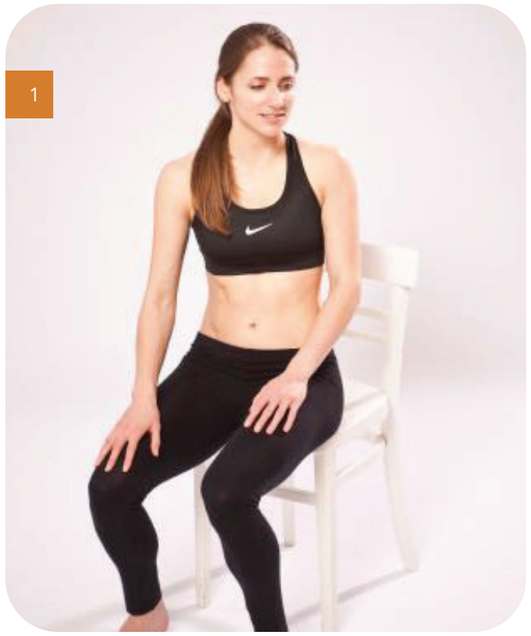
CLINICIAN NOTES:

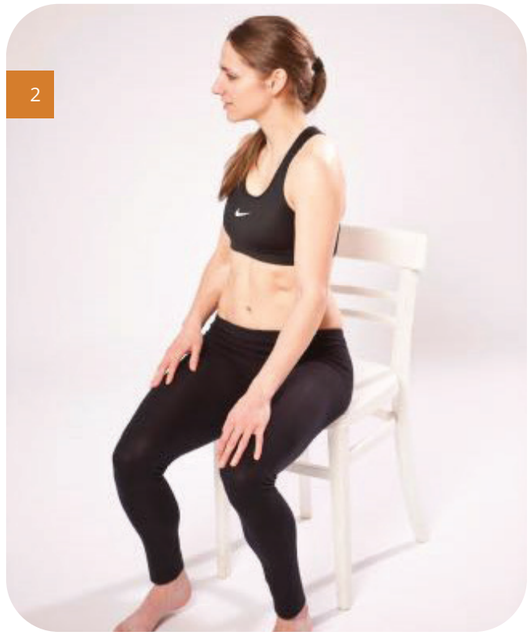
Supporting the upper limb with the contra-lateral arm reduces load on the upper quadrant reducing the risk of compensatory muscle stategies in the early post-operative shoulder.

Refs: Jung et al 2015

THIGH SLIDES

EARLY | ROM | S | P | C | KC





In sitting place your hands on your thighs, twist your shoulder and allow your hand to slide down your thigh twisting your body and then repeat on the other side.

REPEAT (TIMES)

Tip: This exercise can be performed with Sling in Situ

Progression: Try to dissociate your thorax from your head and neck by keeping your head still, facing forwards during the rotational movement.

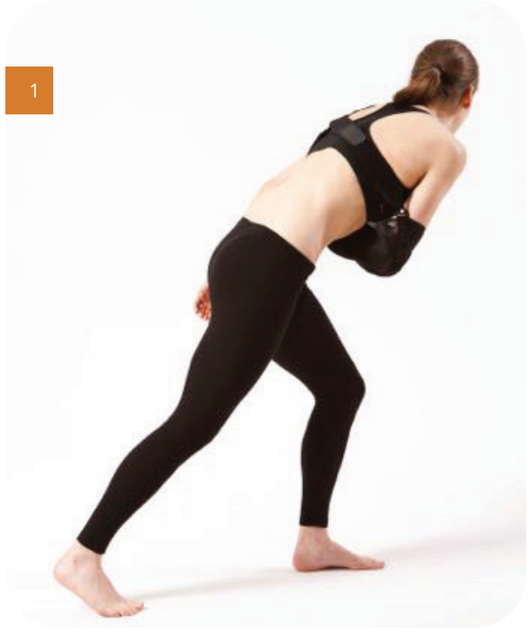
CLINICIAN NOTES:

Vision is a powerful way of promoting good movement patterns. Initially turning the head to face the direction of movement will increase ease of rotation. Dissociation of the head on the thorax can be used as a progression.

SHOULDER DUMP

EARLY | ROM | S | P | C | KC

1



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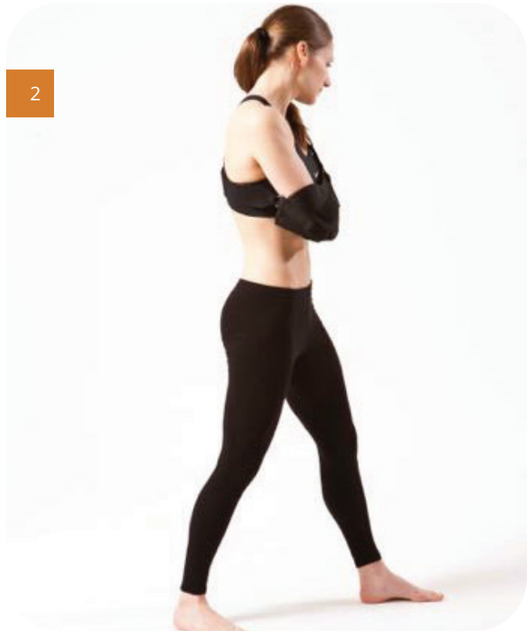


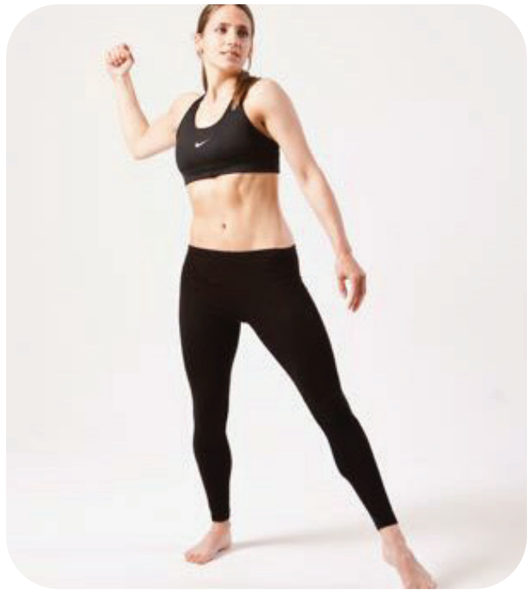
Standing with your opposite leg to the affected arm in front.
Lunge forwards and rotate your body over your front leg,
then transfer your weight onto your back leg
whist standing up and rotating away with your upper body,
and take your shoulder blade towards the opposite hip.

REPEAT (TIMES)

Progression: This can be performed without the sling

1

Adaptation:



CLINICIAN NOTES:

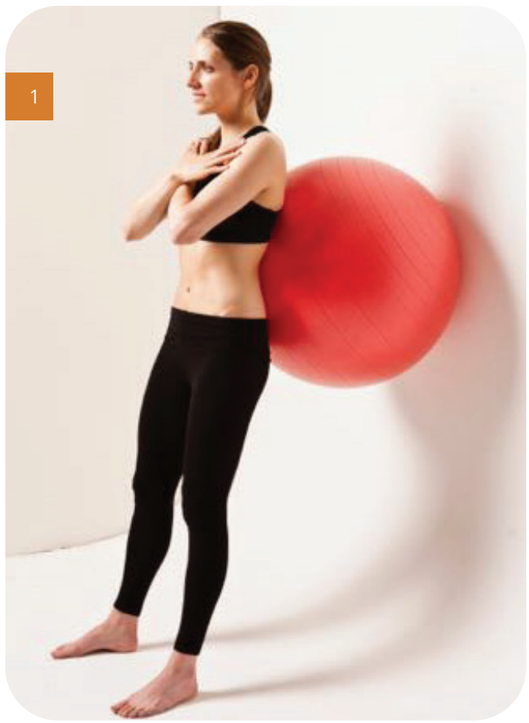
Caution! This exercise should not be used in patients who have had a Subscapularis repair as activation levels of subscapularis exceed 40% MVC. It is however safe to use in other rotator cuff repairs (MVC infraspinatus and supraspinatus < 20%).

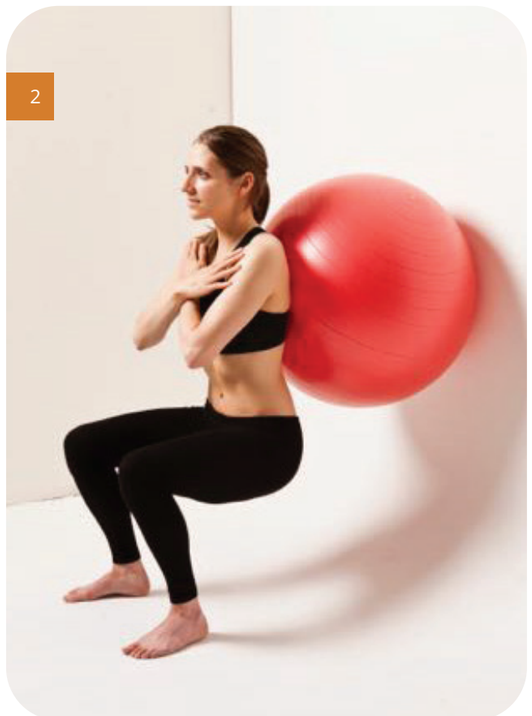
Increasing the lower quadrant emphasis e.g. making more dynamic, will increase scapula muscle recruitment.

Refs: McMullen & Uhl 2000, Smith et al 2006, 2007

WALL SQUAT

EARLY | ROM | S | P | C | KC





Stand with your back leaning on a swiss ball against a wall. Place your arms across your chest. Whilst maintaining pressure through the ball, gently bend your knees and squat down and then return back to your starting position.

REPEAT (TIMES)

Hint:

A Depth of squat should be determined by the patient's ability to maintain control

B. If the patient is in a sling maintain the sling for this exercise

C. Arm position can be varied for control.

D. Can be performed without the swiss ball

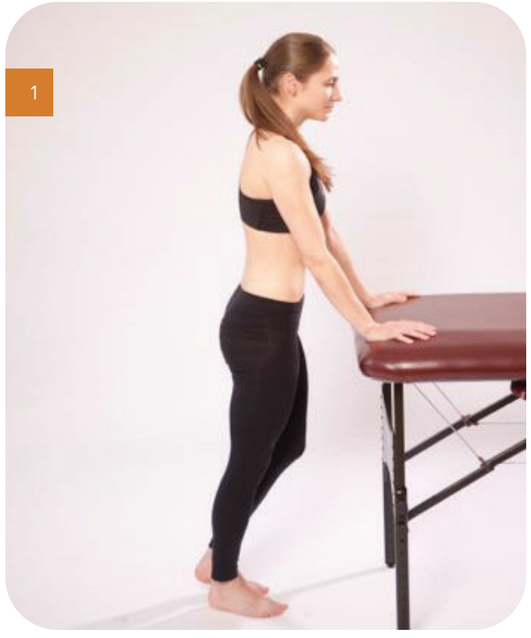
CLINICIAN NOTES:

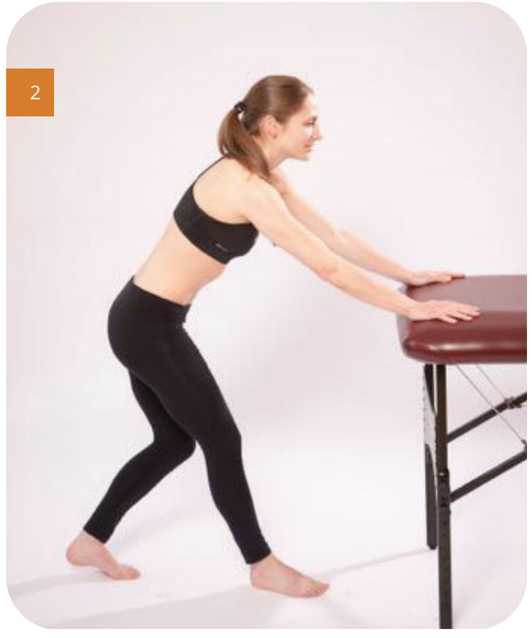
This exercise can be done with a theraband loop around the knees to emphasise the hip rotators.

Refs: Marshall et al 2005, 2006, Kang et al 2014

STEP BACK FLEXION IN STANDING

EARLY | ROM | S | P | C | KC





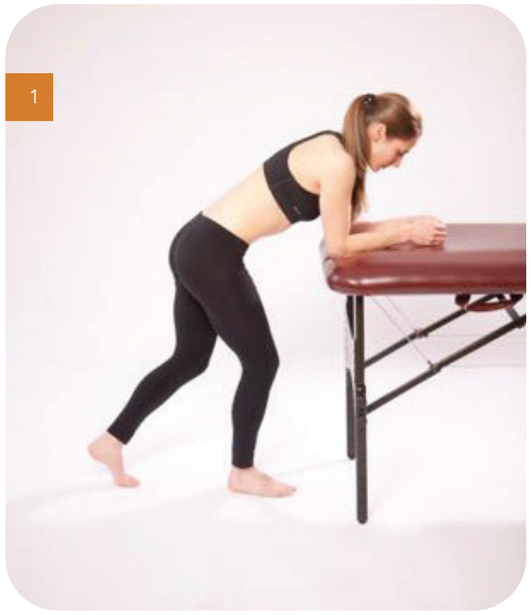
Stand with good posture in front of a high table. Place your hands on the table and step one foot backwards leaving the hands supported, allowing your shoulders to flex. Do not force into a stretch.

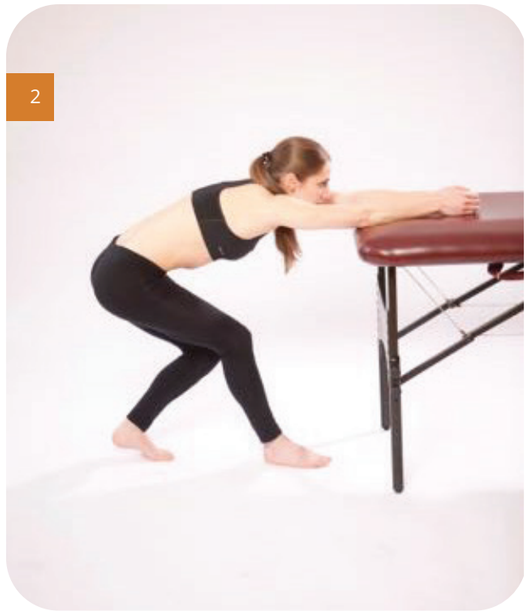
SAFE ZONE	REPEAT (TIMES)

Adaptation:

Easier: Place your forearms on a table, keeping your elbows bent and then step back.

Adaptation:



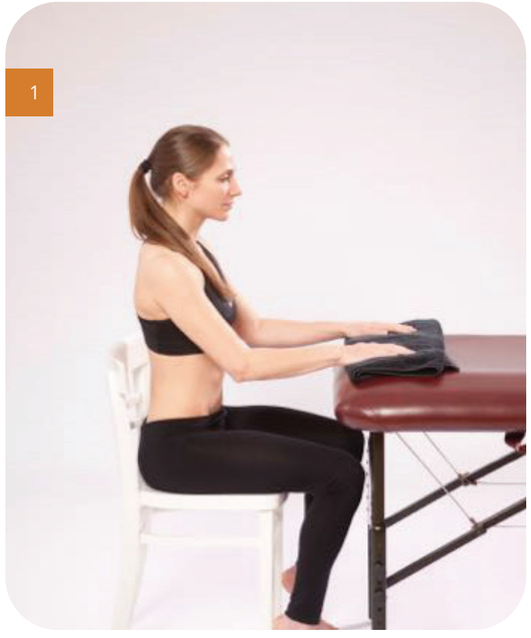


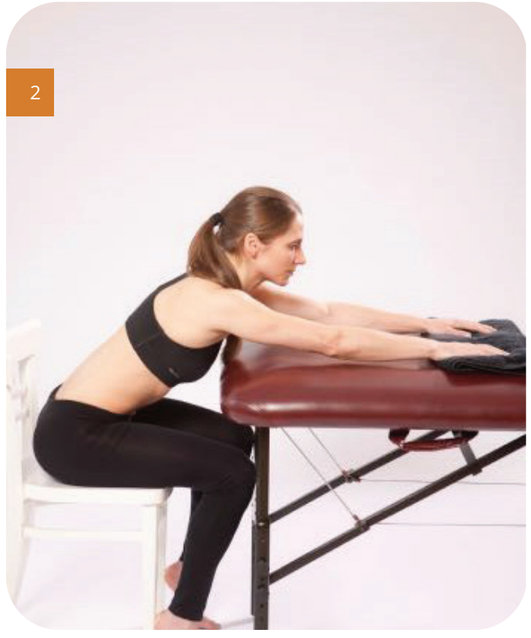
CLINICIAN NOTES:

In patients who have longstanding pain and /or are reluctant to move the hand away from the body, exercises that dissociate the body away from the hand can help facilitate movement.

SEATED TABLE SLIDE INTO FLEXION

EARLY | ROM | S | P | C | KC



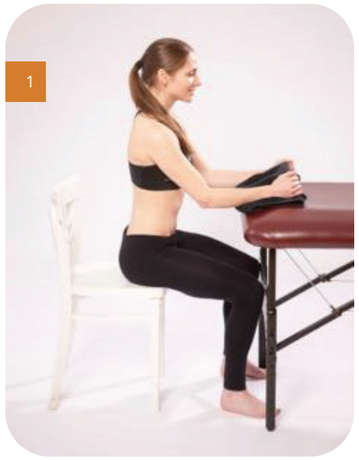


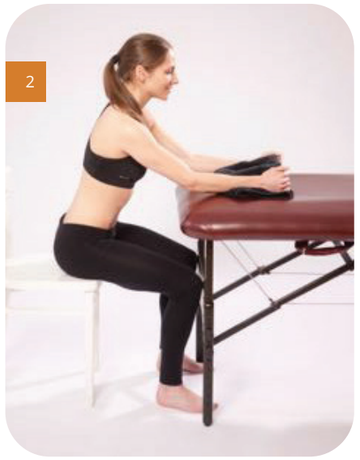
In sitting rest your hands on a table. Using a duster slide both hands forwards as far as comfortable. Let your head drop forwards slightly at the end of the movement. Do not force into a stretch.

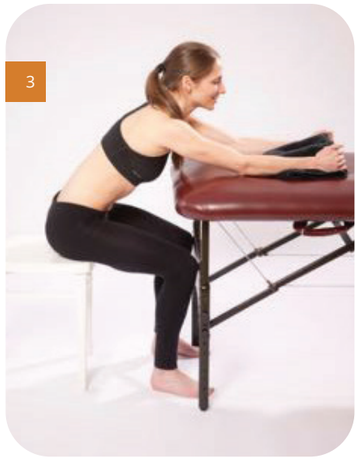
SAFE ZONE	REPEAT (TIMES)

Adaptation Easier:
Place your forearms on the table with your palms facing each other and your elbows slightly flexed.

Adaptation:







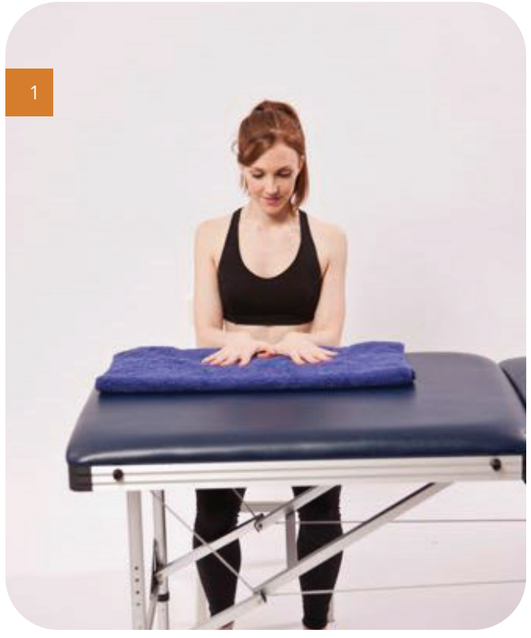
CLINICIAN NOTES:

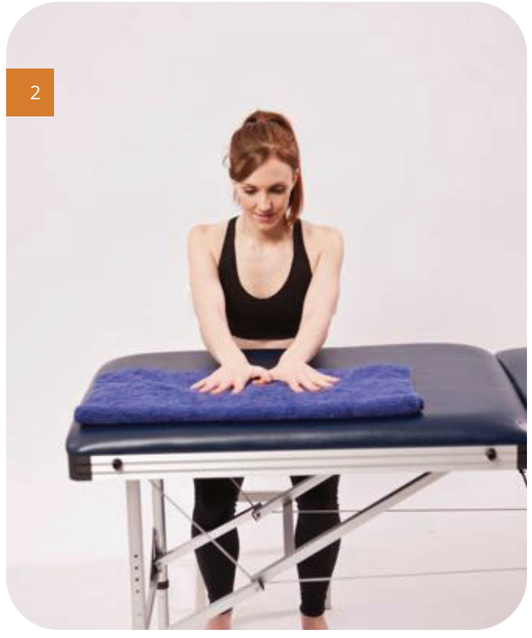
The table slide (as an early mobilisation strategy) is a feature of studies reporting successful outcomes in rotator cuff repair. Supported upper limb elevation is comparable to passive exercises in terms of activation levels of the rotator cuff.

Refs: Wise et al 2004, Murphy et al 2013, Jung et al 2015

SEATED BUTTERFLY TABLE SLIDE FLEXION

EARLY | ROM | S | P | C | KC





Sit in a good posture with both hands on a towel on a table. Cross your thumbs with affected side on top and slide the towel away from the body and return to your starting position.Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

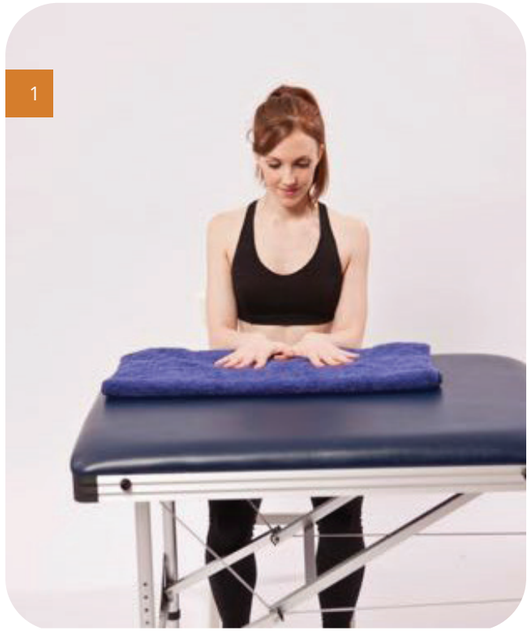
The table slide (as an early mobilization strategy) is a feature of studies reporting successful outcomes in rotator cuff repair.

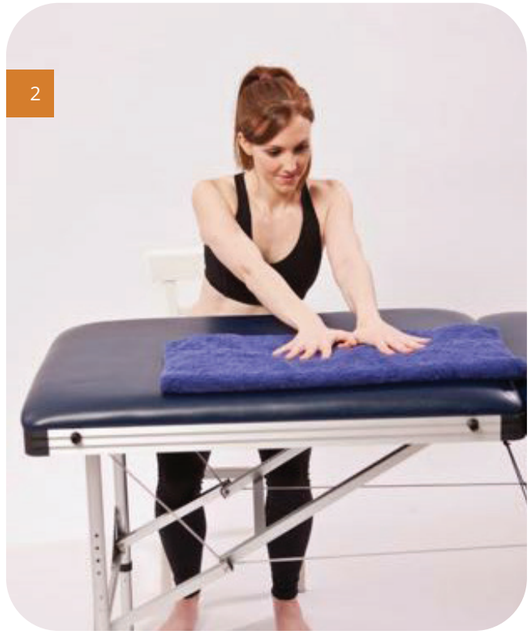
Supported upper limb elevation is comparable to passive exercises in terms of activation levels of the rotator cuff. Sitting is a more proprioceptive position than lying and visual engagement with the hand enhances function.

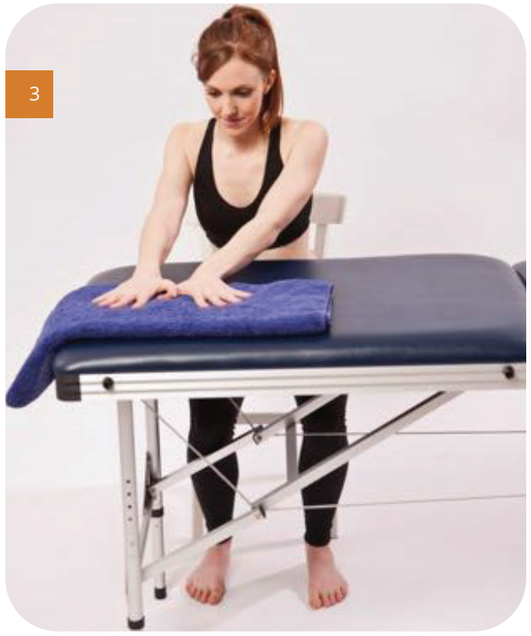
Refs: Wise et al 2004, Murphy et al 2013, Jung et al 2015

SEATED BUTTERFLY CLOCK TABLE SLIDE

EARLY | ROM | S | P | C | KC







Sit in a good posture with both hands on a towel on a table. Cross thumbs affected side on top. Starting position is 12 o'clock. Slide towel away to 2 o'clock and back to start position, then slide towel away to 10 o'clock and back to start position. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

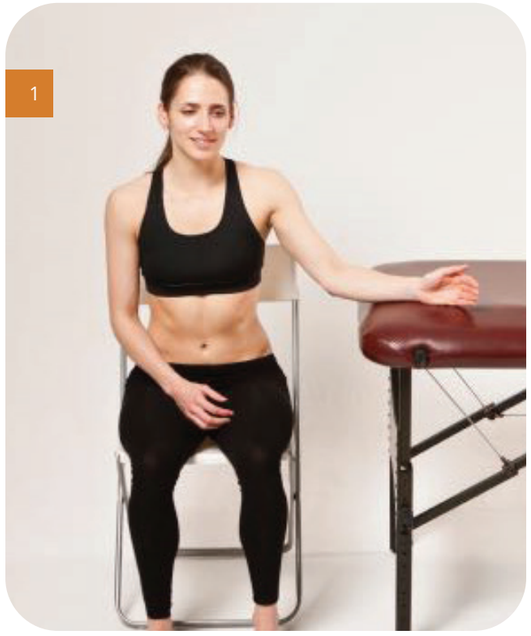
The table slide (as an early mobilization strategy) is a feature of studies reporting successful outcomes in rotator cuff repair.

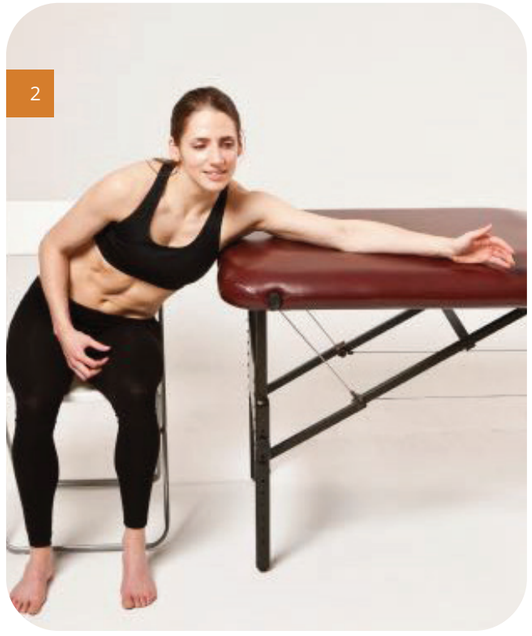
Supported upper limb elevation is comparable to passive exercises in terms of activation levels of the rotator cuff. Sitting is a more proprioceptive position than lying and visual engagement with the hand enhances function.

Refs: Wise et al 2004, Murphy et al 2013, Jung et al 2015

SEATED TABLE SLIDE INTO ABDUCTION

EARLY | ROM | S | P | C | KC





Sitting next to a table. Rest your forearm on the table top and slide your arm away from your body as far as comfortable whilst maintaining contact with the table throughout the movement. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

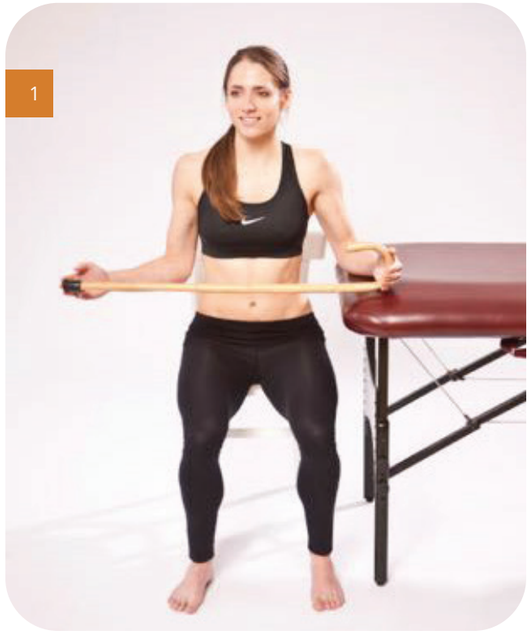
CLINICIAN NOTES:

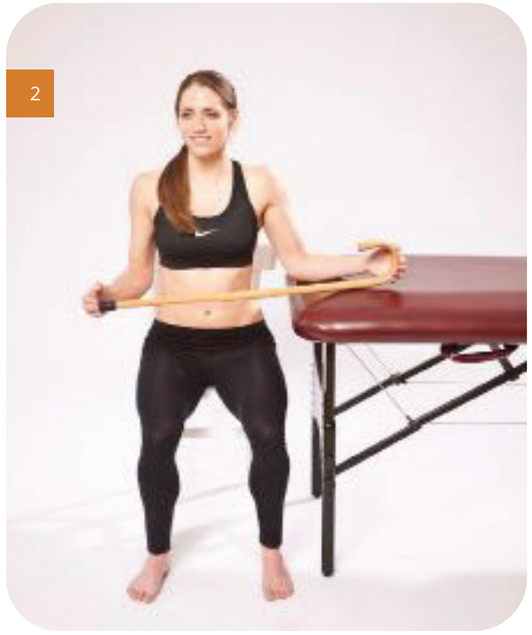
Supported upper limb elevation is comparable to passive exercises in terms of activation levels of the rotator cuff.

Refs: Wise et al 2004, Uhl et al 2010, McMullen & Uhl 2000

SEATED TABLE EXTERNAL ROTATION WITH STICK

EARLY | ROM | S | P | C | KC





Sitting in a good posture with your elbow supported on a table, holding a stick. Use the unaffected hand to gently push the hand of the affected side. During the movement keep your elbows into your side. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

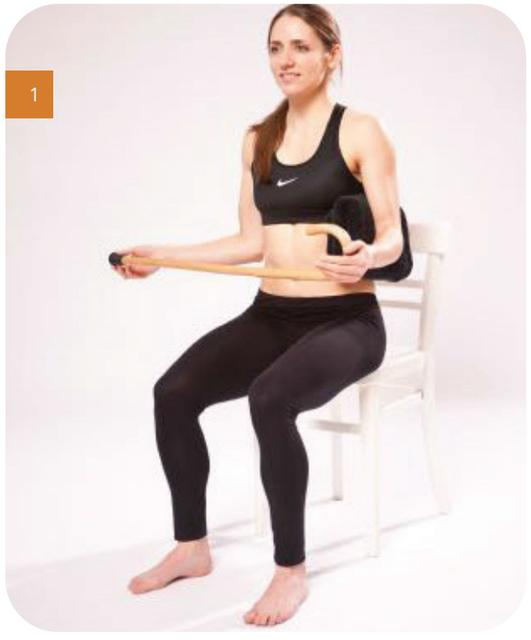
This will specifically target the anterior-superior part of the shoulder capsule.

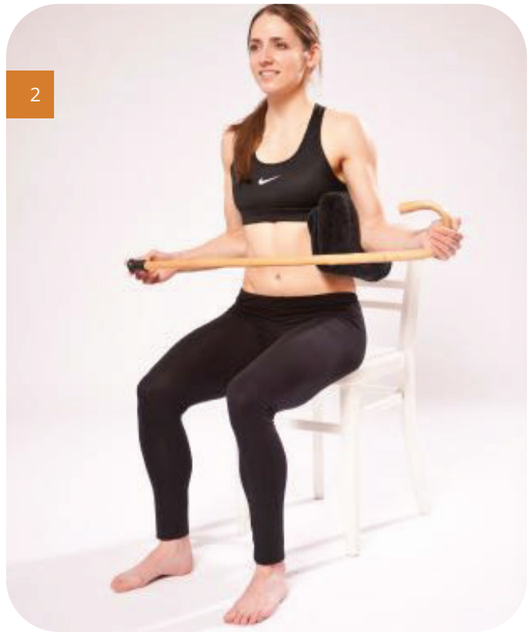
As the cuff insertion is inter-digitated with the deep layers of the capsule gentle hold - relax techniques addressed to subscapularis will enhance the effectiveness of this exercise

Refs: Dockery et al 1998, Misamore et al 1993, Walton & Russell 2015

EXTERNAL ROTATION WITH STICK IN SITTING

EARLY | ROM | S | P | C | KC





In sitting, maintain good posture, place a folded or rolled up towel between the affected arm and your side. Hold a stick with both hands, shoulder width apart palms facing upwards. Keeping your elbows in, use your unaffected arm to push the bar outwards away from the affected arm. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

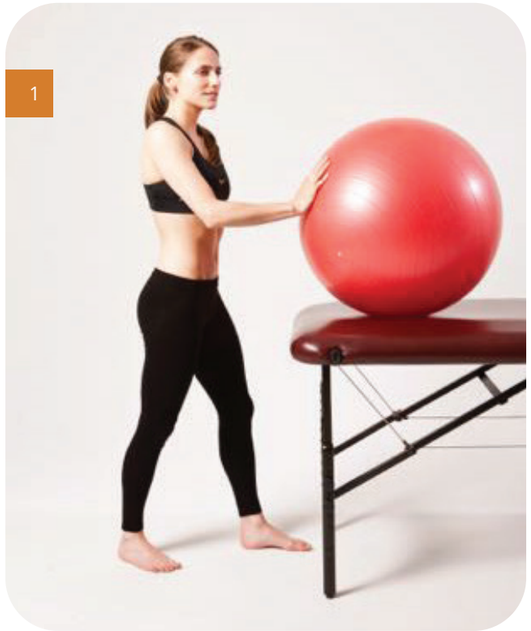
This will specifically target the anterior-superior part of the shoulder capsule.

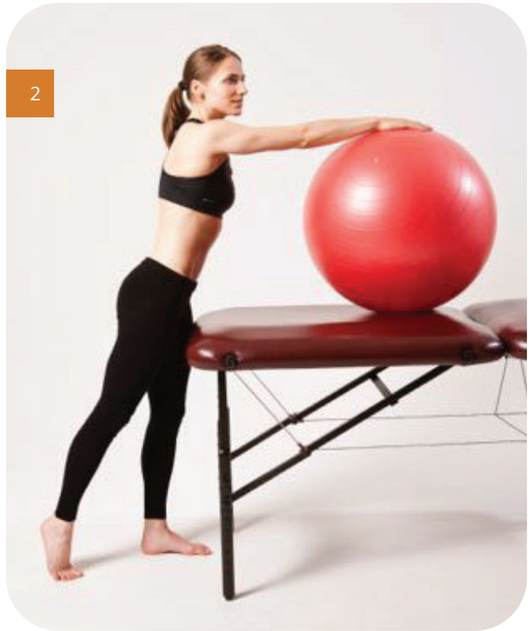
As the cuff insertion is inter-digitated with the deep layers of the capsule gentle hold- relax techniques addressed to subscapularis will enhance the effectiveness of this exercise.

Refs: Dockery et al 1998, Misamore et al 1993, Walton & Russell 2015

TABLE SWISS BALL FLEXION

EARLY | ROM | S | P | C | KC





Standing with one foot in front of the other, facing the table, place your hands or hand of the affected arm on the ball placed on the table. Keeping your arm/s on the ball, roll the ball away from you, transferring your weight from the back to the front leg. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

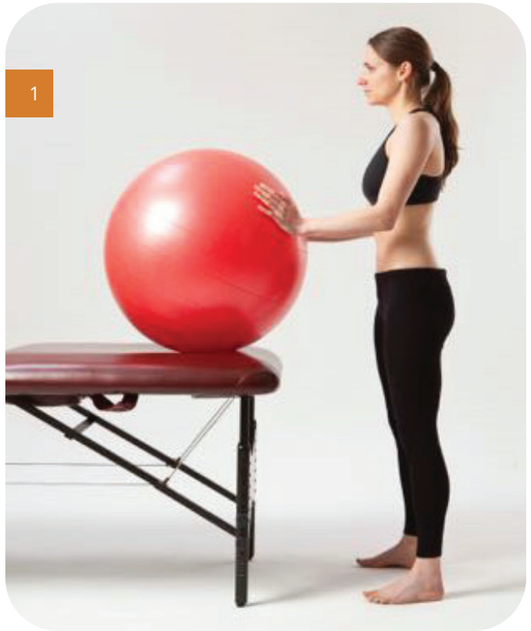
CLINICIAN NOTES:

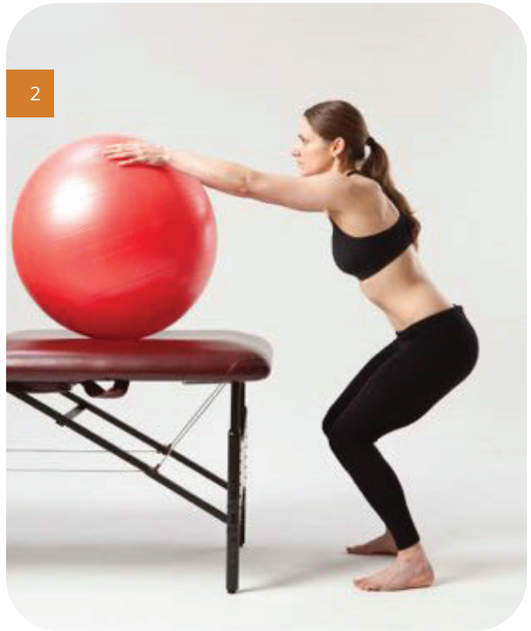
Supported upper limb elevation is comparable to passive exercises in terms of activation levels of the rotator cuff. Using the lower quadrant to initiate the exercise increases scapula muscle recruitment without increasing load.

Refs: Wise et al 2004, Uhl et al 2010, McMullen & Uhl 2000

TABLE SWISS BALL FLEXION SQUAT

EARLY | ROM | S | P | C | KC





Standing facing the table, place both hands on top of the ball. Bend your knees into a squat position whilst your hands remain on the ball, allowing the ball to roll across the table. Return to your starting position. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

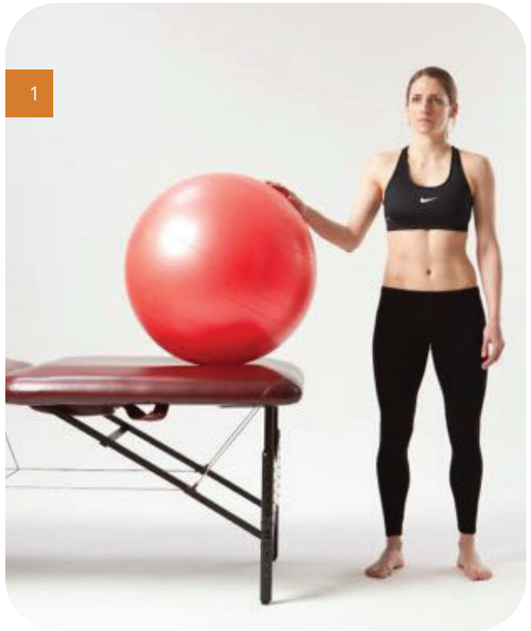
CLINICIAN NOTES:

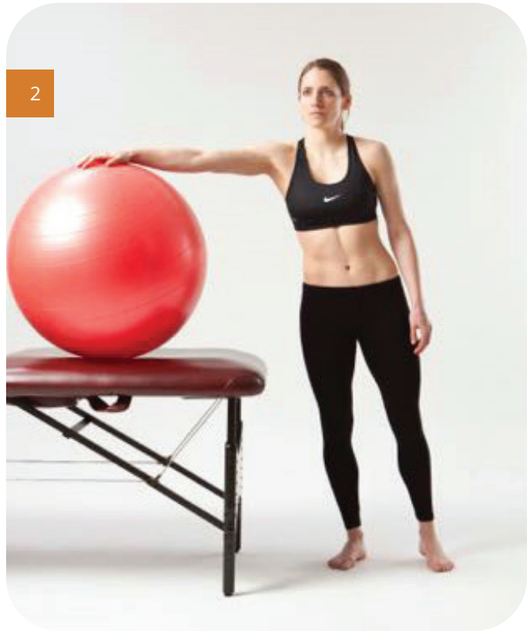
In patients who have longstanding pain and /or are reluctant to move the hand away from the body exercises that dissociate the body away from the hand can help facilitate movement. Support with the ball increases the proprioceptive value of the exercise whilst ensuring activation levels of the cuff are within 'safe' limits.

Refs: Uhl et al 2003, Kibler et al 2001, Wise et al 2004, Elphinston 2013

TABLE SWISS BALL ABDUCTION

EARLY | ROM | S | P | C | KC





Stand next to the ball on the table top with the hand of your affected shoulder resting on the ball. Roll the ball out to the side transferring your weight towards the ball. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

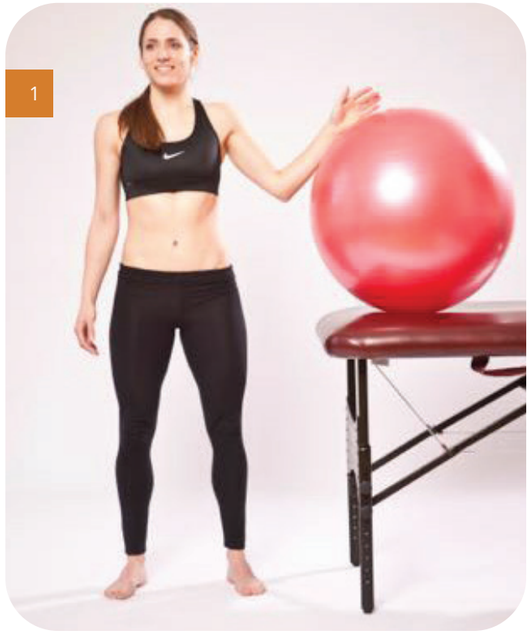
CLINICIAN NOTES:

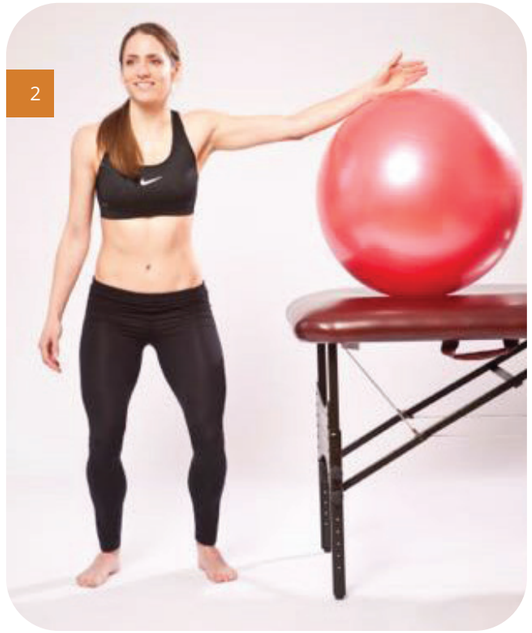
Rotator cuff repair: It is important to ensure good technique in this exercise and respect pain – pain and poor technique and an inability to relax will increase activation levels of the rotator cuff above the ‘safe limit’.

Refs: Uhl et al 2010, Kibler et al 2008

TABLE SWISS BALL ABDUCTION SQUAT

EARLY | ROM | S | P | C | KC





Stand next to the ball on the table top with the hand of your affected shoulder resting on the ball. Bend your knees into a squat position whilst your hands remain on the ball allowing the ball to roll. Return back up to your starting position. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

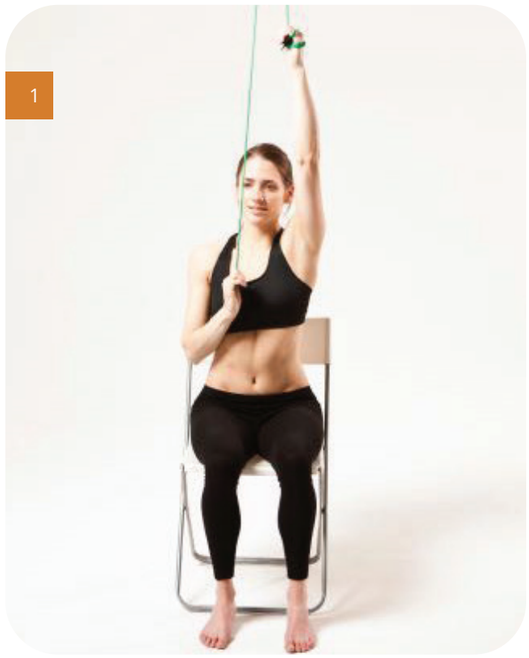
CLINICIAN NOTES:

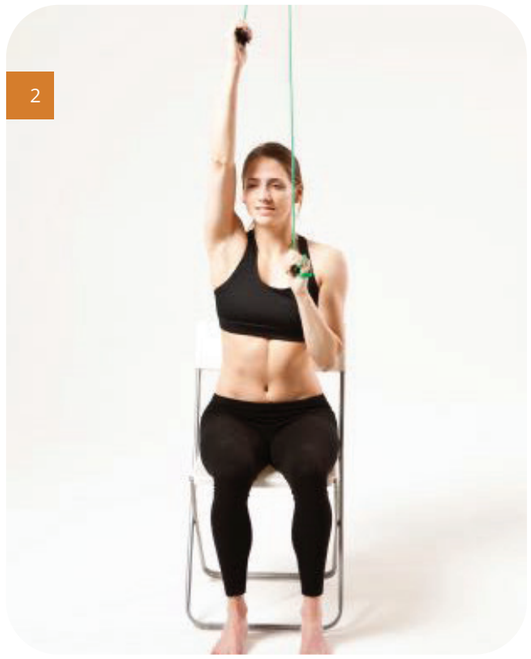
In patients who have longstanding pain and /or are reluctant to move the hand away from the body exercises that dissociate the body away from the hand can help facilitate movement.

Refs: Uhl et al 2003, Kibler et al 2001, Wise et al 2004, Elphinston 2013

PULLEYS

EARLY | ROM | S | P | C | KC





In sitting, hold pulley handles in each hand, use unaffected arm to pull down, moving the affected arm upwards and then lower. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

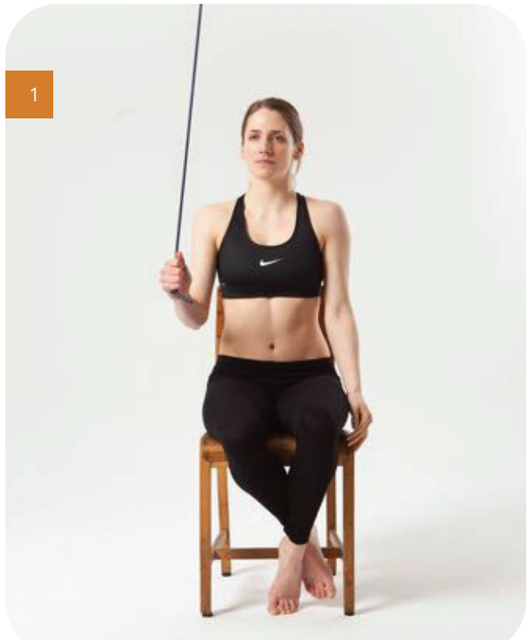
Poor technique e.g hitching the shoulder, and pain are associated with increased activation of the rotator cuff beyond ‘safe’ limits (in early postoperative phase). In these cases supported exercises are preferable e.g. table slide.

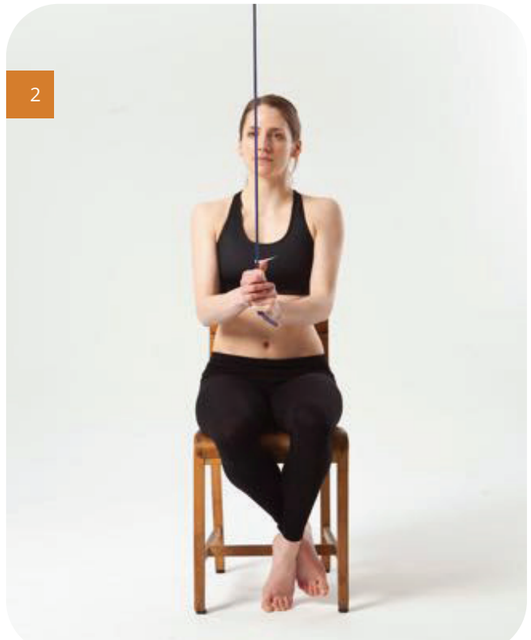
A strong rigid grip (greater than 50 % maximum voluntary contraction) will potentially increase activation levels of the cuff above the ‘safe’ zone in the early postoperative phase.

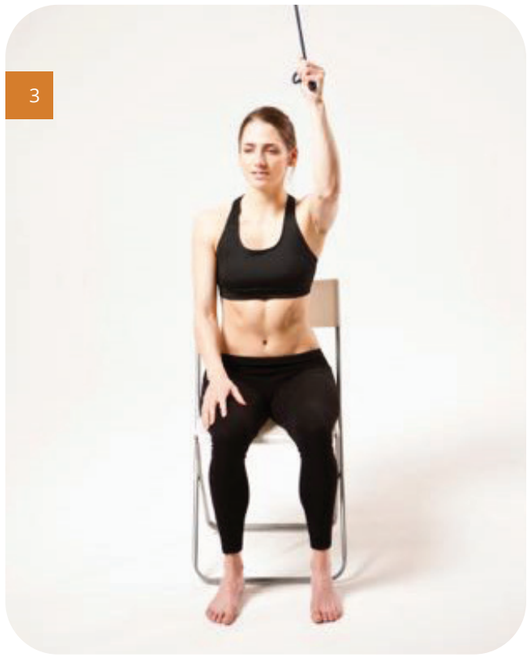
Refs: Alizadehkhaiyat et al 2011, Dockery et al 1998, Jung et al 2015, Murphy et al 2013

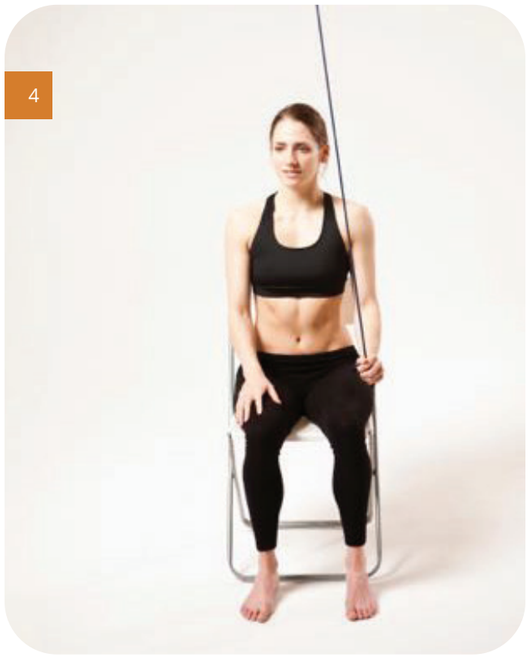
ACTIVE ASSISTED ELEVATION WITH RESISTANCE TUBE

EARLY | ROM | S | P | C | KC









In sitting, with good posture, pull the resistance tube down with the unaffected arm and pass the tube over to the affected arm. Then allow the resistance tube to assist the affected arm to flex up while maintaining control. Then pull the resistance tube back down with the affected arm.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

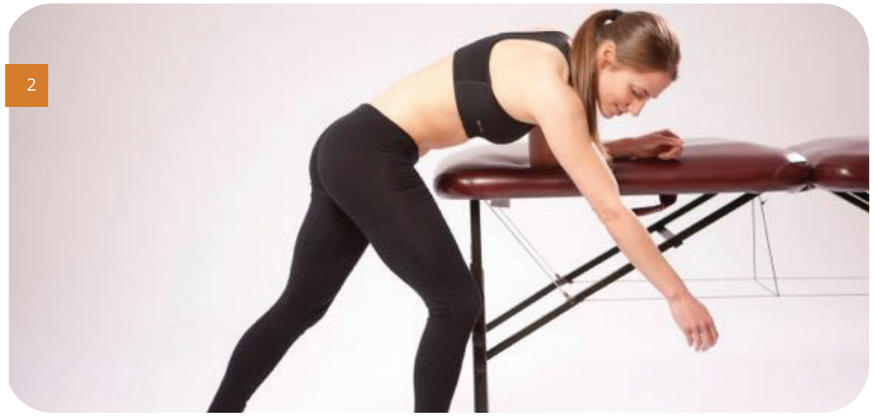
This exercise is designed to unload the upper limb by assisting elevation and then reinforces activation of muscles that inferiorly glide the humeral head during the descent phase. This is a particularly useful exercise for patients with catching pain on the descent phase of elevation.

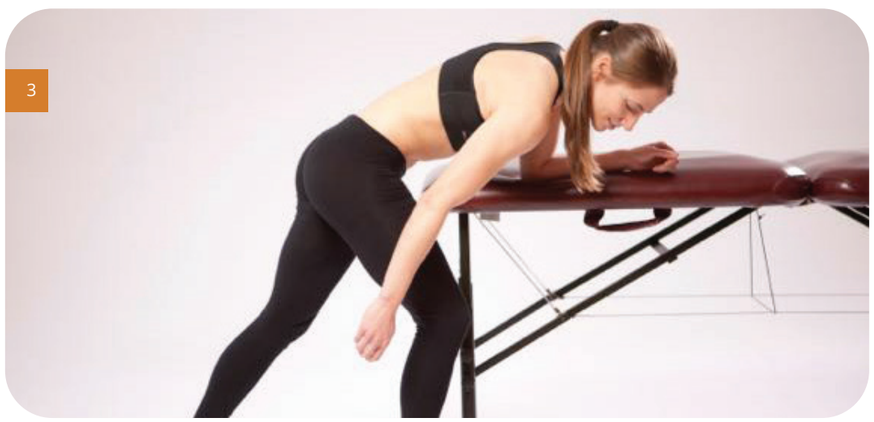
In patients who have had rotator cuff repairs that require a period of protected range of movement, this should be kept to below 90 degrees.

Refs: Wise 2004, Uhl 2010

PENDULAR

EARLY | ROM | S | P | C | KC





Stand with your unaffected hand on a table. Lean well forwards bending at the hips. Let your arm hang down. Gently let your arm swing forwards and backwards and then in a circular motion with minimal effort.

REPEAT (TIMES)

Tip:

Keep the arc / circle small

CLINICIAN NOTES:

Key issues to consider in post-op patients where repair must be protected:

If patients cannot relax fully activation levels of the cuff exceed "safe" levels.

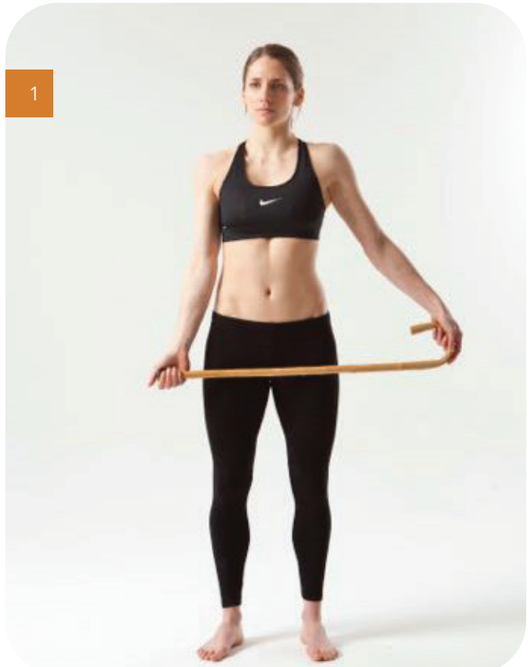
Keep the arc of swing relatively small - arcs greater than 50cm increase the activation levels of the cuff beyond "safe" levels.

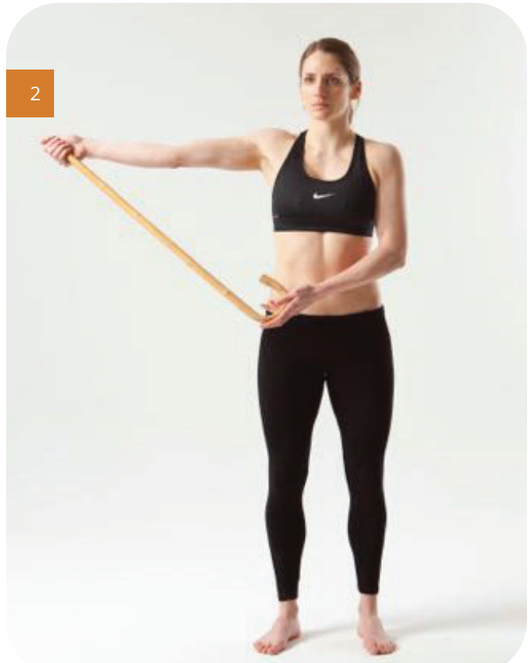
Addition of a small weight e.g. 1-2 kg can increase distraction without increasing muscle activation as long as remains pain-free and small arc.

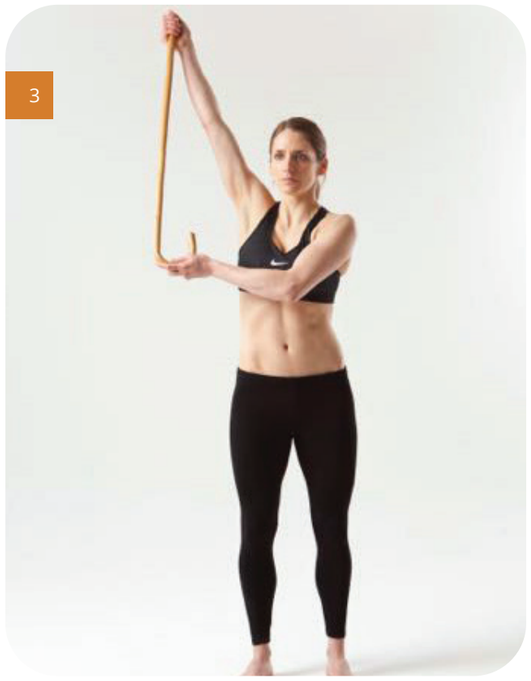
Refs: Dockery et al 1998, Ellsworth et al 2006, Long et al 2010, McCann et al 1993, Murphy et 2013

ABDUCTION WITH STICK IN STANDING

EARLY | ROM | S | P | C | KC







Standing in good posture, hold the stick with both hands shoulder width apart with your hands near your hips. With your unaffected hand push the stick moving the affected arm away from the body out to the side. Return to starting position. Do not force into a stretch.

Adaptation - Easier: Bend your elbow of your affected arm

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

Exercises where the limb load is supported with the use of an external aid such as a stick can be very effective to facilitate range of movement and selective rotator cuff activation without pain or compensatory movement strategies.

ABDUCTION WITH STICK IN LYING

EARLY | ROM | S | P | C | KC

1

2

Lying on your back, knees bent and feet on the floor. Head supported if needed. Hold the stick shoulder width apart, elbows bent to 90°. With unaffected hand push the stick moving the affected arm away from the body in a diagonal movement up and out to the side. Return to starting position. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

Exercises where the limb load is supported with the use of an external aid such as a stick can be very effective to facilitate range of movement and selective rotator cuff activation without pain or compensatory movement strategies.

Refs: Dockery et al 1998, Uhl, et al 2010, Jung et al 2015, Walton & Russell 2015

EXTERNAL ROTATION WITH STICK IN LYING, ARM SUPPORTED

EARLY | ROM | S | P | C | KC

Lying on your back, with neck and affected arm supported. Hold the stick, shoulder width apart with your elbows bent to 90°. Keeping elbows in, use unaffected hand to gently push the stick towards the affected side. Do not force into a stretch. Return to the start position.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

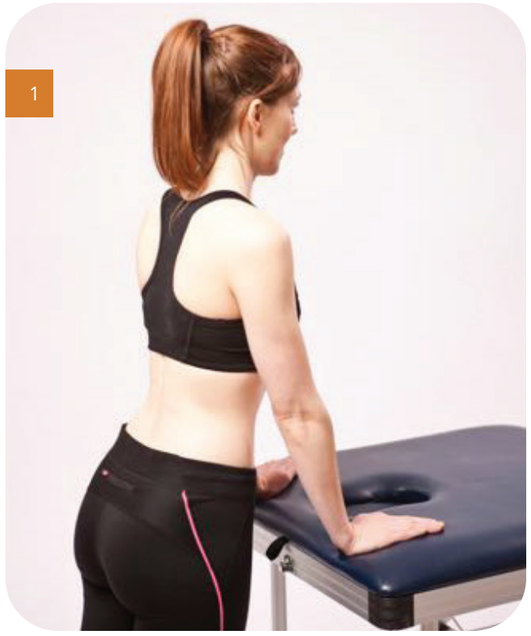
This will specifically target the anterior-superior part of the shoulder capsule.

As the cuff insertion is inter-digitated with the deep layers of the capsule gentle hold - relax techniques addressed to subscapularis will enhance the effectiveness of this exercise.

Refs: Dockery et al 1998, Uhl, et al 2010, Jung et al 2015, Walton & Russell 2015

WEIGHTBEARING CO-CONTRACTION

EARLY | ROM | S | P | C | KC



In standing place your hands on a table and put some weight equally through your hands. As you weight bear through your hands, open up across your chest. This will encourage a better scapula position.

REPEAT (TIMES)

CLINICIAN NOTES:

To ensure the optimal benefit of this exercise ensure that the scapula remains congruent. Varying the hand position (shoulder rotation) will emphasise different components of the rotator cuff and enhance the proprioceptive value of the exercise.

To ensure activation levels of rotator cuff remain within safe levels gently weight shift between hands.

Refs: Lephart & Fu 2000, Kibler & Livingston 2001, Uhl et al 2003

WEIGHT BEARING IN KNEELING

EARLY | ROM | S | P | C | KC

1

2

Kneeling, sitting on your heels, place your hands on the floor either side of your body with your palms facing down. Slowly transfer your weight forwards onto your hands keeping your elbows straight.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

To ensure the optimal benefit of this exercise ensure that the scapula remains congruent. Varying the hand position (shoulder rotation) will emphasise different components of the rotator cuff and enhance the proprioceptive value of the exercise.

To ensure activation levels of rotator cuff remain within safe levels gently weight shift between hands.

Refs: Lephart & Fu 2000, Kibler & Livingston 2001, Uhl et al 2003

FORWARD FLEXION IN LYING WITH STICK

EARLY | ROM | S | P | C | KC

1

2

Lying on your back with your neck supported if needed. Hold the stick with both hands, shoulder width apart. Start with the stick resting on your hips. Lift the stick with straight arms. Return to start position. Do not force into a stretch.

SAFE ZONE	REPEAT (TIMES)

Adaptation - Easier:
Keep your elbows flexed throughout the movement.

CLINICIAN NOTES:

It is important to ensure that patients only use a light grip when holding the bar. A strong rigid grip (greater than 50% maximum voluntary contraction) will potentially increase activation levels of the cuff above the 'safe' zone in the early postoperative phase.

Refs: Dockery et al 1998, Murphy et al 2013, Uhl et al 2010, Alizadehkhaiyat et al 2011

ACTIVE FLEXION IN LYING SHORT LEVER

EARLY | ROM | S | P | C | KC

Lying on your back with your arm supported and your elbow bent to 90°. Lift your arm up keeping your elbow bent
Return to your start position

SAFE ZONE	REPEAT (TIMES)

Tip:
If you have pain on the way back down, gently press your elbow into your opposite hand.

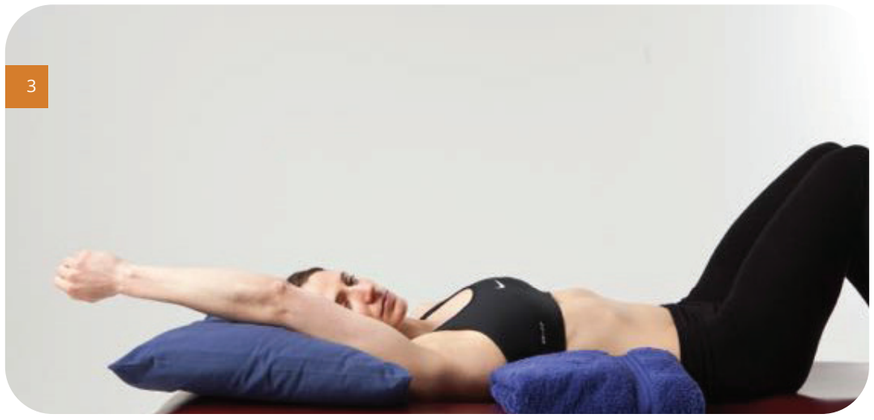
Progression:
As this gets easier increase the upper body position with a pillows so it becomes more difficult as you gently introduce the effects of gravity on the arm movement.

CLINICIAN NOTES:

Patients with shoulder pain often adapt movement patterns where they lead upper limb movement with the elbow. Short lever exercises reinforce selective movement of hand and elbow and reduce load on the shoulder.

ACTIVE FLEXION IN LYING SHORT TO LONG LEVER

EARLY | ROM | S | P | C | KC



Lying on your back with your arm supported and your elbow bent to 90°. Lift your arm up keeping your elbow bent. Then straighten your elbow and take the arm over your head.

SAFE ZONE	REPEAT (TIMES)

Progression:
As this gets easier increase the upper body position with a pillows so it becomes more difficult as you gently introduce the effects of gravity on the arm movement.

CLINICIAN NOTES:

Patients with shoulder pain often adapt movement patterns where they lead upper limb movement with the elbow. Short to long lever exercises reinforce selective movement of hand and elbow and also reduce load on the shoulder.

BALANCE POINT CIRCLES IN LYING

EARLY | ROM | S | P | C | KC

Lying on your back with your arm at 90°, move your arm in small circles first clockwise then anti-clockwise.

CIRCLES (NUMBER)	REPEAT (TIMES)

Progression:
As this gets easier increase the upper body position with a pillows so it becomes more difficult as you gently introduce the effects of gravity on the arm movement.

CLINICIAN NOTES:

Balance point exercises have been found to be useful in the rehabilitation of patients with massive rotator cuff tears. The key is to find the range patients can control without compensatory strategies.

Refs: Kebaetse et al 1999, Levy et al 2008, Ainsworth 2006

LONG LEVER FLEXION ARC IN LYING

EARLY | ROM | S | P | C | KC

Lying on your back with a light weight in your hand take your arm up to 90° and move the arm within an arc.

arc ROM	REPEAT (TIMES)

Adaptation:
Easier to do without weight

Progression:
As this gets easier increase the upper body position with a pillows so it becomes more difficult as you gently introduce the effects of gravity on the arm movement.

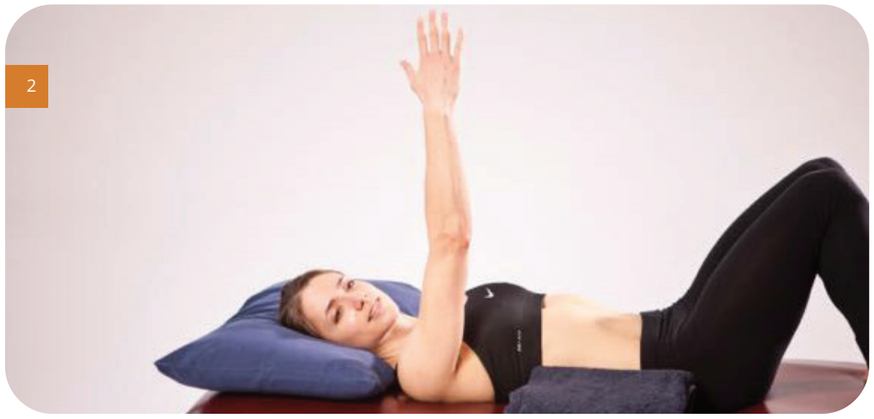
CLINICIAN NOTES:

Balance point exercises have been found to be useful in the rehabilitation of patients with massive rotator cuff tears. The key is to find the range patients can control without compensatory strategies.

Refs: Kebaetse et al 1999, Levy et al 2008, Ainsworth 2006

ACTIVE FLEXION IN LYING LONG LEVER

EARLY | ROM | S | P | C | KC



Lying on your back with your arm supported and your elbow straight. Lift your arm up.

SAFE ZONE	REPEAT (TIMES)

Progression:
As this gets easier increase the upper body position with a pillows so it becomes more difficult as you gently introduce the effects of gravity on the arm movement.

CLINICIAN NOTES:

Active exercises in lying increase the contribution of deltoid and are a useful strategy in patients with massive rotator cuff tears. Encouraging the patient to watch their hand can enhance the effect of the exercise.

Refs: Ainsworth 2006, Levy 2008

SHORT LEVER ABDUCTION IN SIDE LYING

EARLY | ROM | S | P | C | KC

1

2

Lying on your unaffected side and keeping your elbow bent at roughly 90° throughout the exercise, take your arm over your head. Return to your start position.

SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

Patients with shoulder pain often adapt movement patterns where they lead upper limb movement with the elbow. Short lever exercises reinforce selective movement of hand and elbow and reduce load on the shoulder.'

Refs: Ainsworth 2006, Levy 2008, Wise 2004

BALALNCE POINT LONG LEVER ABDUCTION IN SIDE LYING

EARLY | ROM | S | P | C | KC

1

2

Lying on your unaffected side with a light weight in your hand, take your arm up to 90° and move the arm within an arc.

Adaptation:
Easier without a weight

arc ROM	REPEAT (TIMES)

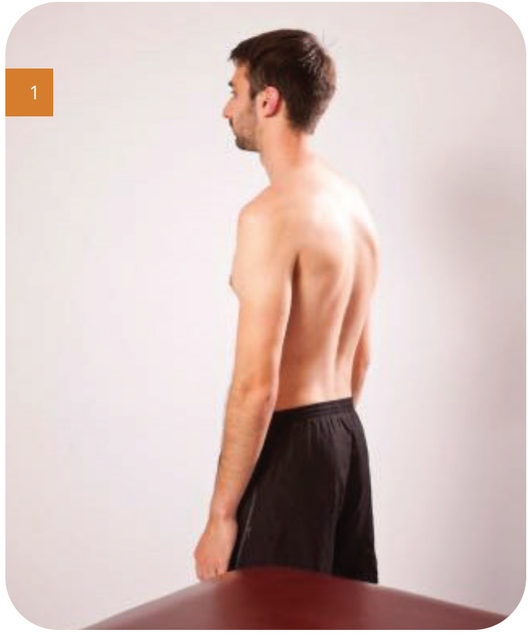
CLINICIAN NOTES:

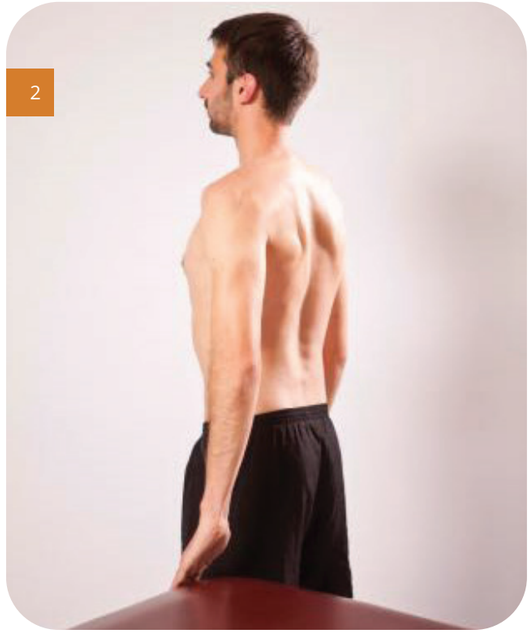
Balance point exercises have been found to be useful in the rehabilitation of patients with massive rotator cuff tears. The key is to find the range patients can control without compensatory strategies.

Refs: Kebaetse et al 1999, Levy et al 2008, Ainsworth 2006

LOW ROW

EARLY | ROM | S | P | C | KC





Stand upright with your arms by your side. Open up across your collar bones whilst pressing backwards with the hand of the affected side against a steady object such as a table. You should feel this working the muscles around the bottom of your shoulder blade.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip:

Use a resistance band loop in both hands across your hips to perform this exercise bilaterally.

CLINICIAN NOTES:

The low row exercise specifically targets serratus anterior, lower fibres of trapezius and subscapularis. Extension of the trunk and scapula retraction whilst pushing into the table enhance recruitment of these muscles. To minimize compensations ask the patient to push both hands back into the table at the same time- this will reduce compensation strategies such as trunk rotation.

Refs: Kibler et al 2008, Uhl et al 2010, McMullen & Uhl 2000

INFERIOR GLIDE

EARLY | ROM | S | P | C | KC

Sitting with good posture in a chair with affected arm resting on a table in a abducted position, hand facing forwards. Gently open up your chest allowing a feeling of lengthening of your collar bones.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip:
Use mirror to help if you are struggling to find the correct movement.

CLINICIAN NOTES:

The inferior glide exercise where the patient performs an isometric contraction pushing the hand into the table has been proposed to result in inferior glide of the humeral head and scapula retraction. It results in early activation of serratus anterior and posterior deltoid.

Refs: DeMey et al 2013, Kibler et al 2008, Uhl et al 2010

PRONE SCAPULAR POSITIONING

EARLY | ROM | S | P | C | KC

1

2

3

Lying on your front with your forehead resting on a rolled towel keeping you neck in neutral. Place your arms by your sides palm down. Open up across your chest drawing your shoulders away from the bed then lift your hands a few centimetres. Finally take the pressure off your forehead ensuring you keep your chin tucked in. Do not lift your chest off the bed.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip: keep elbows soft to prevent latissimus dorsi activation

CLINICIAN NOTES:

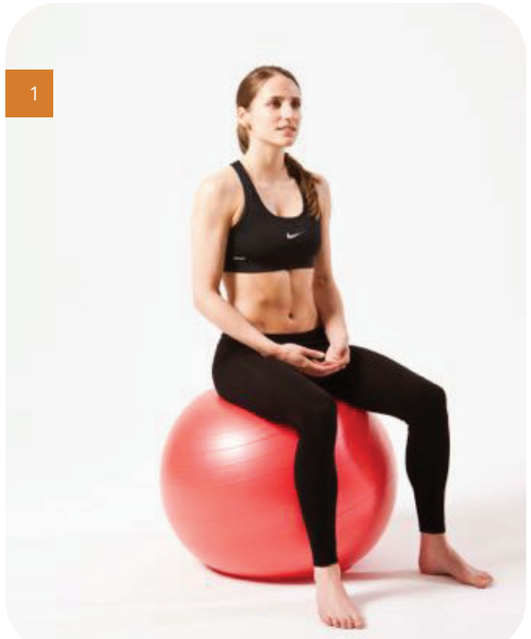
Choice of arm position will increase the activation levels of different parts of the trapezius muscle and target different components of the rotator cuff and deltoid.

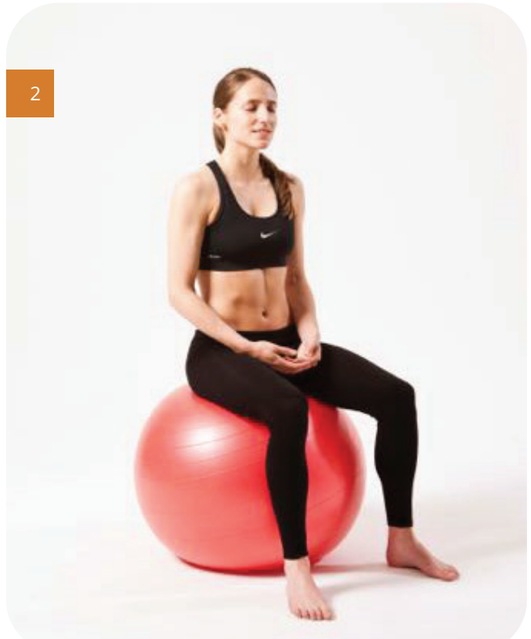
Whilst lifting the arm at the side is commonly thought to target lower trapezius in reality it preferentially recruits middle fibres of trapezius.

Refs: Cools et al 2007, Arlotta et al 2011, Andersen et al 2012

SITTING ON A BALL EYES CLOSED

EARLY | ROM | S | P | C | KC





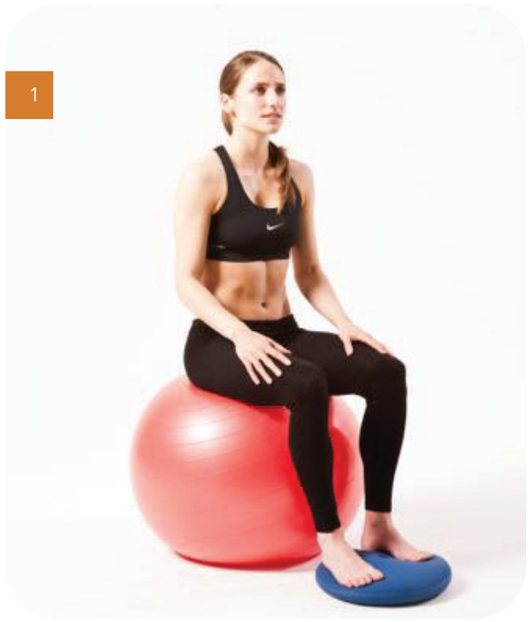
Sit upright on a swiss ball with feet flat on the floor and a space between your calves and the ball. When you feel balanced slowly close your eyes and maintain this controlled position.

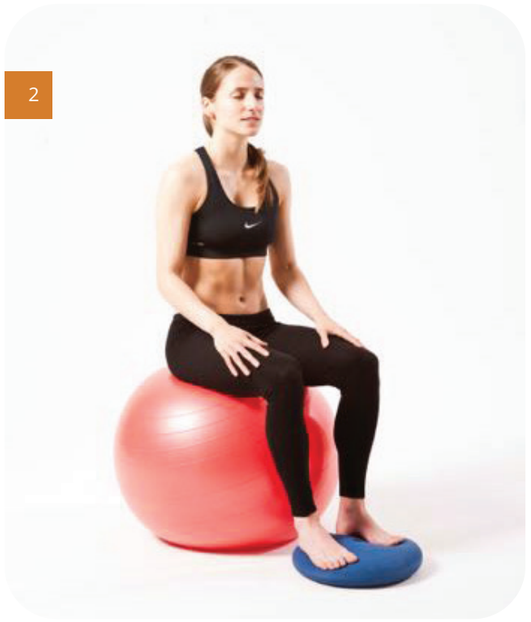
HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation Easier:
To make it easier place the ball in a corner to stabilise it.

Adaptation Harder:
Place a wobble cushion under your feet.

Adaptations:

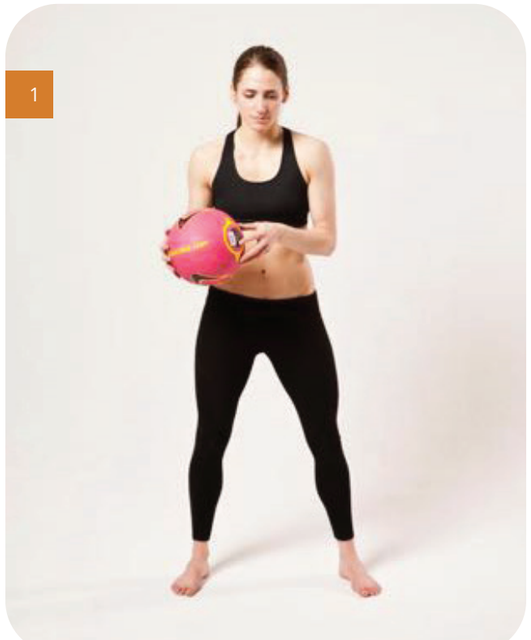


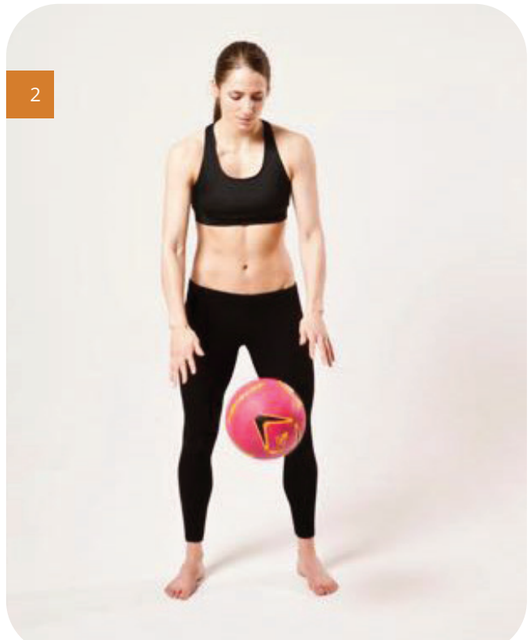


Sensorimotor rehabilitation is an important component of rehabilitation. Reducing stability of the base of support,removing somatosensory input by putting the feet on a wobble cushion and closing the eyes are all ways of challenging different aspects of the senorimotor system
.
Refs: Carriere 1998, Elphinston 2013

BALL BOUNCING

EARLY | ROM | S | P | C | KC

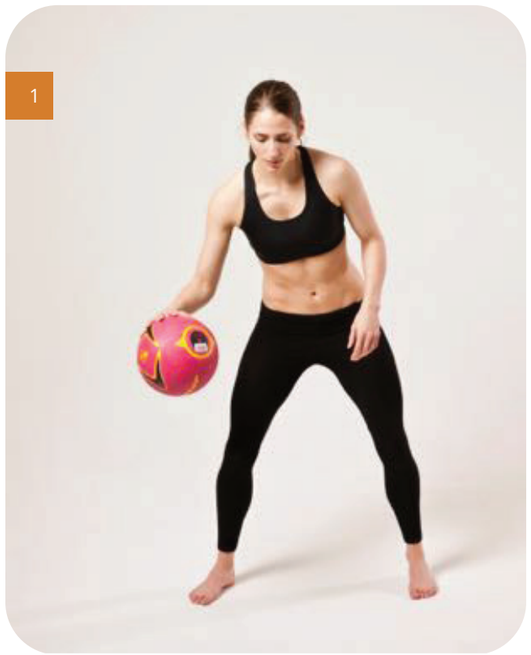


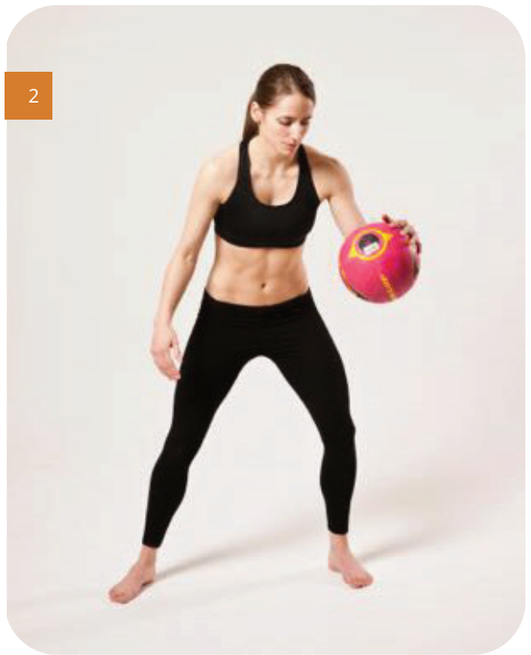


Standing with a wide stance, bounce a ball in front of you with 2 hands.

REPEAT (TIMES)

Adaptations: Ball bouncing hand to hand

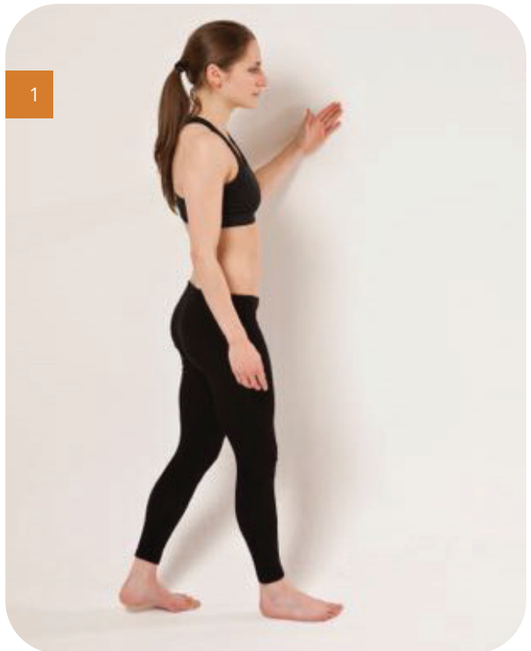


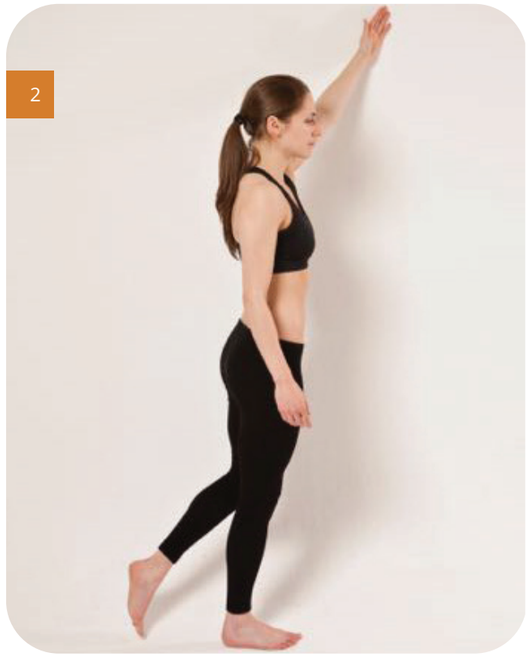


Feedforward reflexes have been shown to be delayed in patients with shoulder pain or instability. This aims to facilitate reaction timing.
Refs: Carriere 1998, Elphinston 2013

LATERAL WALL SLIDE WITH STEP FORWARD

EARLY | ROM | S | P | C | KC





Standing tall, side on to a wall. Affected arm next to the wall. Bend your elbow and apply a gentle pressure against the wall with the back of your hand. Step forward and whilst maintaining this gentle pressure, slide arm upwards against wall into elevation.

SAFE ZONE	REPEAT (TIMES)

Adaptation Easier:
Assist with opposite hand under elbow.

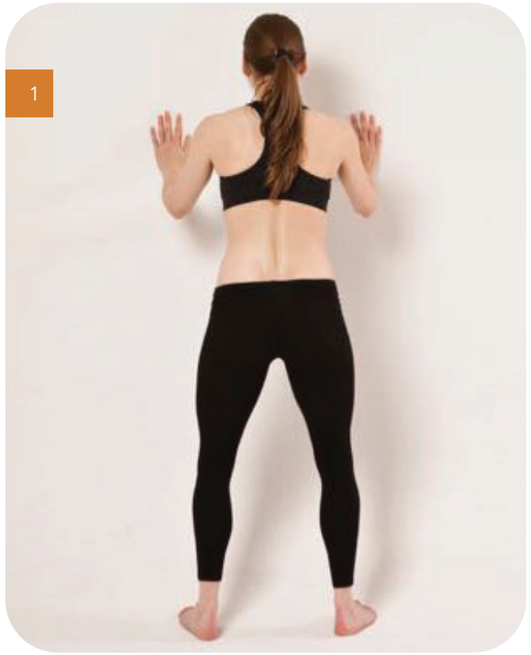
CLINICIAN NOTES:

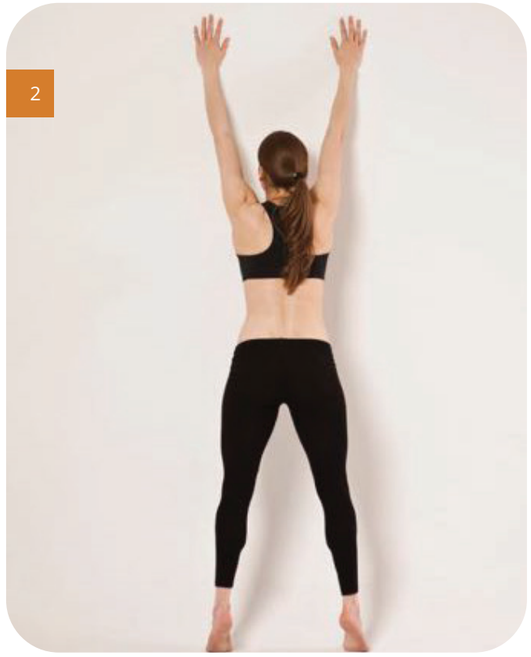
Lower quadrant inclusion in the wall slide exercise emphasises sequential activation patterns throughout the kinetic chain and enhances scapula muscle recruitment. Engaging the hand with the wall aims to reinforce activation of the posterior rotator cuff through elevation.

Refs: Uhl et al 2010, McMullen & Uhl 2000, Siascia 2012, Kaur 2014

SQUAT WALL SLIDES

EARLY | ROM | S | P | C | KC





Stand facing a wall with your feet shoulder width apart and both hands flat on the wall at roughly eye level. Keep your hands in contact with the wall at all times. Squat down as far as comfortable letting your hands slide down the wall. Then extend back up and let your hands slide up the wall, going up onto your toes as able. Return to the starting position. Do not force a stretch.

SAFE ZONE	REPEAT (TIMES)

Adaptation:

Adaptation Easier - Butterfly wall slide:

Place the hands on the wall in a butterfly position. With the thumb of the unaffected hand under the thumb on the affected hand. Use the unaffected arm to assist the affected arm up the wall. Keeping the hands in contact with the wall throughout the movement.

CLINICIAN NOTES:

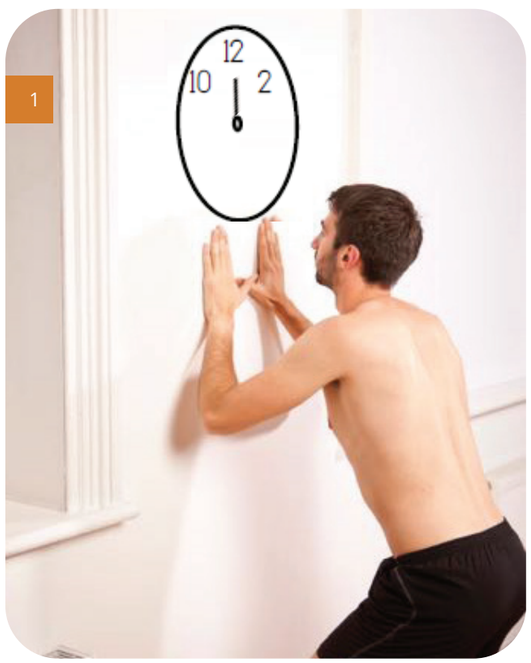
Lower quadrant inclusion in the wall slide exercise emphasises sequential activation patterns throughout the kinetic chain and enhances scapula recruitment.

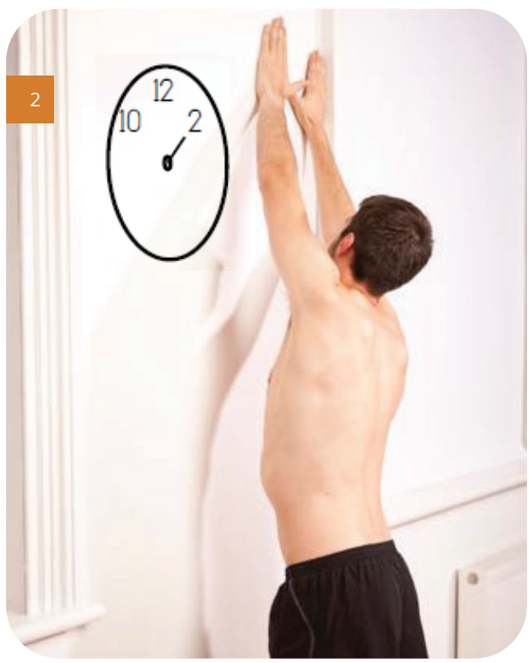
Supporting Limb load on the wall and moving short to long lever keeps activation levels of the rotator cuff within the safe zone.

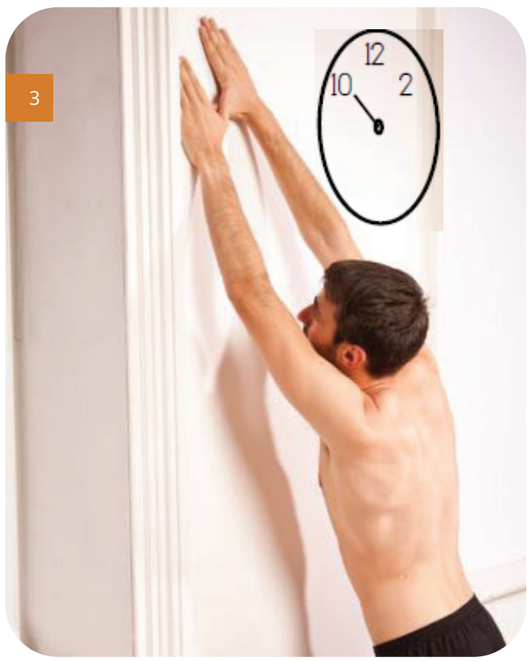
Refs: Hardwick et al 2006, Uhl et al 2010, McMullen & Uhl 2000, Jung et al 2015

BUTTERFLY WALL CLOCK

EARLY | ROM | S | P | C | KC







Start with the knees slightly flexed in a squat position. Facing the wall maintaining good posture. Hands on the wall, thumbs crossed, affected side on top. Slide your hand to 12 o'clock and back to start position and then repeat to 10 and 2. Do not force a stretch.

SAFE ZONE	REPEAT (TIMES)

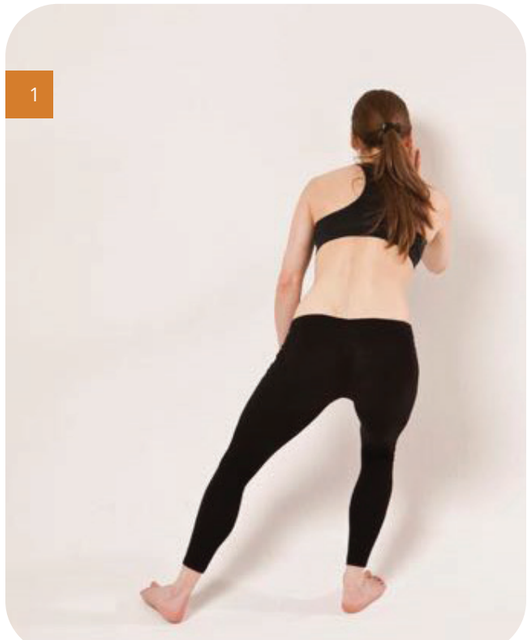
CLINICIAN NOTES:

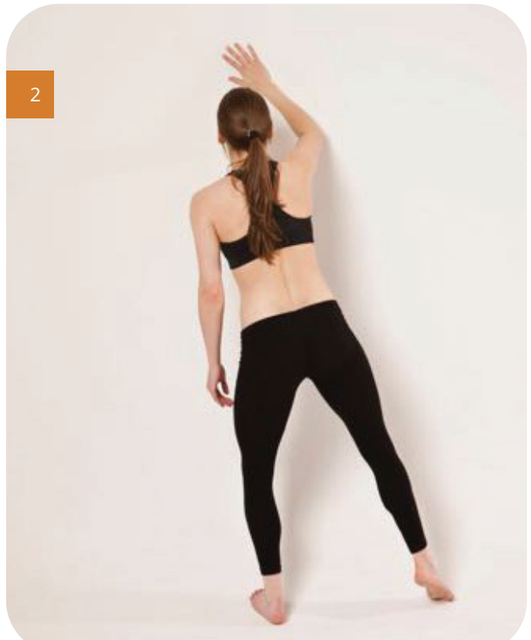
Emphasising the lower quadrant component increases scapula muscle activation levels. Supporting the upper limb and emphasizing short to long lever movement will reduce load on the upper quadrant and keep cuff activation within safe limits.

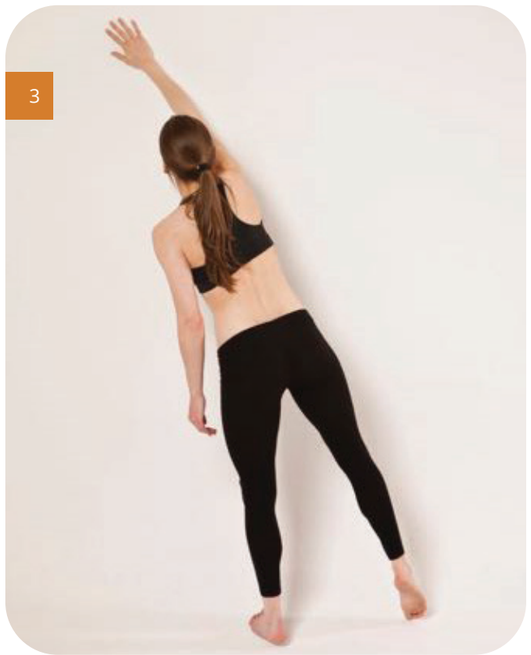
Refs: Hardwick et al 2006, Uhl et al 2010, McMullen & Uhl 2000, Sciascia 2012, Kaur 2014

REACHING WALL SLIDES WITH TRUNK LENGTHENING

EARLY | ROM | S | P | C | KC







Stand with affected hand placed on the wall, transfer your weight on to opposite foot as you slide your hand up and over your opposite side, lengthening your trunk as you do so. Do not force a stretch.

SAFE ZONE	REPEAT (TIMES)

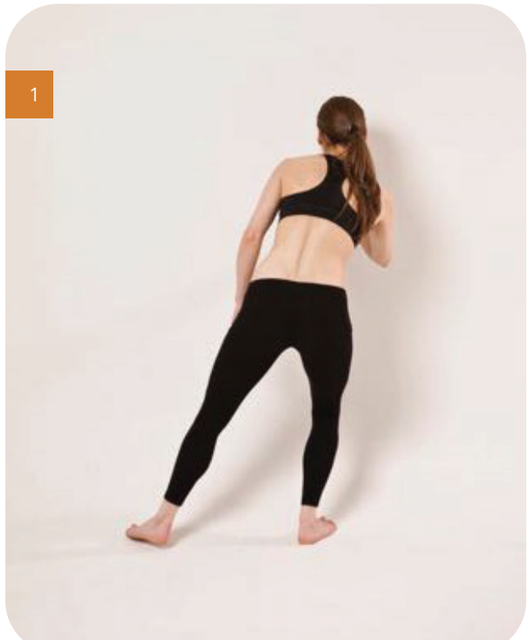
CLINICIAN NOTES:

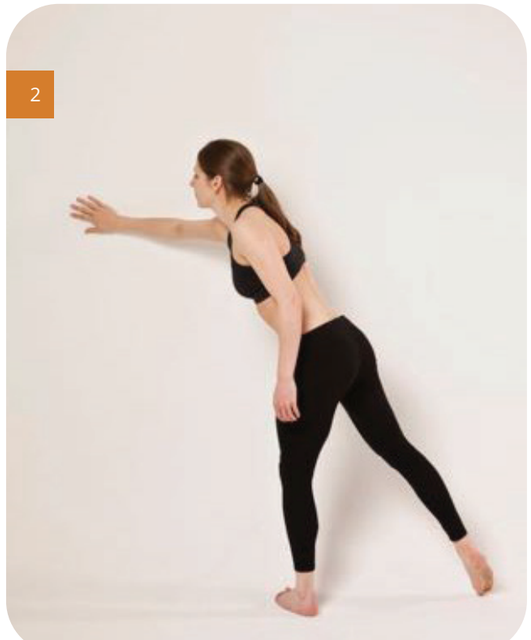
Emphasising the lower quadrant component increases scapula muscle activation levels. Supporting the upper limb and emphasizing short to long lever movement will reduce load on the upper quadrant and will keep activation levels of the rotator cuff within the safe limits.

Refs: Uhl et al 2010, McMullen & Uhl 2000

ACROSS WALL SLIDE

EARLY | ROM | S | P | C | KC





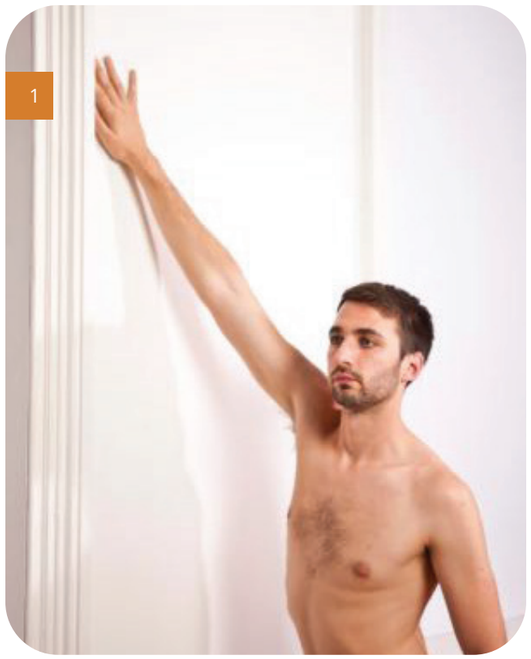
Standing feet hip width apart, facing the wall. Place the hand of the affected side at shoulder height with elbow bent on to the wall. Start with bent knees and then straighten your knees as you slide your hand on wall across the body as far as you can reach, (fingers facing the direction you are going, rotating your ribcage). Return to starting position. Do not force a stretch.

REPEAT (TIMES)

Adaptation:

Take your arm upwards as you rotate your ribcage.

Adaptation:



CLINICIAN NOTES:

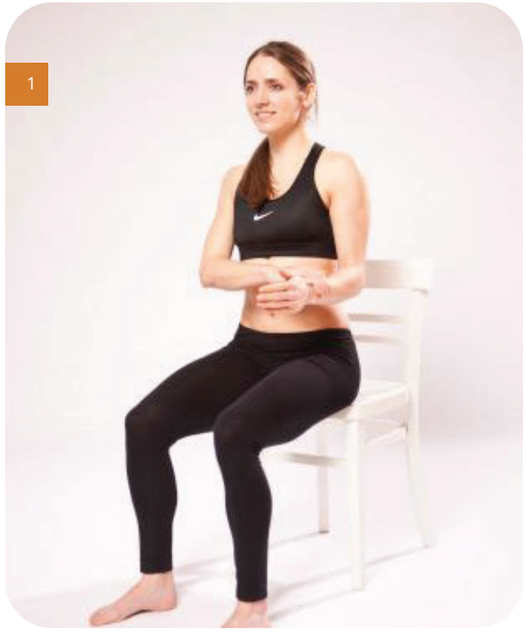
The thorax has a significant influence on upper limb function. The addition of trunk rotation to upper limb exercises enhances scapula mechanics and recruitment ratios.

Lower quadrant inclusion in the wall slide exercise emphasises sequential activation patterns throughout the kinetic chain and enhances scapula recruitment.

Refs: Yamauchi et al 2015, Hardwick et al 2006, Uhl et al 2010, McMullen & Uhl 2000

ISOMETRIC EXTERNAL ROTATION

EARLY | INTERMEDIATE | ROM | S | P | C | KC



In sitting or standing bend your elbow to 90° whilst maintaining your arm at the side of your body. Place the unaffected hand on the outside of the forearm at wrist level and gently push out. This position can then be altered moving your arm further outwards whist maintaining your elbow into your side.

Note 1. You can put a towel between the inside of your arm and your body to help you keep this position.

Note 2. To keep this as an early exercise gently push to only 30 % of your maximum resistance.

HOLD FOR (SECONDS)	REPEAT (TIMES)

CLINICIAN NOTES:

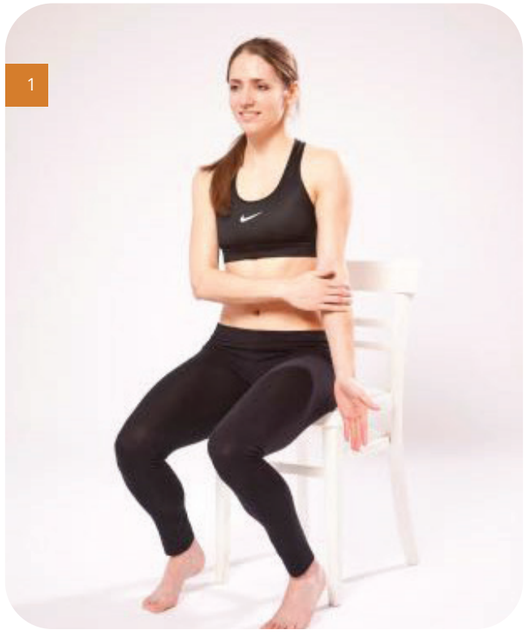
Low intensity (less than 30% MVC) long duration (15 sec-90 sec) contractions have been shown to have an analgesic effect and can be very useful in patients with significant pain.

Isometric exercises performed on the contra-lateral /unaffected limb will increase shoulder muscle activation in the affected limb (this is very useful in patients with severe pain or who have to have a period of immobilisation) and improve cortical activation. *

Refs: Naugle et al 2012, 2014 Vaegter et al 2014, Misra et al 2014, Hendy et al 2012, Roe et al 2000, Carroll et al 2006, Farthing et al 2011, Parle et al 2016

ISOMETRIC ABDUCTION

EARLY | INTERMEDIATE | ROM | S | P | C | KC



In sitting, affected arm straight by your side. Place the unaffected hand on the outside of the affected forearm and gently push against it.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Note 1: You can put a towel between the inside of your arm and your body to help you keep this position.

Note 2: To keep this as an early exercise gently push to 30% of your maximum resistance.

CLINICIAN NOTES:

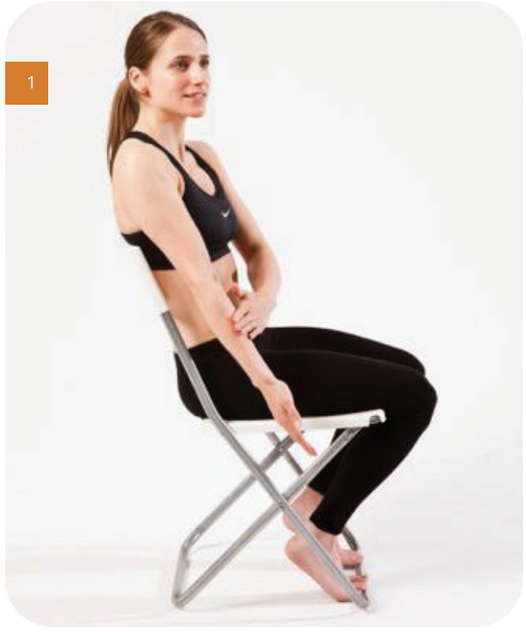
Low intensity (less than 30% MVC) long duration (15 sec-90 sec) contractions have been shown to have an analgesic effect and can be very useful in patients with significant pain.

Isometric exercises performed on the contra-lateral /unaffected limb will increase shoulder muscle activation in the affected limb (this is very useful in patients with severe pain or who have to have a period of immobilisation) and improve cortical activation. *

Refs: Naugle et al 2012, 2014 Vaegter et al 2014, Misra et al 2014,Hendy et al 2012, Roe et al 2000, Carroll et al 2006, Farthing et al 2011

ISOMETRIC FLEXION

EARLY | INTERMEDIATE | ROM | S | P | C | KC



In sitting, affected arm straight by your side. Place the unaffected hand on the front of the affected forearm and gently push against it.

Note 1: You can put a towel between the inside of your arm and your body to help you keep this position.

Note 2: To keep this as an early exercise gently push to 30% of your maximum resistance.

HOLD FOR (SECONDS)	REPEAT (TIMES)

CLINICIAN NOTES:

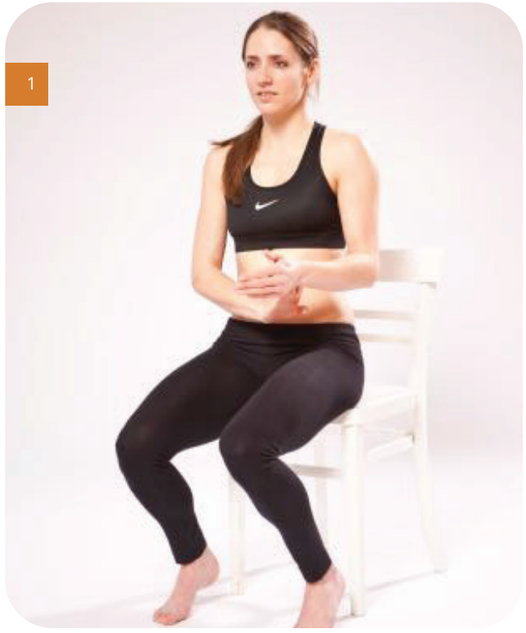
Low intensity (less than 30% MVC) long duration (15 sec-90 sec) contractions have been shown to have an analgesic effect and can be very useful in patients with significant pain.

Isometric exercises performed on the contra-lateral /unaffected limb will increase shoulder muscle activation in the affected limb (this is very useful in patients with severe pain or who have to have a period of immobilisation) and improve cortical activation. *

Refs: Naugle et al 2012, 2014 Vaegter et al 2014, Misra et al 2014, Hendy et al 2012, Roe et al 2000,Carroll et al 2006, Farthing et al 2011

ISOMETRIC INTERNAL ROTATION

EARLY | INTERMEDIATE | ROM | S | P | C | KC



In sitting, affected arm at the side of your body, elbow bent to 90°. Place the unaffected hand on the inside of the affected forearm and gently push against it.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Note 1: You can put a towel between the inside of your arm and your body to help you keep this position.

Note 2: To keep this as an early exercise gently push to 30% of your maximum resistance.

CLINICIAN NOTES:

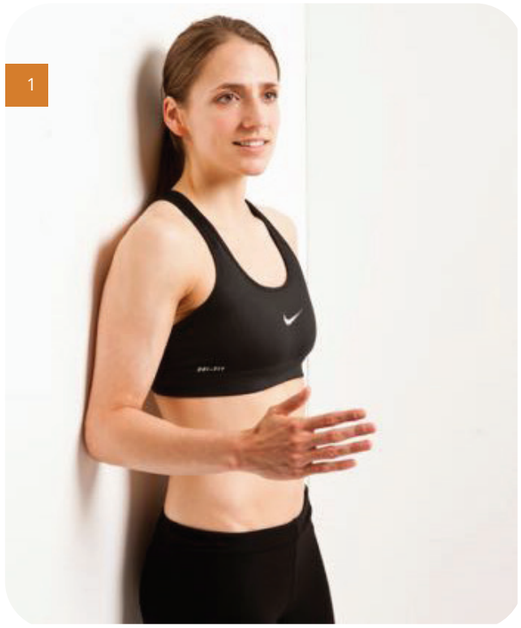
Low intensity (less than 30% MVC) long duration (15 sec-90 sec) contractions have been shown to have an analgesic effect and can be very useful in patients with significant pain.

Isometric exercises performed on the contra-lateral /unaffected limb will increase shoulder muscle activation in the affected limb (this is very useful in patients with severe pain or who have to have a period of immobilisation) and improve cortical activation. *

Refs: Naugle et al 2012, 2014 Vaegter et al 2014, Misra et al 2014, Hendy et al 2012, Roe et al 2000, Carroll et al 2006, Farthing et al 2011

ISOMETRIC EXTENSION

EARLY | INTERMEDIATE | ROM | S | P | C | KC



Stand against a wall, with good posture. Affected arm by side and elbow bent to 90°. Push elbow gently against wall.

Note: To keep this as an early exercise gently push to less than 30% of your maximum resistance.

HOLD FOR (SECONDS)	REPEAT (TIMES)

CLINICIAN NOTES:

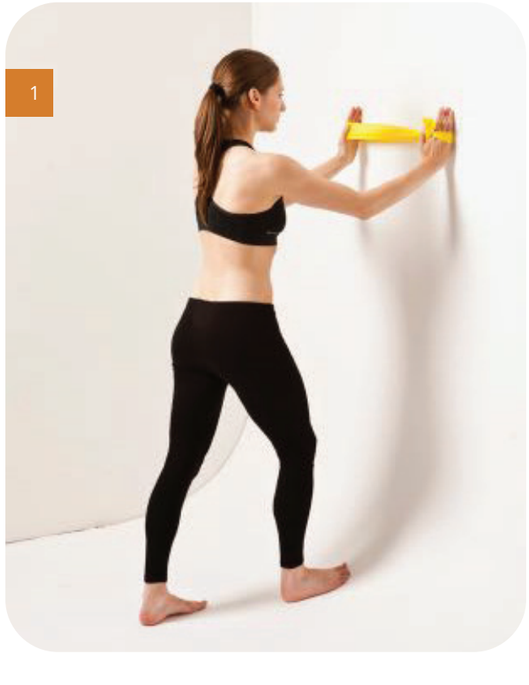
Low intensity (less than 30% MVC) long duration (15 sec-90 sec) contractions have been shown to have an analgesic effect and can be very useful in patients with significant pain.

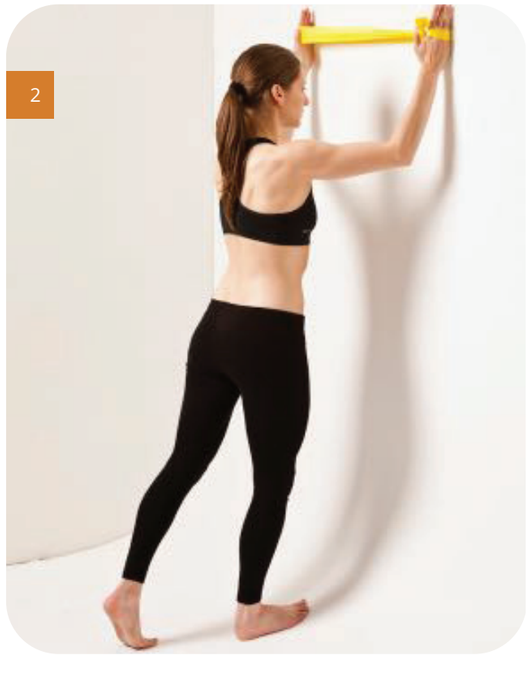
Isometric exercises performed on the contra-lateral /unaffected limb will increase shoulder muscle activation in the affected limb (this is very useful in patients with severe pain or who have to have a period of immobilisation) and improve cortical activation. *

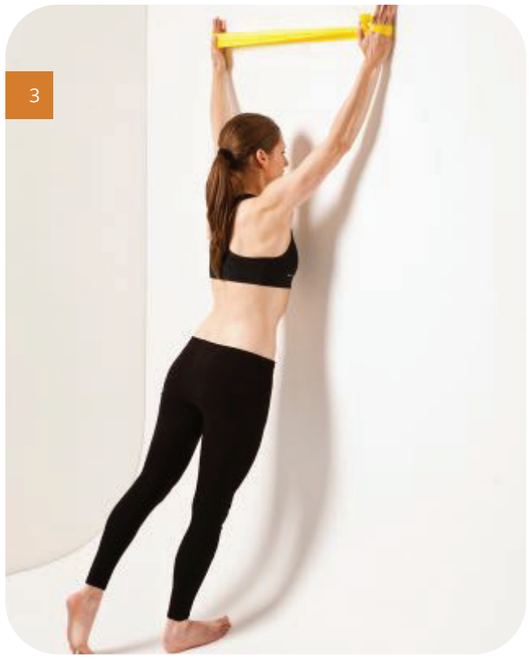
Refs: Naugle et al 2012, 2014 Vaegter et al 2014, Misra et al 2014, Hendy et al 2012, Roe et al 2000, Carroll et al 2006, Farthing et al 2011

WALL SLIDES (WITH OR WITHOUT RESISTANCE BAND LOOP)

INTERMEDIATE | ROM | S | P | C | KC







Adaptation Easier:

Standing with good posture facing the wall. Loop a resistance band around your hands/ wrists with your little fingers placed on the wall. Slide your hands up the wall, keeping in contact with the wall throughout the movement. Continue as high as comfortable gently pushing the resistance band out to the side. Return to your start position. Do not force a stretch.

SAFE ZONE	REPEAT (TIMES)

Adaptation Easier - Place the hands on the wall with the elbows flexed. Keeping the hands in contact with the wall, continue as high as comfortable.

CLINICIAN NOTES:

Lower quadrant inclusion in the wall slide exercise encouraging weight transfer with a step, emphasises sequential activation patterns throughout the kinetic chain and enhances scapula recruitment.

Supporting limb load on the wall and moving short to long lever keeps activation levels of the rotator cuff within the safe zone.

The addition of resistance band reinforces activation of the posterior rotator cuff through elevation range. however it is important to push out into the band rather than pull out. Pulling out will increase activation pectoralis major and biceps , whereas pushing out biases the posterior rotator cuff.

Refs: Hardwick et al 2006, Uhl et al 2010, Park et al 2013, Jung et al 2015, Wattanaprakornkul et al 2011

PRONE SCAPULAR POSITIONING 'W'

INTERMEDIATE | ROM | S | P | C | KC

1

2

3

Lying on your front with your forehead resting on a rolled towel keeping your neck in neutral. Place your arms with your hands at ear level in a “W” position resting on the bed. Open up across your chest drawing your shoulders away from the bed then lift your hands a few centimetres and finally take the pressure off your forehead ensuring you keep your chin tucked in. Do not lift your chest off the bed.

HOLD FOR (SECONDS)	REPEAT (TIMES)

CLINICIAN NOTES:

Choice of arm position will increase the activation levels of different parts of the trapezius muscle and target different components of the rotator cuff and deltoid.

In this position there is increased activation in middle and lower fibres of trapezius, the posterior cuff and serratus anterior.

Refs: Alizadehkhaiyat et al 2015, Andersen et al 2012, Arlotta et al 2011, Cools et al 2007, Reinold et al 2009

EXTERNAL ROTATION TO INTERNAL ROTATION IN SUPINE LYING FULLY SUPPORTED

INTERMEDIATE | ROM | S | P | C | KC

Lie on your back with your arm supported fully to the elbow in 90° shoulder abduction and your elbow bent to 90°. Maintain your shoulder blade back against bed and keep it controlled. Slowly rotate your arm backwards to your full available pain free range and slowly return. Then repeat the opposite way into internal rotation, ensuring the shoulder blade does not compensate and move too.

REPEAT (TIMES)

Progression:

Conduct this exercise with support only halfway along your arm.

CLINICIAN NOTES:

Supporting the arm enables selective activation of the rotator cuff muscles through range.

These exercises aim to work the specific rotator cuff deficit i.e. concentric or eccentric control and should be used according to the patient's key deficit.

e.g. Active external rotation in this position will activate infraspinatus concentrically and subscapularis eccentrically.

Ref: Tardo et al 2013, Boettcher et al 2009

EXTERNAL ROTATION TO INTERNAL ROTATION IN SUPINE LYING WITH SUPPORT PLUS WEIGHT

INTERMEDIATE | ROM | S | P | C | KC

Progression:

Lie on your back with your arm supported fully to the elbow in 90° shoulder abduction and your elbow bent to 90°. Hold a small weight in your hand. Maintain your shoulder blade back against the bed and keep it controlled. Slowly externally rotate your arm backwards to your full available pain free range and slowly return. Then repeat the opposite way into internal rotation, ensuring the shoulder blade does not compensate and move too.

REPEAT (TIMES)

Progression:

A. Conduct this exercise with support only halfway along your arm.

B. Conduct this exercise unsupported

CLINICIAN NOTES:

The addition of weight increases the mobiliser role of the rotator cuff and supporting the arm emphasises selective activation of the rotator cuff.

These exercises aim to work the specific rotator cuff deficit i.e. concentric or eccentric control and should be used according to the patient's key deficit. e.g. Active external rotation in this position will activate infraspinatus concentrically and subscapularis eccentrically.

Ref: Tardo et al 2013, Boettcher et al 2009

EXTERNAL ROTATION TO INTERNAL ROTATION IN SUPINE LYING UNSUPPORTED

INTERMEDIATE | ROM | S | P | C | KC

Lie on your back with your arm at 90° abduction with no support and elbow bent at 90°. Maintain your shoulder blade back against the bed and keep it controlled. Slowly externally rotate your arm backwards to your full available pain free range and slowly return. Then repeat the opposite way into internal rotation, ensuring the shoulder blade does not compensate and move too.

REPEAT (TIMES)

Tip:

Watch the hand to help feedback

Progression:

Speed up while maintaining range of movement

CLINICIAN NOTES:

Performing arm rotation with the arm unsupported emphasises the mobilising role of the rotator cuff and the stability role of the scapula muscles, deltoid and latissimus dorsi.

These exercises aim to work the specific rotator cuff deficit i.e. concentric or eccentric control and should be used according to the patient's key deficit. e.g. Active external rotation in this position will activate infraspinatus concentrically and subscapularis eccentrically.

Ref: Tardo et al 2013, Boettcher et al 2009, Escamilla et al 2010, Ha et al 2013, Reinold et al 2009, Dark et al 2007

EXTERNAL ROTATION TO INTERNAL ROTATION IN PRONE LYING WITH SUPPORT

INTERMEDIATE | ROM | S | P | C | KC

Lie on your front with your arm supported fully to the elbow, in 90° shoulder abduction. Bend your elbow to 90° and maintain your shoulder blade control. Slowly externally rotate your arm backwards to your full available pain free range and slowly return. Then repeat the opposite way into internal rotation, ensuring the shoulder blade does not compensate and move too.

REPEAT (TIMES)

Progression:

Conduct this exercise with support only halfway along your arm.

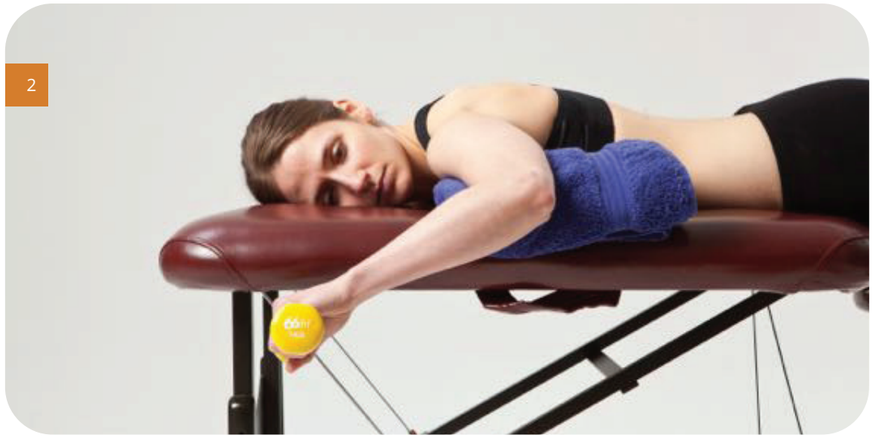
CLINICIAN NOTES:

Supporting the upper arm enables selective activation of the rotator cuff muscles through range.
These exercises aim to work the specific rotator cuff deficit i.e. concentric or eccentric control and should be used according to the patient's key deficit.

Ref: Tardo et al 2013, Boettcher et al 2009,Escamilla et al 2010, Ha et al 2013, Reinold et al 2009, Dark et al 2007

EXTERNAL ROTATION TO INTERNAL ROTATION IN PRONE LYING WITH SUPPORT PLUS WEIGHT

INTERMEDIATE | ROM | S | P | C | KC



Lie on your front with your arm supported fully to the elbow, at 90° abduction. Bend your elbow to 90°. Hold a small weight in your hand. Maintain your shoulder blade control. Slowly externally rotate your arm backwards to your full available pain free range and slowly return. Then repeat the opposite way into internal rotation, ensuring the shoulder blade does not compensate and move too.

REPEAT (TIMES)

Progression:

Conduct this exercise with support only halfway along your arm.

CLINICIAN NOTES:

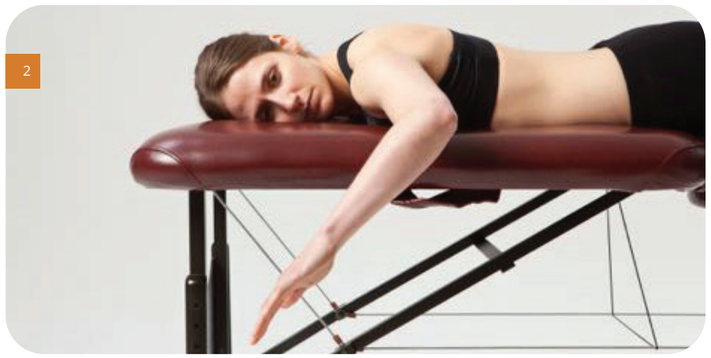
The addition of weight increases the mobiliser role of the rotator cuff and supporting the arm emphasises selective activation of the rotator cuff.

These exercises aim to work the specific rotator cuff deficit i.e. concentric or eccentric control and should be used according to the patient's key deficit.

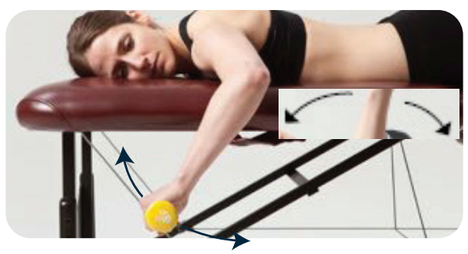
Refs: Tardo et al 2013, Boettcher et al 2009,Escamilla et al 2010, Ha et al 2013, Reinold et al 2009, Dark et al 2007

EXTERNAL ROTATION TO INTERNAL ROTATION PRONE LYING WITHOUT SUPPORT

INTERMEDIATE | ROM | S | P | C | KC



Progression:



Lie on your front with your arm at 90° abduction unsupported and your elbow bent to 90°. Maintain your shoulder blade control. Slowly externally rotate your arm backwards to your full available pain free range and slowly return. Then repeat the opposite way into internal rotation, ensuring the shoulder blade does not compensate and move too.

REPEAT (TIMES)

Progression:

Conduct this exercise with a small weight

CLINICIAN NOTES:

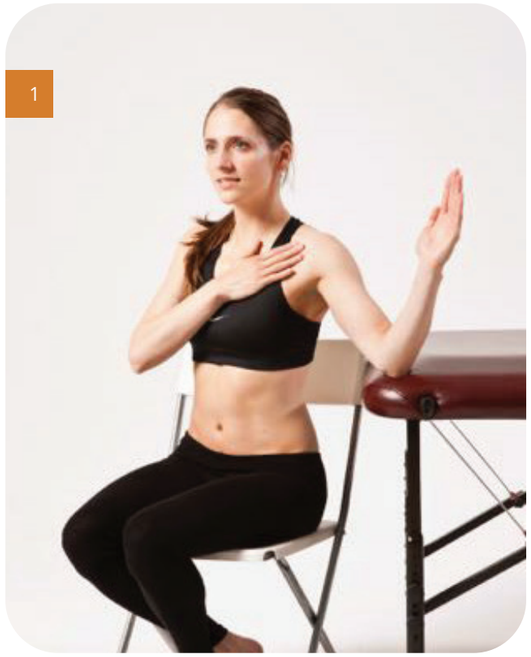
Performing arm rotation with the arm unsupported emphasises the mobilising role of the rotator cuff and the stability role of the scapula muscles and deltoid. The choice of prone or supine positions should be made according to the specific cuff deficit and whether it is an eccentric or concentric problem.

The prone position has been shown to activate lower trapezius, posterior deltoid, supraspinatus and the posterior cuff at levels commensurate with strengthening.

Ref: Alizadehkhaiyat et al 2015, Reinold et al 2009, Tardo et al 2013

EXTERNAL ROTATION TO INTERNAL ROTATION IN SITTING WITH SUPPORT

INTERMEDIATE | ROM | S | P | C | KC



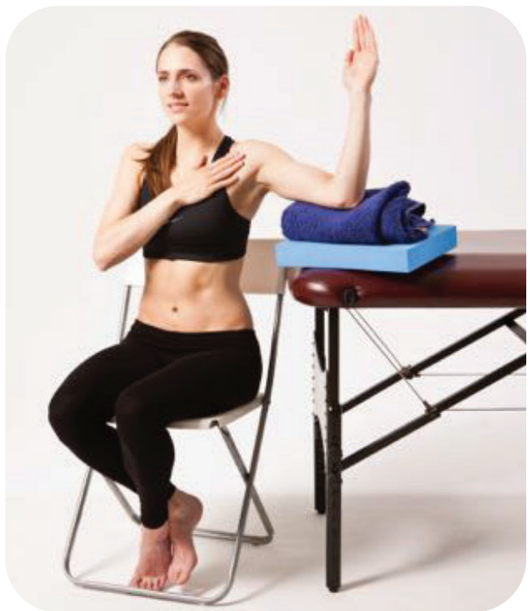
Sitting tall with your elbow supported on a table, maintain your shoulder blade control, slowly rotate your arm into external rotation. Then practice rotating into internal rotation. Looking at your hand through the movement may help with control.

REPEAT (TIMES)

Progression:

Take arm into 90° of abduction

Progression:



CLINICIAN NOTES:

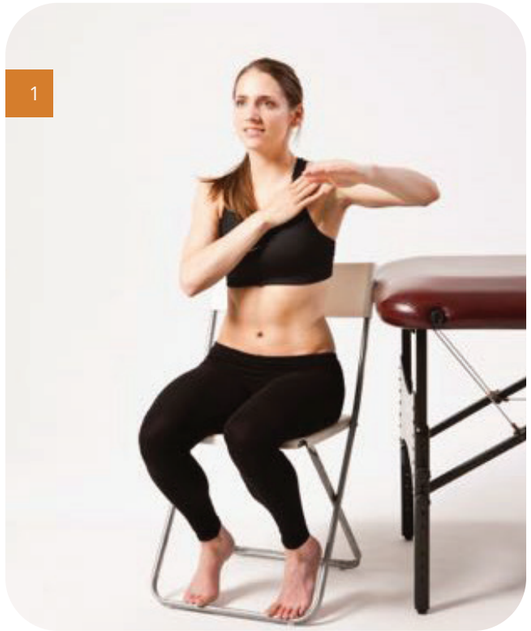
Some patients may struggle with prone or supine rotation exercises due to weakness or poor recruitment of the cuff. In addition, lying is also the least proprioceptive position. Performing the exercises in sitting increases proprioception of the trunk and upper limb and can help patients improve control.

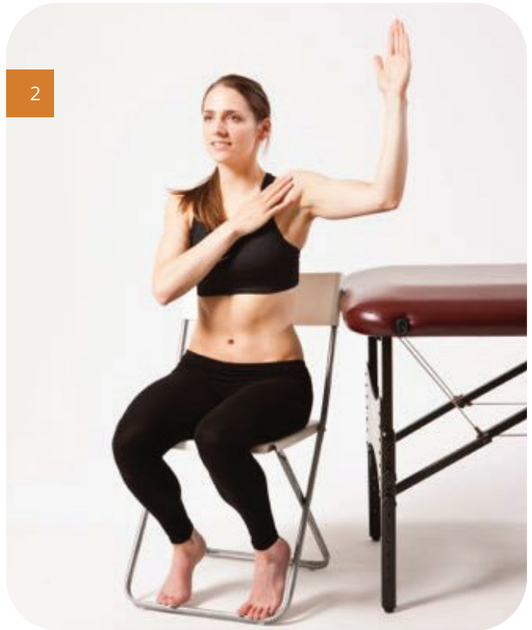
Supporting the upper limb facilitates selective recruitment of the rotator cuff.

Refs: Janwantanaku et al 2003, Boettcher et al 2009, Dark et al 2007

EXTERNAL ROTATION / INTERNAL ROTATION IN SITTING UNSUPPORTED

INTERMEDIATE | ROM | S | P | C | KC



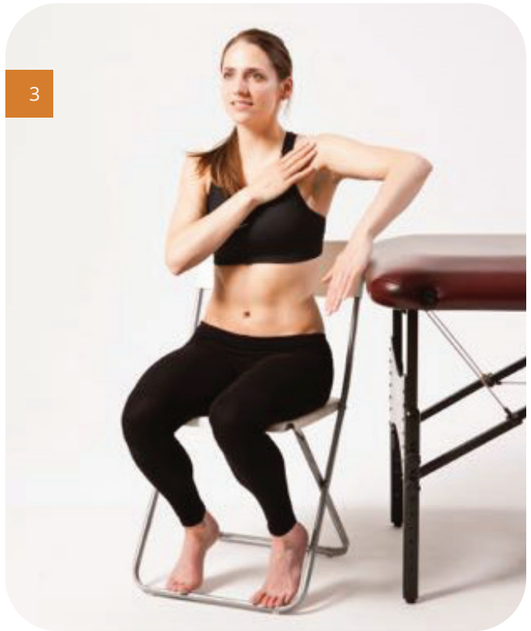


Sitting tall with shoulder and elbow at 90° unsupported. Shoulder blade stabilised throughout the movement. Slowly externally rotate the arm backwards as far as you comfortably can and slowly return. Repeat the opposite way forwards into internal rotation ensuring the shoulder blade does not compensate or move.

REPEAT (TIMES)

Progression:

Add a small weight to the movement



Progression:

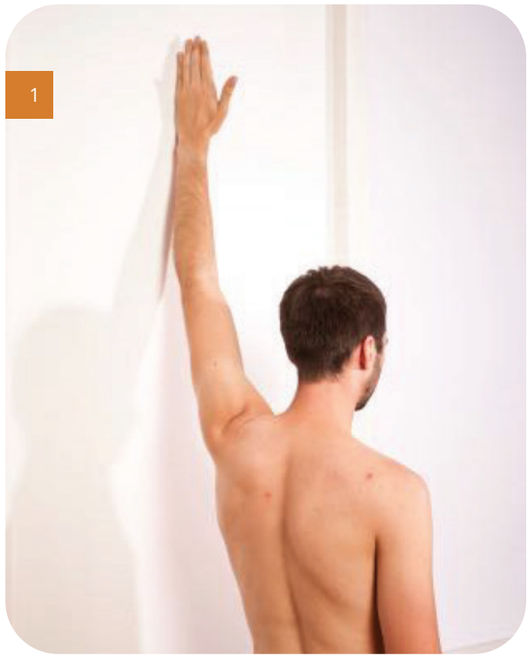
CLINICIAN NOTES:

Performing arm rotation with the arm unsupported emphasises the mobilising role of the rotator cuff and the stability role of the scapula muscles latissimus dorsi and deltoid.

Refs: Alizadehkhaiyat et al 2015, Boettcher et al 2009, Tardo et al 2013

ACTIVATION OF UPPER FIBRES OF TRAPEZIUS USING WALL

INTERMEDIATE | ROM | S | P | C | KC



As comfort allows take arm into full elevation using the wall to guide you. Maintain a straight elbow at all times and reach as far as possible with your fingertips using your shoulder blade muscles to do the work. Whilst keeping your arm in elevation and supported against the wall relax the muscles around your shoulder which will reduce the distance you have reached. Repeat.

REPEAT (TIMES)

Progression 1:

Stand away from the wall to perform the exercise.

Progression 2:

Add small weight in your elevated hand.

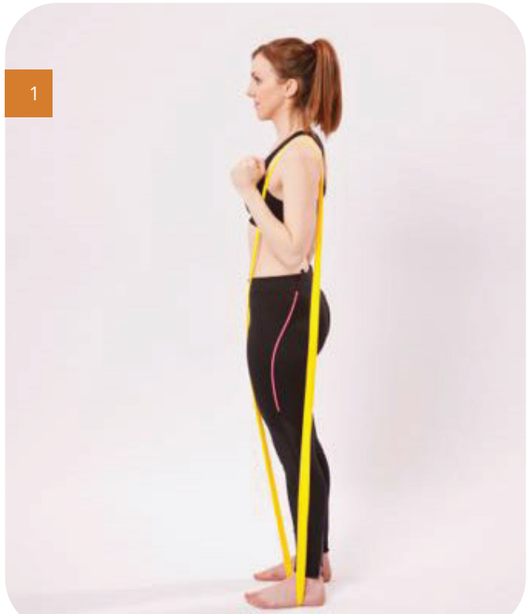
CLINICIAN NOTES:

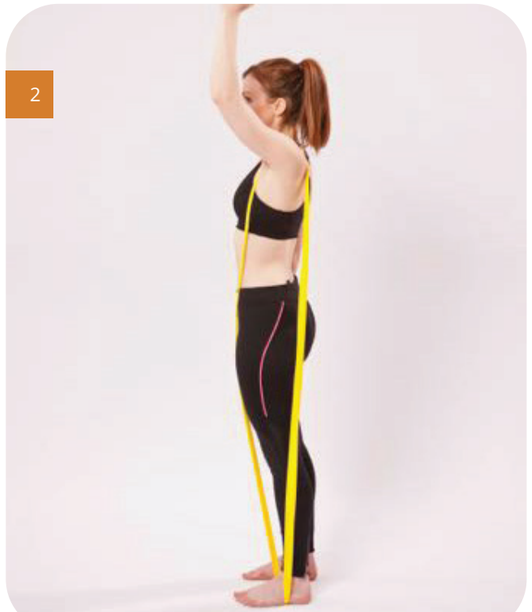
Emphasising a shrug at the end of elevation increases recruitment of the upper fibres of trapezius and serratus anterior and promotes terminal rotation of the clavicle and scapula upward rotation. This can be very useful in clearing end range AC joint pain.

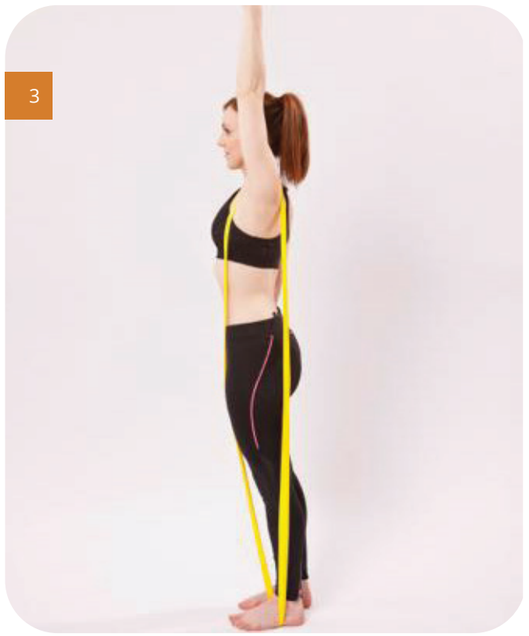
Refs: Ludewig et al 2009, Pizzari et al 2014, Castelein et al 2016

ACTIVATION OF UPPER FIBRES OF TRAPEZIUS USING A RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC







In standing place a long loop of resistance band over the shoulder of the affected arm and under your the foot. Open up across the collar bones to keep the loop in position throughout the movement. Start with a bent elbow and make a fist with your hand. Keep the elbow slightly flexed as you take the arms into elevation. Then straighten the elbow as you get to the vertical position. Return to your start position flexing the elbow again on the way down.

REPEAT (TIMES)

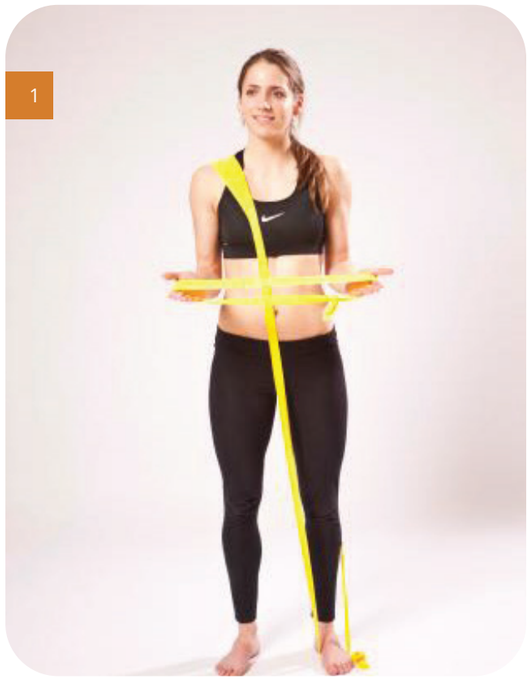
CLINICIAN NOTES:

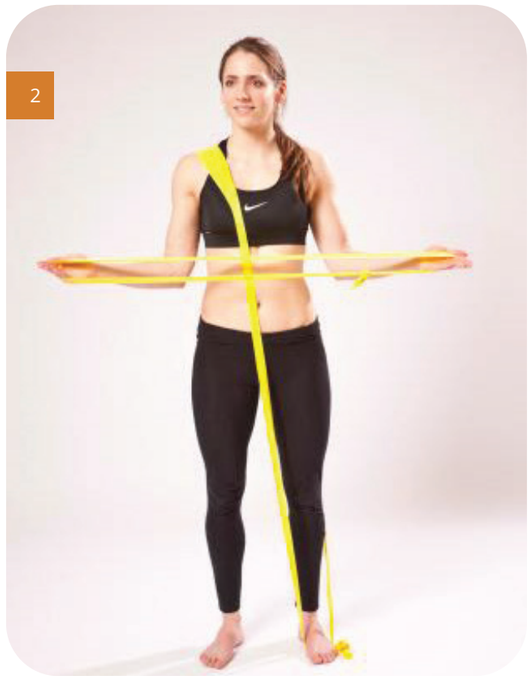
Emphasising a shrug at the beginning and end of elevation increases recruitment of the upper fibres of trapezius and serratus anterior and promotes rotation of the clavicle and scapula upward rotation. This can be very useful in the management of AC joint problems.

Refs: Ludewig et al 2009, Pizzari et al 2014, Castelein et al 2016

UPPER TRAPEZIUS STRENGTH WITH RESISTED EXTERNAL ROTATION

INTERMEDIATE | ROM | S | P | C | KC





Standing tall, feet hip width apart, arms by side and elbows bent at 90°. Place one resistance band over the affected shoulder and under the opposite foot. Hold the other shorter resistance band looped between your hands. Open up across the collar bones feeling the resistance of the band on the affected shoulder. In this position slowly externally rotate both arms out to the side.

REPEAT (TIMES)

Tips:

Ensure your elbows are slightly away from your body to target the upper trapezius.

CLINICIAN NOTES:

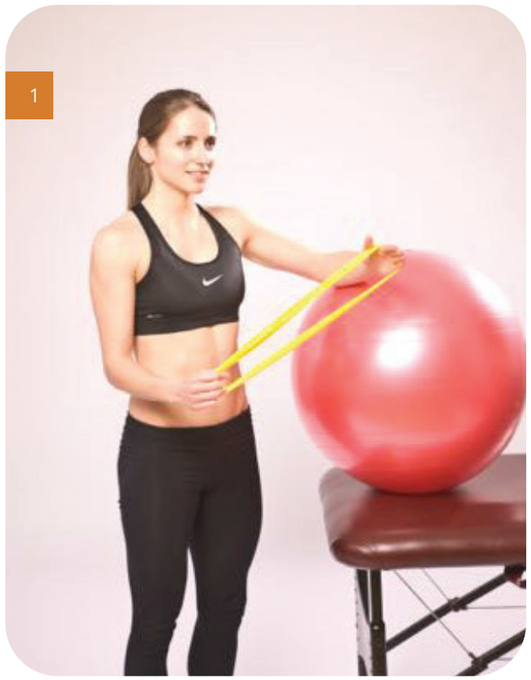
Initiating movement with an upward rotation shrug with the arm in the coronal plane has been shown to facilitate upper trapezius recruitment.

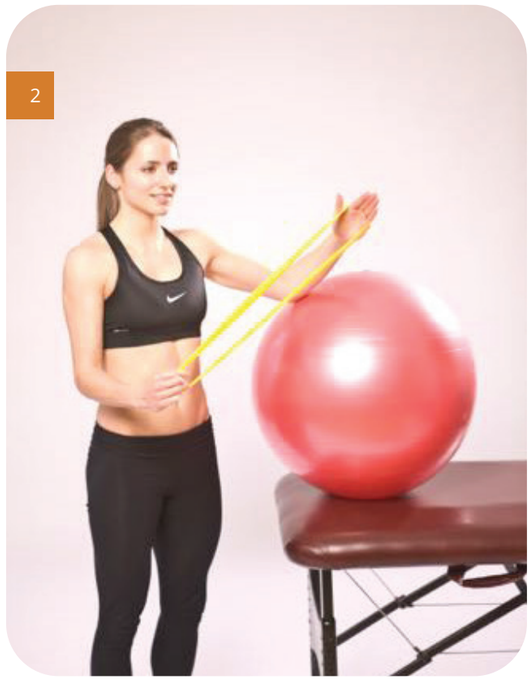
it is important to note that unsupported external rotation exercises in neutral do not specifically target the posterior rotator cuff as effectively as other exercises described.

Refs: Pizzari et al 2014, Castelein et al 2016a

EXTERNAL ROTATION WITH RESISTANCE BAND, ARM ON BALL

INTERMEDIATE | ROM | S | P | C | KC





Stand tall, maintaining good controlled posture, feet hip width apart. Rest the affected arm on a ball on a table with your elbow bent to 90°. Unaffected arm by your side, hold a resistance loop in both hands. Rotate your arm against the resistance (outward into external rotation), keeping your elbow on the ball. Slowly return to your starting position. Be careful not to squeeze shoulder blades together.

REPEAT (TIMES)

CLINICIAN NOTES:

Supporting the upper limb during external rotation exercises has been shown to preferentially recruit infraspinatus and supraspinatus whilst reducing the contribution of deltoid.

Refs: Escamilla et al 2010, Ha et al 2013, Reinold et al 2009

EXTERNAL ROTATION IN LYING WITH RESISTANCE BAND SUPPORTED

INTERMEDIATE | ROM | S | P | C | KC

In lying with your neck and affected arm supported and a resistance band looped around your hands/wrists, elbows bent to 90°. Comfortably, push the resistance band away with your affected arm whilst keeping your elbow in position. Slowly return to starting position.

REPEAT (TIMES)

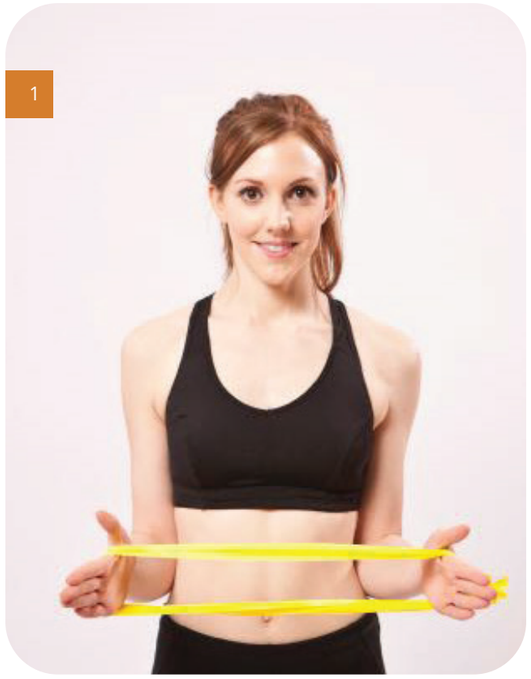
CLINICIAN NOTES:

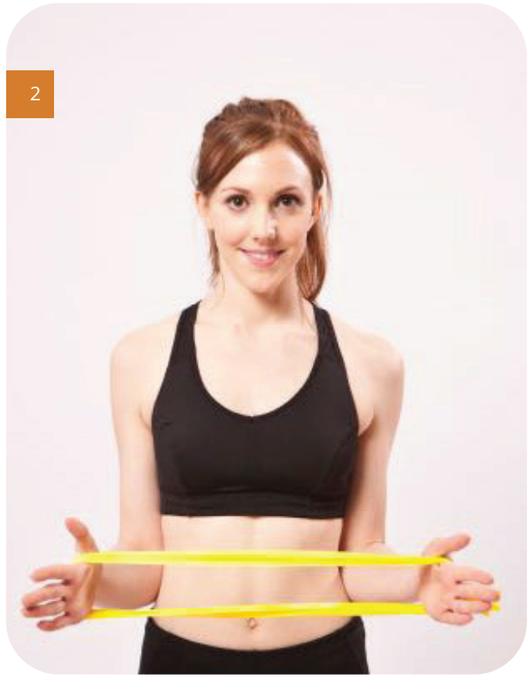
Supporting the upper limb during external rotation exercises has been shown to preferentially recruit infraspinatus and supraspinatus whilst reducing the contribution of deltoid.

Refs: Alizadehkhaiyat et al 2015, Reinold 2009, Boettcher et al 2009

EXTERNAL ROTATION IN STANDING WITH RESISTANCE LOOP

INTERMEDIATE | ROM | S | P | C | KC





Stand with good posture. Put a resistance band looped around your hands/wrists keeping your elbows bent to 90° and thumbs upward. Comfortably, move your forearms out to the side stretching the resistance band and hold, then slowly release back to starting position.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip 1:
It is important that you do not over stretch and squeeze your shoulder blades together.

Tip 2:
Place a towel between your elbow and your side to help position your arm throughout the exercise

CLINICIAN NOTES:

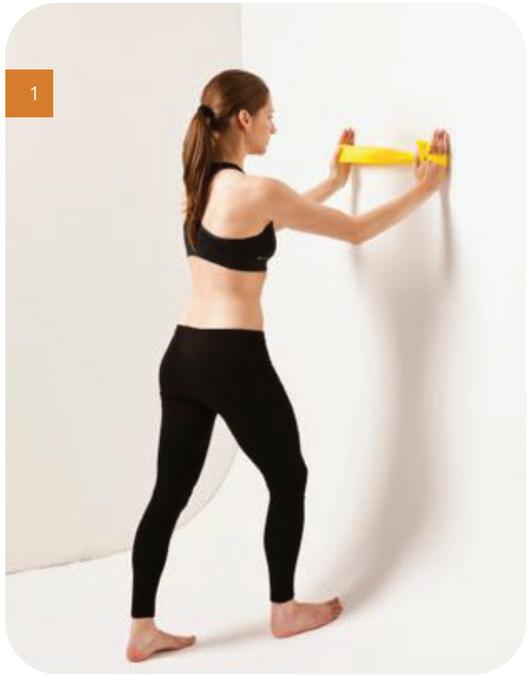
It is important to consider the key aims of any resistance exercise when selecting the best exercise. The pendant position is the least specific in terms of selectively recruiting the rotator cuff muscles and increases activation of pectoralis major.

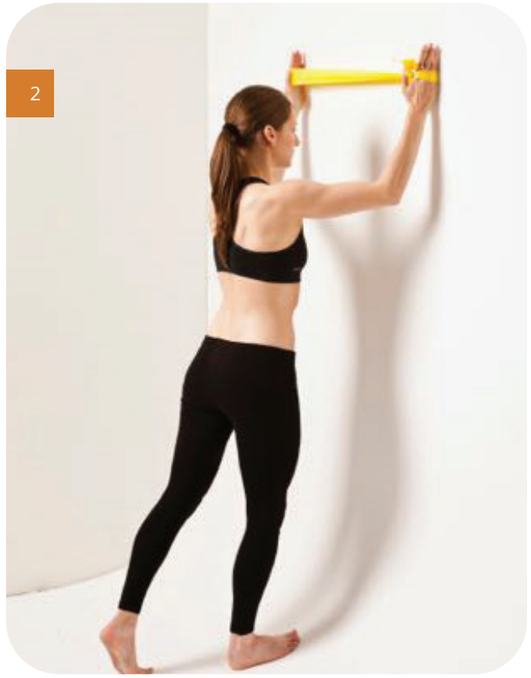
To increase selective activation of the posterior cuff support the arms at 30 degrees in the scapula plane on a table.

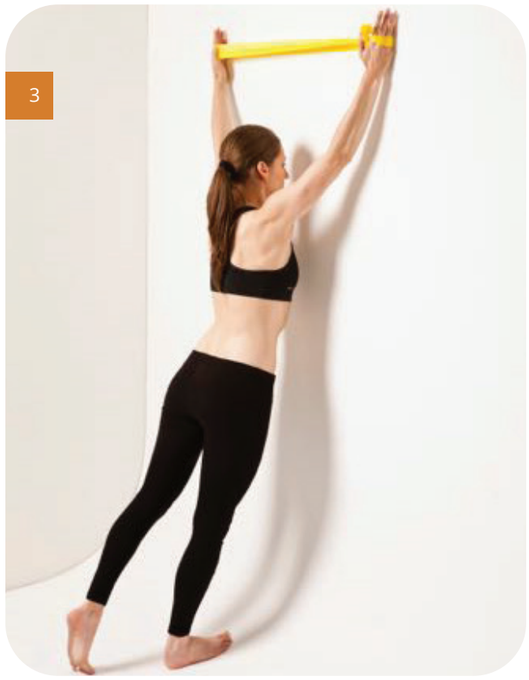
Refs: Alizadehkhaiyat et al 2015, Tardo et al 2013, Dark et al 2007, Boettcher et al 2009, Kang et al 2014

WALL SLIDES WITH RESISTANCE BAND LOOP

INTERMEDIATE | ROM | S | P | C | KC







Step standing with good posture facing the wall. Loop a resistance band around your hands/wrists with your little fingers placed on the wall. Slide your hands up the wall, transferring your weight from the back foot to the front foot. Keep in contact with the wall throughout the movement, gently pushing out into the resistance band. Return to your start position.

SAFE ZONE	REPEAT (TIMES)

Tip: This would not be appropriate for early stage rotator cuff rehabilitation

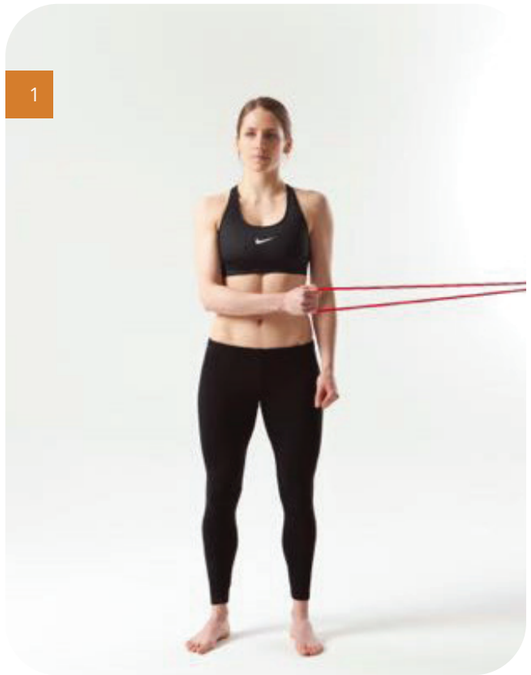
CLINICIAN NOTES:

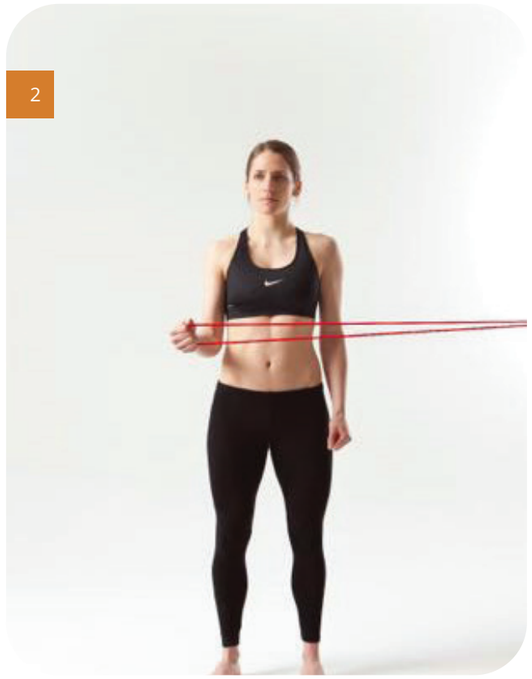
The addition of resistance band increases activation of the scapula muscles and emphasises recruitment of the posterior cuff however it is important to push out into the band rather than pull out. Pulling out will increase activation of pectoralis major and biceps , whereas pushing out biases the posterior rotator cuff. Activiation of the scapula muscles, particularly lower trapezius and serratus anterior, is further emphasized when exercising above 90˚ and encouraging weight shift onto the leading leg as they lift their arms.

Refs: Hardwick et al 2006, Park et al 2013, Lunden et al 2010, Wattanaprakornkul et al 2011, Castelein et al 2016c

EXTERNAL ROTATION WITH RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC





In standing, maintain a good posture. Arm against side, elbow at 90°. Hold the looped resistance band, pull your hand out against the resistance, keeping your elbow in position. Return to your start position and repeat.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip:

Place a towel between your arm and side to help position your arm throughout the exercise.

CLINICIAN NOTES:

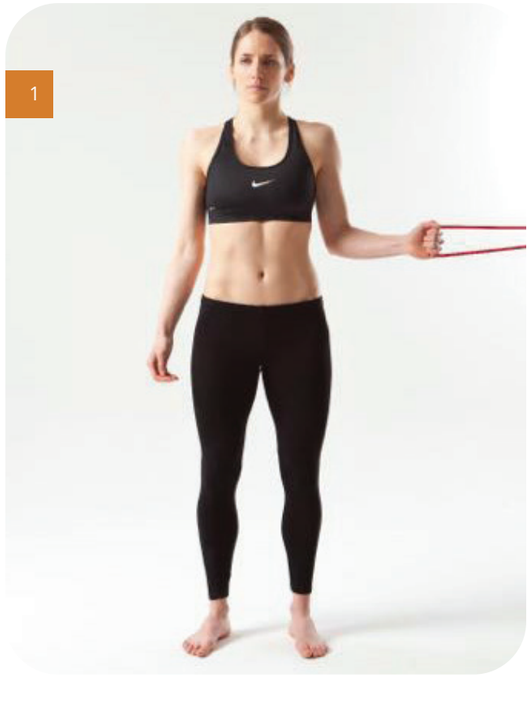
Performing resistance exercises on the contra-lateral limb will increase muscle activation and strength in the affected limb. This can be used to enhance the effectiveness of exercises by performing repetitions on the unaffected limb first. In patients with a long history of pain this cross-education technique can be used to improve central cortical representation.

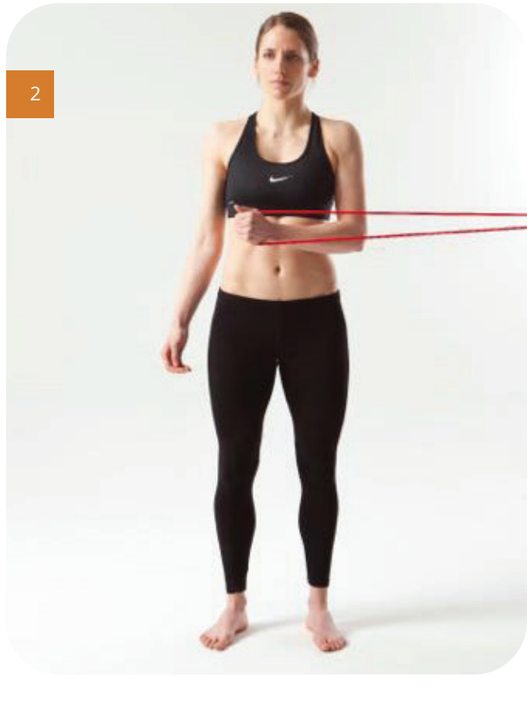
Resisted rotation exercises with the arm unsupported do not preferentially recruit the rotator cuff muscles. Supporting the limb will increase selective recruitment.

Refs: Panzer et al 2011, Munn et al 2004, 2005, Carrol et al 2006, Farthing et al 2011, Hendy et al 2012, Kang et al 2014

INTERNAL ROTATION WITH RESISTANCE BAND IN STANDING

INTERMEDIATE | ROM | S | P | C | KC





Maintain good posture in standing, arms by your side, elbow at 90°, hold onto a resistance band. Keep your elbow bent. Pull the band across your body keeping your elbow in position. Return to your start position and repeat.

REPEAT (TIMES)

Tip: Place a folded towel between your elbow and your side to help position your arm throughout the exercise.

CLINICIAN NOTES:

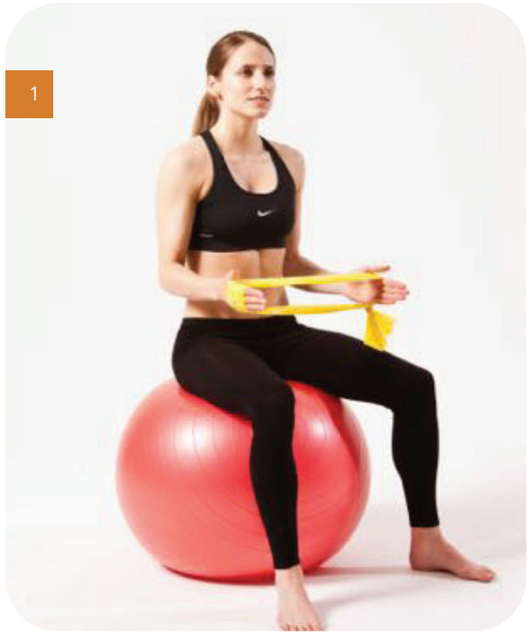
Performing resistance exercises on the contra-lateral limb will increase muscle activation and strength in the affected limb. This can be used to enhance the effectiveness of exercises by performing repetitions on the unaffected limb first. In patients with a long history of pain this cross-education technique can be used to improve central cortical representation.

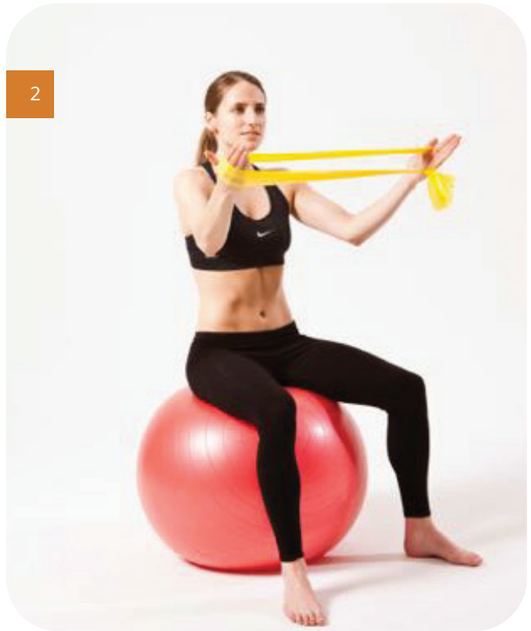
Resisted rotation exercises with the arm unsupported do not preferentially recruit the rotator cuff muscles. Supporting the limb will increase selective recruitment.

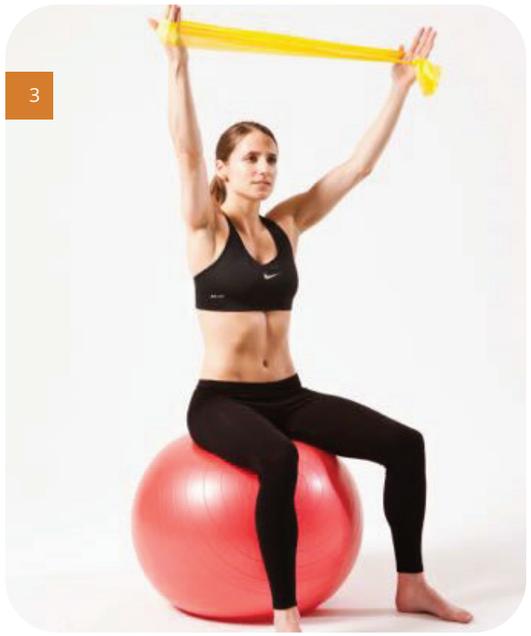
Refs: Panzer et al 2011, Munn et al 2004, 2005, Carrol et al 2006, Farthing et al 2011, Hendy et al 2012, Kang et al 2014

SITTING ON A SWISS BALL BILATERAL ELEVATION WITH RESISTANCE LOOP

INTERMEDIATE | ROM | S | P | C | KC







Sitting tall with good posture on a swiss ball. Start with elbows bent at your side. Push outwards against the resistance of the looped band. Maintain the resistance, straightening your arms upwards.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Hold at the top and slowly returned to your starting position by reversing the movement leading with the elbows.

Tip 1:
The lever arm can be varied to make this an easier or harder exercise.

Tip 2:
This exercise can be made easier by placing the ball in a corner for added stability.

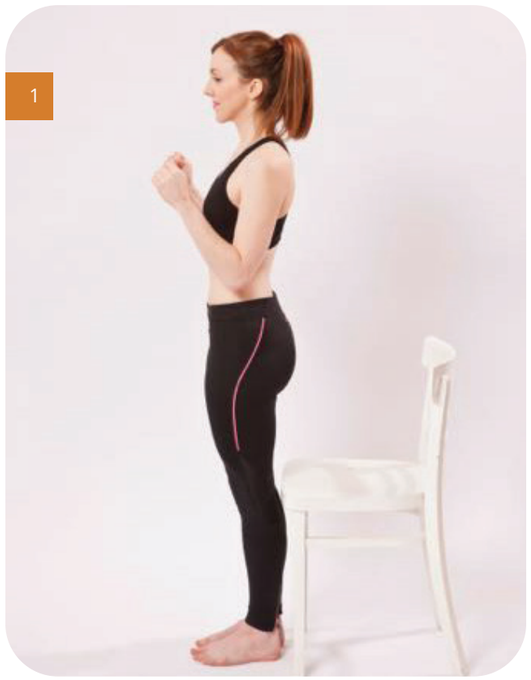
CLINICIAN NOTES:

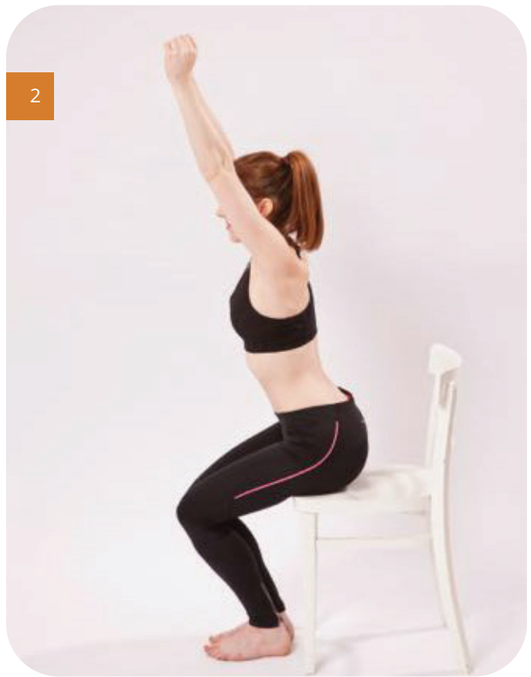
Using the swiss ball will have different effects for different patients. Whilst it is often cited to increase core stability activation this is not consistent between patients so it is important to be clear regarding the aim of exercise prescription.

Refs: Elphinston 2013, Lehmann et al 2006, 2008

STANDING TO SITTING TAKING THE ARMS INTO ELEVATION

INTERMEDIATE | ROM | S | P | C | KC





Stand in front of a chair with your elbows bent and make a fist with your hands. As you sit onto the chair take both arms up into full elevation. Keep the elbows slightly bent in the vertical position. Return to your start position, flexing the elbows again.

REPEAT (TIMES)

CLINICIAN NOTES:

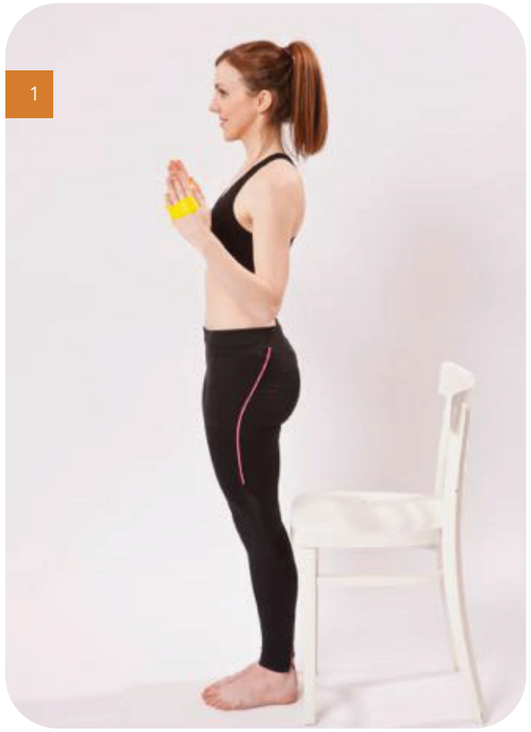
When patients have high pain levels or longstanding symptoms they can be reluctant to take their hand away from their body. Dissociating the body from the arm can be an effective strategy to re-educate elevation.

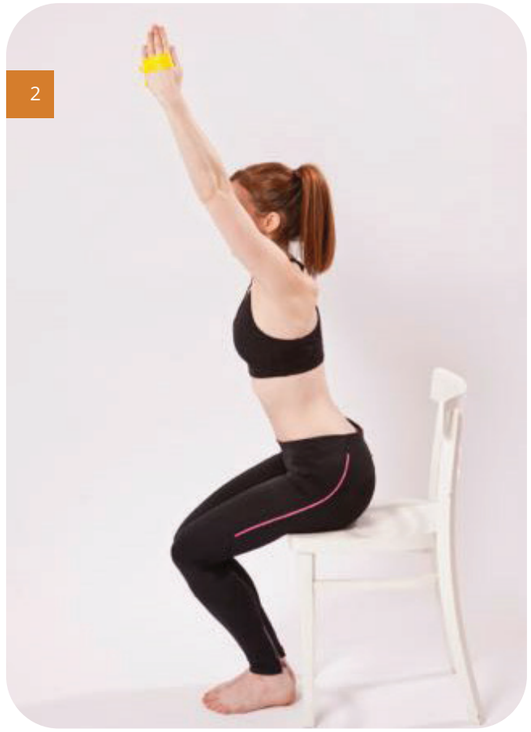
Short to long lever reduces limb load and emphasises selective movement. Gentle hand grip reinforces cuff recruitment.

Refs: Anaprakornkul et al 2011, McMullen & Uhl 2000

STANDING TO SITTING TAKING THE ARMS INTO ELEVATION WITH RESISTANCE LOOP

INTERMEDIATE | ROM | S | P | C | KC





Stand in front of a chair. Place a loop of resistance band around your hands keeping the elbows bent. Gently push out with the backs of your hands against the resistance band to activate the muscles in the back of your shoulder. As you sit onto the chair take both arms up into full elevation. Return to your start position keeping the resistance on the band throughout the movement.

REPEAT (TIMES)

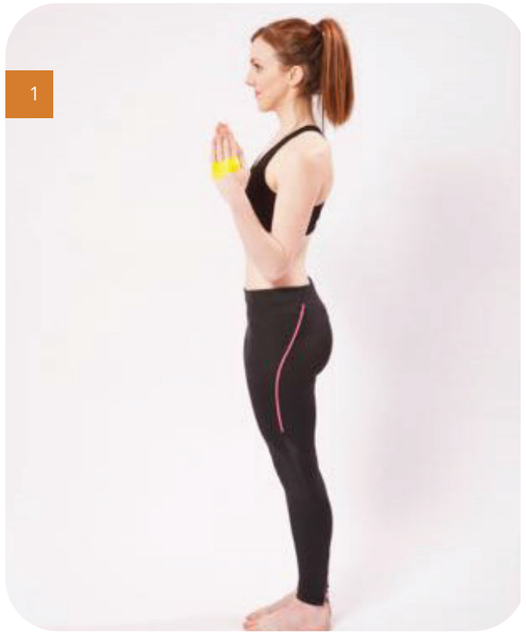
CLINICIAN NOTES:

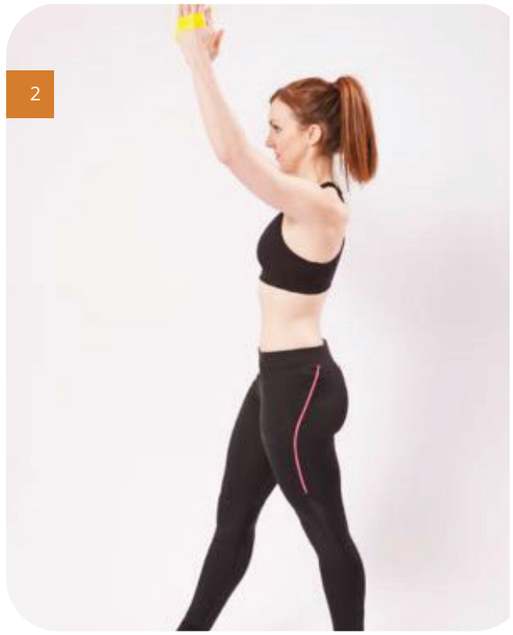
Resistance band is used to facilitate the posterior cuff through elevation reinforcing optimal recruitment patterns. However it is important to push out into the band rather than pull out. Pulling out witll increase activation pectoralis major and biceps, whereas pushing out biases the posterior rotator cuff. Short to long lever exercises reduce load and emphasise selective inter-joint movement.

Refs: Wattanaprakornkul et al 2011, Castelein et al 2016

EXTERNAL ROTATION INTO ELEVATION WITH RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC





Stand with good posture, place your with feet hip width apart. Bend your elbows to 90°, loop a resistance band around both hands/wrists. Hands should face each other. Take a step forwards and slowly stretch the band by taking your hands out to the side and raise arms up in one smooth movement straightening your elbows when finishing with arms above your head. Hold at the top and slowly return to starting position by reversing the movement leading with the elbows.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip: If difficulty stepping forward with control then step backwards.

CLINICIAN NOTES:

Resistance band is used to facilitate the posterior cuff through elevation reinforcing recruitment patterns. The addition of a step reinforces sequential activation patterns from the lower to upper quadrant.

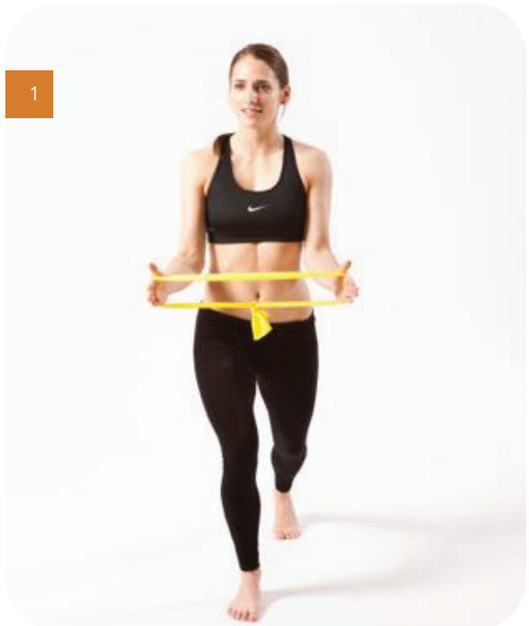
Emphasising short to long lever selective movement helps reinforce functional movement and reduce load on the shoulder.

Refs: Anaprakornkul et al 2011, McMullen & Uhl 2000

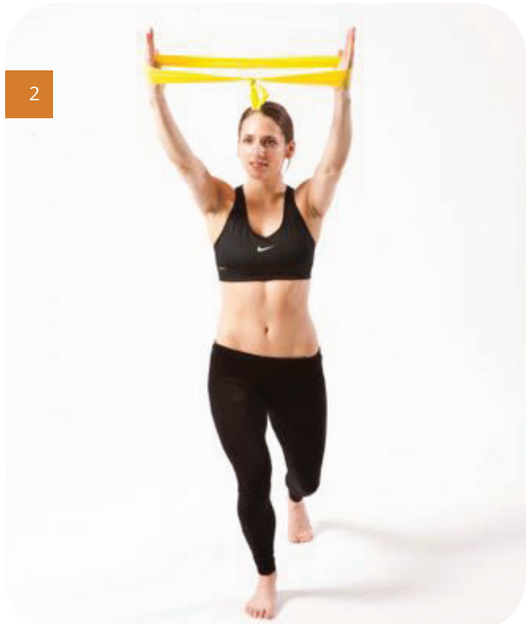
ELEVATION AND EXTERNAL ROTATION WITH RESISTANCE BAND INTO LUNGE

INTERMEDIATE | ROM | S | P | C | KC

1



2



Stand with good posture. Bend elbows to 90°, resistance band looped around both hands/ wrists. Hands should face each other. Push outwards against the resistance of the looped band. Step forwards with the opposite leg into a lunge. Raise your arms up and out in one smooth movement straightening your elbows, finishing with arms above your head. Hold at the top and slowly return to starting position by reversing the movement, leading with the elbows and stepping back.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip: If difficulty lunging forward with control then lunge backwards.

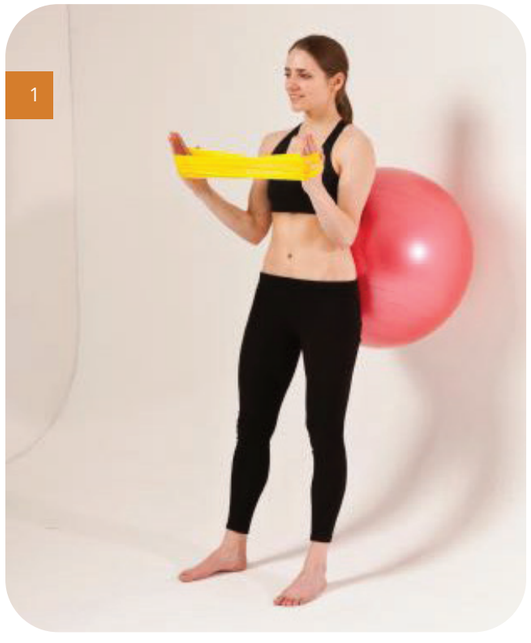
CLINICIAN NOTES:

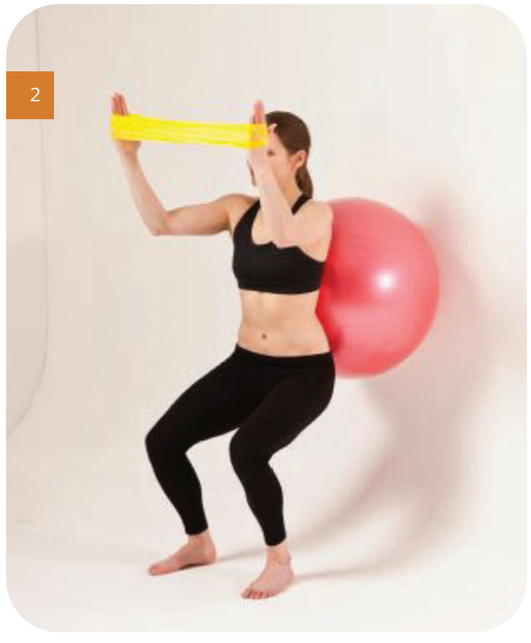
Initiating the movement with the lower quadrant increases activation levels of the scapula muscles. The resistance band loop reinforces recruitment of the posterior rotator cuff through elevation. Initially it is important to keep the lever arm as short as possible to reduce the load on the upper quadrant and emphasise intersegmental movement.

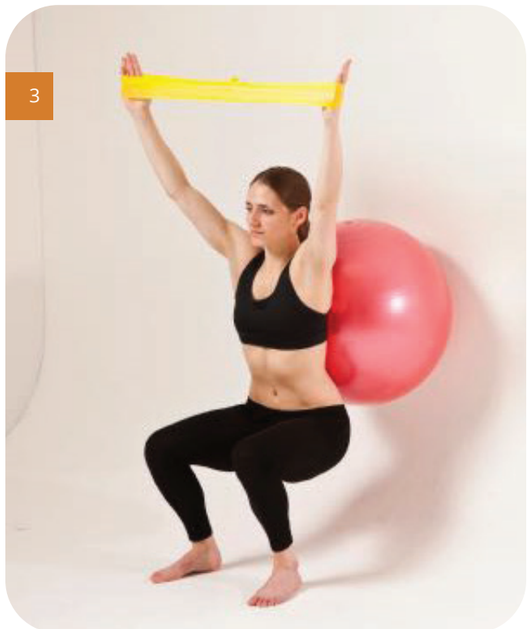
Refs: McMullen & Uhl 2000, Wattanaprakornkul et al 2011

WALL SQUAT USING SWISS BALL AND RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC







HOLD FOR (SECONDS)	REPEAT (TIMES)

Place the Swiss Ball at waist height and lean back on the ball against a wall. Have your feet approximately hip width apart. Starting with your elbows by your side have a resistance band looped around your hands and gently push outwards with the backs of your hands against the band. Squat bending your knees to about 90°, simultaneously take your arms up. Maintain the resistance on the band throughout the movement. Straightening your elbows at the top. Hold then slowly return to your starting position by reversing the movement leading with your elbows.

Tip: Only bend your knees as comfort allows

CLINICIAN NOTES:

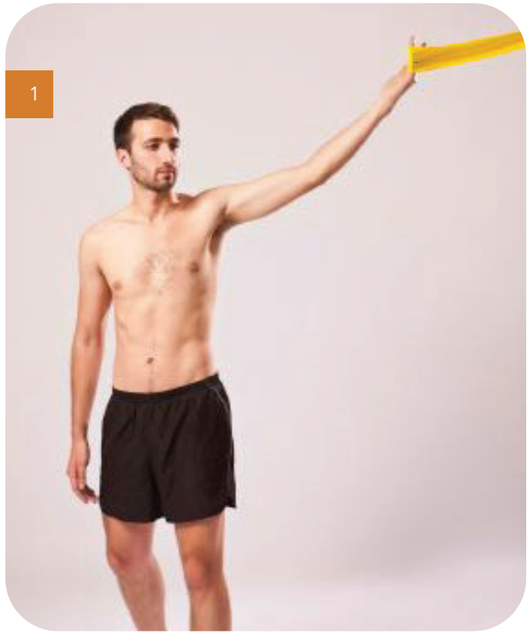
The position of the ball can be altered to emphasise thoracic extension or to enhance trunk stability. Using a loop of resistance band around the knees (resisting lateral rotation) will increase gluteal activation.

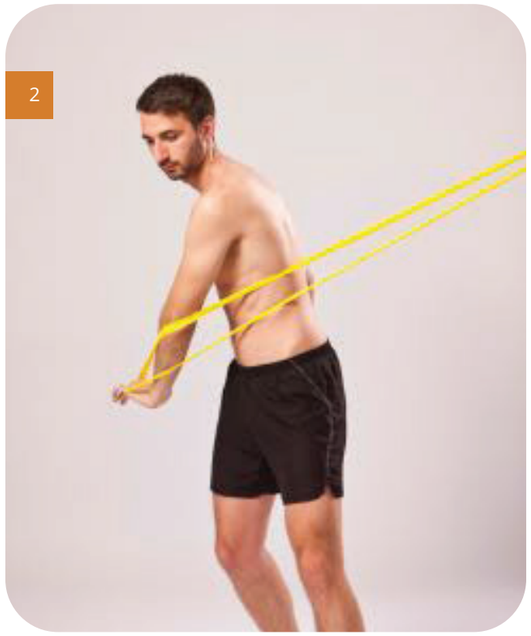
The resistance band loop around the wrists reinforces recruitment of the posterior rotator cuff through elevation. It is important that patients push out into the resistance band loop rather than pulling out against a single piece of reisistance band to avoid excessive pectoralis muscle activation.

Refs: Kang et al 2014, Marshall et al 2005, Wattanaprakornkul et al 2011

DIAGONAL PATTERN 1 WITH RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC





Stand tall maintaining good posture. Attach the resistance band above your head securely. Pull the resistance band across your body, rotating your arm inwards and rotating your trunk away transfering your weight from one leg to the other. Control the return back to the starting position.

REPEAT (TIMES)

CLINICIAN NOTES:

Exercises using the principles of propriceptive neuromuscular facilitation have been shown to increase muscle activation in the non- exercised arm and also increase activation in the lower quadrant.

To increase their effectiveness ensure that you emphasise the rotation component of upper limb movement.

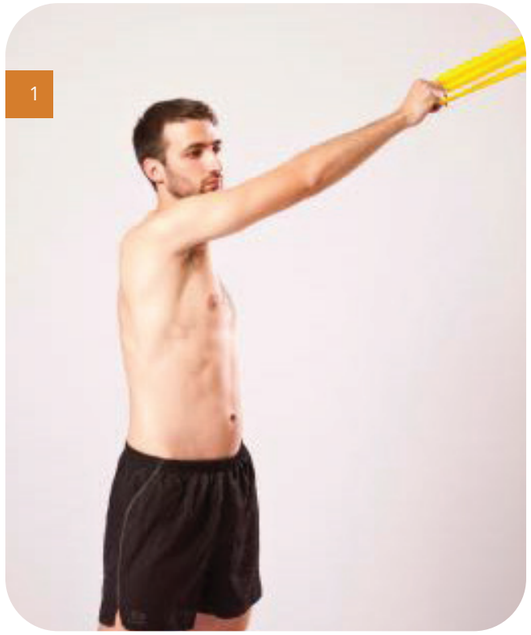
Light weight (1.5-2 kg) will have the same effect on muscle recruitment as using resistance band.

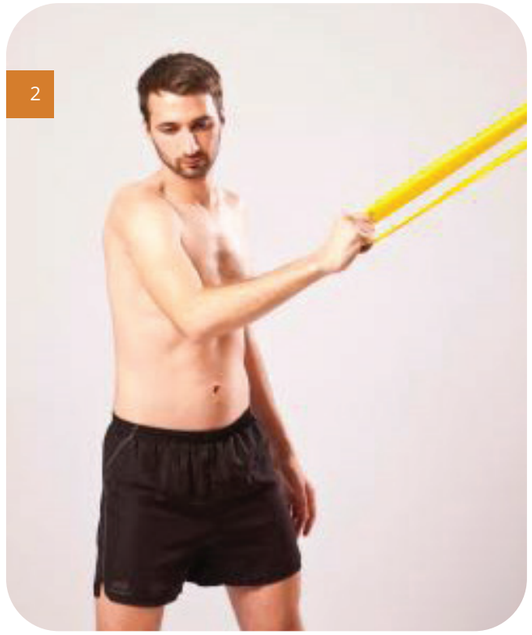
This exercise has been shown to particularly target subscapularis.

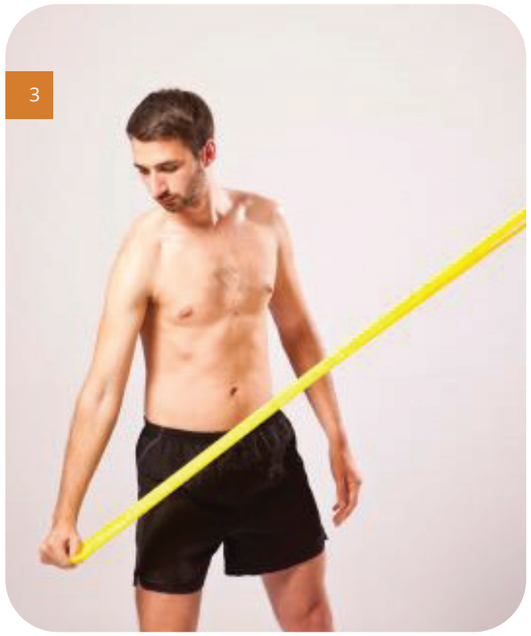
Refs: Abreu et al 2015, Voss et al 1985, Sato et al 2009, Witt et al 2011,Hindle et al 2012, Reinold et al 2009

DIAGONAL PATTERN 2 WITH RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC







Stand tall maintaining a good posture. Attach the resistance band above your head securely. Stand side ways with your affected arm farthest away from the band. Position your arm across your face with your palm facing backwards. Pull the band down and across your body towards the opposite hip transferring your weight from one leg to the other. Control the return back to the starting position.

REPEAT (TIMES)

CLINICIAN NOTES:

Exercises using the principles of propriceptive neuromuscular facilitation have been shown to increase muscle activation in the non- exercised arm and also increase activation in the lower quadrant.

To increase their effectiveness ensure that you emphasise the rotation component of upper limb movement.

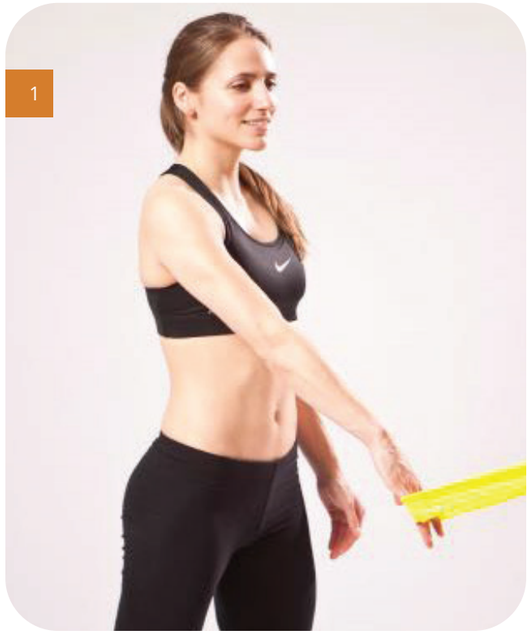
Light weight (1.5-2 kg) will have the same effect on muscle recruitment as using resistance band.

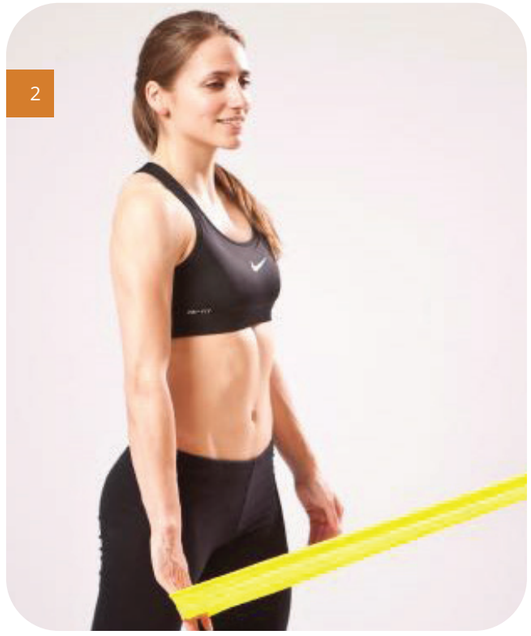
This exercise has been shown to particularly target subscapularis.

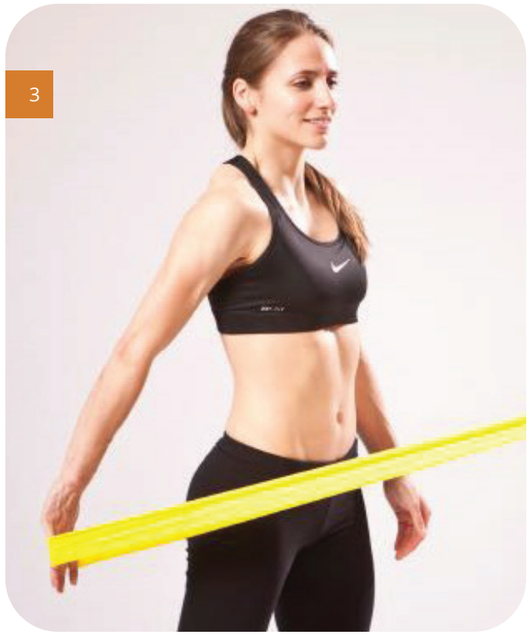
Refs: Abreu et al 2015, Voss et al 1985, Sato et al 2009, Witt et al 2011,Hindle et al 2012, Reinold et al 2009

SHOULDER EXTENSION WITH RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC







Stand tall maintaining a good posture in step standing. Attach a piece of resistance band at chest level to a secure point and holding on to the band pull back against the resistance. Then slowly return to the starting position.

REPEAT (TIMES)

CLINICIAN NOTES:

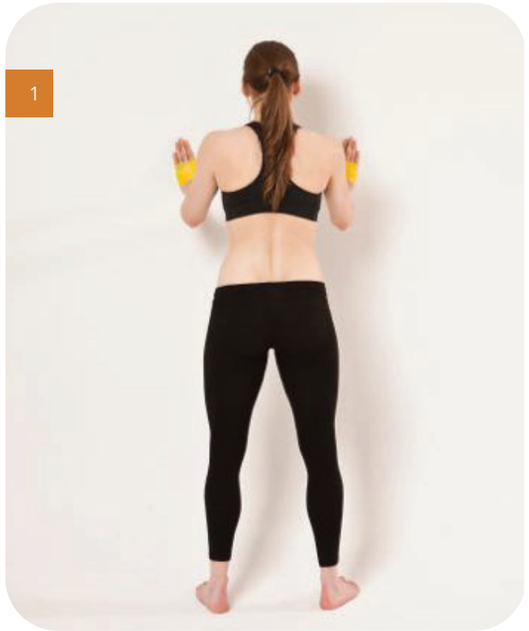
Performing resistance exercises on the contra-lateral limb will increase muscle activation and strength in the affected limb. This can be used to enhance the effectiveness of exercises by performing repetitions on the unaffected limb first. In patients with a long history of pain this cross-education technique can be used to improve central cortical representation.

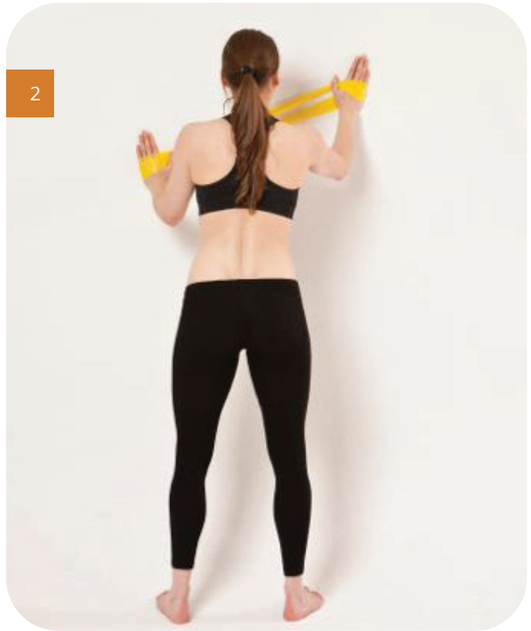
To emphasise the anterior cuff through extension movements i.e. reinforce optimal activation patterns, change the hand position to bias medial rotation through range.

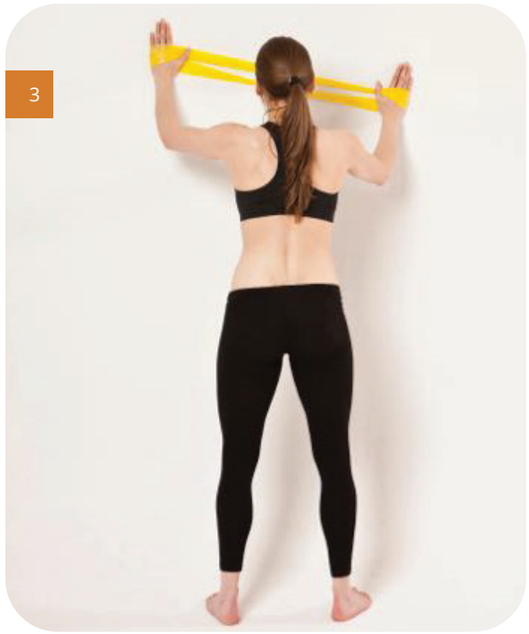
Refs: Panzer et al 2011, Munn et al 2004, 2005, Carrol et al 2006, Farthing et al 2011, Hendy et al 2012, Wattanaprakornkul et al2011

SPIDERMAN

INTERMEDIATE | ROM | S | P | C | KC







Start in a gentle squat position if able. Hands inside a looped resistance band, pushing it apart. Keep tension on against the band and walk hands up the wall as high as you can reach. Straighten legs. Then return back down to start position.

REPEAT (TIMES)

CLINICIAN NOTES:

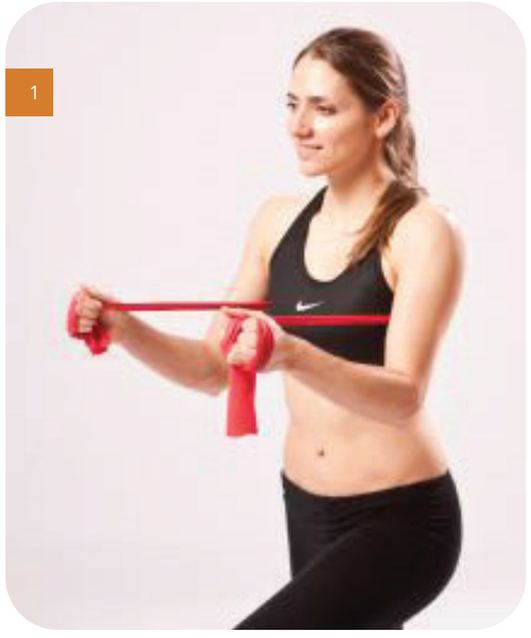
The resistance band loop reinforces recruitment of the posterior rotator cuff through elevation.

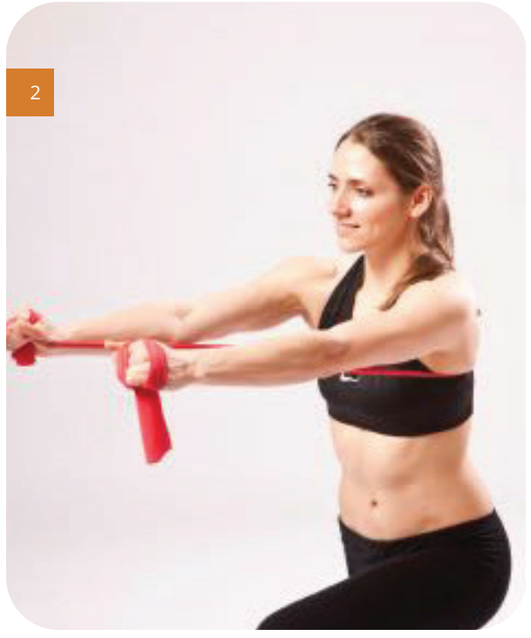
Lower quadrant inclusion in the wall slide exercise emphasises sequential activation patterns throughout the kinetic chain and enhances scapula recruitment

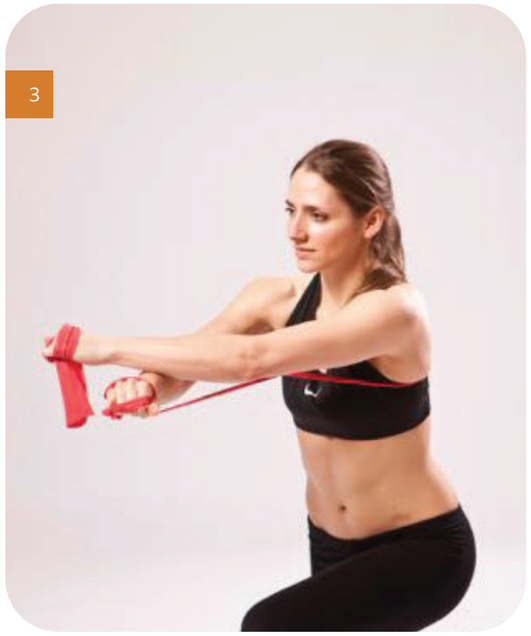
Refs: Panzer et al 2011, Munn et al 2004, 2005, Carrol et al 2006, Farthing et al 2011, Hendy et al 2012, Wattanaprakornkul et al2011

PROTRACTION AND LUNGE WITH RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC







Standing maintaining good posture with resistance band looped under both armpits, both ends wrapped around your hands, and elbows bent. Lunge forwards and at the same time push both hands forwards stretching the band and hold. Release the band slowly as you return to your start position. Repeat using opposite leg to lunge.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip: Crossing your arms at the end of the movement as you push forward will increase the effect on your shoulder blade muscles.

CLINICIAN NOTES:

The dynamic hug exercise has been shown to be one of the most effective ways of targeting serratus anterior recruitment encouraging your patient to almost cross their arms i.e. hug at the end of the movement will enhance this.

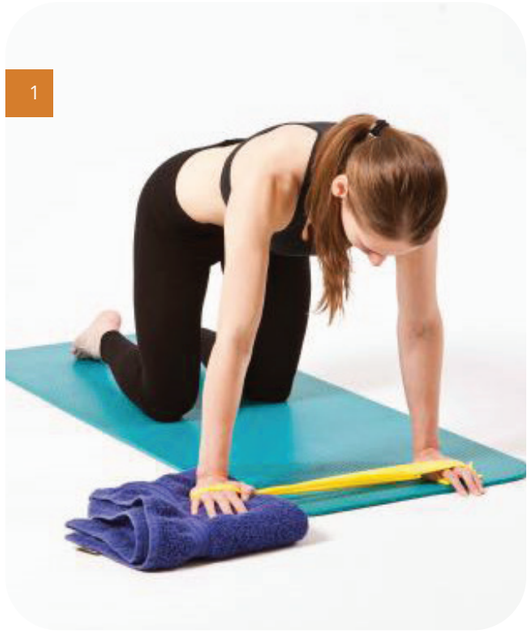
Inclusion of the lower limb, particularly emphasising the gluteal muscles and weight transfer, further increases recruitment of the serratus anterior.

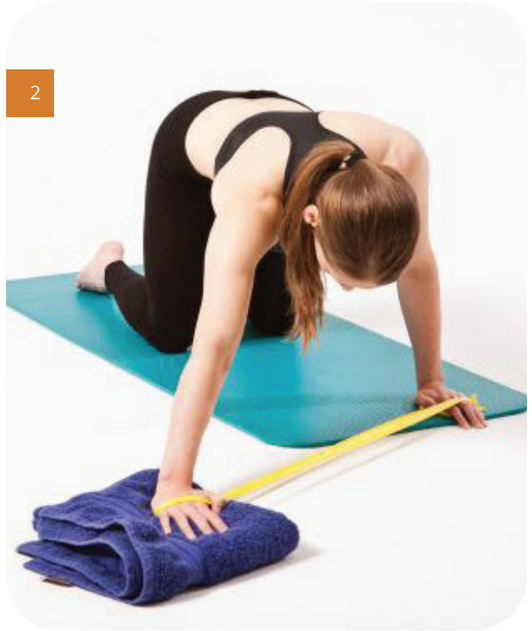
Using theraband around the scapula can be used to reinforce scapula protraction and sensory input whilst also facilitating cuff recruitment.

Refs: Castelein et al 2016, Kaur et al 2014, Reinold et al 2009

4 POINT KNEELING LATERAL GLIDES WITH RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC





Kneeling on your hands and knees, place a loop of resistance band around your hands. Using a towel or a low friction cloth slide your affected hand on the floor away against the resistance and return to your start position. (Maintain scapula against chest wall).

REPEAT (TIMES)

CLINICIAN NOTES:

Weight-bearing enhances proprioception and the addition of theraband emphasises the role of the posterior cuff and scapula muscles during elevation.

Closed chain exercises moving into risk positions after stabilisation surgery can be very useful to increase confidence and emphasise the stability function of the rotator cuff'

Ref: Wattanaprakornkul et al 2011, Kibler 2001

4 POINT KNEELING, HAND SLIDE

INTERMEDIATE | ROM | S | P | C | KC

1

2

3

In 4 point kneeling using a looped resistance band around both hands. Slowly slide one hand out away from the body as instructed by your therapist

DIRECTION	REPEAT (TIMES)

CLINICIAN NOTES:

Closed kinetic chain exercises are a valuable tool in improving neuromuscular control of the shoulder. Increasing load will increase activation levels and increase proprioceptive value. The elastic band is used to reinforce activation of the posterior cuff during elevation.

Closed chain exercises moving into risk positions after stabilisation surgery can be very useful to increase confidence and emphasise the stability function of the rotator cuff

Refs: Tucker et al 2010, Wattanaprakornkul et al 2011

4 POINT KNEELING TO SUPERMAN

INTERMEDIATE | ROM | S | P | C | KC

In four point kneeling with a neutral spine position. Take one arm out in front of you and the opposite leg out behind you. Make sure you hold your neutral spinal posture throughout the movement. Repeat on the opposite side.

REPEAT (TIMES)

Adaptations - easier

1. Only take one arm out in front
2. Only slide out opposite leg to affected arm

Tip:

Allow your toes to slide along the floor while you extend your knee. This will help activation of the bottom muscles (gluteal muscles).

CLINICIAN NOTES:

You can alter the emphasis on specific scapula muscles by changing which leg is extended. Contra-lateral leg extension will bias more lower trapezius activity, whereas ipsilateral leg extension will bias serratus anterior activity.

Refs: Maenhout et al 2010, Cools et al 2007,De Mey et al 2013

4 POINT KNEELING USING RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC

1

Adaptation 1

Adaptation 2

In four point kneeling with a neutral spine position. Place a resistance band around your foot and hold onto the other end with your opposite hand. Take your arm out in front of you and the opposite leg out behind you. Keep your toe on the floor as you slide your foot out behind you, and then lift your leg.

REPEAT (TIMES)

Adaptations - harder:

1. Place a balance disc or soft ball under your supporting hand
2. Use 2 balance discs, under both the supporting hand and knee

CLINICIAN NOTES:

You can alter the emphasis on specific scapula muscles by changing which leg is extended. Contra-lateral leg extension will bias more lower trapezius activity, whereas ipsi-lateral leg extension will bias serratus anterior activity.

Refs: Maenhout et al 2010, Khademi et al 2014, Kang et al 2014

PRONE ON SWISS BALL KNEE FLEXION

INTERMEDIATE | ROM | S | P | C | KC

1

2

Position yourself in a plank position over the ball. Slowly bend both your knees to 90° then lower back down. Do not allow your lower back to dip.

REPEAT (TIMES)

CLINICIAN NOTES:

Closed kinetic chain exercises are a valuable tool in improving neuromuscular control of the shoulder. Increasing load will commonly increase activation levels and proprioceptive value.

Knee flexion-extension changes the stability challenge and if done at speed can introduce perturbation training.

Refs: Wilk et al 1995, Ubinger et al 1999, Tucker et al 2010

PUSH UP PRESS OVER BALL AGAINST RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC

Holding a length of resistance band around your shoulder blades roll over a swiss ball weight bearing through arms into a press up position. The ball can be under your knees. Ensure you keep your shoulder blades flat against the rib cage. Draw your breast bone away from the floor to arch your upper back. Keeping your elbows still. Let your breast bone lower towards the floor

REPEAT (TIMES)

Tip 1:

Easier - Ball under thighs/hips

Harder - Ball towards feet

Tip 2:

Press up

Lower your chest down to the ground, bending your elbows and then push up against the resistance band.

Adaptation

CLINICIAN NOTES:

The addition of protraction at the end of the press up increases activation of serratus anterior.

Hand position will reduce the risk of pectoralis major dominance and increase serratus activation - instruct patients to turn their hands out and keep their hands shoulder width apart.

Resistance band can be used to enhance serratus recruitment by increasing sensory input around the thorax'

Ref: Batbayar et al 2015, Decker 1999, Lee et al 2013

PRESS UP ON BALL RESISTANCE LOOP AROUND WRISTS

INTERMEDIATE | ROM | S | P | C | KC

1

2

Place a loop of resistance band around your hands/wrists, roll over a swiss ball weight bearing through your arms into a press up position. The ball can be under your hips or further towards your thighs or shins as able. Lower your chest down to the ground, bending your elbows whist maintaining the tension of the band. Return to your start position.

REPEAT (TIMES)

Tip:

Ensure you keep your shoulder blades flat against your rib cage.

CLINICIAN NOTES:

Supporting the body on a swiss ball does not consistently increase muscle activation in patients compared with a stable base of support. The main benefits appear to be one of increasing proprioception and reducing load.

Hand position will reduce the risk of pectoralis major dominance and increase serratus activation - instruct patients to turn their hands out and keep their hands shoulder width apart.

The loop of theraband around the wrists aims to reinforce activation of the posterior rotator cuff.

Ref: Batbayar et al 2015, Kalantari et al 2014, Lee et al 2013, de Oliviera et al 2008

PRONE ON SWISS BALL WITH HAND SLIDE

INTERMEDIATE | ROM | S | P | C | KC

1

2

Roll over a swiss ball positioning it under your thighs. Weight bear through your hands with your feet off the floor. With a loop of resistance band around your hands, stabilise with one hand and slide the other hand away then return. Take the hand into different positions and return.

REPEAT (TIMES)

Tip:

To make this exercise harder the ball can be moved further down the legs

CLINICIAN NOTES:

Closed kinetic chain exercises are a valuable tool in improving neuromuscular control of the shoulder. Increasing load will commonly increase activation levels and proprioceptive value.

Keeping the hands slightly turned out will reduce pectoralis major activity.

The combination of weight bearing and use of resistance band aims to reinforce stability and mobility function of the rotator cuff through range.

Refs: Wilk et al 1995, Ubinger et al 1999, Tucker et al 2010

SWIMMING WITH WEIGHTS ON SWISS BALL

INTERMEDIATE | ROM | S | P | C | KC

1

2

3

Roll over a swiss ball positioning it under your trunk. Steady yourself with your hands and feet. Maintaining your balance slowly lift one leg and the opposite hand up holding a small weight, then repeat on the other side.

REPEAT (TIMES)

Tip:

To make this easier do not use the weight

CLINICIAN NOTES:

Supporting the body on a swiss ball does not consistently increase muscle activation in patients compared with a stable base of support. The main benefits appear to be one of increasing proprioception and reducing load.

You can alter the emphasis on specific scapula muscles by changing which leg is extended. Contra-lateral leg extension will bias more lower trapezius activity, whereas ipsilateral leg extension will bias serratus anterior activity.

Refs: Maenhout et al 2010, Cools et al 2007, De Mey et al 2013, Lee et al 2013, de Oliviera et al 2008

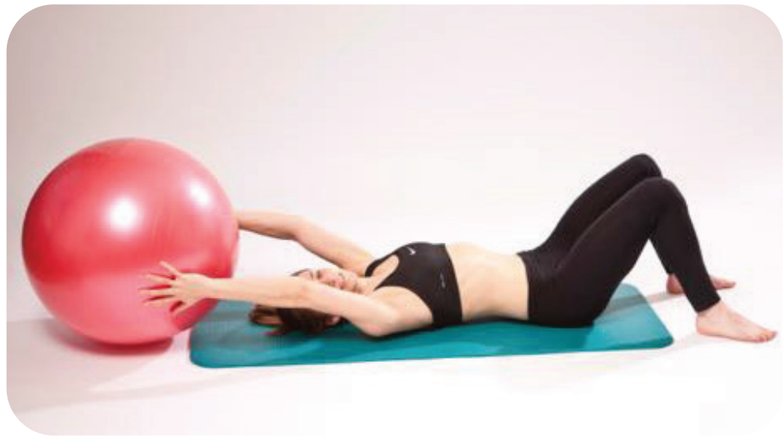
SWISS BALL SUPINE FLEXION

INTERMEDIATE | ROM | S | P | C | KC

Lying on your back, take a swiss ball in both hands and lift slowly over your head as far as you can and then return back to your starting position. Do not allow your lower back to arch.

REPEAT (TIMES)

Adaptation:
If struggling to control lower back, bend your knees with feet flat on floor.



CLINICIAN NOTES:

This exercise aims to emphasise trunk control during upper limb elevation. The gym ball increases the stability challenge due to load, however gently squeezing the ball can help reinforce cuff recruitment through range.

Refs: Elphnston 2013

SHOULDER BRIDGE WITH RESISTANCE BAND LOOP

INTERMEDIATE | ROM | S | P | C | KC

1

2

3

Lay on your back, head supported as required with resistance band looped around both hands. Lift your hips up towards the ceiling. Holding this position with your elbows bent, gently push outwards against the resistance of the band and slowly raise your arms upwards over your head leading with your thumbs. Then take your arms back down before lowering your hips back to the floor.

REPEAT (TIMES)

CLINICIAN NOTES:

Resistance band is used to facilitate the posterior cuff through elevation reinforcing optimal recruitment patterns. Short to long lever exercises reduce load and emphasise selective inter-joint movement.

When patients find it difficult to perform dynamic kinetic chain exercises, static exercises such as the shoulder bridge are helpful to reinforce activation of the trunk and pelvic muscles during shoulder movement.

Ref: Wattanaprakornkul et al 2011, Czaprowski et al 2014, Escamilla et al 2010

SHOULDER BRIDGE WITH STEP

INTERMEDIATE | ROM | S | P | C | KC

Lay on you back without a head support and with your feet on a step. Lift your hips up towards the ceiling until you are resting of your shoulder blades. Holding this position lift one leg off the step and straighten it out whilst keeping your hips level. Do not let your back drop. Hold before lowering yourself back to your starting position.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation Easier:

Do the exercise with your feet on the floor

CLINICIAN NOTES:

It is important to ensure patients don't overuse their erector spinae during this exercise - the basic start position aims to establish a balance between gluteal and back extensor muscle groups. The addition of leg lift and knee extension challenges trunk control.

Refs: Carriere 1998, Elphinston 2013

SHOULDER BRIDGE ON SWISS BALL

INTERMEDIATE | ROM | S | P | C | KC

1

2

Lay on your back with your arms by your sides and your legs supported on the ball. Flatten your back against the floor and then lift up your hips until you are resting on your shoulder blades pushing the ball away as you straighten your legs. Slowly lower back down.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation Harder:
Cross your arms across your chest to challenge your balance.

CLINICIAN NOTES:

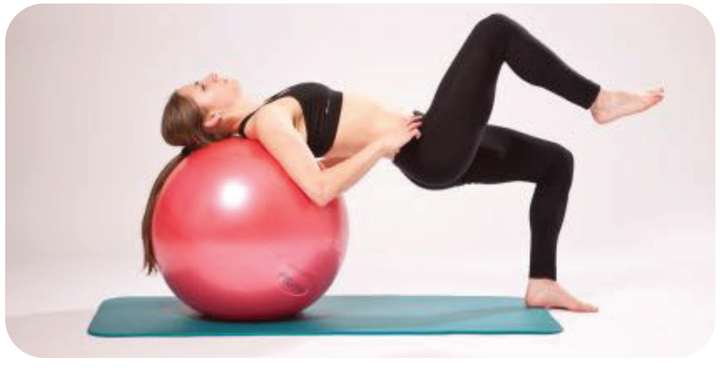
The aim of this exercise is to balance activity of the gluteal and back extensor muscles to increase trunk control. Poor gluteal muscle function has been associated with reduction in shoulder performance in overhead athletes and gluteal strength has been shown to correlate with throwing performance in some overhead sports.

Refs: Elphinston J 2008

SWISS BALL BRIDGE WITH ALTERNATE HEEL RAISE

INTERMEDIATE | ROM | S | P | C | KC

Adaptation



Sit on the ball, then walk your legs out so that your head and shoulders are supported by the ball. Place your hands on your hips. Lift your hips towards the ceiling. Hold this position before lifting each heel slowly and alternatively off the floor. Do not let your hips or pelvis drop during the exercise.

REPEAT (TIMES)

Adaptation 1 Easier:
This exercise is made easier by placing then ball against a wall, so it is more stable.

Adaptation 2 Harder:
Lift alternate hip and knee to 90°

CLINICIAN NOTES:

It is important to ensure patients don't overuse their erector spinae during this exercise - the basic start position aims to establish a balance between gluteal and back extensor muscle groups. The addition of a leg lift challenges trunk control.

Ref: Batbayar et al 2015, Decker 1999, Lee et al 2013

SWISS BALL BRIDGE ABDUCTION WITH STICK

INTERMEDIATE | ROM | S | P | C | KC

Sit on the ball, then walk your legs out so that your head and shoulders are supported by the ball. Your feet need to be flat on the floor and your knees hip width apart. Lift hips so there is a straight line between your rib cage and your knees. Hold the stick in both hands, with your affected arm near to your hip. Take your affected arm in a diagonal movement up and out to the side. Using the stick to apply a gentle stretch at the end of the movement. Return to your starting position.

HOLD FOR (SECONDS)	REPEAT (TIMES)

CLINICIAN NOTES:

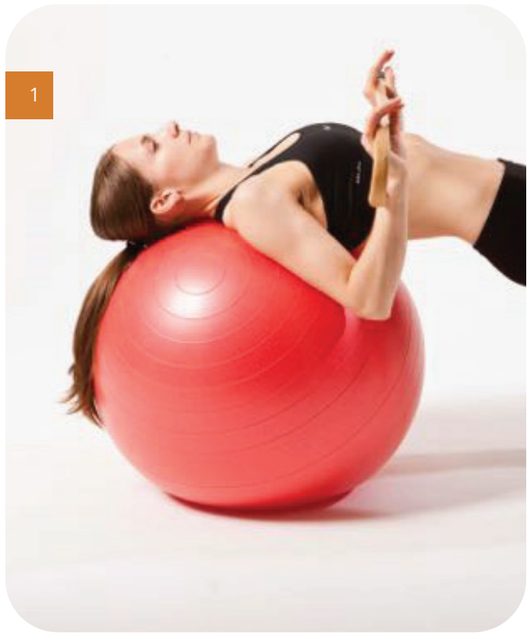
Exercises where the limb load is supported with the use of an external aid such as a stick can be very effective to facilitate range of movement and selective rotator cuff activation without pain or compensatory movement strategies.

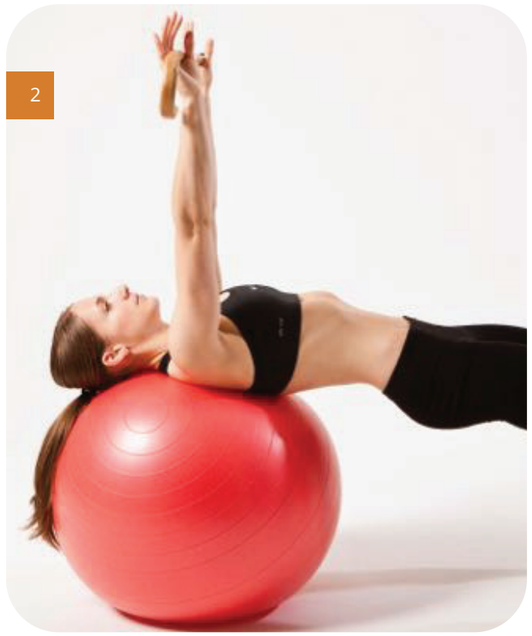
Whilst supporting the upper body on a swiss ball aims to emphasise trunk stability during elevation it does not consistently increase trunk muscle activation in all patients when compared with a stable base of support. The effect can be very variable between patients.

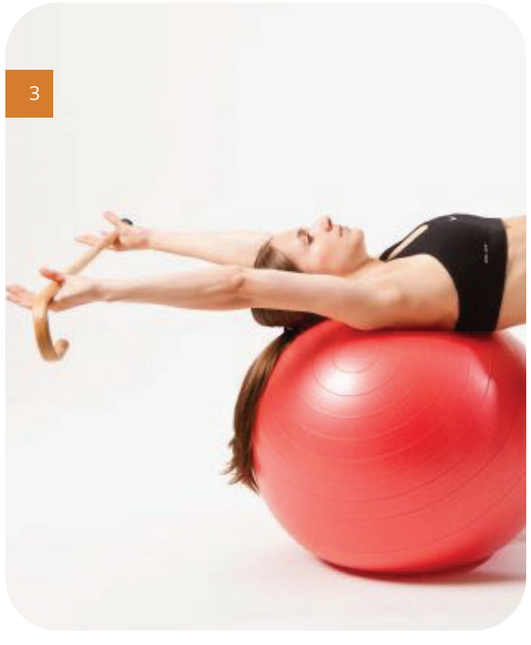
Refs: Marshall et al 2005, Elphinston 2013

SWISS BALL FLEXION WITH STICK

INTERMEDIATE | ROM | S | P | C | KC







Sit on the ball, then walk your legs out so that your head and shoulders are supported by the ball. Holding a stick in both hands with your elbows bent, slowly straighten your elbows and take the stick up to 90° before taking it back over your head.

REPEAT (TIMES)

Adaptation Harder:
Use a medicine ball to increase weight as strength develops

CLINICIAN NOTES:

Whilst supporting the upper body on a swiss ball aims to emphasise trunk stability during elevation it does not consistently increase trunk muscle activation in all patients when compared with a stable base of support. The effect can be very variable between patients.

Refs: Carriere 1998, Elphinston 2013

SWISS BALL ANGEL CIRCLES

INTERMEDIATE | ROM | S | P | C | KC

Sit on the ball, then walk your legs out so that your head and shoulders are supported by the ball. Using some light weights, take your hands out to the side into an arc movement, over your head and back down to your sides again.

REPEAT (TIMES)

Adaptation Easier:
Do this without weights.

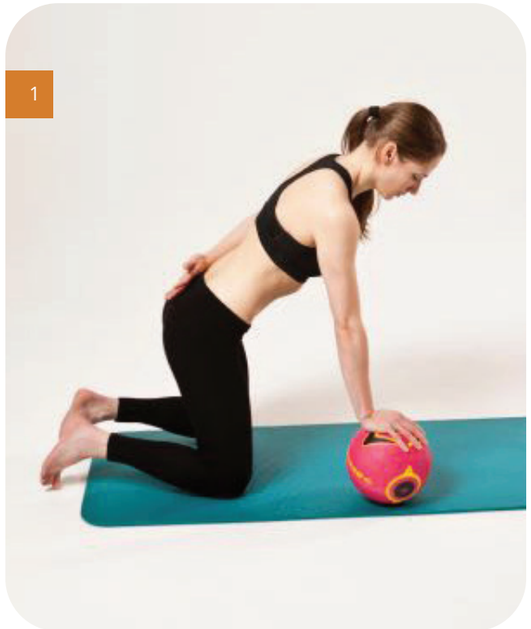
CLINICIAN NOTES:

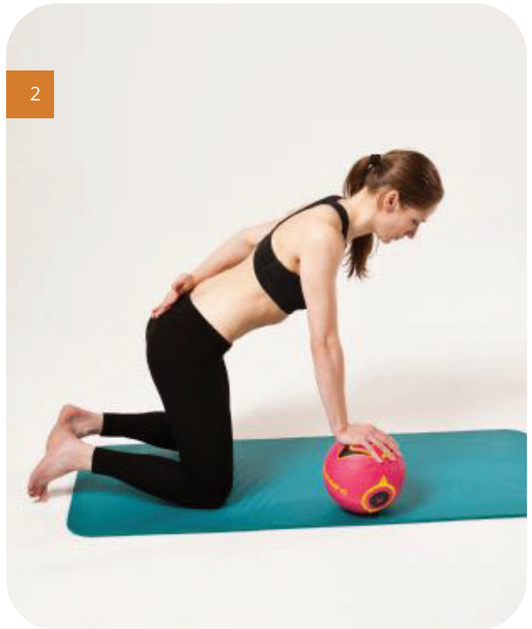
Whilst supporting the upper body on a swiss ball aims to emphasise trunk stability during elevation it does not consistently increase trunk muscle activation in all patients when compared with a stable base of support. The effect can be very variable between patients.

Refs: Carriere 1998, Elphinston 2013

ARM PROTRACTION / RETRACTION ON BALL

INTERMEDIATE | ROM | S | P | C | KC





Kneeling with one hand behind your back and the other on a ball. Keep your arm straight at the elbow and your hand fixed on the ball. Slowly bring your shoulder blade backwards, then let it come forward again.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip:

Avoid shrugging the shoulder up. Avoid rotating or twisting your trunk.

CLINICIAN NOTES:

It is important to be clear what the key aim is of exercises on an unstable base. It is commonly assumed that an unstable base such as a ball increases activation of the shoulder musculature. However this is not supported in the literature.

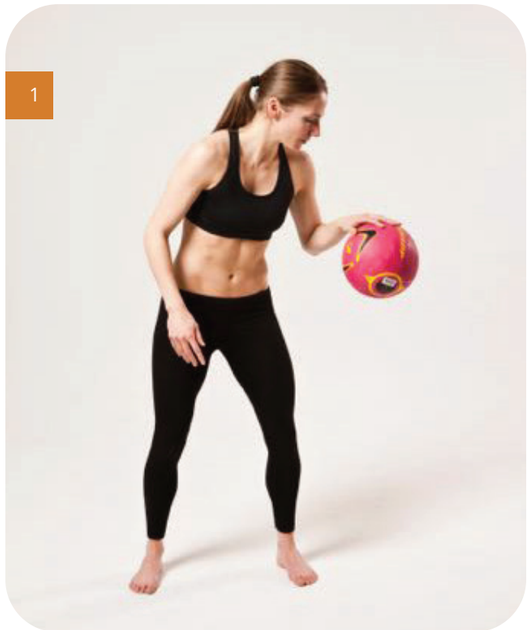
Benefits may relate more to the proprioceptive and stability benefits of the exercise.

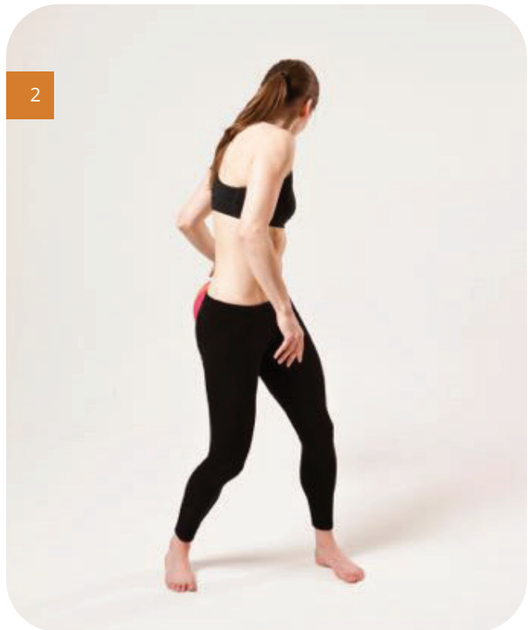
This exercise is a feature of exercise programmes that report successful outcomes in the treatment of shoulder instability

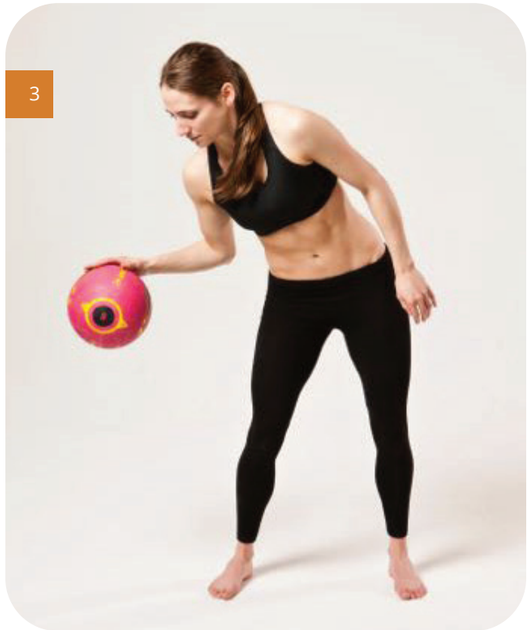
Refs: de Arayo, et al 2011, de Oliveira et al 2008, Maenhout et al 2010, Bateman et al

BALL BOUNCING AROUND THE BODY

INTERMEDIATE | ROM | S | P | C | KC







Stand with feet hip width apart and keep feet facing forward through the exercise. Start to bounce ball with left hand behind the body rotating your trunk as far as you can then swap hands and bounce the ball to the front. Repeat the exercise in the opposite direction starting with the right hand.

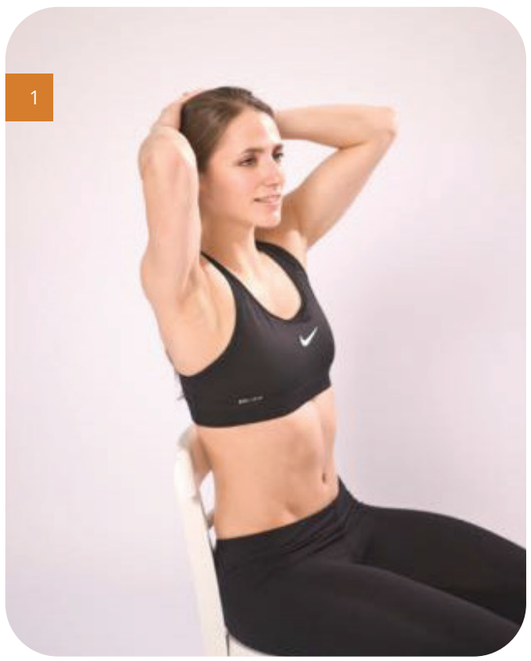
REPEAT (TIMES)

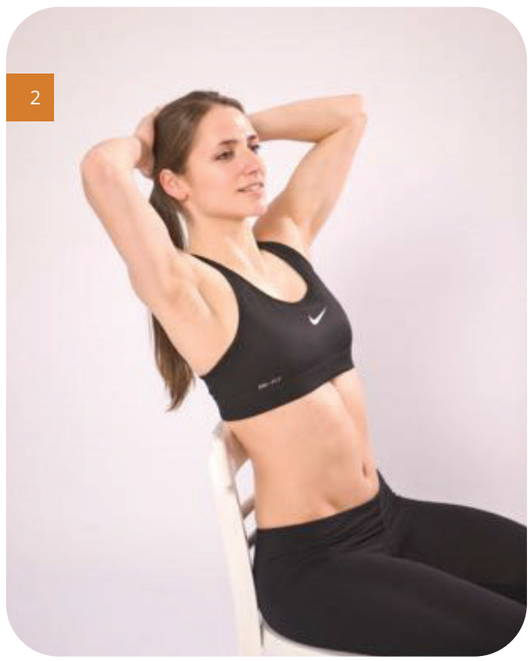
CLINICIAN NOTES:

Ball bouncing around the trunk encompasses coordination, visual input and proprioception together with encouraging cervical and thoracic rotation.

THORACIC EXTENSION OVER A CHAIR

INTERMEDIATE | ROM | S | P | C | KC





Sitting in a chair, place both hands behind your head to support your head and neck. Lean back over the chair, feel a stretch in your mid back.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation Easier:
If you are unable to put your hands behind your head, place them across your chest, or use the unaffected arm only.

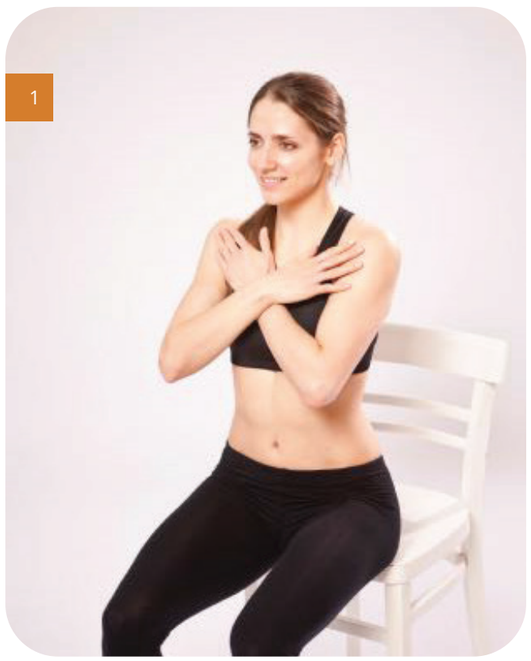
CLINICIAN NOTES:

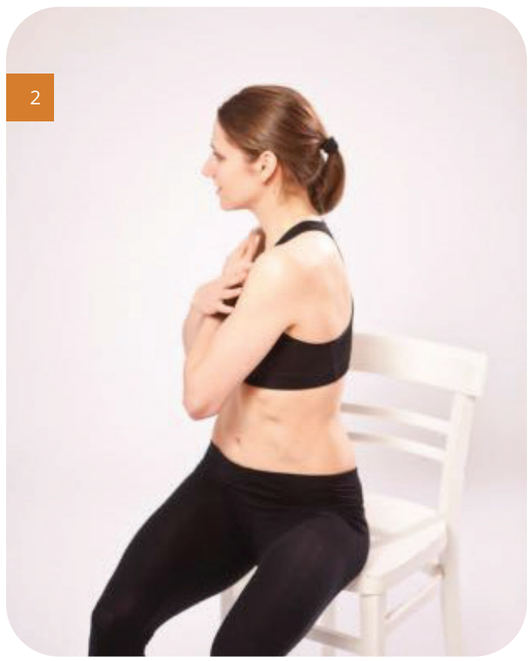
The thorax has a significant influence on upper limb function. Slumped posture is associated with reduced elevation range, increased demand on the scapula musculature.

Refs: Kebaetse et al 1999, Malstrom et al 2015

THORACIC ROTATIONAL STRETCH

INTERMEDIATE | ROM | S | P | C | KC





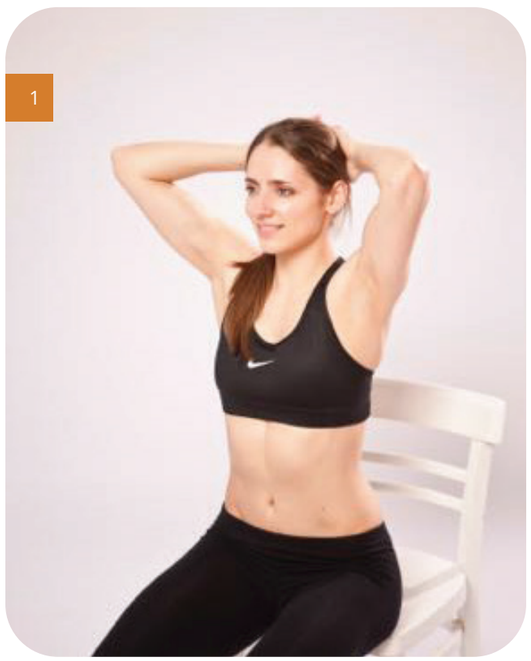
In sitting cross your arms across your chest. Keeping your hips and pelvis still twist your body to the right, feeling a stretch in your mid back. Repeat, turning towards your left until you feel a stretch in your mid back.

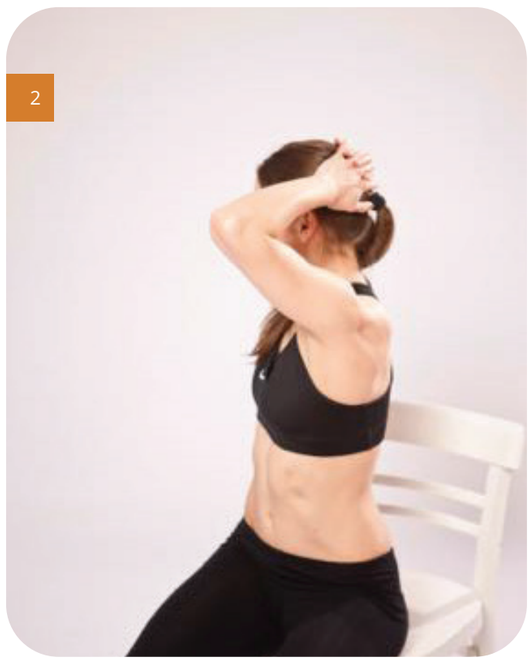
HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation: Intermediate

Place your hands behind your head

Adaptation: Intermediate





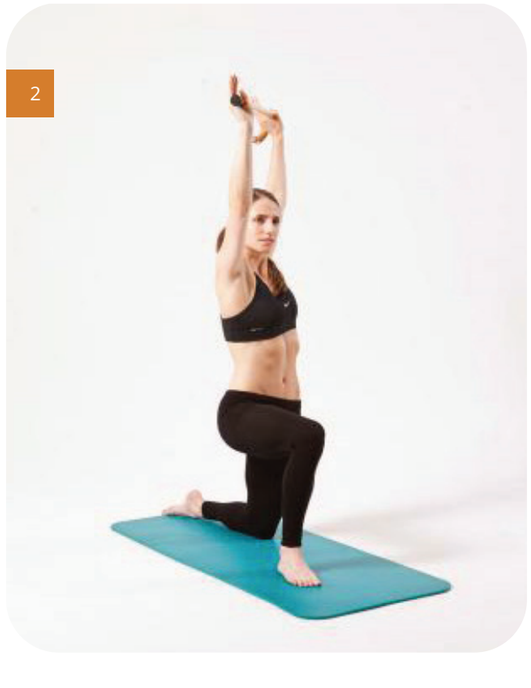
CLINICIAN NOTES:

The thorax has a significant influence on upper limb function. The addition of trunk rotation to upper limb exercises enhances scapula muscle recruitment.

Refs: Yamauchi et al 2015, Elphinston 2013, Cook 2010

STEP LUNGE GRAY COOK, THORACIC ROTATION

INTERMEDIATE | ROM | S | P | C | KC



Kneel down in a lunge position whilst holding a stick high above your head, with your elbows as straight as comfortable but not fully locked. Keeping your hips facing forwards at all times turn your body first left so that the stick becomes parallel to your leading knee, then turn to the right so the same occurs in the opposite direction. Let the movement happen from the trunk and keep the hips and knee stable and steady at all times.

HOLD FOR (SECONDS)	REPEAT (TIMES)

CLINICIAN NOTES:

The thorax has a significant influence on upper limb function. The addition of trunk rotation to upper limb exercises enhances scapula muscle recruitment.

Refs: Yamauchi et al 2015, Elphinston 2013, Cook 2010

THORACIC EXTENSION OVER A FOAM ROLLER

INTERMEDIATE | ROM | S | P | C | KC

1

2

Adaptation:

Sit on the floor and place a foam roller at the base of your shoulder blades. Place both hands behind your head to support your head and neck and then lean back over the foam roller feeling a stretch in the mid back. If the foam roller feels uncomfortable on your back, move it slightly higher or lower to a more comfortable position.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation Harder:

Lift your bottom up off the floor before you lean back over the foam roller.

CLINICIAN NOTES:

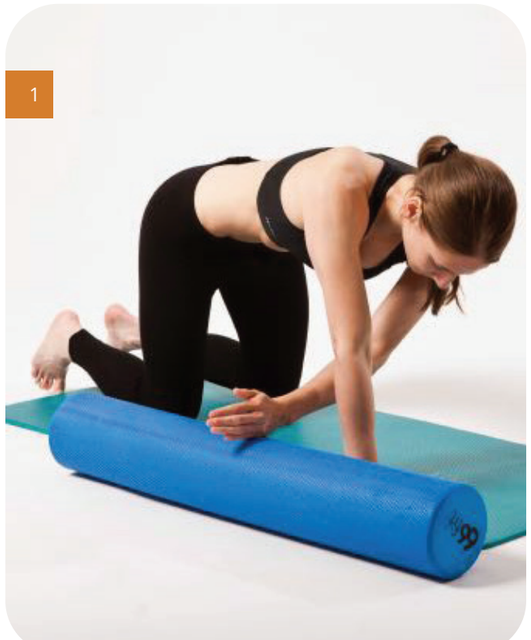
The thorax has a significant influence on upper limb function. Slumped posture is associated with reduced elevation range and increased demand on the scapula musculature.

Refs: Kebaetse et al 1999, Malstrom et al 2015

THREAD THE NEEDLE WITH FOAM ROLLER

INTERMEDIATE | ROM | S | P | C | KC

1



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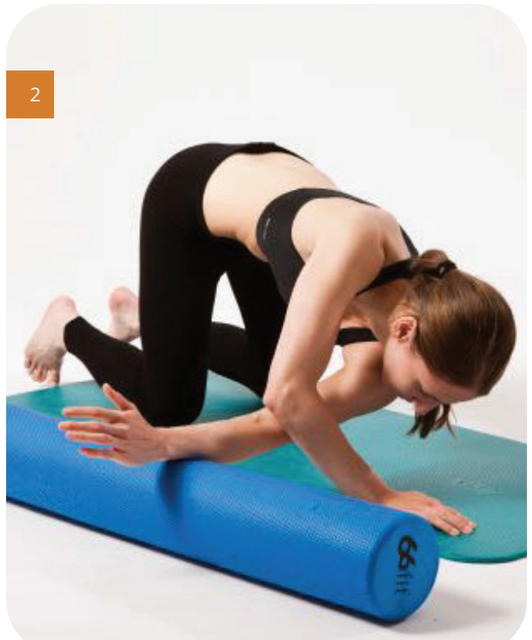


In 4 point kneeling, place the foam roller parallel to your body. “Thread” your hand furthest away from the foam roller under the other arm and rest the back of this hand on the foam roller. Let your hand and forearm roll over the foam roller, pushing it away from your body so that your body twists and your elbow bends on the supporting arm. Keep your weight as evenly as possible on your legs and supporting arm throughout this movement.

HOLD FOR (SECONDS)	REPEAT (TIMES)

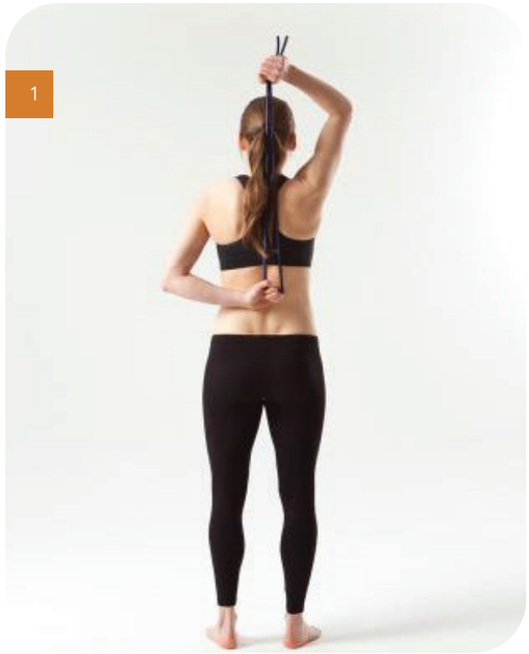
CLINICIAN NOTES:

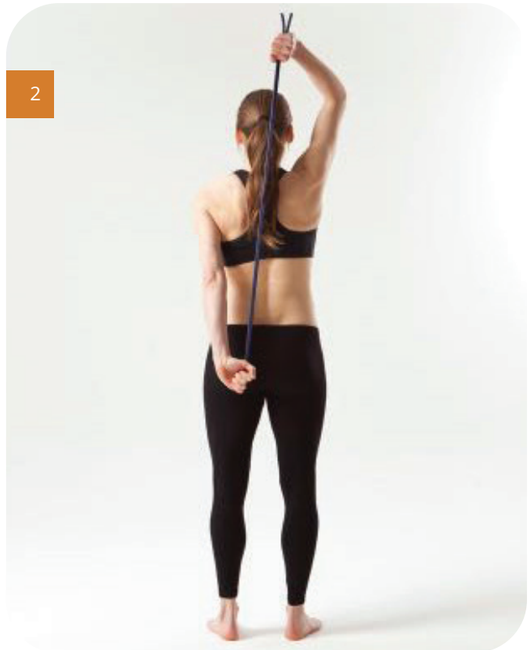
The thorax has a significant influence on upper limb function. The addition of trunk rotation to upper limb exercises enhances scapula muscle recruitment.

Refs: Yamauchi et al 2015, Elphinston 2013, Cook 2010

INTERNAL ROTATION STRETCH WITH HIGH RESISTANCE BAND

INTERMEDIATE | ROM | S | P | C | KC





In standing with your feet hip width apart. Use a high resistance band. Hold on to the band with your affected arm at hip height, with your other hand behind your head. Straighten the elbow on the affected arm working against the resistance of the band. Let the elbow bend again, taking your hand a little further up your back on the return movement.

REPEAT (TIMES)

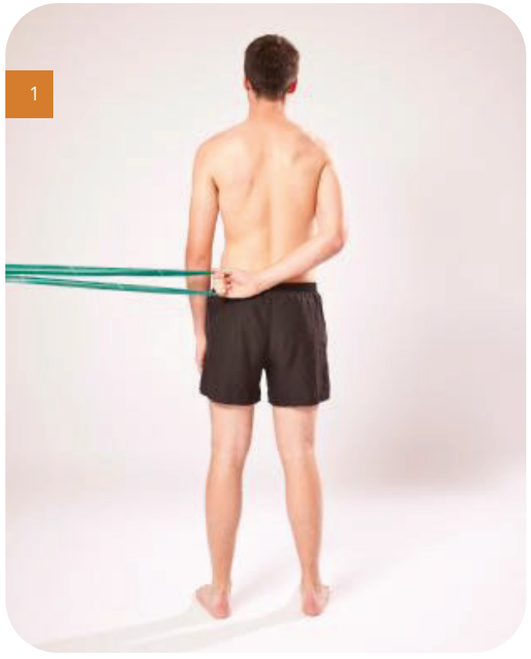
CLINICIAN NOTES:

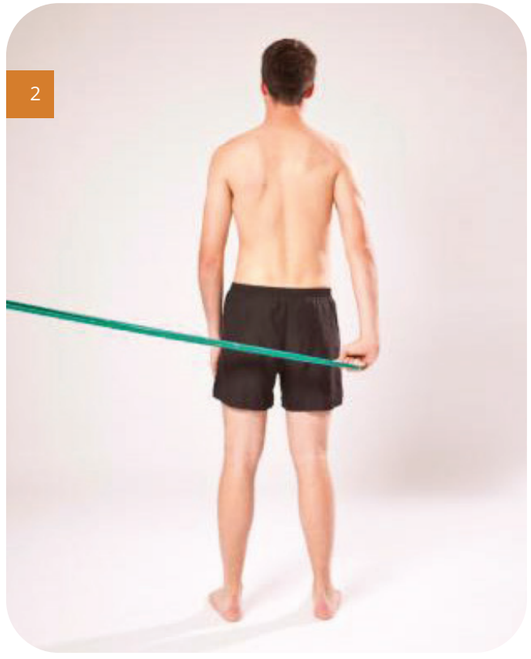
The internal rotation stretch is a composite movement and does not specifically target one part of the capsular complex. It is important to assess rotation through range (both internal and external rotation) to identify the part of the capsule that is tight.

Refs: Walton & Russell 2015

HAND BEHIND BACK - HOLD RELAX ABDUCTION AND EXTENSION

INTERMEDIATE | ROM | S | P | C | KC





In standing with your feet hip width apart using a high resistance band. Hold on to the band with your affected arm behind your back and the other end of the band fixed to a door. Straighten the elbow on the affected arm working against the resistance of the band and then return to your start position.

REPEAT (TIMES)

CLINICIAN NOTES:

The PNF concept of reciprocal relaxation may assist the increase in ROM.

Rowlands et al 2003, Margarey & Jones 2003

LATERAL PLANK

INTERMEDIATE | LATE | ROM | S | P | C | KC

Lying on your side, with your knees and hips slightly flexed. Lean along your forearm with your elbow positioned under your affected shoulder. Lift your hips up straightening your knees and hips, until you are resting on your feet and elbow.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation Harder:

1. You can go into a lateral high plank by straightening your supported arm.
2. Late - lift the top leg to challenge your balance.

CLINICIAN NOTES:

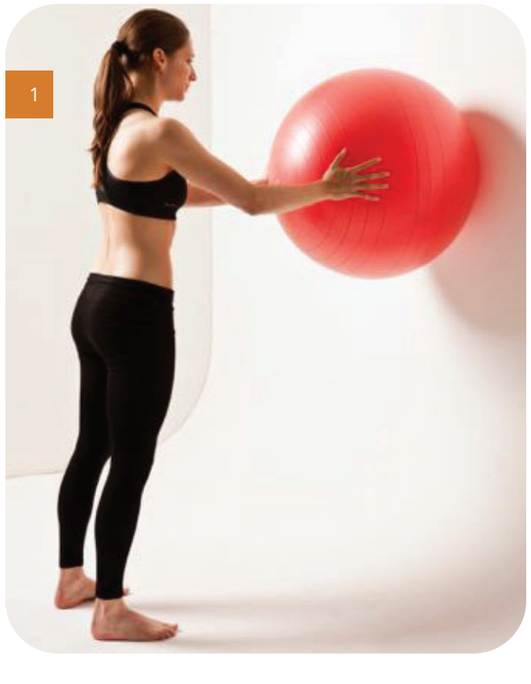
The side plank has been shown to be particularly effective at activating the gluteal muscles at a level necessary for strengthening.

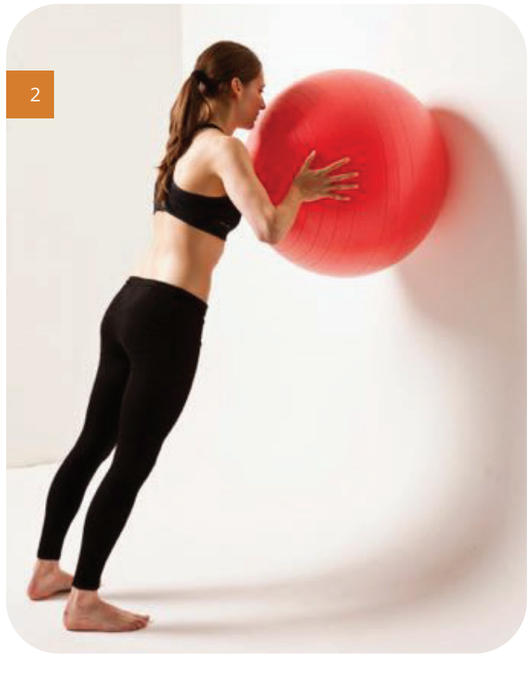
Poor gluteal muscle function has been associated with reduction in shoulder performance in overhead athletes and gluteal strength has been shown to correlate with throwing performance in some overhead sports.

Refs : Riemann et al 2012,Ekstrom et al 2007, Sher et al 2010, Kibler et al 2013

SWISS BALL PRESS UP AGAINST WALL

INTERMEDIATE | LATE | ROM | S | P | C | KC





Standing facing a wall, with your feet hip width apart, Swiss Ball against wall at shoulder height. Hands on swiss ball, start with your elbows almost straight and then lean onto the ball and do a press up bending your elbows. Return to your start position. Ensure you stay open across your collar bones, your back straight and maintain a good neck position throughout the movement.

REPEAT (TIMES)

Tip: To make this exercise easier place ball in the corner of the room to stabilize the ball.

CLINICIAN NOTES:

Weight bearing on the ball enhances the proprioceptive and sensory aspects of the exercise. The wall press is an effective way to recruit the rotator cuff and scapula muscles at relatively low load and coordinate shoulder girdle and trunk control.

Refs: Elphinston 2013, Carriere 1998

SWISS BALL BRIDGE WITH ALTERNATE KNEE EXTENSION

INTERMEDIATE | LATE | ROM | S | P | C | KC

1

2

Sit on the ball, then walk your legs out so that your head and shoulders are supported by the ball. Place your hands on your hips. Lift your hips towards the ceiling. Hold this position before straightening your leg slowly, then lower. Repeat with opposite leg. Do not let your hips or pelvis drop during the exercise.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation Easier: Put ball in corner of room.

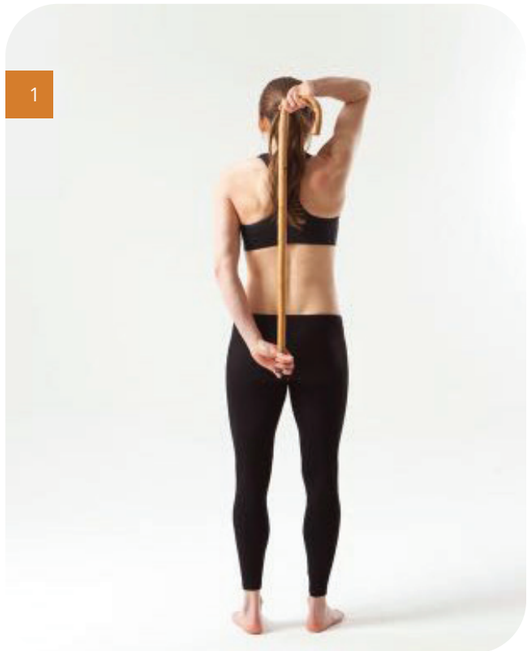
CLINICIAN NOTES:

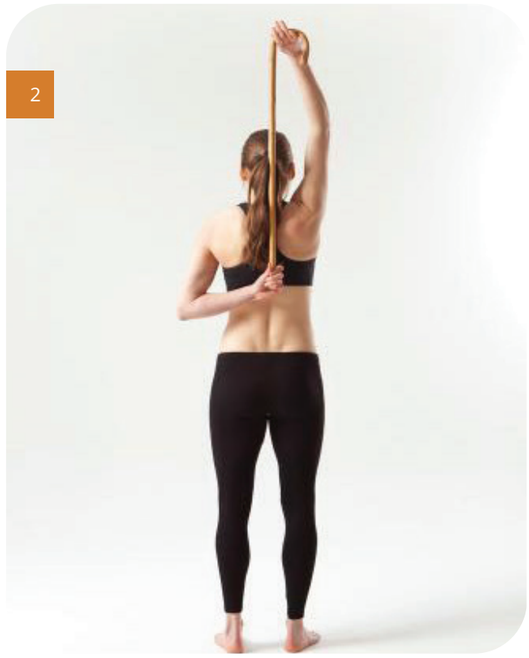
It is important to ensure patients don't overuse their erector spinae during this exercise - the basic start position aims to establish a balance between gluteal and back extensor muscle groups. The addition of a leg lift challenges trunk control.

Refs: Carriere 1998, Elphinston 2013

HAND BEHIND BACK - STRETCH WITH STICK

INTERMEDIATE | LATE | ROM | S | P | C | KC





In standing with the feet hip width apart, place a stick behind your back, with the affected arm at hip height and the unaffected hand behind your head. Use the unaffected hand to pull the affected arm further up your back, applying a stretch at the end of the movement. Return to your start position.

REPEAT (TIMES)

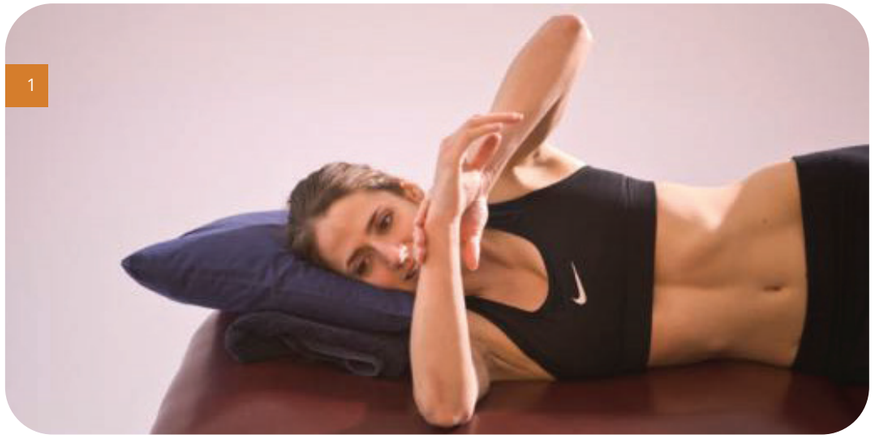
CLINICIAN NOTES:

The internal rotation stretch is a composite movement and does not specifically target one part of the capsular complex. It is important to assess rotation through range (both internal and external rotation) to identify the part of the capsule that is tight.

Refs: Walton & Russell 2015

SLEEPER STRETCH, HOLD RELAX TECHNIQUE

INTERMEDIATE | LATE | ROM | S | P | C | KC



Lie on your affected side, with your shoulder at 90° and your elbow flexed to 90°. Take your affected hand down towards the bed as far as it will go. Then gently resist the movement with your unaffected hand. Relax and then push your hand a little bit further towards the bed. Repeat and gradually increase your range of movement.

HOLD FOR (SECONDS)	REPEAT (TIMES)

CLINICIAN NOTES:

It is important to differentiate the driver of stiffness i.e. is it capsular or muscle stiffness? Muscle stiffness will respond rapidly to hold-relax techniques, however if there is a capsular component it is important to identify which specific part of the capsule is tight*. Due to the inter-digitation of the cuff and capsule exercises addressing the appropriate part of the cuff have potential to enhance range.

Refs: Maenhout et al 2012, Wilk et al 2013, Walton & Russell 2015*

FORWARD ELBOW PLANK

INTERMEDIATE | LATE | ROM | S | P | C | KC

Starting on your elbows and knees, lower into a plank position. Ensure your weight is going through your elbows and shoulders. Do not allow your back to dip. Lower onto your knees to rest.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation Harder:
Forward Full plank In a high plank position, hands are placed shoulder width apart, elbows are straight, but do not over extend. Most weight should go through your hands and shoulders. Maintain good alignment by not allowing your pelvis and lower back to dip. Lower onto knees to rest

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation: Forward Full plank

CLINICIAN NOTES:

Plank recruits the core musculature at levels consistent with strengthening. Plank on the floor recruits latissimus dorsi at lower levels than plank on a gym ball.

Lack of core muscle endurance has been postulated as a potential factor in shoulder pathology in overhead and contact athletes.

Ref: Escamilla et al 2016, Kibler et al 2013, Sher 2010

JACK KNIFE

INTERMEDIATE | LATE | ROM | S | P | C | KC

Walk yourself forward over the ball using your hands until the front of your thighs are resting on the ball and you are in the 'plank' position. Keep your pelvis and back level. Do not let your lower back drop throughout the movement. Slowly bring your knees up towards your chest, taking the ball with you. Slowly take your legs back out straight again.

REPEAT (TIMES)

CLINICIAN NOTES:

Supporting the body on a swiss ball does not consistently increase trunk muscle activation compared with a stable base of support. The main benefits appear to be proprioceptive. Dissociating the body around the arm enables full elevation range with compression throughout the range.

Refs: De Oliviera et al 2008, Kalantari et al 2014

SIDE TO SIDE WITH STICK IN LYING

LATE | ROM | S | P | C | KC

1

2

In lying. Hold onto a stick with both hands. Take your affected arm out to the side, using the stick apply a gentle stretch at the end of the movement. Return to your start position.

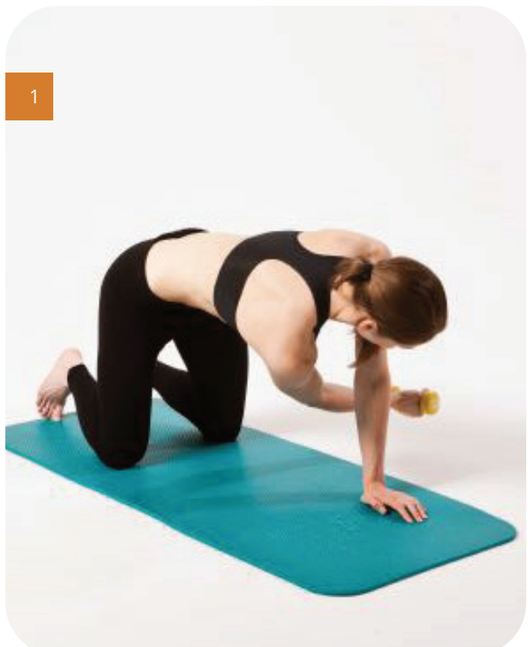
HOLD FOR (SECONDS)	REPEAT (TIMES)

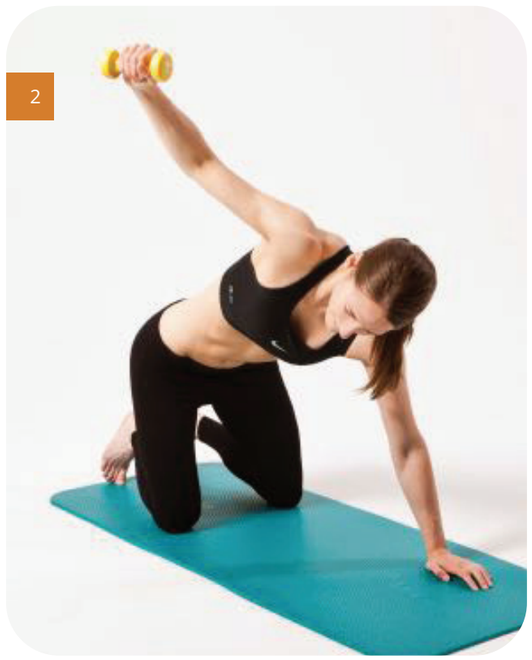
CLINICIAN NOTES:

Exercises where the limb load is supported with the use of an external aid such as a stick can be very effective to facilitate range of movement and selective rotator cuff activation without pain or compensatory movement strategies.

THREAD THE NEEDLE WITH WEIGHT

LATE | ROM | S | P | C | KC





In 4 point kneeling with a weight in the affected hand “thread” the arm holding the weight underneath your supporting arm, letting your body twist as you do so. Keep your weight as evenly distributed as possible on your supporting limbs. Once you have reached as far as you can go, take the weighted arm back and lift it behind you as far as you comfortably can, letting your body twist in the other direction.

REPEAT (TIMES)

CLINICIAN NOTES:

The thorax has a significant influence on upper limb function. The addition of trunk rotation to upper limb exercises enhances scapula muscle recruitment.

Refs: Yamauchi et al 2015

SHOULDER BRIDGE WITH SCISSOR ARM

LATE | ROM | S | P | C | KC

1

2

3

Lay on your back, head supported and arms straight by your sides. Lift your hips up towards the ceiling until you are resting on your shoulder blades. Holding this position do not let your middle drop whilst slowly raising each arm straight over your head in an alternate scissor motion.

REPEAT (TIMES)

Adaptation:

Use hand weights to add resistance

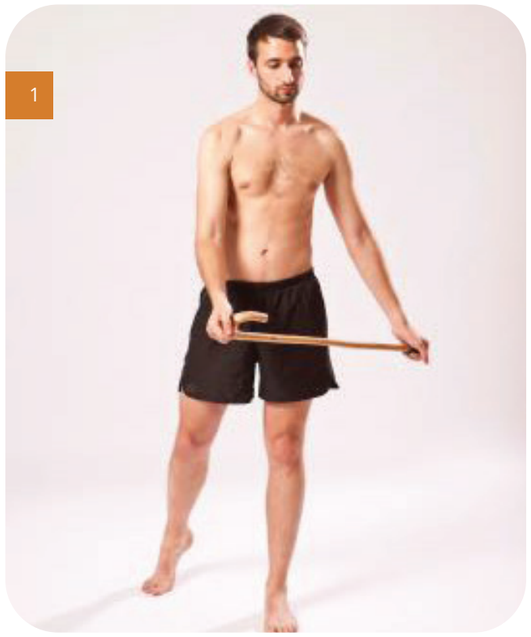
CLINICIAN NOTES:

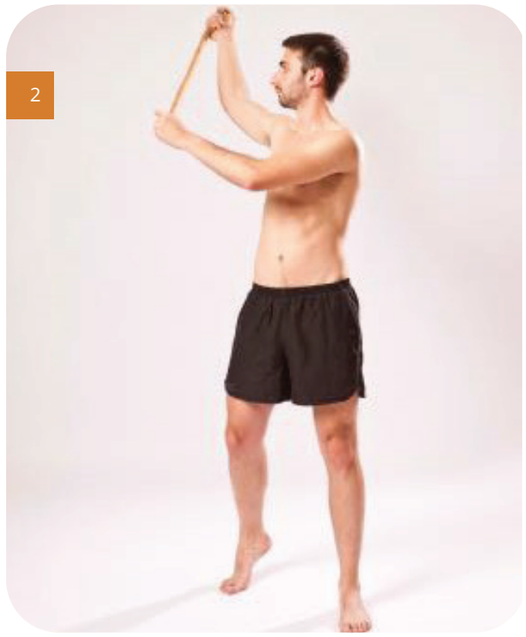
When patients find it difficult to perform dynamic kinetic chain exercises, static exercises such as the shoulder bridge are helpful to reinforce activation of the trunk and pelvic muscles during shoulder movement.

Refs: Czaprowski et al 2014, Escamilla et al 2010

COMBINED ABDUCTION AND EXTERNAL ROTATION WITH STICK IN STANDING

LATE | ROM | S | P | C | KC





In step standing, holding a stick in both hands. Take your affected arm out to the side and up to 90°. Use the stick to apply gentle pressure at the end of the movement. Let your weight transfer from the front leg to the back leg as you progress through the movement

HOLD FOR (SECONDS)	REPEAT (TIMES)

CLINICIAN NOTES:

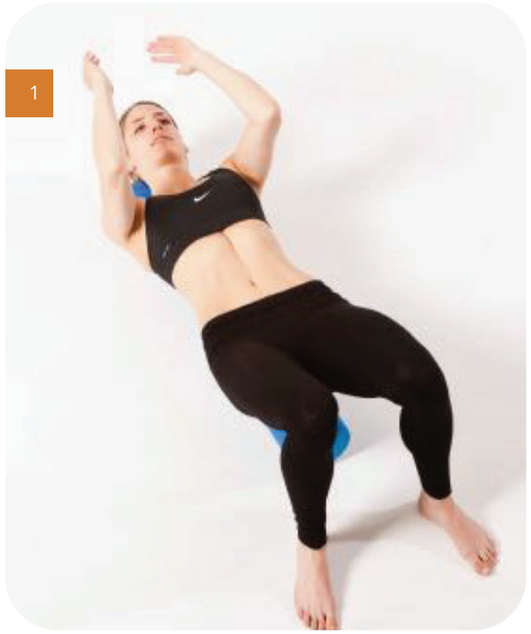
Exercises where the limb load is supported with the use of an external aid such as a stick can be very effective to facilitate range of movement and selective rotator cuff activation without pain or compensatory movement strategies.

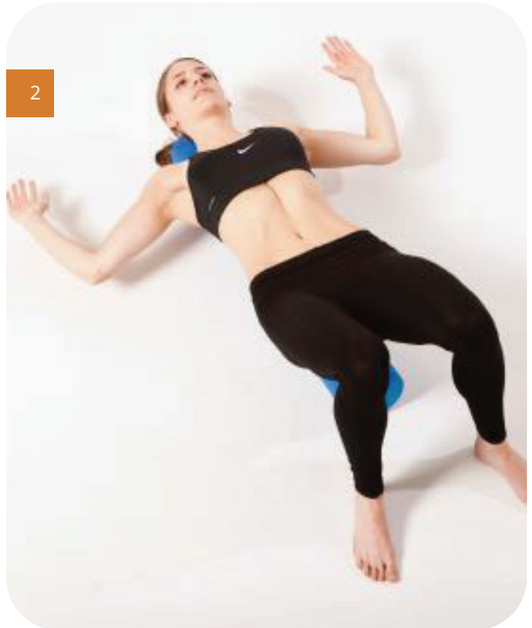
Reinforcing thoracic rotation and weight transfer through the lower quadrant enhances recruitment of the scapula muscles

Refs: Yamauchi et al 2015

PECTORALIS STRETCH ON A FOAM ROLLER

LATE | ROM | S | P | C | KC





Sit on the end of the foam roller and then lie on the foam roller length ways so your spine and head are fully supported. Take your arms up to 90° forwards, then keeping the elbows bent take your arms out to the side, feeling a stretch across the front of your chest.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaption:

Can also do at 120 degrees to target upper part of the pectoralis major.

Adaptation:

CLINICIAN NOTES:

Patients often report positive effects with stretching exercises, however it is important to reason the cause of movement restriction. Commonly muscle stiffness results from lack of strength or poor recruitment and does not represent true shortening.

Refs: Morton et al 2011, Leite et al 2015

PECTORALIS STRETCH ON PLINTH

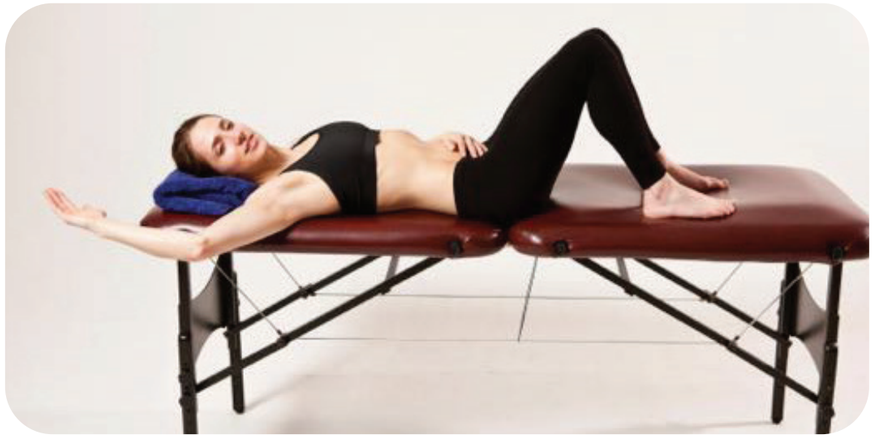
LATE | ROM | S | P | C | KC

1

Lay on your back on the bed with your legs bent and head supported. Take your arm out to the side of your body so that your arm and elbow are both bent to 90°. Let gravity take your arm towards the floor and feel a stretch across the front of your shoulder.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation:



Adaptation:

Let your arm come up higher (approximately 120°) before you let gravity take the arm back towards the floor.

HOLD FOR (SECONDS)	REPEAT (TIMES)

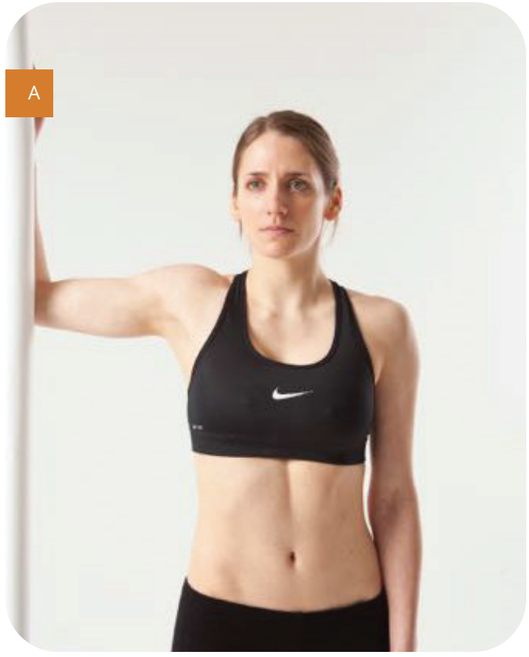
CLINICIAN NOTES:

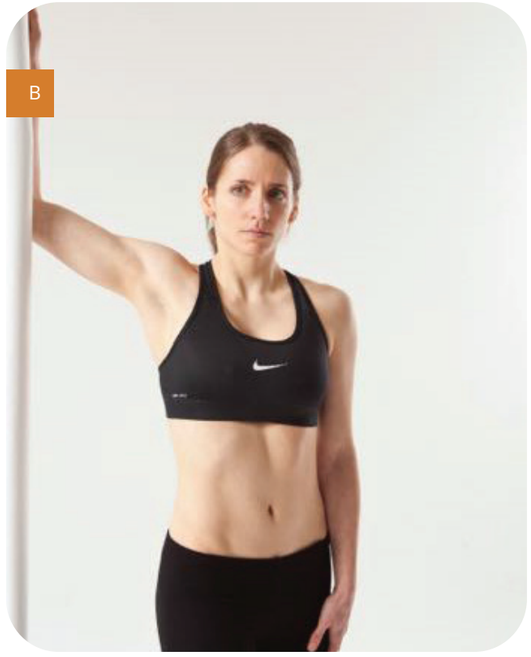
Patients often report positive effects with stretching exercises, however it is important to reason the cause of movement restriction. Commonly muscle stiffness results from lack of strength or poor recruitment and does not represent true shortening.

Refs: Morton et al 2011, Leite et al 2015

PECTORALIS STRETCH IN A DOORWAY

LATE | ROM | S | P | C | KC





A. Clavicular: Stand in a doorway with your forearm resting on the door frame and your elbow and shoulder at 90°. Maintain good posture and face forwards throughout. Take a small step forwards (with the leg on the side you are stretching) whilst keeping your forearm relaxed and resting on the door frame. You should feel a stretch over the front of your chest.

HOLD FOR (SECONDS)	REPEAT (TIMES)

B. Sternal: Stand in a doorway with your forearm resting on the door frame. Slide your arm up the door frame so that your shoulder is at roughly 120°. Maintaining good posture with your arm relaxed, step and twist slightly away from the door frame so that you feel a stretch over the front of your chest

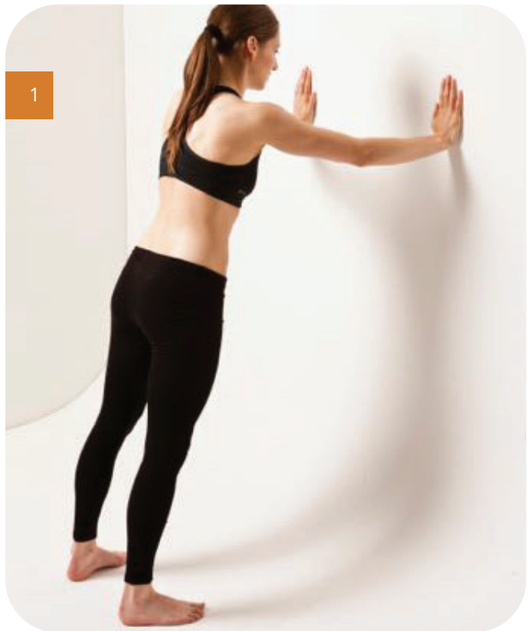
CLINICIAN NOTES:

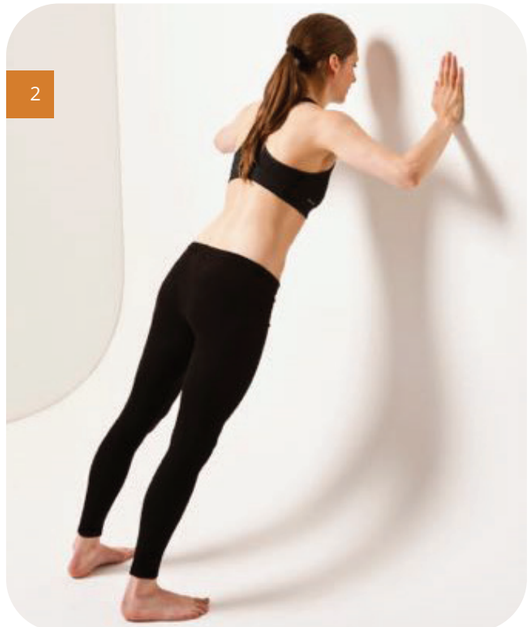
Patients often report positive effects with stretching exercises, however it is important to reason the cause of movement restriction. Commonly muscle stiffness results from lack of strength or poor recruitment and does not represent true shortening.

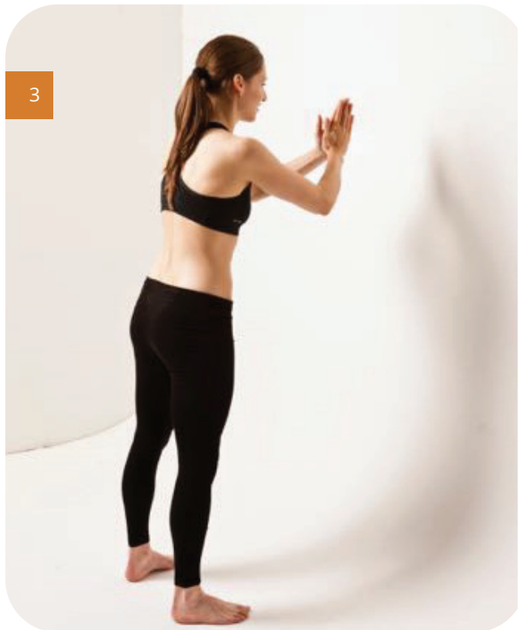
Refs: Morton et al 2011, Leite et al 2015

PLYOMETRIC WALL PRESS UP

LATE | ROM | S | P | C | KC







Stand feet hip width apart with your hands on the wall. Maintain a good posture and scapula control throughout the exercise. Bend elbows to 90° lowering your body to the wall, then push back quickly and clap your hands before they are placed back on the wall.

REPEAT (TIMES)

CLINICIAN NOTES:

Plyometric shoulder exercise programs have been shown to enhance proprioception and kinesthesia.

Altering the start position can influence upper limb recruitment patterns. One legged wall push up increases serratus anterior activity compared to bipedal - the difference is greatest when wall push up is on the contralateral leg to the affected shoulder.

The dynamic wall press is a feature of exercise programmes that report successful outcomes in the treatment of shoulder instability.'

Ref: Bateman et al 2015, Swanik et al 2002, Maenhout et al 2015

DIAGONAL PATTERNS WITH 2 BALLS

LATE | ROM | S | P | C | KC

Lie on your back with your knees bent and feet flat on the floor. One ball is next to your right hip and the other is next to your left hip. Move the ball next to your right hip with both hands diagonally across the body to above the left shoulder and leave it. Repeat the same movement with the other ball to above the opposite shoulder. Then, move the ball from above the left shoulder diagonally across the body to the right hip. Repeat the same move with the other ball above the right shoulder to the left hip.

REPEAT (TIMES)

Adaption: Harder:

A medicine ball can be used to add resistance to this exercise.

This can be further challenged by increasing the speed.

CLINICIAN NOTES:

This exercise uses the principles of proprioceptive neuromuscular facilitation with the addition of load to enhance neuromuscular control.

Upper limb exercises using the principles of propriceptive neuromuscular facilitation have been shown to increase muscle activation increase activation in the lower quadrant. Encouraging visual tracking of the ball enhances cervical and thoracic rotation.

Refs: Abreu et al 2015, Voss et al 1985, Witt et al 2011, Hindle et al 2012

DIAGONAL PATTERNS ON A FOAM ROLLER

LATE | ROM | S | P | C | KC

Lying on a foam roller lengthways. Start with the ball above your affected shoulder. Take the ball in a diagonal pattern down to the opposite hip. Then move the ball over the body to the other hip before you take the ball across the body to the opposite shoulder and repeat.

REPEAT (TIMES)

Adaptations:

1. Use a medicine ball to add some resistance into the exercise
2. Vary the speed of the exercise

CLINICIAN NOTES:

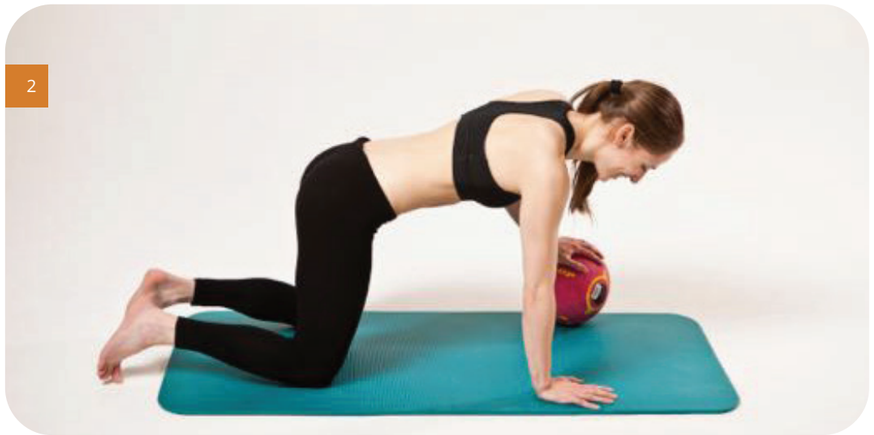
This exercise uses the principles of proprioceptive neuromuscular facilitation with the addition of load to enhance neuromuscular control.

Upper limb exercises using the principles of propriceptive neuromuscular facilitation have been shown to increase muscle activation increase activation in the lower quadrant.

Refs: Abreu et al 2015, Voss et al 1985, Witt et al 2011, Hindle et al 2012

DYNAMIC BALL ROLL

LATE | ROM | S | P | C | KC



In 4 point kneeling put one hand on a football. Keep your pelvis and back stable throughout this exercise. This dynamic exercise involves pushing off the hand which is stable on the floor whilst pushing the football towards the opposite side and alternating this movement.

REPEAT (TIMES)

CLINICIAN NOTES:

The dynamic ball roll incorporates plyometrics with closed chain positions to enhance proprioceptive value.

Refs: De Oliviera et al 2008, Kalantari et al 2014

CRAB TO HAND SLIDE

LATE | ROM | S | P | C | KC

In high plank position with knees slightly bent and a resistance band looped around your wrists/hands. Keep your pelvis and back stable throughout this exercise. Slide your right arm away from your body as directed by your therapist. Repeat using your left arm.

REPEAT (TIMES)

CLINICIAN NOTES:

Closed kinetic chain exercises are a valuable tool in improving neuromuscular control of the shoulder. Increasing load will increase activation levels and increase proprioceptive value. The elastic band is used to reinforce activation of the posterior cuff during elevation.

Closed chain exercises moving into risk positions after stabilisation surgery can be very useful to increase confidence and emphasise the stability function of the rotator cuff.

Refs: Tucker et al 2010, Wattanaprakornkul et al 2011

FULL PLANK WITH A HAND SLIDE

LATE | ROM | S | P | C | KC

Place a loop of resistance band around your wrists. Go into a full plank position with your hands beneath your shoulders maintaining good scapula control. Slide your affected arm away from your body as instructed by your therapist. Repeat using other arm.

REPEAT (TIMES)

CLINICIAN NOTES:

Closed kinetic chain exercises are a valuable tool in improving neuromuscular control of the shoulder. Increasing load will increase activation levels and increase proprioceptive value. The elastic band is used to reinforce activation of the posterior cuff during elevation.

Closed chain exercises moving into risk positions after stabilisation surgery can be very useful to increase confidence and emphasise the stability function of the rotator cuff.

Refs: Tucker et al 2010, Wattanaprakornkul et al 2011

POSTERIOR ELBOW PLANK

LATE | ROM | S | P | C | KC

Lying on your back, resting on your elbows. Lift your hips so that you are resting on your heels and forearms.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation : Posterior Full Plank
Start in a long sitting position with your hands, fingers facing forward on the floor at your hips. Lift your hips and straighten your elbows so that you are in a plank position resting on your heels and hands. Keep your neck in a neutral position

HOLD FOR (SECONDS)	REPEAT (TIMES)

Progression:
Lift alternate legs.

PLANK WITH ALTERNATE HIP EXTENSION

LATE | ROM | S | P | C | KC

1

2

Facing down on to a mat on your elbows and knees. Extend your knees, keeping your body in a straight line. In this plank position lift your right leg up a little maintaining a level pelvis. Hold then lower. Repeat using the left leg.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tip:

Take care that you do not lift the leg too high, This will cause the pelvis to twist.

CLINICIAN NOTES:

You can alter the emphasis on specific scapula muscles by changing which leg is extended. In similar exercises contra-lateral leg extension has been shown to bias more lower trapezius activity, whereas ipsi-lateral leg extension will bias serratus anterior activity.

Refs Maenhout et al 2010

PUSH UP ON THE BALL IN KNEELING

LATE | ROM | S | P | C | KC

1

2

Kneeling in front of the ball, both hands on the ball. Keep your body in a straight line from the shoulders to the knees. Slowly lower your body towards the ball by bending your elbows, keeping ball still. Then push against ball and straighten arms into the push up position.

REPEAT (TIMES)

Adaptation :

Easier version is to place ball against a wall for more stability.

Tip:

Ensure good neck posture throughout the movement and maintain scapula control

CLINICIAN NOTES:

It is important to be clear what the key aim is of exercises on an unstable base. It is commonly assumed that an unstable base such as a Swiss ball increases activation of the shoulder and core musculature. However this is not supported in the literature and effects vary between patients.

Current evidence supports that a more stable base will benefit serratus recruitment whereas an unstable base increases trapezius muscle recruitment. The effect on trunk muscle activation is inconsistent.

Benefits may relate more to the proprioceptive and stability benefits of the exercise.

Refs: Seo et al 2013, Piraura et al 2014, Herrington et al 2015, Lehmann et al 2006, 2008

PUSH UP ON THE SWISSBALL

LATE | ROM | S | P | C | KC

1

2

In a high plank position, both hands on the ball and both feet on the floor. Keep your body in a straight line. Try not to dip your chest in this exercise. Slowly lower your body to the ball by bending your elbows, keeping the ball still. Then push against the ball by straightening your arms into the push up position.

REPEAT (TIMES)

Adaptation:

Easier version is to place ball against a wall for more stability.

Tip:

Ensure good neck posture throughout the movement and maintain scapula control

CLINICIAN NOTES:

It is important to be clear what the key aim is of exercises on an unstable base. It is commonly assumed that an unstable base such as a Swiss ball increases activation of the shoulder and core musculature. However this is not supported in the literature

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Benefits may relate more to the proprioceptive and stability benefits of the exercise.

Seo et al 2013, Piraura et al 2014, Herrington et al 2015, Lehmann et al 2006, 2008

PRESS UP ON WOBBLE BOARD

LATE | ROM | S | P | C | KC

1

2

Position yourself in a press up position with your hands placed on a wobble board. Firstly try to find the balance point where the sides of the board to do not touch the floor. Once you have this then continue to lower your chest towards the floor by bending your elbows and the return back up maintaining your balance throughout the exercise.

REPEAT (TIMES)

Tip:

Maintain posture throughout movement do not let your back dip.

CLINICIAN NOTES:

It is important to be clear what the key aim is of exercises on an unstable base. It is commonly assumed that an unstable base such as a wobble board increases activation of the shoulder and core musculature. However this is not supported in the literature and effects vary between patients.

Benefits may relate more to the proprioceptive and stability benefits of the exercise.

Refs: Maenhout, et al 2010 Herrington et al 2015

BOSU PLANK KNEE TO OPPOSITE SHOULDER

LATE | ROM | S | P | C | KC

High plank position with hands either side of the upside-down Bosu and feet hip width apart on tiptoes. Bend one knee up and rotate to the opposite elbow then back to start position and repeat with the other leg.

REPEAT (TIMES)

Tip:
Keep your body weight forward ensure your pelvis and back are kept stable throughout the exercise.

CLINICIAN NOTES:

It is important to be clear what the key aim is of exercises on an unstable base. It is commonly assumed that an unstable base increases activation of the shoulder and core musculature. However this is not supported in the literature and the effect varies between patients.

Benefits may relate more to the proprioceptive and stability benefits of the exercise.

Refs: Tucker et al 2010, Maenhout, et al 2010

BOSU PLANK AROUND THE CLOCK

LATE | ROM | S | P | C | KC

High plank position with hands either side of the upside-down Bosu and feet hip with apart on tip toes. The start position is 6 o'clock: maintaining a plank position rotate the Bosu to 9 o'clock side stepping your feet laterally. From 9 o'clock rotate the Bosu slowly through to 3 o'clock, side stepping your feet laterally. Return to 6 o'clock start.

REPEAT (TIMES)

Tip:

Your shoulder should be over your hands and your pelvis and back kept stable throughout the exercise.

CLINICIAN NOTES:

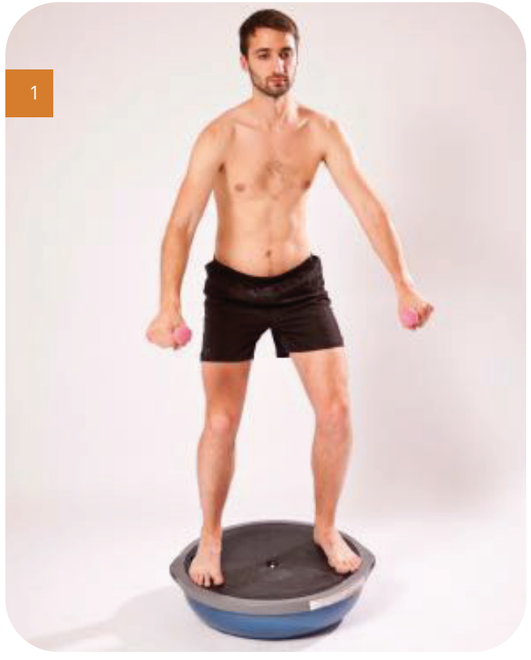
It is important to be clear what the key aim is of exercises on an unstable base. It is commonly assumed that an unstable base increases activation of the shoulder and core musculature. However this is not supported in the literature and the effect varies between patients.

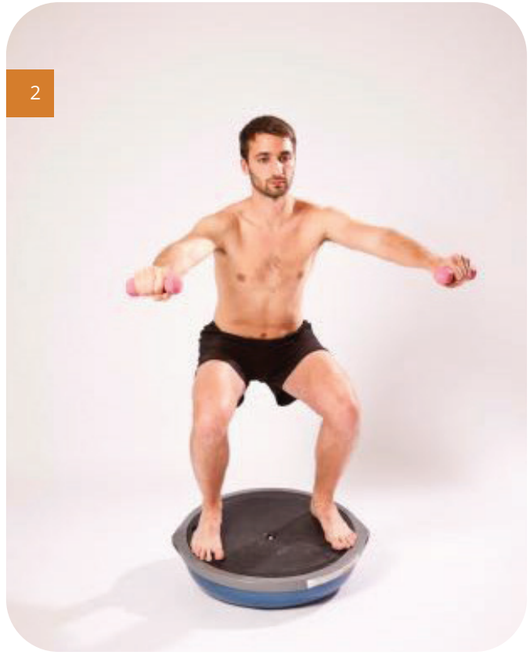
Benefits may relate more to the proprioceptive and stability benefits of the exercise.

Refs: Tucker et al 2010, Maenhout, et al 2010

BOSU SQUAT WITH HAND WEIGHTS

LATE | ROM | S | P | C | KC





Standing on a upside down Bosu with feet hip width apart holding a pair of hand weights. Squat down as far as you can keeping the Bosu balanced whilst lifting your arms away from your body up to 90°. Return to your standing position and lower arms back to your side keeping your balance on the Bosu. Keep your head and chest up throughout this exercise

REPEAT (TIMES)

Adaptation:

This exercise is easier with no weights

CLINICIAN NOTES:

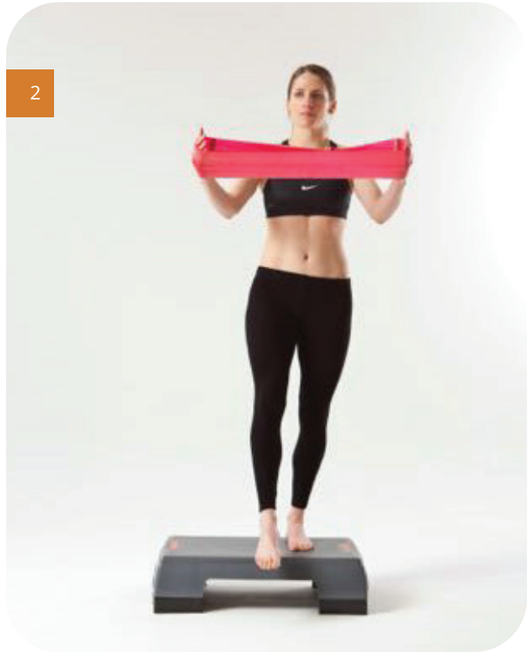
Patients with shoulder pain have been shown to have deficiencies in balance ability and postural stability. It is unclear whether this is cause or effect.

The bosu has been shown to be effective as a training aid to improve balance and postural control.

Refs: Anderson et al 2016, Baierle et al 2013

STEP BACK ONTO STEP WITH RESISTANCE BAND

LATE | ROM | S | P | C | KC



Stand in a lunge position with your back foot on the step. Gently push out against the resistance looped band. Keep your elbows at 90°. Maintain the outward force as you step backwards onto the step and simultaneously take both arms up and out to the side finishing in a Y above your head. Return to your starting position and change legs.

REPEAT (TIMES)

Adaptation:
Reduce squat depth if required.

CLINICIAN NOTES:

Emphasising hip extension reinforces activation of the gluteal muscles and reinforces sequential activation patterns though the kinetic chain. Initiating the movement with the lower quadrant increases activation levels of the scapula and rotator cuff muscles.

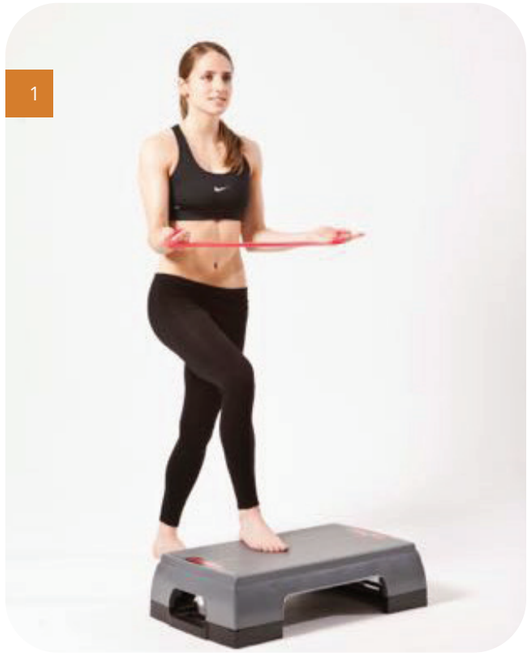
The addition of a resistance band loop helps reinforce activation of the posterior cuff through elevation.

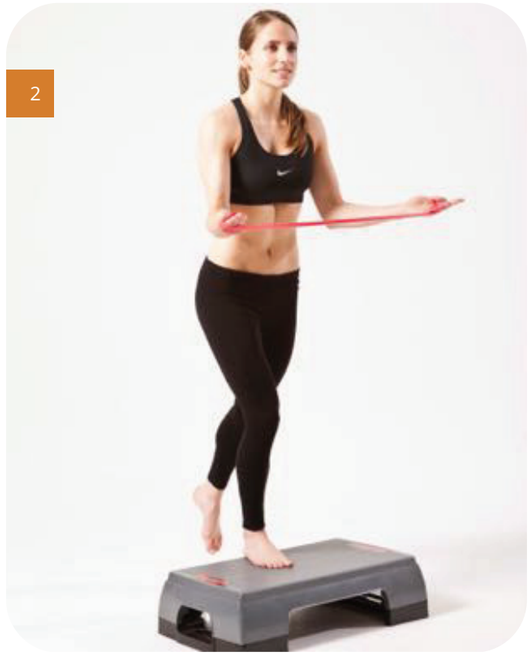
Poor gluteal muscle function has been associated with reduction in shoulder performance in overhead athletes and gluteal strength has been shown to correlate with throwing performance in some overhead sports.

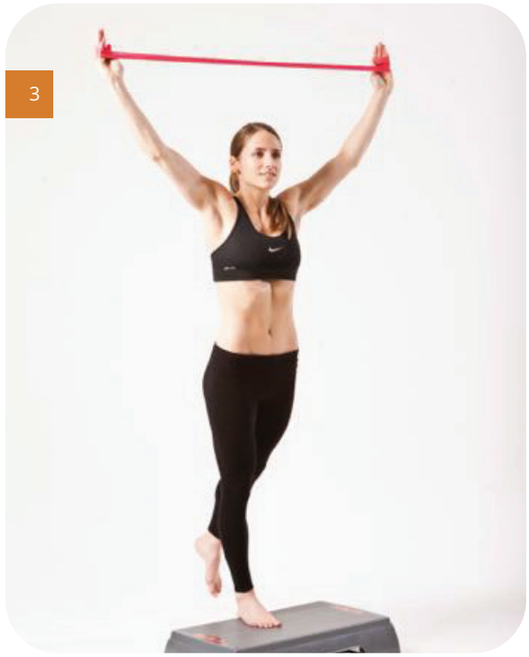
Refs: McMullen & Uhl 2000, Kibler et al 2008 ,Wattanaprakornkul et al 2011,
Boudreau et al 2009, Riemann et al 2012, Sher et al 2010, Ekstrom et al 2007, Kibler et al 2013

STEP UP WITH RESISTANCE BAND

LATE | ROM | S | P | C | KC







Stand facing a step place one foot on the step. Hold the looped resistance band gently pushing out. Hands facing each other, keeping your arms out in front of you with your elbows bent to 90°. Maintain this outward force as you step forwards onto the step and simultaneously straighten both arms lifting them up and out to the side finishing in a Y above your head. Return to your starting position and change legs.

REPEAT (TIMES)

CLINICIAN NOTES:

Emphasising hip extension reinforces activation of the gluteal muscles and reinforces sequential activation patterns though the kinetic chain. Initiating the movement with the lower quadrant increases activation levels of the scapula and rotator cuff muscles.

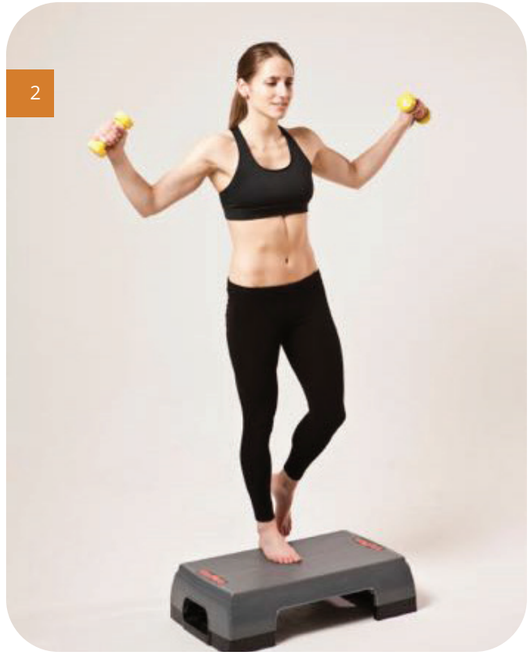
The addition of a resistance band loop helps reinforce activation of the posterior cuff through elevation.

Poor gluteal muscle function has been associated with reduction in shoulder performance in overhead athletes and gluteal strength has been shown to correlate with throwing performance in some overhead sports.

Refs: McMullen & Uhl 2000, Kibler et al 2008 ,Wattanaprakornkul et al 2011, Boudreau et al 2009, Riemann et al 2012, Sher et al 2010, Ekstrom et al 2007, Kibler et al 2013

STEP UP WITH HAND WEIGHTS

LATE | ROM | S | P | C | KC



Stand facing a step, place one foot on the step. Hold a weight in each hand with your arms crossed in front of you. Step forwards onto the step on to one foot and simultaneously take both arms up and out to the side finishing in a Y above your head. Return to your starting position and change legs.

REPEAT (TIMES)

Adaptation:

Step forward without step up

CLINICIAN NOTES:

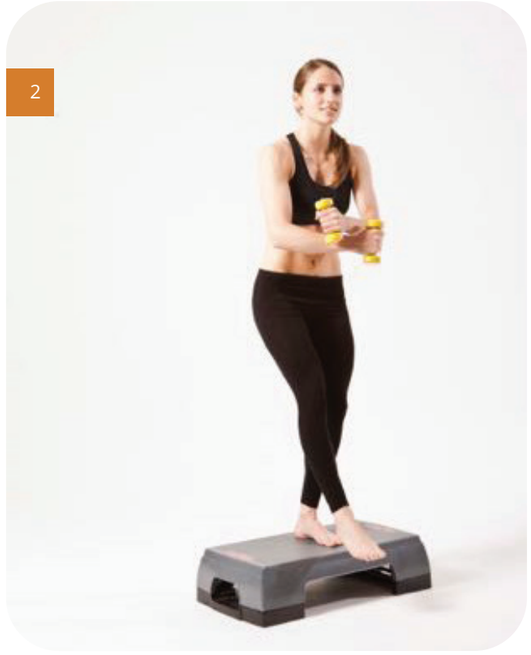
Emphasising hip extension reinforces activation of the gluteal muscles and reinforces sequential activation patterns though the kinetic chain. Initiating the movement with the lower quadrant increases activation levels of the scapula and rotator cuff muscles.

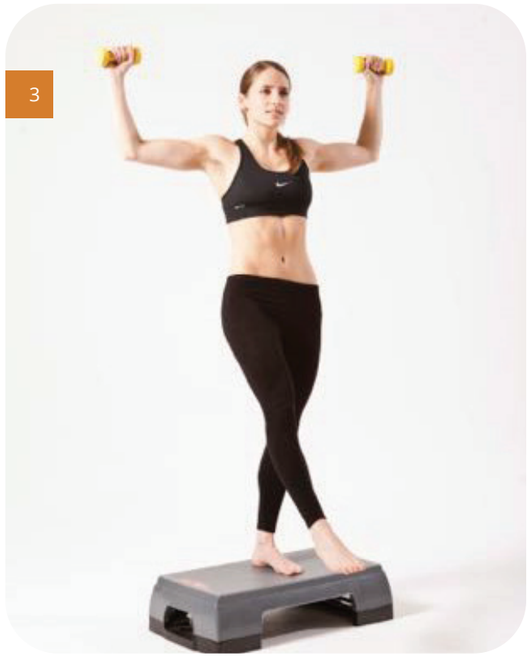
Poor gluteal muscle function has been associated with reduction in shoulder performance in overhead athletes and gluteal strength has been shown to correlate with throwing performance in some overhead sports.

Refs: McMullen & Uhl 2000, Kibler et al 2008, Riemann et al 2012, Sher et al 2010, Ekstrom et al 2007, Kibler et al 2013 Boudreau et al 2009

STEP BACK WITH HAND WEIGHTS

LATE | ROM | S | P | C | KC





Stand with your back to a step with one foot on the step. Hold a weight in each hand and squat with your arms crossed in front of you. Step backwards onto the step and simultaneously take both arms up and out to the side finishing in a Y above your head. Return to your starting position and change legs.

REPEAT (TIMES)

CLINICIAN NOTES:

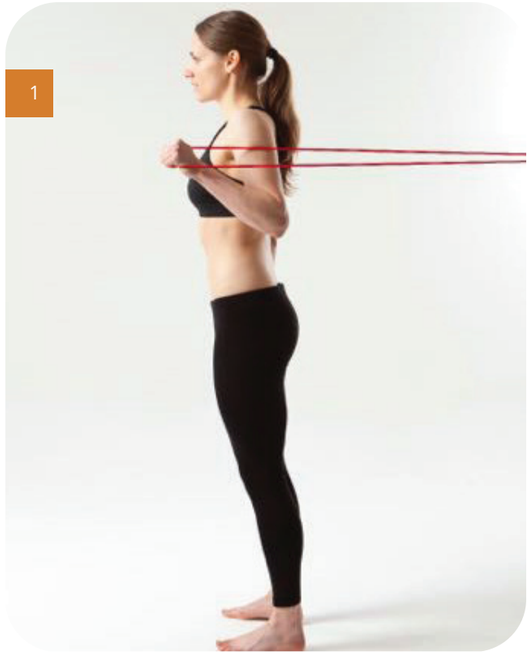
Emphasising hip extension reinforces activation of the gluteal muscles and reinforces sequential activation patterns though the kinetic chain. Initiating the movement with the lower quadrant increases activation levels of the scapula and rotator cuff muscles.

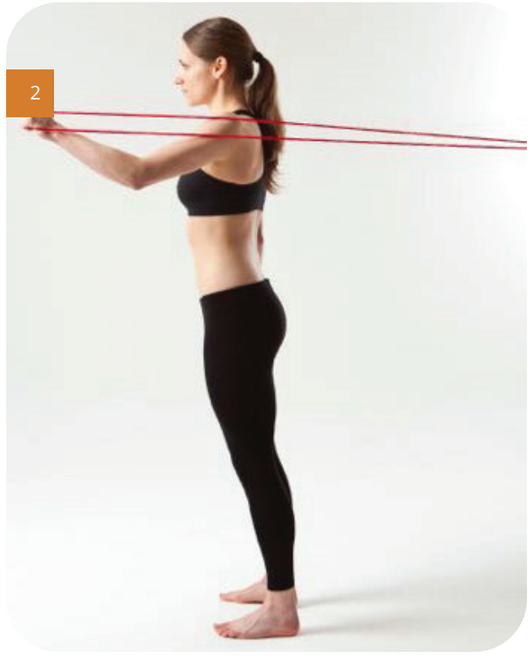
Poor gluteal muscle function has been associated with reduction in shoulder performance in overhead athletes and gluteal strength has been shown to correlate with throwing performance in some overhead sports.

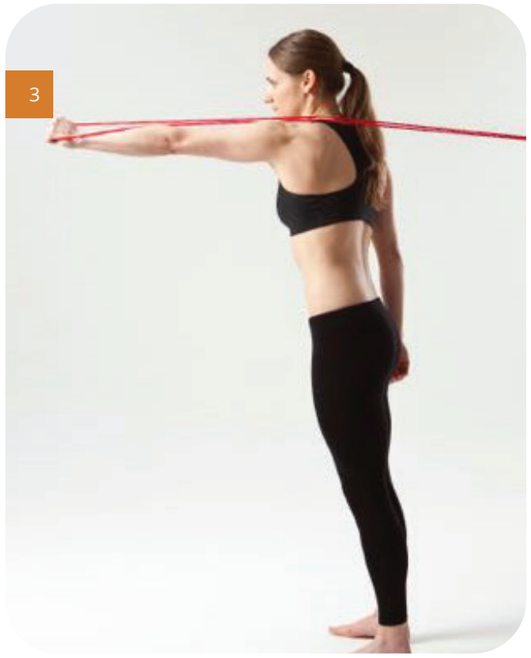
Refs: McMullen & Uhl 2000, Kibler et al 2008, Riemann et al 2012, Sher et al 2010, Ekstrom et al 2007, Kibler et al 2013 Boudreau et al 2009

FORWARD PRESS USING RESISTANCE BAND

LATE | ROM | S | P | C | KC







Standing tall with your feet hip width apart. Hold onto a resistance band which is fixed behind you. Punch forward with your affected arm allowing your shoulder blade to come forward. Return to your start position

REPEAT (TIMES)

Tip:

Maintain good posture throughout movement

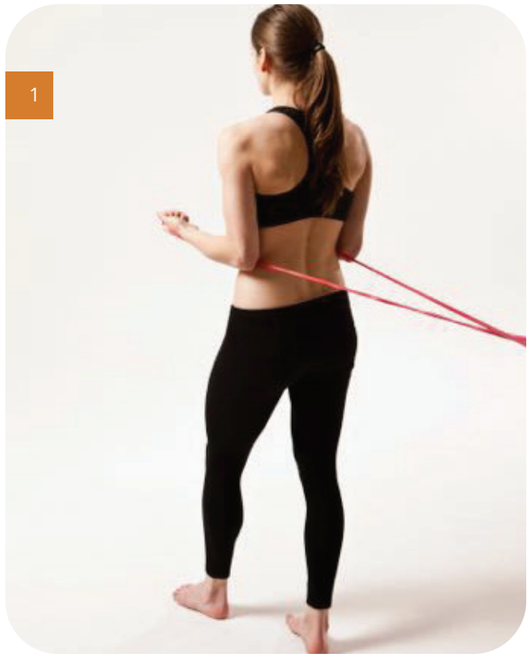
CLINICIAN NOTES:

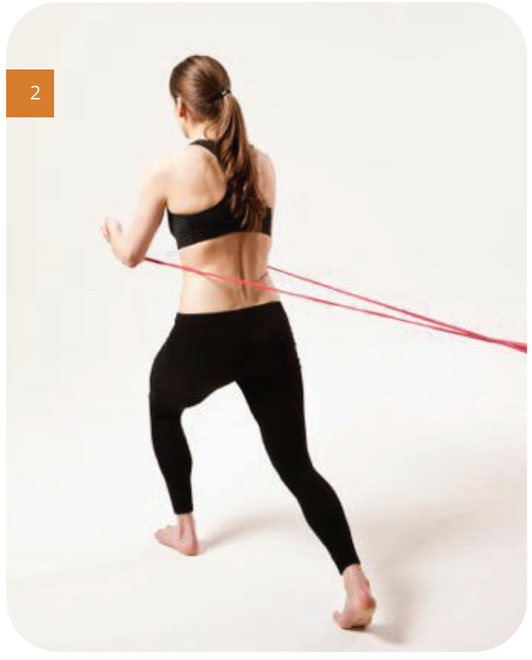
The serratus punch has been shown to selectively recruit serratus anterior in preference to pectoralis major. However it is important to ensure the patient moves from the scapula and protracts with a plus at the end of the movement to gain the maximum benefit.

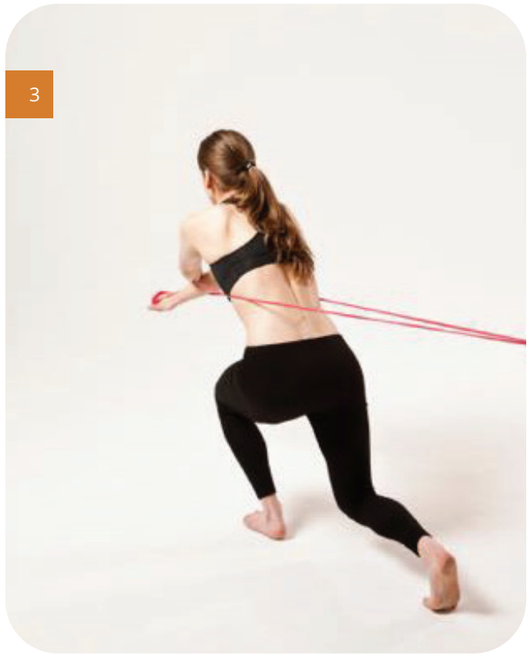
Refs: Kaur et al 2014, Myers et al 2005, Castelein et al 2016b

DYNAMIC LUNGE WITH RESISTANCE BAND

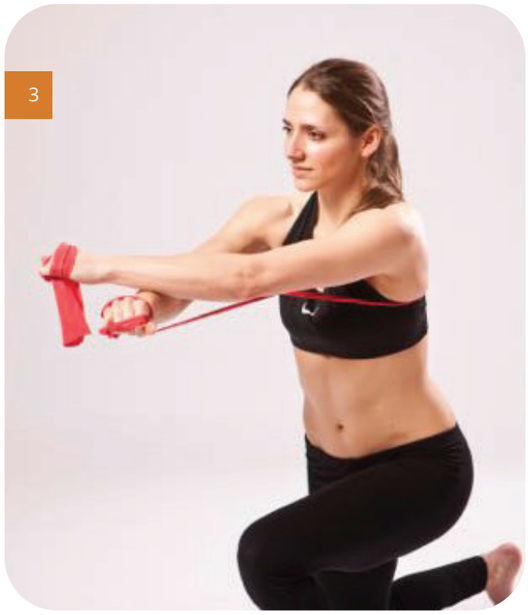
LATE | ROM | S | P | C | KC







Adaptation:



With a resistance band or tubing attached to door handle or around a post. Stand holding each end in your hands facing away. Lunge forward and cross your arms over at shoulder height and return to your start position. Then repeat with opposite leg lunging forward

REPEAT (TIMES)

Adaptation:
Hold onto a resistance band which is around your shoulder blades. Lunge forward and punch with both arms crossing over in front of you allowing your shoulder blades to come forward as well. Return to your start position and repeat.

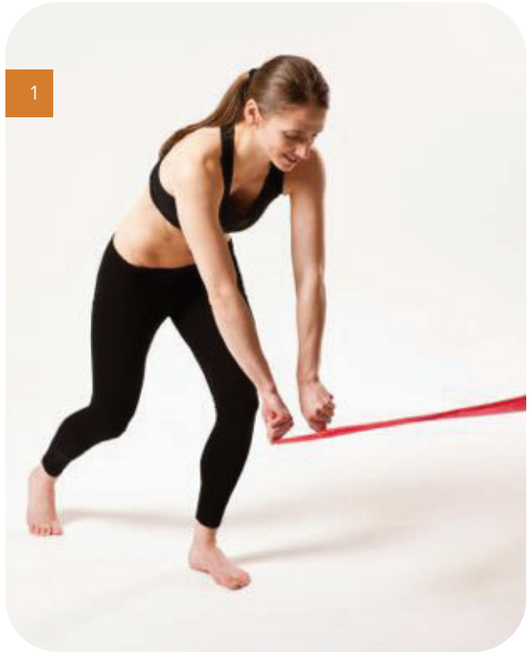
CLINICIAN NOTES:

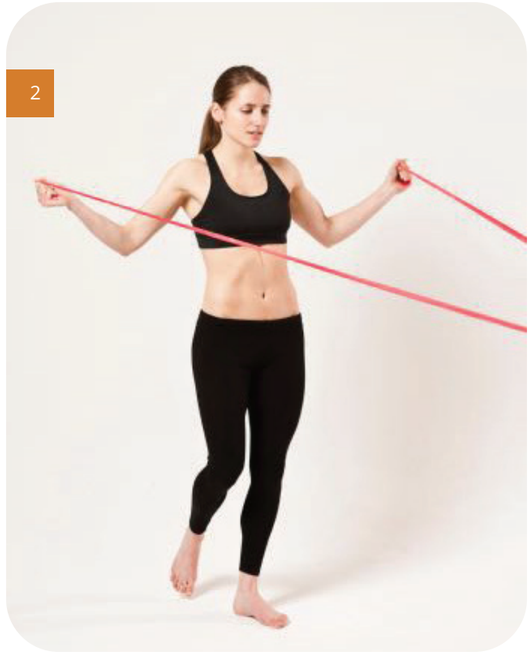
The addition of a lunge enhances the recruitment of the scapula muscles. Crossing the arms at the end of the dynamic hug has been shown to maximally recruit serratus anterior. Using resistance band across the thorax can have a facilitatory effect on the scapulae.

Refs: Kaur et al 2014, Myers et al 2005 Park et al 2013, Castelein et al 2016b

ROBBERY WITH RESISTANCE BAND

LATE | ROM | S | P | C | KC





With a resistance band attached to a door handle or around a post in front of you. Hold onto the resistance band with both hands. Start in a lunge position with your hands together and your palms facing out at knee height. Then take your arms up and out to the side, rotating your arms outwards so your palms face the ceiling at the end of the movement. Step back transferring your weight onto the back leg. Return to your start position.

REPEAT (TIMES)

CLINICIAN NOTES:

Initiating the movement with the lower quadrant improves recruitment of the scapula and rotator cuff muscles.

The amount of elevation can be varied to work the posterior cuff and scapula muscles through range and in a way that is most functionally relevant to the patient.

Refs: McMullen & Uhl 2000,Kibler et al 2008

CRAB WALK WITH RESISTANCE BAND

LATE | ROM | S | P | C | KC

Standing on a long piece of resistance band, cross it over and wrap it around both hands. Side squat and abduct your arms at the same time pulling the resistance band. Bring your legs together and straighten them and lower your arms. Repeat going across the room.

REPEAT (TIMES)

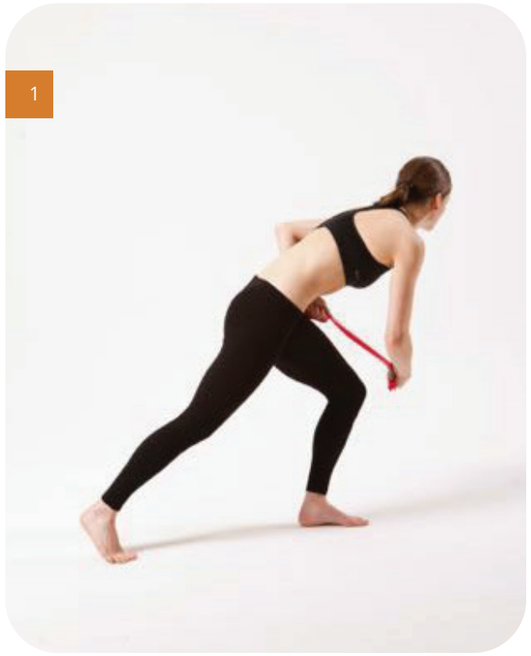
CLINICIAN NOTES:

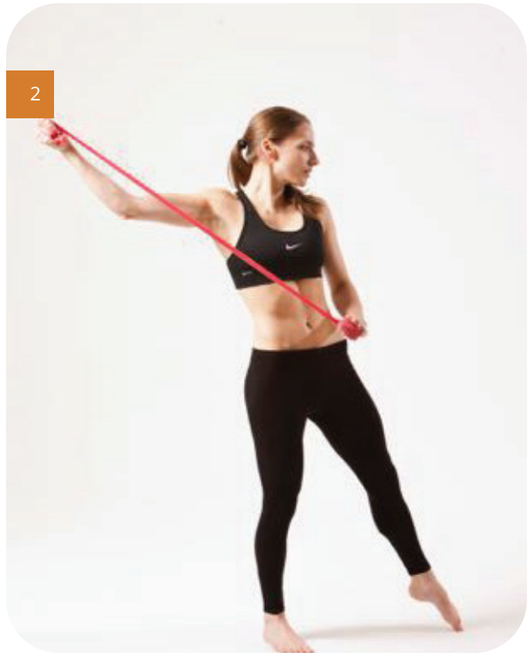
Side lunges are an effective way of emphasising gluteal recruitment. Poor gluteal muscle function has been associated with reduction in shoulder performance in overhead athletes and gluteal strength has been shown to correlate with throwing perfromance in some overhead sports in conjunction with upper limb strengthening.

Refs: Riemann et al 2012, Sher et al 2010, Ekstrom et al 2007, Kibler et al 2013

LAWNMOWER WITH RESISTANCE BAND

LATE | ROM | S | P | C | KC



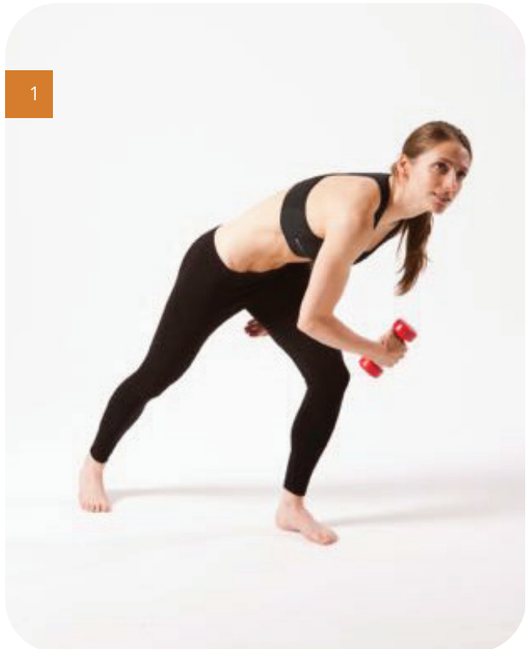


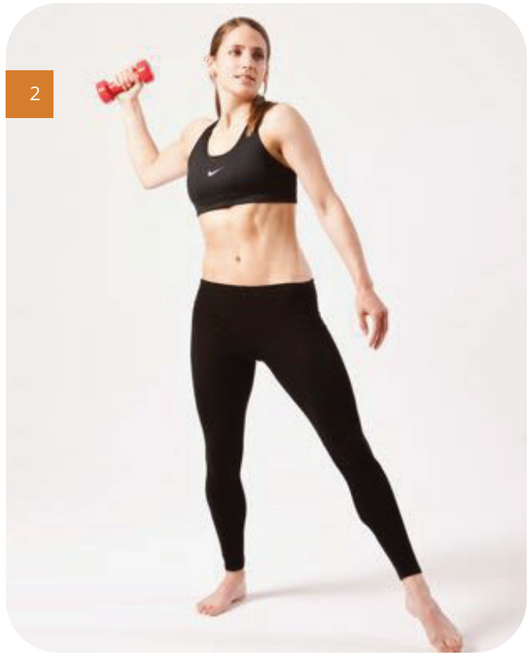
Start in a rotated lunge position. Holding a resistance band in both hands, (or with the affected arm and under the opposite foot). Move in a diagonal pattern, by stepping back to transfer your weight onto the affected side and take your arm up and out as high as comfortable. Hold and slowly return to the start position by reversing the movement.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation:

1. An easier adaptation is to take the exercise through a smaller range of movement
2. Alternatively you can use a small weight





SAFE ZONE	REPEAT (TIMES)

CLINICIAN NOTES:

Initiating the movement with the lower quadrant increases activation levels of the scapula muscles. The thorax has a significant influence on upper limb function. The addition of trunk rotation to upper limb exercises enhances scapula mechanics and recruitment ratios.

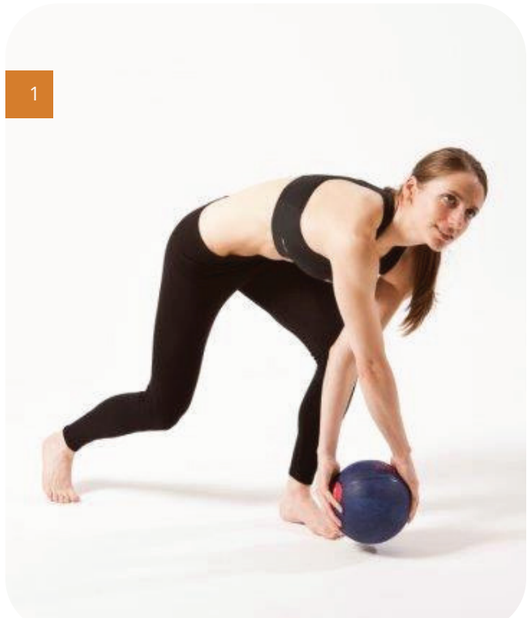
Resistance or load can be used to reinforce activation of the rotator cuff and scapula muscles.

Refs: McMullen & Uhl 2000, Kibler 2008, Moeller et al 2014, Yamauchi et al 2015, Youdas et al 2012

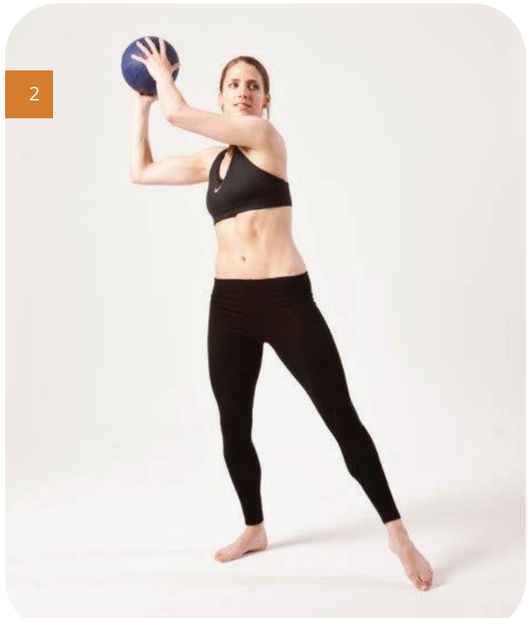
LAWNMOWER WITH MEDICINE BALL IN STANDING

LATE | ROM | S | P | C | KC

1



2



Hold the medicine ball in both hands with the affected arm uppermost on the ball. Starting in a lunge position with the ball positioned at your opposite foot. Your weight is mainly on your front foot. Keeping both hands on the ball, take the ball up and over your affected shoulder in a diagonal pattern while transferring your weight onto the back foot. Return to your starting position.

REPEAT (TIMES)

CLINICIAN NOTES:

Initiating the movement with the lower quadrant increases activation levels of the scapula muscles. The thorax has a significant influence on upper limb function. The addition of trunk rotation to upper limb exercises enhances scapula mechanics and recruitment ratios.

Load can be used to reinforce activation of the rotator cuff and scapula muscles.

Refs: McMullen & Uhl 2000, Kibler 2008, Moeller et al 2014, Yamauchi et al 2015, Youdas et al 2012

DYNAMIC PUSH OFF WALL ON SWISS BALL

LATE | ROM | S | P | C | KC

Lying on the Swiss ball with your knees bent and your feet on a wall. Hug the ball with your arms. Simultaneously push off the wall and raise your trunk and arms up, finishing in a W or a T position.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptations:

1. Use weights to add some resistance into the exercise
2. Vary the speed of the exercise

CLINICIAN NOTES:

The 90/90 position is one of the most effective positions for recruiting the posterior cuff, serratus anterior and middle trapezius at levels consistent with strengthening.

The addition of the lower quadrant aims to reinforce activation through the kinetic chain - knee flexion-extension and hip extension enhance activation of the rotator cuff and scapula muscles.

Poor gluteal muscle function has been associated with reduction in shoulder performance in overhead athletes and gluteal strength has been shown to correlate with throwing perfromance in some overhead sports.

Refs: Nakamura et al 2016, Cricchio et al 2011, Alizadehkhaiyat et al 2015, Riemann et al 2012, Sher et al 2010, Ekstrom et al 2007, Kibler et al 2013

PRONE SWISS BALL WITH WEIGHTS

LATE | ROM | S | P | C | KC

Lying on the swiss ball, holding weights in both hands, keeping your hands resting on the floor. Keep your knees straight and your toes on the floor as you raise your trunk and arms up. Ensure your head is aligned at all times. Take your arms into either a Y above head, a W with the elbows slightly flexed out to the side or a V with your hands level with your hips. Return to your starting position and then repeat.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation:

Easier - without weights

CLINICIAN NOTES:

Prone positions reduce upper trapezius activity compared to upright positions.
Arm position will influence the contribution of scapula and rotator cuff muscles.
Y position: Lower trapezius and middle trapezius, posterior rotator cuff > 40% MVC
W position: Serratus anterior, middle trapezius, posterior rotator cuff > 40% MVC
V position: middle trapezius, posterior deltoid > 40% MVC

Refs: Cricchio et al 2011, Alizadehkhaiyat et al 2015, Nakamura et al 2016

SWISS BALL PRONE ANGEL CIRCLES

LATE | ROM | S | P | C | KC

Position yourself lying over a swiss ball under your chest with your toes balancing on the floor. Take your hands from your hips in an arc movement outwards and over your head and return whilst maintaining this balanced position.

REPEAT (TIMES)

Adaptation:

1. More difficult - add small weights
2. Easier- fix your feet against wall

CLINICIAN NOTES:

It is important to be clear what the key aim is of exercises on an unstable base. It is commonly assumed that an unstable base such as a Swiss ball increases activation of the shoulder and core musculature.

However this is not supported in the literature and effects vary between patients.

Current evidence supports that a more stable base will benefit serratus recruitment whereas an unstable base increases trapezius muscle recruitment. The effect on trunk muscle activation is inconsistent.

Benefits may relate more to the proprioceptive and stability benefits of the exercise.

Refs: Seo et al 2013, Piraura et al 2014, Herrington et al 2015, Lehmann et al 2006, 2008

SWISS BALL PLANK ALTERNATE HIP EXTENSION

LATE | ROM | S | P | C | KC

1

2

Adaptation:

Roll forwards over a swiss ball and walk your hands forwards until your feet are balancing on it, weight bearing through both hands in a plank position. Once balanced, lift one foot up off the ball and return. Ensure your lower back does not dip Repeat with the other leg.

REPEAT (TIMES)

Adaptation:

This exercise can be adapted by fixing a loop of resistance band around your wrists maintaining the tension during the exercise To make this more challenging you can take your toe and tap it to the floor at the side and return

CLINICIAN NOTES:

You can alter the emphasis on specific scapula muscles by changing which leg is extended. In similar exercises contra-lateral leg extension has been shown to bias more lower trapezius activity, whereas ipsi-lateral leg extension will bias serratus anterior activity.

Refs: Maenhout et al 2010

PIKE ON THE SWISS BALL

LATE | ROM | S | P | C | KC

Start in press up position on the swiss ball, with your feet and ankles resting on the ball. Bring your toes onto the ball and then use your feet to bring the ball nearer to your arms going into the pike position. Return to your start position
Repeat

HOLD FOR (SECONDS)	REPEAT (TIMES)

Tips:
See Jack knife for easier version

CLINICIAN NOTES:

Supporting the body on a swiss ball does not consistently increase trunk muscle activation compared with a stable base of support. The main benefits appear to be proprioceptive. Dissociating the body around the arm enables full elevation range with compression throughout the range.

The pike increases load through the arm compared to the jack knife So muscle activation levels are higher- however it is more propricoeptive.

Refs: De Oliviera et al 2008, Kalantari et al 2014

SWISS BALL BRIDGE FLY

LATE | ROM | S | P | C | KC

1

2

Sit on the ball, then walk your legs out so that your head and shoulders supported by the ball, holding small weights in each hand. Lift your hips towards the ceiling and hold this position. Keeping your arms straight, start above your head and then take your arms out to the side.

Repeat

REPEAT (TIMES)

CLINICIAN NOTES:

When patients find it difficult to perform dynamic kinetic chain exercises, static exercises such as the shoulder bridge are helpful to reinforce activation of the trunk and pelvic muscles during shoulder movement.

Refs: Czaprowski et al 2014, Escamilla et al 2010

SWISS BALL BRIDGE, DIAGONAL PATTERNS WITH A MEDICINE BALL

LATE | ROM | S | P | C | KC

1

2

3

Lying on a swiss ball in a bridge position with your head and shoulders supported. Hold the medicine ball in both hands and start with the medicine ball positioned at your hip. Take the ball up and over the opposite shoulder, keeping both hands on the ball through the movement. Repeat the exercise on the opposite side.

REPEAT (TIMES)

Tip: Don't let hips/pelvis drop while moving arms.

CLINICIAN NOTES:

Upper limb exercises using the principles of propriceptive neuromuscular facilitation have been shown to increase muscle activation in the lower quadrant.

To increase their effectiveness ensure that you emphasise the rotation component of upper limb movement.

Refs: Abreu et al 2015, Voss et al 1985, Sato et al 2009, Witt et al 2011, Hindle et al 2012, Reinold 2009

SWISS BALL BACK CRAWL SWIM

LATE | ROM | S | P | C | KC

Position yourself in a bridge position over a swiss ball with the ball under your shoulder blades. Keeping your hips up, slowly carry out a backstroke arm movement with trunk rotation whilst maintaining your balance on the ball. Repeat with the other arm.

REPEAT (TIMES)

SWISS BALL FRONT CRAWL SWIM

LATE | ROM | S | P | C | KC

Position yourself over a swiss ball under your stomach and hips with your toes balancing on the floor. Perform a front crawl arm movement by rotating your trunk, as you draw your thumb up the side of your trunk towards your armpit straighten your arm from your shoulder overhead returning your trunk to neutral and return your arm to your side. Repeat on opposite side.

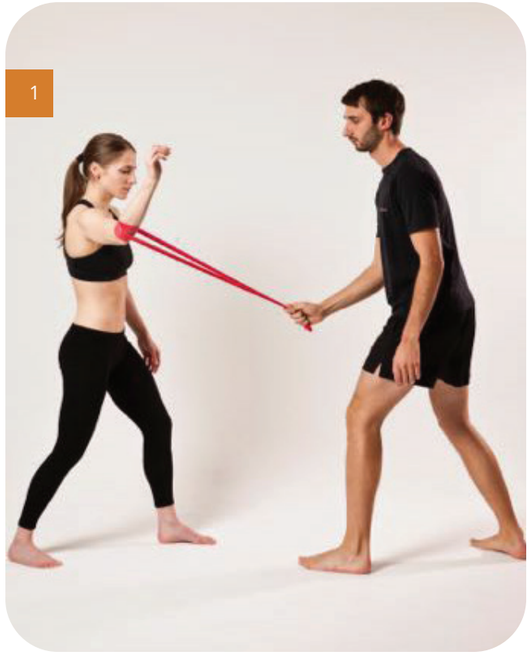
REPEAT (TIMES)

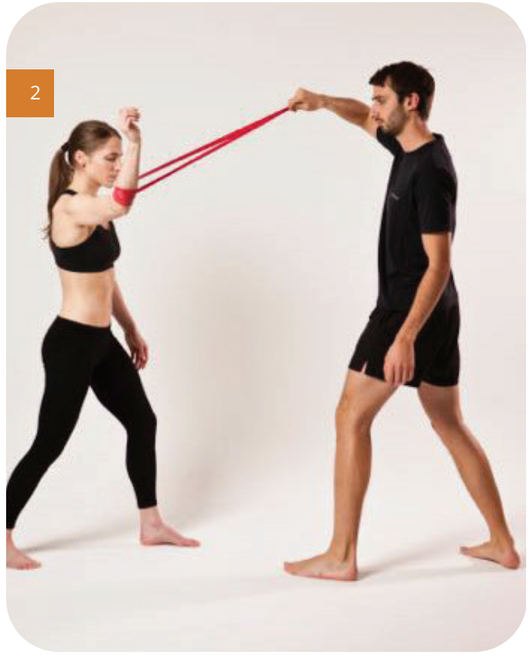
TIPS:

Ensure good balance and good trunk rotation with your arm movement. To make this exercise easier stabilize your feet against a wall or let a partner support your feet.

RHYTHMIC STABILISATION WITH RESISTANCE BAND

LATE | ROM | S | P | C | KC





This exercise requires two people to perform. Put your arm in a position guided by your therapist and your feet in a stable step-stance position. The resistance band is unpredictably pulled on by the assisting person in different directions. Keep your arm stable by not letting it be moved in the direction it is being pulled.

REPEAT (TIMES)

CLINICIAN NOTES:

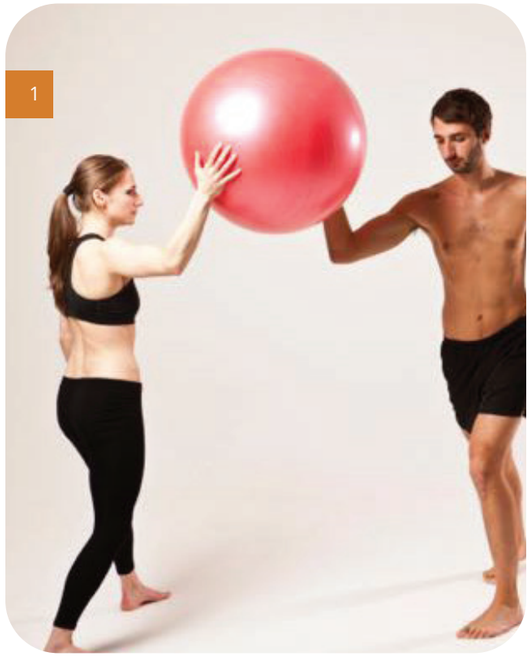
Exercises utilising the principles of propriceptive neuromuscular facilitation will increase muscle activation in the non- exercised upper limb and the lower quadrant as the exercised arm.

Rhythmic stabilisations aim to target reactive stabilisation of the shoulder muscles and are particularly useful working into a patient's functioal risk positions. Working the opposite arm first can improve performance of this exercise.

Refs: Guido et al 2007, Sato et al 2009, Abreu et al 2015

SWISS BALL 1 HANDED MAUL IN EXTERNAL ROTATION AND ABDUCTION

LATE | ROM | S | P | C | KC



Position a swiss ball between the hands of you and a partner with your opposite foot in front and your arm in a combined abduction and external rotation position. The aim is to maintain the position of the ball. Resist and continue to adjust maintaining your position and control throughout.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation:
The exercise could be progressed by mirroring larger movements made by the other partner.

CLINICIAN NOTES:

The dynamic stability system relies on feed-forward and feedback motor control to anticipate and react to joint movements or loads. Functional training such as perturbations and plyometrics will enhance the ability of the dynamic stabilisers to activate appropriately to stabilise the gleno-humeral joint in functionally relevant positions.

Refs: Guido et al 2007, Swanick et al 2002, Panzer et al 2011, Munn et al 2004, 2005, Lephart & Fu 2000, Ellenbecker et al 2015

SWISS BALL SHOULDER TACKLE

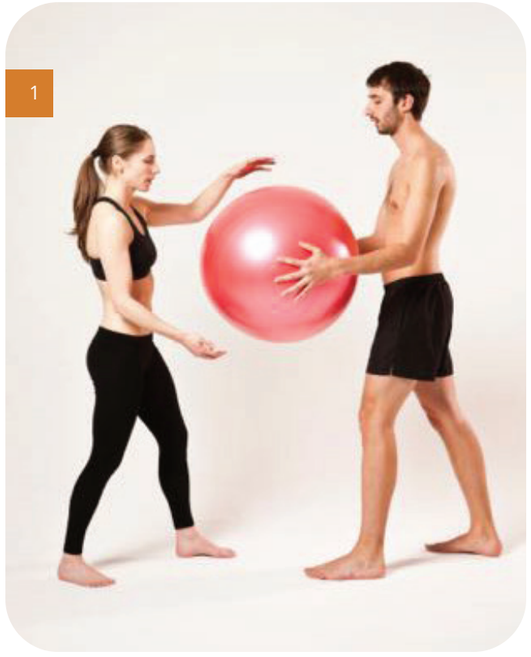
LATE | ROM | S | P | C | KC

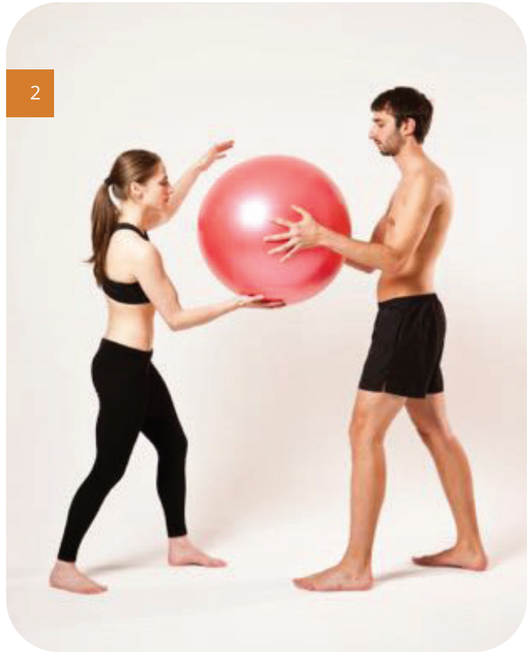
With a partner holding a swiss ball stand with a wide balanced stance and make a tackling shoulder manoeuvre into the swiss ball as it is resisted and stabilized by your partner.

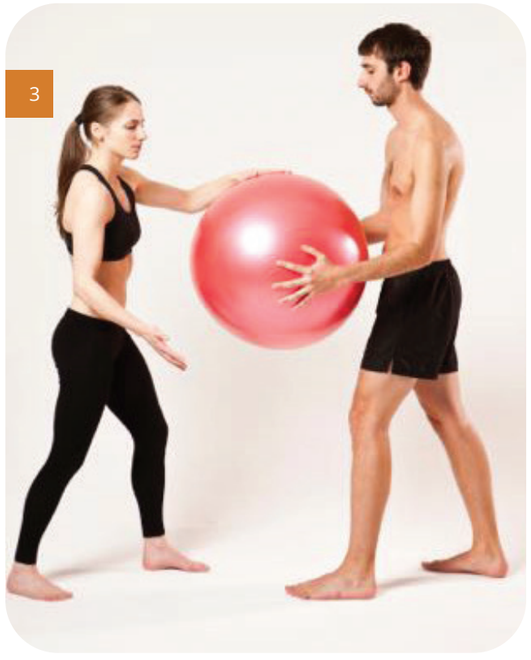
HOLD FOR (SECONDS)	REPEAT (TIMES)

PERTURBATION BALL TAP

LATE | ROM | S | P | C | KC







Hold a swiss ball between you and a partner maintaining a good balanced stance. On command try to resist the force your partner is providing to tap the ball from your grasp.

REPEAT (TIMES)

Adaptation:
Increase force and speed.

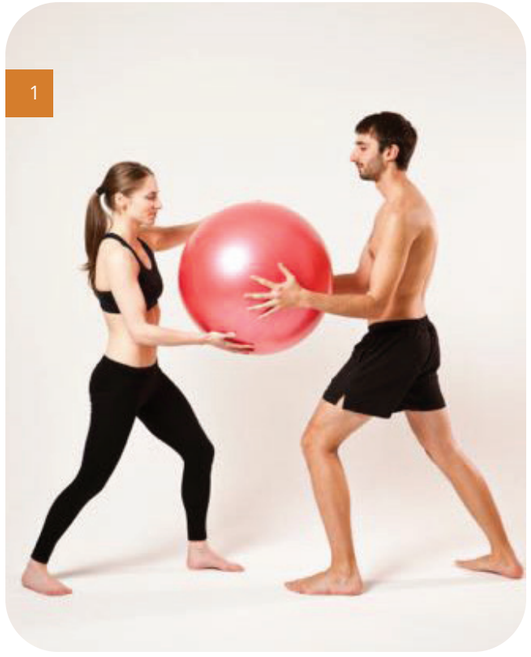
CLINICIAN NOTES:

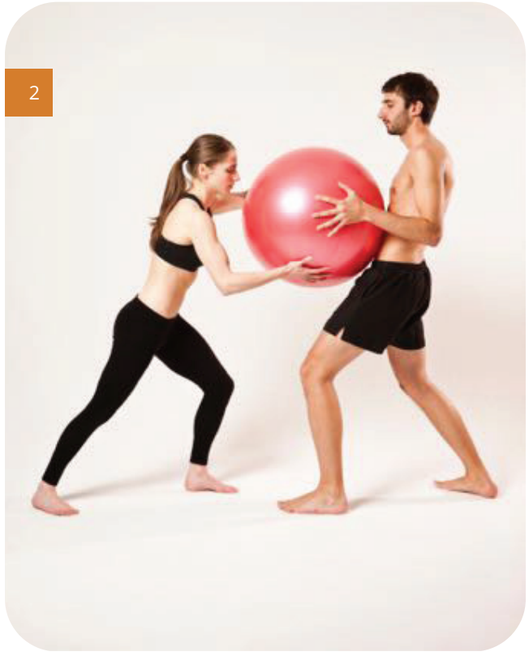
The dynamic stability system relies on feed-forward and feedback motor control to anticipate and react to joint movements or loads. Functional training such as perturbations and plyometrics will enhance the ability of the dynamic stabilisers to activate appropriately to stabilise the gleno-humeral joint in functionally relevant positions.

Refs: Guido et al 2007, Swanick et al 2002, Panzer et al 2011, Munn et al 2004, 2005, Lephart & Fu 2000, Ellenbecker et al 2015

PERTURBATION GRAB

LATE | ROM | S | P | C | KC





Hold a swiss ball between you and a partner maintaining a good balanced stance. On command try to resist the force your partner is providing to pull the ball away.

HOLD FOR (SECONDS)	REPEAT (TIMES)

CLINICIAN NOTES:

The dynamic stability system relies on feed-forward and feedback motor control to anticipate and react to joint movements or loads. Functional training such as perturbations and plyometrics will enhance the ability of the dynamic stabilisers to activate appropriately to stabilise the gleno-humeral joint in functionally relevant positions.

Refs: Guido et al 2007, Swanick et al 2002, Panzer et al 2011, Munn et al 2004, 2005, Lephart & Fu 2000, Ellenbecker et al 2015

SWISS BALL MAUL

LATE | ROM | S | P | C | KC

In step standing, face a partner. Both hugging either side of a Swiss Ball, place your affected shoulder against the ball and then push against the ball trying to move your partner off balance.

HOLD FOR (SECONDS)	REPEAT (TIMES)

Adaptation:
This exercise can be made easier by using verbal command by your therapist

CLINICIAN NOTES:

The dynamic stability system relies on feed-forward and feedback motor control to anticipate and react to joint movements or loads. Functional training such as perturbations and plyometrics will enhance the ability of the dynamic stabilisers to activate appropriately to stabilise the gleno-humeral joint in functionally relevant positions. Working the unaffected arm first can improve recruitment and performance.

Refs: Guido et al 2007, Swanick et al 2002, Panzer et al 2011, Munn et al 2004, 2005, Lephart & Fu 2000, Ellenbecker et al 2015

PRONE BALL CATCH

LATE | ROM | S | P | C | KC

Lying on a bed on your front with your affected arm at 90° over the side of the bed. Hold a small ball in your hand. The upper arm should not be resting on the bed. Drop the ball and catch it, as quickly as possible.

REPEAT (TIMES)

Adaptation

Vary the arm position specific to functional goals

CLINICIAN NOTES:

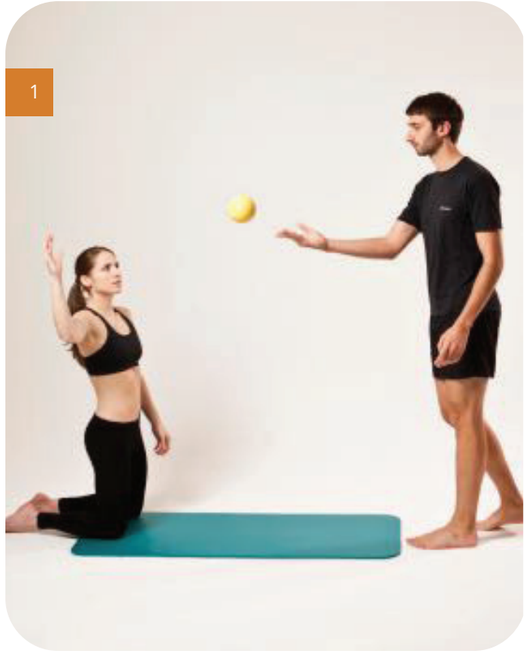
Working the unaffected arm first can improve recruitment and performance. This exercise preferentially targets middle and lower trapezius function the posterior rotator cuff and supraspinatus when compared to other plyometric exercises. Using relatively low loads i.e. a ball or a 0.5 or 1 Kg weight facilitates relative activation of the rotator cuff compared with the deltoid.

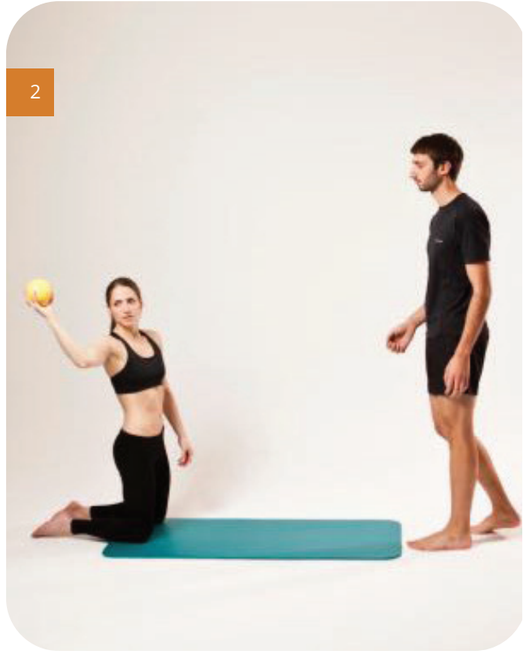
The drop and catch exercise is a feature of exercise programmes that report successful outcomes in the treatment of shoulder instability.

Refs: Bateman et al, Guido et al 2007, Swanick et al 2002, Panzer et al 2011, Munn et al 2004, 2005, Lephart & Fu 2000, Ellenbecker et al 2015, Maenhout et al 2016, Bitter 2007, Ganderton 2013

CATCHING AND THROWING A BALL IN KNEELING

LATE | ROM | S | P | C | KC





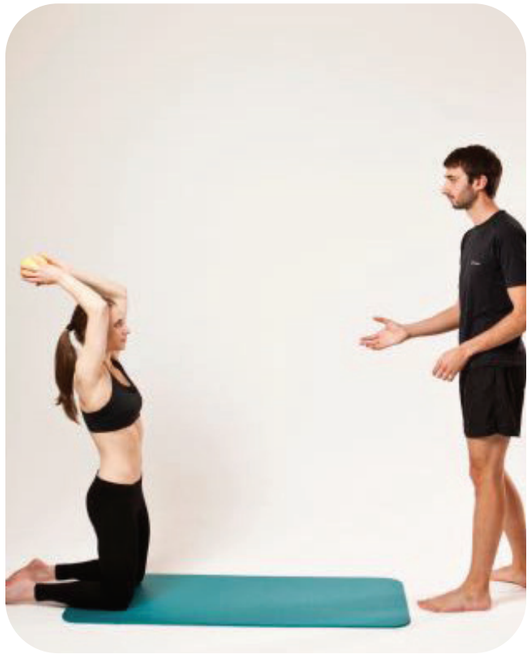
Kneel with your knees hip width apart. Take your arm out to the side, keeping your elbow bent and extend at the shoulder into a cocking position. Catch a small ball and then throw it back.

REPEAT (TIMES)

Adaptations:

1. Alter the speed of the throw
2. Alter the weight of the ball
3. Try kneeling on a balance cushion to challenge your core stability

Adaptation:



Easier: This can also be performed with a 2 handed technique.

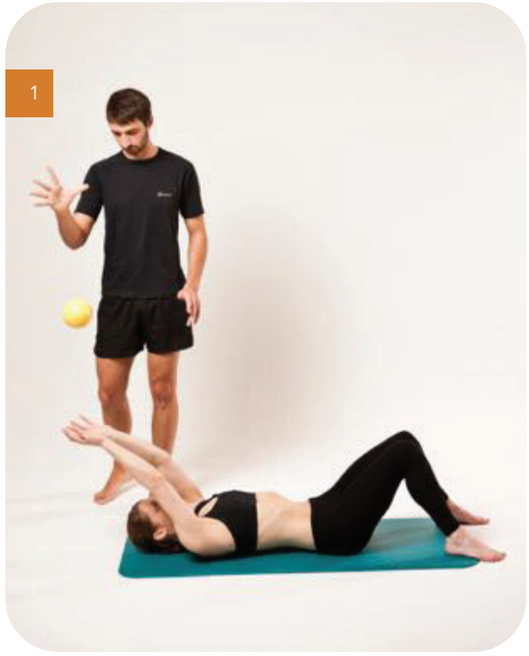
CLINICIAN NOTES:

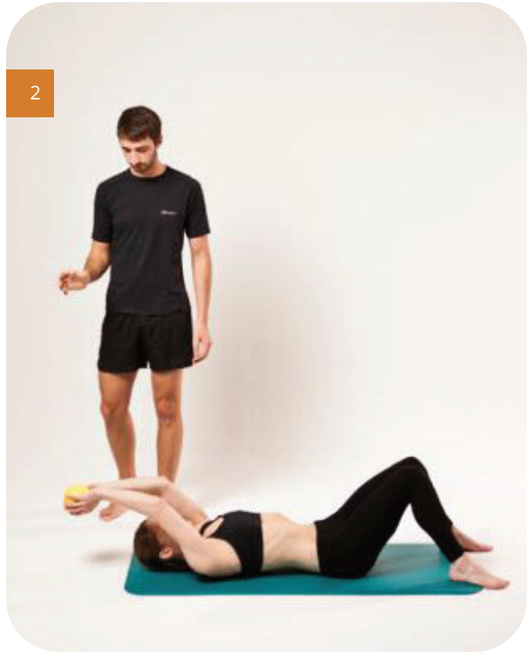
The dynamic stability system relies on feed-forward and feedback motor control to anticipate and react to joint movements or loads. Functional training such as perturbations and plyometrics will enhance the ability of the dynamic stabilisers to activate appropriately to stabilise the gleno-humeral joint in functionally relevant positions. Working the unaffected arm first can improve recruitment and performance.

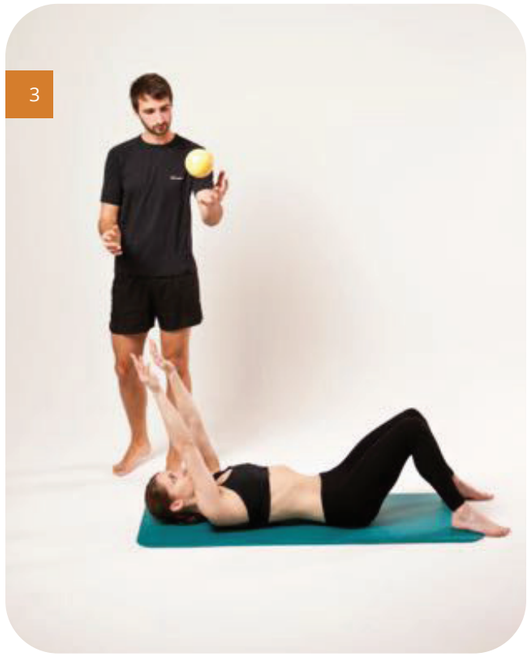
Refs: Guido et al 2007, Swanick et al 2002, Panzer et al 2011, Munn et al 2004, 2005, Lephart & Fu 2000, Ellenbecker et al 2015

SUPINE BALL CATCH AND THROW

LATE | ROM | S | P | C | KC







Lay on your back with your knees bent and feet flat on the floor, arms held above your head. Get a partner to stand above you and drop a ball down towards your hands. You must then catch the ball with both hands. Do not let your hands hit the ground when catching the ball. Then throw the ball back.

REPEAT (TIMES)

Adaptation:

1. Alter speed of throw
2. Alter weight of ball

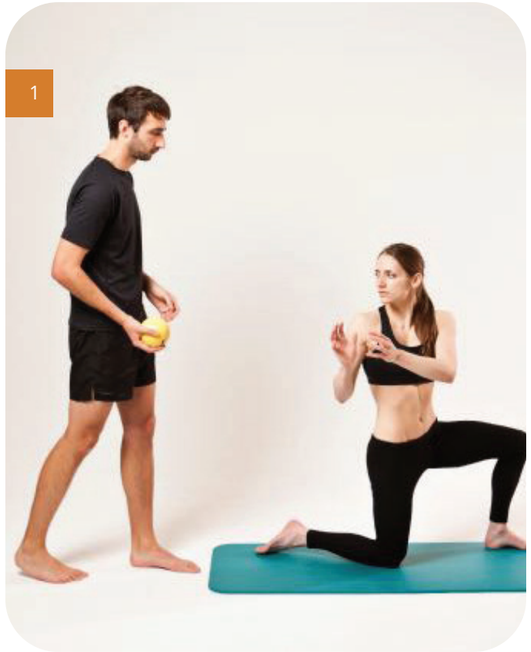
CLINICIAN NOTES:

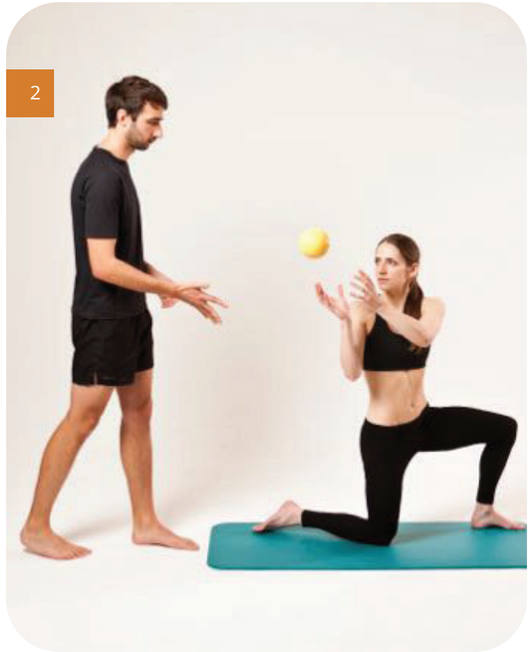
The dynamic stability system relies on feed-forward and feedback motor control to anticipate and react to joint movements or loads. Functional training such as ball catching and throwing can enhance the ability of the dynamic stabilisers to activate appropriately to stabilise the gleno-humeral joint in functionally relevant positions.

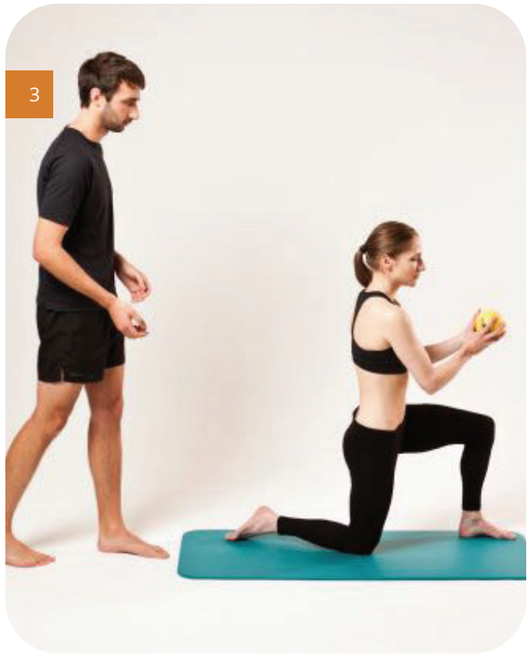
Refs: Guido et al 2007, Swanick et al 2002, Panzer et al 2011, Munn et al 2004, 2005, Lephart & Fu 2000, Ellenbecker et al 2015

REVERSE CATCHING IN KNEELING

LATE | ROM | S | P | C | KC







Kneeling on one knee. Catch a ball that is thrown from behind you by turning through the trunk.

REPEAT (TIMES)

Adaptations:

1. Alter speed of the throw
2. Alter the weight of the ball
3. Try kneeling on a balance cushion to challenge your core stability

CLINICIAN NOTES:

Functional training such as ball catching will enhance the ability of the dynamic stabilisers to activate appropriately to stabilise the gleno-humeral joint in functionally relevant positions by emphasising hand-eye coordination and visual input.

Visual tracking will enhance cervical and thoracic rotation.

Refs: Guido et al 2007, Lephart & Fu 2000, Ellenbecker et al 2015

SWISS BALL BRIDGE OVER HEAD CATCH

LATE | ROM | S | P | C | KC

Position yourself in a bridge position over a swiss ball with the ball under your head neck and shoulder blades. Get a partner to stand at your feet and gently throw a ball. Catch the ball as it travels over your head and then throw it back to your partner.

REPEAT (TIMES)

Adaptation:

1. Alter speed of throw
2. Alter weight of ball

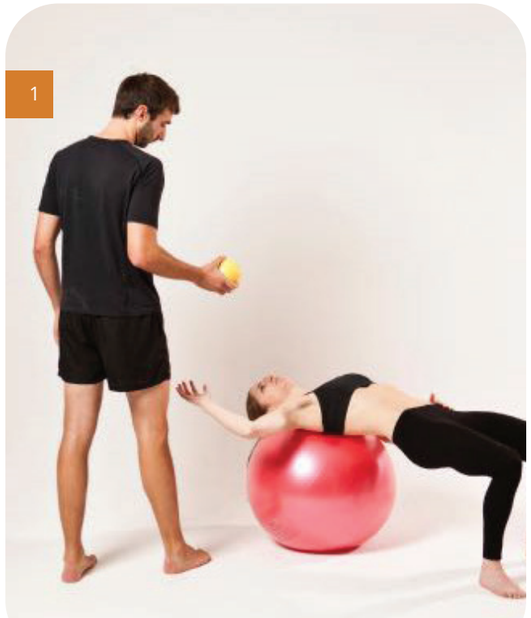
CLINICIAN NOTES:

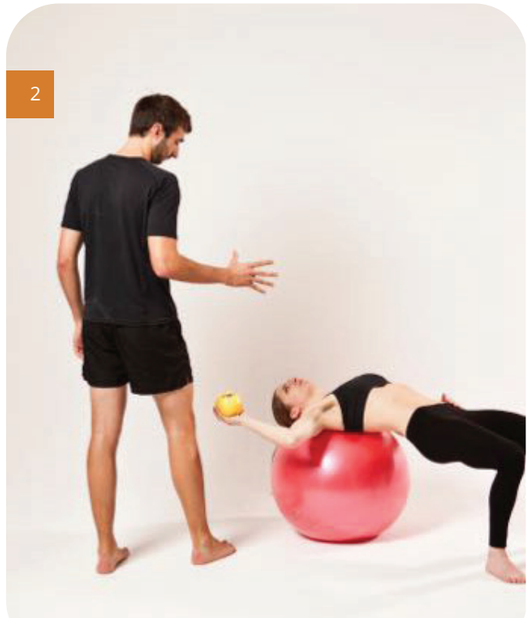
The dynamic stability system relies on feed-forward and feedback motor control to anticipate and react to joint movements or loads. Functional training such as ball catching and throwing can enhance the ability of the dynamic stabilisers to activate appropriately to stabilise the gleno-humeral joint in functionally relevant positions.

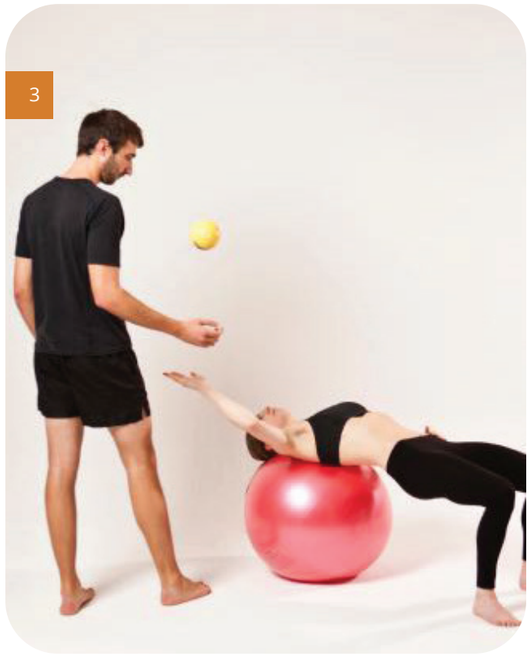
Refs: Guido et al 2007, Swanick et al 2002, Panzer et al 2011, Munn et al 2004, 2005, Lephart & Fu 2000, Ellenbecker et al 2015

SWISS BALL BRIDGE 1 ARM EXTERNAL ROTATION CATCH

LATE | ROM | S | P | C | KC







Position yourself in a bridge position on a swiss ball with the ball under your head neck and shoulder blades. Keep your hips up. With your arm in a combined abduction and external rotation position, get a partner to drop a ball for you to catch and then throw back whilst maintaining this position.

REPEAT (TIMES)

Adaptation:

1. Alter speed of throw
2. Alter weight of ball

CLINICIAN NOTES:

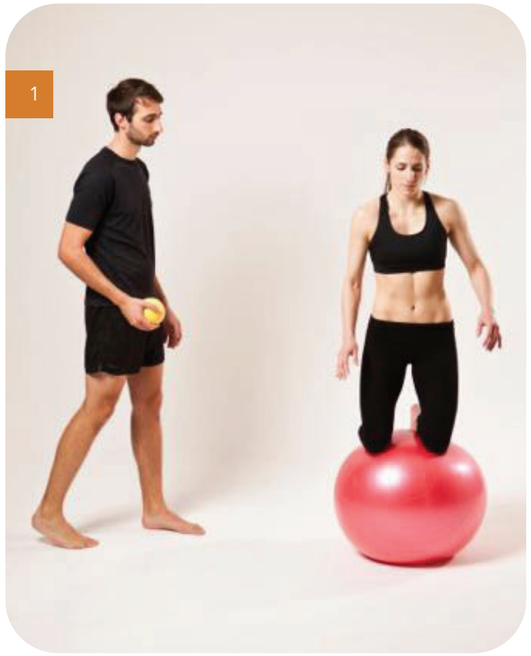
Functional training such as ball catching and throwing will enhance the ability of the dynamic stabilisers to activate appropriately to stabilise the gleno-humeral joint in functionally relevant positions.

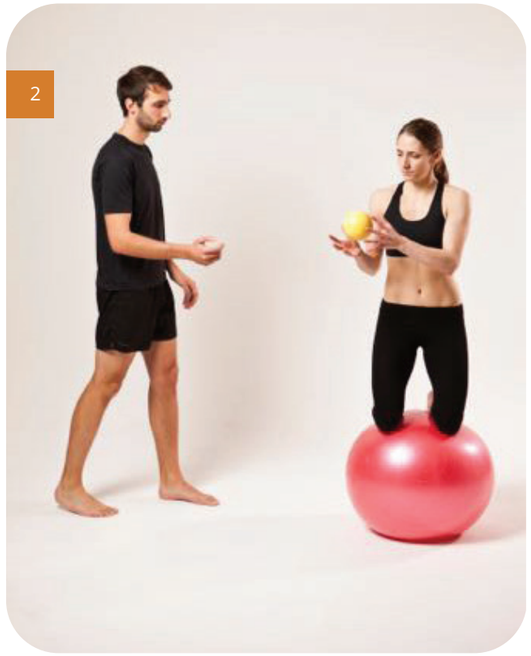
Working the unaffected arm first can improve recruitment and performance.

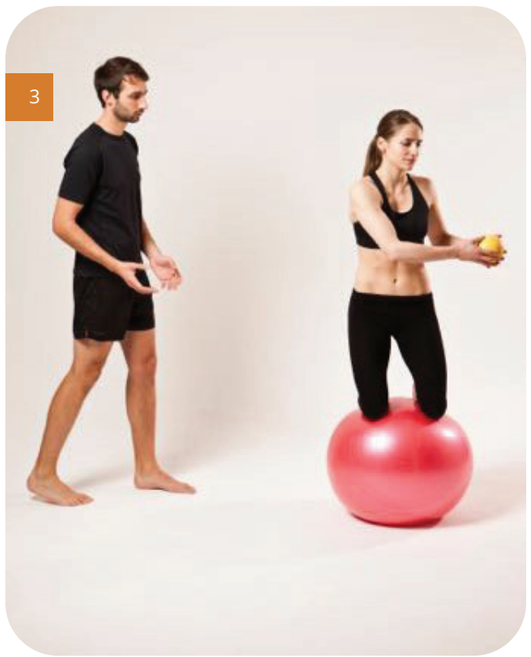
Refs: Guido et al 2007, Panzer et al 2011, Lephart & Fu 2000, Ellenbecker et al 2015

SWISS BALL KNEELING LATERAL BALL CATCH AND THROW

LATE | ROM | S | P | C | KC







Balance yourself in kneeling on a swiss ball. When steady get a partner to stand at your side and gently throw you a ball for you to throw back whilst maintaining your balance.

REPEAT (TIMES)

Adaptation:

1. Different balls can be used depending on the sport
2. Therapist can also throw from behind and in front of the patient

CLINICIAN NOTES:

Kneeling on the ball removes somato-sensory input from the feet and increases dependence on the visual and vestibular systems for balance and postural control.

Visual tracking will enhance cervical and thoracic rotation.

Refs: Elphinston 2013

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APPENDIX

The principle of 'cross education' can be utilised in the early, protected phase of rehabilitation. Cross-education of strength is defined as the increase in strength of the untrained, contralateral limb after unilateral training of the opposite limb. Studies reports its effectiveness in the prevention of strength loss in an immobilised upper limb and have shown that improvements gained early during resistance training the uninjured/un-operated limb have been found to facilitate earlier return to function. The exact mechanisms by which strength gains occur are unclear but are theorised to be a combination of neurological (with contributions from spinal, cortical and peripheral levels), muscular and systemic. It has been suggested that maintenance of neurophysiological activation minimises negative morphological adaptations and may facilitate quicker recovery after injury.

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