

REHA nach
Rotatorenmanschetten-OP

Physiopark

A K A D E M I E



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Web & Breakfast

Neuropathischer Schmerz

Die Mobilisation des Nervensystems

4. Oktober 2025

9:00 bis 12:15 Uhr

Referent: Andreas Lieschke

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REHA

Immobilisation



REHA

Immobilisation



Mobilisation



REHA

Immobilisation



Mobilisation



Training



Re-Rupturrisiko vs. Kontraktur



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AKADEMIE





Houck et al. 2017

Der frühe Vogel fängt den Wurm?

Mobilisation

Pacing:

Frühmobilisation: leichte Vorteile in der Frühphase
(ROM: unter $\pm 10^\circ$, 3-6 Monate)

Re-Rupturrate: kein Einfluss

Ausbilden einer Kontraktur: kein Unterschied

Aggressive Mobilisation: Re-Rupturrate höher!

PROMS: Frühmobilisation + defensive Gruppe:
bessere Funktion (12 Monate)





Der frühe Vogel fängt den Wurm?

Fazit:

Frühe Mobilisation ist sicher, wenn diese moderat ausgeführt wird ("spannungsfrei").

Die (leicht) positiven Effekte werden nach einigen Monaten wieder eingeholt!



*Der **frühe** Vogel fängt den **frühen** Wurm!*

Individueller Ansatz?

Time- vs. Criterion-based



Individueller Ansatz?

- **Intraoperativ:**
 - Defektgröße
 - Spannungsfreie Fixation
 - OP-Methode
 - Sehnenqualität
 - ...



Niedriges Risiko

Alter <50 Jahre

normale Knochendichte

geringe Muskeldegeneration

Komorbidität -

kleine-mittlere Risse

Keine Retraktion der Rupturenden

gute Gewebequalität
(intraoperativ)

geringes präoperatives Kraftdefizit
($\geq 3/5$)

Operateur mit großer Erfahrung

Hohes Risiko

Alter >60 Jahre

Osteoporose

starke Muskeldegeneration

Komorbidität +

große Risse, Massenruptur

Retraktion der Rupturenden

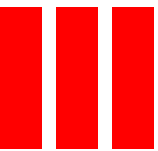
schlechte Gewebequalität
(intraoperativ)

großes präoperatives Kraftdefizit
($<3/5$)

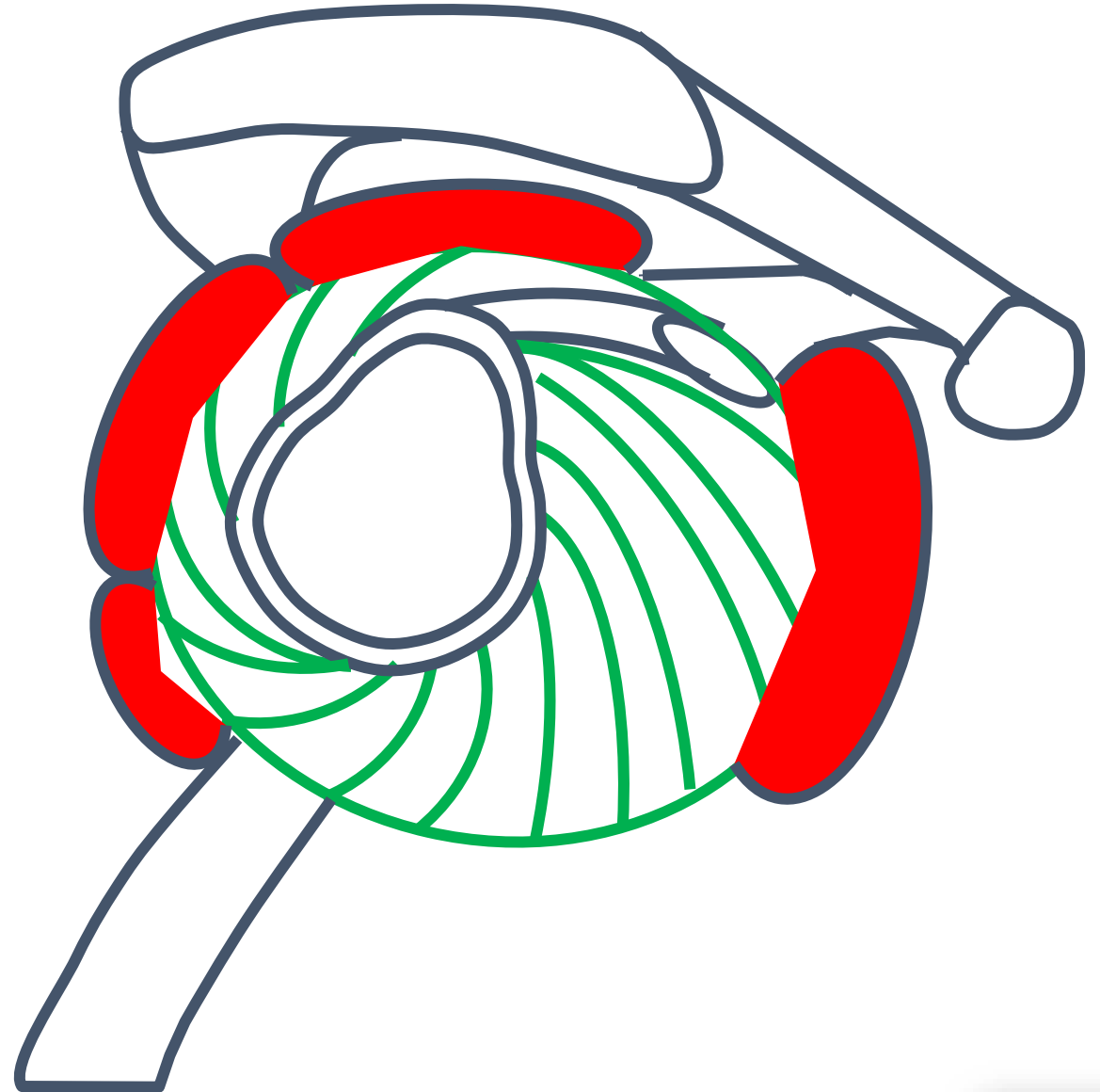
Operateur mit geringer Erfahrung

Das Modell der Kapselrekrutierung





Verschmelzung der Strukturen

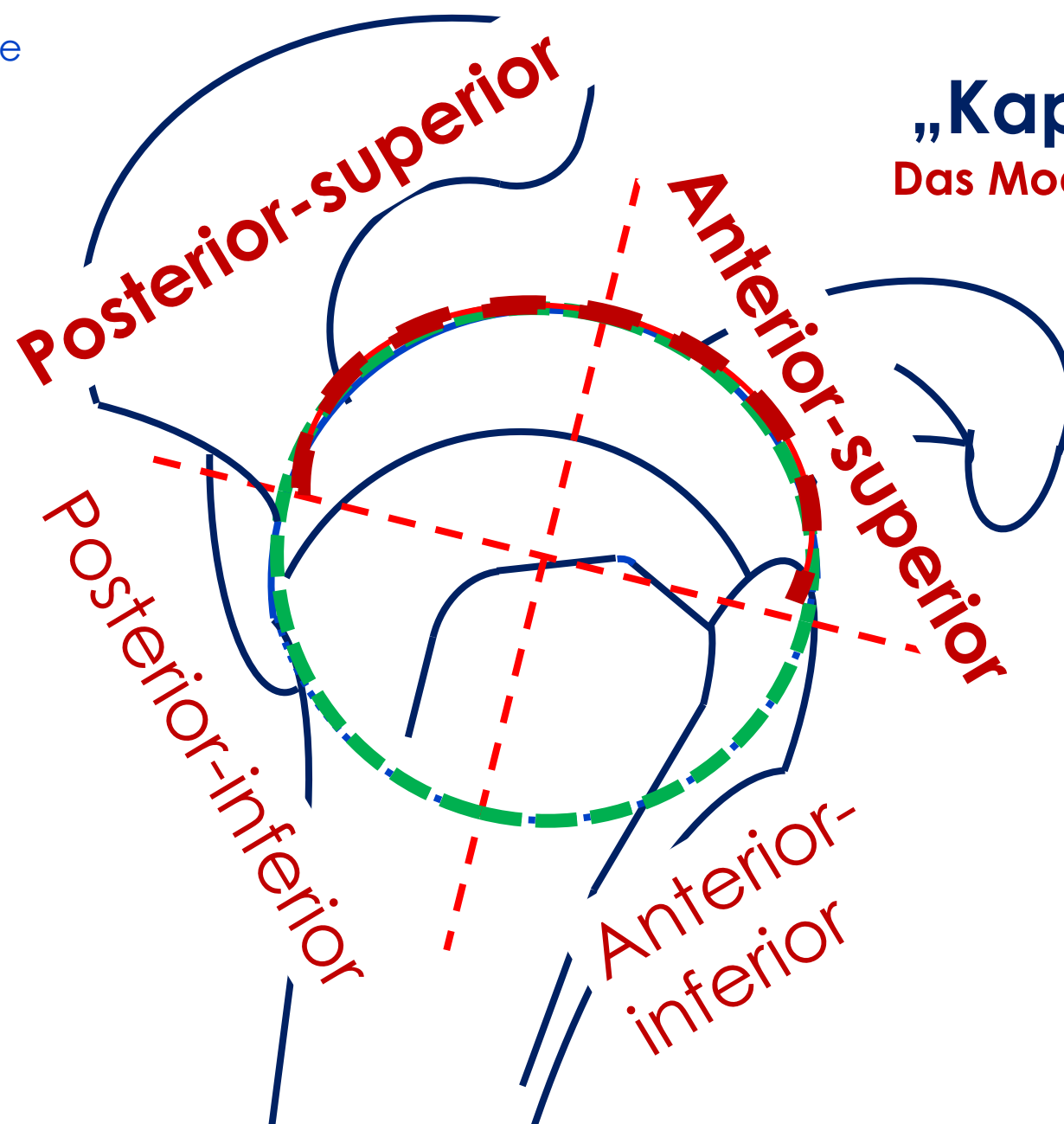


EFFECT OF SELECTIVE CAPSULORRHAPHY ON THE PASSIVE RANGE OF MOTION OF THE GLENOHUMERAL JOINT

BY C. GERBER, MD, C.M.L. WERNER, MD, J.C. MACY, MD,
H.A.C. JACOB, PHD, AND R.W. NYFFELER, MD, DIPL ING ETH/FIT

Investigation performed at the Department of Orthopaedics, University of Zürich, Balgrist, Zürich, Switzerland





„Kapselquadranten“

Das Modell der Kapselrekrutierung



“Spannungsfrei“



Einfluss auf Immobilisation

Gao et al. 2023; Chen et al. 2023; Pandey et al. 2020

Immobilisation bei **kleinen** Defekten

Abduktionsschiene vs. Schlinge:

Klinische Ergebnisse
Constant-Score,
VAS- und WORC-Scores
ROM des Schultergelenks
Re-Rupturrate
Heilung

Kein Einfluss!

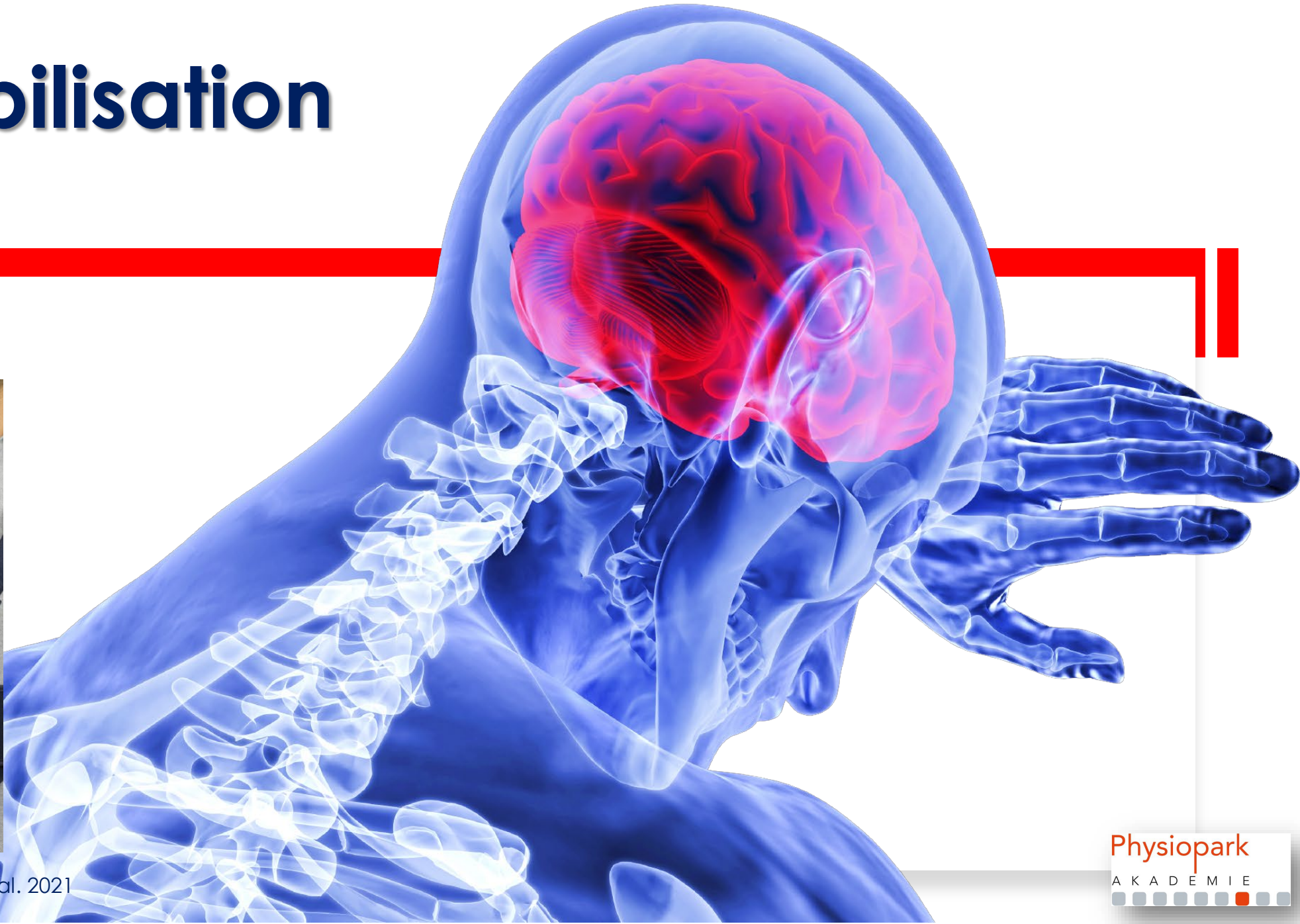


Immobilisation

Compliance



Stephens et al. 2021, Littlewood et al. 2021



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Immobilisation

Fazit:

Keine pauschale Immobilisation-Art

Schlinge bei kleinen Defekten oft ausreichend

Individueller Ansatz:

Spannungsfrei Immobilisation
Je nach Defektgröße:
Situatives Anlegen

“Pain neuroscience Education“ (PNE)

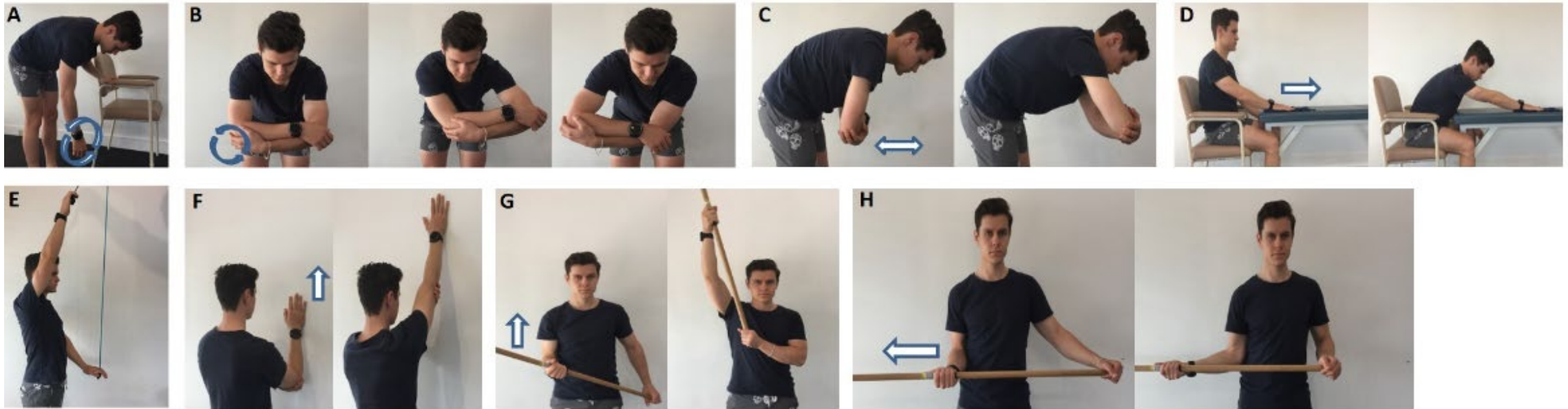


Mobilisation

Spannungsfreie Mobilisation

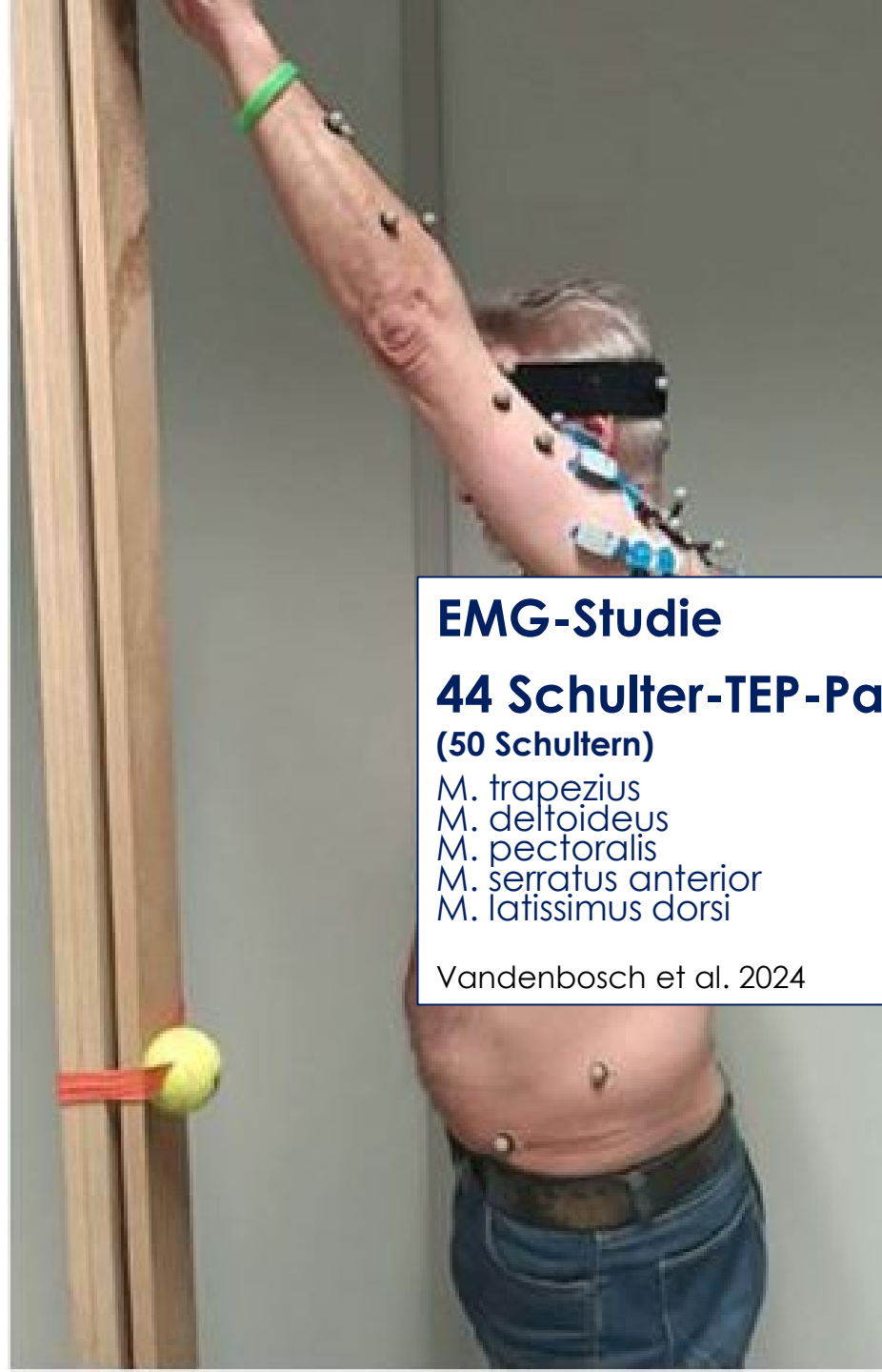


Mobilisation



Pendelübungen, Bench-Slides und Wall-Slides:
weniger als 15% MVC für Rotatorenmanschette

Spannungsfreie Mobilisation wählen!



EMG-Studie

44 Schulter-TEP-Patient*innen

(50 Schultern)

M. trapezius
M. deltoideus
M. pectoralis
M. serratus anterior
M. latissimus dorsi

Vandenbosch et al. 2024



Figure 1 Start Bench Slide.



Figure 2 120° Bench Slide.



Figure 3 Start Bench Slide against TheraBand.



Figure 4 120° Bench Slide against TheraBand.



Figure 5 Start Wall Slide.



Figure 6 120° Wall Slide.



Figure 9 Start Forward Flexion.



Figure 10 120° Forward Flexion.



Figure 7 Start REACH.



Figure 8 120° REACH.



Figure 11 Start SCAPtion.



Figure 12 120° SCAPtion.

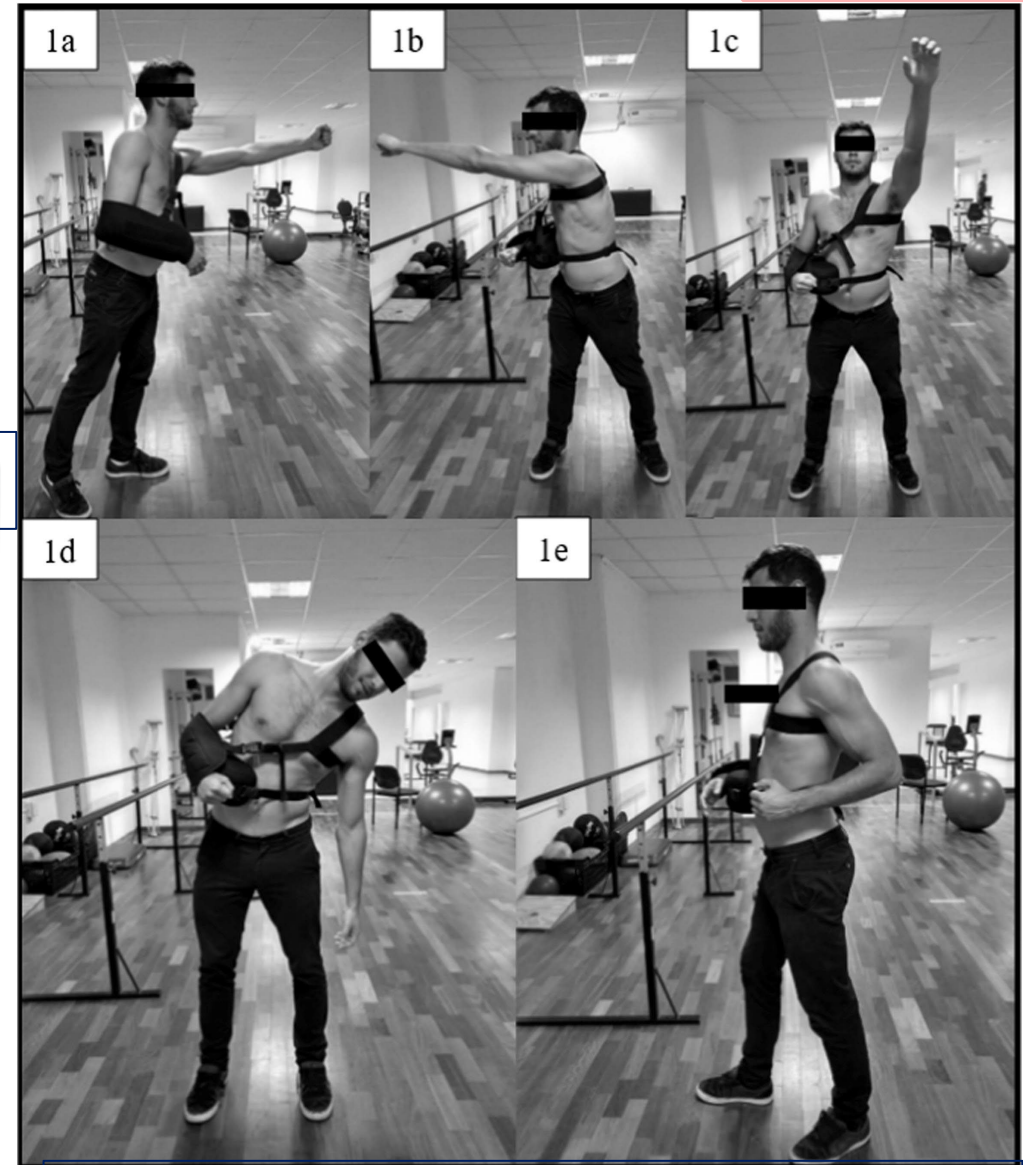
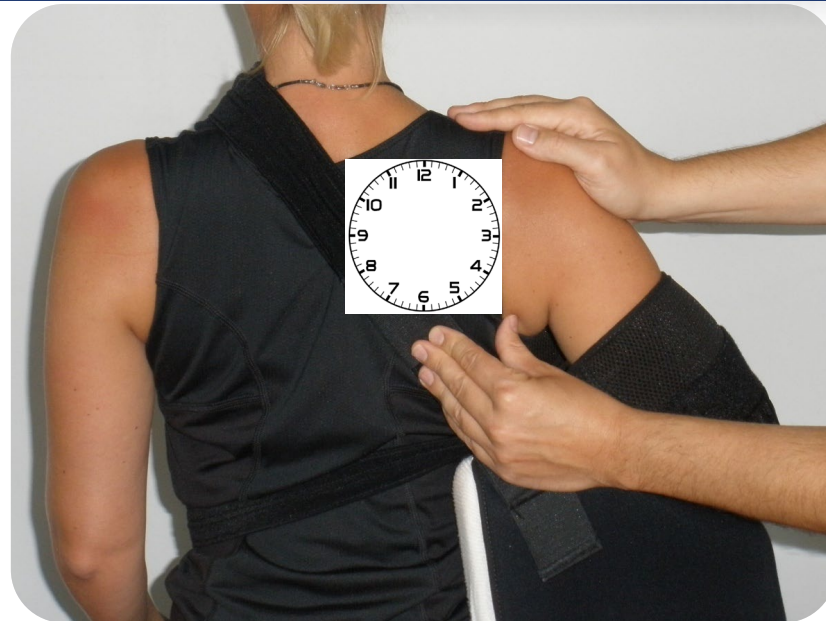
- Frühphase
- Mittlere Phase
- Spätere Phase



Aktive Übungen



Frühphase: aktive Übungen mit Orthese



Frühphase: aktive Übungen KONTRALATERAL mit Orthese

Aufbau: aktive Übungen



CONSENSUS STATEMENT

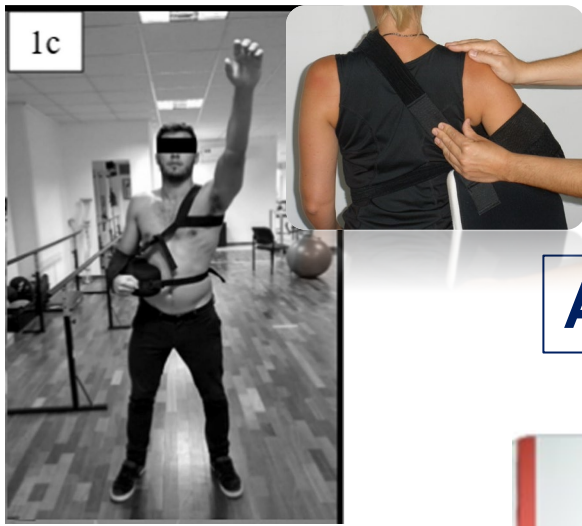
The American Society of Shoulder and Elbow Therapists' consensus statement on rehabilitation following arthroscopic rotator cuff repair



Charles A. Thigpen, PT, PhD, ATC^{a,b,*}, Michael A. Shaffer, MSPT, OCS, ATC^c,
Bryce W. Gaunt, PT, SCS^d, Brian G. Leggin, PT, MS, OCS^e, Gerald R. Williams, MD^f,
Reg B. Wilcox III, PT, DPT, MS, OCS^g

JOURNAL OF
SHOULDER AND
ELBOW
SURGERY

www.elsevier.com/locate/ymse



Übungen
mit/ohne Orthese
Isometrie
< 15% MVC
1-6 W

Aufbau: aktive Übungen



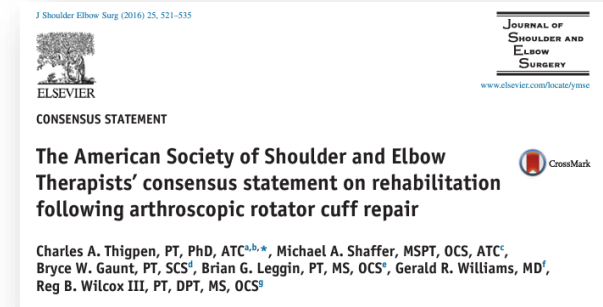
Aktive Übungen mit
Theraband
< 30% MVC
ADD, ARO, IRO
8-12 W



Aktive Übungen mit
Theraband
< 50% MVC
ADD, ARO, IRO
12-20 W



Aktive Übungen Krafttraining
> 50% MVC
ADD, ARO, IRO
ab 20 W





REHA nach Rotatorenmanschetten- OP

Zusammenfassung

Immobilisation: individueller Ansatz?

Frühe Mobilisation

Intensität: weniger ist mehr!
Spannungsfreie Bewegungsebene

Aktive Übungen, Training:
langsamer Aufbau, Stufenmodell

Reha nach Rotatorenmanschettenrekonstruktion

evidenzbasierte Physiotherapie

Ein Vorschlag

Timebased:
individuell anpassen



Rehabilitation

0 – 6. Woche

Individuelle Bewegungslimits, spannungsfreie Mobilisation, < 15% MVC



Milde passive Mobilisation



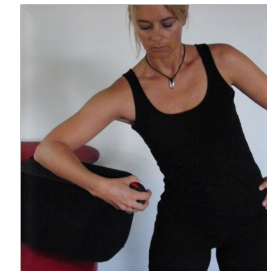
CPM



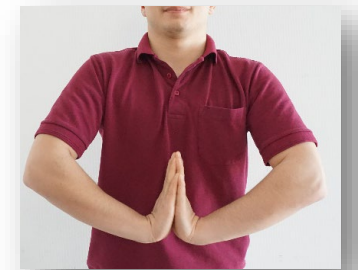
Pendeln in Abd.



“Bench-Slides“



Eigenmobilisation



Hand & Ellbogen

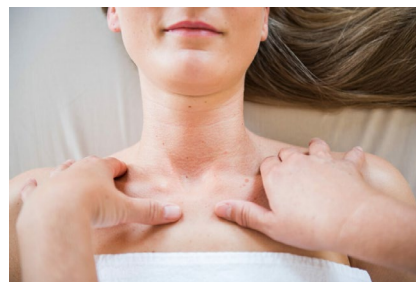
Individuelle für 4-6 Wochen



Ruhigstellung



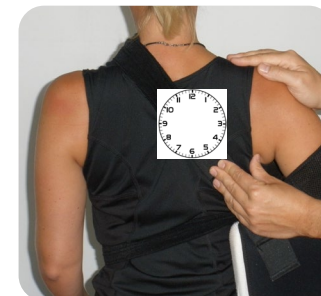
Kryotherapie



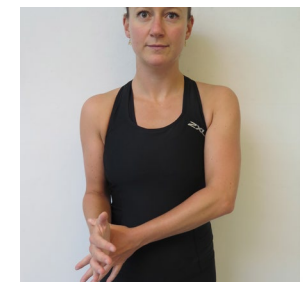
Lymphdrainage



Elektrotherapie



Skapula-Uhr



Isometrie

Garofalo et al. 2010 Thigpen et al. 2016 Raschhofer et al. 2017; Kjøer et al. 2018; Stephens 2020; Pandey et al. 2020; Chen et al. 2023, Gao et al. 2023; Schulze et al. 2021;

Rehabilitation 0 – 6. Woche

Ruhigstellung



**Individuell
4-6 Wochen**

Kryotherapie



Rehabilitation 0 – 6. Woche

Individuelle Bewegungslimits, spannungsfreie
Mobilisation, < 15% MVC



Milde passive
Mobilisation



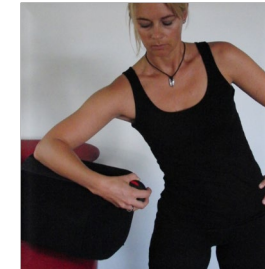
CPM



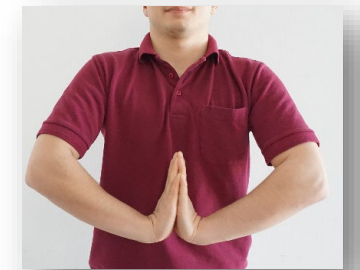
Pendeln in Abd.



“Bench-Slides“



Eigenmobilisation



Hand & Ellbogen

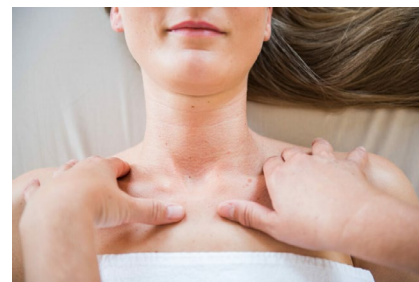
Individuelle für 4-6 Wochen



Ruhigstellung



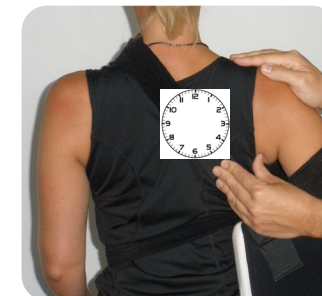
Kryotherapie



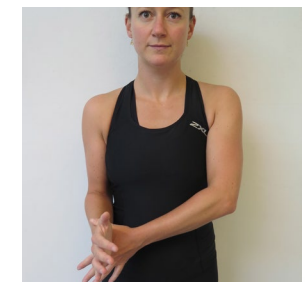
Lymphdrainage



Elektrotherapie



Skapula-Uhr



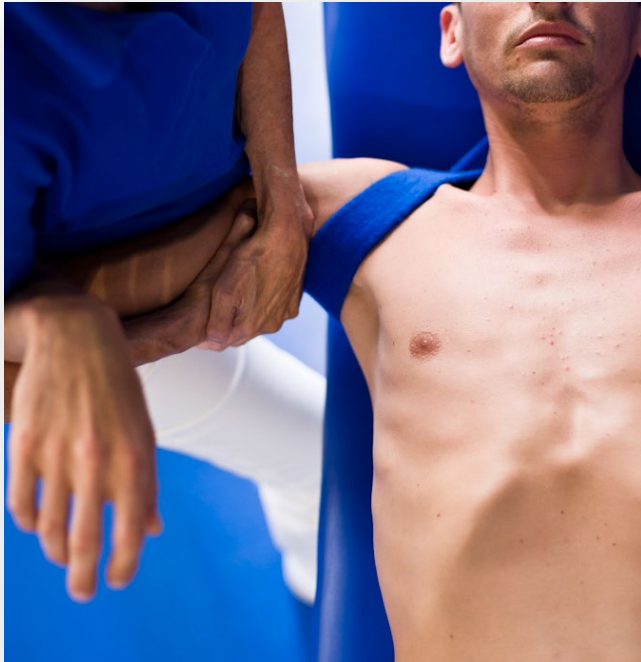
Isometrie

Garofalo et al. 2010 Thigpen et al. 2016 Raschhofer et al. 2017; Kjøer et al. 2018; Stephens 2020;
Pandey et al. 2020; Chen et al. 2023, Gao et al. 2023; Schulze et al. 2021;

Rehabilitation 0 – 6. Woche

Individuelle Bewegungslimits,
spannungsfreie Mobilisation

Gelenkspezifische Mobilisation (MT)



Milde passive Mobilisation, durchbewegen (MKR)



Rehabilitation 0 – 6. Woche

Individuelle Bewegungslimits, Spannungsfreie Mobilisation, < 15% MVC



Milde passive Mobilisation



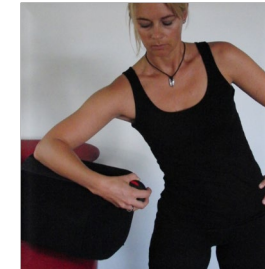
CPM



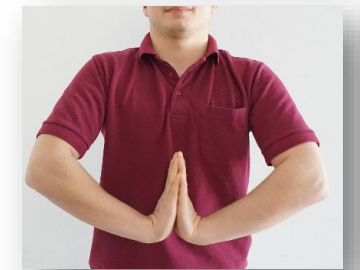
Pendeln in Abd.



“Bench-Slides“



Eigenmobilisation



Hand & Ellbogen

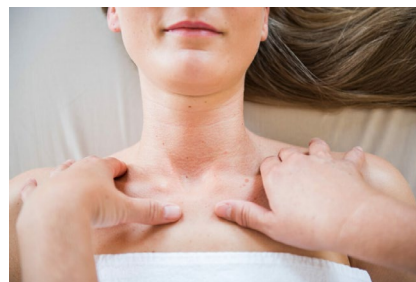
Individuelle für 4-6 Wochen



Ruhigstellung



Kryotherapie



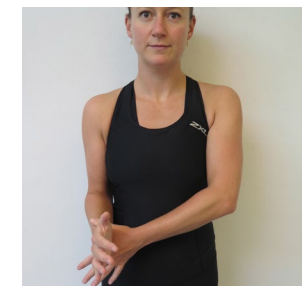
Lymphdrainage



Elektrotherapie



Skapula-Uhr



Isometrie

Garofalo et al. 2010 Thigpen et al. 2016 Raschhofer et al. 2017; Kjøer et al. 2018; Stephens 2020; Pandey et al. 2020; Chen et al. 2023, Gao et al. 2023; Schulze et al. 2021;

Rehabilitation 0 – 6. Woche

**Eigenmobilisation: individuelle
Bewegungslimits, spannungsfreie
Mobilisation, < 15% MVC**

Mobilisation



CPM



Pendeln in Abd.



“Rocking“



Stab



Abduktion



Bench Slides



Abduktion



Flaschenzug



Wall-Slides



Hand & Ellbogen

Rehabilitation

0 – 6. Woche



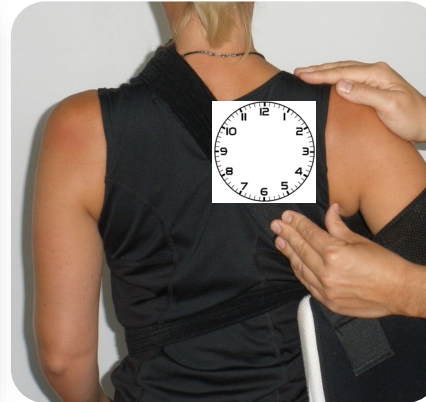
Lymphdrainage

Kleinet al. 2020



Elektrotherapie

Osti et al. 2015; Mahure et al. 2017,



Übungen mit Orthese

Intelangelo et al. 2024



Isometrie, <15% MVC

Kjaer et al. 2018

Rehabilitation

7. – 12. Woche und 12.-20. Woche

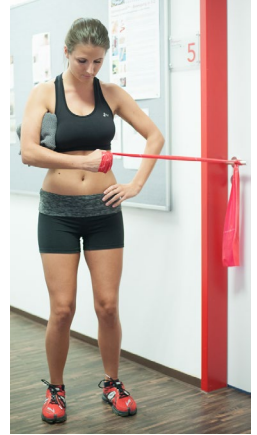
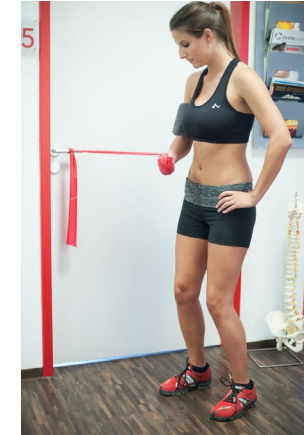
Mobilisation



**Scapulothorakale
Stabilität**



**Kraft-Ausdauer-
Übungen**



Kraft-Ausdauer-Training der Rotatorenmanschette

Isoliertes Training ISP

Kelly et al, 1996; Reddy et al. 2000; Graichen et al. 2005; Escamilla et al. 2009; Wattanaprakornkul 2011; Huegel et al. 2015; Akhtar et al. 2021

Rehabilitation

7. – 12. Woche

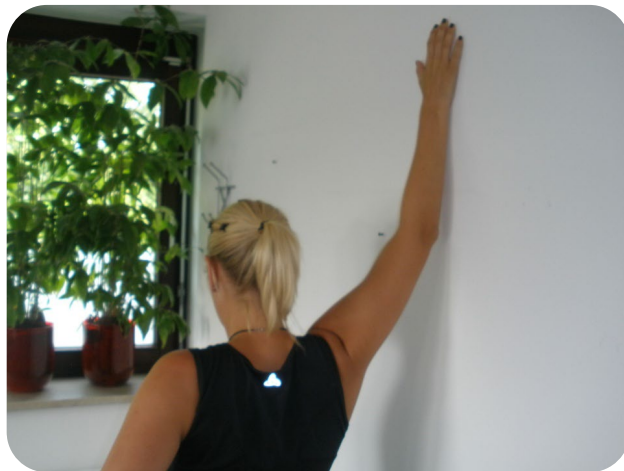
Aktive Übungen: AUSDAUER

- Scapulothorakal
- Theraband: ADD, IRO, ARO
- < 30% MVC

Thigpen et al. 2016, Kjær et al. 2018; Intelangelo et al. 2024



Mobilisation ohne Bewegungslimits



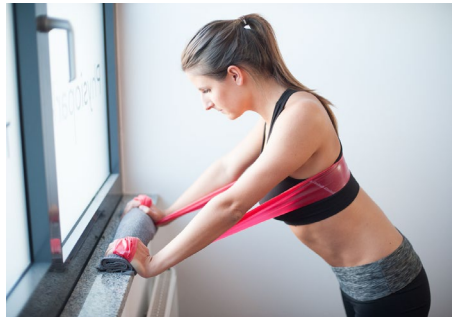
Rehabilitation

7. – 12. Woche und 12. – 20. Woche

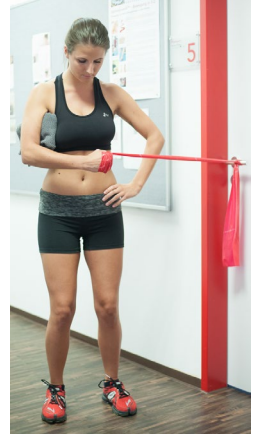
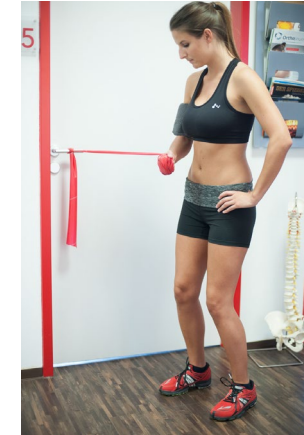
Mobilisation



**Scapulothorakale
Stabilität**



**Kraft-Ausdauer-
Übungen**



Kraft-Ausdauer-Training der Rotatorenmanschette

Isoliertes Training ISP

Kelly et al, 1996; Reddy et al. 2000; Graichen et al. 2005; Escamilla et al. 2009; Wattanaprakornkul 2011; Huegel et al. 2015; Akhtar et al. 2021

Rehabilitation

12. – 20. Woche

Aktive Übungen: KRAFTAUSDAUER

- Scapulothorakal
- Theraband: ADD, IRO, ARO
- < 50% MVC

Kjær et al. 2018



Kraft-Ausdauer-Training der Rotatorenmanschette

Isoliertes Training ISP



Rehabilitation ab 20. Woche

Aktive Übungen: HYPERTROPHIE

- Scapulothorakal
- Theraband: ADD, IRO, ARO
- > 50% MVC
- Sportartspezifisch





Return to Sports

16-24 Wochen

Assessments

A close-up, slightly blurred photograph of a person in medical attire. They are wearing a white lab coat over blue scrubs. A stethoscope is visible around their neck. Their right hand is extended forward, palm facing up, in a gesture of offering or communication. The background is dark and out of focus.

Kommunikation ist alles!



Therapeutisches Management nach Rotatorenmanschettenläsionen

**Kompromiss zwischen der Gefahr Kontraktur
und Schutz des OP-Ergebnisses.**

“Pain Neuroscience Education“ (PNE)

Immobilisation: individuell

**Mobilisation: am Anfang ist weniger mehr...
SPANNUNGSFREIE MOBILISATION!**

Ruhiger, stufenweiser Aufbau des aktiven Trainings

Die Reha braucht Zeit!



A close-up, shallow depth-of-field photograph of the spines of several old, leather-bound books. The books are arranged in a row, with the focus sharp on the spines in the middle ground. The leather is dark brown and shows signs of wear and age. Some spines feature gold-tooled decorative patterns, including diamond shapes and horizontal bands. The word "Literatur" is overlaid in white, sans-serif font in the center of the image.

Literatur

Literaturverzeichnis

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- Edwards PK, Kwong PWH, Ackland T, Wang A, Donnelly CJ, Ebert JR. Electromyographic Evaluation of Early-Stage Shoulder Rehabilitation Exercises Following Rotator Cuff Repair. *Int J Sports Phys Ther*. 2021 Dec 1;16(6):1459-1469. doi: 10.26603/001c.29513. PMID: 34909253; PMCID: PMC8637301. Elkins, Ashleigh R.; Lam, Patrick H.; Murrell, George A. C. (2020): Duration of Surgery and Learning Curve Affect Rotator Cuff Repair Retear Rates: A Post Hoc Analysis of 1600 Cases. In: *Orthopaedic journal of sports medicine* 8 (10), 2325967120954341. DOI: 10.1177/2325967120954341.
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