RAPID RESEARCH

@physicaltherapyresearch

February 2023

Inside This Week:

Deadlifts & the Posterior Chain

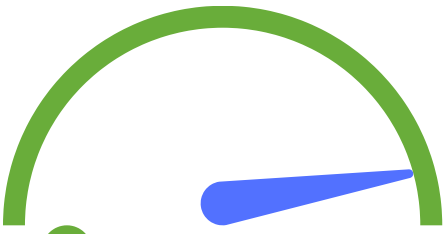
- EMG Muscle Activity During a Deadlift
- Posterior-Chain Training to Treat Chronic Low Back Pain
- Exercises with Highest Pressures Created via Valsalva Maneuver

EMG MUSCLE ACTIVITY DURING A DEADLIFT

FEBRUARY 2023

Click for Full Text (Martı´n-Fuentes et al. 2020)

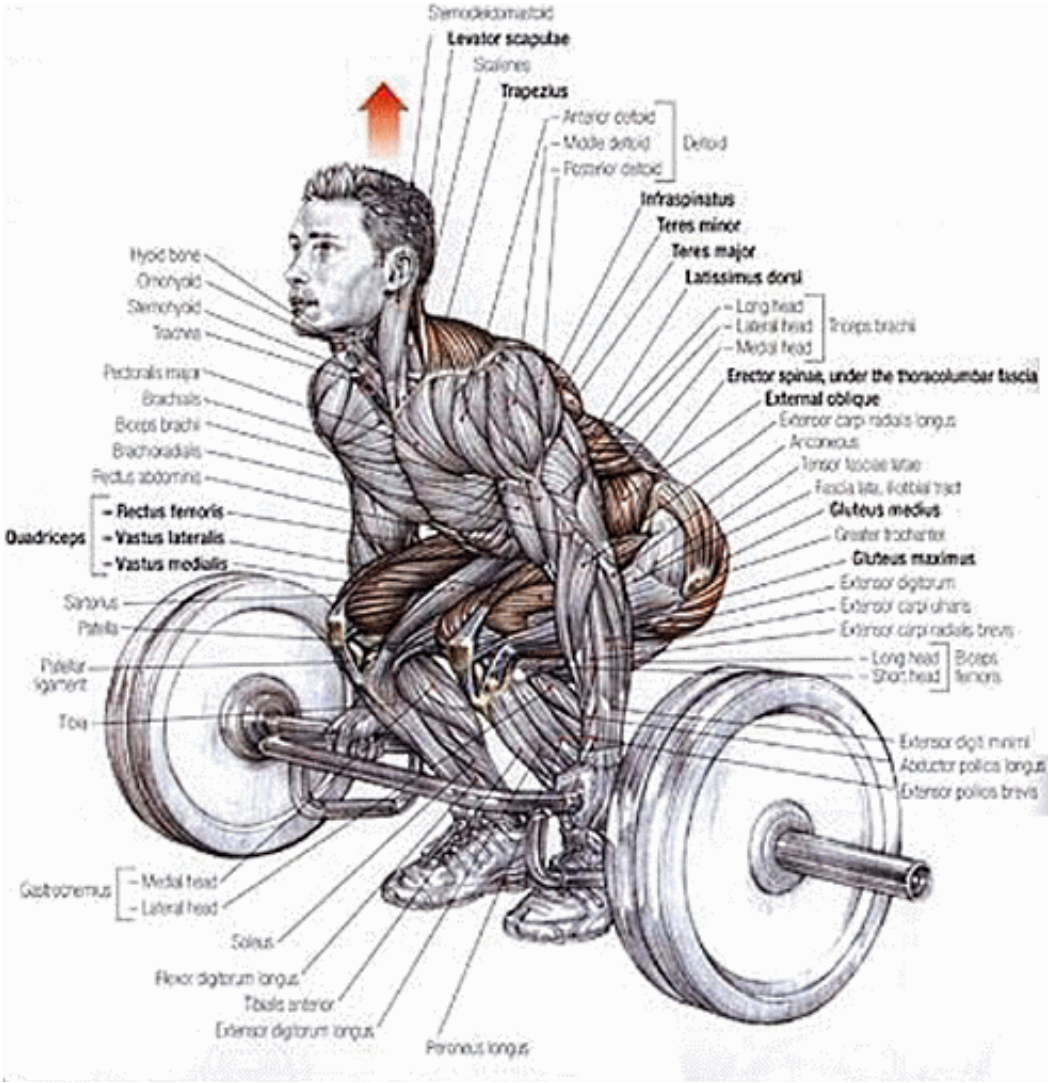
JBI 10/11 [90%]



Quality Check

*see appx

This systematic review investigated muscle activation measured with sEMG of muscles recruited when performing the Deadlift exercise and all its best-known variants.



KEY FINDINGS

19 studies included; 340 participants, all with >6 mo training exp.
Conventional Barbell Deadlift (10/19 studies)
Stiff Leg Deadlift (6/19 studies)
Unilateral Stiff Leg Deadlift (2/19 studies)
Romanian Deadlift (2/19 studies)
Hexagonal Bar Deadlift (2/19 studies)

Highest Activations:
Erector spinae & Quadriceps had greater activation vs Glute-Max & Biceps femoris during Deadlift & variants.

Romanian Deadlift showed lower activation for erector spinae than for biceps femoris and semitendinosus.

Deadlift also showed greater activation of the Quadriceps muscles than the Glute-Max and hamstring muscles.

MAIN TAKEAWAYS

This systematic review provided 3 main takeaways from the research:
1. Biceps femoris is the most studied muscle (13/19), followed by Gluteus maximus (10/19), Vastus lateralis and Erector spinae (9/19) during Deadlift exercises.

2. Erector spinae and Quadriceps muscles are more activated than Gluteus maximus and Biceps femoris muscles within Deadlift exercises (9/19).

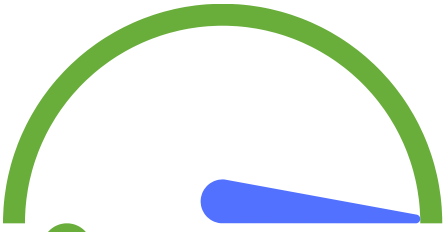
3. Within the Hamstrings complex, Semitendinosus elicits slightly greater muscle activation than Biceps femoris during Deadlift exercises (6/19). recordings

POSTERIOR-CHAIN TRAINING TO TREAT CHRONIC LOW BACK PAIN

FEBRUARY 2023

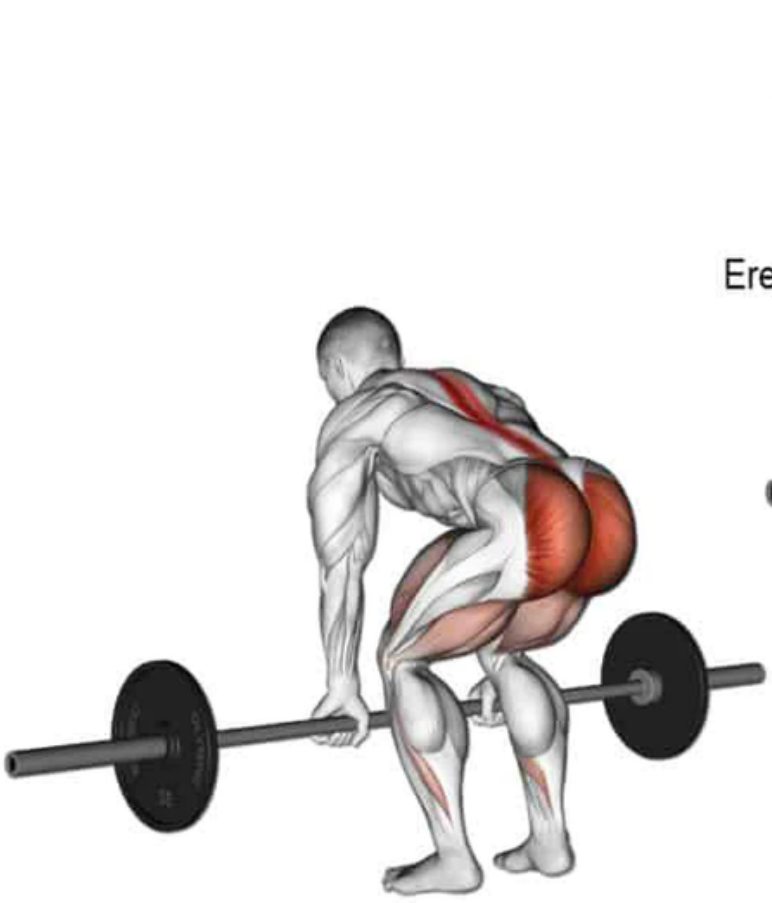
Click for Full Text (Tataryn et al. 2021)

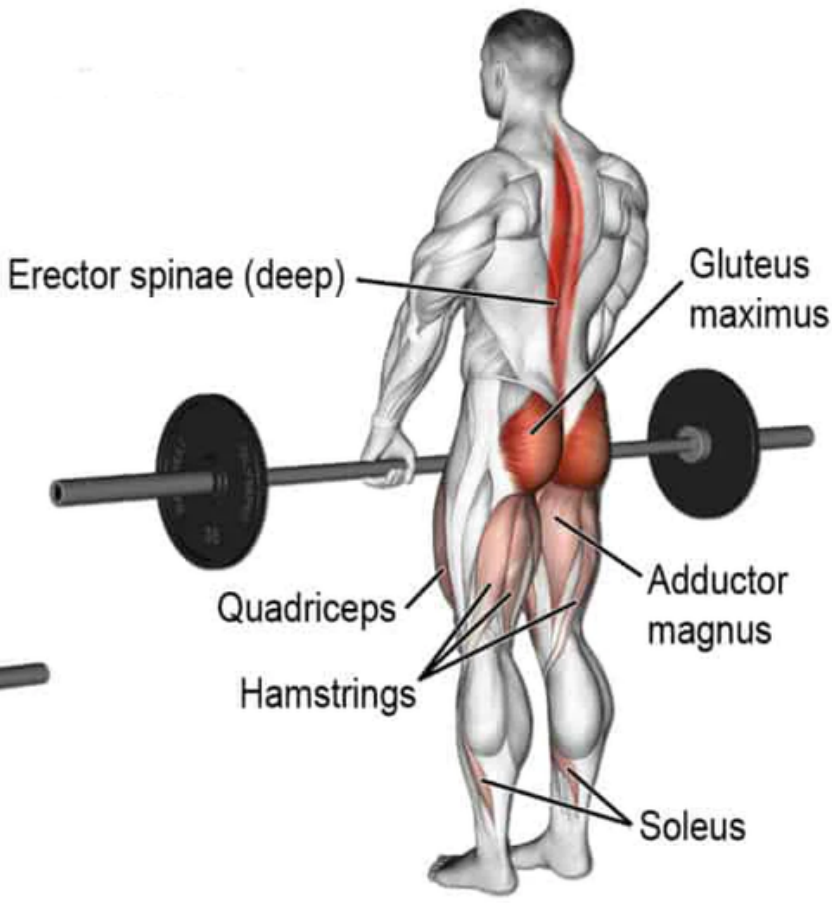
JBI 11/11 [100%]



Quality Check
*see appx

This systematic review determined if posterior chain resistance training (PCRT), is more effective than General Exercise in improving pain, level of disability, muscular strength and the number of adverse events in recreationally active and sedentary individuals with Chronic Low Back Pain (CLBP)





KEY FINDINGS

8 studies included; 408 participants (203 PCRT, 205 GE).

Both PCRT and GE were effective in improving CLBP-related outcomes.

When compared, **PCRT had significantly greater improvements vs GE**, especially with greater training durations (12–16 weeks vs. 6–8 weeks).

PCRT demonstrated greater improvements vs. GE in:
Pain
Level of disability
Muscle strength

Adverse events:
No differences between PCRT and GE.

MAIN TAKEAWAYS

Treating CLBP using PCRT is significantly more effective than using GE.

Strong levels of evidence show significant improvements in pain, level of disability and strength with PCRT, with no increase in adverse outcomes.

Evidence suggests prescribing PCRT over a 12–16-week period.

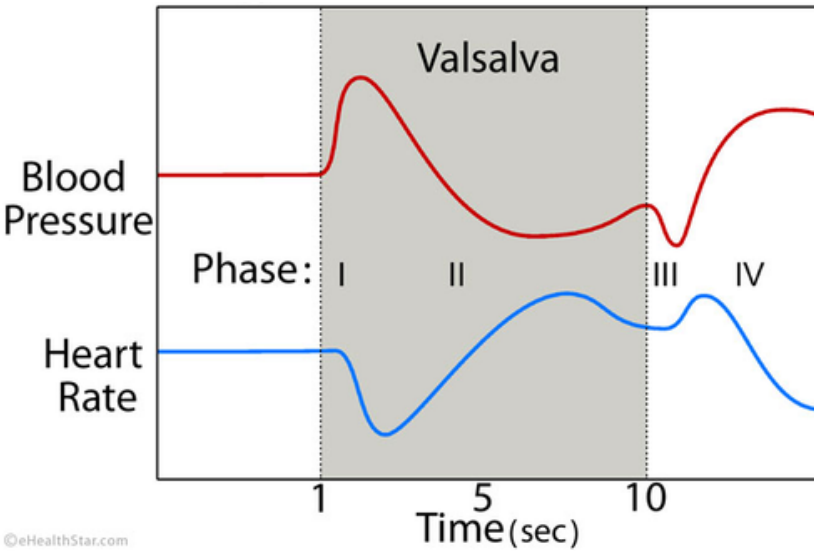
The variance across exercises in the PCRT programs suggest a wide range of programming can be beneficial.

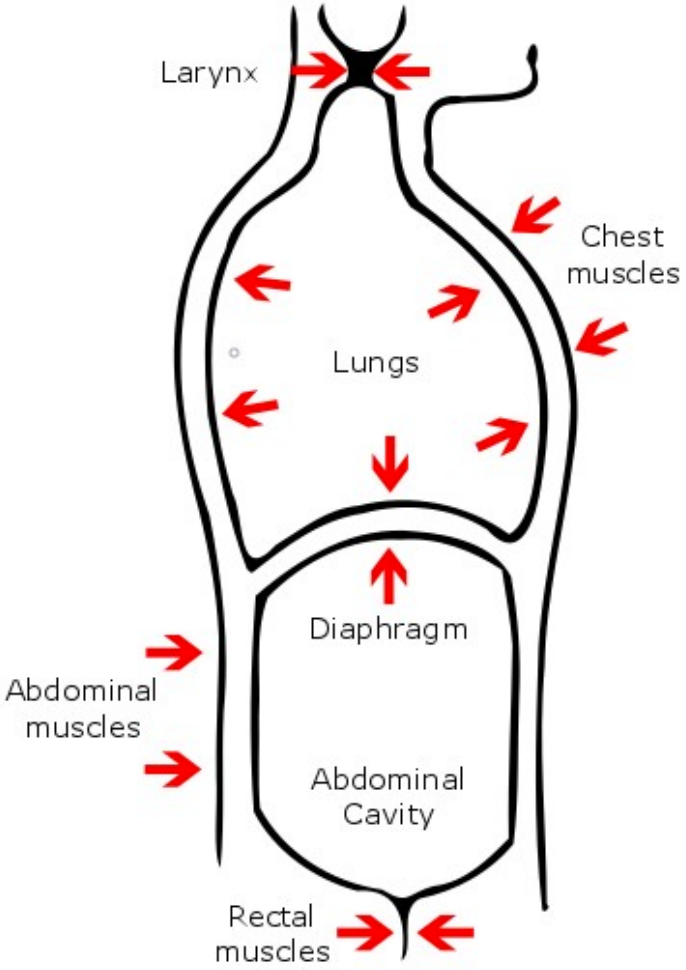
EXERCISES WITH HIGHEST PRESSURES CREATED VIA VALSALVA MANEUVER

FEBRUARY 2023

Click for Full Text (Blazek et al. 2019)

This systematic review summarized the intra-abdominal pressure (IAP) and intra-thoracic pressure (ITP) responses to determine which exercises elicit the highest or lowest body pressure values under high-intensity resistance exercise.





KEY FINDINGS

16 studies were included.

IAP Response Compared Across 10 Exercises:

Squats [over 200 mmHg] **Highest IAP across exercises*
Deadlift [161-176 mmHg]
Slide row [161-176 mmHg]
Leg press [161-176 mmHg]
Bench Press [79mmHG] **Lowest IAP across exercises*

ITP Response Compared Across 7 Exercises:

Clean & Jerk [161-261 mmHg] **Highest ITP across exercises*
Leg press [105-130 mmHg]
Deadlift [105-130 mmHg]
Box lift [105-130 mmHg]
Bench press [95 ± 37 mmHg]
Slide row [88 ± 32 mmHg] **Lowest ITP across exercises*

MAIN TAKEAWAYS

Based on pressure levels, bench press and slide row exercises could be useful for beginners and individuals with hypertension.

Untrained individuals should not use heavy squats, deadlift, box lift and clean exercises until they have undergone progressive adaptation for lifting high loads resulting in high IAP and ITP.

The high IAP and ITP seem to be determined by body and external load positions.

Increase in IAP and ITP, is associated with an increase in systolic blood pressure.

GIVE US YOUR FEEDBACK!

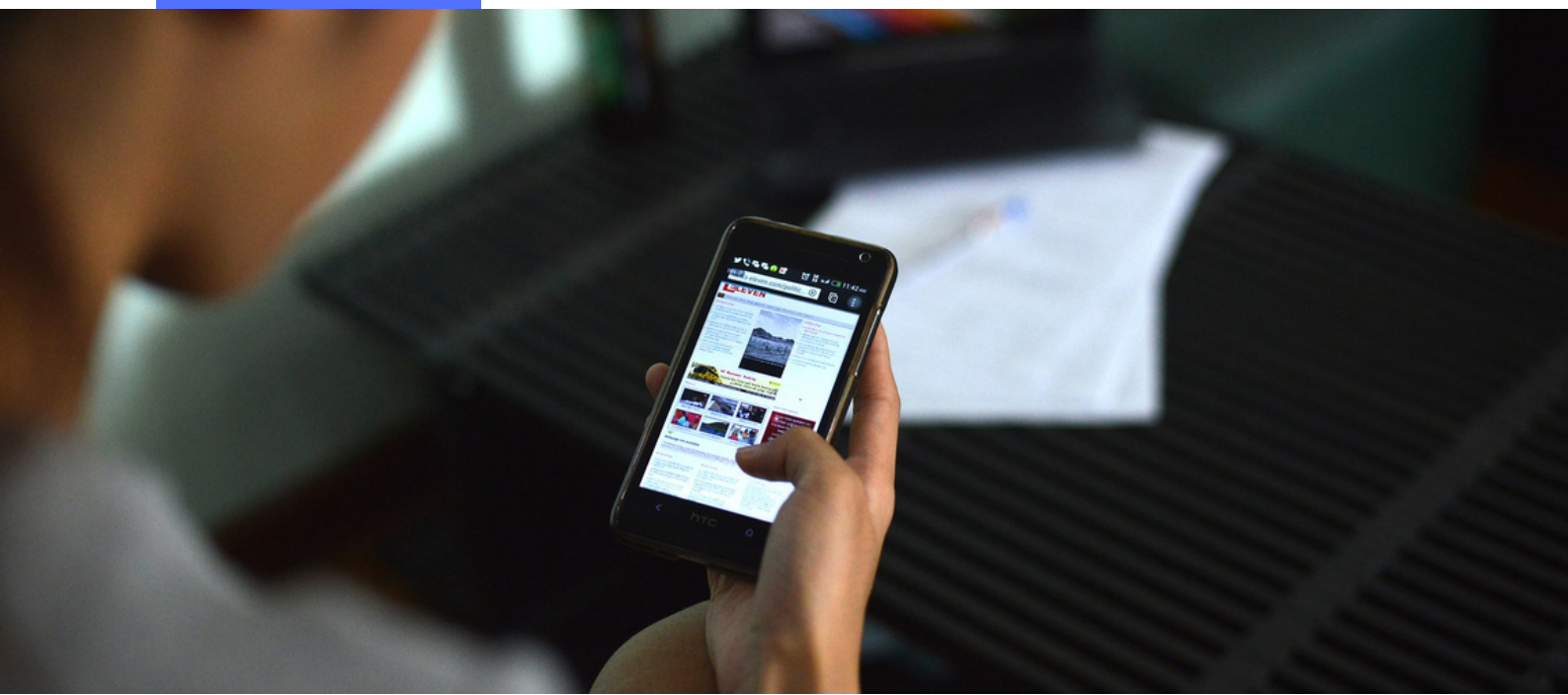
MEMBERS

We are on a mission to make research more accessible, easier to interpret, and quicker to implement.

Help us by giving 1 minute of your time to leave feedback for us.

We would greatly appreciate any feedback you have, as it helps us continually improve!

Leave Review



JBI Critical Appraisal Checklist for systematic reviews and research syntheses

Author: Martı´n-Fuentes et al. Year: 2020

		Yes	No	Unclear	Not applicable
1.	Is the review question clearly and explicitly stated?	+	☐	☐	☐
2.	Were the inclusion criteria appropriate for the review question?	+	☐	☐	☐
3.	Was the search strategy appropriate?	+	☐	☐	☐
4.	Were the sources and resources used to search for studies adequate?	+	☐	☐	☐
5.	Were the criteria for appraising studies appropriate?	+	☐	☐	☐
6.	Was critical appraisal conducted by two or more reviewers independently?	+	☐	☐	☐
7.	Were there methods to minimize errors in data extraction?	+	☐	☐	☐
8.	Were the methods used to combine studies appropriate?	+	☐	☐	☐
9.	Was the likelihood of publication bias assessed?	☐	X	☐	☐
10.	Were recommendations for policy and/or practice supported by the reported data?	+	☐	☐	☐
11.	Were the specific directives for new research appropriate?	+	☐	☐	☐

Overall appraisal: 10/11 (90%)

LIMITATIONS:

No unified criterion has been followed in categories of time management during exercise phase among study methodologies, which could also be treated as a potential bias risk.

Electrode location placement guidelines varied in the studies, some didn't include one.

Most studies did not report hand grip and stance position in any depth of detail.

JBI Critical Appraisal Checklist for systematic reviews and research syntheses

Author: Tataryn et al. Year: 2021

		Yes	No	Unclear	Not applicable
1.	Is the review question clearly and explicitly stated?	+	☐	☐	☐
2.	Were the inclusion criteria appropriate for the review question?	+	☐	☐	☐
3.	Was the search strategy appropriate?	+	☐	☐	☐
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9.	Was the likelihood of publication bias assessed?	+	☐	☐	☐
10.	Were recommendations for policy and/or practice supported by the reported data?	+	☐	☐	☐
11.	Were the specific directives for new research appropriate?	+	☐	☐	☐

Overall appraisal: 11/11 (100%)

LIMITATIONS:

Variations in exercise interventions for both PCRT and GE. Thus, what constitutes the optimal form of PCRT in terms of exercise selection, loads, sets, repetitions and rest periods is still relatively unknown.

Variance in the GE comparator groups, which could possibly lead to an unintentional bias towards PCRT if one of these comparators is less effective than the others.

JBI Critical Appraisal Checklist for systematic reviews and research syntheses

Author: Blazek et al. Year: 2019

		Yes	No	Unclear	Not applicable
1.	Is the review question clearly and explicitly stated?	+	☐	☐	☐
2.	Were the inclusion criteria appropriate for the review question?	+	☐	☐	☐
3.	Was the search strategy appropriate?	+	☐	☐	☐
4.	Were the sources and resources used to search for studies adequate?	+	☐	☐	☐
5.	Were the criteria for appraising studies appropriate?	+	☐	☐	☐
6.	Was critical appraisal conducted by two or more reviewers independently?	+	☐	☐	☐
7.	Were there methods to minimize errors in data extraction?	+	☐	☐	☐
8.	Were the methods used to combine studies appropriate?	+	☐	☐	☐
9.	Was the likelihood of publication bias assessed?	☐	X	☐	☐
10.	Were recommendations for policy and/or practice supported by the reported data?	+	☐	☐	☐
11.	Were the specific directives for new research appropriate?	+	☐	☐	☐

Overall appraisal: 10/11 (90%)

LIMITATIONS:

Exercise comparison lacks studies performed on a resistance-trained population, suggestions only apply to general population.

Some studies were not included in the review, but were still related to IAP, ITP and the VM.