

STRENGTH TRAINING WITHOUT LOWER BACK PAIN.

NSCA Coaches Conference
San Antonio, Texas

Presented by: *Richard Ulm, DC, MS*





- Who is this guy?**
- . Treating physician at Columbus Chiropractic & Rehabilitation**
- . Adjunct professor of manual therapy & rehab at National University of Health Sciences**
- . 20+ years as a strength training coach**
- . Competitive Olympic weightlifter**
- . Team physician for Project Lift, an amazing local lifting club**

LOADED
FLEXION
OF THE
LUMBAR
SPINE
PRODUCES
LOW BACK
PAIN.”

- *Captain Obvious* -



LOOKS GOOD
TO ME...



THE STRENGTH TRAINING PROFESSION OVER-EMPHASIZES THE POSTERIOR CHAIN. ^{& rehabilitation} S



OVER-EMPHASIS ON THE POSTERIOR CHAIN

SAMPLE LOWER BODY LIFTING PROGRAM

	Exercise	Rest	sets/reps	Notes
A1.	Power Clean	120 sec	4 x 3	85-92%
B1.	Back Squat	120 sec	5 x 5	All sets at 77.5%
C1.	Romanian Deadlift	60 sec	3 x 10	50% of B. Squat 1RM
D1.	Glute-Ham Raise	0 sec	3 x 8	5sec eccentric
D2.	Supermans	0 sec	3 x 20	No weight
D3.	Weighted Sit-ups	60 sec	3 x 10	25lbs/15lbs

OVER-EMPHASIS ON THE POSTERIOR CHAIN

COACHING CUES IN THE WEIGHT ROOM

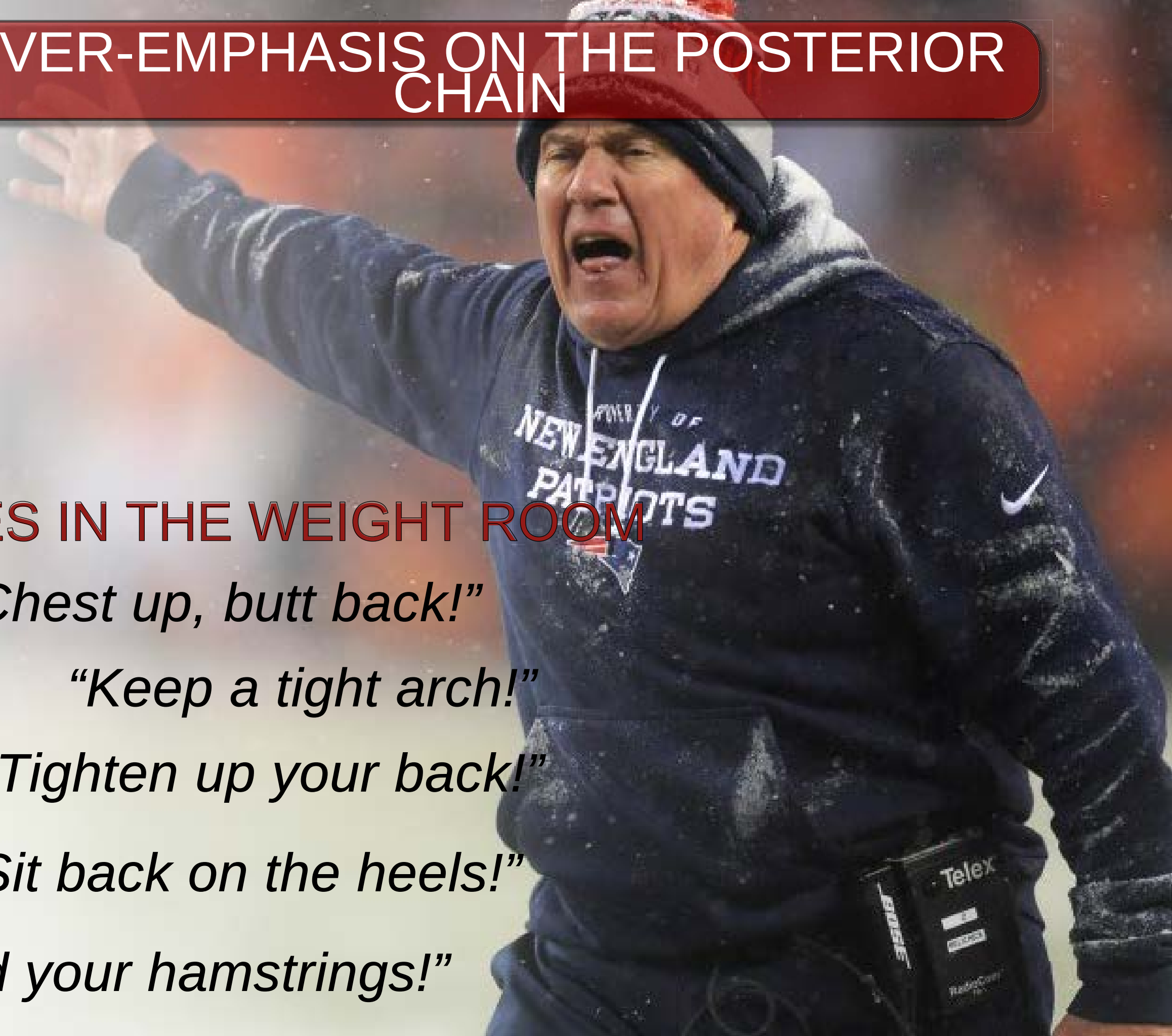
“Chest up, butt back!”

“Keep a tight arch!”

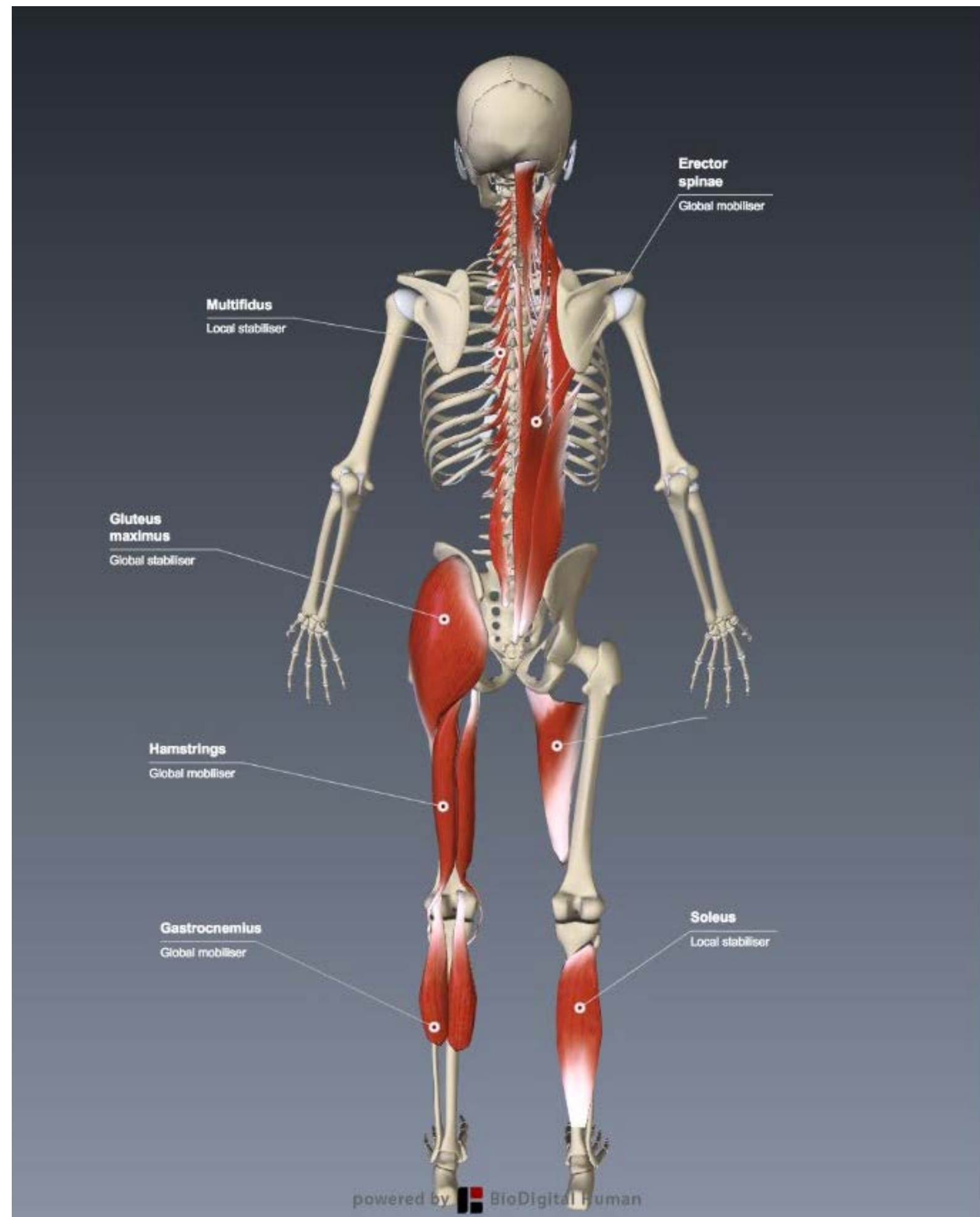
“Tighten up your back!”

“Sit back on the heels!”

“Find your hamstrings!”



WHAT
EXACTLY
MAKES
UP THE
POSTERIOR
CHAIN?



WHY IS THE POSTERIOR CHAIN SO OVER- EMPHASIZED?

1. IT IS AN OVER-CORRECTION FOR AVOIDING LOADED FLEXION.
2. MOST STRENGTH TRAINING IS PREDOMINANTLY IN THE SAGITTAL PLANE, ESPECIALLY BARBELL MOVEMENTS.
3. THAT'S HOW I WAS TAUGHT (#TRADITION).
4. I ACHIEVED SUCCESS BY TRAINING THE POSTERIOR CHAIN.
5. IT WORKS...IN THE SHORT TERM.

MECHANISM OF LBP IN WEIGHT TRAINING POPULATION

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graph TD; A[MECHANISM OF LBP IN WEIGHT TRAINING POPULATION] --> B[OVER-EMPHASIS ON THE POSTERIOR CHAIN]; B --> C[POSTURAL DISTORTION (PELVIC ANTEVERSION)]; B --> D[INCREASED SPINAL COMPRESSION]; B --> E[POOR ECCENTRIC FUNCTION OF SPINAL EXTENSORS];
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OVER-EMPHASIS ON THE POSTERIOR
CHAIN

POSTURAL
DISTORTION
(PELVIC
ANTEVERSION)

INCREASED
SPINAL
COMPRESSION

POOR ECCENTRIC
FUNCTION OF
SPINAL EXTENSORS

MECHANISM OF LBP IN WEIGHT TRAINING POPULATION



OVER-EMPHASIS
ON THE
POSTERIOR CHAIN

32 KG X 10

GOOD MORNINGS



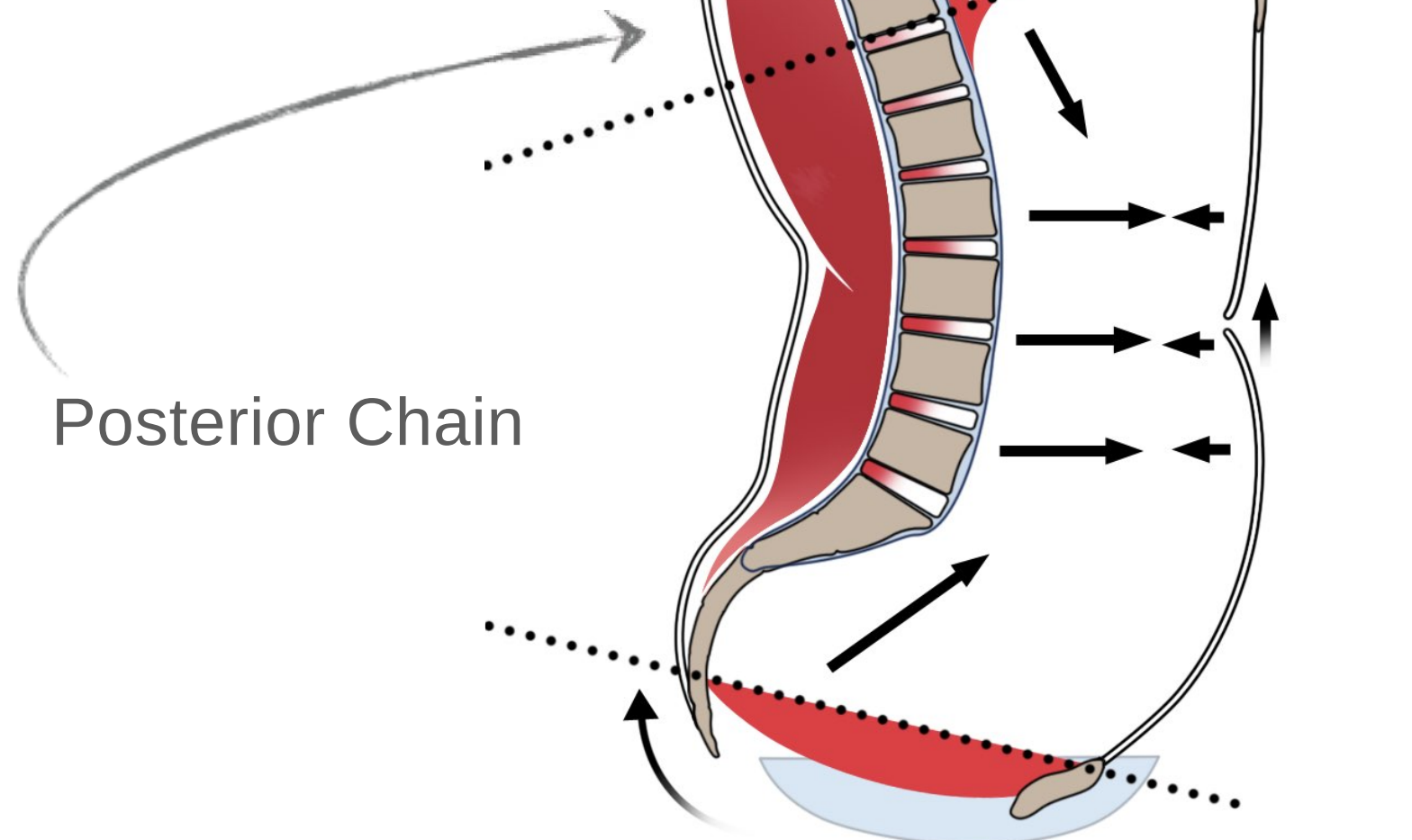
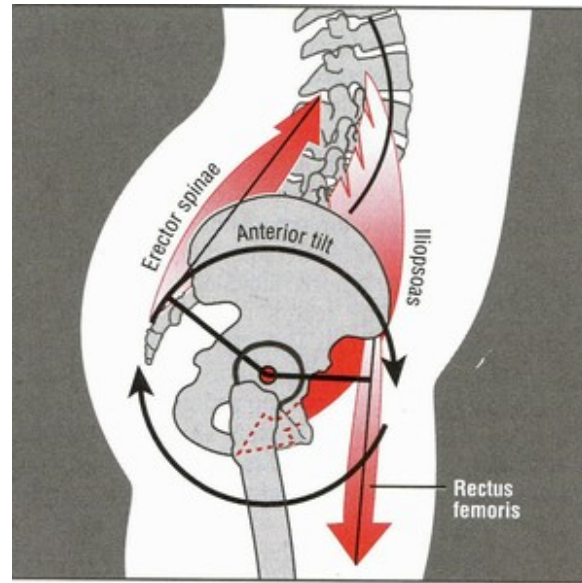
MECHANISM OF LBP IN WEIGHT TRAINING POPULATION



OVER-EMPHASIS ON THE POSTERIOR CHAIN



POSTURAL DISTORTION (PELVIC ANTIVERSION)



Posterior Chain

MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



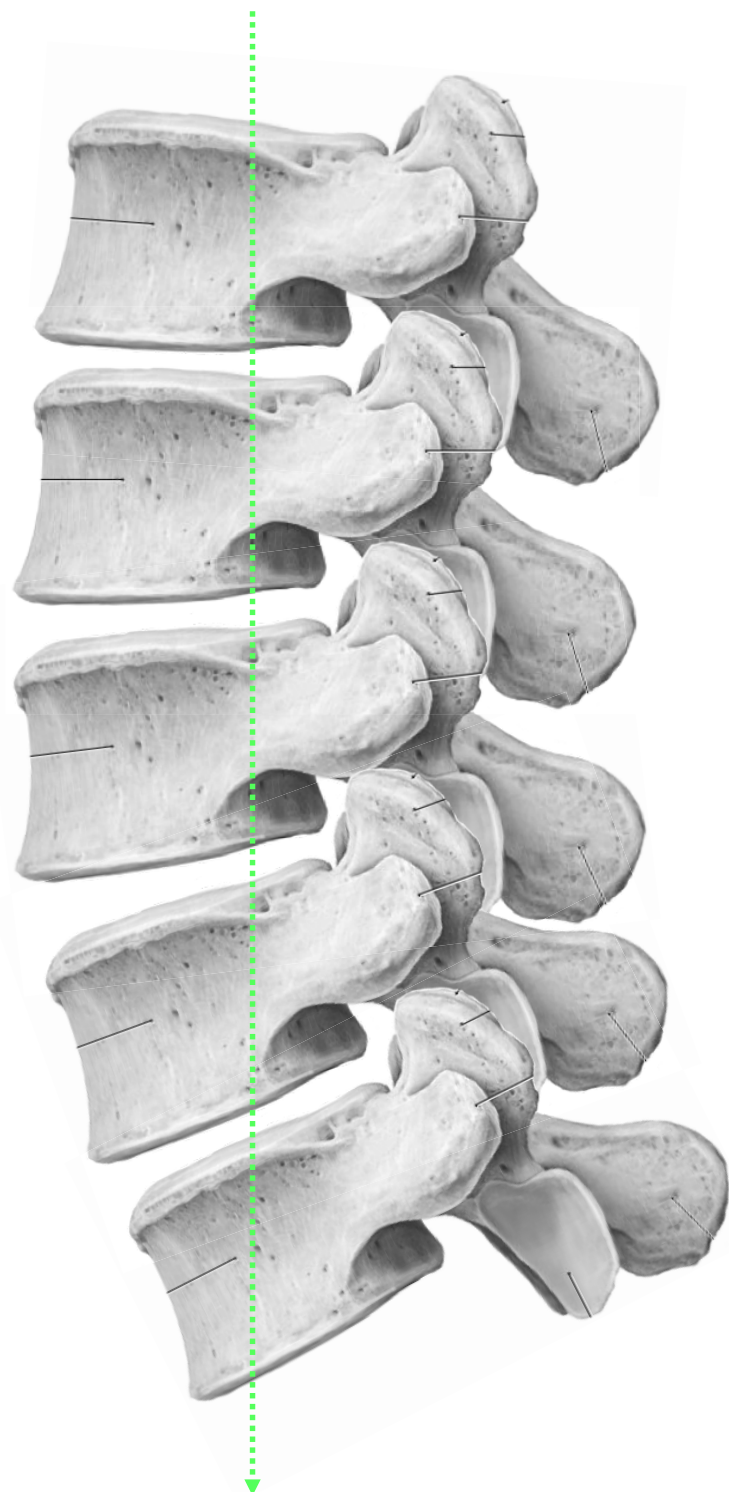
POSTURAL
DISTORTION
(PELVIC ANTIVERSION)



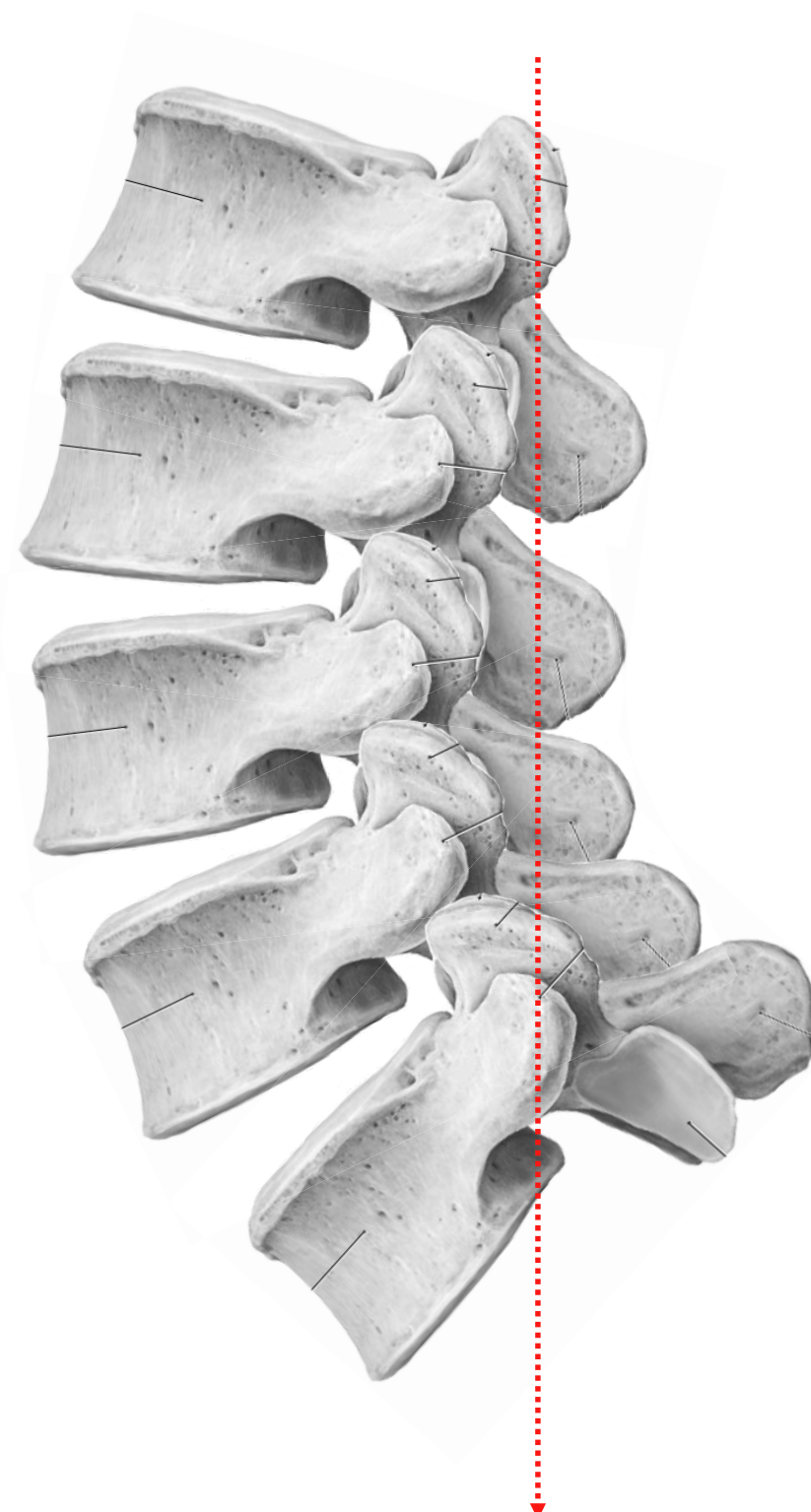
HYPER-
LOADING OF
THE NEURAL
ARCH



NEUTRAL SPINE



HYPEREXTENDED SPINE



MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



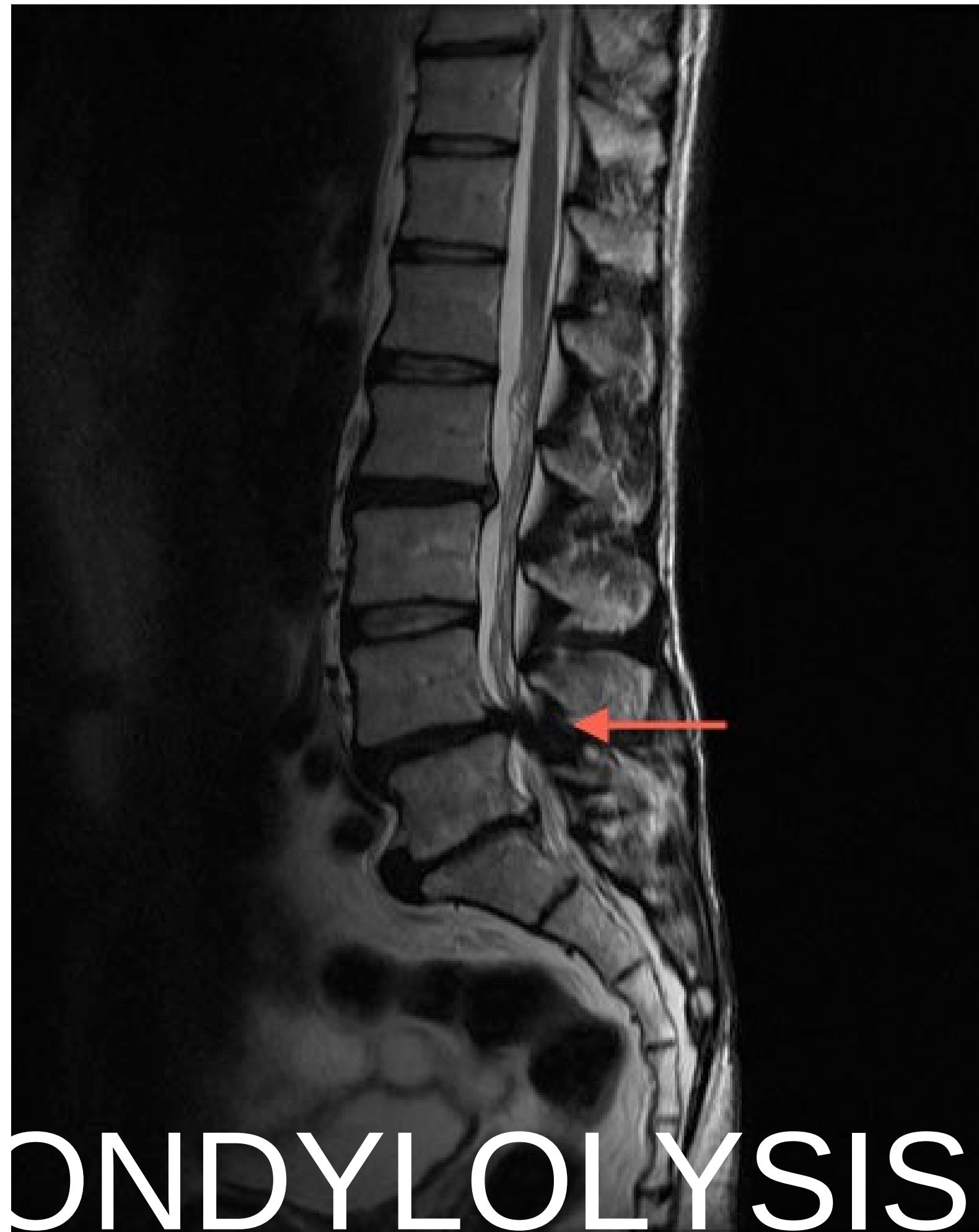
POSTURAL
DISTORTION
(PELVIC ANTIVERSION)



HYPER-
LOADING OF
THE NEURAL
ARCH



FACET IMBRICATION
& SPONDYLOLYSIS



SPONDYLOLYSIS

RESEARCH:

PLoS One. 2018 Oct 29;13(10):e0206125. doi: 10.1371/journal.pone.0206125. eCollection 2018.

Incidence rates and characteristics of abnormal lumbar findings and low back pain in child and adolescent weightlifter: A prospective three-year cohort study.

Shimozaki K¹, Nakase J¹, Yoshioka K¹, Takata Y¹, Asai K¹, Kitaoka K², Tsuchiya H¹.

Author information

Abstract

PURPOSE: The purpose of this three-year cohort study was to assess the incidence rates and characteristics of abnormal lumbar findings and low back pain (LBP) in child and adolescent weightlifting athletes using magnetic resonance imaging (MRI) and medical questionnaires. This study evaluated subclinical sports injuries, which in turn may help prevent competition-specific injuries and improve performance levels.

MATERIALS AND METHODS: Between 2014 and 2016, twelve participants who had been competing in weightlifting events for at least 2 years were enrolled in this study. The mean age of the participants at the start of this study was 11.4 ± 2.0 years, and there were 6 boys and 6 girls. Annual medical questionnaire surveys and lumbar examinations using MRI were performed during the 3-year follow-up. The incidence rates and variations of LBP and abnormal MRI findings were evaluated.

RESULTS: At the start of this study, there were no positive findings of LBP, and abnormal lumbar findings on MRI were observed in only 2 participants. At the 2-year follow-up, 1 participant had LBP, and 8 of 12 participants had abnormal lumbar findings. In the final year, only 3 participants had LBP; however, abnormal lumbar findings were observed on MRI in 11 participants. Among these, lumbar spondylolysis was observed in 4 participants, lumbar disc protrusion or extrusion in 2 participants, and lumbar disc degeneration in 9 participants.

CONCLUSION: This prospective 3-year cohort study of 12 child and adolescent weightlifters revealed abnormal lumbar findings in 11 participants at a high rate on MRI examination. Children and adolescents undergoing resistance training at the competition level could potentially have irreversible changes in the lumbar vertebra without symptoms.

THE NEURAL
ARCH, BUT WHAT
EFFECT DOES IT
HAVE ON AN
ATHLETE'S
GLOBAL
FUNCTION?

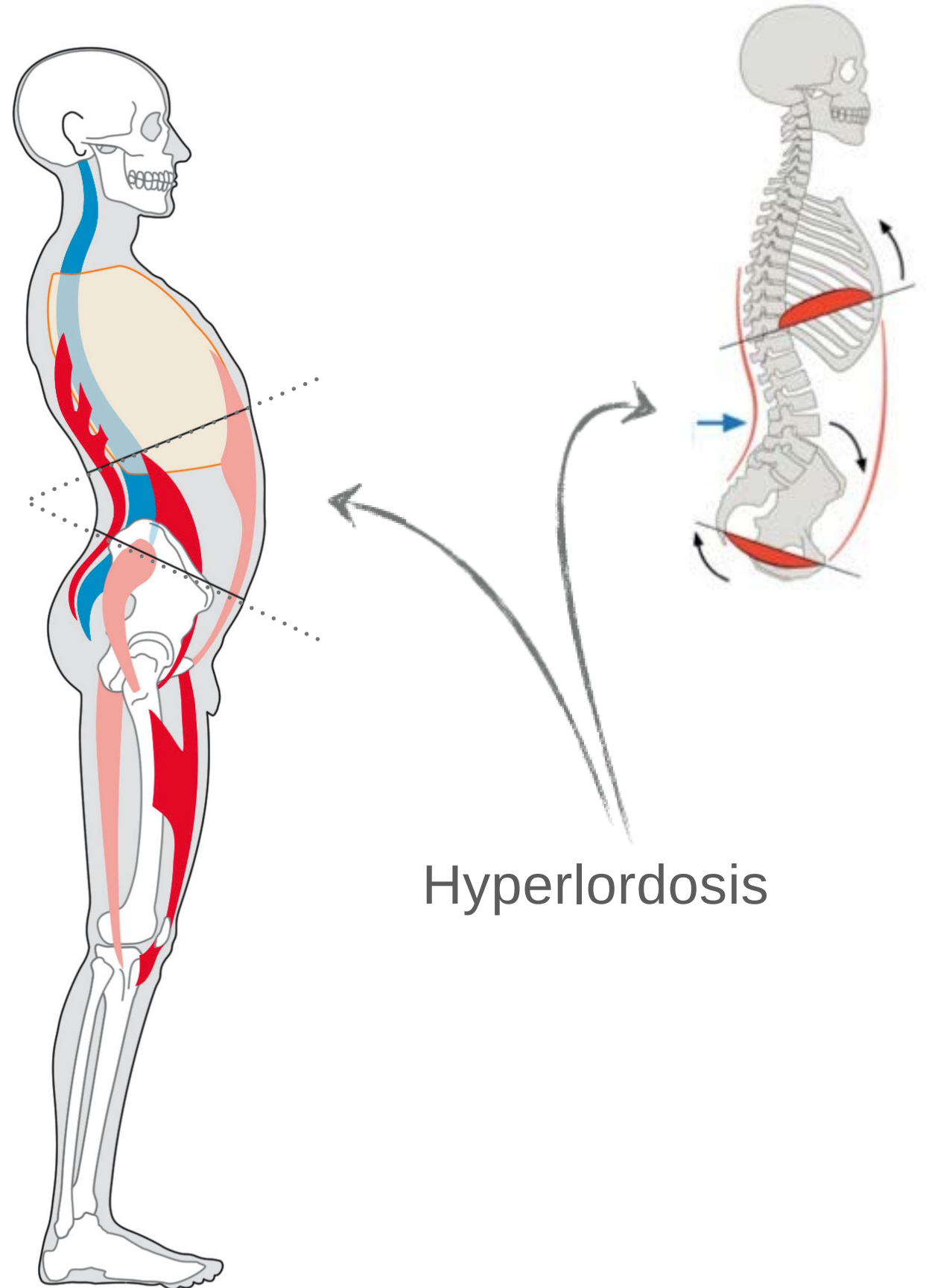
MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



POSTURAL
DISTORTION
(PELVIC ANTIVERSION)



MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



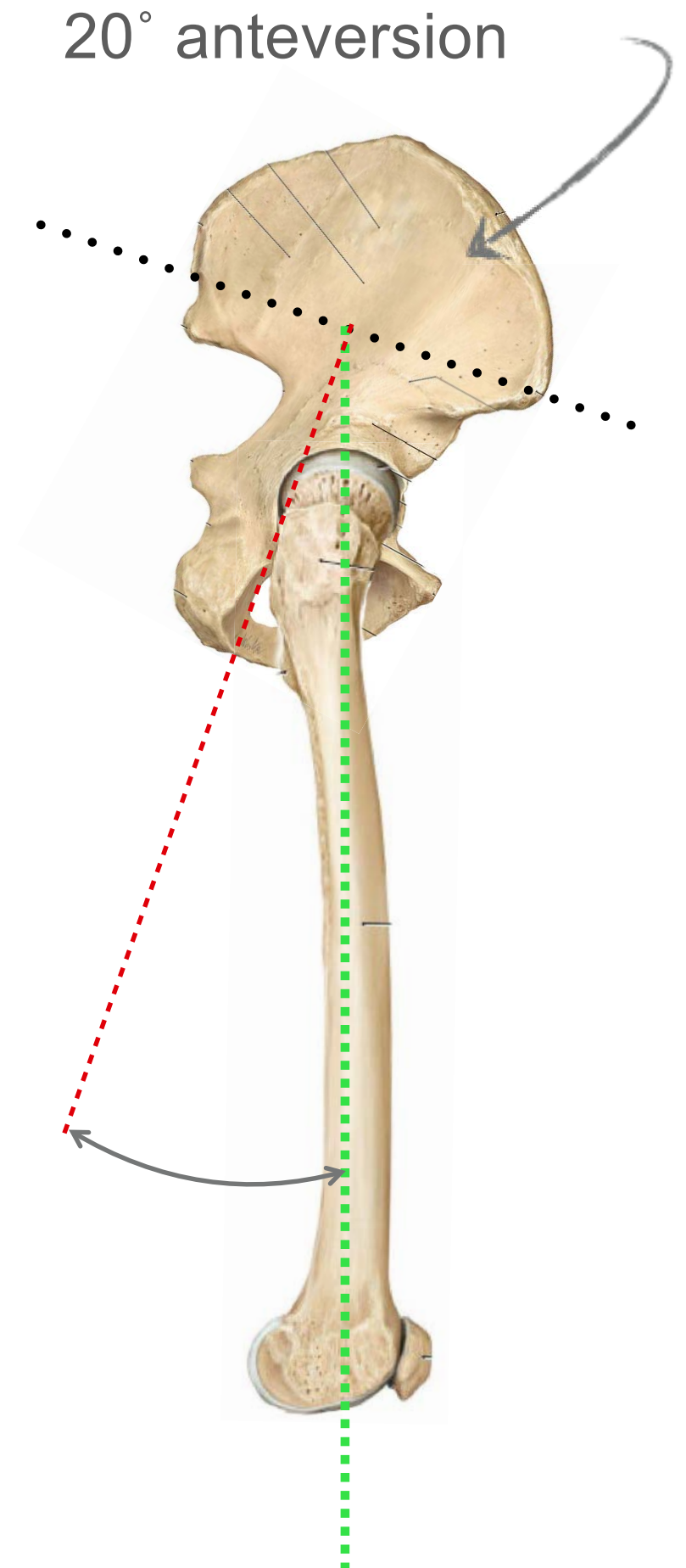
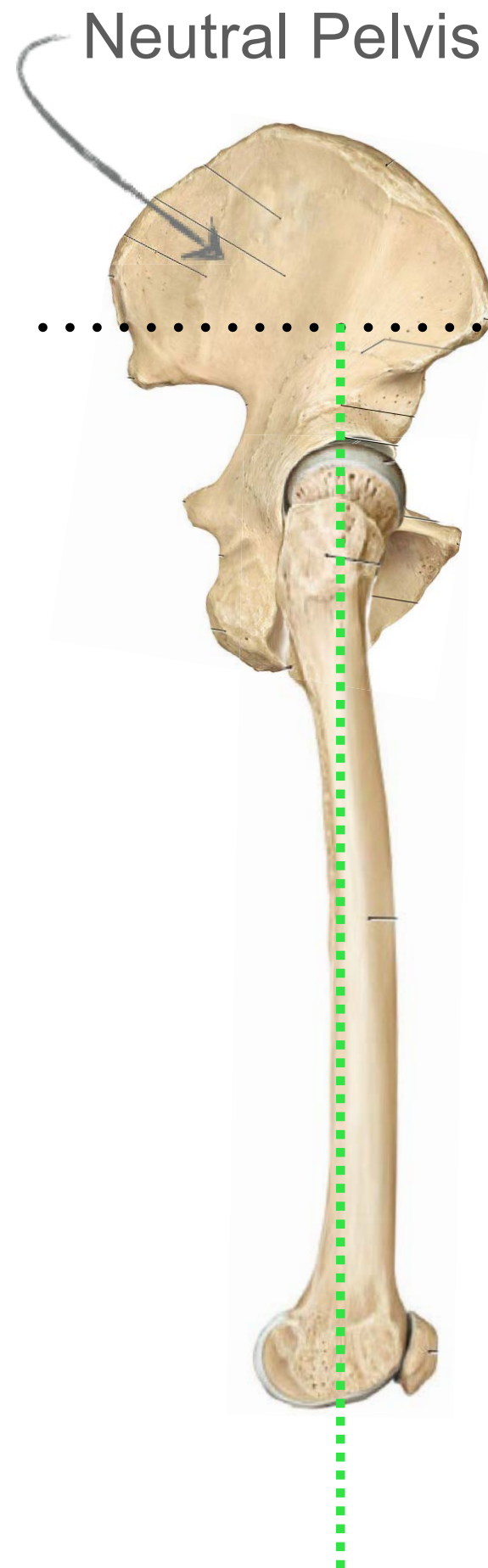
OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



POSTURAL
DISTORTION
(PELVIC ANTEVERSION)



REDUCED HIP
FLEXION RANGE
OF MOTION



MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



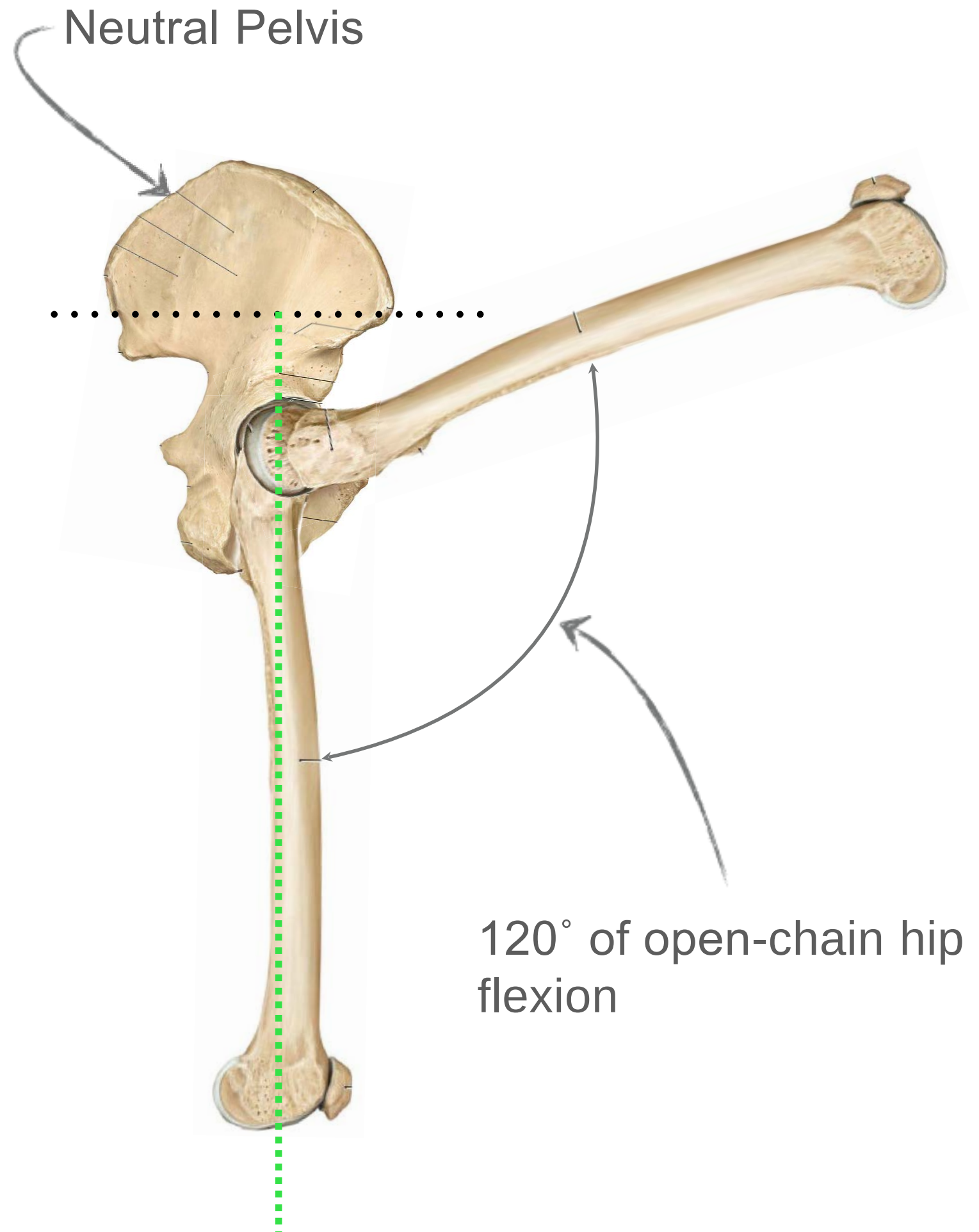
OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



POSTURAL
DISTORTION
(PELVIC ANTIVERSION)



REDUCED HIP
FLEXION RANGE
OF MOTION



MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



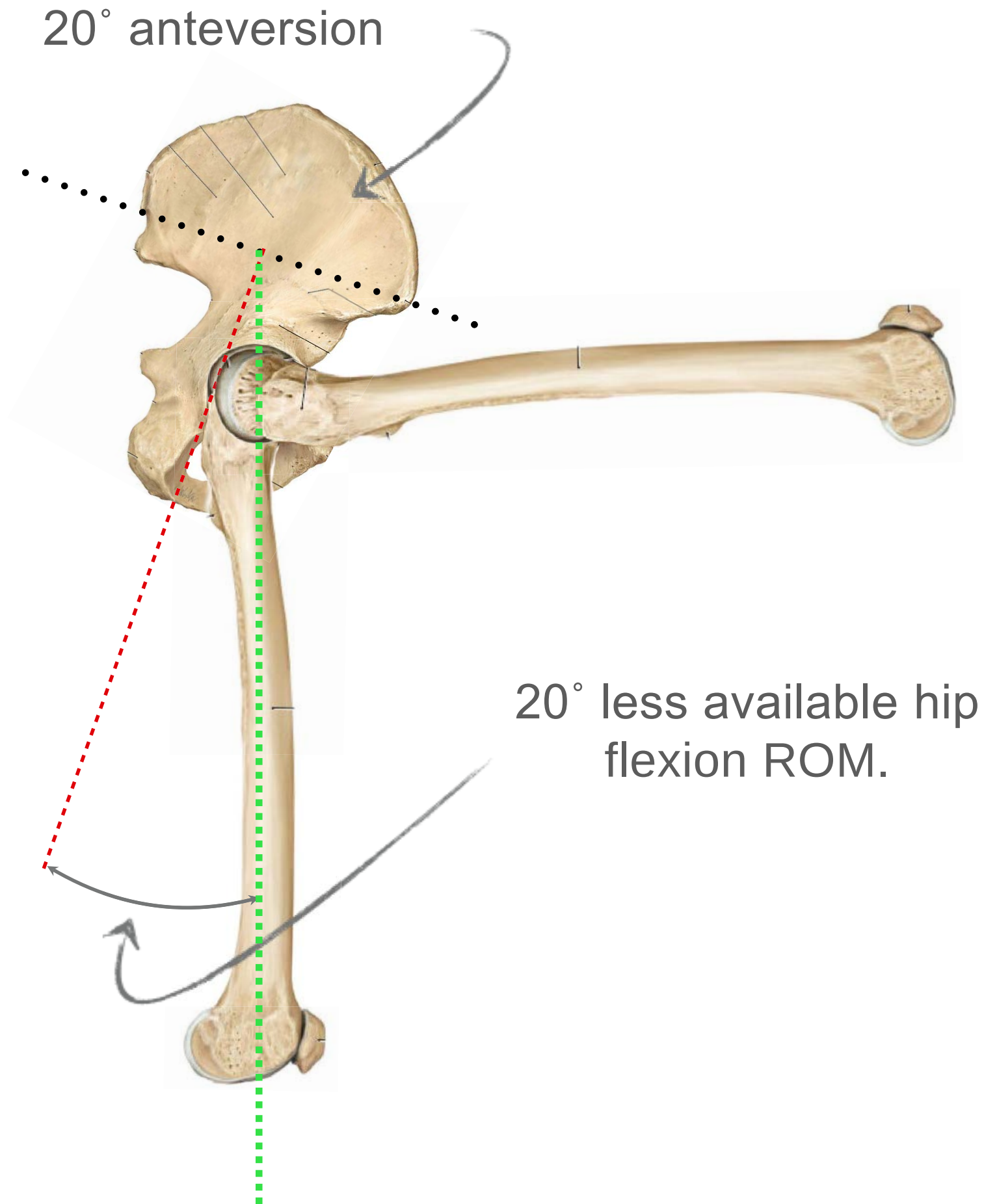
OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



POSTURAL
DISTORTION
(PELVIC ANTIVERSION)

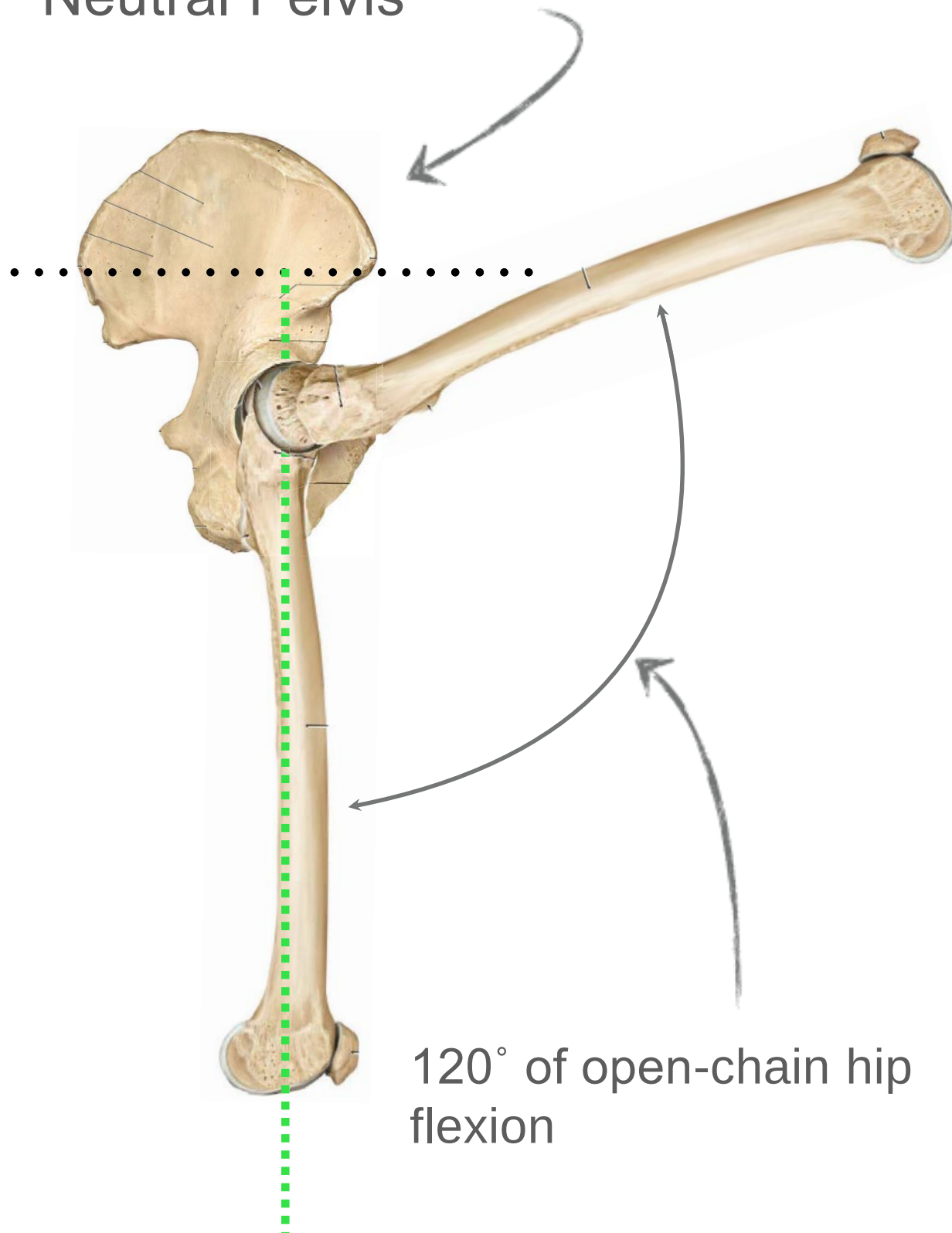


REDUCED HIP
FLEXION RANGE
OF MOTION

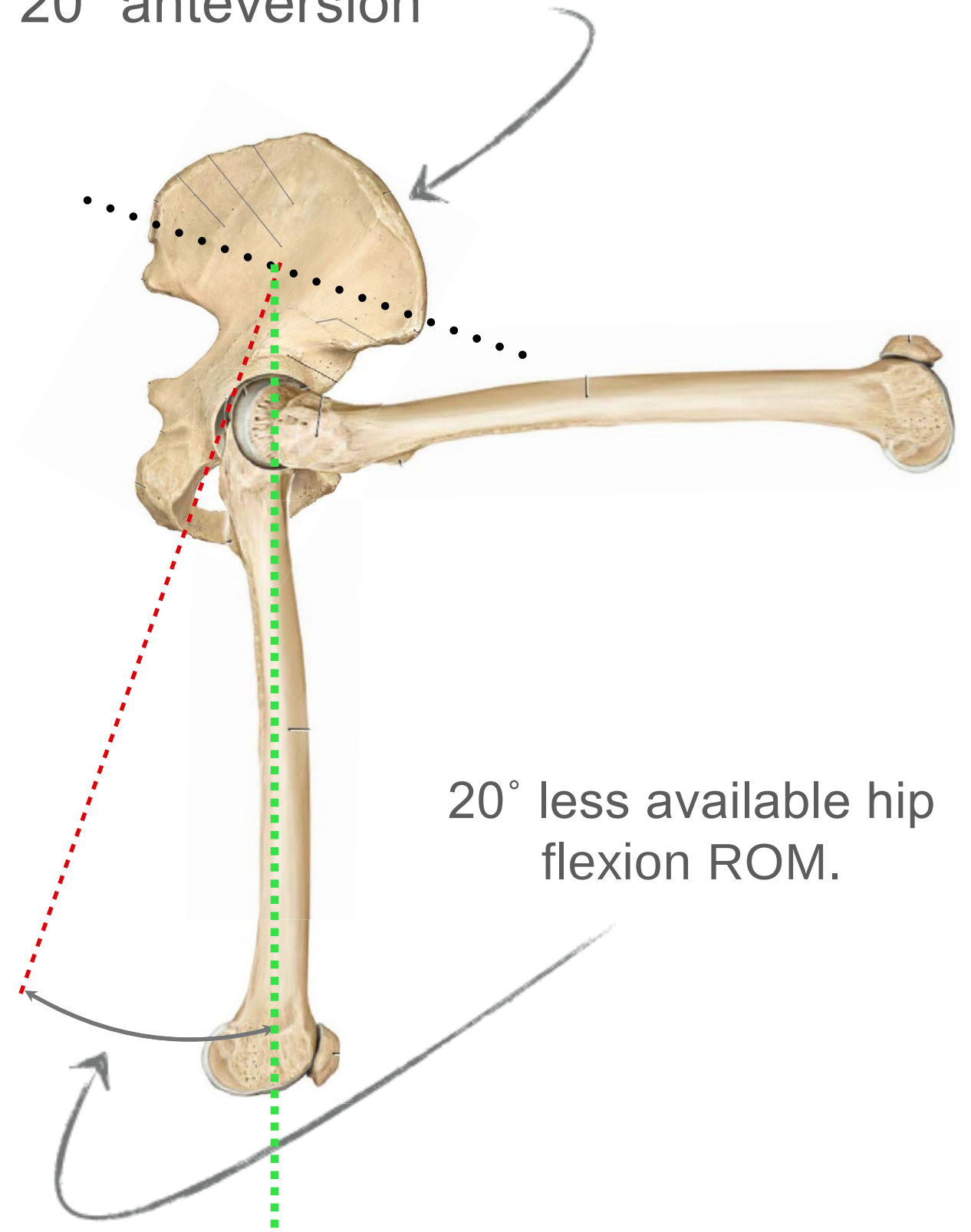


PELVIS POSITIONING AND ITS AFFECT ON HIP FLEXION ROM

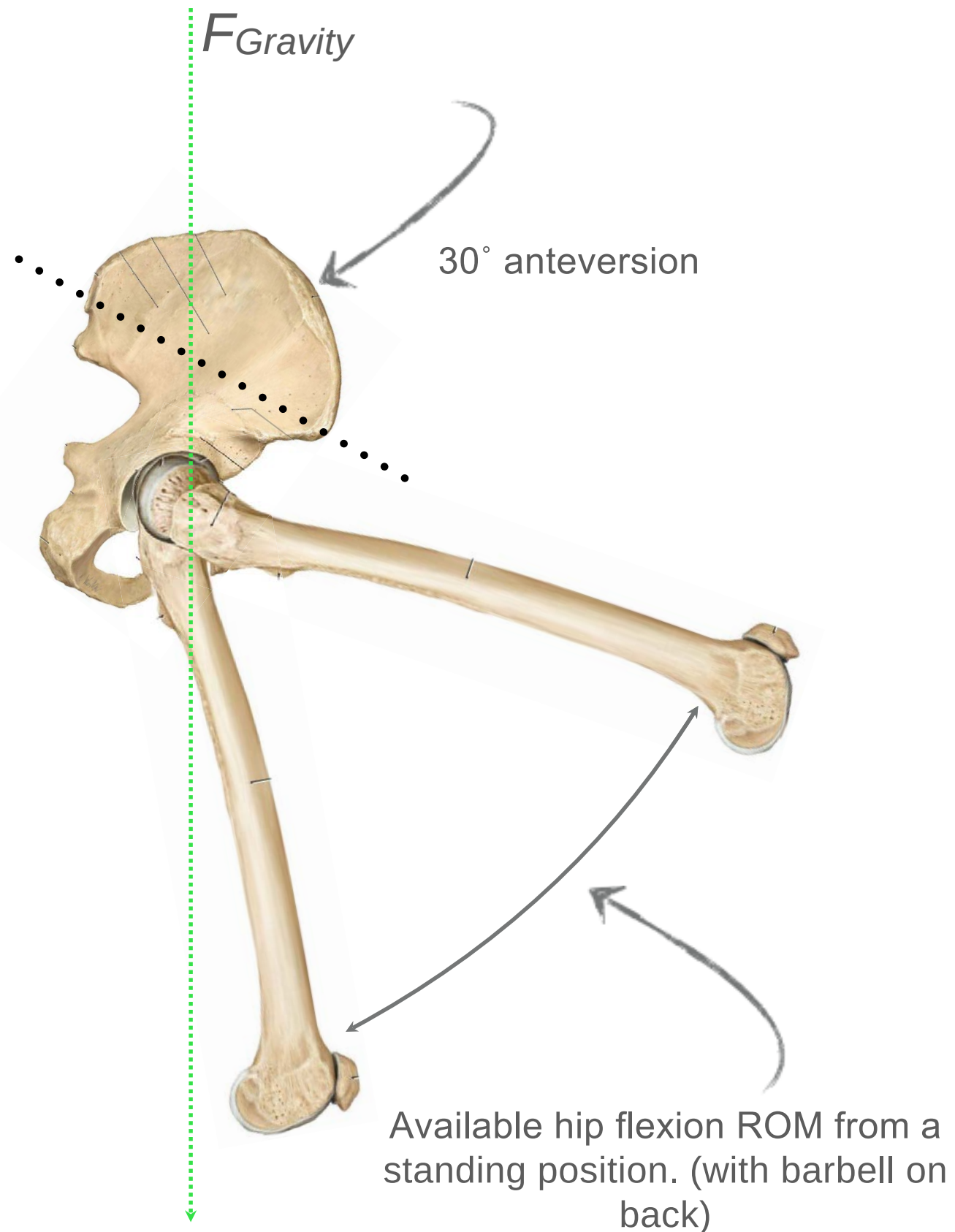
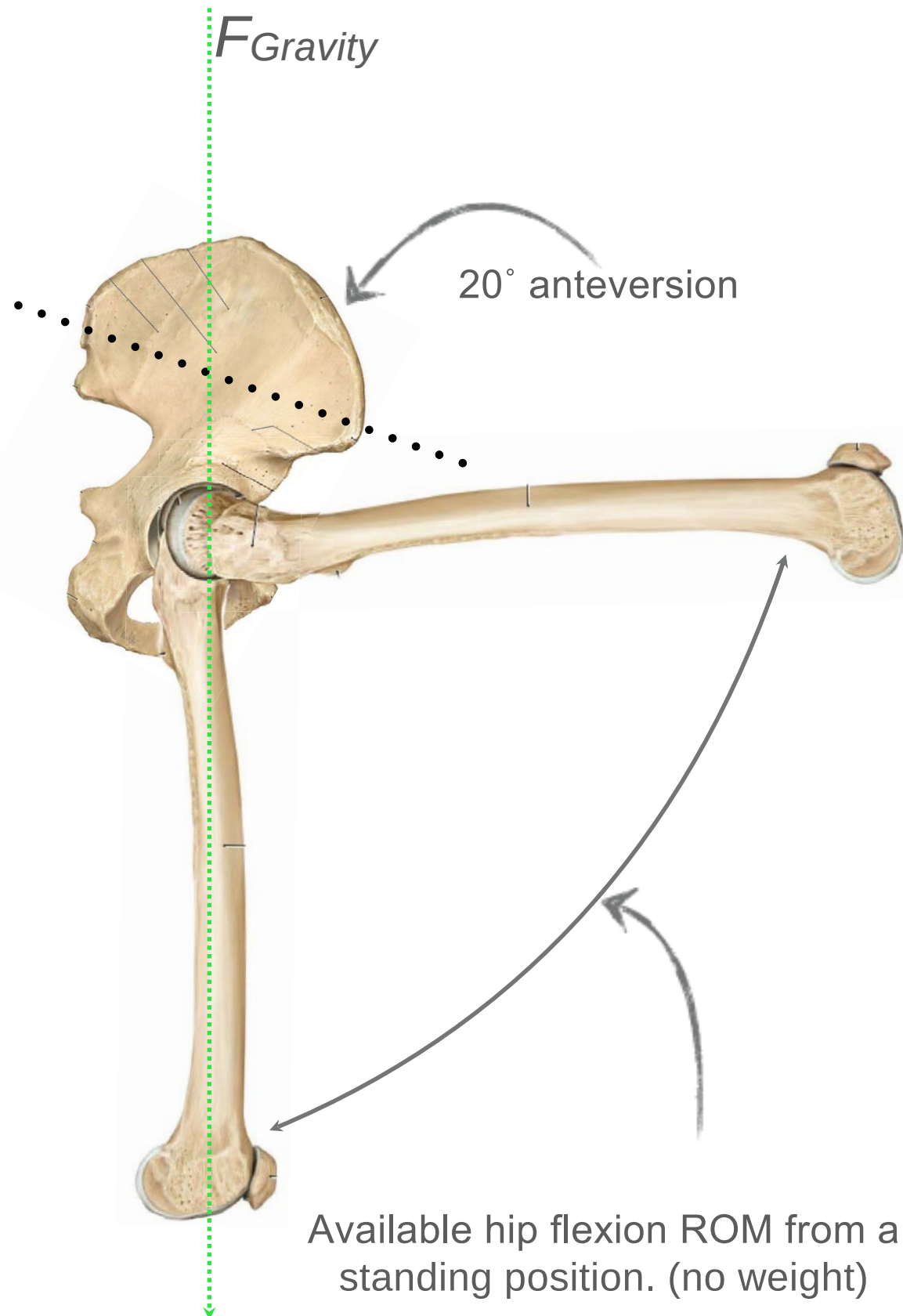
Neutral Pelvis



20° anteversion



PELVIS POSITIONING AND ITS AFFECT ON HIP FLEXION ROM



MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



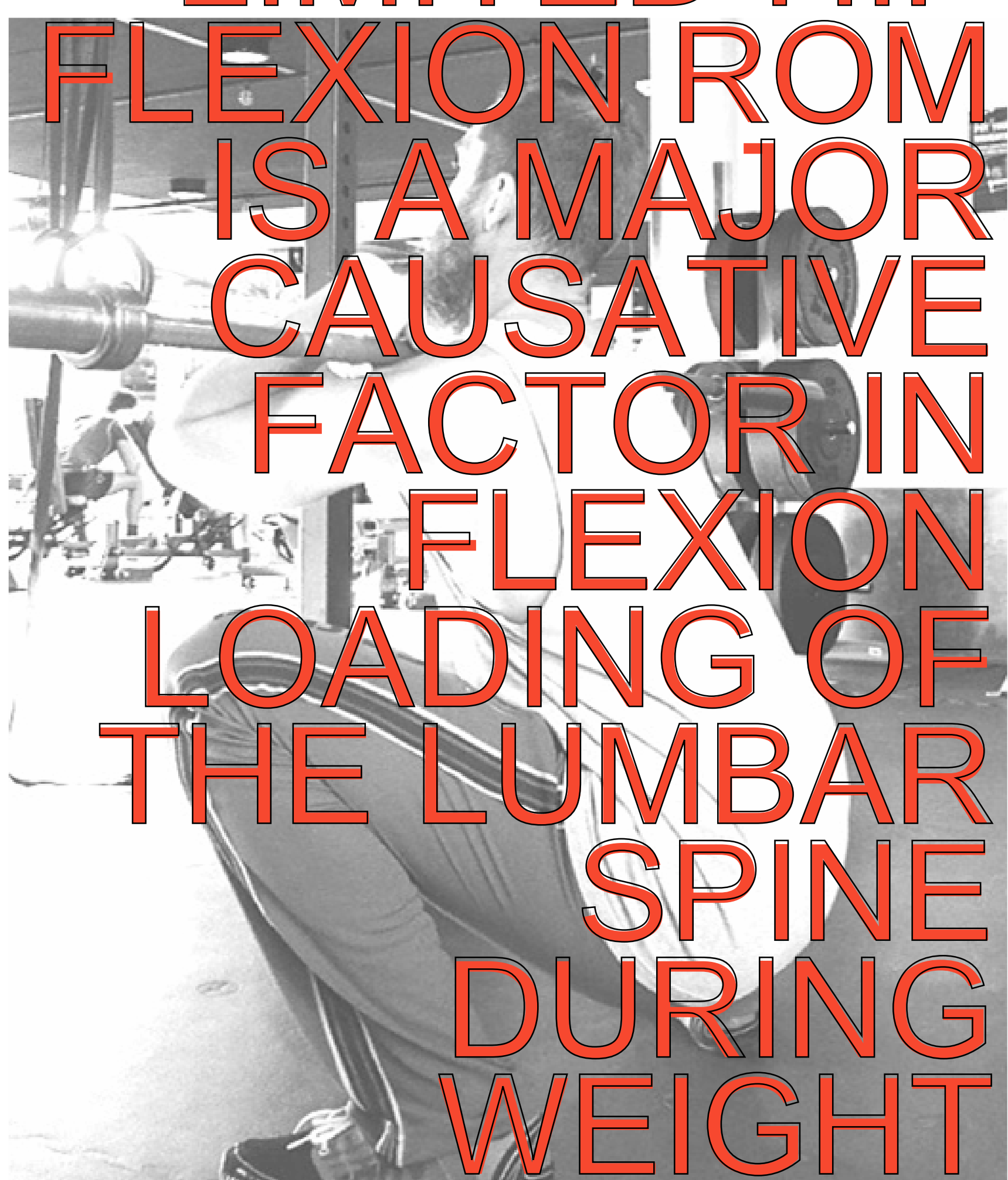
POSTURAL
DISTORTION
(PELVIC ANTIVERSION)



REDUCED HIP
FLEXION RANGE
OF MOTION



INCREASED FREQUENCY
& MAGNITUDE OF
LOADED FLEXION



MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



POSTURAL
DISTORTION
(PELVIC ANTIVERSION)



REDUCED HIP
FLEXION RANGE
OF MOTION



INCREASED FREQUENCY
& MAGNITUDE OF
LOADED FLEXION



MOTION FOR
HIP FLEXION IS
115-125°.

Table 1. *Comparison of Textbook References for Hip and Knee Active Range of Motion (in Degrees)*

Motion	Source					
	A ^a	B ^b	C ^c	D ^{d,e}	E ^f	F ^g
Knee flexion	140	130	135	150	...	135
Hip flexion	125	115–125	120	120	120	120
Hip extension	10	10–15	30	30	30	...
Hip abduction	45	45	45–50	45	45	...
Hip internal rotation	45	45	35	45	45	45
Hip external rotation	45	45	45	45	45	40

^aKendall et al.⁶

^bDaniels and Worthingham.⁷

^cHoppenfeld.⁸

^dMohr.⁹

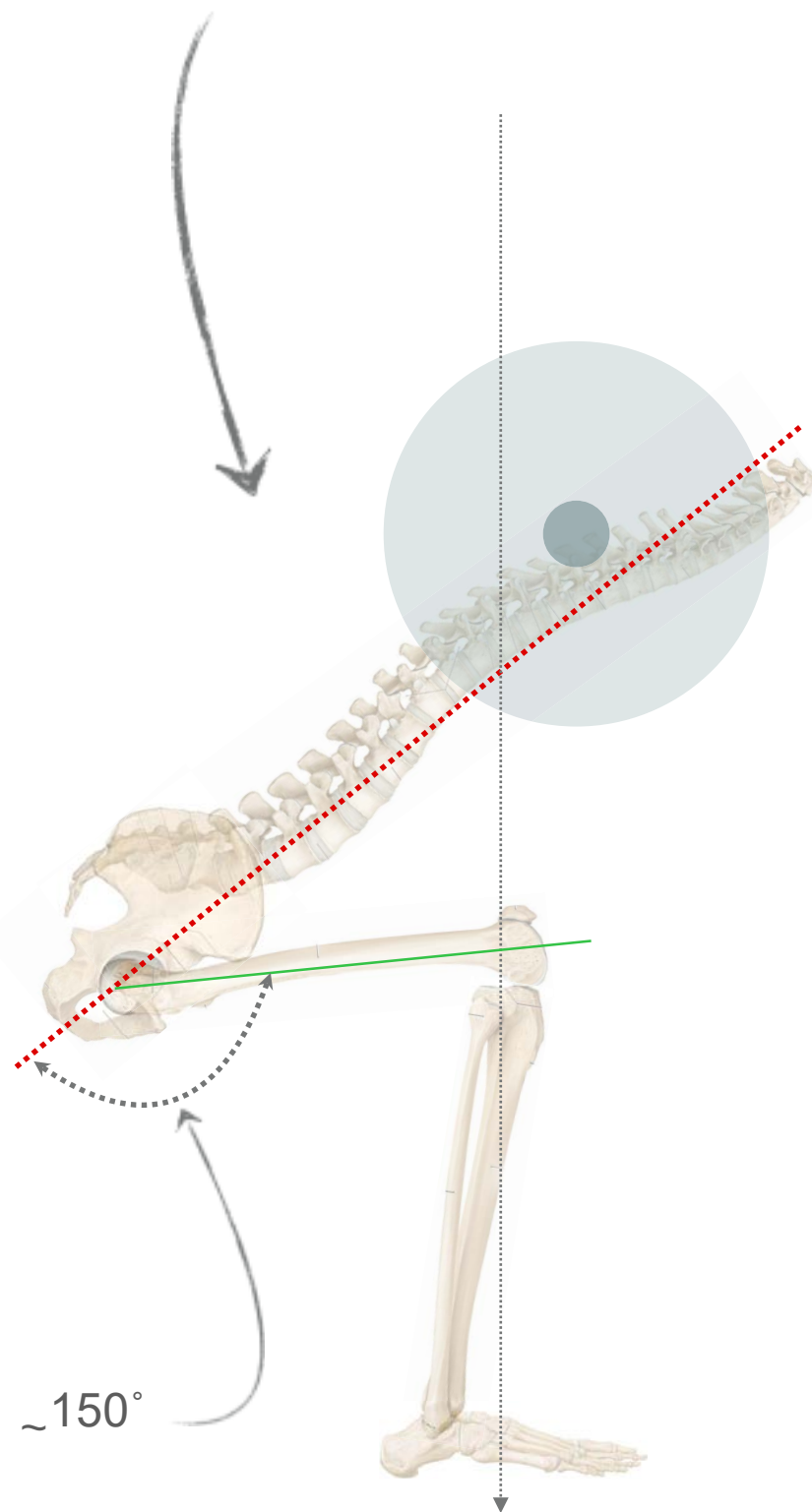
^eMorrissey.¹⁰

^fCailliet.¹¹

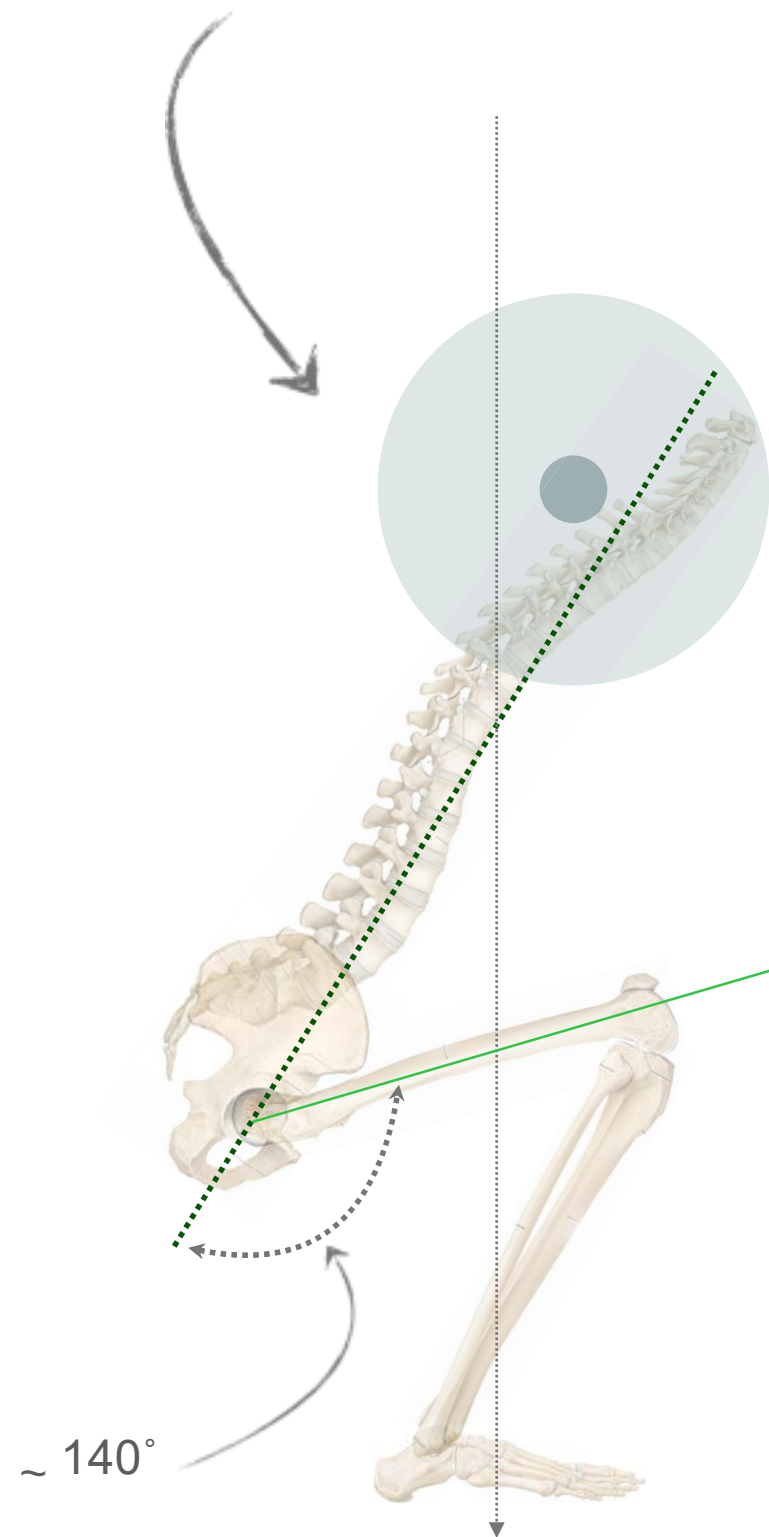
^gCole.¹²

SQUAT VARIATIONS, TORSO ORIENTATION & HIP FLEXION ROM

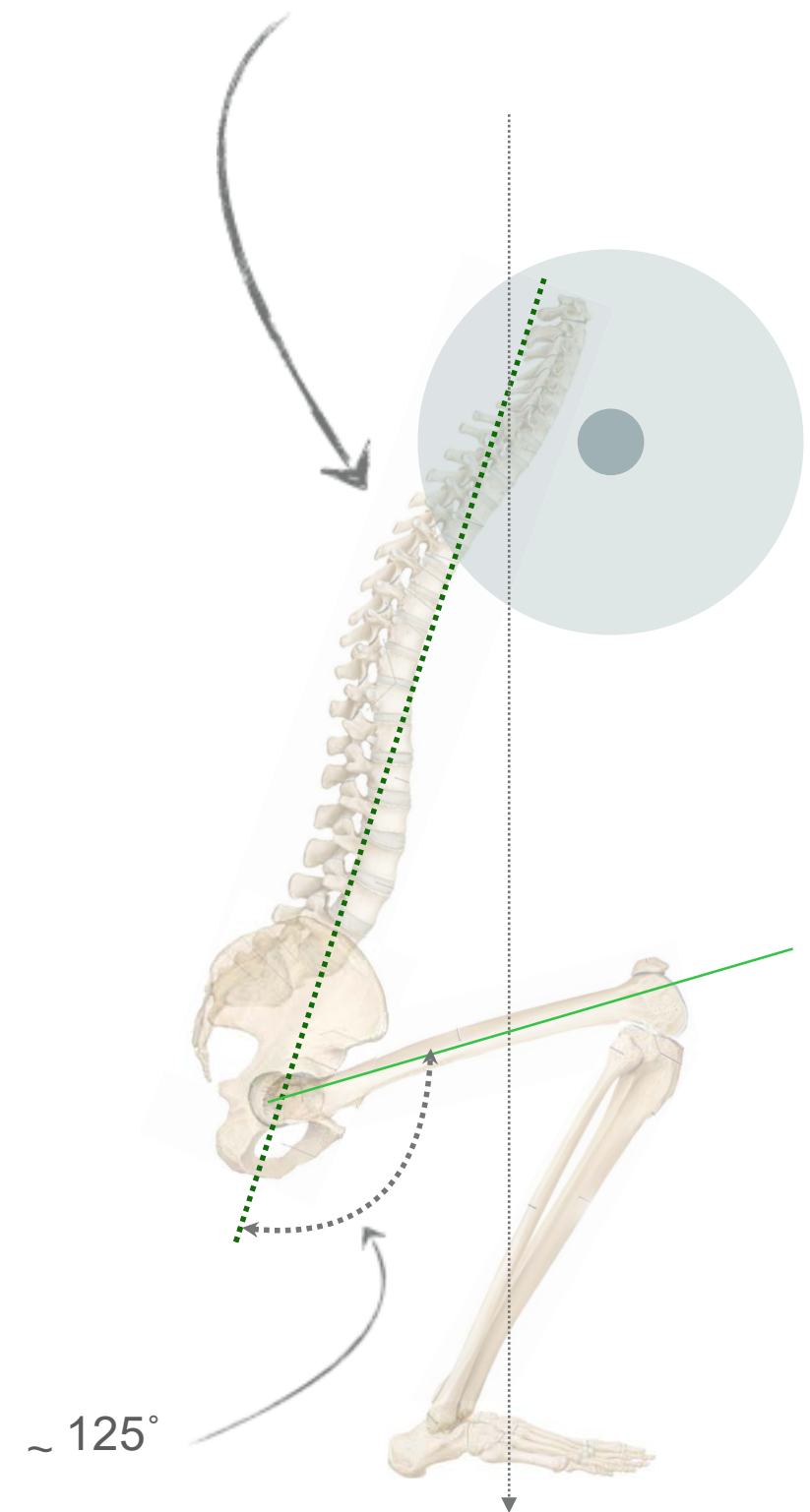
Low Bar B-Squat



High Bar B-Squat

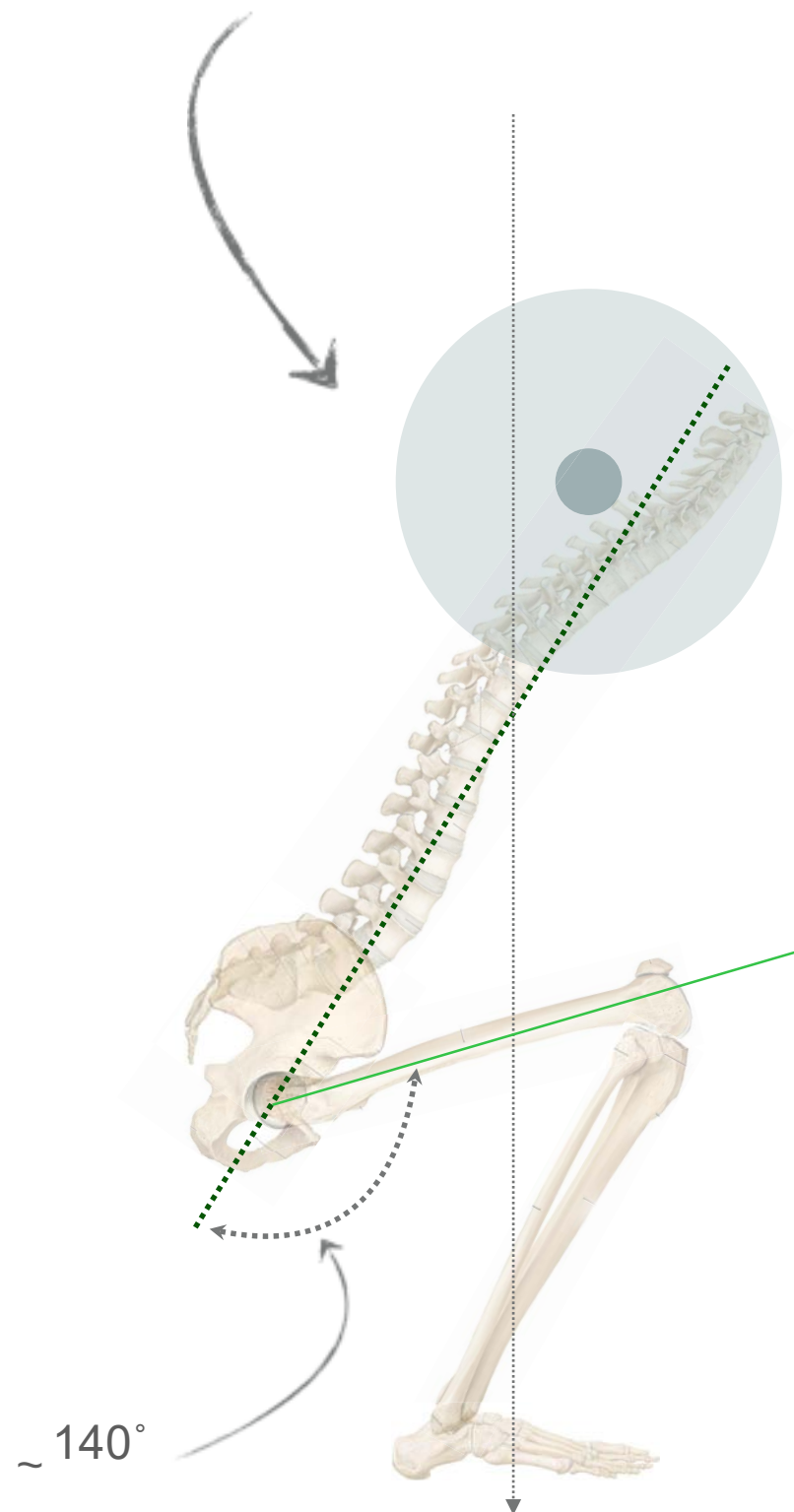


Front Squat

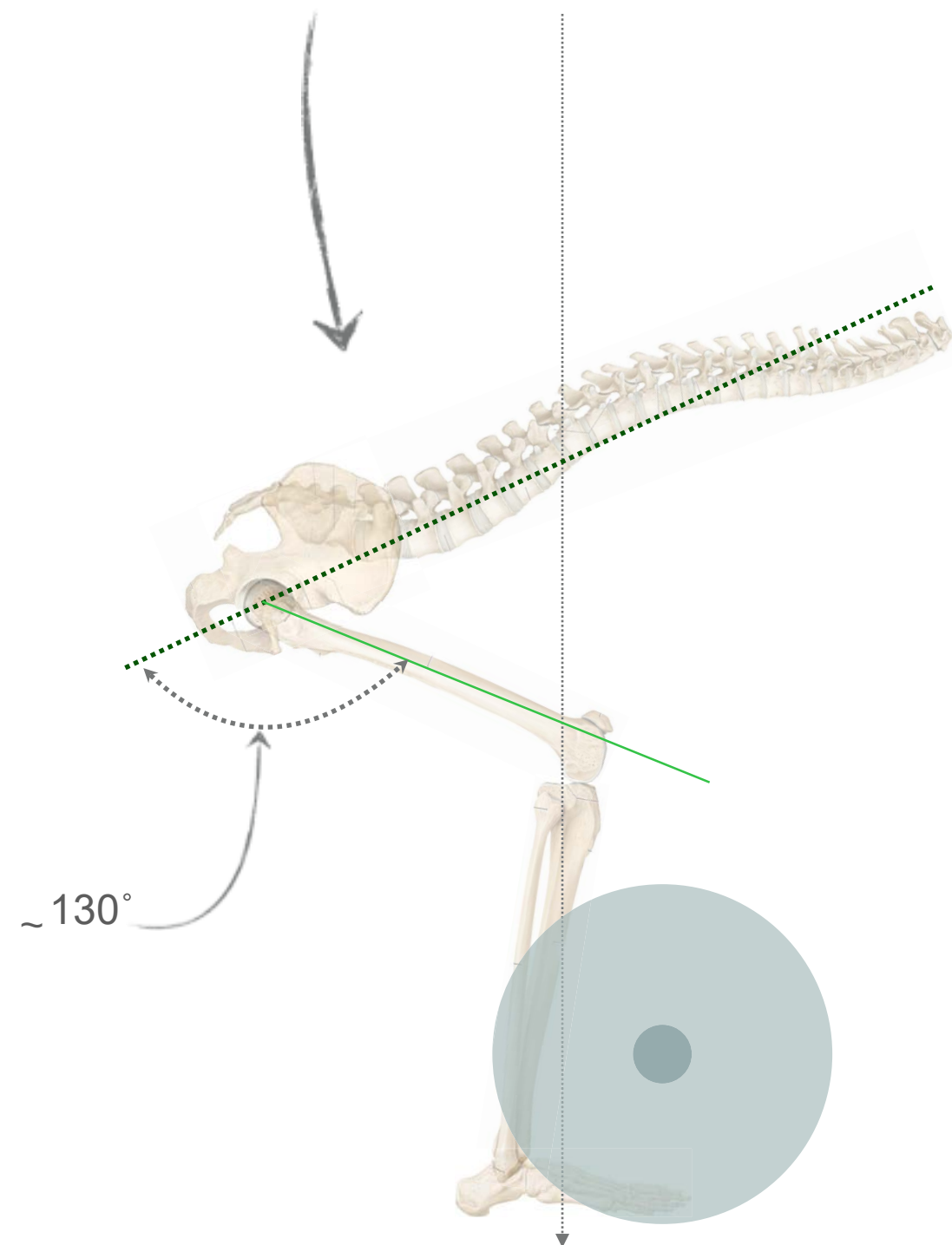


SQUAT VARIATIONS, TORSO ORIENTATION & HIP FLEXION ROM

High Bar B-Squat

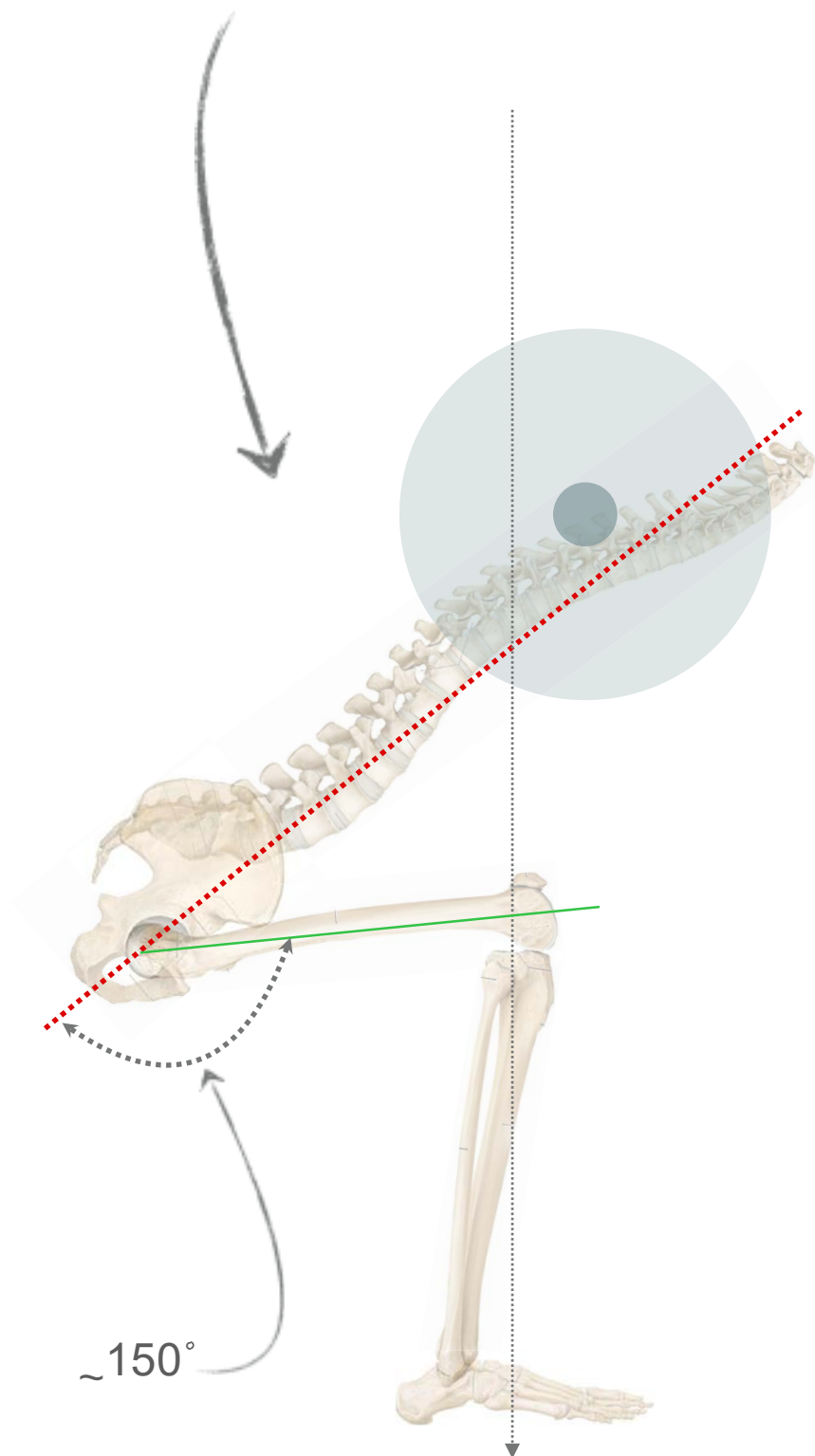


Barbell Deadlift (conventional)

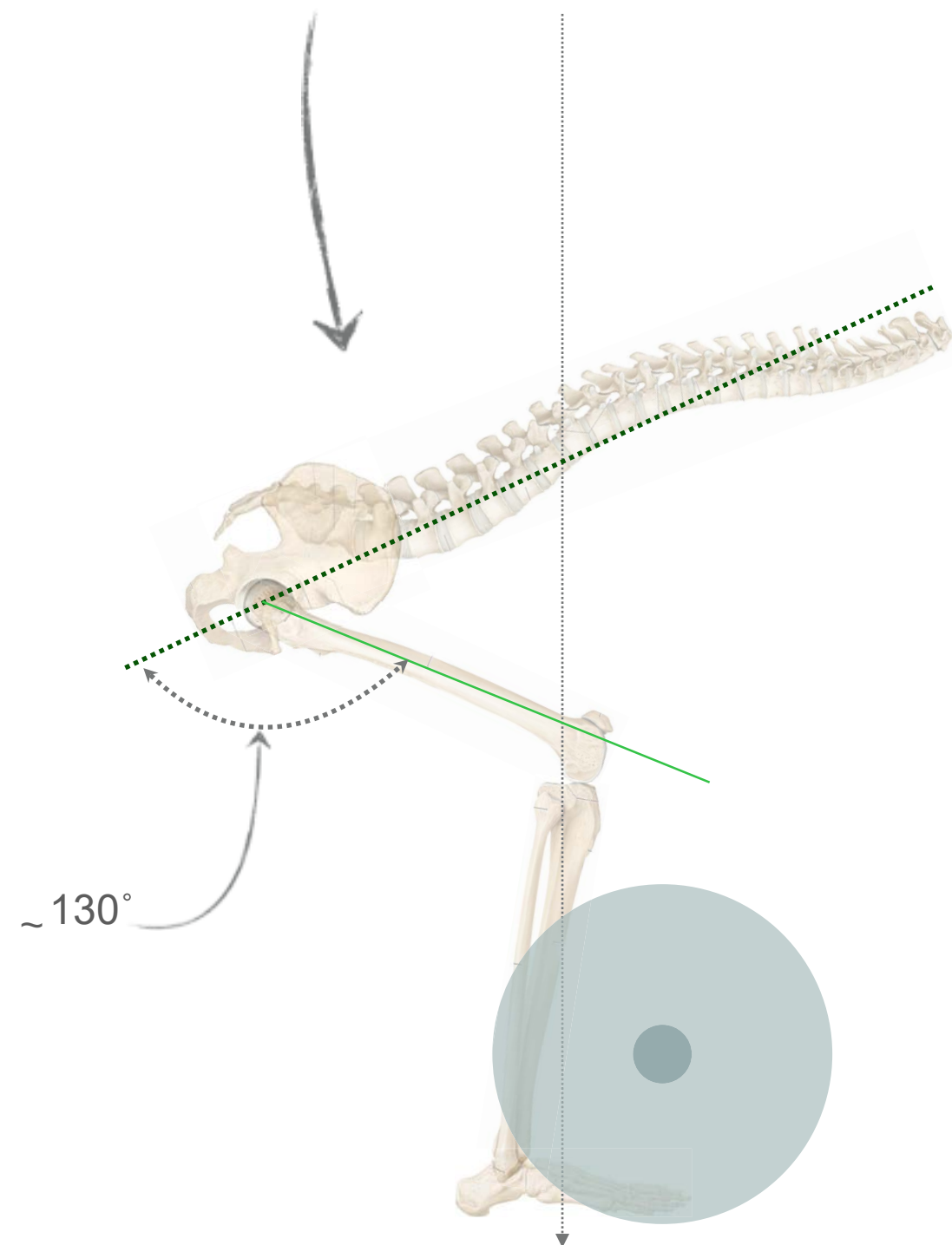


SQUAT VARIATIONS, TORSO ORIENTATION & HIP FLEXION ROM

Low Bar B-Squat



Barbell Deadlift (conventional)



MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



WEIGHTED
HYPEREXTENSIONS

MECHANISM OF LBP
IN WEIGHT TRAINING
POPULATION



OVER-EMPHASIS
ON THE
POSTERIOR CHAIN



INCREASED
SPINAL
COMPRESSION

