

A night-time photograph of the Dallas skyline, featuring several illuminated skyscrapers and the Reunion Tower. The sky is dark with some clouds, and the city lights are visible against the twilight background.

R2P Symposium

Cody Dimak DC

Parker University

Dallas, TX

Day 1 – February 26th, 2022

Quick Intro

I don't know how this man has time to have 2 families let alone teach PT2 at Parker!



Roll Call

- Chiro's
- PT's
- S&C/Personal Trainers
- Students
- What Tri's/Quarter?

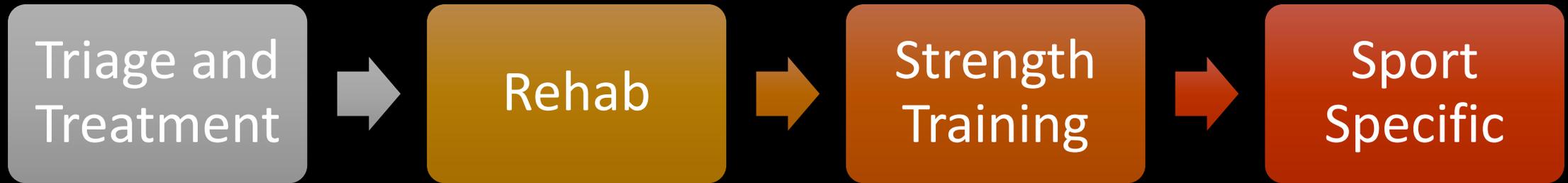
Quick Concept Check

- DNS
- McGill
- McKenzie/MDT
- Regional Interdependence
- Nick Winkelman
- Dynamic Systems Theory/Constraints Approach

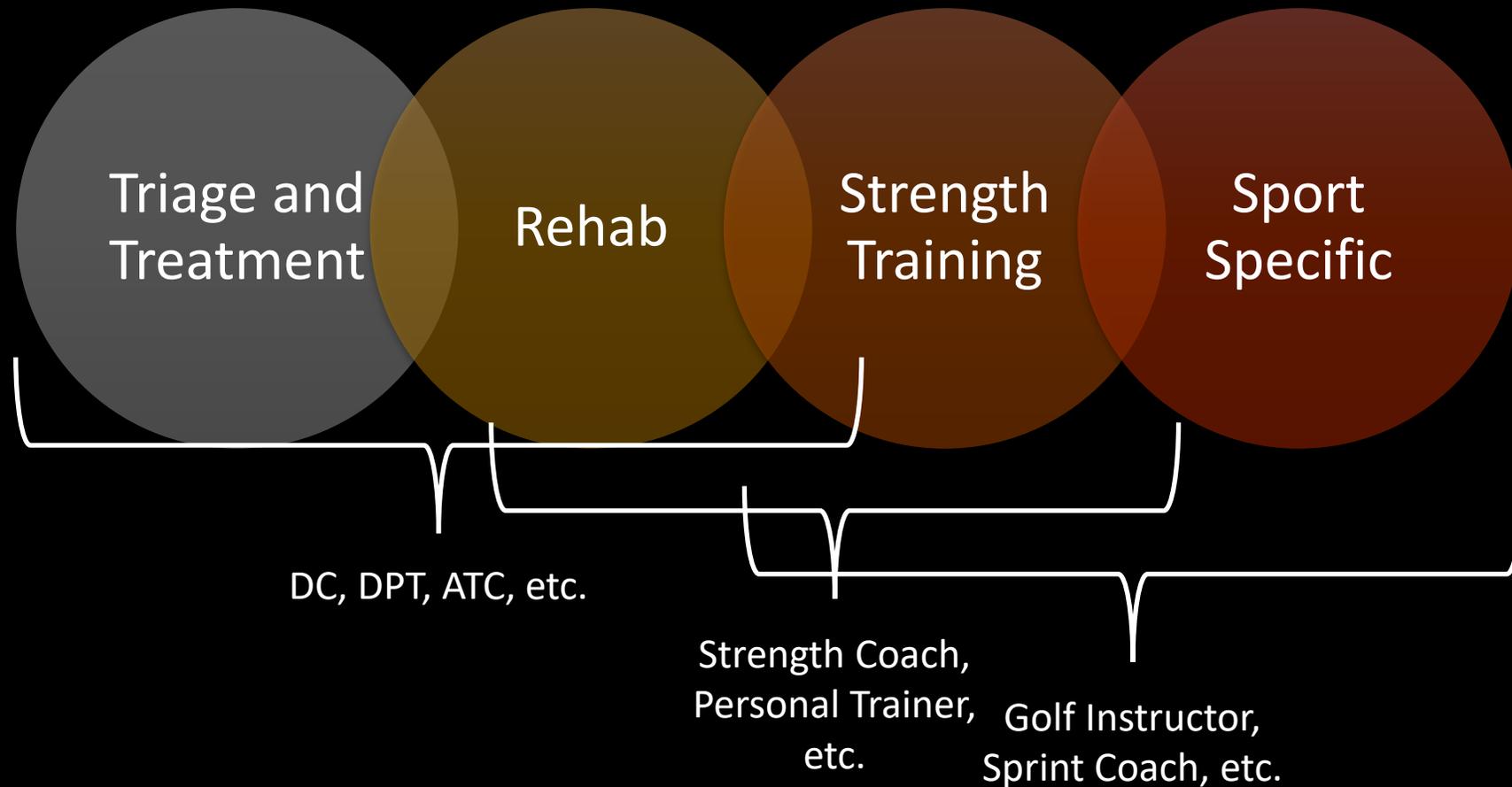
Loading the painful patient

Typical Patient Continuum

“Whiskey Tango
Foxtrot happen
to your
strength?”



Patient-Centered Continuum



What does it mean when we say,
“load a patient”?

Load is going to be some type neuromuscular stress being placed on the patient ideally to enhance or create adaptation.

Could be body weight considering the intent of the exercise



H3



E2

Liebenson ROS 3

Could also be some type of resistance used within an exercise



Load tissue in pain?

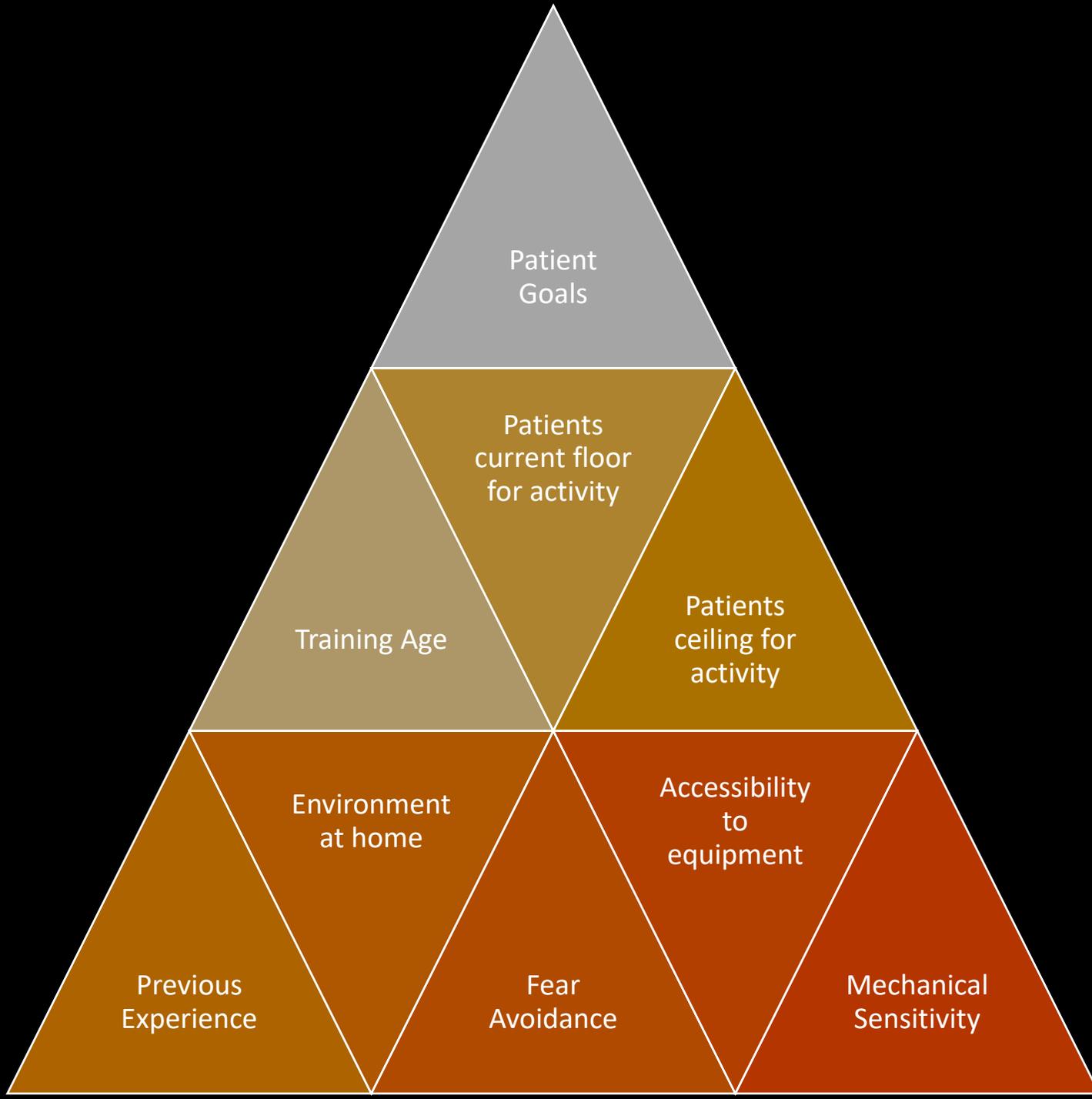
- Heavy mid-range isometrics for Achilles Tendinopathy
- Heavy eccentric loading for medial and lateral epicondylitis
- Heavy farmers carry for shoulder impingement

Load tissue or region to off load area in pain?

- Single leg deadlift variation for knee pain
- Half kneeling kettlebell halo for cervical discogenic pain
- Heavy 3-point single arm bent over rows

Load is scaled to individual

- “Heavy” has context
- Individual abilities are always considered



Corrective Exercise

Corrective Exercise

“...a technique that leverages an understanding of anatomy, kinesiology, and biomechanics to address and FIX movement compensations and imbalances to improve the overall quality of movement during workouts and in everyday life.” – National Academy of Sports Medicine (NASM)

Corrective exercise, used to try and “fix” something,
leads down a road of movement hypervigilance
because we obsess over the specifics or perfect
movement

Everyone calm down!

A baby with light skin and hair is sitting in a blue plastic toy bathtub. The baby is looking directly at the camera with a neutral expression. The bathtub is filled with water and has several bubbles on the surface. A white speech bubble with a black outline is positioned to the right of the baby, containing the text "Say what?". The background is solid black.

**Say
what?**

The actual exercises may not be bad, but we need to look through a different lens

If it's working on the "parts" or the "patterns" then we need to use the lens of constraint manipulation, but then plug it back into the movement as a whole.

Is there a case for basic strength exercises in the rehab setting?

Let's ask Robert Redford...





“The goal is
to keep the
goal the goal”
– Dan John



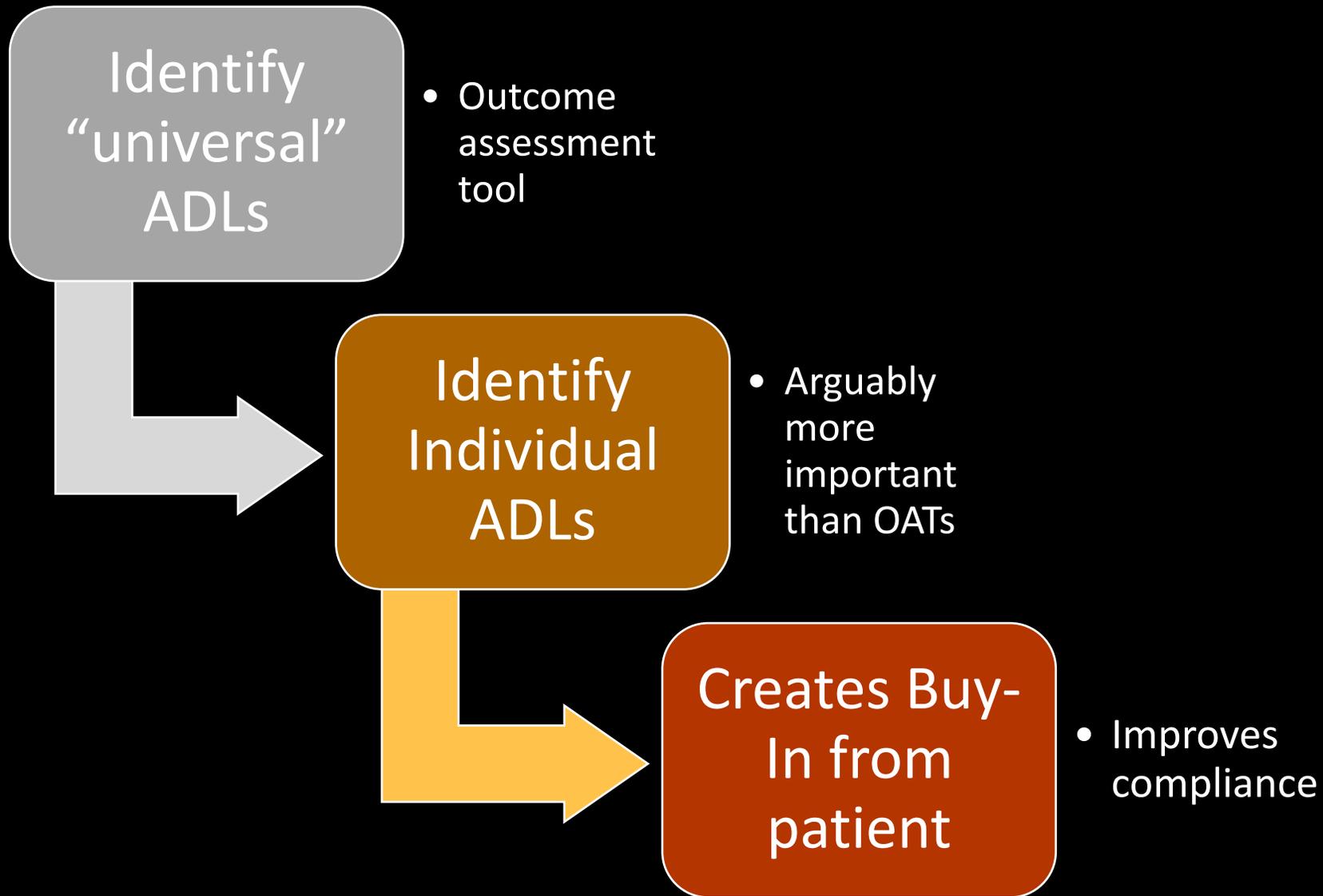
How do you find out the goals of you patient?

YOU ASK!

Are they in your office because of pain?

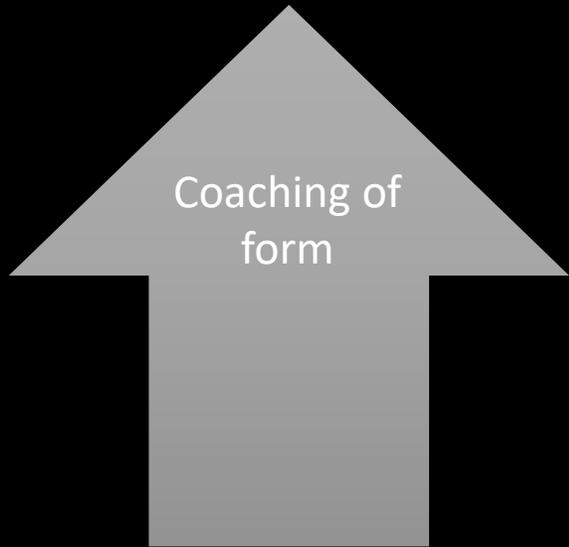
Yeah...but no.

Usually, their pain is limiting something they either must do or something they love to do.



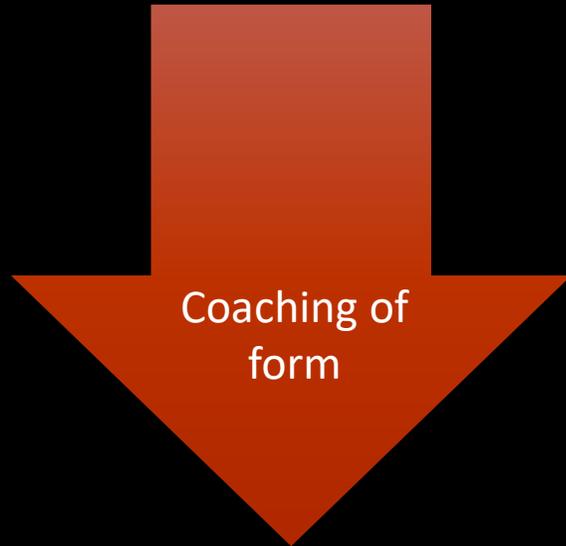
Do biomechanics matter?

Yes...but depending on the patient we may coach some out of what we observe more than others.



Acute Pain and Performance

-Usually more coaching of patients form to promote skill acquisition.



Chronic Pain

-**Potentially** less coaching on patients form to decrease fear avoidance and hypervigilance.

How we communicate and teach biomechanical modification is important, so we do not create hypervigilance and fear avoidance in acute pain scenarios?



Liebenson, ROS 3, Figure 1.22

Examples of Negative Affectivity Threatening Illness Information

- AKA: Nocebo
 - Vertebra is out
 - Bone on Bone
 - Rib popped out
 - Reversed Cervical Curve
 - Disc will slip out
 - Don't lift anything heavy or you will hurt your back
 - Don't flex your spine...

CELL ↔ SOCIETY

BIOCHEMISTRY

ANATOMY

PHYSICS

NEUROPHYSIOLOGY

BIOMECHANICS

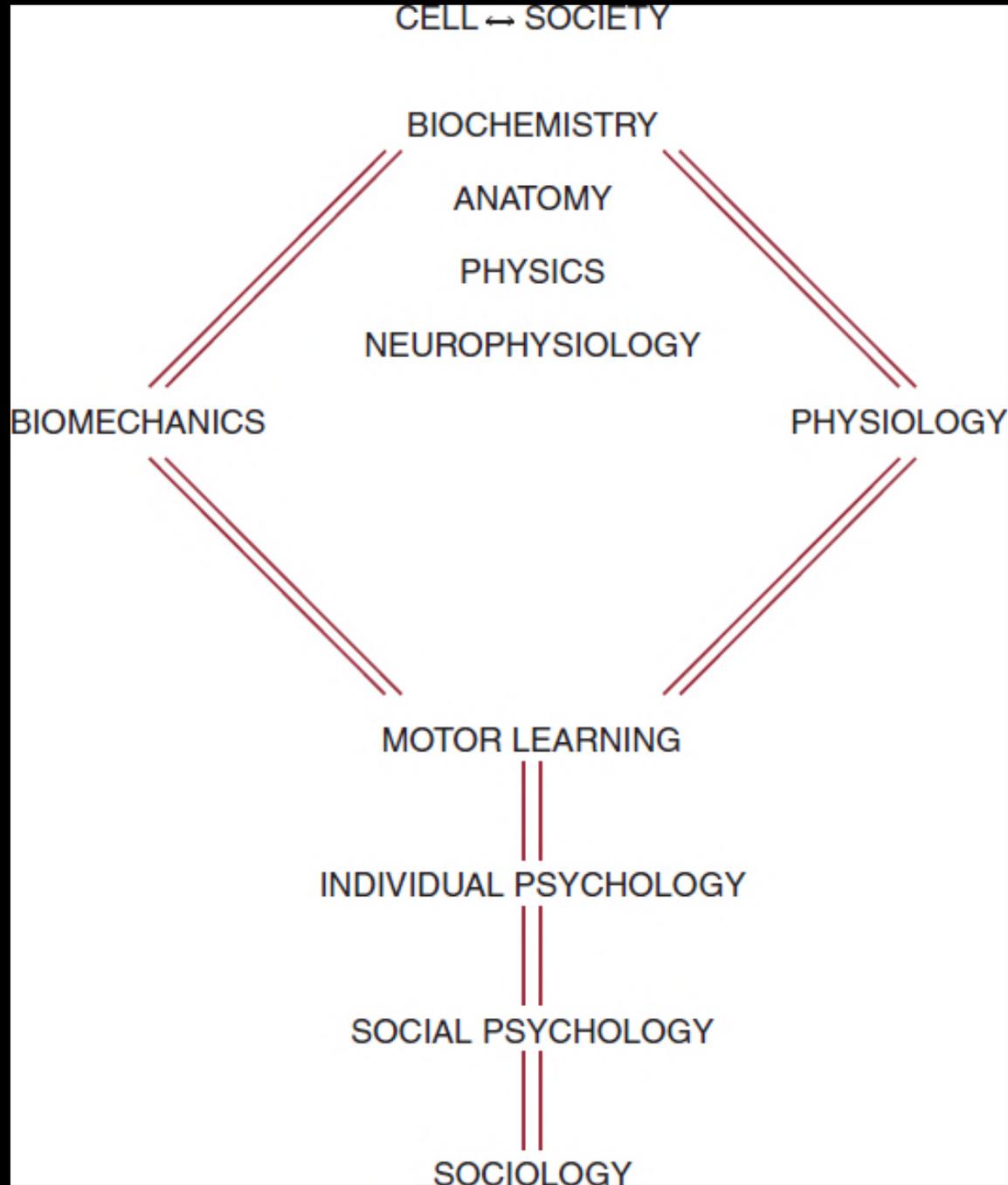
PHYSIOLOGY

MOTOR LEARNING

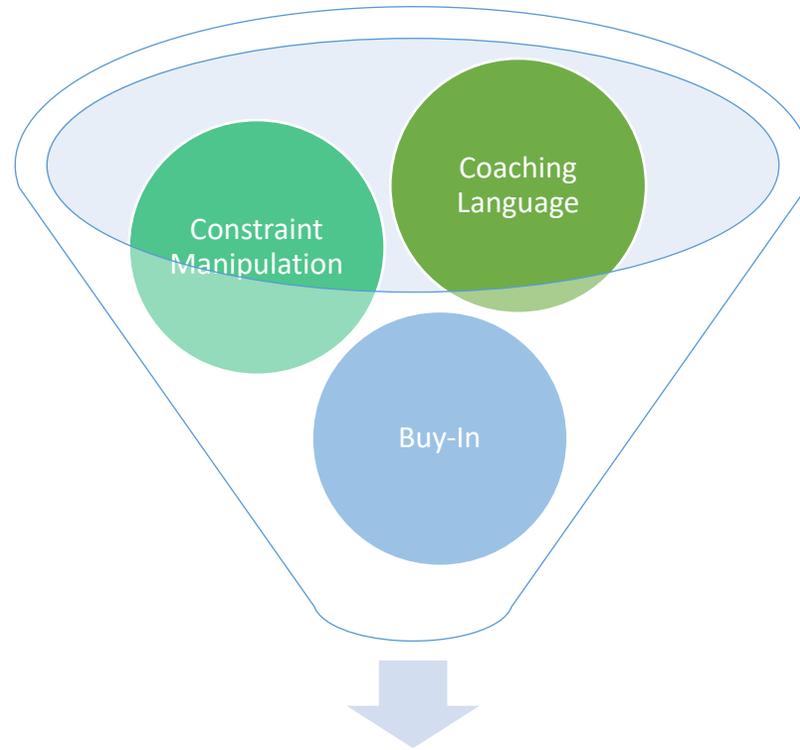
INDIVIDUAL PSYCHOLOGY

SOCIAL PSYCHOLOGY

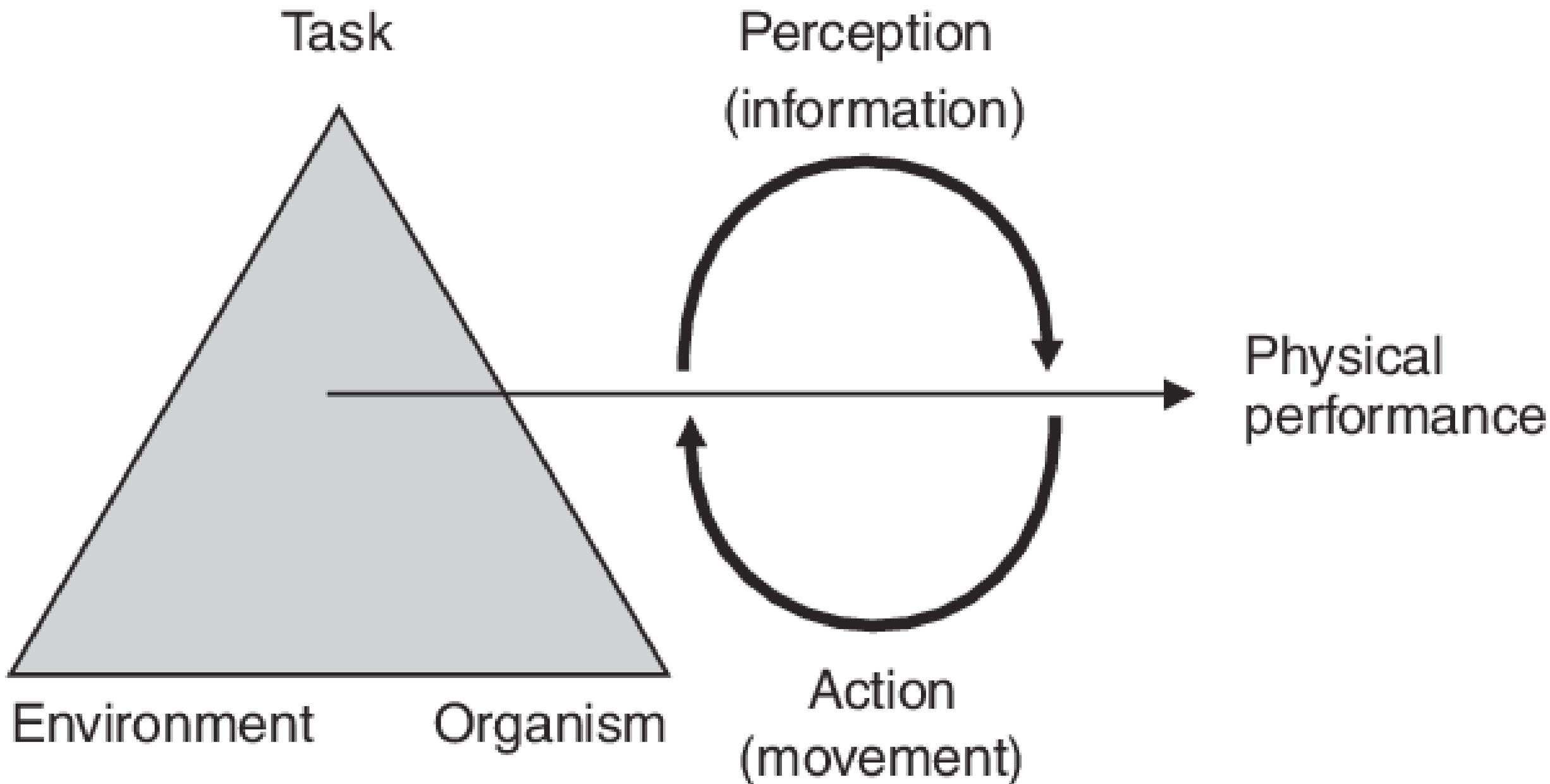
SOCIOLOGY



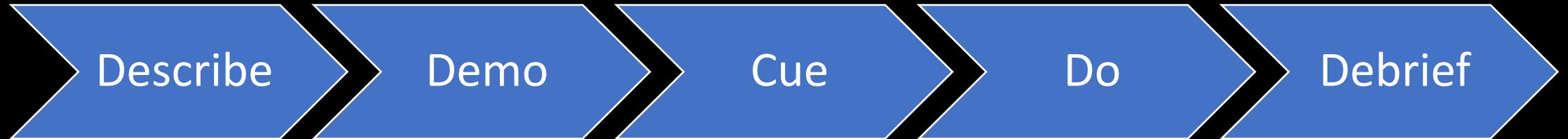
How do we get transfer of things
we do in the office to life?



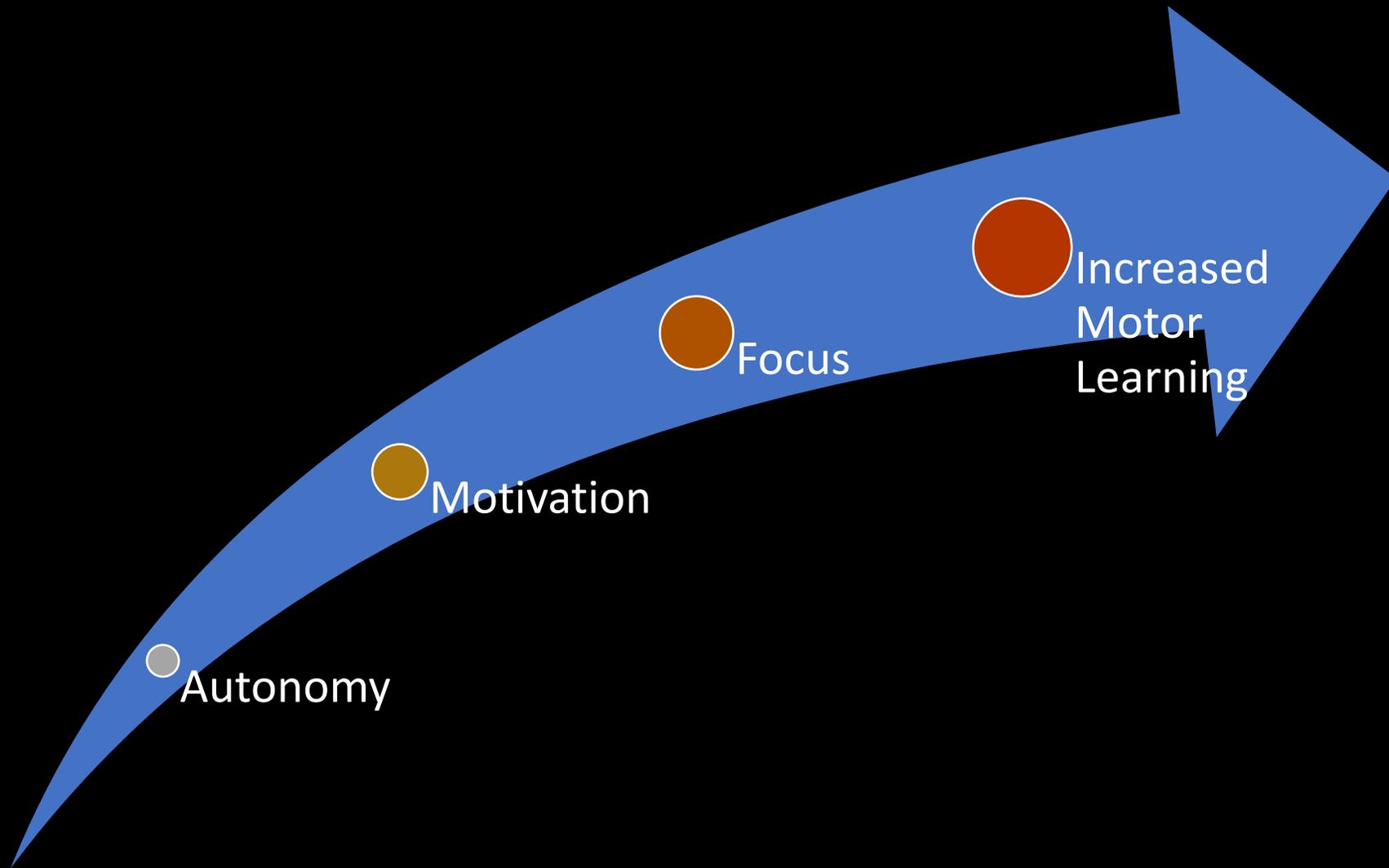
Motor Learning



Communication for Comprehension



Winkelman



Autonomy

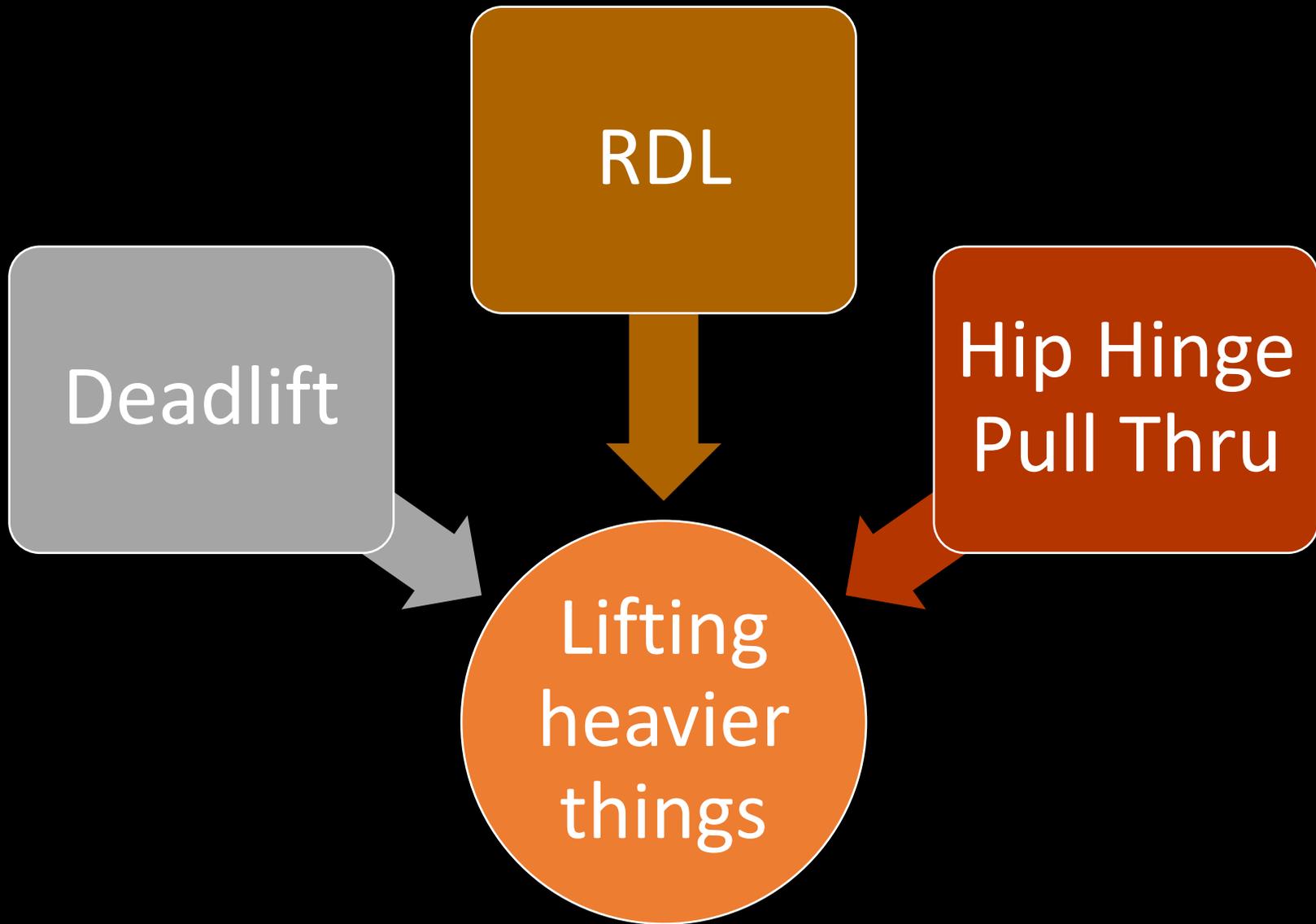
Motivation

Focus

Increased
Motor
Learning

What do ADLs and Strength Exercises have in common?

ADL and its strength exercise
counterpart

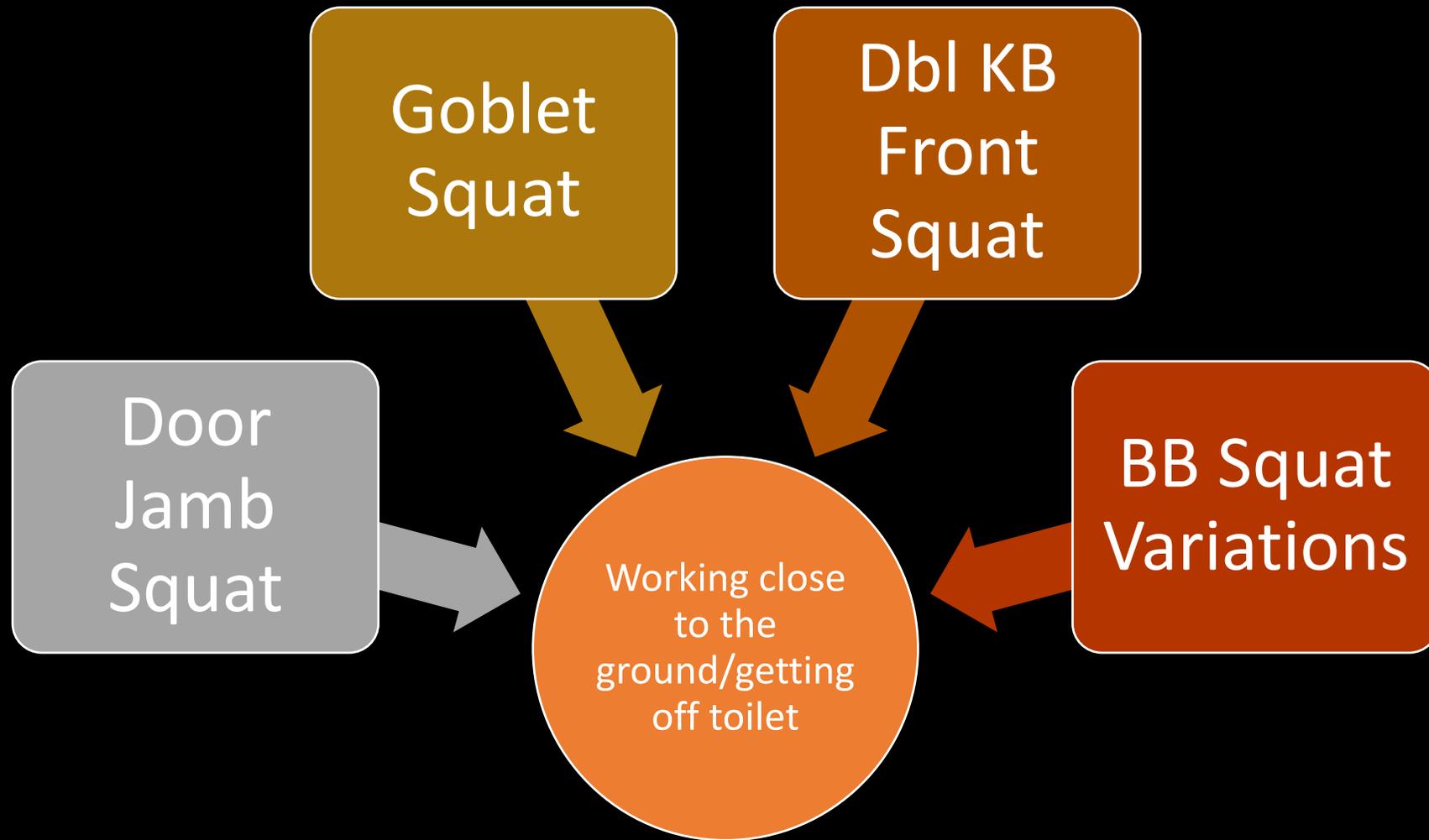


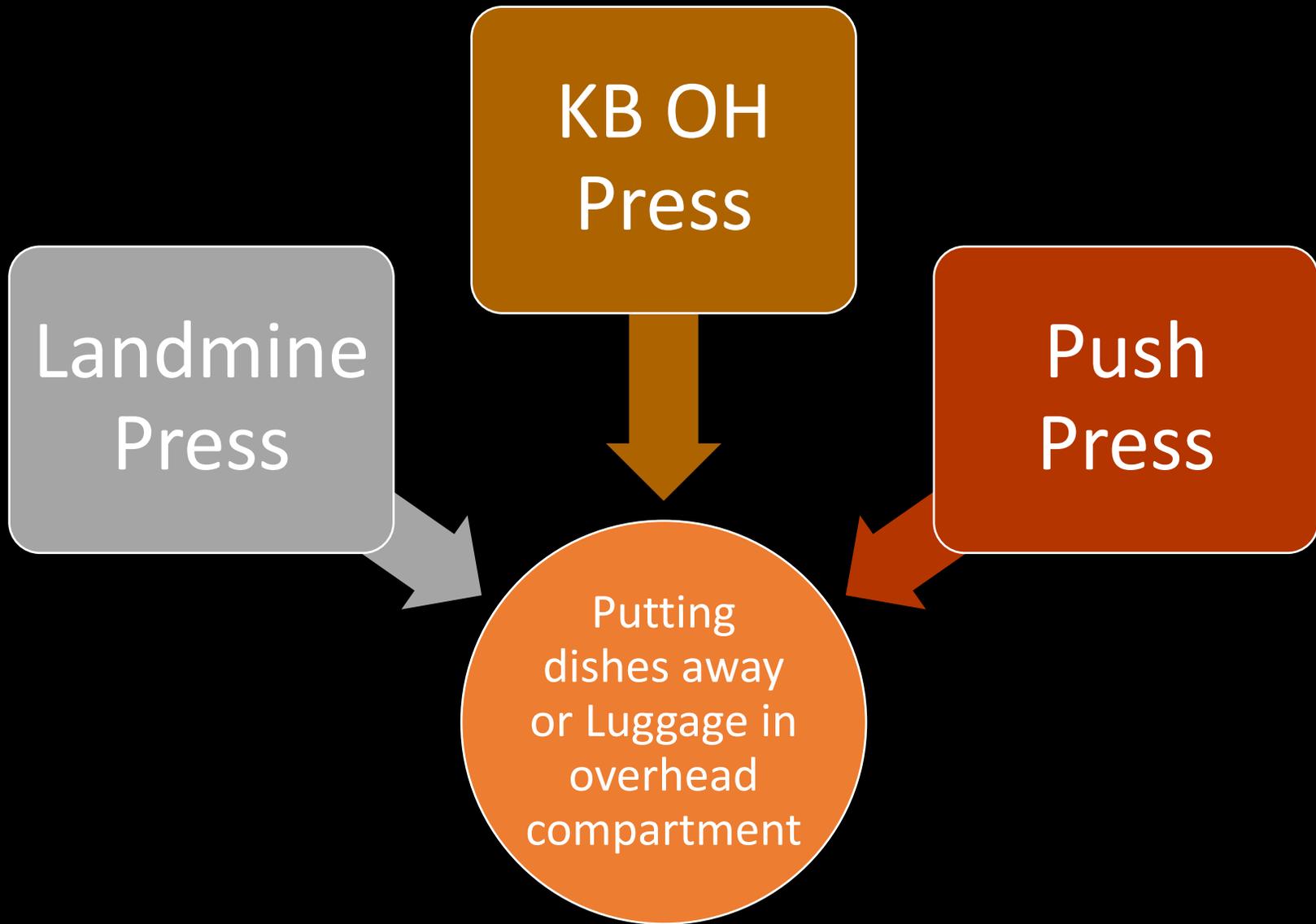
Deadlift

RDL

Hip Hinge
Pull Thru

Lifting
heavier
things



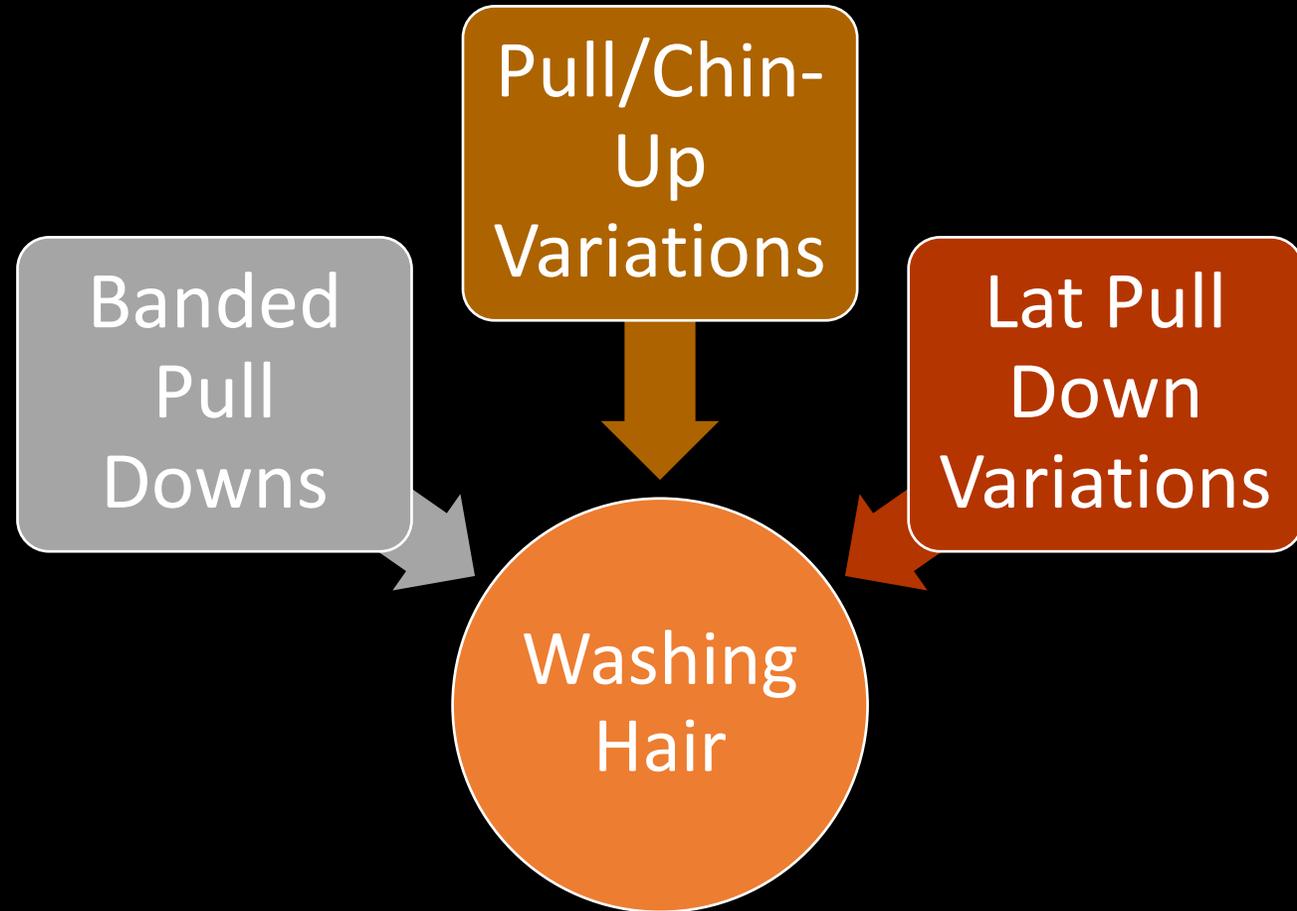


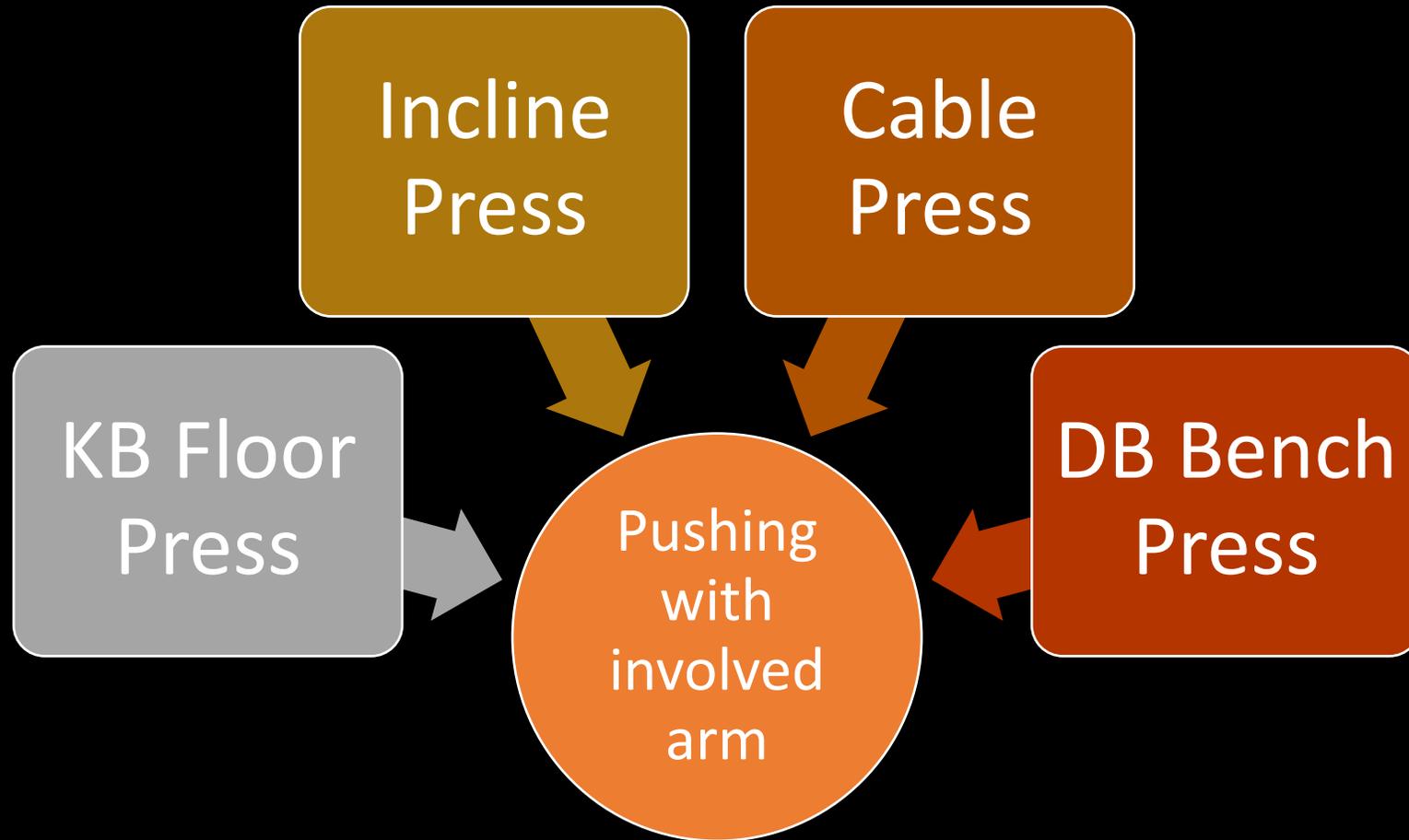
Landmine Press

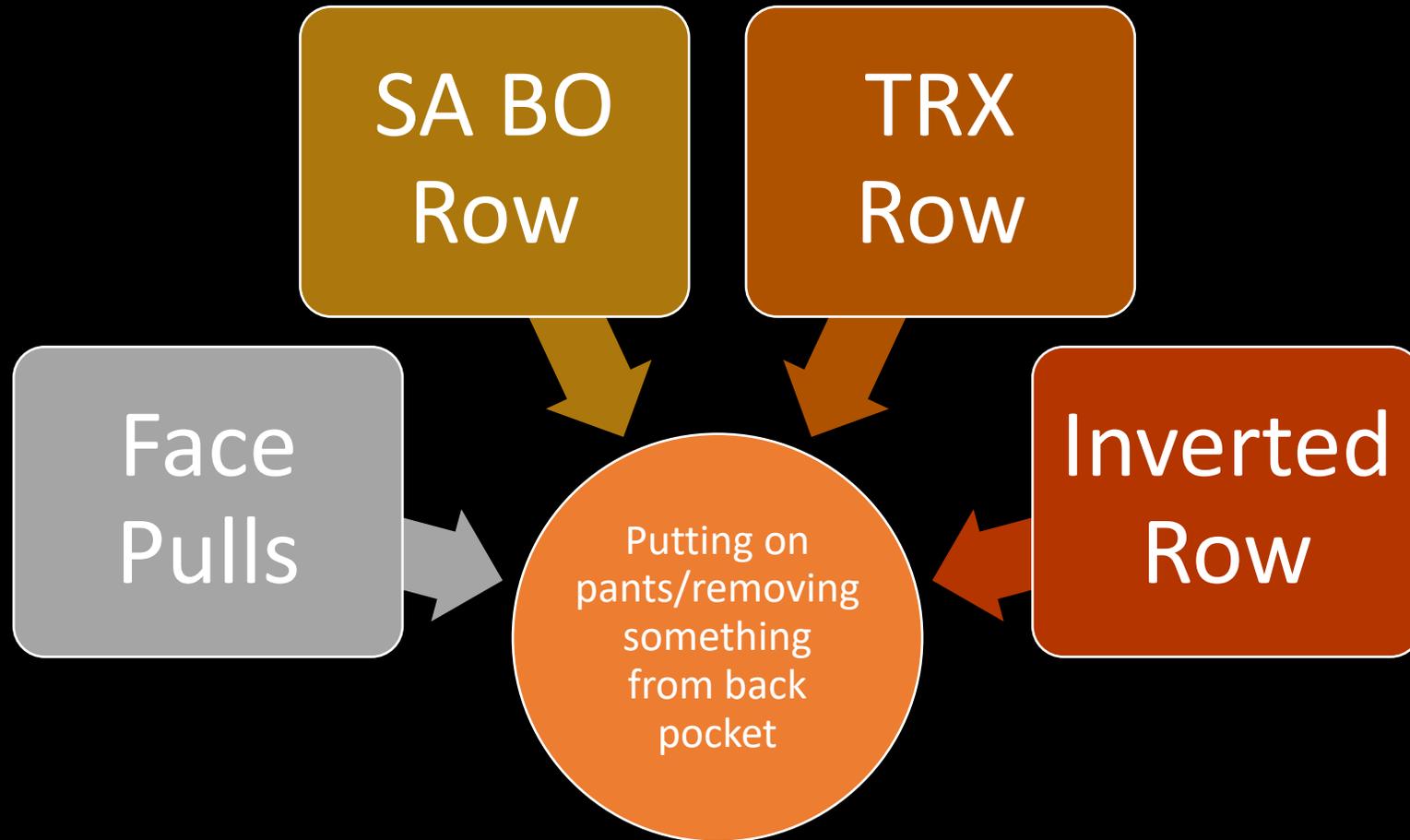
KB OH Press

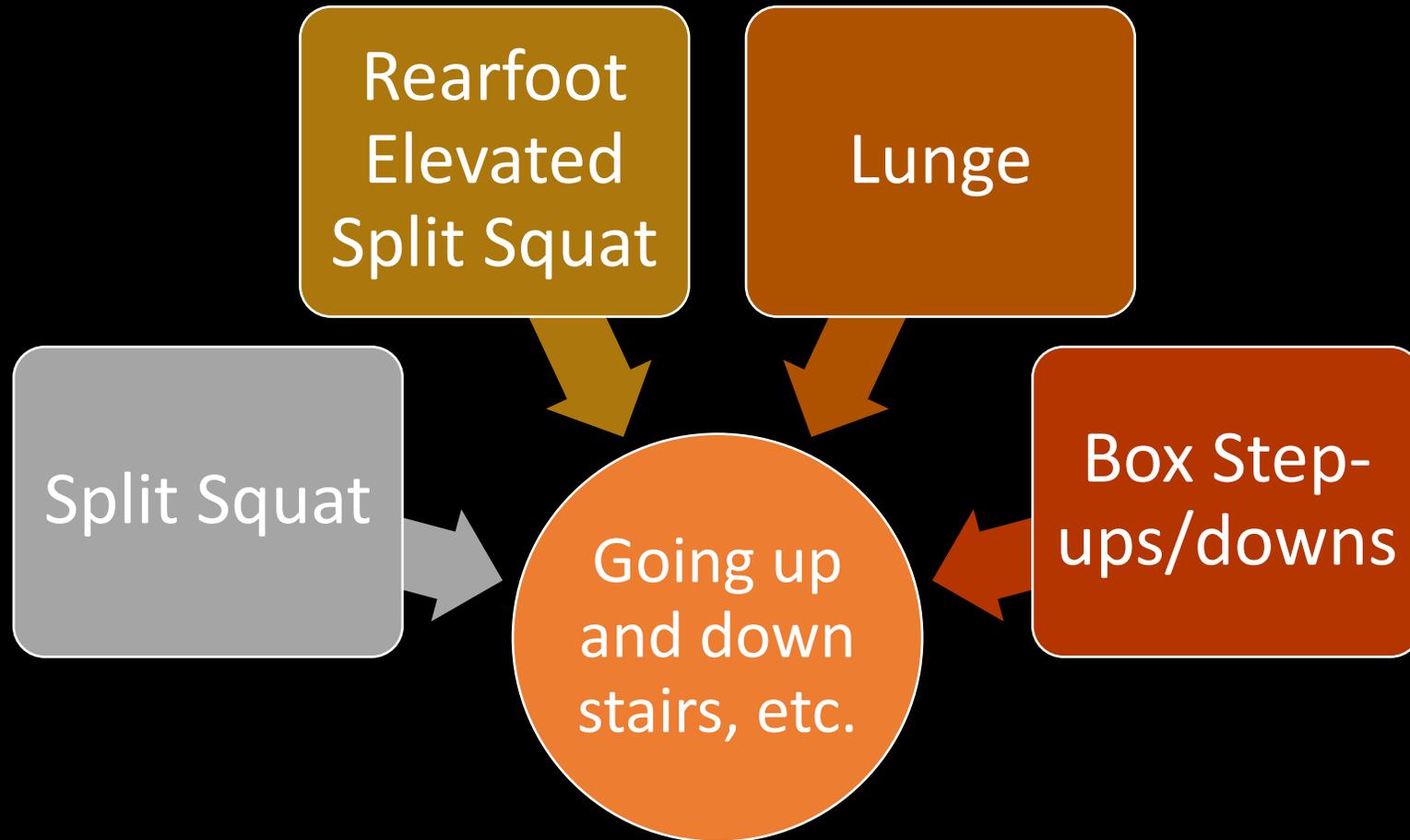
Push Press

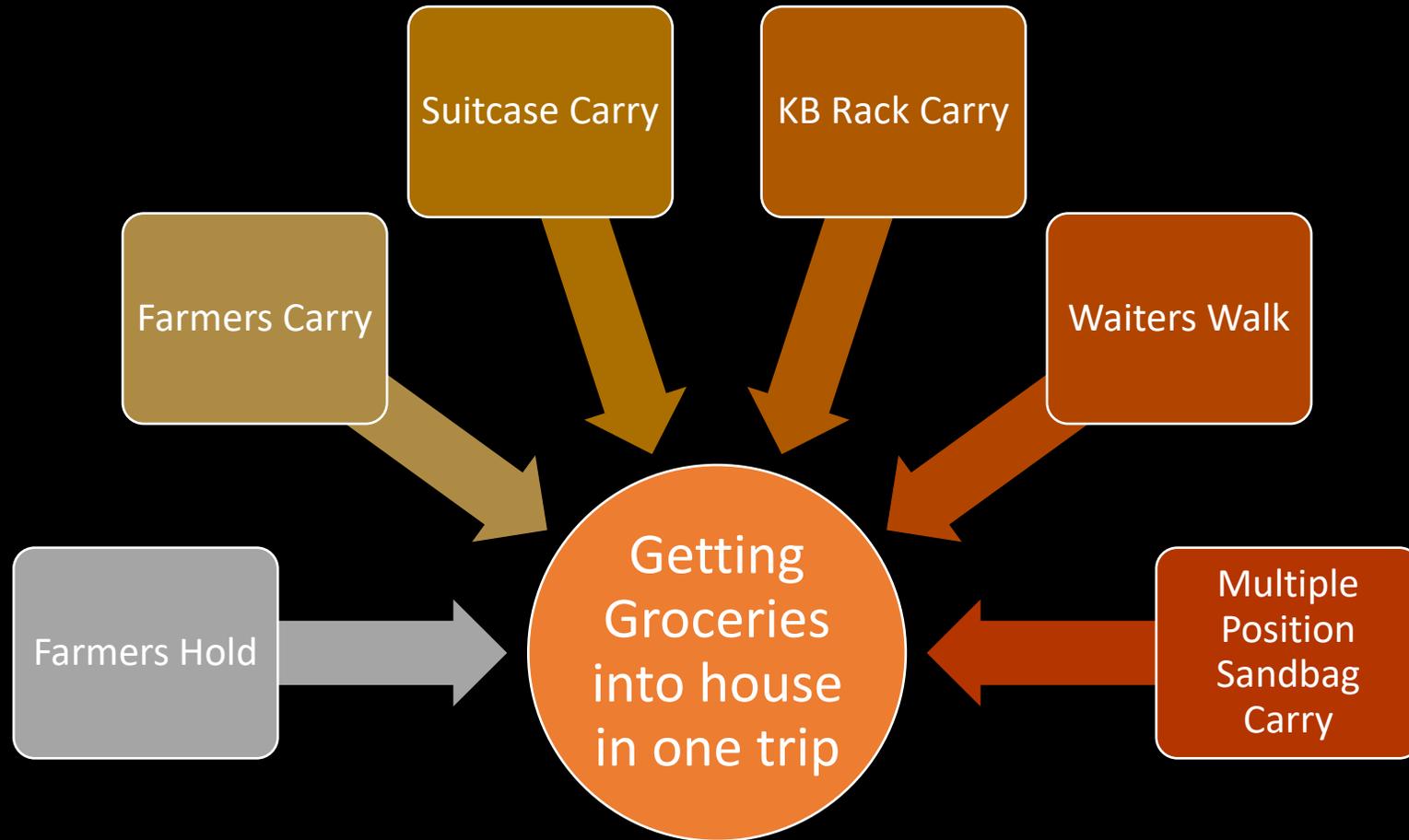
Putting dishes away or Luggage in overhead compartment











Let's pick on the deadlift and
walk through it

A night-time photograph of the Dallas skyline, featuring several illuminated skyscrapers and the Reunion Tower. The sky is dark with some clouds, and the city lights are visible against the twilight background.

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Day 2 – February 27th, 2022

Tension

One thing we need to talk about that is very important in rehab is the manipulation and control of tension.

Tension is...

...the lynchpin to basic loaded/core exercises.

...the antivenom to pain.

...Grandpa's cough medicine to ADL limitations.

Sherrington's Law of Irradiation

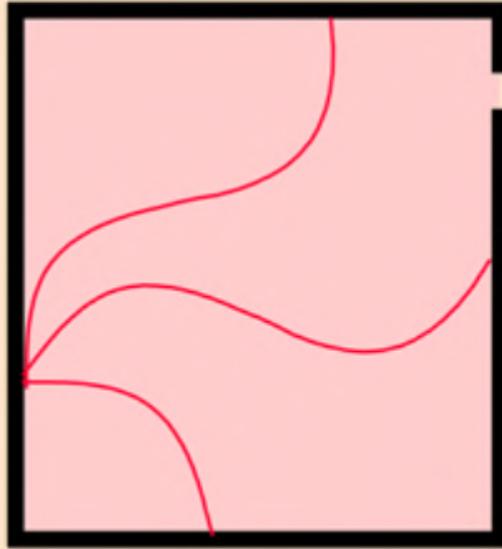
Radiation modes in a hot cavity provide a test of quantum theory



	#Modes per unit frequency per unit volume	Probability of occupying modes	Average energy per mode
CLASSICAL	$\frac{8\pi\nu^2}{c^3}$	Equal for all modes	kT
QUANTUM	$\frac{8\pi\nu^2}{c^3}$	Quantized modes: require $h\nu$ energy to excite upper modes, less probable	$\frac{h\nu}{e^{\frac{h\nu}{kT}} - 1}$

Cavity Modes

A mode for an electromagnetic wave in a cavity must satisfy the condition of zero electric field at the wall. If the mode is of shorter wavelength, there are more ways you can fit it into the cavity to meet that condition. Careful analysis by Rayleigh and Jeans showed that the number of modes was proportional to the frequency squared.



Number of modes
per unit frequency
per unit volume

$$\frac{8\pi\nu^2}{c^3}$$

For higher frequencies
you can fit more modes
into the cavity. For
double the frequency,
four times as many
modes.



[Evaluation of the number of modes](#)

$$\langle E \rangle = \frac{h\nu}{e^{h\nu/kT} - 1}$$

This average energy times the [density of such states](#), expressed in terms of either frequency or wavelength

$$\rho(\nu) = \frac{dn_s}{d\nu} = \frac{8\pi}{c^3} \nu^2 \qquad \rho(\lambda) = \frac{dn_s}{d\lambda} = \frac{8\pi}{\lambda^4}$$

gives the energy density, the Planck radiation formula.

Energy per unit volume per unit frequency	$S_\nu = \frac{8\pi h}{c^3} \frac{\nu^3}{e^{h\nu/kT} - 1}$	Example
Energy per unit volume per unit wavelength	$S_\lambda = \frac{8\pi hc}{\lambda^5} \frac{1}{e^{hc/\lambda kT} - 1}$	Example

Sherrington's Law of Radiation

Sherrington's Law of Irradiation

“...when one set of muscles is stimulated, muscles opposing the action of the first are simultaneously inhibited.”

Let's review the deadlift from a coaching perspective



Deadlift (Doctor)

- Grip
- Upper Quarter
- Core
- Foot Placement for thigh path
- Foot engagement
- Execution
- Active Negative

Grip

Grip

- Lobster Claw
- Hook Grip
- Double Overhand
- Alternating/Over-Under



A person is shown from the chest down, holding a barbell with both hands. The person is wearing a black t-shirt with a grey logo. The background is a wall with large, stylized orange and grey letters. A white diamond-shaped graphic is overlaid on the center of the image, containing the text "Hook Grip".

Hook Grip



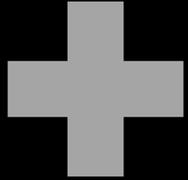
Double Overhand Grip



Alternate Grip

Upper Quarter

Slight
shoulder
external
rotation



Mostly
scapular
depression

Lat
Post

Lat Attachment Variations

- Type 1: Physical muscular attachment to scapula
- Type 2a: Fascial attachment to scapula
- Type 2b: no “physical” attachment to scapula, intervening bursa

Lat Attachment Variations

- Type 1: Physical muscular attachment to scapula (43%)
- Type 2a: Fascial attachment to scapula (36%)
- Type 2b: no physical attachment to scapula, intervening bursa (21%)

Significance of the Latissimus dorsi for shoulder instability and variations in its anatomy around the humerus and scapula (Part 1) (100 Specimens)

Pouliart and Gagey 2005

Lat Attachment Variations

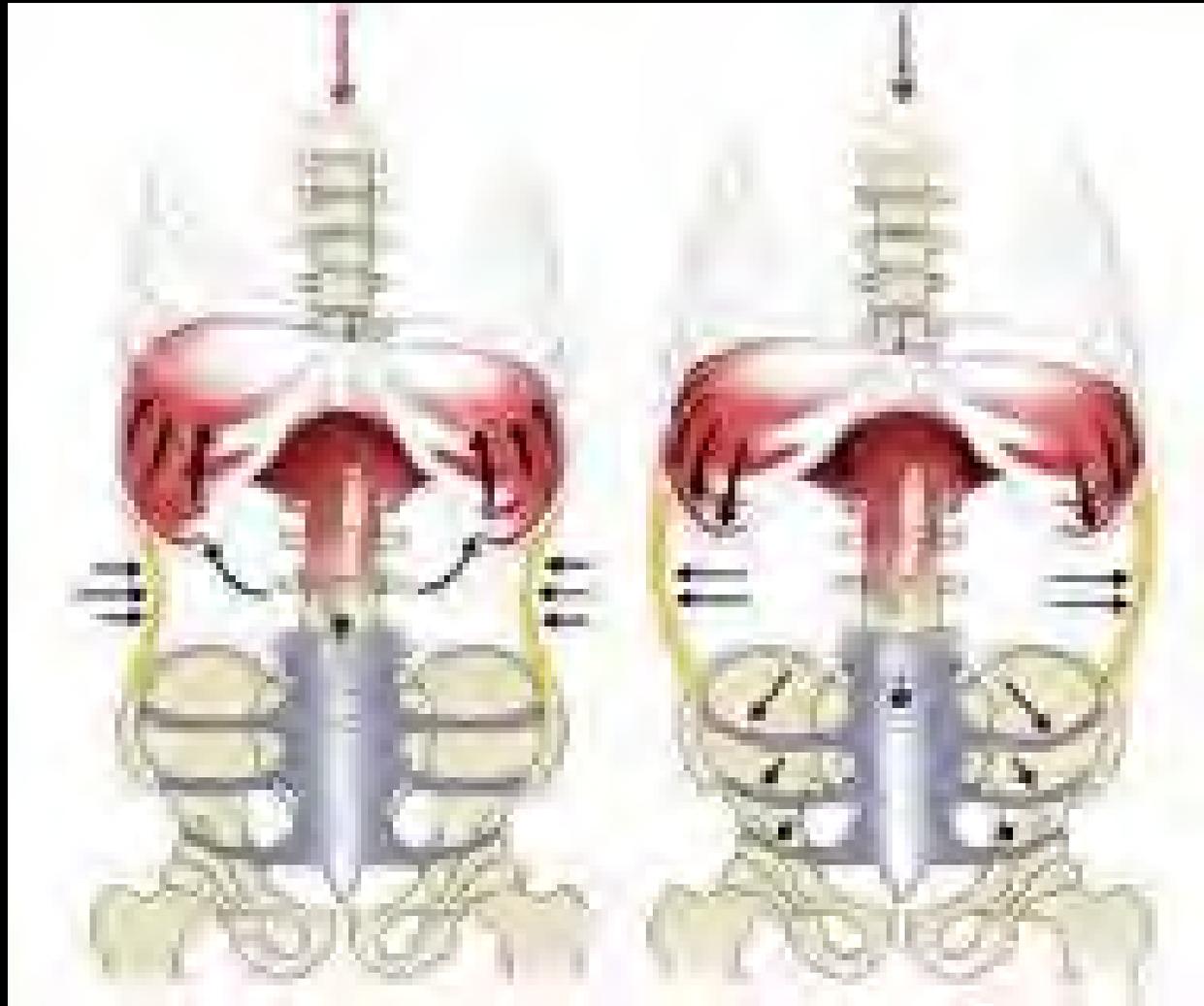
- Type 1: Physical muscular attachment to scapula (31- 41.3%)
- Type 2a: Fascial attachment to scapula (29- 38.7%)
- Type 2b: no physical attachment, intervening bursa (15- 20%)

Significance of the Latissimus dorsi for shoulder instability and variations in its anatomy around the humerus and scapula (Part 2) (75 specimens)

Pouliart and Gagey 2005

Core

Internal Strategy



External



Foot position for thigh path

- Acetabular/Pelvic anatomy
- Hip anatomy
- Implement choice

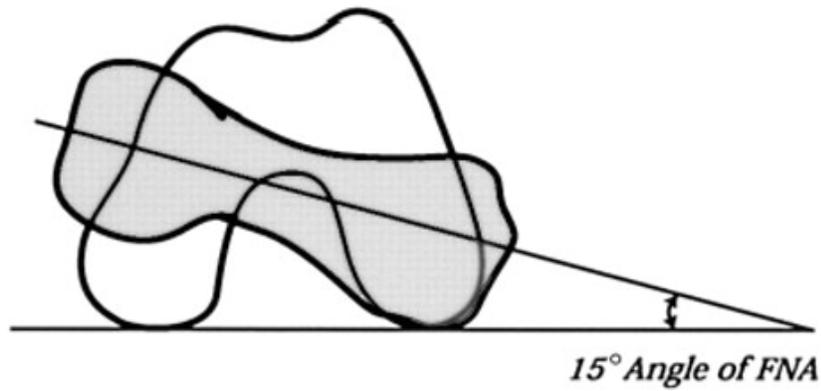


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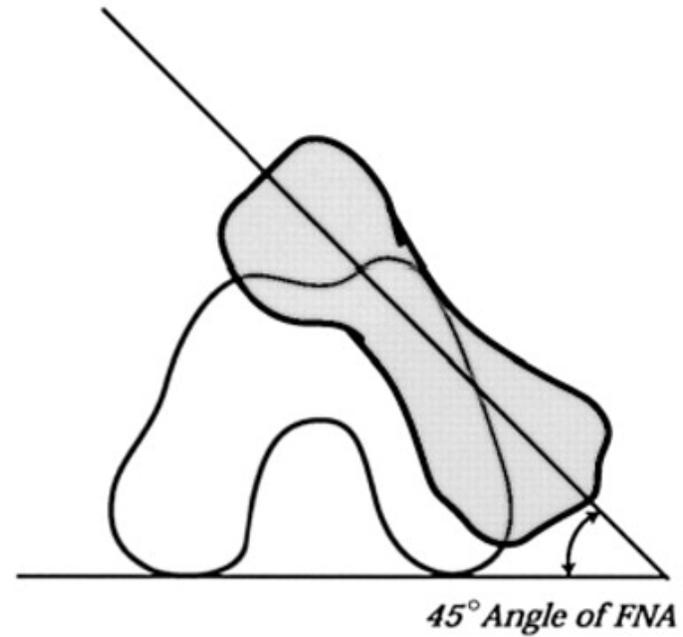


Acetabular Hip Socket Orientation

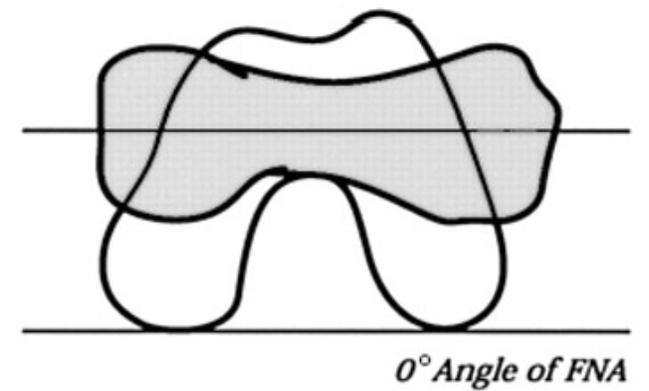
Normal Femoral Neck Anteversion

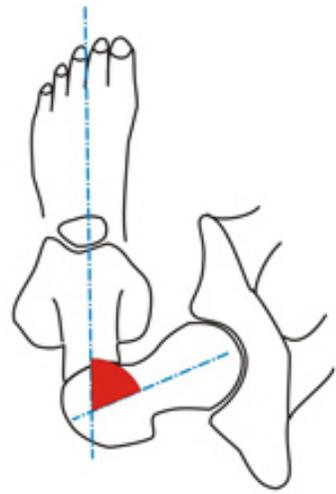


Increased Femoral Neck Anteversion



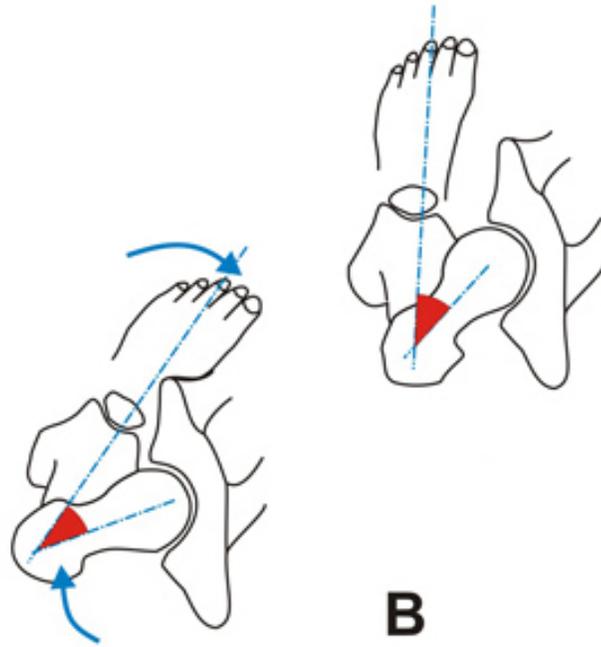
Femoral Neck Retroversion





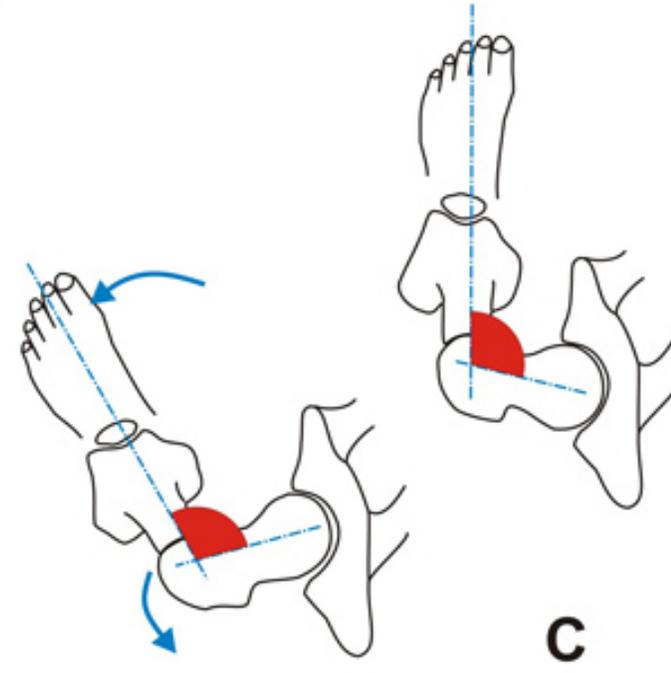
A

NORMAL HIP



B

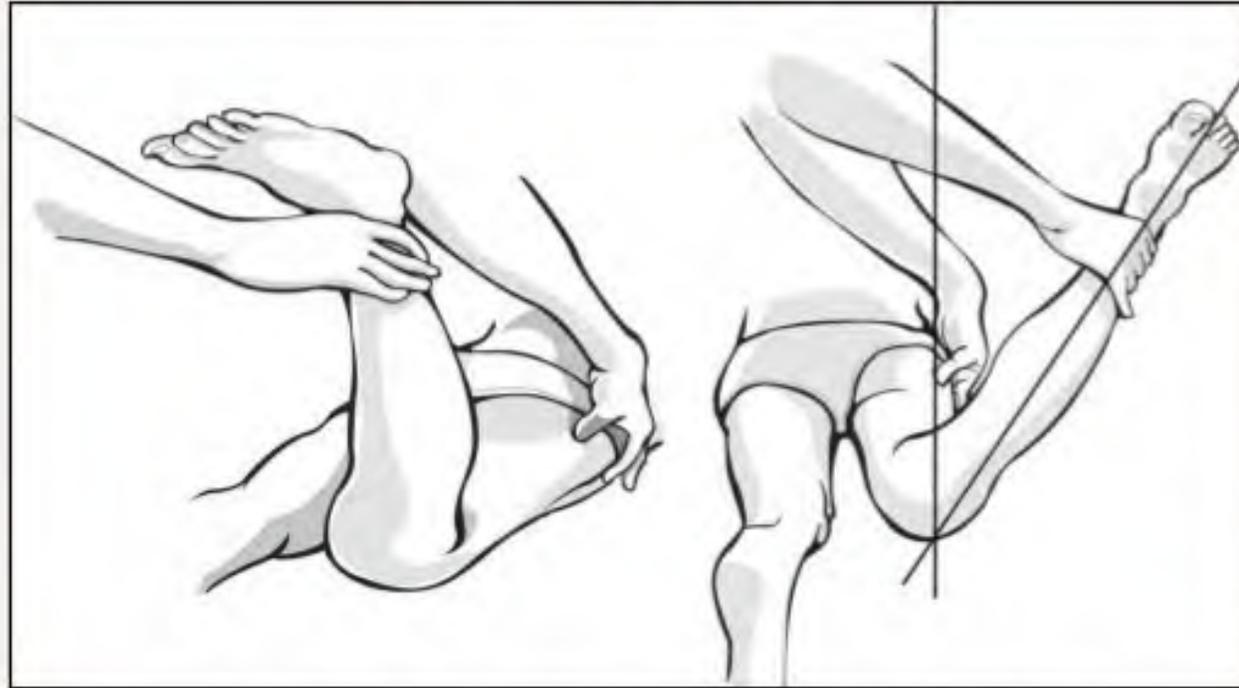
FEMORAL ANTEVERSION



C

FEMORAL RETROVERSION

Craig's test



In prone, knee flexed to 90 deg. With one hand over the greater trochanter, the other hand internally or externally rotates the leg till the trochanter is felt most prominent. The angle of version is that subtended between the imaginary vertical to the long axis of the leg.



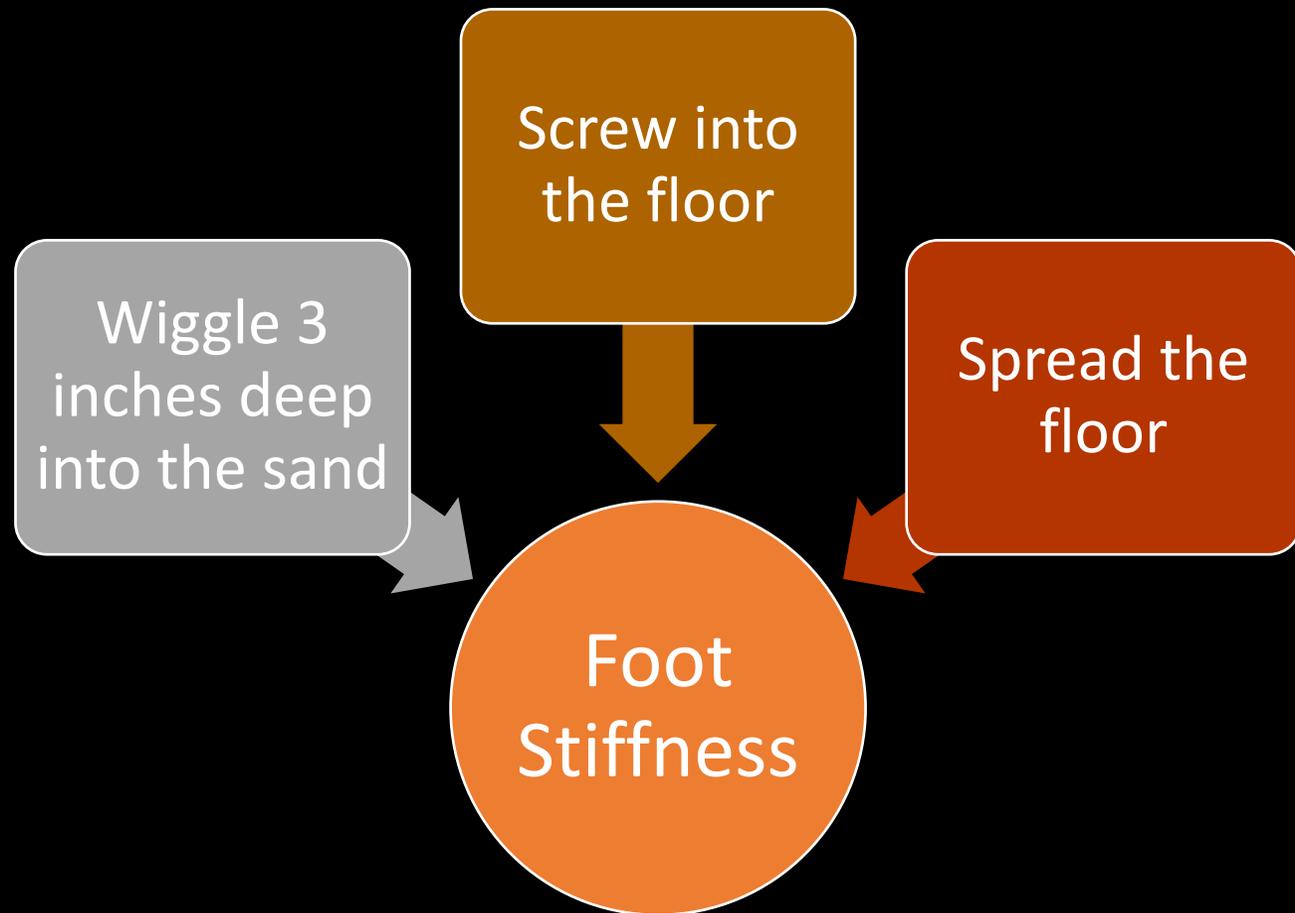




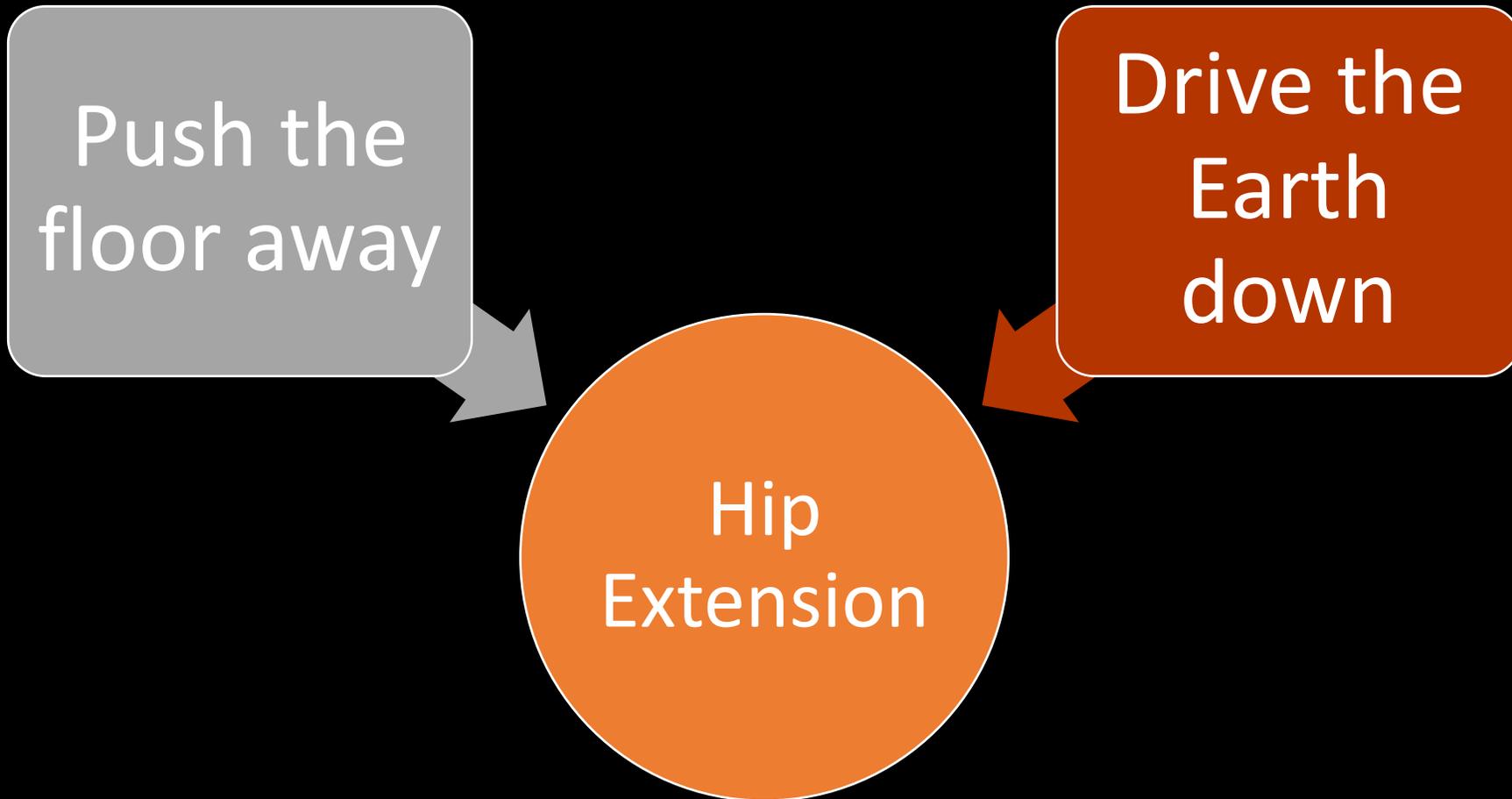




Foot Engagement



Execution



Active Negative

“Pull the weight down” creates reactive stiffness

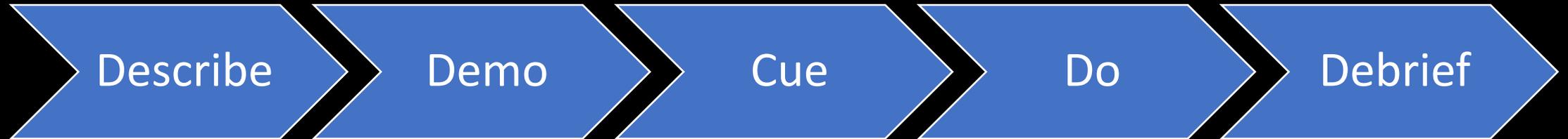
Deadlift (Patient/Client)

- Wiggle into sand
- Bite Bar
- Sip Air low
- Break/bend the bar
- Drive floor away
- Active Negative/Active Eccentric

How do we coach that?

Coaching Communication loop

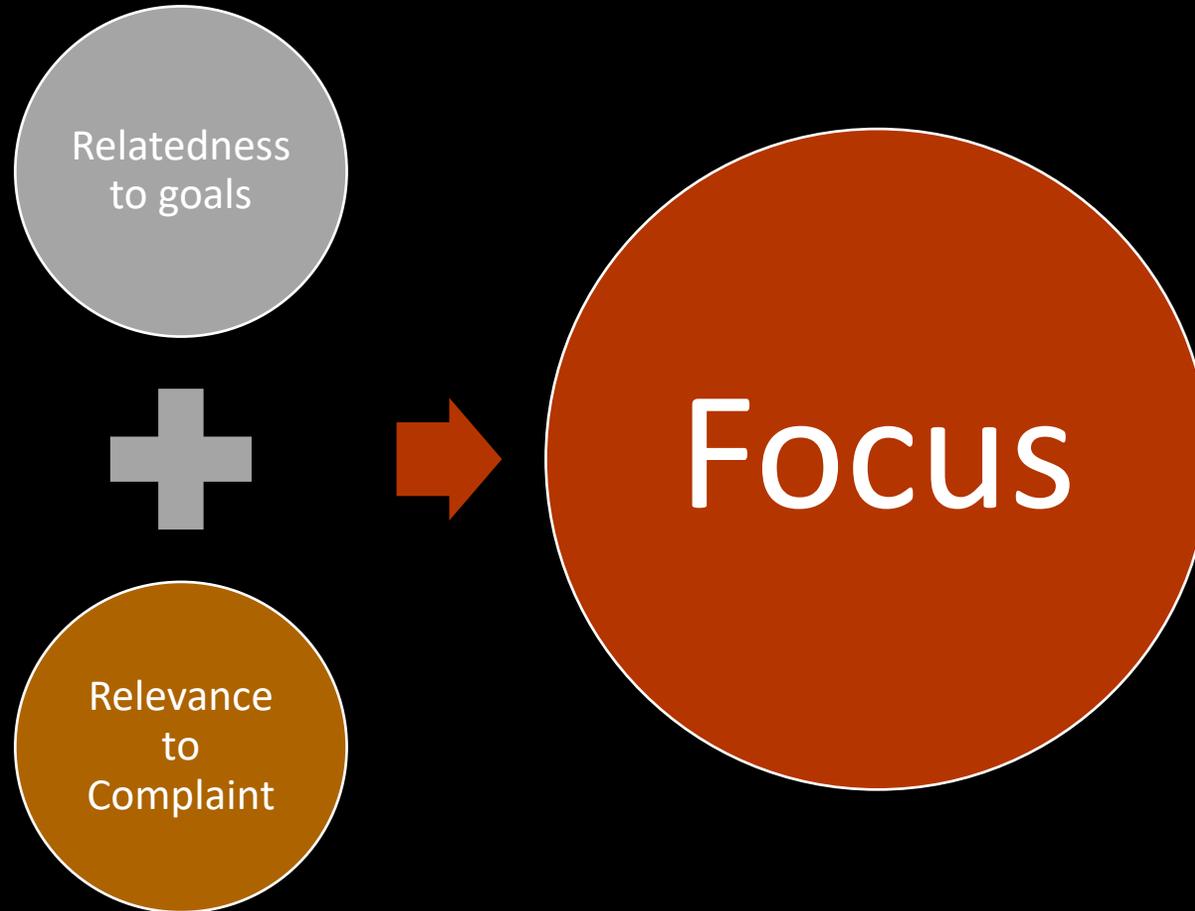
Coaching Communication Loop (Winkelman)



Describe

- Tell patient WHY they are about to do the exercise.
- Tell them what the exercise is called
- Describe in as few as words possible how to perform the exercise.

The “Why”



Demo

Physically demonstrate the activity while
describing and cueing

Cue

Utilize and external cue for the main action being performed

Do

Patient performs the exercise while you observe
for anything you may want to change

Debrief

If you identify something that you want to change
then you can use appropriate explicit instruction
or constraint manipulation

Constraint Manipulation for Deadlift

- Body/Individual
 - Position
 - Pattern
 - Power
 - Previous Experience/Psychosocial
- Environment
- Task

Body

- Grip – plate carries
- Lat Post – HEAVY single arm bent over rows
- Core – IAP and Brace
- Isometric Lifters wedge into strap
- Footwork
- Pattern work (active loading – Horizontal, Vertical for SLDL, hip hinge drills)

Environment

- Implement change
- RNT
- Alter degrees of freedom

Task

- Appropriate regression to hit similar target tissue or energy system