

# Practical Applications of Breathing, Posture and Exercise

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## WHAT IS RESPIRATION?

1. The primary mechanism to support life
2. Provides oxygen for cellular metabolism
3. Removes the waste product CO<sub>2</sub>
4. Maintains acid/alkaline (pH) balance

## Two types of respiration

1. Cellular = gaseous exchange at the level of the cells
2. Pulmonary = visible breathing which removes CO<sub>2</sub> from body with exhalation and draws O<sub>2</sub> into the body with inhalation

## Other definitions

1. From the alternative health view point, when you inhale you're bringing in life force, also known as chi or prana
2. In the CHEK system, respiration is at the top of the CHEK Totem Pole, with the highest priority of any physiological or musculoskeletal system

The average person breathes 25,900 times daily. Any imbalances in the breathing apparatus can compound themselves rapidly, showing up as musculoskeletal, biochemical, digestive, mental-emotional and cognitive problems.

## PRIMARY MUSCLES OF RESPIRATION

### Inhalation

- Diaphragm
- External intercostals

### Exhalation

- Internal intercostals
- Elastic recoil of lung tissue
- Surface tension
- Gravity on rib cage
- Transversus Abdominis



## SECONDARY /ACCESSORY MUSCLES OF RESPIRATION

### Inhalation

- Sternocleidomastoid
- Scalenes
- Pectoralis major & minor
- Serratus anterior
- Serratus posterior superior
- Upper iliocostalis
- Levator scapulae

### Exhalation

- External oblique
- Internal oblique
- Rectus abdominis
- Lower iliocostalis
- Lower longissimus
- Serratus posterior inferior

## THE MECHANICS OF BREATHING

### During inspiration:

- The diaphragm descends
- The ribcage elevates and/or expands in all 3 planes
- Intrathoracic volume increases
- Intrathoracic pressure decreases
- Exterior air flows into the lungs

### During expiration:

- The diaphragm ascends
- The ribcage descends and/or contracts
- Intrathoracic volume decreases
- Intrathoracic pressure increases
- Air in lungs flows out to the exterior

## BREATH AND POSTURE

### Breath and posture are intimately linked

- Inhalation is coupled with and facilitates extension, abduction and supination; *moving out of the fetal position.*
- Exhalation is coupled with and facilitates flexion, adduction and pronation; *moving into the fetal position.*

Good posture creates the best body mechanics for optimal breathing.

Poor posture will lead to inefficient and labored breathing.

## BREATH AND EXERCISE

Well-designed exercise programs should always consider posture:

- What effect to the exercises themselves have on posture?
- Do the exercises support and balance the postures created by the activities of the person outside the gym?

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A poorly designed exercise program, too much exercise or not enough exercise to counteract the demands of any work or sports situation can lead to negative changes in posture.

SPINE		UPPER EXTREMITY		LOWER EXTREMITY	
INHALATION	EXHALATION	INHALATION	EXHALATION	INHALATION	EXHALATION
Axial Extension	Axial Flexion	Flexion	Extension	Extension	Flexion
Lengthening	Shortening	Abduction	Adduction	Abduction	Adduction
↑ Stability Stiffness	↓ Stability Stiffness	Horizontal Abduction	Horizontal Adduction	External Rotation	Internal Rotation
		Supination	Pronation	Supination	Pronation
		Scapular Retraction	Scapular Protraction		

### BREATHE IN OR OUT – WHEN DO YOU INHALE?

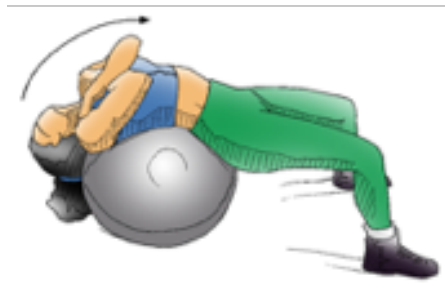
Examine exercises carefully to determine when you should inhale and when you should exhale.



Single Arm Cable Push



Single Arm Cable Pull



Swiss Ball Crunch



Dead Lift

## CONCLUSION

1. Breath, posture and exercise are all related to each other
2. Efficient breathing requires good posture
3. Good posture comes from effective exercise programs
4. Breathing can facilitate exercise to both enhance posture and optimize results and performance
5. Inhalation is coupled with and facilitates extension
6. Exhalation is coupled with and facilitates flexion

Breathing is an essential component of life and can both energize and relax you when performed properly and with intent.

## KEY REFERENCES AND RESOURCES

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For a complete list of references, please e-mail the CHEK Institute.



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