

Children's Yoga Anatomy

Understanding anatomy helps us understand how the body moves.

As yoga teachers we can use our knowledge to help inform our teaching, help students deepen their practice, minimize risk of injury and maximise the physical benefits of yoga

When teaching yoga safety to children the practice can support their growth, build strength and develop anatomically.

Head and neck-

The head/scull is much bigger than the rest of body and neck. With this in mind a child's neck is vulnerable area.

A heavy head on a weak neck increases risk of torque.

The increased mobility is due to loose ligaments between C2-3 and C3-4 and the joints cannot withstand intense flexing and rotation. The muscles of the neck are also underdeveloped in children, therefore we need to add the following modification:

Modifications

- tuck chin to chest in forward folds
- gaze forward in backbends

Benefits of yoga on the head and neck

- strengthening and supporting neck muscles

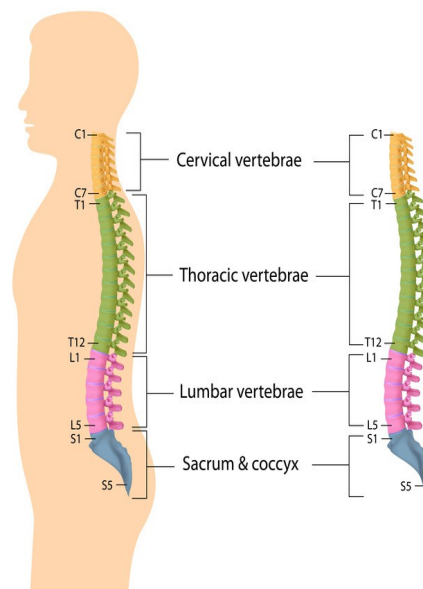
Spine

The spine consist of 33 vertebrae.

- 7 cervical
- 12 thoracic
- 5 lumbar
- 5 sacral
- 4 coccyx

The spine protects the spinal chord and supports the body's weight.

In children the spine is hyper mobile, the elastic ligament, underdeveloped muscles, shallow joints contribute to a higher risk of spinal injury



Children's spines naturally curve in stages:

- During fetal development, the primary curves the thoracic spine develop, as well as the sacral curve at the bottom of the spine.
- As babies, children have a C-shaped spine. Secondary curves in the cervical and lumbar spine develop as infants become able to lift their heads, sit up, crawl, stand, and walk.
- As children grow, their spine continues to develop natural curves into a normal, mature spine.

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You may notice that children may be quite clumsy in their movement, this is due to spinal development; as they grow up the centre of gravity moves down the spine.

Modifications

- variation of poses to support balance
- chin to chest in forward folds
- gaze forward in backbends.

Benefits of yoga on the spine

- alleviates back pain
- decompresses lower back
- enhanced flexibility of spinal support muscles
- restores spinal curves and relieves pressure on nerves
- strengthens and strengthens spinal muscles

Chest

A child's chest muscles are thin and the ribs are soft. With this in mind it is important for us to stay conscious when leading high energy activities.

Modifications

- stay present and aware!

Benefits of yoga in the chest

- Strengthens chest muscle
- Protects the ribs

Abdomen

The centre of balance is in constant flux as children grow. Yoga is profoundly beneficial for developing balance, especially by working on the core muscles.

Modifications

- Mountain pose- feet hip width apart
- Before a balance pose or backbend, ensure the core is warm up sufficiently
- Do another core strengthening pose after a big backbend to contain the energy within the body and re-engage the core

Benefits of yoga on the abdomen

- develops balance
- strengthens core muscles
- increases body awareness

Limbs

Growth plates in the limbs are areas of cartilage located near the ends of bones. Because they are the last portion of a child's bones to harden (ossify), growth plates are particularly vulnerable to fracture. Approximately 15% to 30% of all childhood fractures are growth plate fractures.

The limbs are the major bones of body and the longest in body. They are responsible for height.

Modifications

- Avoid really challenging poses if you don't think they are ready
- Girls bones develop earlier than boys- so fractures in boys may be more common.

Benefits of yoga on the limbs

- enhances flexibility, strengthen and stretches limb muscles

Alignment

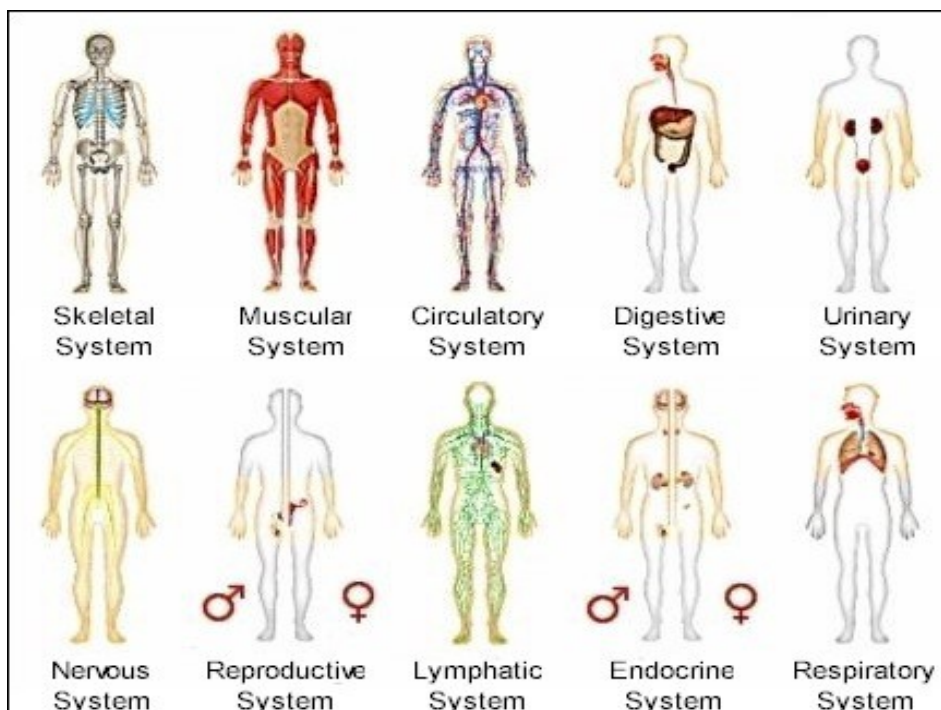
It's important to teach the children where they are and not expect them to be perfect or create a perfect pose. Remind them each class that when we make the shapes with our body, it's not about what it looks like, it's more important to listen to the body and explore what it feels like.

Verbal adjustments are great for children's imagination-

- Tree- imagine you are a tree- roots growing down to the ground, branches growing height to the sky
- Yogi pose- glue bottom to the ground then imagine a string pulling you up from the top of head.

Physiology

Whereas anatomy is all about the structure of the human body, physiology is about the function; the scientific study of the physics and chemistry of the body and how they support the functions of life by working together.

**The systems of the body and the Physical Benefits of yoga on each system.**

Yoga Postures/Asana, Pranayama and Meditation have a profound impact on all the systems of the human body. The muscles, bones, nervous system, respiratory, circulatory and digestive systems benefit greatly from regular practice and can support the healthy functions of our body.

**Skeletal System**

The internal framework of the body; the bones, connective tissues, cartilage, ligament and tendons

Function:

- supports the structure for the body
- allows movement
- Protects the organs
- Stores minerals
- Makes blood cells

Benefits of Yoga:

- Helps develop, strengthen and release tension from bones, muscles and joints.
- Encourages strength and endurance
- Reduces pain and improves posture

Muscular System

Muscles and tendons. The muscles are composed of specialist cells called muscles fibres bound together by connective tissues.

Function:

- Mobility and movement
- Stability
- Posture

Benefits of Yoga:

- The dynamic postures safely strength muscles groups
- Reduces tension in the muscles
- Improves posture
- Reduces risk of injury
- Improves performance

Respiratory System

The network of organs and tissues that help us breath, including the nose, mouth, larynx, pharynx, lungs and diaphragm.

Function:

- Helps you breath!
Delivers oxygen to the cells in the body
- Allows you to talk and smell
- Removes waste gases from body
- Protects your airways from harmful substances
- Brings the air to body temperature and moisturises it to the humidity your body needs

Benefits of Yoga:

- Helps supply oxygen to every cell in the body and then transports carbon dioxide, the waste product of respiration out of the body
- Increases cardiorespiratory endurance
- Stretches and strengthens respiratory muscles and encourage deep full breathing
- Develops greater control over respiration
- Deep belly breathing stimulates the Parasympathetic Nervous System

**Cardiovascular System**

Includes the heart, blood vessels and the blood.

Function:

- Circulates oxygen and removes Carbon Dioxide
- Heart pumps bloody through the body
- Provides cells with nutrients
- Removes the waste products of metabolism to the excretory organs for disposal
- Protects the body against disease and infection
- Clotting stops bleeding after injury

Benefits of Yoga

- Promotes healthy blood pressure and circulation
- Lowers cholesterol levels and risk of heart disease.
- Normalises bloody sugar
- Strengthens heart
- Twisting poses promte blood flow after twist is released
- Inversion ecourgae blood flow back to the heart

Digestive System

The mouth, oesophagus, liver, stomach, pancreas, gall bladder, small intestine, appendix, large intestines, rectum and anus.

Function:

- Break down food in order for it to be absorbed by the blood and deliver to the cells to make energy
- Ingestion of food
- Secretion of fluids and digestive enzymes
- Mixing and movement of food and wastes through the body
- Digestion of food into smaller pieces
- Absorption of nutrients
- Excretion of waste

Benefits of Yoga

- Yoga posture massage the digestive organs by compressing and releasing the abdomen
- Supports the functioning of ingestion, digestion, absorption and defecation
- Deep breathing stimulates the digestive system
- Improves blood and nerve supply to the digestive systems to maintain good functioning
- Improves weight control

Tips! Twists and belly down poses are create for constipation.

**Nervous System**

The complex network of nerves and cells that carry messages from the brain along the spinal cord to various parts of the body and vice-versa.

The central nervous system- The brain and spinal cord

The peripheral nervous system- The nerves that begin at the central nervous system and innervate the body

Function:

- Control of body's internal environment to maintain 'homeostasis' E.g- of this is the regulation of body temperature
- Programming of spinal cord reflexes
- Memory and learning
- Voluntary control of movement
- **The Sympathetic Nervous system (SNS)**- The bodies flight or flight responses which is responsible for actions that require a quick response. The SNS initiates a series of physiologic changes in the body by releasing the stress hormones adrenalin and cortisol. When the SNS is activated, bloody, energy and oxygen flow to the arms, legs and torso to allow us to respond quickly (flight or fight) Acute and chronic psychological factors like anxiety and stress can increase activate the SNS.
- **The Parasympathetic Nervous System (PSN)** – The bodies rest and digest response which is responsible for actions that require rest and relaxation. The PSN works in harmony with the SNS to modulate slower actions in the body to recover from stressful event. Blood, energy and oxygen return to the digestive and reproductive, allowing us to rest-and-digest.

Benefits of Yoga

- Improves blood circulation, easing muscle tension
- Activates and balances the sympathetic and parasympathetic nervous systems
- Asana reduces stress and anxiety levels, and increased feelings of calm and well-being
- Encourages locomotor development
- Increase sleep quality and quantity

Endocrine System

The complex network of glands- hypothalamus, pituitary, thyroid, parathyroids, adrenals, pineal body, the ovaries and the testes.

Function:

- Helps produce, store and release hormones
- Help control mood, growth and development, the way our organs work, metabolism, and reproduction.
- Support sexual function and reproduction.
- Normalise heart rate and blood pressure
- Manages appetite
- Manages sleeping and waking cycles
- Assists body temperature.

Benefits of yoga

- Regulates metabolism, growth, development and puberty, and tissue function
- Regulates and controls the secretion of hormones from all glands in the body



Urinary System

This include the kidneys, bladder, urethra and ureters.

Function:

- Eliminate waste from the body
- Regulate blood volume and blood pressure
- Control levels of electrolytes and metabolites
- Regulate blood pH.

Benefits of Yoga

- Yoga asana stimulate the internal organs which improves the overall health of all parts of the urinary system

Tips! Make sure children use the toilet before they come to class to avoid accidents and encourage them to drink water to stay hydrated.

Immune system

The organs and tissues important in the proper function of the immune system include the thymus and bone marrow, lymph nodes and vessels, spleen, and skin.

Function:

- Protect the body from infect
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Benefits of yoga:

- Decreases stress and its negative effects on the immune system
- Physical exercise increases antibody production
- Increase lymphocyte circulation
- Improve immune function
- Increase growth hormone levels