

Exercise Therapy

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Axis and Planes

Kinesiology: Axes and Planes of Human Movement

Definition

Definition of Plane

A plane is an imaginary flat surface passing through the body that divides it into sections. Human movements occur within these planes.

Types of Planes

1. Sagittal Plane

- Divides the body into **right and left halves**.
- Movements occur forward and backward.

Examples:

- Neck flexion and extension
- Elbow flexion and extension
- Knee flexion and extension
- Ankle dorsiflexion and plantarflexion

2. Frontal (Coronal) Plane

- Divides the body into **anterior (front) and posterior (back) parts**.
- Movements occur sideways.

Examples:

- Shoulder abduction and adduction
- Hip abduction and adduction
- Lateral flexion of trunk and neck

3. Transverse (Horizontal) Plane

- Divides the body into **upper and lower parts**.
- Movements occur around the vertical axis.

Examples:

- Rotation of head and neck
- Trunk rotation
- Shoulder internal and external rotation

- Forearm pronation and supination

Definition Axis

An axis is an imaginary line around which a body segment rotates during movement.

Important Rule:

Movement occurs in a plane and rotates around an axis perpendicular to that plane.

Types of Axes

1. Mediolateral Axis (Frontal Axis)

- Runs from one side of the body to the other.
- Perpendicular to the sagittal plane.

Movements Around This Axis

- Flexion
- Extension

Examples

- Knee flexion-extension
- Elbow flexion-extension
- Neck flexion-extension

2. Anteroposterior Axis (Sagittal Axis)

- Runs from front to back.
- Perpendicular to the frontal plane.

Movements Around This Axis

- Abduction
- Adduction

Examples

- Shoulder abduction-adduction
- Hip abduction-adduction

3. Vertical (Longitudinal) Axis

- Runs from head to foot.
- Perpendicular to the transverse plane.

Movements Around This Axis

- Rotation

Examples

- Trunk rotation

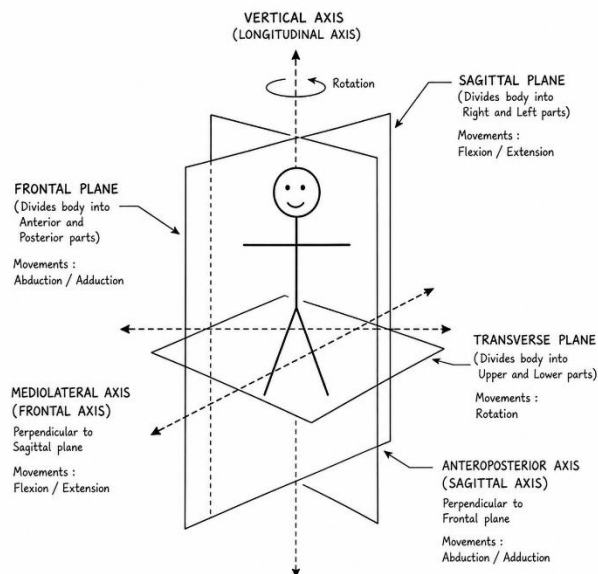
- Neck rotation
- Shoulder internal and external rotation

Relationship Between Planes and Axes

Plane	Divides Body Into	Axis Perpendicular to Plane	Common Movements
Sagittal Plane	Right and Left	Mediolateral Axis	Flexion, Extension
Frontal Plane	Front and Back	Anteroposterior Axis	Abduction, Adduction
Transverse Plane	Upper and Lower	Vertical Axis	Rotation

Clinical Importance in Physiotherapy

1. Helps in analysis of normal and abnormal movement.
2. Essential for goniometric measurement of joint motion.
3. Useful in gait analysis.
4. Assists in exercise prescription and rehabilitation.
5. Important for posture assessment and biomechanical evaluation.



Reference

Norkin CC, Levangie PK. Joint Structure and Function. 6th Edition. F.A. Davis Company.

Hall SJ. Basic Biomechanics. 9th Edition. McGraw-Hill Education.

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