

SNS COLLEGE OF PHYSIOTHERAPY

1. Elderly Retiree's Forward Head Posture in Daily Tasks

Mr. Raman, a 70-year-old retiree, reports neck strain and fatigue during reading.

Observation: anterior head carriage with rounded shoulders, increasing gravitational moment at cervical joints. Real-time sitting reveals excessive lordosis and reduced suboccipital space, suggesting ligament laxity. History: prolonged desk work. Focus: gravity line in sagittal plane and optimal joint alignment.

Options for Intervention:

- A. Cervical retraction exercises.**
- B. Shoulder girdle strengthening.**
- C. Posture education with mirror feedback.**
- D. Neck collar during activity.**

Structured Reasoning: Compare options on physiological accuracy (gravity line equilibrium), safety (cervical strain), efficiency (functional correction), resources (low-cost tools), long/short-term impact (muscle plasticity vs. support), ethics (autonomy).

Option A realigns head over trunk, safe, efficient, low resources, promotes long-term plasticity, ethical.

Option B supports stability long-term but less immediate.

Option C educates alignment, safe, low-cost, ethical, short-term focused.

Option D stabilizes but restricts motion.

Best: A for accuracy and long-term correction, transitioning to C for sustained awareness

2. Office Worker's Lumbar Strain from Poor Sitting Alignment .

At a workstation, 35-year-old Priya complains of low back pain after 6 hours. Observation: posterior pelvic tilt, flattened lumbar curve, anterior gravity line shift. Real-time typing shows sustained flexion stress on lumbar ligaments. History: ergonomic chair absent. Focus: role of muscles and ligaments in maintaining gravitational moments.

Options for Intervention:

- A. Lumbar support cushion.**
- B. Active pelvic tilting exercises.**
- C. Core stabilization training.**
- D. Standing desk conversion.**

Structured Reasoning: Evaluate accuracy (gravitational moment equilibrium), safety (spinal load), efficiency (work integration), resources (equipment), long/short-term (plasticity vs. relief), ethics (productivity).

Option A restores lumbar curve, safe, efficient, moderate resources, short-term.

Option B corrects muscle balance, safe, low resources, long-term, ethical.

Option C builds endurance, slow onset.

Option D reduces load but resource-heavy.

Optimal: B for physiological accuracy and ethics, with A as adjunct.

3. Student's Kyphosis from Heavy Backpack Load

School clinic: 16-year-old Arjun shows rounded upper back during standing. Observation: increased thoracic kyphosis, forward gravity line, scapular protraction. Real-time walking reveals compensatory lumbar hyperlordosis. History: 10 kg backpack daily. Focus: postural deviations – kyphosis and joint alignment in AP/lateral view.

Options for Intervention:

A. Backpack weight reduction education.

B. Thoracic extension mobility drills.

C. Scapular retraction strengthening.

D. Rigid back brace.

Structured Reasoning: Assess accuracy (spinal alignment equilibrium), safety (growth plate stress), efficiency (school function), resources (tools), long/short-term (plasticity vs. restriction), ethics (development).

Option A reduces mechanical load, safe, efficient, low resources, long-term prevention, ethical.

Option B improves mobility, safe, short-term.

Option C builds postural control, moderate onset.

Option D enforces alignment but limits growth.

Best: A for accuracy and ethics, with B as adjunct.

4. Ballet Dancer's Swayback Posture in Performance

Studio: 24-year-old Meera reports lower back tightness post-rehearsal. **Observation:** exaggerated lumbar lordosis, anterior pelvic tilt, posterior gravity line shift. **Real-time pliés** show overactive hip flexors and weak abdominals. **History:** hypermobile joints. **Focus:** muscles maintaining erect posture and lordosis deviation.

Options for Intervention:

- A. Pelvic neutral awareness training.**
- B. Hip flexor stretching protocol.**
- C. Abdominal recruitment exercises.**
- D. Lumbar taping during dance.**

Structured Reasoning: Compare accuracy (pelvic equilibrium), safety (hypermobility risk), efficiency (performance), resources (coaching), long/short-term (plasticity vs. support), ethics (artistic goals).

Option A corrects neutral alignment, safe, efficient, no resources, long-term, ethical.

Option B reduces tightness, short-term.

Option C strengthens control, moderate onset.

Option D supports but restricts expression.

Optimal: A for precision and ethics.

5. Factory Worker's Flat Feet Pain in Prolonged Standing

At a plant, 45-year-old Kumar reports arch pain after 8-hour shifts. Observation: pes planus with pronated subtalar joint, medial gravity line deviation. Real-time standing shows collapsed longitudinal arch and valgus knees. History: concrete flooring. Focus: postural deviations – pes planus and gravitational effects.

Options for Intervention:

A. Arch support orthotics.

B. Intrinsic foot muscle exercises.

C. Calf stretching routine.

D. Rest with elevation.

Structured Reasoning: Gauge accuracy (arch equilibrium), safety (joint stress), efficiency (work continuity), resources (insoles), long/short-term (plasticity vs. relief), ethics (independence).

Option A restores alignment, safe, efficient, moderate resources, short-term.

Option B promotes active support, safe, low resources, long-term, ethical.

Option C aids flexibility, adjunctive.

Option D relieves but inefficient.

Best: B for physiological correction and ethics, with A initially.

6. Teenager's Idiopathic Scoliosis in Growth Phase

Clinic: 14-year-old Nisha shows lateral spinal curvature during screening. **Observation:** right thoracic scoliosis, rib hump on forward bend, asymmetric gravity line in AP view. **Real-time posture** reveals shoulder height imbalance. **History:** rapid growth spurt. **Focus:** postural deviations – idiopathic scoliosis and AP alignment.

Options for Intervention:

A. Schroth method exercises.

B. Bracing protocol.

C. General spinal mobility.

D. Observation only.

Structured Reasoning: Assess accuracy (curve equilibrium), safety (growth interference), efficiency (progression control), resources (therapy), long/short-term (plasticity vs. monitoring), ethics (development).

Option A corrects 3D alignment, safe, efficient, moderate resources, long-term, ethical.

Option B stabilizes progression, short-term.

Option C lacks specificity.

Option D risks worsening.

Best: A for physiological accuracy.

7. Elderly Woman's Hallux Valgus in Daily Walking

Community: 68-year-old Lakshmi reports big toe pain during walks. **Observation:** hallux valgus with bunion, medial gravity line shift at forefoot. **Real-time gait** shows reduced push-off and compensatory pronation. **History:** narrow footwear. **Focus:** postural deviations – hallux valgus and lower limb alignment.

Options for Intervention:

A. Wide-toe box footwear education.

B. Toe spacer usage.

C. First MTP joint mobilization.

D. Bunion splint at night.

Structured Reasoning: Compare accuracy (forefoot equilibrium), safety (skin pressure), efficiency (mobility), resources (shoes), long/short-term (plasticity vs. relief), ethics (independence).

Option A realigns load, safe, efficient, low resources, long-term, ethical.

Option B supports alignment, short-term.

Option C improves motion, adjunct.

Option D relieves pain, passive.

Best: A for accuracy and ethics.

8. Athlete's Pes Cavus with Ankle Instability

Sports clinic: 28-year-old Vijay reports recurrent ankle sprains. Observation: high-arched feet (pes cavus), rigid plantar flexion, lateral gravity line deviation. Real-time running shows poor shock absorption. History: hereditary foot type. Focus: postural deviations – pes cavus and joint stability.

Options for Intervention:

A. Cushioned insoles with lateral wedge.

B. Peroneal strengthening program.

C. Ankle proprioceptive training.

D. Rigid orthotics.

Structured Reasoning: Evaluate accuracy (shock equilibrium), safety (ankle shear), efficiency (performance), resources (insoles), long/short-term (plasticity vs. support), ethics (athletic goals).

Option A improves absorption, safe, efficient, moderate resources, short-term.

Option B builds dynamic control, safe, long-term, ethical.

Option C enhances balance, adjunct.

Option D restricts motion.

Optimal: B for long-term stability and ethics, with A initially.

9. Office Goer's Forward Shoulder Posture in Computer Use

Ergonomics check: 40-year-old Anil shows protracted shoulders during typing. Observation: internal humeral rotation, elevated upper traps, anterior gravity line at shoulder girdle. Real-time reveals reduced thoracic inlet space. History: laptop use. Focus: role of muscles in erect posture and AP alignment.

Options for Intervention:

A. Scapular setting exercises.

B. Pectoral stretching routine.

C. Ergonomic keyboard tray.

D. Posture reminder app.

Structured Reasoning: Assess accuracy (shoulder equilibrium), safety (nerve compression), efficiency (work), resources (setup), long/short-term (plasticity vs. cue), ethics (productivity).

Option A activates retractors, safe, efficient, low resources, long-term, ethical.

Option B reduces tightness, short-term.

Option C optimizes environment, moderate resources.

Option D cues awareness, low impact.

Best: A for physiological correction.

10. Senior's Combined Kyphosis-Lordosis in Standing Balance

Geriatric ward: 75-year-old Mr. Iyer shows increased thoracic kyphosis and lumbar hyperlordosis. Observation: posterior upper gravity line, anterior lower shift, reduced base of support. Real-time standing reveals sway and fear of falling. History: osteoporosis. Focus: gravitational effects and combined postural deviations.

Options for Intervention:

- A. Postural re-education with cane support.**
- B. Spinal extension strengthening.**
- C. Balance training on foam.**
- D. Corset for trunk stability.**

Structured Reasoning: Compare accuracy (global alignment equilibrium), safety (fall risk), efficiency (daily tasks), resources (tools), long/short-term (plasticity vs. support), ethics (independence).

Option A integrates alignment and safety, safe, efficient, low resources, long-term, ethical.

Option B strengthens extensors, slow.

Option C improves proprioception, adjunct.

Option D supports but restricts.

Best: A for comprehensive correction and ethics.