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Ankylosing Spondylitis

A chronic autoimmune inflammatory disease of the axial skeleton — leading to spinal fusion and the classic "bamboo spine."

MUSCULOSKELETAL | IMMUNOLOGY | RHEUMATOLOGY | CHRONIC INFLAMMATORY

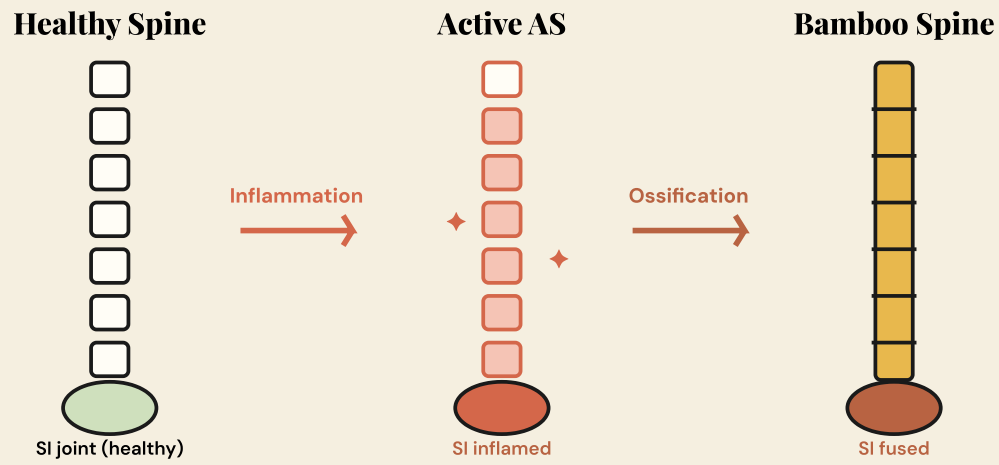
1 Definition & Overview

WHAT IT IS · WHY IT MATTERS

- **Ankylosing spondylitis (AS)** is a chronic, progressive autoimmune **seronegative spondyloarthropathy** primarily affecting the **sacroiliac (SI) joints and spine**.
- Chronic inflammation at the entheses (where ligaments/tendons attach to bone) leads to erosion, reactive bone formation, and eventual **vertebral fusion (ankylosis)** — producing a rigid "bamboo spine."
- Strong genetic link: **HLA-B27 positive in ~90% of cases**. Typically begins in young adult males (15–30 yrs); male-to-female ratio ~3:1.
- Why it matters: progressive disability, fall/fracture risk from rigid spine, and serious **extra-articular complications** (uveitis, aortitis, pulmonary fibrosis).

2 Pathophysiology

FROM INFLAMMATION TO FUSION



Progression: Healthy SI joints & spine → Autoimmune inflammation → Bony ossification & fusion ("bamboo spine")

1. **Genetic trigger:** HLA-B27 antigen presents self-peptides → autoimmune T-cell response.
2. **Enthesitis:** Inflammation localizes at entheses (ligament/tendon-bone junctions), especially the sacroiliac joints.
3. **Erosion phase:** TNF-α and IL-17 release → cartilage destruction and subchondral bone erosion.
4. **Reactive bone formation:** Body deposits new bone (syndesmophytes) to repair damage.
5. **Ossification & fusion:** Syndesmophytes bridge vertebrae → spinal rigidity.
6. **End-stage:** Continuous fused column = "bamboo spine"; loss of mobility, kyphosis, fracture risk.

3 Signs & Symptoms

EARLY · LATE · EXTRA-ARTICULAR

🌱 Early Findings

- **Insidious onset** low back/buttock pain > 3 months
- Morning stiffness **> 30 minutes**
- Pain **improves with activity**, worsens with rest
- Awakens client at night (2nd half of night)
- **Alternating buttock pain**
- SI joint tenderness
- Fatigue, low-grade fever

🔥 Late / Severe Findings

- Loss of spinal mobility (flexion/extension)
- **Fixed kyphosis** — "question mark" posture
- Restricted chest expansion **< 2.5 cm**
- "Bamboo spine" on imaging
- Cervical fusion → cannot turn head
- Weight loss, anemia of chronic disease
- ↑ ESR, ↑ CRP, HLA-B27 positive

🌐 Extra-Articular Manifestations (PAIR)

- **P — Pulmonary fibrosis** (apical, restrictive)
- **A — Aortitis & aortic regurgitation;** AV conduction blocks
- **I — Iritis / anterior uveitis** (most common extra-articular finding — up to 40%)
- **R — Renal amyloidosis;** IBD association (Crohn's, UC)

🚨 Red Flag Findings — Notify HCP Immediately

- **Sudden severe neck/back pain after minor trauma** → rigid spine fractures easily (cervical = highest risk)
- **Acute eye pain, redness, photophobia, blurred vision** → anterior uveitis, sight-threatening
- **New chest pain, dyspnea, murmur** → aortic regurgitation or cardiac conduction defect
- **Saddle anesthesia, bowel/bladder dysfunction** → cauda equina syndrome (rare but emergent)
- **Sudden inability to move limbs after fall** → spinal cord injury from fracture

4 Priority Nursing Interventions

ABCs · SAFETY · MOBILITY

- **Airway/Breathing:** Monitor chest expansion (< 2.5 cm = restrictive lung disease); auscultate breath sounds; teach deep breathing & incentive spirometry.
- **Cervical spine precautions:** Rigid spine = high fracture risk with minor trauma. Pad the bed, avoid neck manipulation, and use **fiberoptic intubation** if airway needed.
- **Fall & fracture prevention:** Clear walkways, non-slip footwear, assistive devices, fall risk band; **cervical collar after any fall** until cleared by imaging.
- **Posture & positioning:** Encourage upright posture; **sleep prone** or supine with a thin pillow (NOT high Fowler's — promotes flexion deformity); firm mattress.
- **Pain management:** Assess pain (PQRST); administer NSAIDs around the clock; apply **moist heat** for stiffness; cold packs for acute flares.
- **Mobility & PT:** Daily ROM & back-extension exercises; **swimming is ideal** (buoyancy + ROM); refer to physical therapy.
- **Eye assessment:** Ask about eye pain, redness, photophobia each visit — uveitis is the most common extra-articular complication; urgent ophthalmology referral if suspected.
- **Cardiac/Respiratory monitoring:** Auscultate for new murmur; baseline ECG; pulmonary function tests as ordered.
- **Smoking cessation:** Smoking accelerates disease progression and worsens spinal mobility & lung restriction.
- **Psychosocial support:** Chronic disease, body image changes, fertility concerns — refer to support groups; screen for depression.
- **Pre-op/peri-op alert:** Difficult airway, fragile spine, possible cardiac/pulmonary involvement — flag in chart, anesthesia consult.

5 Pharmacology

FIRST-LINE THROUGH BIOLOGICS

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
NSAIDs (ibuprofen, naproxen, indomethacin) — *first-line*	Block COX-1/COX-2 → ↓ prostaglandins → ↓ inflammation & pain	GI bleeding, ulcers, nephrotoxicity, ↑ BP, ↑ cardiac risk	Give **with food**; monitor BUN/Cr, stool guaiac, BP; avoid in CKD; not in 3rd-trimester pregnancy
Sulfasalazine (DMARD)	Anti-inflammatory; effective for *peripheral* joint involvement	GI upset, hepatotoxicity, sulfa allergy, ↓ folate, photosensitivity	Check sulfa allergy; encourage folic acid; LFTs & CBC q3 months; sun protection
Methotrexate (DMARD)	Folate antagonist → immunosuppression	Bone marrow suppression, hepatotoxicity, pulmonary fibrosis, teratogenic	Weekly (not daily!) dosing; folic acid supplement; **avoid pregnancy**; avoid alcohol; CBC & LFTs
TNF-α Inhibitors (etanercept, adalimumab, infliximab, golimumab)	Block TNF-α → ↓ inflammation; especially helpful for axial disease	Serious infection, reactivation of **TB** & hepatitis B, lymphoma risk, injection-site reactions	**TB skin test & hep B screen BEFORE starting**; teach infection signs; hold for active infection; live vaccines contraindicated
IL-17 Inhibitors (secukinumab, ixekizumab)	Block IL-17A cytokine	Infection, candidiasis, IBD flare	Screen for TB & IBD before use; teach injection technique
JAK Inhibitors (tofacitinib, upadacitinib)	Block Janus kinase signaling pathway	Infection, ↑ lipids, thromboembolism, ↑ cardiovascular events	Monitor CBC, lipids, LFTs; screen for clot & cardiac risk
Corticosteroids (local injection only — systemic generally avoided)	Suppress inflammatory cascade	Osteoporosis, hyperglycemia, infection, Cushingoid features	Avoid abrupt stop; monitor glucose; calcium & vit D supplementation; bone density screening

6 NCLEX Test Traps

WRONG vs RIGHT THINKING

❌ TRAP

"Rest improves AS pain" — choosing bed rest as priority intervention.

✅ NCLEX ANSWER

AS pain **worsens with rest, improves with activity**. Encourage movement, swimming, & PT.

❌ TRAP

"Elevate HOB to high Fowler's for comfort."

✅ NCLEX ANSWER

Avoid high Fowler's — it promotes flexion contracture. Sleep **prone or flat with a thin pillow**.

❌ TRAP

Confusing AS with osteoarthritis (OA) or rheumatoid arthritis (RA).

✅ NCLEX ANSWER

AS = axial (spine, SI joint); **RA = peripheral & symmetric**; **OA = wear-and-tear, large weight-bearing joints**.

❌ TRAP

"Routine intubation is safe" for the client with advanced AS.

✅ NCLEX ANSWER

Rigid cervical spine = high fracture risk → **fiberoptic intubation** required. Flag chart for anesthesia.

❌ TRAP

Treating red, painful eye as conjunctivitis.

✅ NCLEX ANSWER

In AS, eye pain + photophobia = **anterior uveitis**. Urgent ophthalmology referral — sight-threatening.

❌ TRAP

"HLA-B27 positive = diagnostic of AS."

✅ NCLEX ANSWER

HLA-B27 is **associated, not diagnostic**. Many positives never develop AS. Diagnosis = clinical + imaging (SI joint MRI/X-ray).

❌ TRAP

Starting TNF inhibitor without baseline screening.

✅ NCLEX ANSWER

Always screen for **latent TB & hepatitis B** BEFORE first dose. Reactivation is life-threatening.

❌ TRAP

Minor neck pain after a fall → treat with NSAIDs and discharge.

✅ NCLEX ANSWER

In AS, **any new spinal pain after trauma = assume fracture until ruled out**. Immobilize & image (CT preferred).

7 Patient & Family Education

LIFE-LONG SELF-MANAGEMENT

Posture

Stand & sit tall. Avoid prolonged flexion. Workstation ergonomics matter — straight-back chair, monitor at eye level.

Sleep Setup

Firm mattress, sleep **prone** or supine with thin/no pillow. Avoid soft sofas & recliners.

Exercise Daily

Swimming is ideal. Add stretching, back extension, deep-breathing & postural exercises. Avoid contact sports if advanced.

Stop Smoking

Smoking accelerates spinal damage and worsens lung restriction. Refer to cessation programs.

Eye Symptoms = ER

New eye pain, redness, photophobia, or blurred vision → seek care **same day**. Untreated uveitis can cause blindness.

Medication Safety

Take NSAIDs with food. On biologics: report fever, cough, weight loss. **No live vaccines.**

Family & Genetics

Strong HLA-B27 hereditary link. Family members with chronic back pain should be evaluated early.

Fall & Trauma Plan

After ANY fall or neck injury → ER, even if pain seems mild. Wear medical alert ID stating "rigid spine."

8 Memory Boosters & Mnemonics

PATTERN RECOGNITION FOR THE NCLEX

"A PAIR of AS"

Extra-articular: **P**ulmonary fibrosis · **A**ortitis/AR · **I**ritis (uveitis) · **R**enal amyloidosis

"Bamboo Spine"

Classic X-ray finding — fused vertebrae bridged by syndesmophytes resemble a stalk of bamboo.

"Young man with morning stiff back that gets BETTER with movement"

The classic NCLEX vignette: male, 15–30, low back pain > 3 mo, AM stiffness, improves with exercise.

"HLA-B27"

Hereditary **L**ink to **A**nkylosing — present in ~90% of AS clients but not diagnostic alone.

"Stiff in the AM, Better with Action"

AM stiffness > 30 min that improves with movement = inflammatory back pain (vs. OA which worsens with use).

"Question Mark Posture"

Late-stage AS: fixed thoracic kyphosis + cervical flexion creates a "?" silhouette.

"Prone, Not Pillow"

Sleep prone or flat — high Fowler's promotes the very kyphotic deformity we want to prevent.

"Swim, Don't Sit"

Swimming = best exercise (buoyancy supports spine + full ROM). Sitting still = enemy.

9 NCJMM Clinical Judgment Scenario

NEXT GEN NCLEX 6-STEP MODEL

CLIENT SCENARIO

*A **26-year-old male** presents to the rheumatology clinic with a 9-month history of **insidious low back and right buttock pain**. He reports stiffness that lasts about 45 minutes each morning and improves once he starts moving around. He has been awakened from sleep by the pain. Today he also reports a **painful, red right eye with photophobia** that started 2 days ago. Vital signs: BP 128/78, HR 84, RR 16, T 99.4 °F. Labs: **HLA-B27 positive, ESR 48 mm/hr, CRP 22 mg/L**. Chest expansion measures **2.3 cm**. MRI of the SI joints shows bilateral sacroiliitis.*

1 Recognize Cues

Relevant data: Young male, insidious low back/buttock pain > 3 months, AM stiffness > 30 min improving with activity, night pain, HLA-B27 positive, elevated ESR & CRP, restricted chest expansion (< 2.5 cm), bilateral sacroiliitis on MRI, painful red eye with photophobia.

2 Analyze Cues

The classic presentation (young male, inflammatory back pain, axial involvement, HLA-B27+, sacroiliitis) is consistent with **ankylosing spondylitis**. Restricted chest expansion suggests early costovertebral involvement. The red painful eye with photophobia is highly suggestive of **anterior uveitis** — the most common extra-articular complication and a sight-threatening emergency.

3 Prioritize Hypotheses

Priority 1 (most urgent): Acute anterior uveitis — risk of permanent vision loss without prompt treatment. **Priority 2:** Active inflammatory AS with axial involvement & pulmonary restriction. **Priority 3:** Long-term progression risk (spinal fusion, fracture, cardiac involvement).

4 Generate Solutions

Immediate: Urgent ophthalmology referral for slit-lamp exam & topical corticosteroid + cycloplegic drops. **Short-term:** Initiate scheduled NSAID therapy with GI protection; consider TNF-α inhibitor after TB & hep B screening. **Long-term:** Physical therapy referral (postural exercises, swimming), smoking cessation, cardiac & pulmonary baseline, patient/family education on red flags.

5 Take Action

- Notify ophthalmology STAT for uveitis evaluation.
- Administer ordered NSAID with food; teach signs of GI bleeding.
- Order TB skin test & hep B serology in anticipation of biologics.
- Educate on prone sleeping, firm mattress, daily back extension exercises & swimming.

• Reinforce: any new severe back/neck pain after trauma = ER visit; any eye symptoms = same-day care.
• Refer to physical therapy, smoking-cessation program (if applicable), and AS support group.

6 Evaluate Outcomes

Expected: Resolution of uveitis within 1–2 weeks (no vision loss); pain score ↓ ≥ 50% within 4 weeks; AM stiffness < 30 min; ESR & CRP trending down; chest expansion stable or improving; client verbalizes correct sleep posture, exercise plan, and red flag symptoms. **Unexpected:** Persistent or worsening eye pain, new vision loss, new dyspnea/murmur, sudden severe spinal pain, or signs of infection on biologic therapy → reassess and escalate.