NGN NCLEX 2026 ▸ INFECTION / IMMUNITY / INTEGUMENTARY

# Candidiasis

All Types — Oral, Esophageal, Cutaneous, Vulvovaginal, Diaper, Balanitis, Paronychia, and Invasive Candidemia. Opportunistic fungal infections caused by *Candida* species — most often *Candida albicans*.

Fungal Infection | Opportunistic | High-Yield Pharm | NCJMM Integrated

## 1 Definition / Overview

WHAT & WHY

- **Candidiasis** = fungal infection caused by yeast of the *Candida* genus; *C. albicans* is the most common organism.
- **Opportunistic** — *Candida* is normal flora on skin, GI tract, and vagina; becomes pathogenic when host defenses are compromised.
- Spectrum ranges from **superficial** (oral thrush, diaper rash, vaginitis) to **life-threatening invasive disease** (candidemia/sepsis).

⚡ **Why it matters on NCLEX:** Candidiasis links infection control, immunosuppression, antibiotic stewardship, diabetes management, and high-risk populations (infants, elderly, HIV, chemo, TPN, central lines). Expect priority & teaching questions.

## 2 Pathophysiology (Simplified)

MECHANISM


Normal flora disrupted (antibiotics, immunity) → Candida overgrowth on mucosa / skin → Yeast → pseudohyphae (virulent form) → Tissue invasion + biofilm on devices → Local infection OR bloodstream spread → sepsis

🧠 **Key principle:** Candida is not "caught" — it's already there. Infection = a *host problem*, not an exposure problem. Identify **what tipped the balance** (antibiotics, steroids, glucose, moisture, device).

# 3 Types of Candidiasis

KNOW ALL 8

### 👅 Oral (Thrush)

White, curd-like, adherent plaques on tongue, palate, buccal mucosa. **Bleeds when scraped.** Common in infants, elderly, denture wearers, inhaled-steroid users, HIV+.

### 🫧 Esophageal

Dysphagia, odynophagia, retrosternal pain. **AIDS-defining illness** — CD4 typically <200. Requires systemic antifungal therapy.

### 🤝 Cutaneous / Intertrigo

Beefy-red, macerated rash in skin folds (axilla, inframammary, groin, abdominal pannus) with **satellite lesions**. Worsened by moisture and obesity.

### 👶 Diaper Candidiasis

Bright-red rash covering the diaper area **including skin folds**, with satellite pustules. Distinguishes it from irritant diaper dermatitis (which spares folds).

### 🌸 Vulvovaginal ("Yeast Infection")

Thick, white, **cottage-cheese** discharge, intense pruritus, vulvar erythema, dyspareunia. Common after antibiotics, in pregnancy, and with uncontrolled diabetes.

### 💧 Candidal Balanitis

Erythema, white plaques, and burning on the glans/foreskin in uncircumcised males or partners of women with vaginal candidiasis. Linked to diabetes.

### 💅 Paronychia / Onychomycosis

Red, swollen nail folds with possible purulent drainage; nail becomes thickened, discolored. Seen in people whose hands stay wet (dishwashers, healthcare).

### 🩸 Invasive / Candidemia

**Bloodstream infection — medical emergency.** Risk: central lines, TPN, broad-spectrum antibiotics, neutropenia, ICU stay. Presents as sepsis; high mortality.

## 4 Risk Factors

WHO GETS IT

- **Broad-spectrum antibiotic therapy** — wipes out competing bacteria, lets Candida overgrow (#1 modifiable cause).
- **Uncontrolled diabetes mellitus** — hyperglycemia feeds yeast and impairs neutrophil function.
- **Immunosuppression** — HIV/AIDS (esp. CD4 <200), chemotherapy, organ transplant, chronic corticosteroids.
- **Indwelling devices** — central lines, urinary catheters, ETT, TPN (biofilm formation → candidemia).
- **Inhaled corticosteroids** — without mouth rinsing → oral thrush.
- **Pregnancy & oral contraceptives** — estrogen-driven glycogen ↑ in vaginal epithelium.
- **Extremes of age** — neonates (diaper/oral), elderly (denture stomatitis, intertrigo).
- **Moisture & occlusion** — skin folds, tight clothing, wet diapers, prolonged hand immersion.
- **Neutropenia & ICU admission** — biggest risk factors for invasive candidemia.

## 5 Signs & Symptoms

LOCAL VS SYSTEMIC

### LOCAL / SUPERFICIAL

- ✓ White curd-like patches (oral) that **bleed when scraped**
- ✓ Beefy-red rash with **satellite lesions** (skin/diaper)
- ✓ Pruritus, burning, dyspareunia (vaginal)
- ✓ Cottage-cheese discharge (vaginal)
- ✓ Dysphagia, odynophagia, retrosternal pain (esophageal)
- ✓ Poor feeding/fussiness (infant thrush)

### INVASIVE / CANDIDEMIA

- ✗ **Fever / chills unresponsive to antibiotics**
- ✗ Hypotension, tachycardia, tachypnea (sepsis)
- ✗ Altered mental status, oliguria
- ✗ Endophthalmitis — visual changes / floaters
- ✗ Macronodular skin lesions (disseminated)
- ✗ ↑ WBC, ↑ lactate, ⊕ blood cultures for Candida

**Red flag:** Persistent fever in a patient on broad-spectrum antibiotics with a central line or TPN → *think candidemia*. Draw blood cultures and notify provider.

## 6 Diagnostics

CONFIRM IT

- **Clinical inspection** — sufficient for most superficial cases (oral, diaper, intertrigo).
- **KOH prep** of scrapings → reveals budding yeast and pseudohyphae (classic finding).
- **Fungal culture** — Sabouraud agar; speciates Candida (important — non-*albicans* species can be azole-resistant).
- **Vaginal wet mount** — pseudohyphae, pH typically <4.5 (vs bacterial vaginosis >4.5).
- **Endoscopy with biopsy** — confirms esophageal candidiasis.
- **Blood cultures × 2 sets** — required for suspected candidemia.
- **Beta-D-glucan assay** — serum marker; supportive (not definitive) for invasive disease.
- **Glucose & HbA1c** — recurrent candidiasis warrants diabetes screening.
- **HIV testing** — esophageal candidiasis or unusual recurrence in adults.

## 7 Priority Nursing Interventions

ABC → SAFETY → NCLEX

- **A — Airway:** Assess for airway compromise in severe oral/laryngeal thrush; monitor for stridor in infants.
- **B — Breathing:** Suspect candidemia → assess respiratory rate, $SpO_2$, work of breathing for septic decompensation.
- **C — Circulation:** Monitor VS q4h (or per protocol) for fever, tachycardia, hypotension; trend lactate.
- **Administer prescribed antifungal** on time; document response over 7–14 days.
- **Nystatin "swish and swallow"** — instruct client to swish ≥1 minute, then swallow; NPO 30 min after.
- **Skin care:** Keep affected areas **clean, dry, and exposed to air**; pat — never rub. Avoid talc/cornstarch on raw skin.
- **Oral care:** Soft toothbrush, no alcohol-based mouthwash; remove dentures at night and clean.
- **Glucose control:** Monitor blood glucose; coordinate sliding scale with provider — hyperglycemia feeds infection.
- **Central line stewardship:** Sterile technique with dressing changes, scrub hubs, assess daily for line necessity; remove if candidemia confirmed.
- **Standard precautions** for routine care; **contact precautions** if drainage is uncontained.
- **Patient teaching** at every encounter — adherence prevents recurrence.

🧭 **Priority on NCLEX:** If candidemia is suspected, *blood cultures BEFORE antifungal*, then start empiric therapy — don't delay either step. Notify provider for line removal.

# 8 Pharmacology

ANTIFUNGAL TOOLKIT

| Drug / Class | Use | Key Side Effects | Nursing Considerations |
|---|---|---|---|
| **Nystatin** (Polyene, topical) | Oral thrush, cutaneous, diaper | Generally well tolerated; rare GI upset; bitter taste | "Swish & swallow" ≥1 min; NPO 30 min after; for infants, swab inside cheek; treat 7–14 days even after symptoms clear |
| **Fluconazole** (Diflucan) (Azole, PO/IV) | Vaginal, esophageal, candidemia (susceptible spp.) | Hepatotoxicity, QT prolongation, GI upset, rash | Monitor LFTs; check for drug interactions (warfarin, statins, phenytoin); single 150 mg dose treats uncomplicated vaginal candidiasis |
| **Clotrimazole** (Mycelex) (Azole, topical/troche) | Oral thrush troches, vaginal, skin | Local burning, irritation | Troche dissolves slowly in mouth (15–30 min) — do not chew/swallow whole; complete full course |
| **Miconazole** (Monistat) (Azole, topical/vaginal) | Vaginal candidiasis, skin/diaper | Local burning, itching | Insert at bedtime; can weaken latex condoms/diaphragms × 72 hrs; complete full regimen even during menses |
| **Caspofungin / Micafungin** (Echinocandins, IV) | First-line for invasive candidemia in unstable / azole-resistant patients | ↑ LFTs, infusion reactions, hypokalemia | IV only; monitor LFTs and electrolytes; preferred over fluconazole when patient is critically ill or species unknown |
| **Amphotericin B** (Polyene, IV) — "Ampho-terrible" | Severe / refractory invasive candidiasis | **Nephrotoxicity**, infusion reaction (fever, chills, rigors), hypokalemia, hypomagnesemia, anemia | Premedicate with acetaminophen ± diphenhydramine; infuse slowly; monitor BUN/creatinine, $K^+$, $Mg^{2+}$ daily; ensure hydration |

🧯 **"Ampho-terrible": Amphotericin B is famously nephrotoxic and causes intense infusion reactions. Always check baseline renal function and electrolytes; hydrate the client.**

# 9 NCLEX Test Traps

WRONG VS RIGHT

### ✗ COMMON WRONG ANSWERS

- ✗ Scrape off white oral patches to "clean the mouth"
- ✗ Have client eat/drink right after nystatin to "wash it down"
- ✗ Cover intertrigo with thick occlusive ointment
- ✗ Stop antifungal as soon as patches disappear
- ✗ Brush teeth, then give nystatin
- ✗ Treat oral thrush in an infant with topical steroid cream
- ✗ Place a powder (talc) on a moist, red rash
- ✗ Use alcohol-based mouthwash for "extra cleaning"
- ✗ Give fluconazole without checking other meds (warfarin!)
- ✗ Continue using the central line in confirmed candidemia

### ✓ CORRECT NURSING ACTIONS

- ✓ Do not scrape — risk of bleeding; treat with antifungal
- ✓ Hold food/drink 30 minutes after nystatin for contact time
- ✓ Keep skin folds clean, dry, and **open to air**
- ✓ Complete the full prescribed antifungal course (typically 7–14 days)
- ✓ Give nystatin **first**, then brush gently afterward
- ✓ Antifungal (nystatin) is the treatment — not steroids
- ✓ Pat dry; consider barrier cream on intact skin only
- ✓ Use bland saline rinses or chlorhexidine per facility policy
- ✓ Screen for interactions: warfarin, phenytoin, statins, sulfonylureas
- ✓ Notify provider — central line typically removed for candidemia

🎯 **Priority vs non-priority:** When candidemia is suspected, the priority is *blood cultures & empiric antifungal*, not waiting for KOH results. For oral thrush, the priority is *medication contact time*, not aggressive cleaning.

## 10 Patient & Family Education

PREVENT RECURRENCE

- **Complete the full course** of antifungal even if symptoms improve early — relapse is common.
- **Keep skin clean and dry**; wear loose, breathable cotton clothing; change wet clothes promptly after exercise or swimming.
- **Rinse mouth with water** after every inhaled corticosteroid dose to prevent thrush.
- **Denture care:** Remove at night, soak in cleanser, brush gums and tongue daily.
- **Control blood glucose** — recurrent yeast infection may be the first clue to undiagnosed diabetes.
- **Diaper care:** Change frequently, gently cleanse, allow air-drying time, use prescribed antifungal cream — not just barrier cream.
- **Vaginal candidiasis:** Avoid douching, scented soaps, tight non-breathable underwear, and prolonged wet swimsuits.
- **Sexual partners:** Treat symptomatic partners (balanitis); routine treatment of asymptomatic partners is not required.
- **Probiotics / yogurt with live cultures** may help restore flora during/after antibiotic courses.
- **Return-precautions:** Fever, spreading rash, inability to swallow, severe abdominal/back pain, or pregnancy with vaginal infection → call provider.

## 11 Memory Boosters & Mnemonics

LOCK IT IN

### "CANDID"

- **C** **Curd-like** oral patches & cottage-cheese discharge
- **A** **Antibiotics** trigger it; **Antifungals** treat it
- **N** **Nystatin** — swish & swallow, then NPO 30 min
- **D** **Diabetes** & hyperglycemia ↑ risk
- **I** **Immunocompromised** = invasive risk
- **D** **Dry** skin folds & areas to prevent recurrence

### "MOIST" — risk

- **M** **Moisture** (diapers, sweat, wet clothing)
- **O** **Obesity** & deep skin folds
- **I** **Immunosuppression** (HIV, chemo, transplant)
- **S** **Steroids** & broad-spectrum antibiotics
- **T** **Tight** clothing, occlusion, indwelling devices

🧠 **Quick Associations:**

- **"-azole" suffix** = antifungal (fluconazole, ketoconazole, clotrimazole, miconazole)
- **"Ampho-terrible"** = Amphotericin B is nephrotoxic — monitor BUN/creatinine
- **Satellite lesions** = Candida fingerprint on the skin
- **Cottage cheese + itch** = vaginal candidiasis (no fishy odor — that's bacterial vaginosis)
- **White patches that bleed when scraped** = thrush, NOT leukoplakia
- **Fever on broad-spectrum abx + central line** = think candidemia until proven otherwise

# 12 NCJMM Clinical Judgment Scenario

NGN 2026

**Scenario:** A 68-year-old client with type 2 diabetes (A1c 9.4%) was admitted 6 days ago for community-acquired pneumonia. They have a triple-lumen central venous catheter and are receiving piperacillin-tazobactam and TPN. Today, the nurse notes T 38.9 °C (102 °F), HR 116, BP 96/58, RR 24, $SpO_2$ 93% on 2 L NC, confusion compared to yesterday. White curd-like plaques are visible on the tongue and buccal mucosa. Blood glucose is 248 mg/dL.

### 1 Recognize Cues

Fever despite broad-spectrum antibiotics, hypotension, tachycardia, ↑ RR, ↓ $SpO_2$, new confusion, oral thrush, hyperglycemia, central line, TPN — all red flags for **candidemia + sepsis**.

### 2 Analyze Cues

Risk profile (DM, antibiotics, central line, TPN) + persistent fever + sepsis vitals + oral thrush together strongly suggest invasive Candida bloodstream infection seeded from the line.

### 3 Prioritize Hypotheses

#1: **Candidemia with septic shock** (highest acuity). #2: bacterial line infection. #3: worsening pneumonia. #4: pulmonary embolism. Treat the most life-threatening first.

### 4 Generate Solutions

Notify provider; obtain blood cultures ×2 (peripheral + line); start empiric IV echinocandin (caspofungin/micafungin); prepare for central-line removal; sepsis bundle — IV fluids, lactate, repeat VS.

### 5 Take Action

Draw cultures, hang ordered antifungal & antibiotics, give 30 mL/kg isotonic crystalloid, titrate $O_2$ to $SpO_2$ ≥ 94%, treat thrush with nystatin, monitor glucose, hold TPN per provider, prep for line removal.

### 6 Evaluate Outcomes

Reassess in 1 hr: VS trending toward baseline, lactate ↓, mental status clearing, urine output ≥ 0.5 mL/kg/hr, $SpO_2$ ≥ 94%. Follow blood cultures & sensitivities; de-escalate antifungal once species known.