SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai

Approved by Pharmacy Council of India, New Delhi.

Coimbatore -641035

COURSE NAME : PHARMACOVIGILANCE (BP805ET)

VIII SEM / IV YEAR

TOPIC 5 : URINANLYSIS

EFFECTIVE COMMUNICATIION IN PHARMACOVIGILANCE

SNS DESIGN THINKING

EMPATHIZE

Goal:
Understand the needs of healthcare professionals, patients, and regulators.

Actions:
- Conduct interviews with stakeholders.
- Analyze feedback from SNS platforms (e.g. Twitter, patient forums).

DEFINE

Goal:
Frame thecore communication problems.

Actions:
- Identify barriers to clear pharmacovigi-lance messaging.
- Create user personas (e.g. busy clinicians. concerned patients).

IDEATE

Goal:
Generate creeative solutions for better communication.

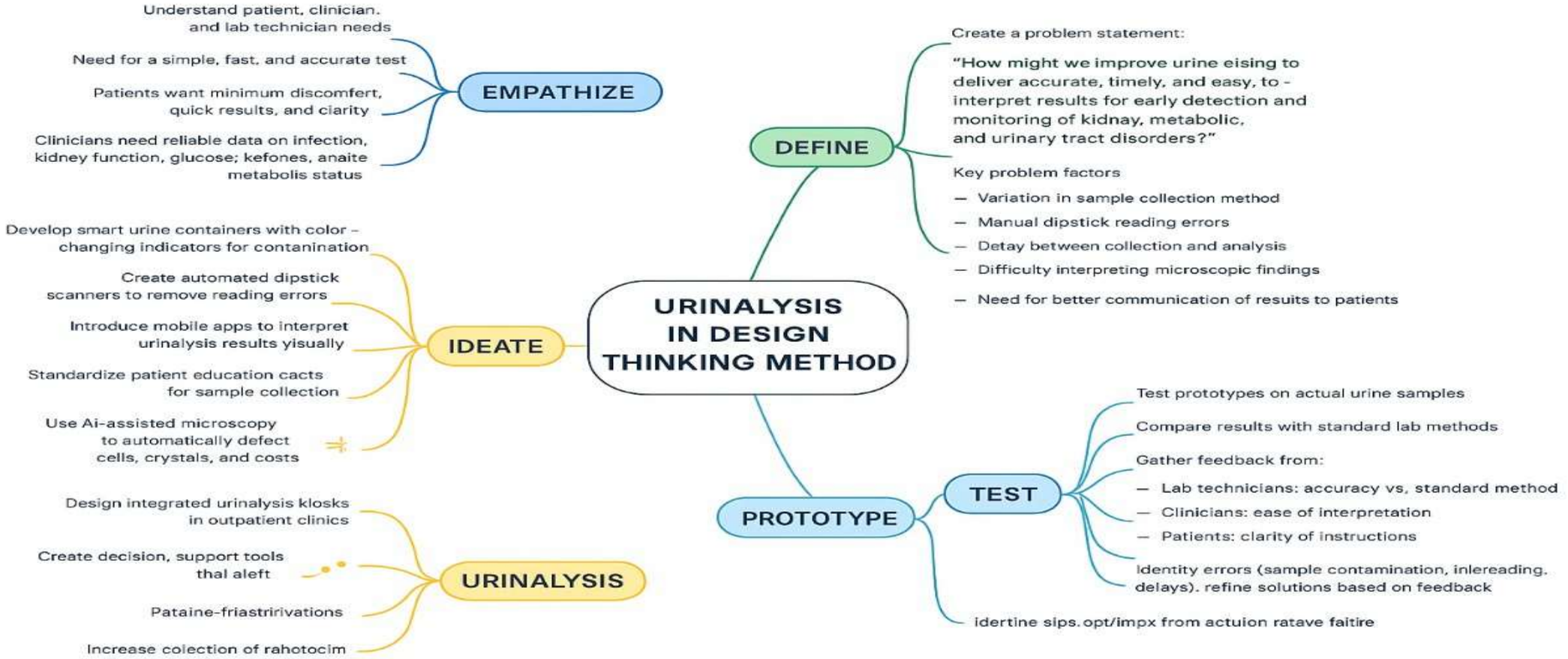
Actions:
- Brainstormm SNS-based tools (e.g. visual ADR alerts, chatbot explainers).
- Explore gamified reporting system or multilingual content.

PROTOTYPE

Goal:
Build and test communication tools

Actions:
- Develop mockups of SNS posts, infographics, or interactive dashboards.
- Test with target users for clarity and engagement.

MINDMAP


URINALYSIS IN DESIGN THINKING METHOD
EMPATHIZE
Understand patient, clinician, and lab technician needs
Need for a simple, fast, and accurate test
Patients want minimum discomfert, quick results, and clarity
Clinicians need reliable data on infection, kidney function, glucose; kefones, anaite metabolis status
DEFINE
Create a problem statement:
"How might we improve urine eising to deliver accurate, timely, and easy, to - interpret results for early detection and monitoring of kidnay, metabolic, and urinary tract disorders?"
Key problem factors
— Variation in sample collection method
— Manual dipstick reading errors
— Detay between collection and analysis
— Difficulty interpreting microscopic findings
— Need for better communication of resuits to patients
IDEATE
Develop smart urine containers with color – changing indicators for contanination
Create automated dipstick scanners to remove reading errors
Introduce mobile apps to interpret urinalysis results yisually
Standardize patient education cacts for sample collection
Use Ai-assisted microscopy to automatically defect cells, crystals, and costs
URINALYSIS
Design integrated urinalysis klosks in outpatient clinics
Create decision, support tools thal aleft
Pataine-friastririvations
Increase colection of rahotocim
PROTOTYPE
TEST
Test prototypes on actual urine samples
Compare results with standard lab methods
Gather feedback from:
— Lab technicians: accuracy vs, standard method
— Clinicians: ease of interpretation
— Patients: clarity of instructions
Identity errors (sample contamination, inlereading, delays). refine solutions based on feedback
Idertine sips. opt/impx from actuion ratave faltire

Empathize

INTRODUCTION

Empathize

URINE COLLECTION FOR URINALYSIS

1. TYPES OF URINE SAMPLE

A. Random (Spot) Urine Sample
B. First Morning (Early Morning) Urine
C. Midstream Clean-Catch Sample
D. 24-Hour Urine Collection
E. Catheterized Sample
F. Suprapubic Aspiration

3. SAMPLE HANDLING & STORAGE

Examine a sample within 1 hour

if refrigerate at 2–8°C (up to 4–6 hours)

Leaving at royom temperature can cause bacterial growth, pH increasel.' decomposition of cells and casis

False-negative glucose/ketone results

5. SPECIAL COLLECTIONS

Timed urine (2-hour, 12-hour, 24-hour)

Container with preservative

Discard first urine up tor ecal

Discard all urine for sperly

Specified time

Keep container refrigeerated during collection

2. COLLECTION PROCEDURE (MIDSTREAM CLEAN-CATCH)

1. Wash hands.
2. Clean genital area
   Females: front to back
   Males: retract foreskin & clean glans.
3. Begin urinating into toilet:
4. Collect midstream urine in sterile container.
5. Seal the container tightly.
6. Label with name, date, time.

4. IMPORTANT PRECAUTIONS

Use a clean, dry, steriie container

Avoid contamination with stool, toilet water, menstrual blood talcum powder

Instruct patient celearly before collection

Avoid heavy exercise or excessive fiuid intake before sample

5. SPECIAL COLLECTIONS

Timed urine (2-hour, 12-hour, 24-hours)

Catheterized sample

Clean catheter port, use stere syring

Empathize

TYPES OF URINE SAMPLES

1. Random Urine Sample

Collected at any time of the day

First Morning (Early Morning) Urine Sample

Collected first thing in the morning

3. Midstream Clean-Catch Sample

Reduces contamination

4. Timed Urine Sample

Fixed duration, e.g, 2-hour, 12-hour, 24-hour

5. 24-Hour Urine Sample

Collected for a full 24 hours

6. Catheterized Urine Sample

Using a urinary catheter

7. Suprapubic Aspiration Sample

Urine drawn directly

8. Pediatric Urine Collection (Pediatric Bag Method)

Special adhesive urine bag

Empathize

PHYSICAL EXAMINATION OF URINE

1 COLOR

Urine color reflect hydration status, kidney function, metabolic disorders, and presence of blood or pignents

Color	Possible Causes
Pale yellow	Normal, high hyd.
Dark yellow/am-	Dehydration
Red / pink	Hematuria, hemoglo-bin, beetroot intake, rifampicin
Brown	Bile pigments, myogiobin
Orange	Dehydration, certain drugs (phena-zopyridine)
Green	Pseudomonas infection, drugs
Milky white	Pyuria (pus). phosphaturia
Normal color	Pale yellow

Normal color: Pale yellow –
Doto rorforome pigmennt

2 APPEARANCE

Indicates the presence of cells, crystals, or infection

Appearance	Possible Meaning
Clear	Normal
Slightly cioudy	Mucus, epithelialc
Cloudy / Turbid	Infection s WBCs, bacteria
Smoky	RBCs

3 ODOR

Certain odors can indicate metabolic or infectious conditions

Color	Volume Feature
Mild smell	Normal
Fruity / Sweet	Ketones diabetes ketoacidosis
Ammonia-like	Long standing urine, bacterial growth
Foul	UTI
Mousy odor	Phenylketonuria (rare)

Define

CHEMICAL EXAMINATION (DIPSTICK ANALYSIS)

PH

ł4.5 – 8.0

Acuonl

- acdosis, high-prote-in diet
- Alkaline : ɐıots vegetarian aıeт

PROTEIN

Normal: negative

- Mascoſ. Ephítal ìs bretus
- Present ɯncuɹtrón, dygocnɘble

GLUCOSE

Absent

Present in

- Liver disease hepaтitis / obstoıre
- Decreased bile duct obstruction

KETONE

Seen in Upurs

- Diabetic ketoacios peenazopɾane

BILIRUBIN

Liver di-sease

- Hemolysis : omeral desease

UROBILIN-OGEN

Decreas-

- Hemolysis ; liver disease

BLOOD

Deeagal

- Preraturia (ostone-oınfection)

NITRITE

Positive gram-ñu-TI

- Grarın-negative UTI

LEUKOCYTE ESTERASE

Positive

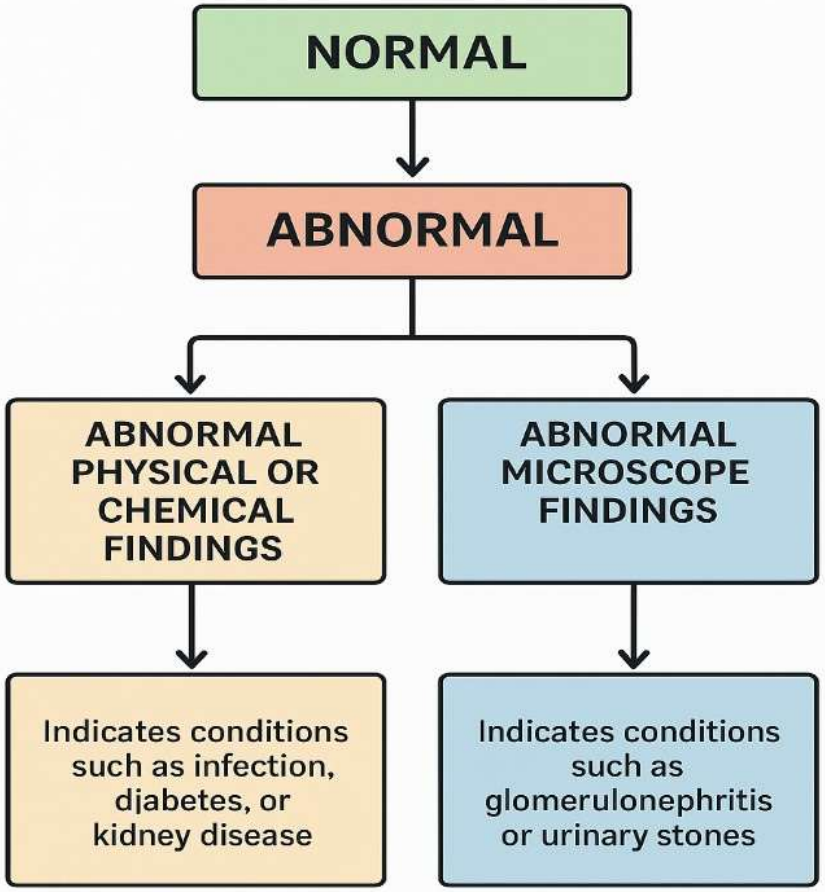
- WBCs : eat ɯi c ɻinm

Define


MICROSCOPIC EXAMINATION
Red blood cells RBCs
White blood cells WBCs
Epithelial cells
Casts
Kidney stones
Bacteria
Crystals
Yeast
Leukocyte esterasee

Ideate

INTERPRETATION OF URINALYSIS RESULTS



PATHOLOGICAL CONDITIONS IDENTIFIED BY URINALYSIS

1. **Urinary Tract Infections (UTI)**
   Findings: Positive nitrites, positive leukocyte esterase, cloudy urine, presence of WBCs, bacteria
   Cause: Bacterial infection in the bladder or irethra

2. **Diabetes Mellitus**
   Findings: Glucosuria, ketonuria, Increased specific gravit
   Cause: Uncontrolled blood glucose levels

3. **Renal (Kidney) Diseases**
   a. **Glomerulonephritis:** Fenors proteinuria, eeh ers RBC casts, hyaline/granuar casts
   b. **Nephrotic Syndrome:** Fenors severe proteinuria, lipiduria, fatty casts, foamy urine

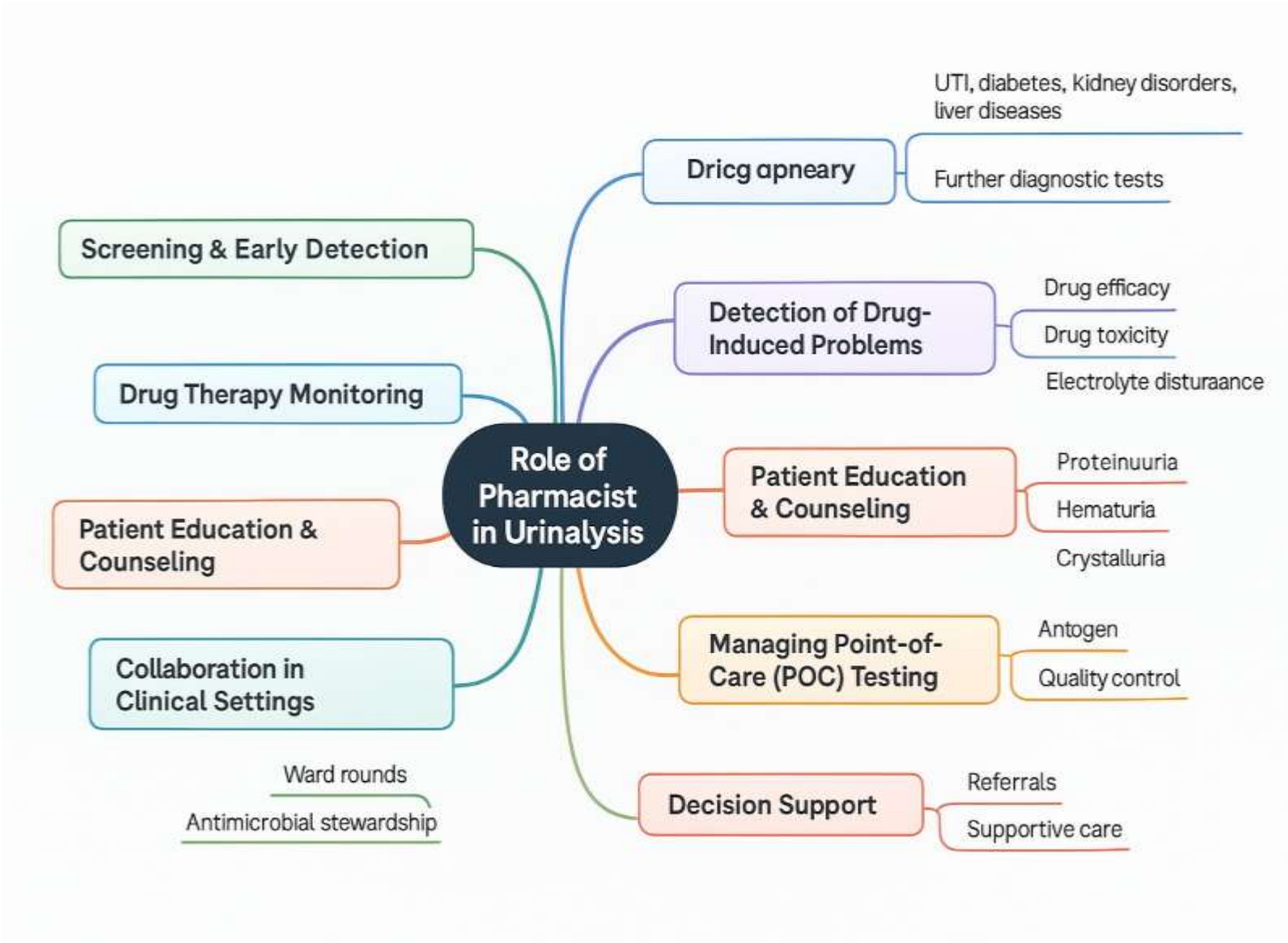
4. **Kidney Stones (Urolithiasis)**
   Findings: Hematuria, crystals, Increascific gravity
   Cause: Crystal formation inside kidneys

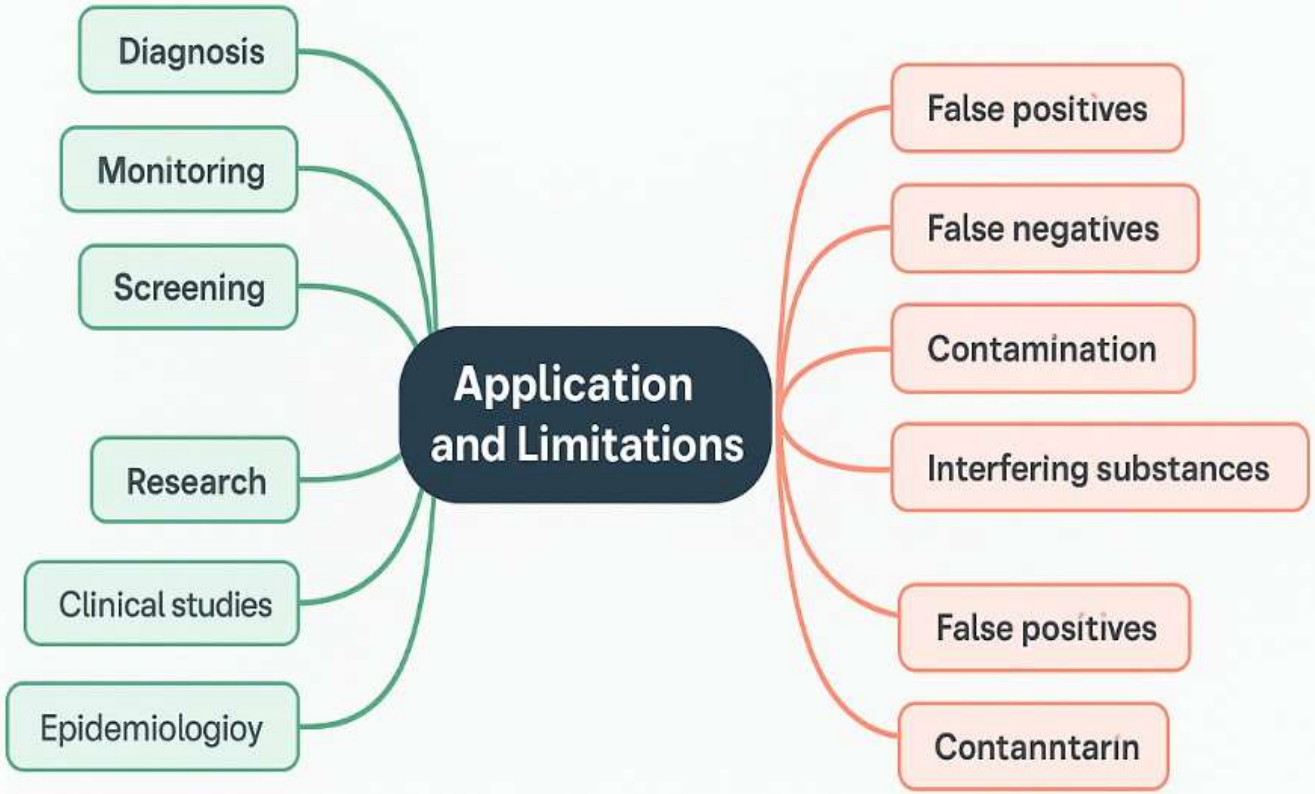
5. **Liver Disease / Hepatic Dysfunction**
   Findings: Bilirubinuria, dark yellow or cola-colored urine, Increased urobilinogen
   Cause: Impaired liver function or bile obstruction

6. **Hemolytic Disorders**
   Findings: Increased urobilinogen, no bilirubin, hemoglobinuria
   Cause: Excessive RBC breakdown

7. **Dehydration**
   Findings: High specific gravity, dark yellow urine
   Cause: Low fluid intake or fluid loss

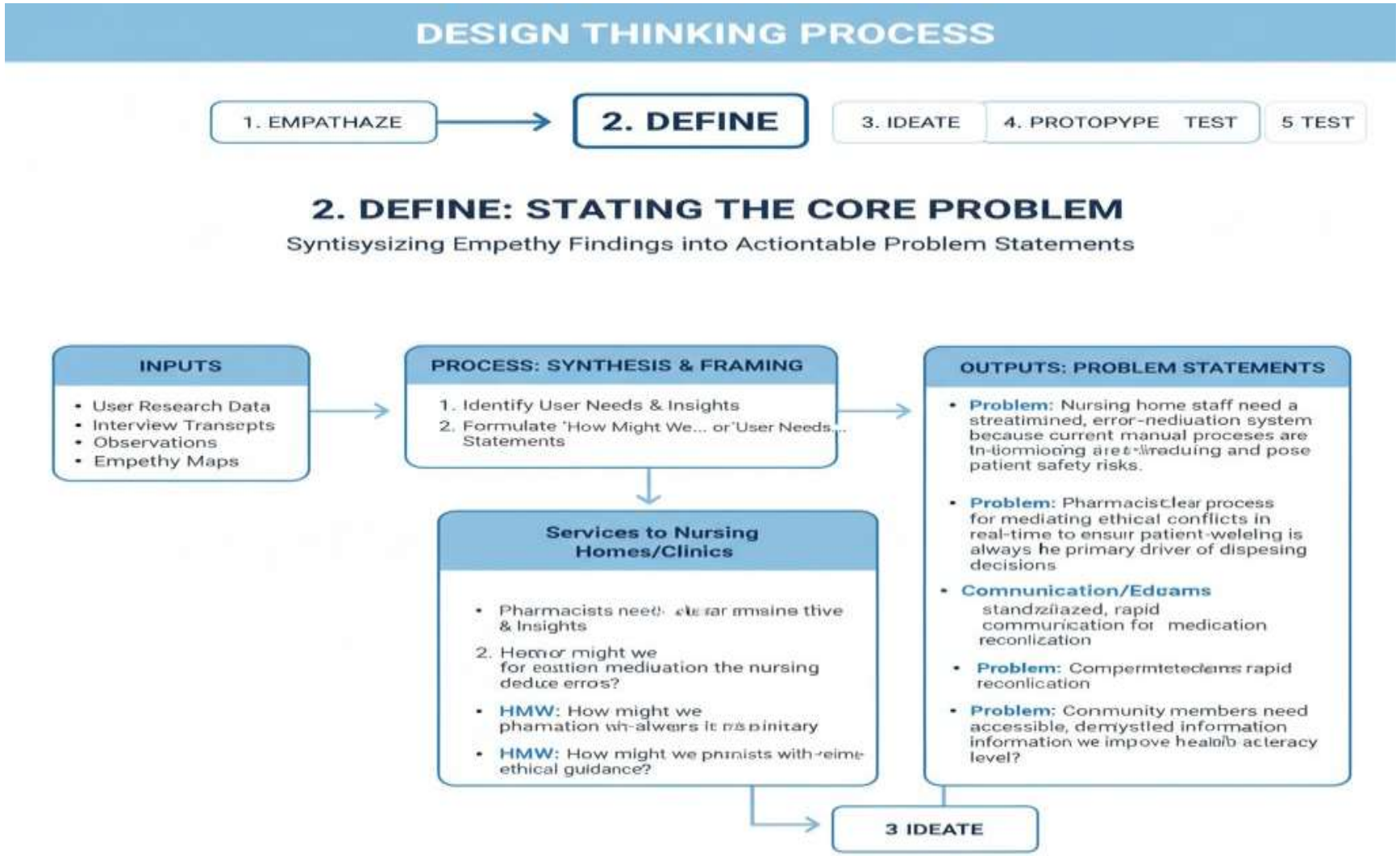
Prototype


Role of Pharmacist in Urinalysis
Screening & Early Detection
Drug Therapy Monitoring
Patient Education & Counseling
Collaboration in Clinical Settings
Ward rounds
Antimicrobial stewardship
Dricg apneary
UTI, diabetes, Kidney disorders, liver diseases
Further diagnostic tests
Detection of Drug-Induced Problems
Drug efficacy
Drug toxicity
Electrolyte disturaance
Patient Education & Counseling
Proteinuuria
Hematuria
Crystalluria
Managing Point-of-Care (POC) Testing
Antogen
Quality control
Decision Support
Referrals
Supportive care


Diagnosis
Monitoring
Screening
Research
Clinical studies
Epidemiologioy
Application and Limitations
False positives
False negatives
Contamination
Interfering substances
False positives
Contanntarin


PROTORYPE TESTING
PROTOTYPE
A/B TESTING
ETHICAL CONFLICT RESOLUTION
SAFE USE OF ANTIBIOTICS
CLICK-THROUGH RATE:
15%
ANSWER: FALSE
SAFE USE OF ANTIBIOTICS
CLICK-THROUGH RATE:
22%
ANSWER: FALSE
TRUE 'X FARTE:
Anibiotics cure virues.
ANSWER: FALSE

SUMMARY


DESIGN THINKING PROCESS
1. EMPATHAZE
2. DEFINE
3. IDEATE
4. PROTOPYPE
TEST
5 TEST
2. DEFINE: STATING THE CORE PROBLEM
Syntisysizing Empethy Findings into Actiontable Problem Statements
INPUTS
User Research Data
Interview Transcpts
Observations
Empethy Maps
PROCESS: SYNTHESIS & FRAMING
1. Identify User Needs & Insights
2. Formulate 'How Might We... or 'User Needs... Statements
Services to Nursing Homes/Clinics
Pharmacists need & Insights
2. Hemor might we for eosttion mediuation the nursing deduce erros?
HMW: How might we phamation wh-alwers
HMW: How might we phrnists with-eime ethical guidance?
OUTPUTS: PROBLEM STATEMENTS
Problem: Nursing home staff need a streatimined, error-nediuation system because current manual proceses are
reduing and pose patient safety risks.
Problem: Pharmacist lear process for mediating ethical conflicts in real-time to ensur patient-weleing is always he primary driver of dispesing decisions
Comnunication/Eduams
standzziiazed, rapid communrication for medication reconlization
Problem: Compermtetedems rapid reconlication
Problem: Community members need accessible, demystled information information we impove healb acteracy level?
3 IDEATE

CLASS ASSESMENTS

1. **A patient with the HLA-B*57:01 allele is prescribed abacavir. What is the most appropriate action to prevent a severe adverse drug reaction?**

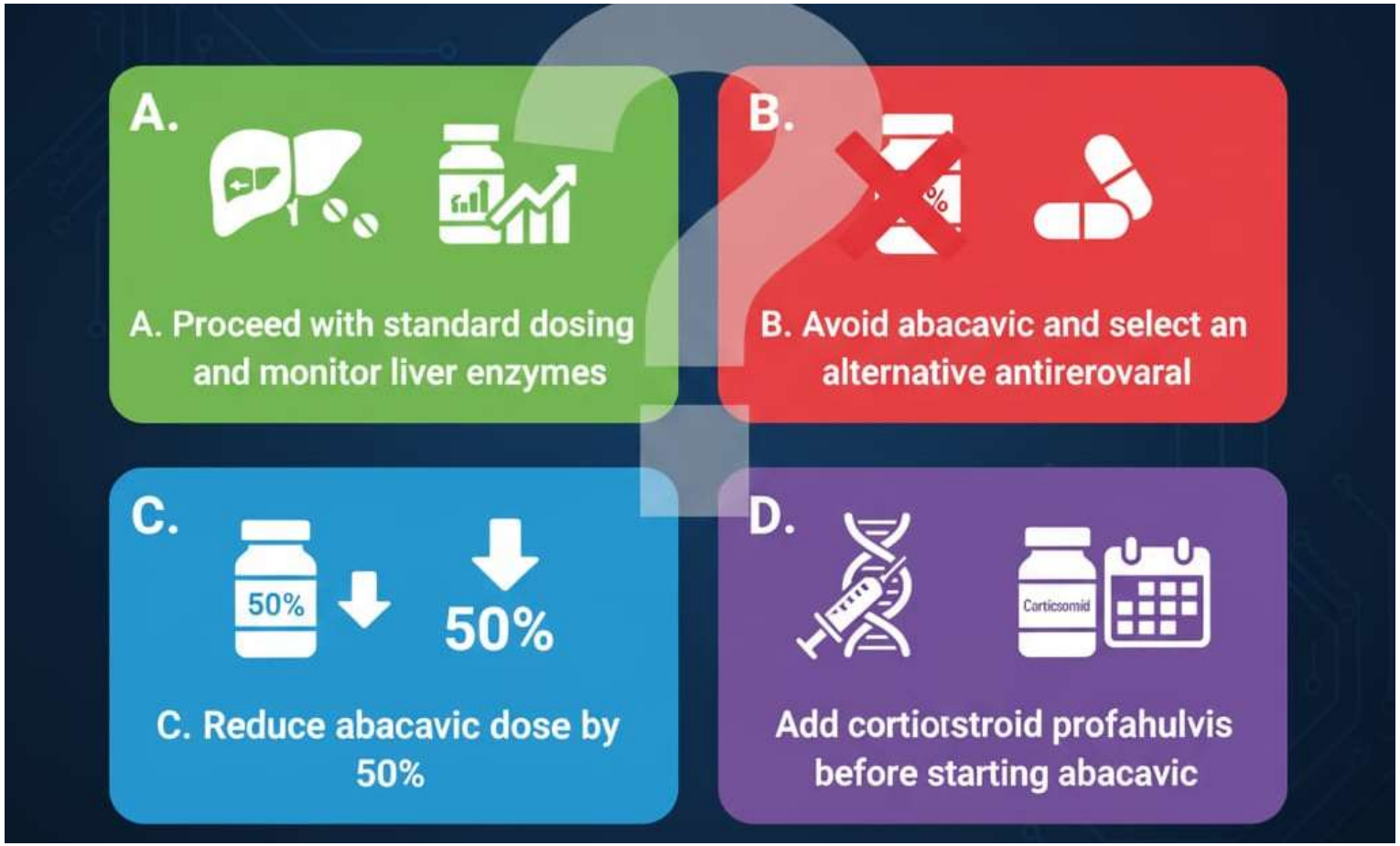
a. Proceed with standard dosing and monitor liver enzymes

b. Avoid abacavir and select an alternative antiretroviral

c. Reduce abacavir dose by 50%

d. Add corticosteroid prophylaxis before starting abacavir

CLASS ASSESSMENTS



CLASS ASSESSMENTS

Which genotype is most associated with life-threatening skin reactions (e.g., Stevens–Johnson syndrome) when exposed to carbamazepine in certain Asian populations?

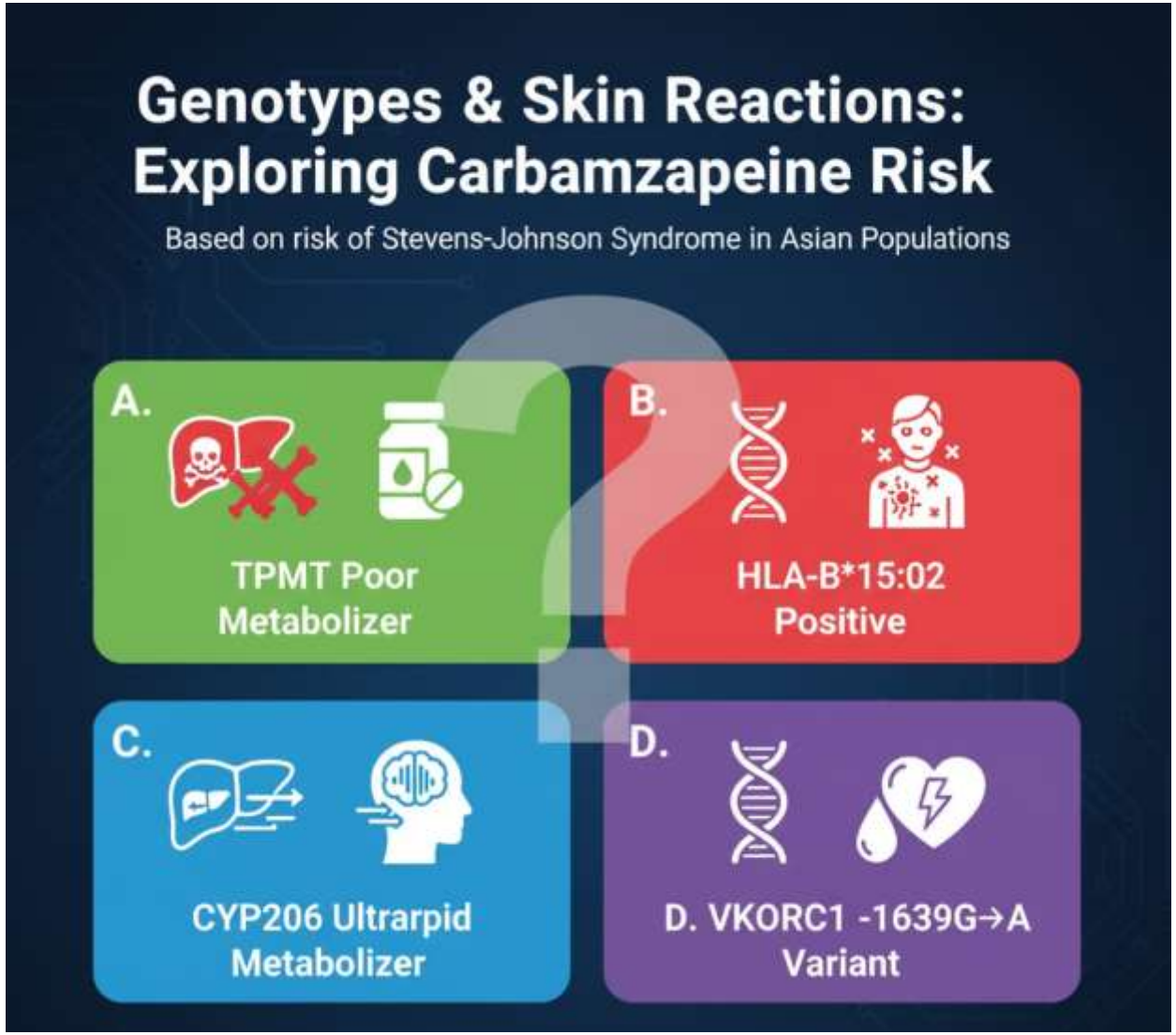
a. TPMT poor metabolizer

b. HLA-B*15:02 positive

c. CYP2D6 ultrarapid metabolizer

d. VKORC1 -1639G→A variant

CLASS ASSESSMENTS



CLASS ASSESSMENTS

A patient with reduced TPMT and NUDT15 activity is starting thiopurine therapy (e.g., mercaptopurine). What adverse reaction risk is increased and how should therapy be adjusted?

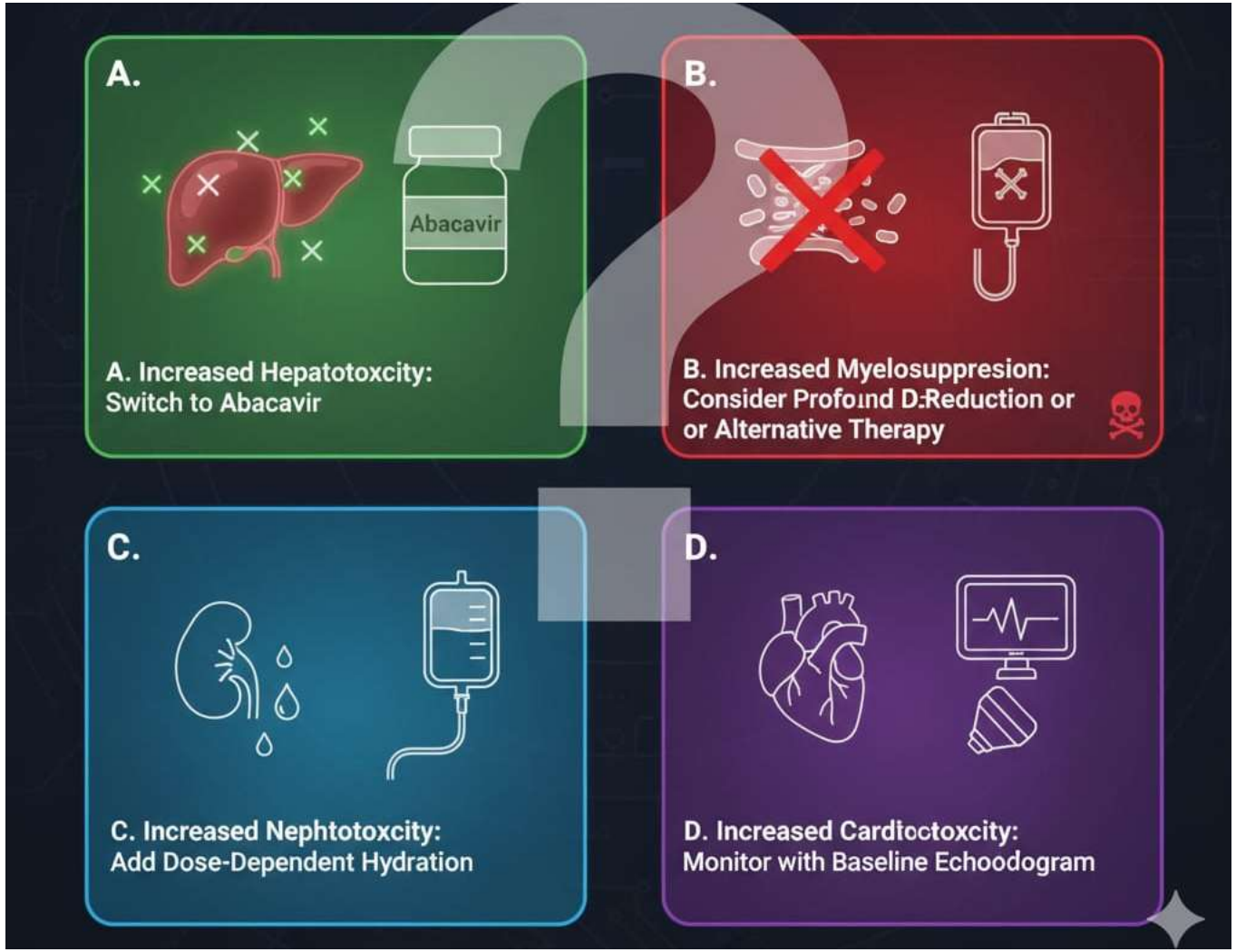
a. Increased hepatotoxicity; switch to abacavir

b. Increased myelosuppression; consider profound dose reduction or alternative therapy

c. Increased nephrotoxicity; add dose-dependent hydration

d. Increased cardiotoxicity; monitor with baseline echocardiogram

CLASS ASSESSMENTS



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Thank
you!