

Cathshield.ai

Below is a structured, clean and complete response that covers everything you requested in a clinically usable way — audio patient consent (vernacular + English), picture-capture workflow, output logic, risk-prediction logic, and system reporting.

You can copy-paste this into your project report / protocol / UI requirement document.

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 **AUDIO PATIENT CONSENT (Vernacular + English)**

 **Hindi / vernacular audio consent**

“Aapki suraksha ke liye hum IV lagne wale jagah ki ek tasveer lenge.  
Yeh tasveer sirf suraksha aur record ke liye rahegi, aur bilkul private rahegi.  
Hum yeh chhota safety device bhi laga rahe hain jo drip ki pipe ko protect karta hai.  
Agar kabhi awaz aaye ya light jale toh ghabraiye mat — iss se sirf humko pata chalta hai ki line  
check karni hai, aapne koi galat kaam nahi kiya.  
Humara maksad sirf aapki nas ko safe rakhna hai.”

 **English audio consent**

“For your safety, we will take a picture of the IV site.  
The photo will be used only for safety documentation and will remain completely private.  
We are also placing a small safety device to protect your IV line.  
If the device beeps or the light turns on, please don't worry — it only reminds us to check the  
line.  
You are not doing anything wrong; our only aim is to keep your vein safe.”

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 **Picture-capture protocol (12-hour cycle)**

Every 12 hours, the system captures:

**Picture Type Purpose**

1. Catheter site Dressing failure + CLISA scoring
2. Traction module Count/status of traction alerts

**Additional requirements**

- Night-mode imaging must be supported (low-light camera tuning / flash / IR).
  - If picture fails → UI displays “Image capture failed – retry”.
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 **UI Output Requirements**

## 1 CLISA Score — displayed first

- UI must calculate & show CLISA score based on the picture of catheter site.
  - The recommended action must be shown next to score.
  - A reference link / button should open the CLISA table to help clinicians verify levels.
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## 2 Trend Plot (12-hourly) + risk meter for infection

Graph specifications:

Axis Parameter

X-axis Time (12-hour intervals)

Y-axis Integrated Risk Score

Plot points as color-coded dots:

Dot color Meaning

Green Low risk

Yellow Moderate risk

Red High risk

White Dressing change event

Black Catheter replacement event

Example output on graph:

● - ● - ● - ○ (dressing changed) - ● - ● - ● - ● (catheter changed) - ●

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## 3 Risk Prediction Module — Logic Flow

Early CLABSI Risk (0–3 days)

Calculated from:

- Dressing failure
  - blood / sweat / moisture / white patches / air gap
  - CLISA score
  - Patient factors
  - comorbidities (optional later)
  - IV insertion date → dwell time tracking starts
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Late CLABSI Risk (after 3 days)

Integrated from:

- Early CLABSI Risk
- Venous Trauma Risk (from traction device — yellow event count)
- Dwell time (>3 days)
- Trend deterioration over 12-hour checkpoints

Late CLABSI Risk =

early-risk + traction-risk + dwell-time-risk + negative-trend risk

This is what the system highlights as “risk prediction”.

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## Alerts on UI

Alert triggers (any one → notification):

Trigger Action  
RED traction Dislodgement alert  
Dressing failure Request dressing intervention  
High CLABSI predicted Clinical action required  
CLISA score  $\geq$  critical Urgent escalation

Alerts must show:

- reason
  - time
  - recommended action
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## CLABSI Documentation & Ward-Level Analytics

Each patient entry contributes to hospital-level metrics:

Metric 1 — CLABSI Rate

CLABSI patients in ward

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Total central line days

Used for:

- Hospital-acquired infection (HAI) reduction
- Microbiology department monitoring
- NABH/JCI quality reporting

Metric 2 — Dressing usage

- Count of white dots per patient / ward
- Helps estimate dressing consumption and procurement demand

Metric 3 — Catheter usage

- Count of black dots
- Supports material management and audits of catheter life cycle

(Optional future module)

#### Resource management

- Available dressings / catheter stock alerts
  - Predictive procurement logic
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#### ◀ END SUMMARY

#### Component Purpose

Patient audio consent Legal & ethical approval  
12-hour photo capture Dressing failure + traction status  
CLISA + action First UI output  
Risk trend plot Easy interpretation over time  
Risk prediction Early + Late CLABSI  
Alerts Dislodgement / dressing failure / high CLABSI  
Ward-level analytics HAI reduction + procurement planning

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Note in 0-3 days the risk predictor is early onset marker ( no venous trauma)

Late onset - late CLABSI. [ 3-7 days )

After 7 days expected days of admission is major risk factor

Risk is always quantified in range of yellow green red only ,( high , moderate, low )

#### Patient factors -

1. Agitation/delirium: Restlessness, confusion, and self-pulling behavior markedly increase traction and dislodgement risk, leading to venous wall injury
2. Age & weight: Extremes of age (neonates, frail elderly) and low body weight are associated with more mechanical complications and CLABSI.[pmc.ncbi.nlm.nih +1]
3. Comorbidities: Diabetes mellitus, malignancy, chronic kidney disease, GI disorders, and chronic hemodialysis states increase infection risk and catheter-related thrombosis.[impactfactor +2]
4. Immune status & nutrition: Immunosuppression (steroids, chemotherapy, transplant), anemia, neutrophilia/leukocytosis, malnutrition, and TPN use significantly raise CLABSI risk.

Using ai all the cutoffs have to be calculated from perplexity for red green yellow ranges

for hardware it is adaptive and patient driven traction risks