

# Networked Surveillance for Medication Safety

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UNIVERSITY OF MINNESOTA  
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# Conflicts of Interest

- UptoDate Section Editor for Patient Safety in Anesthesiology
- Chair of SCA Foundation - received research funding from PharMedium for medication safety work

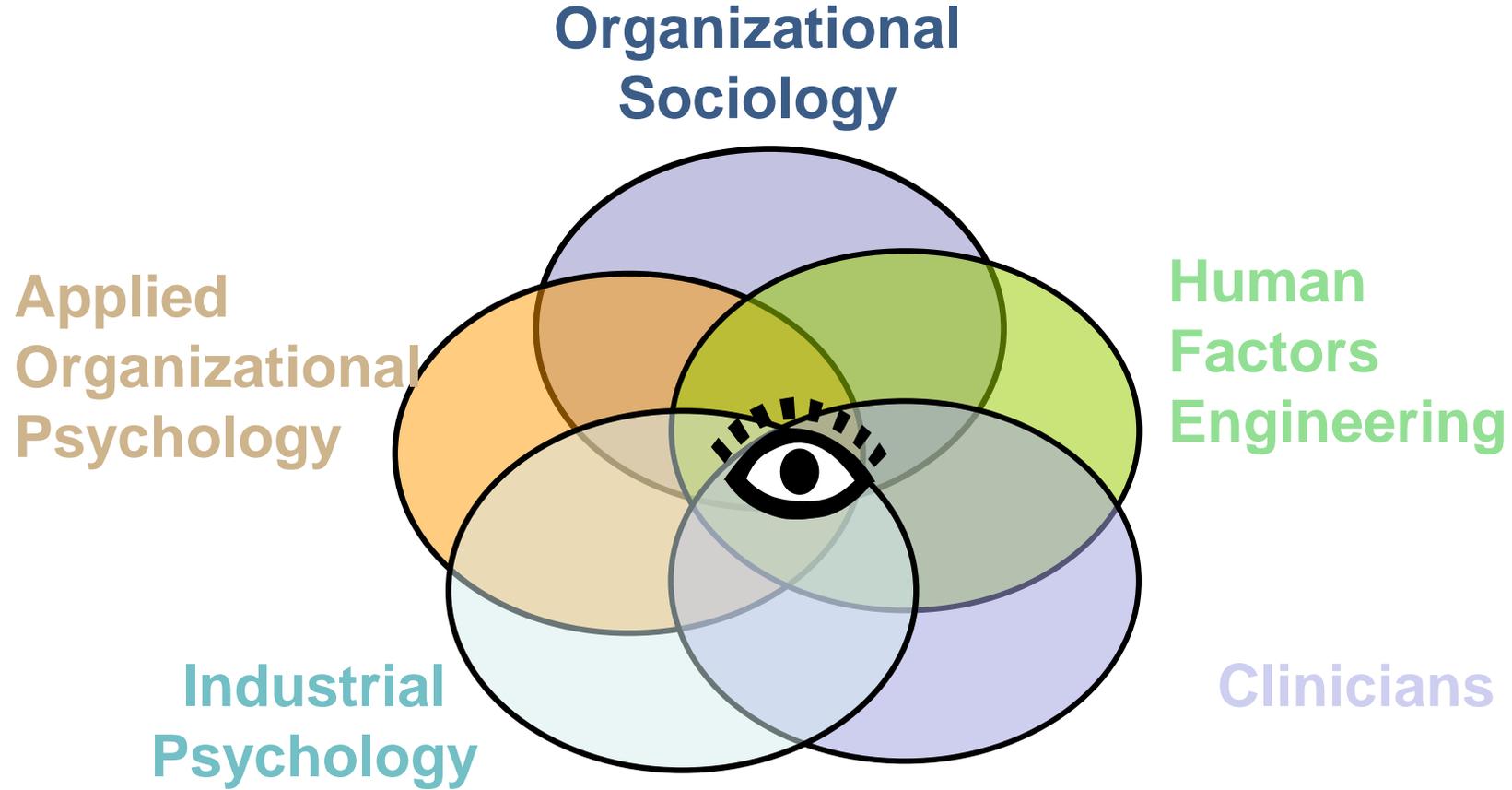


# Objectives

- Be able to define what networked surveillance actually is or could be
- Be prepared to establish a networked medication safety program at their institution



# LENS: Locating Errors thru Networked Surveillance



## Standardization

1. High alert drugs (such as phenylephrine and epinephrine) should be available in standardized concentrations/ diluents prepared by pharmacy in a ready-to-use (bolus or infusion) form that is appropriate for both adult and pediatric patients. Infusions should be delivered by an electronically-controlled smart device containing a drug library.
2. Ready-to-use syringes and infusions should have standardized fully compliant machine-readable labels.
3. *Additional Ideas:*
  - a. Interdisciplinary and uniform curriculum for medication administration safety to be available to all training programs and facilities.
  - b. No concentrated versions of any potentially lethal agents in the operating room.
  - c. Required read-back in an environment for extremely high alert drugs such as heparin.
  - d. Standardized placement of drugs within all anesthesia workstations in an institution.
  - e. Convenient required method to save all used syringes and drug containers until case concluded.
  - f. Standardized infusion libraries/protocols throughout an institution.
  - g. Standardized route-specific connectors for tubing (IV, arterial, epidural, enteral).

## Technology

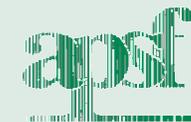
1. Every anesthetizing location should have a mechanism to identify medications before drawing up or administering them (bar code reader) and a mechanism to provide feedback, decision support, and documentation (automated information system).
2. *Additional Ideas:*
  - a. Technology training and device education for all users, possibly requiring formal certification.
  - b. Improved and standardized user interfaces on infusion pumps.
  - c. Mandatory safety checklists incorporated into all operating room systems.

## Pharmacy/Prefilled/Premixed

1. Routine provider-prepared medications should be discontinued whenever possible.
2. Clinical pharmacists should be part of the perioperative/ operating room team.
3. Standardized pre-prepared medication kits by case type should be used whenever possible.
4. *Additional Ideas:*
  - a. Interdisciplinary and uniform curriculum for medication administration safety for all anesthesia professionals and pharmacists.
  - b. Enhanced training of operating room pharmacists specifically as perioperative consultants.
  - c. Deployment of ubiquitous automated dispensing machines in the operating room suite (with communication to central pharmacy and its information management system).

## Culture

1. Establish a “*just culture*” for reporting errors (including near misses) and discussion of lessons learned.
2. Establish a culture of education, understanding, and accountability via a required curriculum and CME and dissemination of dramatic stories in the *APSF Newsletter* and educational videos.
3. Establish a culture of cooperation and recognition of the benefits of STPC within and between institutions, professional organizations, and accreditation agencies.



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# The Technology of Networked Surveillance

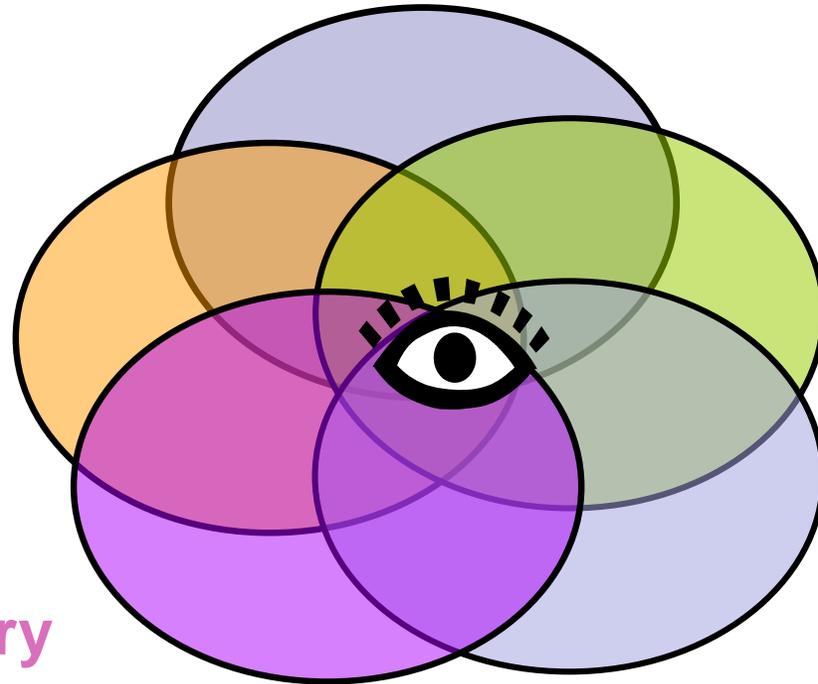
CPOE, ADCs, BCAM

Decision Support

Information Technology

Laboratory

Pharmacists

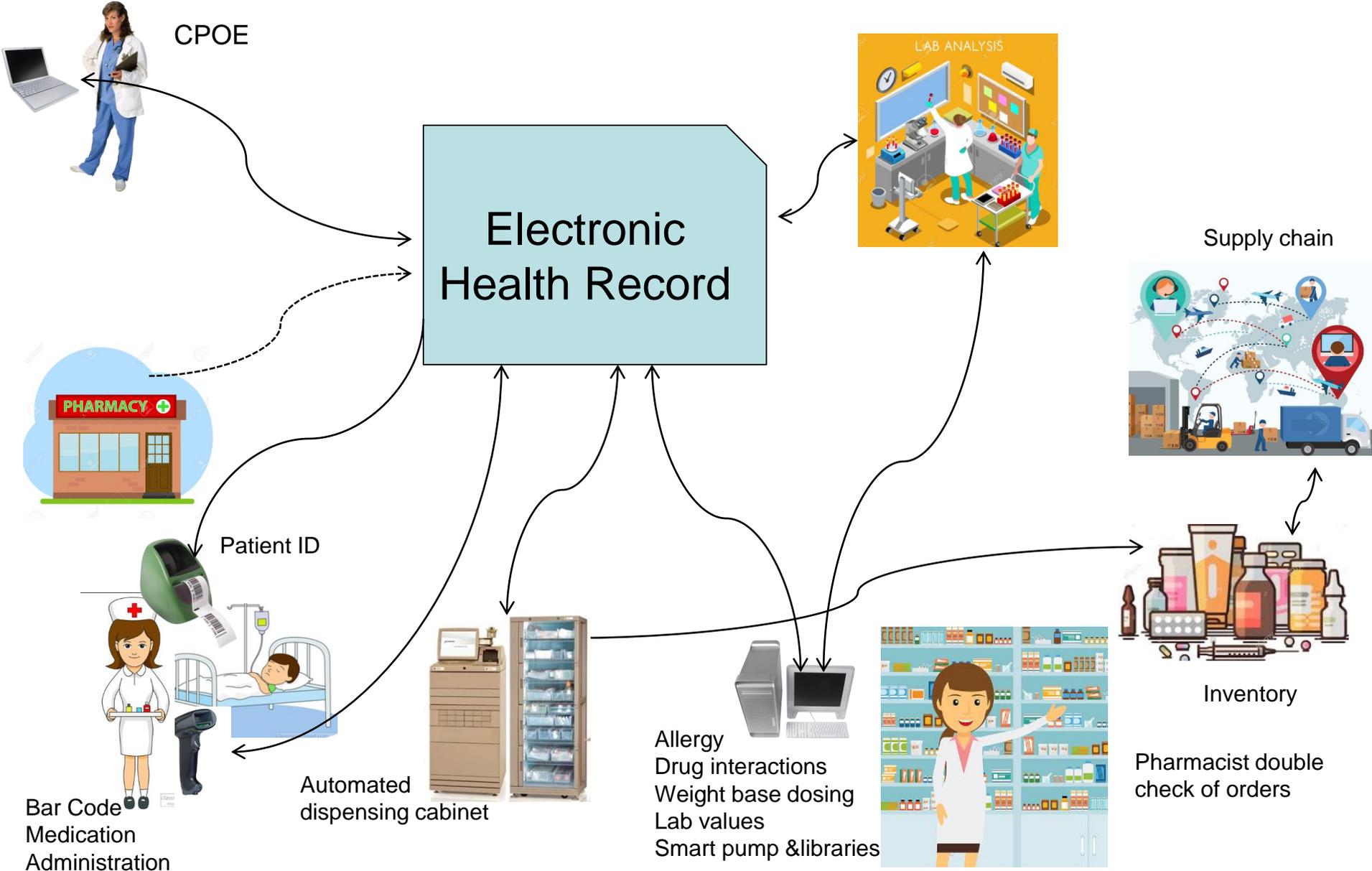


# Networked Surveillance - Technology

- Computerized order entry  EHR
  - Limited choices for each drug, handwriting, decimal points
  - Algorithms check weight, allergy list, drug-drug interaction, lab values (creatinine)
  - Drug dictionary instantly available for more details
  - Writing a medication order can trigger specific lab draw orders
- Pharmacy review, release
- Automated Dispensing Cabinet
- Bar Code Administration
- Smart Pumps







## Warning



Attention: Renal adjustment is necessary  
For Vancomycin

The min interval can be 18 hours. And  
the max dose can be 30 mg.

Do you want me to correct?

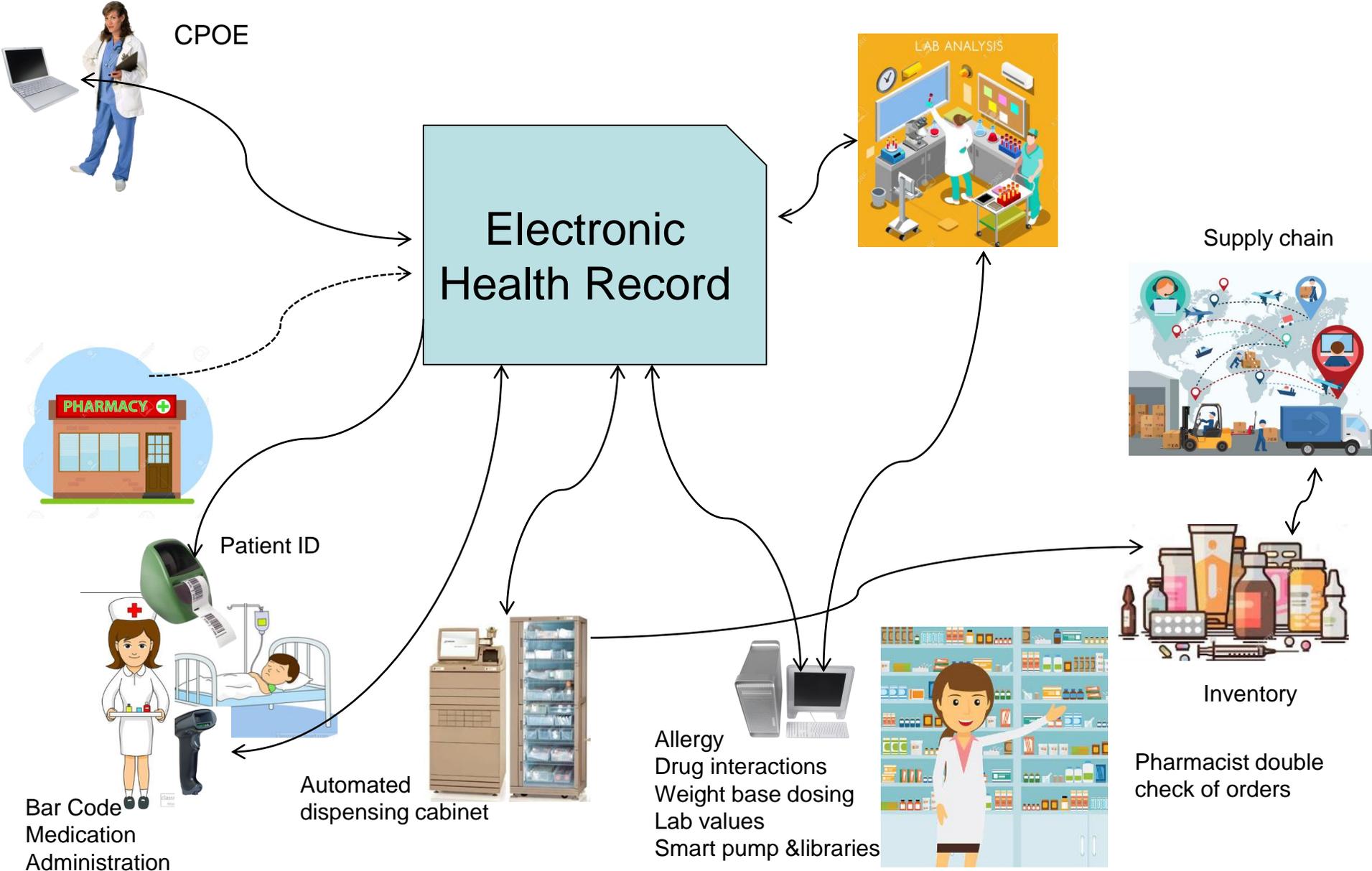
Yes

No

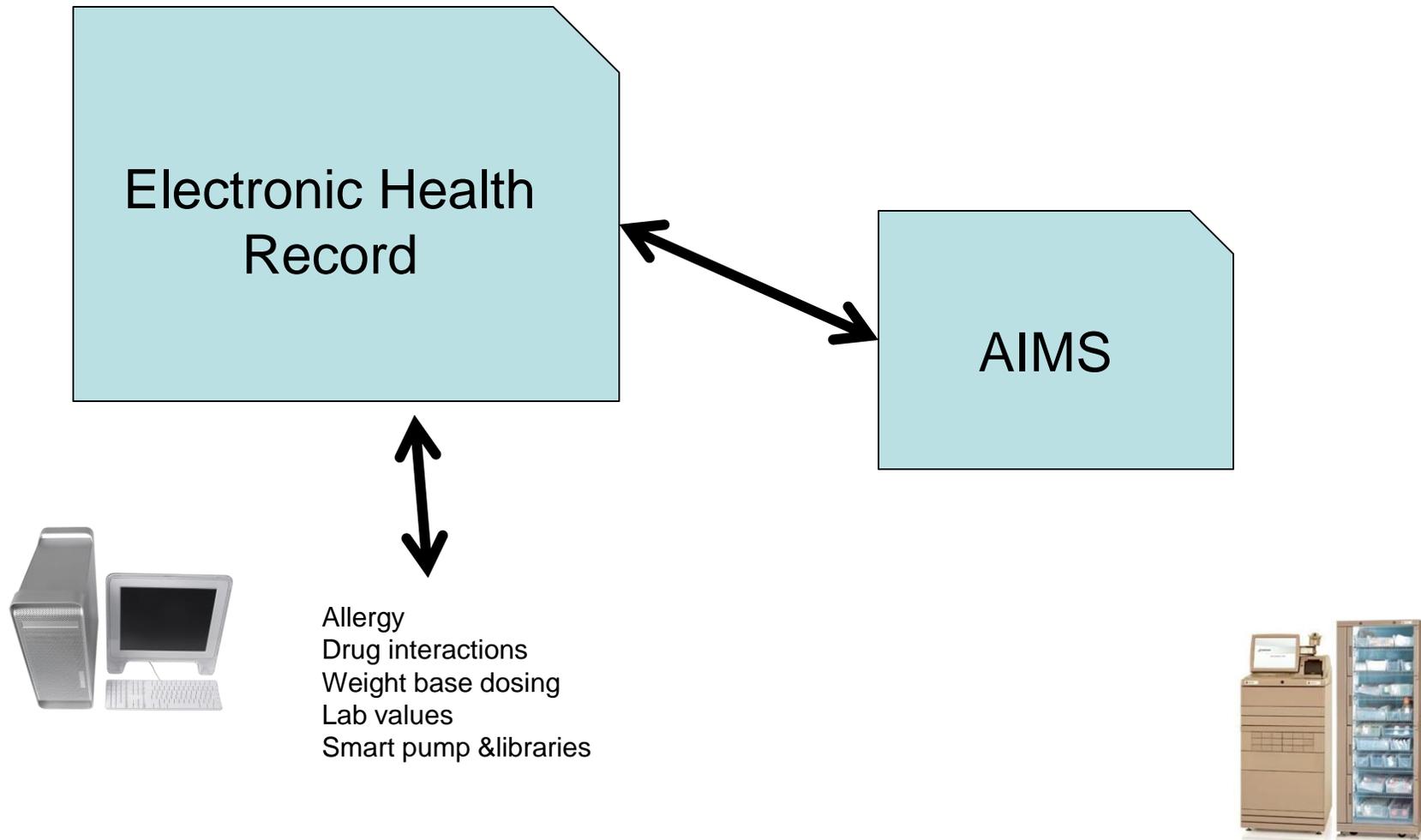


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# Networked Surveillance Technologies - Anesthesia

- SAFERsleep™ Anesthesia Systems
  - customized drug tray for organization of syringes and vials
  - barcoded, color-coded drug labels
  - touch-screen computer with barcode reader
  - auditory and visual cross-checking before drug administration
  - real-time automated compilation of anesthetic record
- Codonics™
  - vial barcode scanner reads barcode on drug vial, speaks the name, displays the name on a splash screen, prints a syringe label
  - at drug administration, syringe label is scanned and SAM system speaks the name, displays the name on a dose entry screen for dose entry

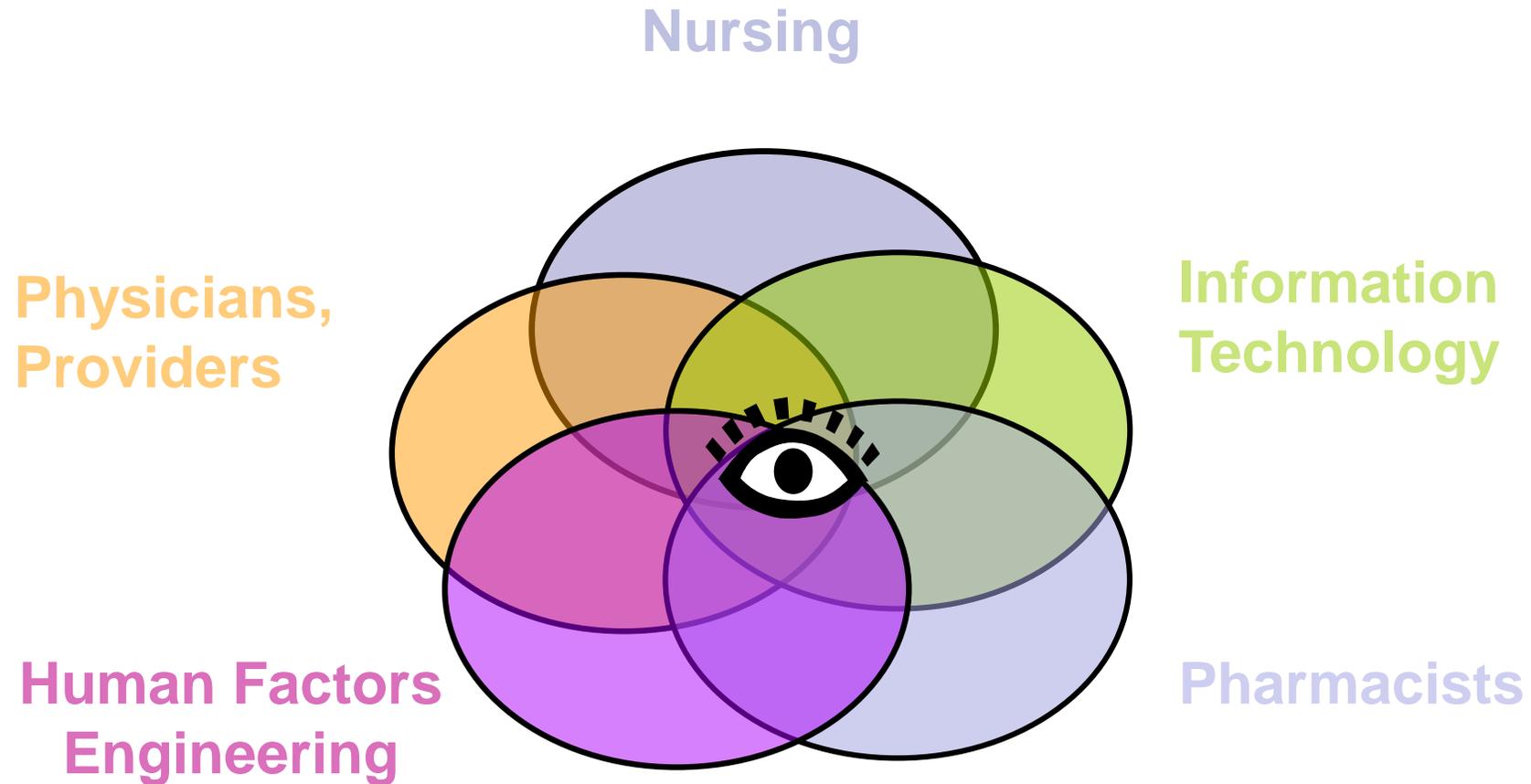


# Smart pumps

- Electronic drug libraries
- Guardrails
  
- Blue-tooth pumps that interface with the EHR in the OR and at the bedside



# The Human Factors of Networked Surveillance





# Multidisciplinary

- Physicians, providers
- Pharmacists
- Nursing (pre and post op)
- Human factors engineers
- IT coders
- Data analysts
- Order set managers



# Multidisciplinary

- Order set creation
- Incident review
- Root cause analysis
- Develop procedures
- Choose technology solutions
- Educate, train

**Include a human factors engineer!**

