Informatics and Quality Improvement

Clinical Decision Support Tools

Clinical decision support (CDS) encompasses a variety of technological tools that directly support clinical decisions across settings. Which of the following are an examples of CDS? Select all that apply.

Real-time monitors and dashboards

Automatic order implementation

Event-driven alerts and reminders

Condition-specific guidelines, order sets, care plans, and protocols

Smart documentation forms and templates

CDS encompasses a variety of technological tools that directly support clinical decisions across settings including:

Immediate warning alerts for clients and providers

Event-driven alerts and reminders

Parameter guidance for providers

Real-time monitors and dashboards

Condition-specific guidelines, order sets, care plans, and protocols

Smart documentation forms and templates

CDS architectures that influence design, implementation, and adoption

It provides order implementation support for a provider but not the automatic initiation of orders.

Automated Medication Dispensing System

The nurse retrieves medication through an automated medication dispensing system. How does an automated medication dispensing system increase the quality of care?

Eliminates client misidentification

Reduces intravenous (IV) pump programming

errors Eliminates adverse drug reactions

Decreases medication errors

The use of an automated medication dispensing system decreases medication errors. It does not eliminate adverse drug reactions or identification errors, since providers still need to go through the medication administration checks at the bedside. It also does not reduce IV pump programming errors. This alert would be part of a smart pump.

Culture of Safety

How does technology promote a culture of safety?

Electronic incident reports improve reporting rates

Clinical decision support systems determine

consequences Video surveillance catches perpetrators

Databases track who has been involved in unsafe acts

A culture of safety is where all employees are committed to being safe, whether or not someone is watching. It is not about punishing unsafe acts or catching perpetrators. Technology can be used to improve reporting rates of incidents, allowing organizations to identify issues and respond with solutions to improve quality and safety.

Types of Clinical Decision Support

The nurse scans bar codes of the client's wristband and the medication. An alert comes up on the computer of a potential drug-allergy interaction. This is an example of which type of clinical decision support?

Expert Systems

Point-of-Care

Workflow Support

Order Implementation

Point-of-Care alerts include drug-condition interaction reminders , drug-drug interaction , drug-allergy interactions , plan-of-care alerts , and high-risk state monitoring .

Order implementation assists providers with order sets and protocols. Expert systems offer support for labs, equipment, and tools. Workflow support provides templates and documentation support.

Smart Pumps

The nurse is using a smart pump in the emergency room. How does a smart pump increase the quality of care?

Decreases adverse drug reactions

Eliminates client misidentification

Reduces programming errors

Eliminates medication errors

The use of smart pumps reduces programming errors. It does not eliminate medication or identification errors, since providers still need to go through the medication administration checks. It also does not decrease adverse drug reactions. This alert would be part of medication administration.

Alert Fatigue

One study in an intensive care unit found that they had 187 alarms per bed per day, of which 72%-99% were false alarms (Drew et al., 2014). How could this unit use technology to combat alert fatigue?

Changing the default alarm settings to settings based on each client's condition

Install flashing colors that correspond to each of the types of alarms

Hire more staff to attend to the alarms

Increase the decibels on all alarms from 70 dB to 90 dB

Since all client's are unique, tailoring alarm signals of devices to each client's needs can reduce the number of false alarms and therefore, reducing the total number of alarms. Increasing the decibels or using flashing colors will cause more sensory overload. Hiring more staff is expensive and does not combat the alert fatigue.

Reference

Drew, B. J., Harris, P., Zègre-Hemsey, J. K., Mammone, T., Schindler, D., Salas-Boni, R., Bai, Y., Tinoco, A., Ding, Q., & Hu, X. (2014). Insights into the problem of alarm fatigue with physiologic monitor devices: a comprehensive observational study of consecutive intensive care unit patients. Plos One, 9(10), e110274. https://doi.org/10.1371/journal.pone.0110274

Sentinel Events

Which of these sentinel events, or "never events," could technology prevent?

Staff injury associated with a burn

Staff death or serious disability associated with an electric shock

Surgery or other invasive procedure performed on the wrong client

Significant injury of a staff member resulting from a physical assault

Identification errors can be prevented using a bar code system or other technology coded system where the procedure or medication is "matched" with the correct client. It is difficult for current technology to prevent spontaneous accidents or situations.

Electronic Incident Reporting

A local clinic had a low rate of reported safety issues. After instituting an electronic incident reporting form, the rates went up. What is the most likely reason for the increase in incident reports?

It was easier for staff to access and fill out forms.

The clinical staff were more careless.

The clinical staff did not understand the reporting

process. It was more difficult to access safety information.

Studies have shown that organizations that moved to an electronic reporting system have an increased rate of reporting frequency. It does not mean the staff were more careless. It means that reporting was

easier, so staff were more likely to do it. Information is easier to access and the process is easier to understand.

Decreasing Rates of Adverse Reactions

A local hospital has high rates of adverse drug reactions. What technologies could be utilized to decrease these rates? Select all that apply.

Bar code administration

Standardized incident reports

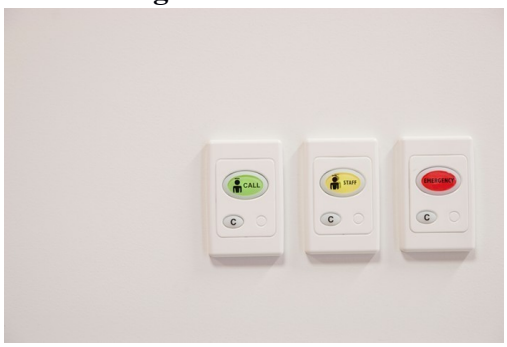
Smart pumps

Electronic health records

Automated medication dispensing

Electronic medical records and bar code administration will decrease adverse drug reactions by alerting to drug-drug and drug-allergy reactions. Automated medication dispensing decreases medication errors at the point of dispensing. Smart pumps reduce programming errors. Standardized incident reports help identify quality issues, but the actual reports do not decrease rates.

Color-Coding Call Buttons



How does color-coding call buttons increase the quality of care for clients? Select all that apply.

Creates severity levels

Decreases false alarms

Increases specificity of alarms

Decreases number of

emergencies Increases frequency

of alarms

Adding color to alarms helps distinguish between the types and severity of alarms, so staff are more prepared to answer. Making alarms user friendly also decreases false alerts as clients are

more apt to select the correct one. It does not decrease the number of emergencies or increase the frequency of alarms. Color-coding is used to decrease alarm fatigue.

Bypassing Safety Features

What is the main reason staff and providers bypass the safety features of technology?

They do not understand the safety features.

The safety features are annoying.

They do not care.

They want to save time.

The main reason safety features are bypassed is the misconception that they save time. Staff are busy in healthcare and alarms sometimes seem like a waste of time. Providers that care and understand why the alarms exist still bypass them. Although some view alerts as annoying, this is not the main reason cited for bypassing them in activity volume-based care to value-based care.

Reducing Medical Errors

The hospital moved from paper incident reporting to electronic. Data was collected and a committee was organized to review the data and produce ideas on how to prevent "never events". Which solutions would reduce medical errors?

Provide strict consequences for violations.

Report all never events to a national

organization.

Use data to track individuals involved in "never events".

Conduct webinars for providers on safety concerns.

Information technology can help providers to use data obtained, apply the knowledge gained, and reduce the rates of medical errors and never events by preventing adverse events and errors through webinars, online meetings, conferences, or classes for healthcare providers. Incident reporting is not to punish or track those involved. Sentinel events are sometimes reported to organizations depending on their nature but the reporting itself does not reduce errors. It is the response to the reports that do.

Impact of Technology on Safety