DENVER HEALTH
Level One Care for ALL

Improving the Integrity of the Immunization Cold Chain Process with a Multi-Disciplinary Approach

Background

A May 2010 immunization inventory registry snapshot captured our agency Community Health Services clinics storing an aggregate vaccine inventory of 31,846 doses valued over $1.3 million in VFC and private vaccines combined. Having experienced occasional vaccine loss due to power outage, refrigerator malfunction or human error at our variety of sites, a standardized process was sought to enhance vaccine storage and handling practices and minimize possibility for temperatures out of acceptable range.

Setting and Population

Denver Health is a comprehensive, integrated organization serving the city and county of Denver with multiple components including a 500-bed inpatient hospital, Level 1 Trauma Center, the Denver County Public Health Department, and a Community Health Services division with family health centers spanning 8 geographic locations and 13 school-based health centers.

Community Health Services cares for 112,000 patients at family health centers and administered 171,046 pediatric, adolescent and adult vaccinations in year 2009. School-based health clinics served 8,622 students and administered 14,940 vaccinations during the school year 2009-2010.

Team Representation

A multi-disciplinary Task Force with representation from the following disciplines was created:

- Community Health Services Nursing
- Immunization Program office
- Biomedical Technology
- EOC (Environment of Care) Committee
- Engineering
- Pharmacy
- Communications
- Security

Process

The Task Force examined ***current state*** at our variety of sites, determined ***target state*** recommendations, then ***educated staff*** to implement improvements to safeguard expensive vaccines. The Task Force continues to oversee the implementation of improvements and make adjustments accordingly.

(over)

Current State

Examination of current state was accomplished by identification of variables for a gap analysis process of the 35 refrigeration units evaluated. Gap analysis illuminated findings including:

- only 3 sites had back-up power generators despite the majority thinking they did
- only 1 site had UPS (uninterruptible power supply) battery back-up
- no sites conducted testing of cold chain failure system such as practice/mock drills
- leaders believed they routinely updated their cold chain failure call-down trees however findings showed average 2-3 years since last update to contacts
- each Biomed on-call Technician (total 6 for the agency) had separate on-call books needing to be updated and maintained
- responding site staff were not aware that they may and should (for safety and physical assistance considerations) contact 24x7 Security staff for assistance related to cold chain failure response
- lack of communication/coordination of response actions in large buildings housing multiple clinic sites (e.g.: when power to entire building is out, Pediatric and Women's Care and Adult clinic sites did not share resources)

Target State

The team developed the target state by identifying process improvements including:

- consideration of UPS batteries at additional sites (those stocking highest volumes of vaccines),
- reprogramming of telephone equipment for standardization of automated outgoing calls,
- standardization of template used for staff call-down trees,
- initiating routine practice drills for staff and routine call-down tree updates by leaders,
- consistency in suggested action steps for responders to carry out,
- consolidation to one updated on-call manual for Biomed Technicians to share, and
- education to leadership related to findings and suggested enhancements.

Staff Education

Education occurred via a variety of communications:

- To rollout the suggested improvement practices, results from examination of current state and determination of target state were overviewed by Task Force members at the Nursing Program Manager leadership meeting.
- As follow-up, detailed email instructions were sent to Nursing Program Managers including templates for site-specific tools
  - template for handbook detailing steps involved for maintaining cold chain
  - template for cold chain failure call-down tree
- Nursing Program Managers reviewed the suggested improvements with clinic employees at their sites during staff meetings. Cold chain response includes <u>all</u> clinic employees such as clerical, nursing, and providers.
- VFC site visitors and JCO tracer teams conducting clinic inspections reinforce the importance of consistency of call-down information throughout clinic and availability to all staff.

Results

Completed	Improvement	Comments
✓	Reducing on-hand inventory	
✓	Reprogramming of phone alarm outbound dialing	
✓	Standardization of staff call down template	
	Biannual alarm response drills at sites	need leadership coordination
✓	Automated reminder for update of clinic responder forms	
✓	Biomed huddles for event debriefings and transfer of on-call manual	
	Use of Event Critique Form and review of findings at EOC	seeking administrative approval
	Evaluate cost vs. benefit for UPS batteries at high-volume clinics	requires leadership input

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