



The Skin Injury Prevalence Study (SIPS): Utilizing Web-based Electronic Data Capture at the Bedside

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Purpose

SIPS is a series of hospital-wide one-day prevalence surveys of pediatric skin injury. Paper-based data collection of this large scale is inefficient, error prone, and delays communication of data to stakeholders. Therefore, we utilized a new web-based electronic data capture system - REDCap (Research Electronic Data Capture).



Significance

- Hospital-acquired skin injury (HASI) is a serious, often preventable event shown to increase cost, length of stay, and patient suffering.
- HASI is well documented in the adult population, but there is little information regarding the prevalence and incidence in the pediatric population.
- All pediatric hospital inpatient settings are vulnerable to skin injury.
- Accurate, timely, and efficient documentation of the scope of HASI in a busy pediatric hospital setting is challenging.
- Both internal and external benchmarking is important to recognize trends over time.

Background

- In December 2008, the first SIPS prevalence survey was conducted on 373 inpatients.
- Data collection was paper-based and included chart review and patient assessment focusing on 10 categories of skin injury, totaling 93 discreet data points.
- Multiple problems were identified with this data collection method:
 - lengthy 6-page form with no capability of skipping non-applicable data points
 - data forms required scanning which was time consuming and created errors due to stray marks
 - multiple database checks were required due to errors

Strategy and Implementation

- Our original database was redesigned and data were collected and managed using the REDCap electronic data capture system hosted at The Children's Hospital of Philadelphia.¹ REDCap is a secure, web-based application designed to support data capture for research studies, providing:
 - an intuitive interface for validated data entry
 - audit trails for tracking data manipulation & export procedures
 - automated export procedures for seamless data downloads to common statistical packages
 - procedures for importing data from external sources
- Experts in HASI and database development constructed the questions to encompass the scope of the issue, from documentation of skin injuries on admission to the current state of the skin. We also included NDNQI pressure injury data points.
- By collaborating with the IS department, laptops were obtained to support the project.

Measurement

- In June 2010, sixty nurses were trained to use the REDCap web-based system. Inpatients that met inclusion criteria underwent a chart review and an unbiased skin assessment to document the presence of HASI. Nurses worked in teams of two; each team with a laptop. A total of 405 inpatients (97% of census) were assessed in a 12-hour shift to yield approximately 77,000 data points.
- Major categories of data included: admission documentation, current documentation, and a real-time, unbiased skin assessment.
- We utilized REDCap's SmartLogic capabilities which allowed fewer questions requiring answers on non-complicated patients, while more in-depth questioning for patients with risk factors or skin injury.

Evaluation

- Minor difficulties were experienced including:
 - dropped wireless connections/difficulty connecting (20%)
 - needing frequent laptop charges (7.5%)
 - being unable to complete survey in order of choice (52%)
- Overall, nurses were extremely satisfied (95%) with the user-friendliness of the REDCap web-based system and felt that it streamlined data collection.

Implications for Practice

- Frequent monitoring of HASI and documentation of prevention strategies are critical to understanding areas for improvement.
- The REDCap web-based system proved to be easy to design and implement, user-friendly, and resulted in a ready to use database with minimal post-study processing needed.
- Efficient web-based data collection allows more timely trending of practice over time.
- Although user-friendly, some training and hands-on practice was needed for nurses to be fully functional and confident.
- The REDCap web-based system can be adapted and utilized in various nursing research studies requiring data capture at the bedside.
- Future trialing of data collection utilizing handheld devices.

References

¹Paul A. Harris, Robert Taylor, Robert Thielke, Jonathon Payne, Nathaniel Gonzalez, Jose G. Conde, Research electronic data capture (REDCap) - A metadata-driven methodology and workflow process for providing translational research informatics support, J Biomed Inform. 2009 Apr;42(2):377-81.

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