What Goes Up, Must Come Down: A State-of-the-Art Electronic Health Record Downtime and Uptime Procedure in a Metropolitan Health Setting

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Abstract

Background Electronic health records (EHRs) are used at most hospitals around the world, and downtime events are inevitable and common. Downtime represents a risky time for patients because patient information and critical EHR functionality are unavailable. Many institutions have used EHRs for years, with health professionals less likely to be familiar or comfortable with paper-based processes, resulting in an increased risk of errors during downtimes. There is currently limited guidance available on how to develop and operationalize downtime procedure at a local level. In this paper, we fill this gap by describing our state-of-the-art downtime and uptime procedure and its evaluation.

Method A district-wide downtime and uptime procedure was revised and standardized based on lessons learned from other health care organizations. The procedure outlines downtime and uptime preparations including downtime drills, downtime viewer auditing, and downtime education; downtime response including activating downtime and tracking patient changes; and uptime recovery including medication reconciliation and uptime documentation.

Implementation We implemented our new procedure across the district during an 8-hour planned downtime. A district downtime planning committee was formed, and a virtual command center was established to coordinate the downtime and uptime events. During downtime and uptime, onsite support was provided by the district's health informatics teams and clinicians. Data recovery was completed safely and efficiently with the revised uptime process. Following the event, we gathered staff feedback and reflections on implementing the procedure which highlighted its success but also revealed some areas for further improvement.

Conclusion In this paper, we describe a state-of-the-art EHR downtime and uptime procedure and lessons learned from its implementation. The implementation was successful with staff well prepared and information reconciled efficiently ensuring safe continuity of care. It was only through extensive planning, significant commitment, and engagement of all stakeholders that this outcome was possible.

Keywords
- electronic health records
- downtime
- hardware/software failure

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Downtime: A Risky Time for Patients

Electronic health records (EHRs) are now used in most health care organizations around the world. Downtime events (periods of time when the EHR is unavailable), typically occur for planned maintenance or system upgrades but can also be initiated to address cyber-attacks or the problems caused by information technology (IT)-related failures (e.g., fire systems), power outages, or hardware/software failures.[1]

Downtime represents a particularly risky time for patients,[2] as patient information and critical EHR functionality, such as clinical documentation, medication management, clinical decision support, and diagnostic reporting, are unavailable, resulting in delayed or suboptimal care. During an EHR downtime, the continuity of patient care is also impacted because key clinical information is not easily accessible. ►Table 1 describes high-risk scenarios that can result from an EHR downtime, based on our own experiences and those of other health care organizations. These risks are presented with respect to the Australian National Safety and Quality Health Standards (NSQHS), which provide a nationally consistent statement of the level of care consumers can expect from health service organizations[3] (►Table 1).

As many institutions have now used EHRs for years, some for decades, health professionals are less likely to be familiar or comfortable with paper-based care processes such as paper orders for pathology, fluid management, patient observations, and medication charts. This can result in downtime being a stressful and error-prone time for health care workers.

Despite these risks and the frequency with which downtime events occur, there has been limited research quantifying the impact of downtime and uptime on health care organizations or on patients.[1] In the studies that have done this, significant negative impacts have been described. For example, an evaluation across two U.S. hospitals showed that downtime resulted in test results being delayed by 62%,[4] and a study in a Swedish emergency department (ED) showed that downtime was associated with a median increase in length of stay of 76 minutes.[5]

An in-depth analysis of downtime event incident reports across a 3-year period in the United States revealed that downtime procedures was not in place or were not followed in nearly half the incidents.[6] Similarly, a 2014 survey of 50 U.S. health institutions revealed that most organizations did not have a comprehensive contingency plan for downtime in place.[7] Survey participants reported a range of infrastructure and point-of-care components for preparing for and dealing with a downtime event, but these varied across organizations.[7] Frequently reported infrastructure components included an uninterrupted power supply and a redundant path to the internet at an organizational level. Common point-of-care solutions included a clinic-level read-only back-up system, data back-up practices (e.g., staff training), and the availability of paper forms.[7] The authors of this seminal paper called for comprehensive guidance to inform the development of EHR-specific downtime best practices.

The Contingency Planning SAFER Guide, produced by the Office of the National Coordinator for Health Information Technology,[8] includes 12 recommended practices for ensuring safe EHRs, safe use of EHRs, and monitoring safety during downtime events.[9] For example, it is recommended that paper forms are available to replace key EHR functions during downtimes, and staff are trained and tested on downtime and recovery procedure. Despite the availability of this guide, a recent scoping review highlighted that there is limited guidance available on how to develop and operationalize downtime procedure at a local level, with organizational experiences of downtime not well described or

Table 1 High-risk downtime scenarios, mapped to the Australian National Safety and Quality Health Standards[3]

Risk Overview	Key risks during downtime
Standard 4 Medication safety	• Delayed documentation of patient information • Adverse drug reactions due to incomplete or inaccurate documentation • Poor continuity of medication management including recent increases, decreases or cessation of doses • The safety mechanisms that have been built into the EHR for high-risk drugs are not available on paper forms, e.g., insulin, warfarin, and chemotherapy.
Standard 6 Communicating for safety	• Delayed discharge paperwork (paper or electronic) • Missing discharge paperwork • Discharge paperwork not being transferred to primary the health care team (e.g., general practitioner) • Inability to get complete clinical information during transfer of care between departments or to external facilities • Poor transfer of care for patients admitted from the emergency department or operating theaters due to paper processes being in place
Standard 8 Recognizing and responding to acute deterioration	• Altered calling criteria transcription onto paper observation chart can be delayed • Delay in communicating end of life care, and not for resuscitation orders • Inability to easily see vital sign trends

Abbreviation: EHR, Electronic Health Record.

researched.[1,10] In this paper, we aimed to fill this gap by describing our state-of-the-art downtime and uptime procedure and its evaluation.

Project Context

This work was undertaken across a large tertiary and quaternary health district in Sydney, NSW, Australia. The district comprises four hospitals, employs 14,000 staff and is responsible for the health and wellbeing of more than 740,000 people living within its boundaries as well as caring for patients living in rural and remote areas in NSW and Australia. All hospitals in the district utilize Cerner Millennium version 2018.11.07 as its EHR.

The district and state recognized the importance of an effective downtime and uptime procedure, with three key drivers identified: patient and medication safety, performance reporting, and medico-legal requirements. Significant time was therefore invested in revising and standardizing a state-of-the-art district-wide downtime and uptime procedure based on lessons learned and collective intelligence with other health care organizations. Downtime procedure are complex to develop and require significant input from all levels of the organization. For the purposes of this paper, we outline the core components that we believe make our procedure state-of-the-art. We present our downtime and uptime preparations and implementation processes with respect to the NSW State Emergency Management Plan (EMPLAN) which emphasizes risk management across the spectrum of prevention, preparation, response, and recovery.[11] ►Table 2 describes the components of our procedure, mapped to the EMPLAN categories.

It is worth noting our preference for paper-based forms to be used during a downtime event over other technology-based solutions, for example, smartphones or tablets. This is because paper-based forms are easily accessible, and in the event of a major disruption (i.e., network or power failure), there are no risks related to devices being inaccessible. In addition, in a large and complex organization, such as ours, purchasing specific electronic devices to be used in the event of downtime would be costly and these would require regular maintenance and auditing, resulting in the need for additional resources.

Preparation: Downtime and Uptime Preparations

Thorough preparation was identified as being critical for successful downtime and uptime events, and seven key preparatory activities were included in our procedure.

Education and Training

Online learning modules focused on the district's downtime policies and procedure and medication management during downtime and uptime are available for staff to complete. Department managers are responsible for ensuring that modules are completed as part of orientation. The district's health informatics unit (HIU) and teams (HITs) assist with refresher training for planned EHR downtimes. Downtime education is also provided as part of the Downtime drilling process (see section "Downtime Drills")

Back-up System and Daily Audits

Our backup system, the Cerner 724 Downtime Viewer (724DTV) application, provides access to 7 days of electronic clinical data for current active patients up until the point of loss of access to the EHR. The 724DTV computer runs on an uninterrupted power supply so can be accessed during a downtime, even if power has been impacted. Each clinical area has access to at least one downtime computer with the application installed. A system of regular daily audits on the 724DTV application by staff has been implemented following a specified audit procedure, to ensure it is in a state of readiness. The daily audits are also undertaken to ensure that staff remain current with knowing how to access the 724DTV application in the event of any unplanned EHR downtimes. The audit process also identified that the 724DTV application can randomly not update as expected on some computers. We discovered that this occurs roughly once per week across our health care organization, hence the additional need for an auditing process to be in place to escalate issues promptly.

Downtime Kits

Each clinical area is required to ensure that adequate stock for a local downtime kit is available at all times. The kits are standardized and located in a central area so that staff are able to access them easily if the EHR goes down unexpectedly. In addition to the standard downtime kit contents, laminated examples of completed paper medication charts have

Table 2 Components of our state-of-the-art downtime and uptime procedure

Preparation: downtime and uptime preparations	Response: downtime implementation	Recovery: uptime implementation
• Education and training • Back-up system and daily audits • Downtime kits • Downtime drills • Escalation and communication pathway • Clear roles and responsibilities • Uptime resource planning	• Activating downtime • Medication management in downtime • Tracking patient movement and changes • Medical imaging downtime webpage • Offline patient search	• Uptime medication procedure • Uptime clinical documentation procedure • Generic EHR note

Abbreviation: EHR, electronic health record.

been included to help guide clinical staff that are unfamiliar with them.

Downtime Drills

Downtime drills provide an opportunity for staff to practice skills in downtime and uptime procedure. Drills may be conducted as a staff preparedness audit, with planned downtime activities being used to test staff readiness for any unplanned downtime events. The district procedure requires the drills to be completed at least 6 monthly by the HIT or other delegated positions at randomly selected clinical areas at each facility. A minimum of three units are to be audited per downtime drill with staff being drilled selected at random. The drills involve locating the downtime kit, locating the unit 724DTV, logging into the application, searching for medications, and printing the downtime medication administration record (MAR) and uptime processes. See ►Supplementary Fig. S1 (available in the online version) for an example of a downtime drill assessment. Once the drills have been completed, the HIT report on each facility's results.

Escalation and Communication Pathway

Downtime communication depends on whether an EHR downtime is planned or unplanned. In planned downtimes, the chief information officer (CIO) or their delegate is responsible for communicating in advance any planned downtime via email, intranet bulletin board, and an EHR announcement box. The HIT are responsible for providing further information to end users and coordinating preparation activities. For unplanned downtimes, issues with the EHR are logged with the Service Desk and escalated to the relevant line manager. If the issue requires escalation, the Service Desk will inform the CIO or their delegate who then will communicate the incident to the facility executives. Departments must wait for formal downtime notification from executives before commencing downtime to ensure all units move into downtime together. See ►Supplementary Fig. S2 (available in the online version) for further information on unplanned downtime escalations. For unplanned downtime disruptions that are severe and/or prolonged, the risk to business continuity and patient management becomes greater so events are classified as a Code Yellow (Internal Disaster) and a dedicated incident management team is required to control the situation. This service management approach follows the industry best practices for incident management.

Clearly Defined Roles and Responsibilities

Clear roles and responsibilities for downtime and uptime ensure staff are prepared and know what to do. Each facility has a downtime coordinator, typically the nurse unit manager or nurse in-charge after hours, who is the point of contact for the incident management team and communicates with the facility coordinator. Standardized task cards, outlining key roles for downtime and uptime positions (e.g., unit coordinator, HIT, medical staff, and nursing and midwifery staff) are also available. See ►Supplementary Fig. S3 (available in the online version) for an example of a task card.

Uptime Resource Planning

Staff resourcing requirements for uptime will vary depending on the facility, the nature of the downtime, length of time, and time of day it occurs. Uptime teams consist of doctor–pharmacist pairs who work with the unit coordinator to identify and prioritize patient records to be reconciled within the EHR. Nursing and midwifery, and HIT staff may be required to assist the uptime teams. The district uses as a guide for resourcing: 2 to 3 hours are required for a doctor–pharmacist team to reconcile medication charts in a clinical area of high medication use (e.g., cardiology ward) and 30 to 45 minutes in areas with lower medication use. The resource guide is based on a formula developed from resources required during previous downtime events.

Response: Downtime Implementation

Our downtime implementation procedure includes five key components, as outlined below.

Activating Downtime

Once downtime has been activated and communicated, all staff are required to log out of the EHR and commence downtime procedure. This is important as sometimes downtime is activated for reasons outside of the EHR application being unavailable (i.e., due to remote-access server issues), meaning staff can still access the system, however, access would be unpredictable.

Medication Management in Downtime

Existing electronic medication orders are printed from the 724DTV on downtime commencement, and all paper medication charts in use are tracked in all clinical areas. New medication orders are prescribed on approved paper medication charts. Changes to existing orders are marked as ceased on the 724 charts and prescribed as new orders on the approved paper charts. Paper charts are kept in the patient bedside folder and medication supply is coordinated by the ward pharmacist, where possible. Pharmacists consult with staff to determine if there were any pending medication requests in the EHR prior to downtime, take a photocopy of the 724 medication chart and any additional charts to pharmacy to be dispensed, and retain a copy of the chart, including annotations with dispensing information, in the pharmacy.

Tracking Patient Movement and Changes

At patient registration points and clinical units, staff track all patient activity and changes using a district-wide, standardized inpatient downtime tracking form. The tracking form has been developed to assist staff involved in the uptime process as it contains the minimum data required for uptime reconciliation in all patient care areas. The information captured on the tracking form includes patient information, all inpatient and outpatient registrations, births and deaths, and all transfers, discharges, physician, and service category

changes. Unit coordinators must track all clinical events such as diet changes, alerts, clinical incidents, procedure attended, altered calling criteria changes and medication changes into the standardized inpatient downtime tracking form. For patients who are transferred to another facility during downtime, a paper discharge summary form is completed.

Medical Imaging Downtime Webpage

A medical imaging downtime webpage (PACS viewer) separate from the EHR is made available on the intranet, allowing staff to view patients' medical imaging, while the EHR is unavailable. However, if the downtime has been caused by a network outage, then the webpage would not be available and images inaccessible. There is no contingency in place for this event, and therefore, it would be categorized as a code yellow event where a plan would be put in place by the incident controller depending on the length of time expected for the downtime.

Offline Patient Search

The Patient Master Index Offline Search (PMIOS) allows access to patient demographic data during downtime, allowing staff to determine if the patient arriving during downtime has previously attended the organization. If a patient cannot be found in the PMIOS, administration staff can allocate a downtime medical record number (MRN). Supply of downtime MRNs is maintained by medical records or the health information manager/department at each facility.

Recovery: Uptime Implementation

Uptime is formally announced by the incident manager in consultation with key executive staff following rigorous testing of the EHR. This is then communicated to all facilities and services via the same method used to communicate a downtime activation. Staff are not to go into uptime until this has been formally communicated. The inpatient downtime tracking form is used to prioritize and streamline re-entry of patient Iormation into the EHR during uptime. The tracking form and recovery process involves retrospective data entry, restocking of EHR downtime resources, reporting of completed uptime tasks, and evaluation processes. Downtime paper-based records are stored in the patient record. Outlined below are important uptime considerations.

Uptime Medication Procedure

Uptime teams prioritize reconciliation of medication changes during downtime (i.e., new, modified, and ceased medications) for inpatients with online medication orders. Nurses utilize the inpatient downtime tracking form and paper medication charts to check and action any overdue medication administrations on the MAR. See ►**Supplementary Fig. S4** (available in the online version) which outlines the workflow for entry of retrospective medications administrations into the EHR. The uptime team communicates with staff to ensure medication prescribing and administration remains on paper until reconciliation has been completed.

Uptime Clinical Documentation Procedure

Our district uses several uptime procedure based on the type of clinical documentation, as shown in ►**Table 3**. All paper forms, records, and charts used during downtime are stored in the patient's paper medical record, or scanned for paper lite areas.

Generic Electronic Health Record Note

A generic note is entered into the EHR progress notes by the EHR unit indicating that the EHR was not in use for a period and paper records should be referred to for clinical information for that period. The note is entered on the next business day for patient charts with an active encounter prior to the downtime. A subsequent generic entry is added more than 24 hours after uptime has commenced to capture patients without an active EHR encounter prior to the downtime who require an encounter being added retrospectively.

Table 3 Uptime procedure for various clinical documentation types

Clinical documentation	Uptime procedure
Observations	Fluid balance chart tallies and any changes to tubes, lines, and drains are documented in the EHR by nursing and midwifery staff.
Between the flags chart	Altered calling criteria in "between the flags" charts are updated in the EHR by the medical team.
Discharge summaries	All discharge summaries are retrospectively entered into the EHR by the medical team.
Operation reports	The surgeons' operation report is entered or scanned into the EHR retrospectively by the delegated medical officer. The nursing intraoperative report is retrospectively entered into the EHR as a retrospective entry by the operation theater manager's delegate.
Outpatients	Patients with an outpatient encounter during a downtime have an EHR encounter retrospectively created by relevant administration or Medical Record staff within 24 h of uptime commencement. A generic entry is added to the EHR progress notes.
Emergency department: treated and discharged	The data re-entry into the EHR is as per the outpatient procedure.

Abbreviation: EHR, electronic health record.

Evaluation of Our Downtime and Uptime Procedure and Lessons Learned

We trialed our state-of-the-art procedure across the district during a large, planned downtime, which was required to upgrade the EHR to the universal time code (UTC). The upgrade to UTC would eliminate the need for an EHR downtime every daylight savings change. The UTC upgrade needed to be completed in 2022 and required approximately 8 hours of downtime. We scheduled our downtime event for 10 pm on a Friday in May, as we expected reduced patient and medication activity. Outpatient departments and elective surgery do not occur on weekends, reducing risks associated with technical problems, extending the downtime period. The disadvantages associated with a Friday evening downtime, including increased potential ED presentations and reduced staffing resources, were taken into consideration.

Preparation: Downtime and Uptime Preparations

A district downtime planning committee was formed in March 2022 and met weekly to discuss and plan the required downtime and uptime preparations, to align with our new state-of-the art procedure. To ensure we had adequate resources to complete the procedure, we sought approval from the district's chief executive for additional staff at each facility. A virtual command center was established to coordinate the downtime and uptime events. The use of mobile devices and an "open meeting" allowed for immediate notification of urgent issues during the downtime.

In line with the new procedure, district communications about the planned EHR downtime were circulated to staff via email and uploaded to the district intranet. Staff were reminded to complete their online modules. The local HIT, and pharmacy and medical information officers, provided downtime training at each facility, including specific training on the relevant paper charts and the uptime medication reconciliation process. Areas or roles that were more complex, for example, the ED, pharmacists, and medical officers, required longer training sessions than the standard 30-minute session for other hospital staff. Quick reference guides were also developed.

Response and Recovery: Downtime and Uptime Implementations

During downtime and uptime, onsite support was provided by the district's HIU. The downtime support involved ensuring the wards were aware of and correctly completing their downtime preparation tasks. The uptime support involved assisting the dedicated uptime teams to correctly reconcile patient information back into the EHR.

In total, there were 86 ED presentations, 30 new admissions, 4 births, and 2 deaths across the district during the EHR downtime period. These figures were comparable to the same time periods in the preceding and succeeding weeks. Approximately 2,700 medications were administered to patients during the downtime. This figure was estimated from an EHR report of the medications administered during the same time period on 17 to 18 June 2022. Uptime was successfully completed and finalized within 6 hours across the district. No major incidents were reported during the downtime and operational performance was not significantly impacted during and after the event. Feedback from the HIU was sought to gain insight on the procedure implementation from a support perspective, and we highlight components of our procedure that worked well, and those that did not, in ►Table 4.

To explore staff experiences of implementing the new procedure, an online REDCap survey was administered to staff following the downtime and uptime events and responses were received from 83 staff members across the district. The responses were collated in an excel spreadsheet, and basic descriptive statistics were performed. Feedback from staff aligned with that of the HIU. Nearly all staff (>95%) were aware of the planned downtime, 87% indicated that they were partially or fully aware of their roles and responsibilities in downtime and uptime and 76% of staff felt confident with how to escalate issues during downtime and uptime.

In contrast, 51% of staff reported that they were unaware of the online downtime resources available, 27% said they did not feel supported during the downtime and uptime events, and several staff were not aware of the rationale for the downtime, or of the date and time chosen.

Lessons Learned

Our local evaluation, including staff feedback, revealed some clear areas for improving our downtime and uptime procedure. In total, we identified 24 areas where the procedure could be improved, related to the following themes: communication and change management, resource allocation, training, downtime artifacts, and downtime support. See ►Table 4 for a summary of the key issues identified. In particular, we identified a need for clearer communication on why downtime is occurring and why a particular time and date has been chosen and on waiting for formal notification from coordinators to commence downtime and uptime processes. To address this need, we revised our notification text to be shorter and simpler, introduced a burst short message service to staff, and created a communications checklist. We introduced additional resources, particularly in larger facilities overnight, to assist in the transition to downtime and provided further training on using downtime paper forms, and uptime medication reconciliation.

Next Steps

Further steps are being taken to continue to improve the downtime approach in NSW, Australia's largest state. Training and education are being further developed with a focus on a blended learning approach to prepare staff for downtimes. Downtime drills will become centralized through a state-wide platform to increase visibility and governance. Downtime paper forms require standardization to align with current clinical and digital workflows and improve the user experience. We also recommend a formal evaluation be undertaken of our new procedure.

Table 4 Reflections on our state-of-the-art downtime and uptime procedure

Components that worked well	Problems or issues that emerged
Downtime and uptime preparations	
The number of medical and pharmacy staff estimated via the formula developed for the uptime teams was sufficient	Many staff did not understand the rationale for the timing of the downtime and uptime events. Having clearer communication as to why the specific downtime is occurring and reasoning for the period chosen could be beneficial
Training for pharmacy on using paper forms and the uptime process for medication reconciliation was useful and informative	The medical teams and nursing and midwifery staff rostered for uptime did not receive the same training as pharmacy and therefore would benefit from the uptime medication reconciliation training
The use of a district approach to request provision of staff resources resulted in having a centralized budget for additional staff allowing for adequate number of staff at each facility	
Downtime and uptime implementations	
The Inpatient Downtime Event Tracking Form, when used correctly, was excellent in assisting the uptime teams to efficiently reconcile patient information into the EHR	Not all wards were aware of how to utilize the Inpatient Downtime Event Tracking Form and further training for future downtimes is needed
A virtual command center for coordinating and communicating downtime and uptime events was utilized well and was successful for escalating issues	Some staff began using the EHR before they were officially informed to do so by the facility uptime coordinator. The result was that they had to re-enter this information
The use of the Vocera Badge (handsfree communication device) and Microsoft Teams chats allowed for timely and efficient communication between staff during the downtime and uptime events	Not having a downtime clinical resource allocated to assist the larger facilities overnight meant that some information was missed during handovers and some tasks were not completed, e.g., completing the Inpatient Downtime Event Tracking Form, and continuing to use the paper medication chart until reconciliation had been finalized
	Some of the paper forms used for the downtime, e.g., the National Inpatient Medication Chart, were not well utilized due to lack of training

Abbreviation: EHR, electronic health record.

Conclusion

In this paper, we describe our state-of-the-art downtime and uptime procedure, and lessons we learned from its implementation. We hope our detailed description and lessons are of value to other organizations embarking on their EHR downtime journey. The implementation was successful with staff well prepared and information reconciled efficiently, ensuring safe continuity of care. It was only through extensive planning, and significant commitment and engagement of all stakeholders, including front-line staff, executives, and HIT, that this outcome was possible.

Clinical Relevance Statement

There is limited guidance available on how to develop and operationalize downtime procedure at a local level. This paper fills this gap by outlining a comprehensive, mature, downtime procedure including downtime and uptime preparations, downtime response, and uptime recovery. This procedure prepares and equips staff and organizations to manage EHR downtimes, mitigating some of the associated high risks to patient safety and care. Our procedure is vendor agnostic, and key elements can be applied by any hospital or district, like our quantification of the resources required to safely complete uptime processes and enter data back into the system. Overall, our emphasis on approaching downtime management like any other clinical emergency ensures staff are well prepared for these events.

Multiple-Choice Questions

1. Electronic Health Record downtime events are a high risk due to:
   a. Medication information being unavailable
   b. Clinical decision support being unavailable
   c. Delays in delivering patient care
   d. All of the above

   Correct Answer: The correct answer is option d. Downtimes are risky as patient information and critical EHR functionality, such as medication ordering and administration, and clinical decision support, are unavailable, resulting in delayed or suboptimal care.

2. With downtime and uptime preparations which of the following is a key preparatory activity?
   a. Preparation is not needed
   b. Activating downtime

c. Education and training
d. Tracking patient movement and changes

Correct Answer: The correct answer is option c. Education and training is part of the downtime and uptime preparation activities. Activating downtime and tracking patient movement are a part of the downtime implementation response activities.

3. Which of the following was a lesson learnt from implementing the new downtime and uptime procedure?
   a. Need for clearer communication on the purpose of the downtime event
   b. Education and training for staff is not required
   c. There were no lessons learned
   d. Downtime events pose no risks to patients

Correct Answer: The correct answer is option a. From the staff survey responses, we identified multiple lessons learned including a need for clearer communication on why the downtime is occurring and why a particular time and date has been chosen. Education and training are essential to downtime preparation.

Protection of Human and Animal Subjects

This work constituted a quality improvement project, and ethics approval was not required.

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None.

Conflicts of Interest

None declared.

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