# Houston, We Have a Problem: An Informatics Analysis of Downtime Preparedness

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## BACKGROUND/SETTING

- Use of Electronic Medical Record (EMR) has increased patient safety and staff efficiency.
- There is an increased reliance on digital strategies in health care delivery.
- System downtimes can have significant impact on business continuity and can increase risk of patient harm
- Prolonged system outage at a regional institution heightened concern and awareness of local staff readiness.

## LITERATURE REVIEW

- Staff notification of Downtime
- Accessing patient data and documents
- Explicit Policies & Procedures
- Staff Education
- Interprofessional Collaboration
- Use of simulation software

References:
Anderson, L.K., Stafford, C.J. (2002); Bulson, J., Van Dyke, M., & Skibinski, N. (2017); Cano, R., Bejarano, B., Vidal, M., Luna, D., & Benítez, S. (2018); Coffey, P. S., Postal, S., Houston, S. M., & McKeeby, J. W. (Summer 2016); Getz L. (2009); Kashiwagi, D. T., Sexton, M. D., Graves, C. E. S., Johnson, J. M., Callies, B. I., Jr., Yu, R. C., & Thompson, J. M. (2017); Larsen, E., Haubitz, C., Wernz, C., & Ratwani, R. (2016); Mielcarek, F., Badger, M., & Gall, K. (2016); Nelson NC. (2007); Sano, J. M., & Alexander, S. (2020); Sittig, D. F., Gonzalez, D., & Singh, H. (2014); Vaughn, S. (2011); Walsh, J. M., Borycki, E. M., & Kushniruk, A. W. (2019)

## THEORETICAL FRAMEWORK

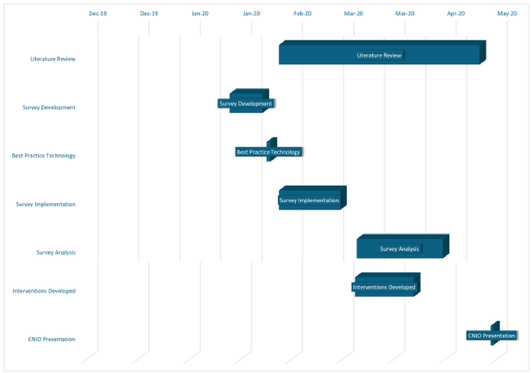
Theorists:

- Sister Callista Roy
- Kurt Lewin
- Avadis Donabedian
- Patricia Benner

The Donabedian Model for Quality of Care


Benner's Novice to Expert Theory


## METHODS

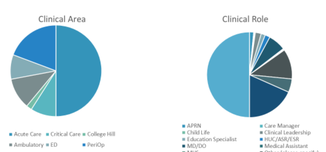


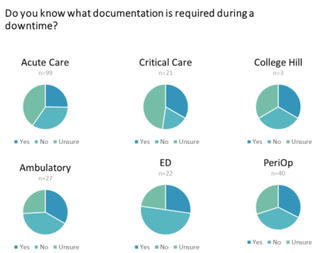

## RESULTS

Setting:

- Large midwestern pediatric facility.
- Institution reports 1.3 million annual patient encounters.
- Users in Benner's Novice/Beginner Stage

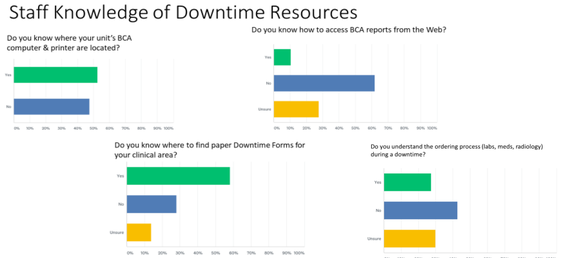
Survey Demographics n=261



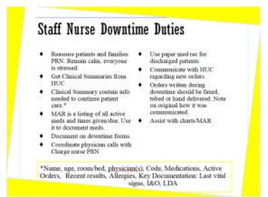

Staff Understanding of Roles & Responsibilities


Staff Knowledge of Downtime Resources




## OUTCOMES

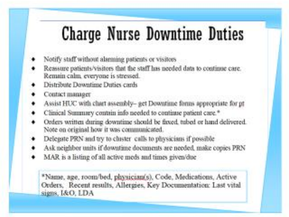
Role Cards



Staff Nurse Downtime Duties

- Reassure patients and families PRN. Remain calm, everyone is stressed.
- Get Clinical Summaries from HUC
- Clinical Summary contain info needed to continue patient care.*
- MAR is a listing of all active meds and times given/due. Use it to document meds.
- Document on downtime forms.
- Coordinate physician calls with Charge nurse PRN
- Use paper med rec for discharged patients
- Communicate with HUC regarding new orders
- Orders written during downtime should be faxed, tubed or hand delivered. Note on original how it was communicated.
- Assist with charts/MAR

*Name, age, room/bed, physician(s), Code, Medications, Active Orders, Recent results, Allergies, Key Documentation: Last vital signs, I&O, LDA



Charge Nurse Downtime Duties

- Notify staff without alarming patients or visitors
- Reassure patients/visitors that the staff has needed data to continue care. Remain calm, everyone is stressed.
- Distribute Downtime Duties cards
- Contact manager
- Assist HUC with chart assembly– get Downtime forms appropriate for gr
- Clinical Summary contain info needed to continue patient care.*
- Orders written during downtime should be faxed, tubed or hand delivered. Note on original how it was communicated.
- Delegate PRN and try to cluster calls to physicians if possible
- Ask neighbor units if downtime documents are needed, make copies PRN
- MAR is a listing of all active meds and times given/due

*Name, age, room/bed, physician(s), Code, Medications, Active Orders, Recent results, Allergies, Key Documentation: Last vital signs, I&O, LDA

**Downtime Levels**

ERO=EPIC Read Only( a snapshot of EPIC before downtime)
BCA= Business Continuity Access (Downtime Reports )

| Page Reference to Downtime Binder- for further info | Level 4 Minimal Impact | Level 3 Mild Impact | Level 2 Moderate Impact | Level 1 Major Impact |
|---|---|---|---|---|
| Definition | EPIC fully available Other system down that may affect processes. *Functions dependent on system that is down | EPIC available with interruptions during redirect to and from back-up server. | Full network intranet available ERO with BCA Reports, NO access to Back-up Server. | NO Network Available- NO Epic Read Only (ERO), Back-up Servers down |
| Access to Patient Information (pg. 8-12) | Epic | EPIC available fully except during transition to and from Back-up server. May see all info in Epic. ERO available during transition. Able to see reports, MARS in ERO, MAR and Patient Summary available from BCA | Able to see all documentation prior to downtime in ERO. Unit Census, MAR, Patient Summary & department specific reports available from BCA computer | Unit Census, MAR, Patient Summary & department specific reports available from BCA computer |
| **Documentation (pg 7)** | | | | |
| Where? | In EPIC | In EPIC- May use downtime forms when transitioning to Downtime Server | Downtime forms | Downtime Forms |
| Interfaced vital signs | N/A *unless this system interface is down | If patient is moved or discharged, the data from cardiac monitors or ventilators, for example, may not store and will need to be manually recorded prior to discharging pt from the system. Data must be manually added into EPIC. | | |
| Results (pg.28) | Radiology: Call 636-9853 LAB: N/A unless systems interface is down | Radiology: Call 636-9853 LAB: N/A unless system interfaces impacted | Radiology: Call 636-9853 LAB:Critical results will be called to clinical care. All other results Call 636-4281 | Radiology: Call 636-9853 LAB:Critical results will be called to clinical care. All other results Call 636-4281 |
| **Orders (pg. 13-14 )** | | | | |
| Orders Order sets available on Order Set Repository | May be entered in Epic, but may not cross over to receiving systems. *requisitions can be printed and sent. | May be entered in Epic with follow up, may not cross over to receiving systems once Epic is restored. | Pharmacy: Fax paper orders. STAT orders sent to designated STAT number. LAB: Send specimen with downtime requisition form. Radiology: Fax Radiology Downtime Request Form | Use paper orders and requisitions. Tube system or runner delivery. Follow up to departments. STAT orders need to be called. |
| Labels | Print from Epic | Print from Epic, use ERO during transition | Print from ERO. Use Downtime Label printer for new patients not in EPIC | Downtime Label Printer Icon |
| Mobile Applications (Rover, Haiku, Canto) | N/A unless mobile wifi network is down. | | | |

Prepared by Clinical Informatics/April 2020

## CONCLUSIONS

Key Learnings:

- Inevitability of downtime necessitates staff proficiency in downtime procedures
- Organizational assessment of staff preparedness and development of interventions to address knowledge and resource gaps is vital for business continuity

Next Steps:

- Engagement of key stakeholders.
- Creation of interprofessional working group.
- Development of educational curriculum.
- Follow up survey after implementation of interventions

Recommendations:

- Future research for evidence-based practice
- Include concepts of downtime preparedness in pre-licensure education