Unmasking the Sources and Dynamics of Adaptive Capacities

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In Memoriam

Robert L. Wears
MD, PhD, MS, FACEP

March 18, 1947 - July 16, 2017
Overloaded Emergency Departments: A Chronic Problem in the US and Globally

Case Study as part of a longer Observational Study

In the study:

• 1200+ hours of ethnographic observations over 4 years at a busy 90K patients/yr urban US Emergency Department (ED) and Level 1 Trauma Center
• Shadowing residents, nurses, technicians, others
• Semi-structured interviews with front line workers
• Case study data include interviews with 5 doctors, 7 nurses from day and night shifts, 1 nurse manager, 1 clerk, and 2 EMR systems coordinators.
History of Presenting Illness

Chief Complaint/Reason For Visit
1. Headache

HPI: Headache

Concern: Headache

Onset: 3 Weeks ago
Duration: 3 Hours
Severity: Moderate
Status: Improved

Location:
- Entire Head
- Frontal Left
- Occipital Left
- Parietal Left
- Temporal Left
- Temporal Right
- Occipital Right

Radiation:
- No

Quality:
- Blinding
- Pressure
- Superficial
- Throbbing

Aggravated By:
- Allergies
- Nausea
- Bright Lights
- Caffeine
- Exercise

Relieved By:
- Nothing
- Bath
- Ice

Context:
- Recent Head Trauma
- Recent MVA

Associated Symptoms/ Pertinent Negatives:
- Blurred Vision
- Clear Sinus Discharge
- Dizziness
- Double Vision
- Family History Migraine
- Headache

Comments:
- Childhood Motion Sickness
- History of Migraines
- Ice Cream Headache
- Sleepwalking
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Scheduled Downtime for Periodic Maintenance of EMR System is a Normal Routine

- Scheduled on the Night Shift, for 1:45 am
- Expected to last for two hours

- “It was a planned downtime. Our normal planned downtimes are 2 hours. IT gets a 2 hour window. It’s always 1:45 to 3:45 on a Tuesday night, Wednesday morning. Generally slow, and it affects less people. And for nursing flow on the patient floors, it’s good because it’s not medication time and it’s not wrap up your shift time.”
What Happened?

- 1:45 am – EMR system taken down
- 2:45 am – EMR system comes back on line

- “It's normally very smooth. It doesn't even hardly ever last two hours. ... Most of the time we’re down an hour or an hour and a half, and they we’re right back up again and everything functions normally right when we come back up.”
- “It's usually two hours, and you can pull up [the shadow system], which will give a picture of what it was, but normally we just use our whiteboards. You know, we get all our papers out, we get the folders out. Night shift, we're really efficient at it. We don't really have any trouble with it.”
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New Patient
What Happened?

- 1:45 am – EMR system taken down
- 2:45 am – EMR system comes back on line

BUT ...

11
Houston, we have a problem …

• “Apparently there were some issues when it came back up.”

• “Some of the notes were not floating over. None of the vitals from the machines were floating in to validate.”

• “It was also deleting complete notes. So that you would file a note and it wouldn’t file it. It would be lost.”

• “You couldn't move (the patients) from the triage computer slot to the ICU slot.”

• “At some point you could put that patient in a bed but it … created a double chart, because there was still that patient in triage and it was also showing the patient was in ICU at [the same] time, so it kind of created a double chart.”
Houston, we have a problem …

• “No one else could see that the patient was in the room or in the area. … I think he was in bed 9, it was like room 7, 8, 10. There was no 9. It just went away.”

• “Someone called back and said, ‘What are you doing down there? What are you typing in?’ I said ‘What do you mean? I am doing what I always do.’”

• “Rows from one column were flowing into other columns, or rows with one cell were flowing into other cells that shouldn’t be allowed.”

• “The medications that she was documenting weren’t falling off of her list either, which was very concerning because then she could create a medication error.”
Houston, we have a problem …

- “The SpO2 of 95% was like 0%. Values that shouldn’t be in there but were in there.”
- “There was actually a pain documentation of 2.227.”
- “A respiration should be 18 and it was saying that it was 2400.
- “Numbers that everybody knew were wrong, but we weren’t sure how they got there or how to get ‘em out. We couldn’t get them back out to correct them.”
- “It was probably one of the worst downtimes we’ve ever had.”
What Happened?

• 1:45 am – EMR system taken down
• 2:45 am – EMR system comes back on line
• 4:30 am – Charge nurse calls the Informatics Coordinator at home
• 6:08 am – Emergency shut down of EMR system
Why Downtime is Such a Problem

• “You don't really know where the patient is. You know, the patient could have checked in, they could have left, they could be in the back, they could be over here. ... Patients could get lost, easily.”

• “During the first downtime, we had all [the shadow] available to us. But, when the emergency downtime came, they shut everything down. We couldn’t use any of that. So we were all relying on patient history, ... it slows down the system and then they’re not 100% reliable about what’s going on.”

• “Shadow was corrupted also.”

• “We found most of [the BCA computers]. Some units didn’t have them anymore, ... but we haven’t touched these computers in a while, I think since Go Live. ... This is a very valuable tool for like the doctors.”
Why Downtime is Such a Problem

• “The hospital really does not move when we are on downtime. Everything takes longer. ... Just to call a bed, you have to fill out a form and fax it, ... The doctors all have to write their orders out.”

• “Bed board was down, because they work off of [the EMR]. ... they couldn’t even get the pending bed requests.”

• “Instead of just telling the computer to pull in vitals from the monitor you literally have to go over and write them all down.”

• “The poor triage nurse, if you have 30 home meds, they’re sitting in triage or the air room writing all those down.”

• “And then, some patient, ‘I just take a pink pill, I don’t..."
Why Downtime is Such a Problem

• “Any care that was initiated that wasn’t completed disappeared.”

• “There was a patient in CDU that needed to get blood and we couldn't see any of that. So, there was no paper we could pull up.”

• “You don’t know what’s ordered, what’s not ordered, when the doctors wrote their orders, if they were admitted, ... Everything was lost. So, it was kind of a scary time to say ‘What am I supposed to be doing for this patient right now?’”

• “I was just hoping that someone didn’t mess up a verbal order or pull the wrong med or you know something horrible with the meds.”
What Happened?

• 1:45 am – EMR system taken down
• 2:45 am – EMR system comes back on line
• 4:30 am – Charge nurse calls the Informatics Coordinator at home
• 6:08 am – Emergency shut down of EMR system
• 7:00 am – Shift Change
But, oh, the day shift

• “If you don’t work on nights, you have no clue what downtime is. It was like a whole new playing field for everybody.”
• “We had a lot of new people that never witnessed downtime before.”
• “There was a clerk that had never been here through a downtime. … it's huge for the clerks, because they are the ones that have to put these orders in.”
• “People get into such a panic, because they've never had it on paper, so it's like they don't know what to do. Everybody! They don't know how to, how do you label things?”
But, oh, the day shift

• “Emergency downtime generates a whole new pandemonium of people like “Ahhhh, what is paper? You mean we have to write with a pen?”
• “They were kind of freaking out about it, because there weren't any orders.”
• “My first thought was “Oh my God, all the day shift people.” … “Oh, no, this is going to be a mess, if day shift nurses have to do all this, and clerks”
• “The day shift nurses are going to freak out.”
Expressions of Resilience: What did they do?

- Knowledge Transfer
- Implicit Coordination
- Explicit Coordination
- Resource Management
- Emotion Management

Resilient Response
Knowledge Transfer

• “There's a lot more to it than people think.”
• “A lot of us stayed over to help them out, explain the forms to them, explain the process. Made sure they were competent and understood the process before we left, because it can be kind of overwhelming if you're not used to it.”
• “I pretty much explained to the NOD what her process was. I told the clerk how to write down the downtime forms. I helped with the clerks transcribing the orders from the order sheet. I explained to my nurse when I was giving report to make sure she was comfortable with what the downtime process was.”
• “I told her, I would worry more about your PRN medications than anything.”
Knowledge Transfer

• “The night shift to day shift handoff, was pretty good. Because they explained to the nurses. …’Keep charting on this paper until they tell you to stop.’”

• “Just trying to let them know “This is what you do. Fill out these forms. This is the process. This is your best way to kind of set it up,” because you kind of shift roles out here.”

• “The registration people didn’t realize they have to shift out front now. Hey, I’m going to need you to be out here, because you have to do everything up front. On the computerized part, the ER staff, the techs register the patients. But when we go to downtime, we have to have registration [do it]."
Implicit Coordination

• “We kind of pretty much just talked and said, ‘did you talk to this person?’ Yes. ‘Have you talked to that person?’ Yes. ‘Okay I'm an going to check on this area, make sure they're good.’ We pretty much just bounced around and made sure they were okay.”

• “People were asking where particular forms go, what should I do with this form, how to I get in contact with a one of the medical services on the floor to get this patient admitted, how do I get find out the admitting orders if I can’t see them on the computer, how do I know if this patient has a room.”

• “We basically trained each other from different perspectives, from different points of view about how to go about the situation at that point in time.”
Implicit Coordination

• “If you were a nurse in ICU you just stayed in ICU and kind of told the people that were relieving you how to do the system. So, it was like kind of one-on-one, to share with the next shift. … It was kind of person to person. Now you’re going to take over and do this.”

• “The nurses were kind of just helping each other.”

• “It was like brand new training for everybody else, so making sure everybody noticed that we’re back on paper charts, so you had to pay attention.”

• “Pretty much wherever you were at, you just stayed and helped that specific person.”

• “[The techs said] If we don’t see it, just reach out and grab one of us, so we can know the labs are up and ready.”
Explicit Coordination

• “I am really happy that [the charge nurse] called me, … because people love to find workarounds rather than actually trying to fix the issue.”

• “Our manager came out and asked us if we could just stay for a few more minutes, 15 to 20 min.”

• “[The managers] was letting the NOD know what to look out for. They were telling the clerks, just giving us the run down, so we know what to do. It was little things, to keep the flow going.”

• “She designated. Will you help here, and can you go to triage? I said ‘Yeah, I can do both of those.’ ”
Resource Management

• “We go through the ED and just make sure they have adequate paper forms.”

• “I mean the forms are actually always there. There’s like a rack of them. … The forms are always there.”

• “And backup forms are in a closet. For resus, stemis, and stroke alerts, I have pre-made packets, like 3 to 5 of each.”

• “I just placed it in the copier and made copies of it, the tricolored paper. White, yellow, and pink.”
Emotion Management

• “[At morning huddle, the nurse manager] basically put a stop to it (the questioning) and said ‘This is a bad situation, everybody. You’re going to have to chart on paper today.’ Because they started, … ‘What am I supposed to do? I’ve never done this before.’” She basically put a stop to that and said you know ‘I am here to help.’”

• “So I just told her “it's okay, you can’t do anything if it’s down, how are you supposed to know.””

• “I saw a couple of different conversations where the daytime was like, ‘What? What? What?’ and the nighttime said, ‘Hey, hey, it's going to be all right. This is what we do.’”
Enablers of Resilience: Resilient Capabilities

- Knowledge Transfer
- Implicit Coordination
- Explicit Coordination
- Resource Management
- Emotion Management

Resilient Response
Enablers of Resilience: Resilient Capabilities

- Protocols and Routines
- Individual Expertise
- Social Capital
- Special Sauce

- Knowledge Transfer
- Implicit Coordination
- Explicit Coordination
- Resource Management
- Emotion Management

Resilient Response
Protocols and Routines

• “The process is the doctor gets the order sheet, he writes the order in and then hands it to the clerk. And then that clerk is responsible for putting it in the computer, marking it off, and then flagging it for the nurse. So then the nurse comes by, takes the sheet, draws the labs, or you know, does the orders.

• “I printed up an H and P on my patient, ... just in case the system doesn't come back, which it didn't come back.

• “I gave it to the next nurse coming on. I left it in the patient's chart. And I said this is what they are here for, you know, because you can't look at any of that stuff.”
Individual Expertise

• “There were quite a few of us on night shift that have done it. Yeah, it's not a big deal.”
• “We’re comfortable with the process. They are not. They never have to do it. And, I come from paper. I came before the [EMR] system even was up, so I’m very comfortable with the paper process”
• “‘One of the night shift clerks who is very well versed in downtime, she actually agreed to stay”
• “Most people with experience and knowledge do somehow end up on the night shift, for whatever reason.”
• “I’ve been here a lot during [EMR] downtime. I was here actually when we switched over to [EMR] years ago.”
• “An attending in flex and attending in ECC … were familiar with the downtime, so hopefully they were able to
Social Capital

• “Because I think everyone has worked together. … It was just like the nurses staying over, helping, making sure that they all knew. It was just everyone just did what they were supposed to. Nobody like bailed ship. Everyone stayed to make sure there was a clear understanding, do you get it, do you understand, do you have any questions, kind of thing. I think that we all did a great job of it.”

• “That’s why as a team it’s easier for us to adapt, and go independently when we don’t always have support.”
Social Capital

• “A bunch of us stayed over. … you didn’t have to like twist our arms or anything, we were more than willing to stay and help them out. … And, day shift was very receptive of it. None of them seemed to have an attitude. They were all like very gracious and like thank you so very much for staying over. You could tell they seemed a little stressed about it. And, they were all very thankful. It was actually kind of nice. Nice little flow.”
“I think ED people just by nature are a little bit more like adaptive and go with the flow, and whatever comes next, and just deal with it.”

“I mean they took it by the horns. They didn’t complain about it or nothing. They just ... rolled with the punches at that point in time. You know, because everybody feels like you just gotta deal with it right now because there’s no time. Because if you sit around and complain about it you gonna fall further behind. So, everybody was, OK, just show me how to do this and we gonna get this done.
Special Sauce

• “We [the night shift] kind of learn how to overcome things, because we are kind of floating by ourselves. We don’t have all the ancillary support that day shift people have, so we kind of just deal with it, hit it head on, and just go, and keep going. … I think we’re good problem solvers at night. I think that’s why when adversity comes to us it doesn’t shake our bones very much, because we’re kind of used to it, I guess. … I think it just comes with time.”
Special Sauce

- It was just everyone just did what they were supposed to. Nobody like bailed ship. Everyone stayed to make sure there was a clear understanding, do you get it, do you understand, do you have any questions, kind of thing. I think that we all did a great job of it.

- “That's pretty cool. And you know what, we have a couple of nighttime nurses that are really level headed, common sense types and they, I could hear them talking about it before the people came in and it was almost a sense of planning.”
Conclusion

• “Yeah, everybody just kept cranking along in the ED. We didn’t really have any big issues in the ED.”
• “Even though it was not fun, I think it was a good drill for day shift. … I think it was a good learning experience for everybody.”
• “We’re keeping the white boards everywhere just for downtimes.”
What Happened?

- 1:45 am – EMR system taken down
- 2:45 am – EMR system comes back on line
- 4:30 am – Charge nurse calls the Informatics Coordinator at home
- 6:08 am – Emergency shut down of EMR system
- 7:00 am – Shift Change
- 9:15 am EMR system comes back on line
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- 7:00 am – Shift Change
- 9:15 am EMR system comes back on line
- 9:15 am to 9:45 am: Five critical patient arrivals
  - Resus went to Bed 1
  - Stroke alert went to Bed 2
  - Newborn delivery in the parking lot
  - Two trauma patients from the same MVC, one with two broken legs and received a thoracotomy
Conclusion:

PREPARATION AND IMPROVISATION

Protocols and Routines

Knowledge Transfer

Implicit Coordination

Explicit Coordination

Resource Management

Emotion Management

Resilient Response

Individual Expertise

Social Capital

Special Sauce
Reflections

- The system reconfigured itself, temporarily shifting resources to the area of greatest need.
- The response developed spontaneously in a community of practice, and
- Was not explicitly codified in procedures
- Specific details were negotiated in an impromptu manner, on the fly, in real time.

> The specific path of a given expression of resilience is not predictable in advance but is dependent on contingencies that are constantly changing

- Many of the resources facilitating these expressions appear at different levels of the system and often have accumulated over long periods of time.
Thank you