Interprofessional Nursing Education for Technological Advancement in Cardiac Arrest Documentation

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Abstract Summary

Goals of project:

- To improve preparedness of nursing students to utilize technology and to interact with professionals from a technological-centered field;
- To develop an educational collaboration between a nursing course and a software engineering course;
- To enhance learning through the development and trial of two electronic cardiac arrest flow sheets for code simulations during cardiac arrests
- To provide SE students with an opportunity to interact with clients from a different domain and work on a real-world problem

Background

- According to the Quality and Safety Education for Nurses (QSEN) Institute (2018), interprofessional collaboration and informatics are competencies all nurses should meet.

- The National Academy of Medicine, the former Institute of Medicine (2018), recommends providing opportunities to participate in collaborative and interprofessional activities. Software engineering provides a unique opportunity to learn the role of informatics in patient care (Gray & Christov, 2017).

Background

- Information technology is increasingly permeating healthcare—from electronic health records and computers on wheels to smart pumps, various devices that monitor the patient, and even smart phone apps for instant communication and paging.
- Education that includes some form of technological background is increasingly important to enable nurses to quickly and effectively learn how to operate in a technology-permeated working environment.

Background

- A deeper understanding of technology and how it is developed could also empower nurses to participate in the building of the devices and the software that they use on a daily basis. This could in turn result in more positive patient outcomes and higher-quality software used in healthcare (Qin et al., 2017).

- This bridging of the gap between technology professionals who deliver technological solutions and nurses who know what is needed, may remove some of the barriers to utilizing electronic health records by nursing (Houston-Raasikh, 2014).

Prior Interprofessional Collaboration

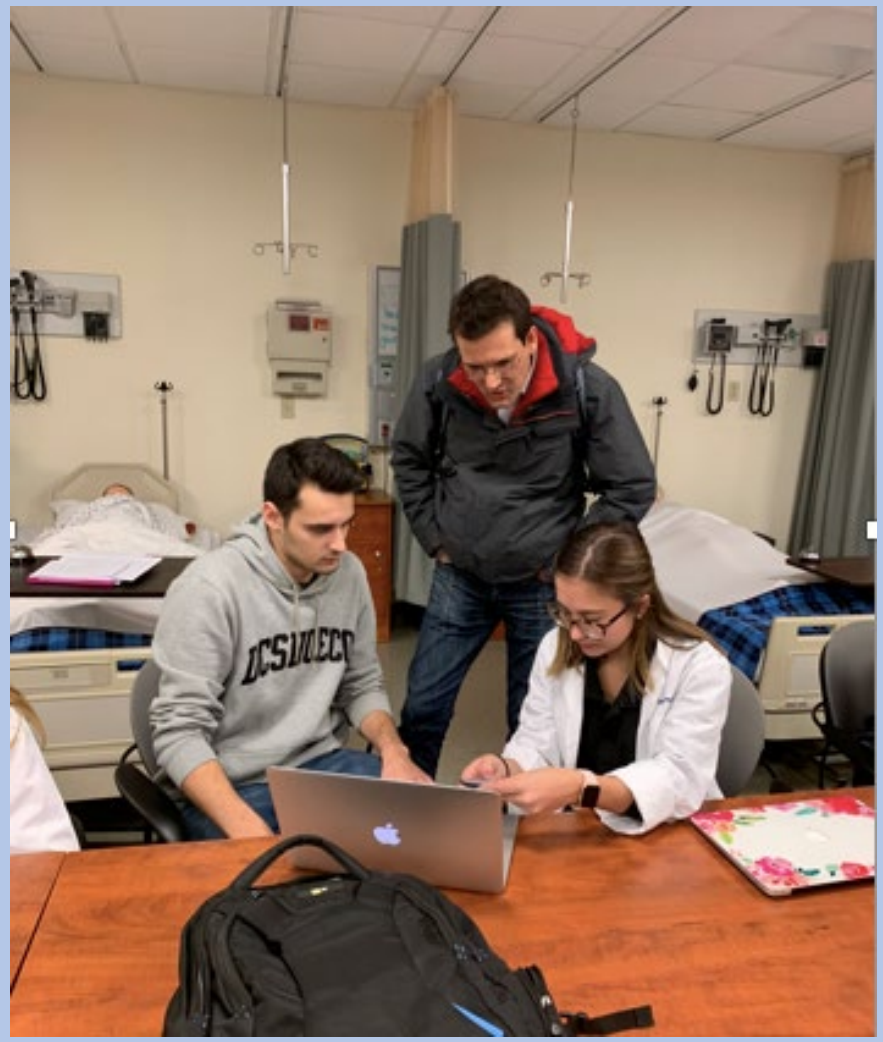
1. 2015: Interprofessional Collaboration Related to Clinical Decision Support (CDS)
2. 2016: Interprofessional Collaboration with Software Engineering and Jr Nursing students Regarding Insulin Administration Guidance and Documentation
3. 2016-2017: QU Grant: Interprofessional Education and Improved Student Advising through a Collaboration between Software Engineering and Nursing
4. 2018: Interprofessional Collaboration with Code Documentation (one semester course, project began in last 7 weeks of the semester)

Four Phase Project
Phase I

- Nursing professors met with SE professor to discuss the idea of a computer-based code sheet
- Nursing professors provided SE students with a background on codes for cardiac arrests and their documentation (1hour class)
- SE students elicited the requirements for the code documentation course project, prepared mock-ups to illustrate their ideas for a prototype, and obtained feedback from the nursing professors (2 week time period)

Phase II

- SE students developed a first working version of a software application for documenting codes and demonstrated to nursing students and professors for feedback and suggestions for modifications



Phase III

- SE students refined their software applications based on the feedback from the previous phase (1 week time period).

- At the end of phase III, SE students presented their final applications to a jury of nursing students and professors who choose the top two software applications

Phase IV

- Top 2 applications are used by nursing students during cardiac arrest simulations practice
- Top 2 applications are used by nursing students during cardiac arrest simulation finals
- Two students documented during each code- one using paper and one using the software applications during the code simulations

Evaluation

Surveys were administered to both the nursing and the SE students as well as the lab faculty. Questions included:

- the value of the specific skills learned
- the value of the project r/t interprofessional collaboration
- code sheet preference

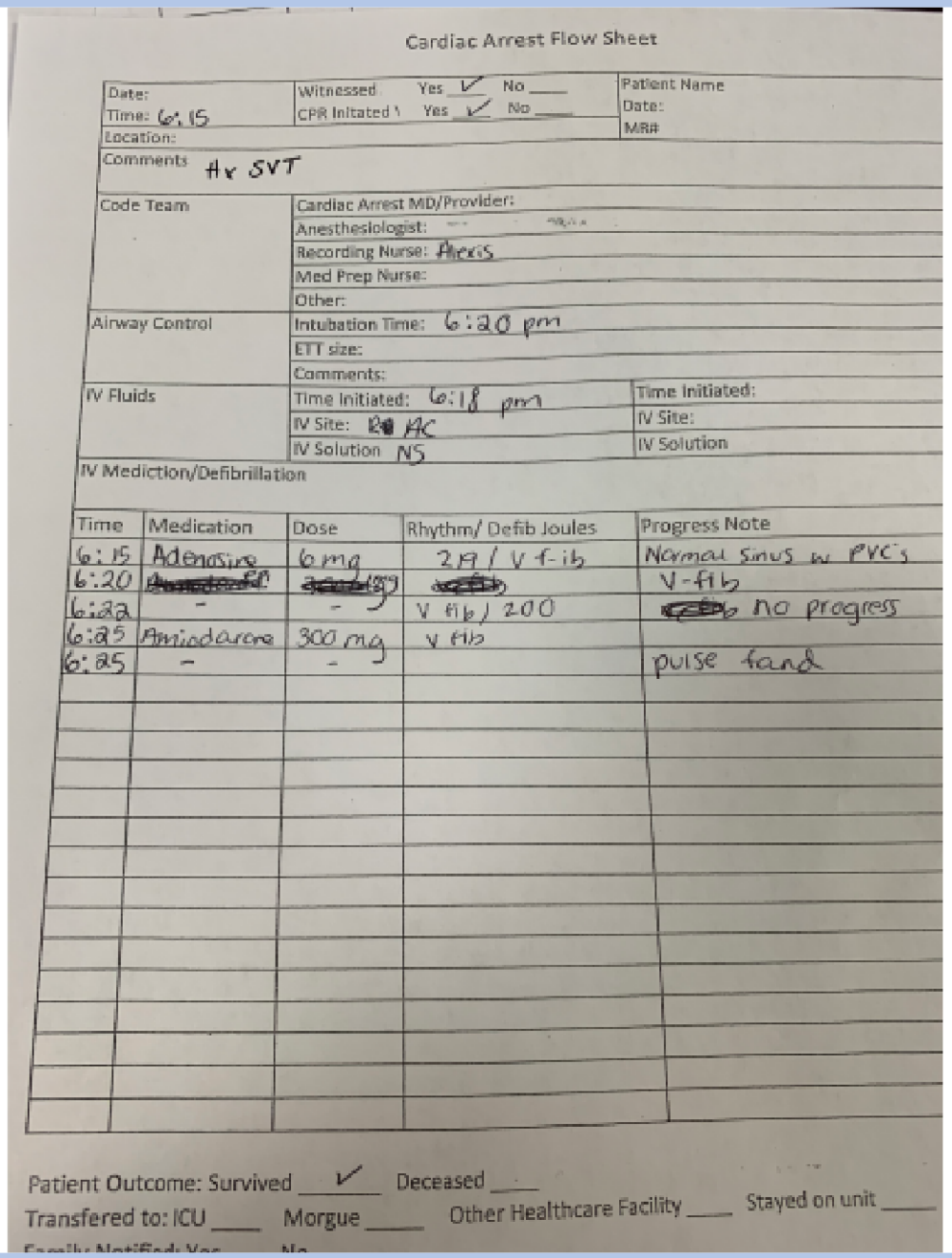
Survey Results

- 100% reported Collaboration was effective
- 100% reported positive interdisciplinary skills
- 100% of students/instructors preferred the software over paper

Benefits of New Software

- More complete
- Easier to read
- Easier to correct documentation
- Easier to use in post code huddles/debriefing

**Higher quality code documentation using an electronic system is supported by previous research (Grig et al., 2013; Coffey et al., 2015).*



Cardiac Arrest Flow Sheet

Date:	Witnessed Yes ✓ No ___	Patient Name
Time: 6:15	CPR Initated Yes ✓ No ___	Date:
Location:		MR#
Comments #x SVT		

Code Team	Cardiac Arrest MD/Provider:	
	Anesthesiologist:	
	Recording Nurse: Alexis	
	Med Prep Nurse:	
	Other:	
Airway Control	Intubation Time: 6:20 pm	
	ETT size:	
	Comments:	
IV Fluids	Time Initiated: 6:18 pm	Time Initiated:
	IV Site: R AC	IV Site:
	IV Solution NS	IV Solution

IV Mediction/Defibrillation

Time	Medication	Dose	Rhythm/ Defib Joules	Progress Note
6:15	Adenosine	6mg	29 / V f-ib	Normal sinus w PVC's
6:20	[illegible]	[illegible]	[illegible]	V-fib
6:22	-	-	V fib / 200	[illegible] no progress
6:25	Amiodarone	300 mg	V fib	
6:25	-	-		pulse fand

Patient Outcome: Survived ✓ Deceased ___

Transfered to: ICU ___ Morgue ___ Other Healthcare Facility ___ Stayed on unit ___

Family Notified: Yes ___ No

Quinnipiac University Coding Sheet

Patient Info

Patient Name: Jeff Saxton
Patient ID: 0
Patient DOB: 01-01-1998

Code Info

Patient Deceased: false
CPR Performed: true
Transferred to: ICU

Code Notes

Nurses

Team Leader: Logan Hayes
Anesthesiologist: Steph C, Brooke Hamilton
Documenter: Nicole Bucci
Other Roles: airway - alexis jones, CPR erin greely, and Victoria Fascione

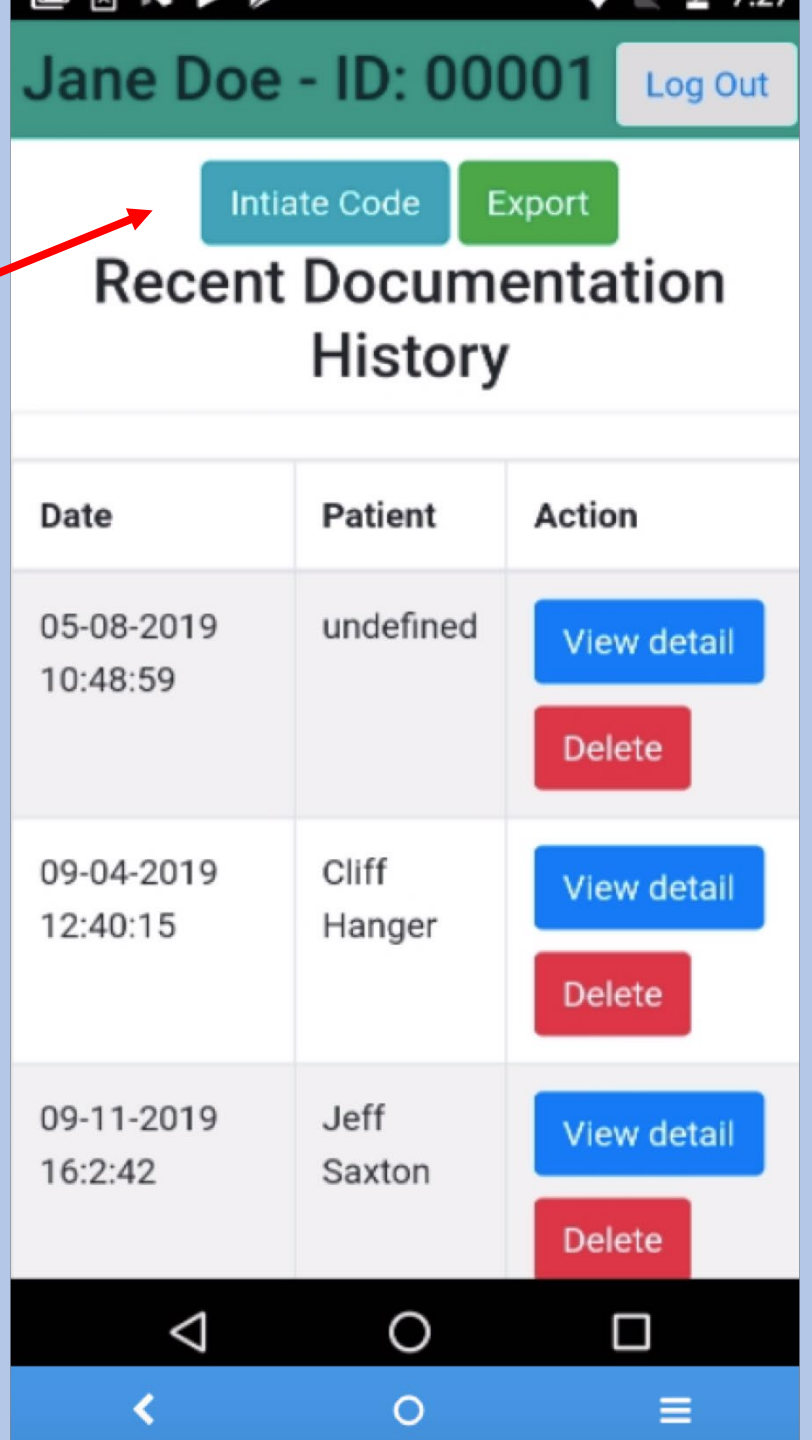
List of code actions

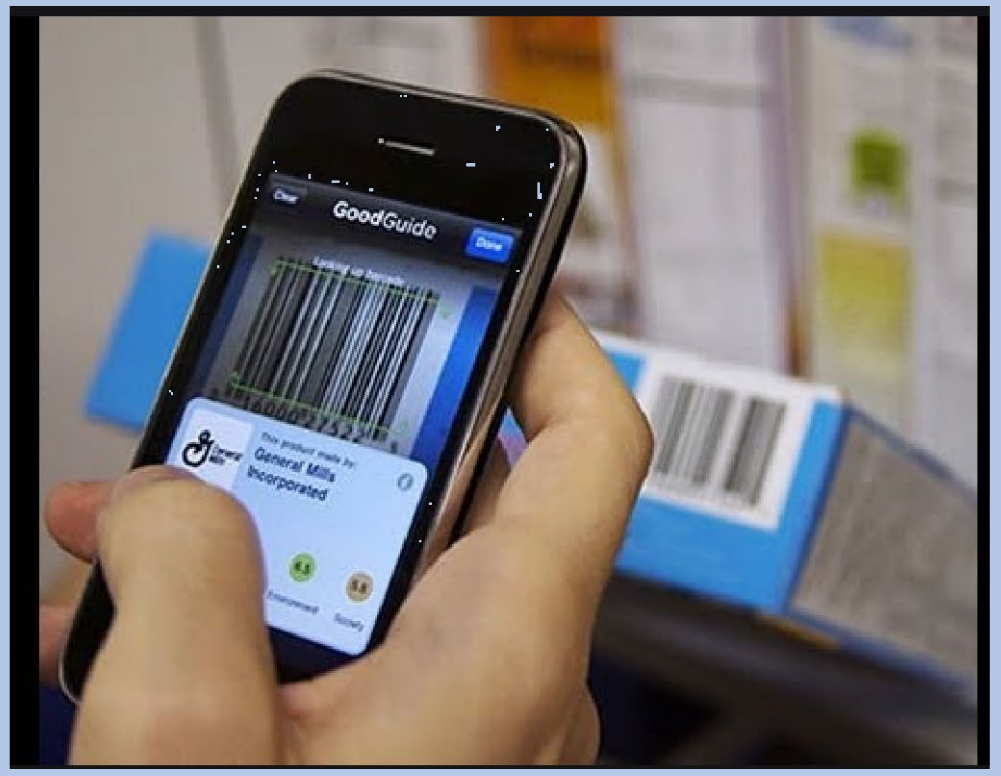
- 18:22:12 rapid response called
- 18:22:43 patient in SVT
- 18:23:06 Patient heart rhythm is Ventricular fibrillation (VF)
- 18:23:59 Patient was shocked with 200 joules
- 18:24:04 compression began
- 18:26:19 Patient heart rhythm is Ventricular fibrillation (VF)
- 18:26:31 Patient was shocked with 200 joules
- 18:26:36 Compressions Started
- 18:27:02 Patient was injected with 1 of Epinephrine
- 18:28:20 Patient was injected with 300 of Amiodarone
- 18:28:45 CPR stopped to analyze
- 18:29:15 patient woke up
- 18:29:18 code ended

Lessons Learned

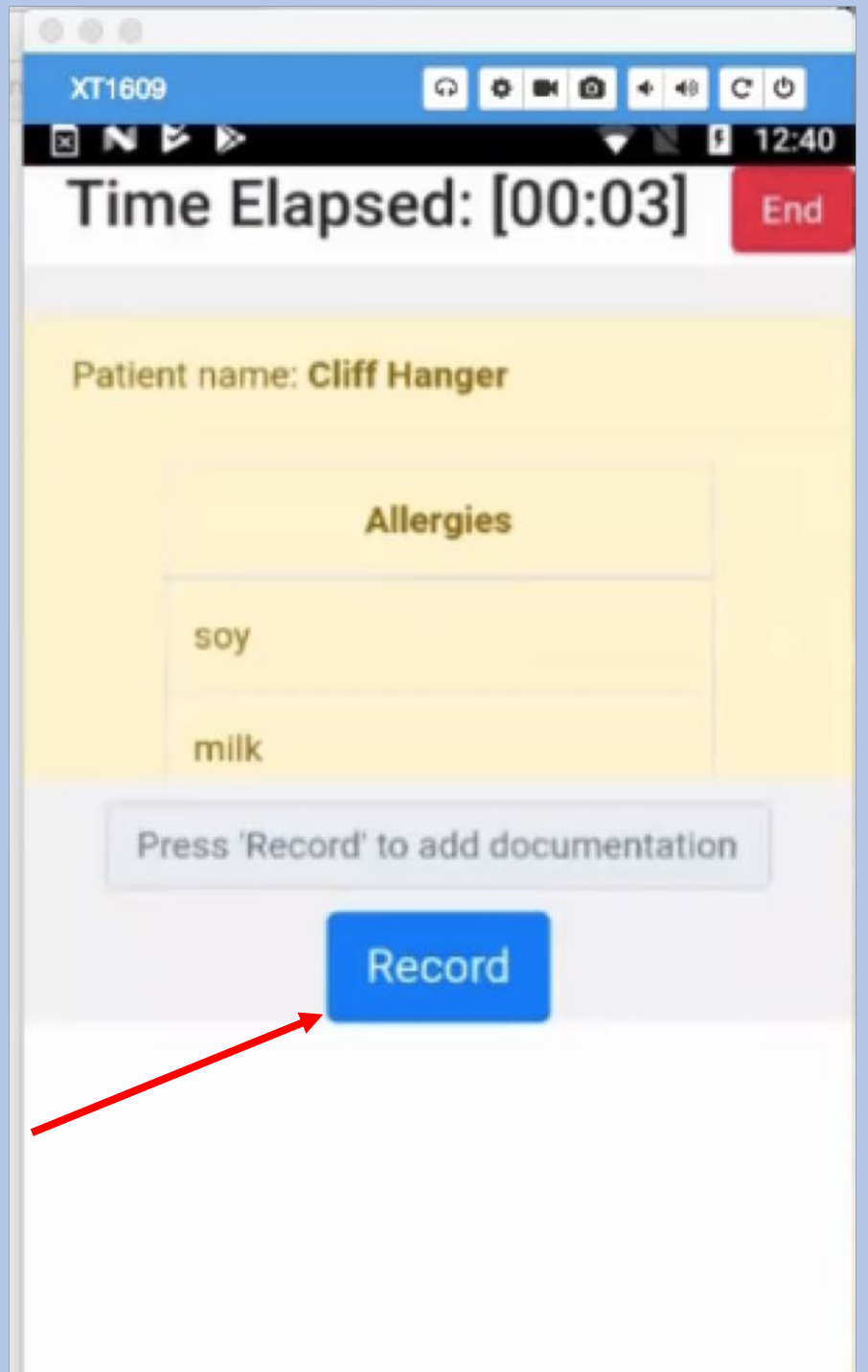
- Additional time is needed for teaching and development of the application
- Emphasis should be placed on the importance of Code documentation in the SIM lab content
- Accuracy and completeness of the code record should be included in SIM grading
- Code documentation should be included in the final code huddle and debriefing

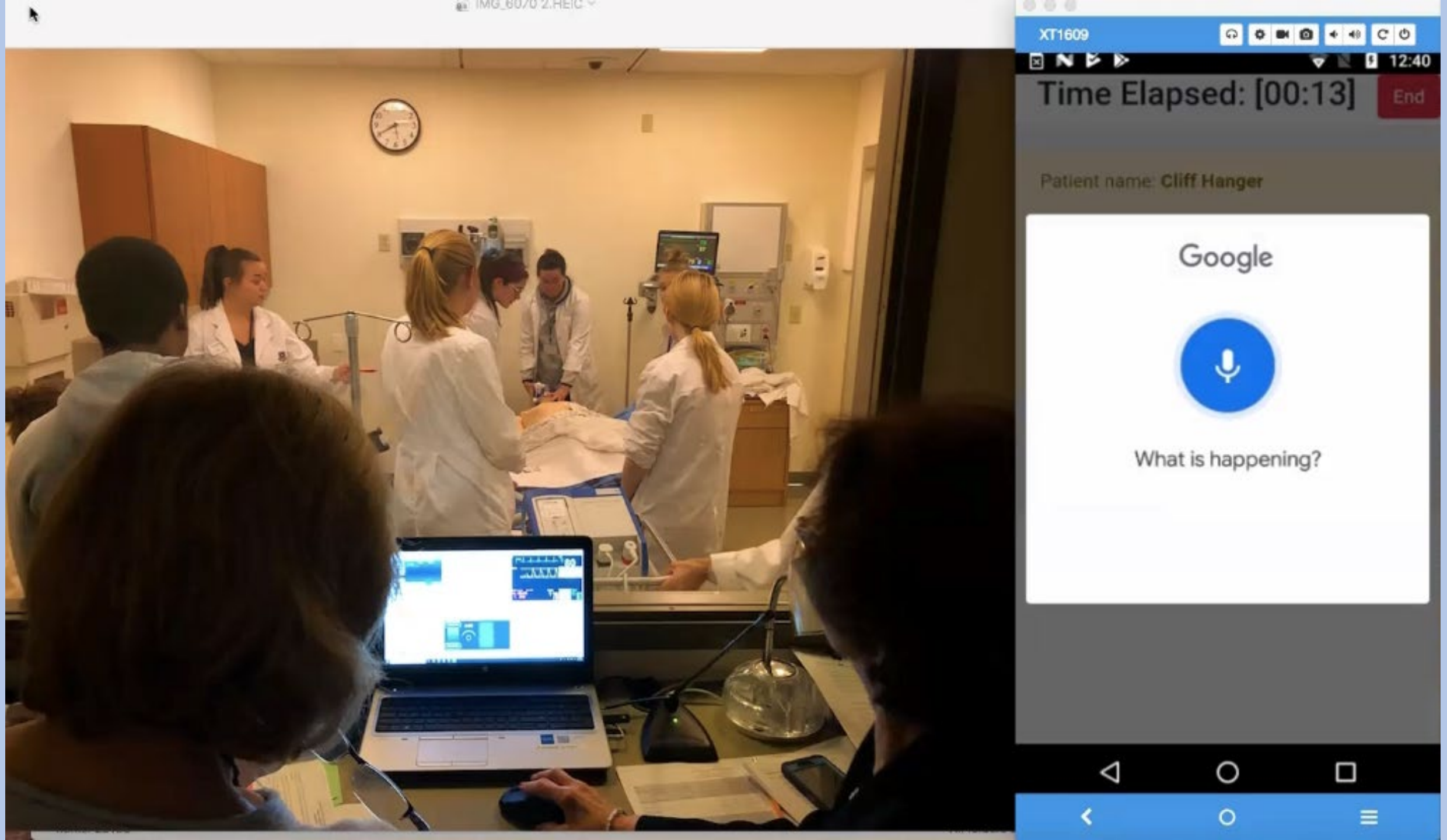
Brief Demo

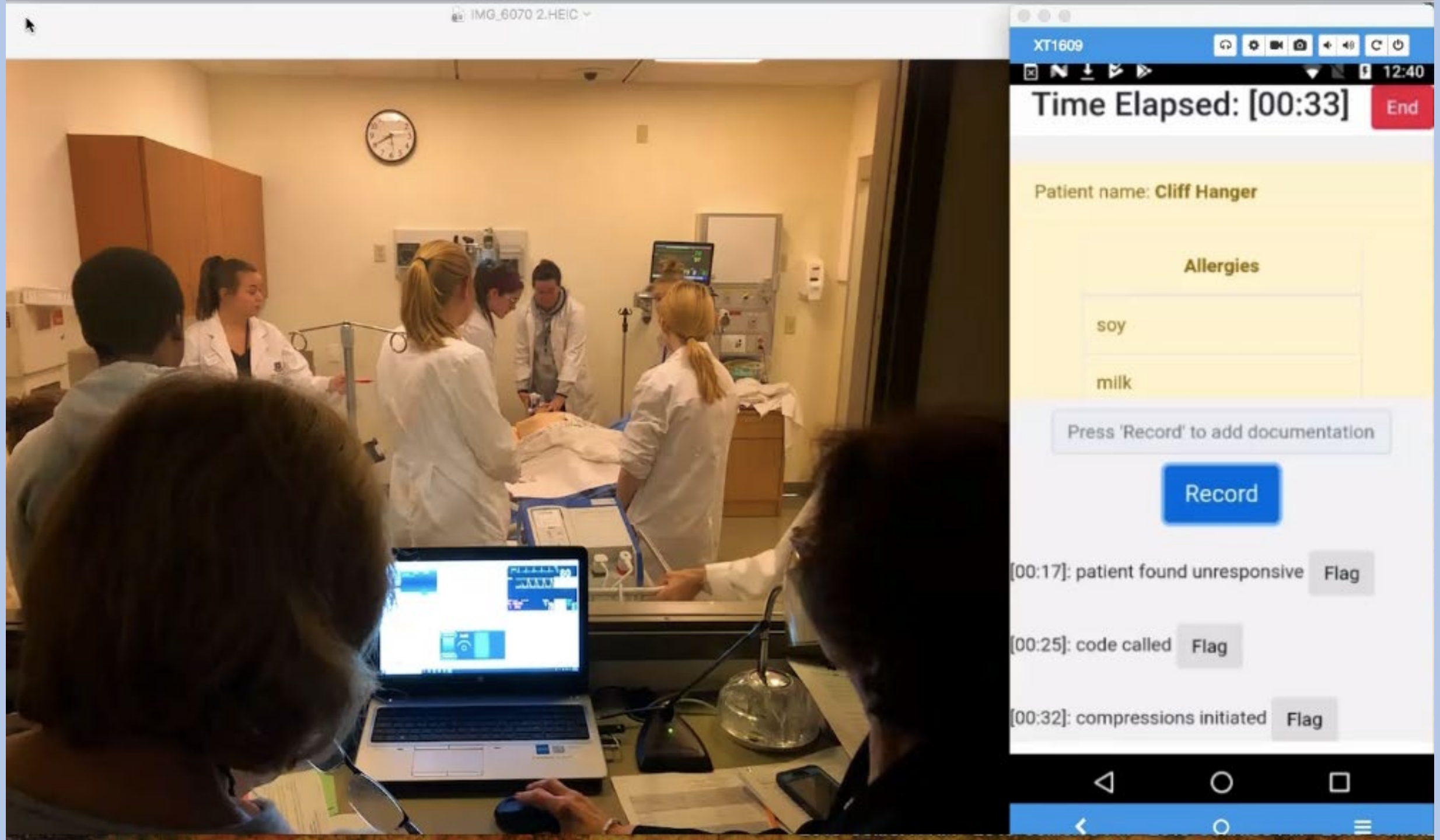

Jane Doe - ID: 00001
Log Out
Intiate Code
Export
Recent Documentation History
Date
Patient
Action
05-08-2019 10:48:59
undefined
View detail
Delete
09-04-2019 12:40:15
Cliff Hanger
View detail
Delete
09-11-2019 16:2:42
Jeff Saxton
View detail
Delete

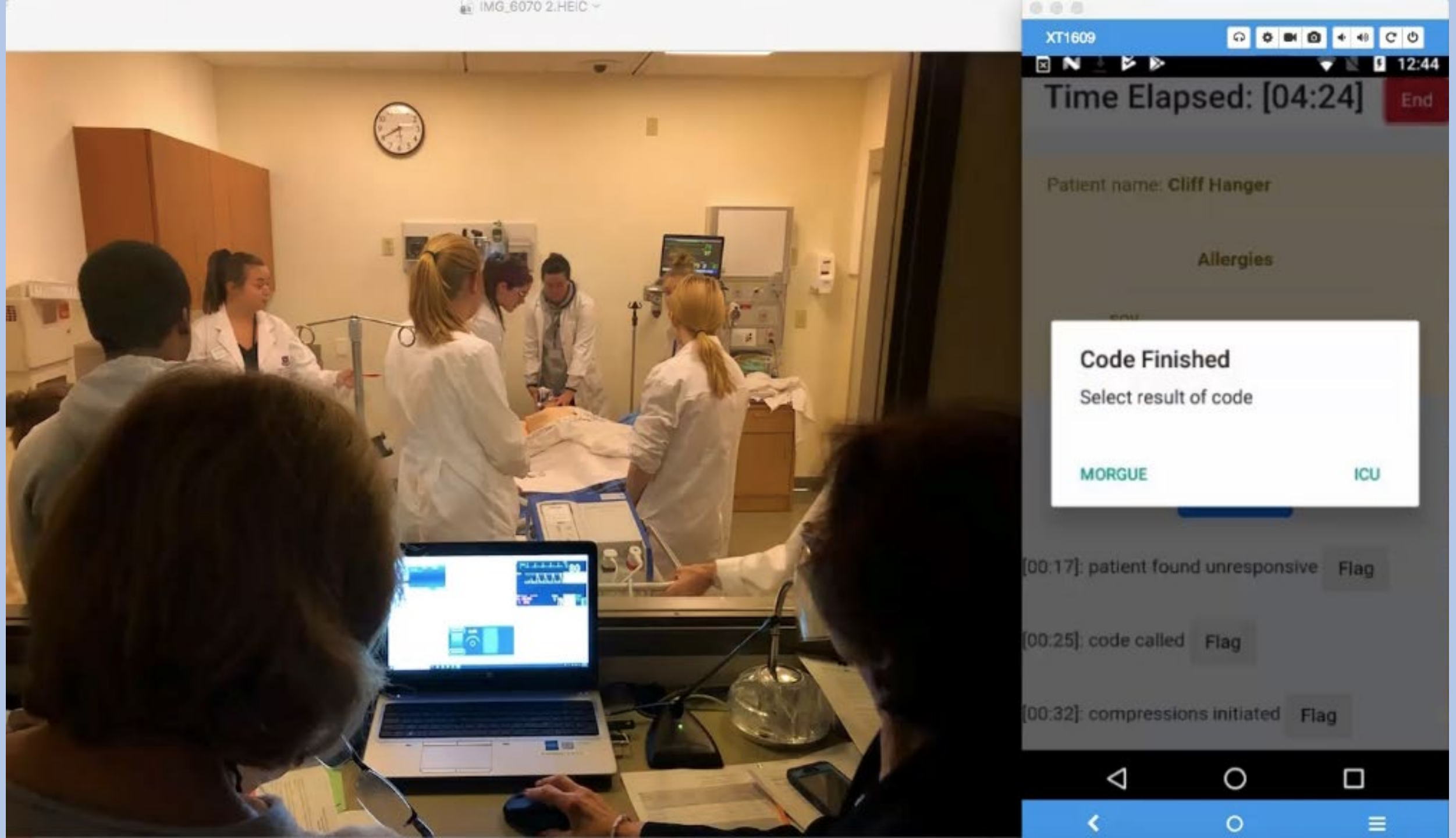


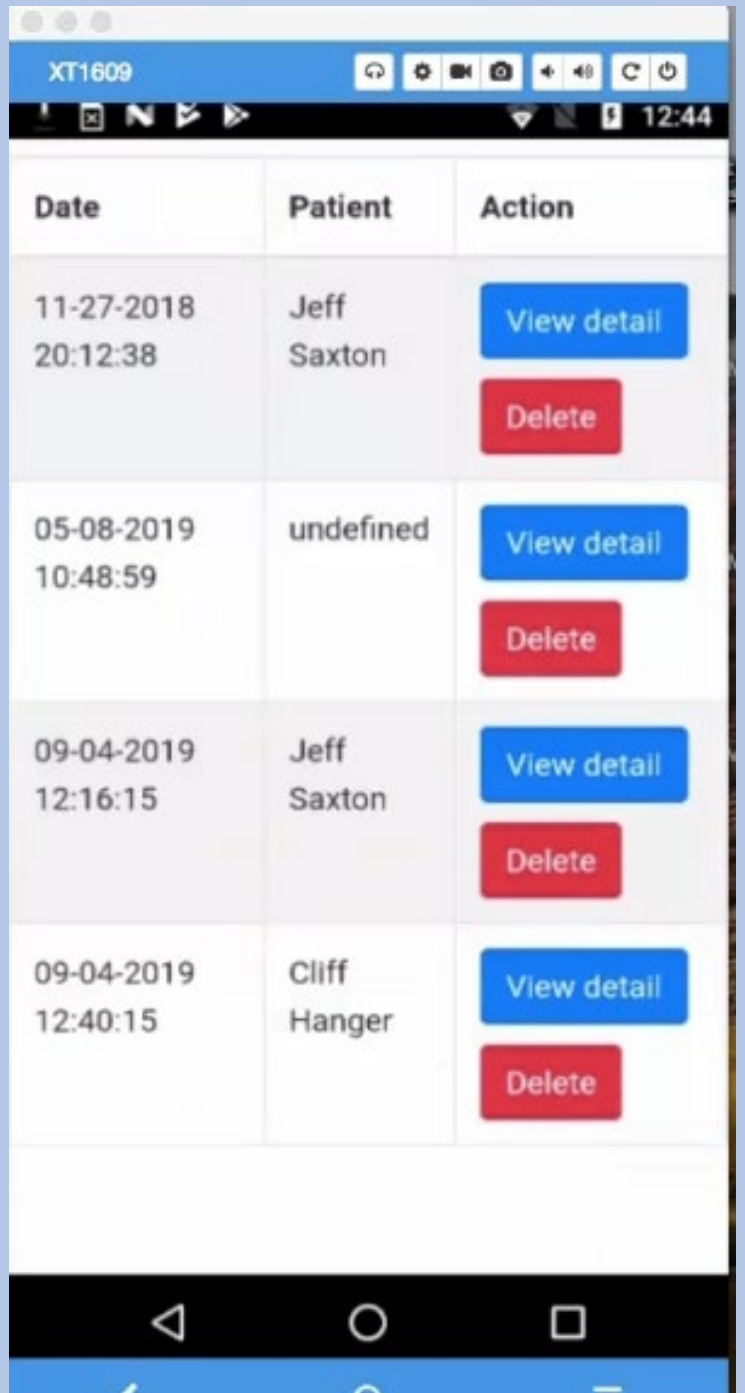
{“name”:”Cliff Hanger”, “allergies”: “peanuts##milk##soy”}

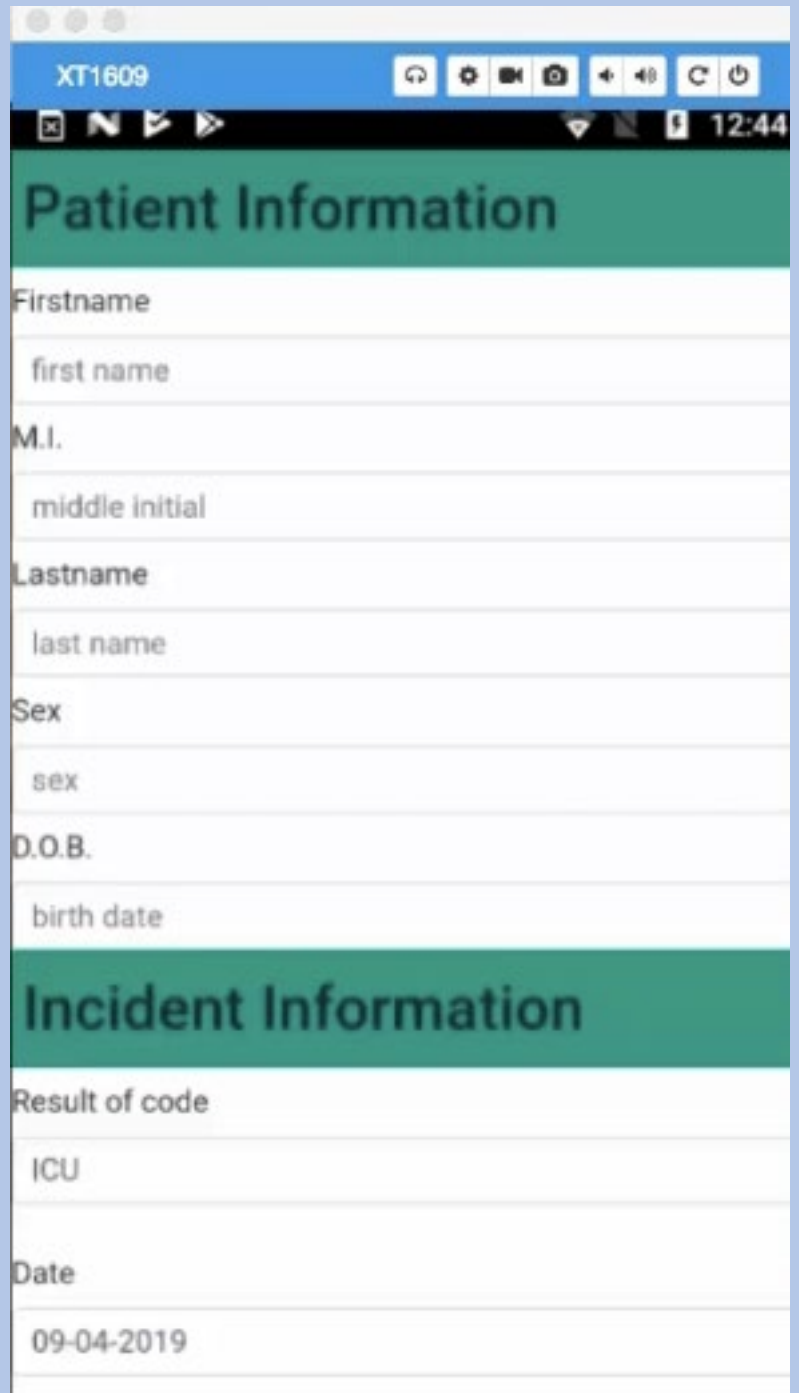

XT1609
12:40
Time Elapsed: [00:03]
End
Patient name: Cliff Hanger
Allergies
soy
milk
Press 'Record' to add documentation
Record

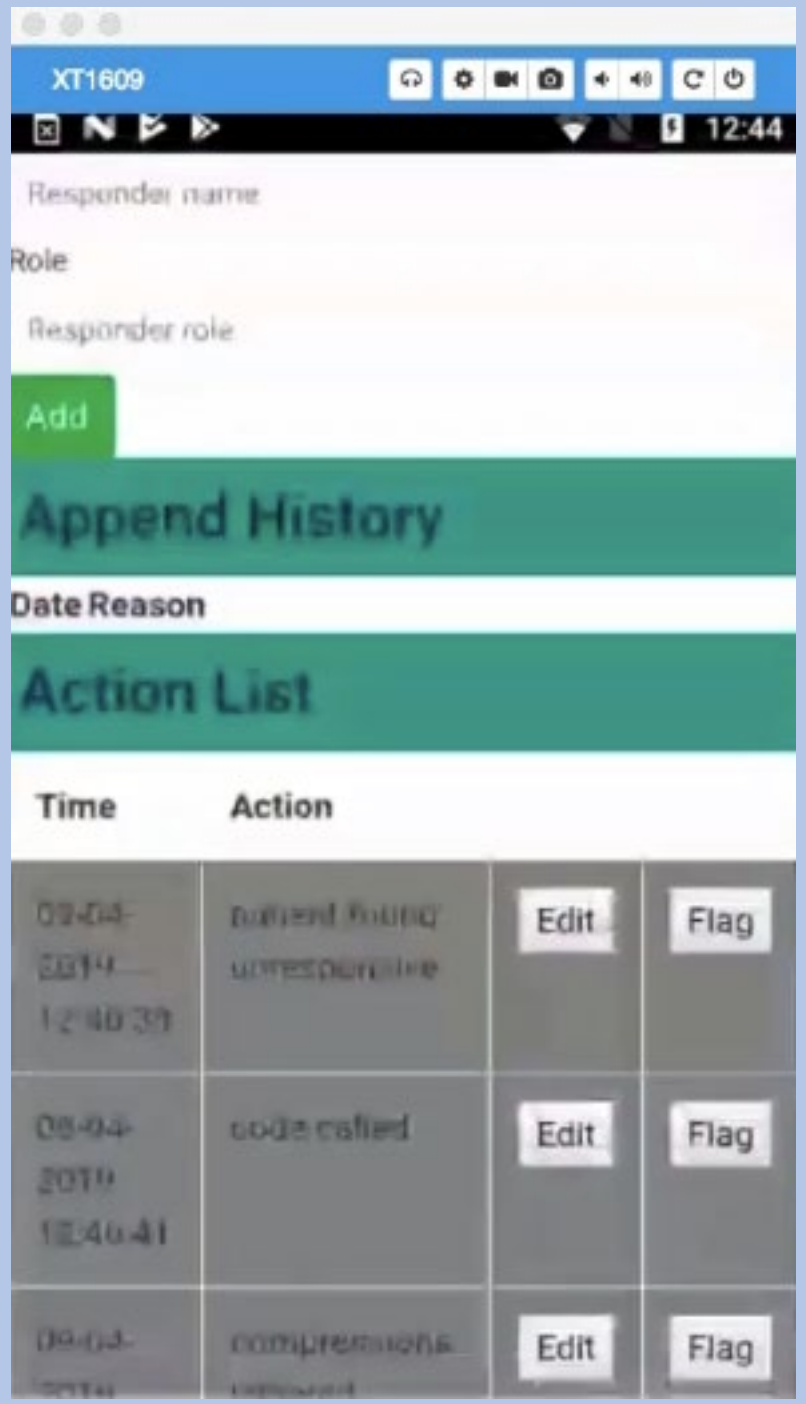

XT1609
12:40
Time Elapsed: [00:13]
End
Patient name: Cliff Hanger
Google
What is happening?


IMG_6070 2.HEIC
XT1609
12:40
Time Elapsed: [00:33]
End
Patient name: Cliff Hanger
Allergies
soy
milk
Press 'Record' to add documentation
Record
[00:17]: patient found unresponsive
Flag
[00:25]: code called
Flag
[00:32]: compressions initiated
Flag


IMG_6070 2.HEIC
XT1609
12:44
Time Elapsed: [04:24]
End
Patient name: Cliff Hanger
Allergies
Code Finished
Select result of code
MORGUE
ICU
[00:17]: patient found unresponsive
Flag
[00:25]: code called
Flag
[00:32]: compressions initiated
Flag


XT1609
12:44
Date
Patient
Action
11-27-2018 20:12:38
Jeff Saxton
View detail
Delete
05-08-2019 10:48:59
undefined
View detail
Delete
09-04-2019 12:16:15
Jeff Saxton
View detail
Delete
09-04-2019 12:40:15
Cliff Hanger
View detail
Delete

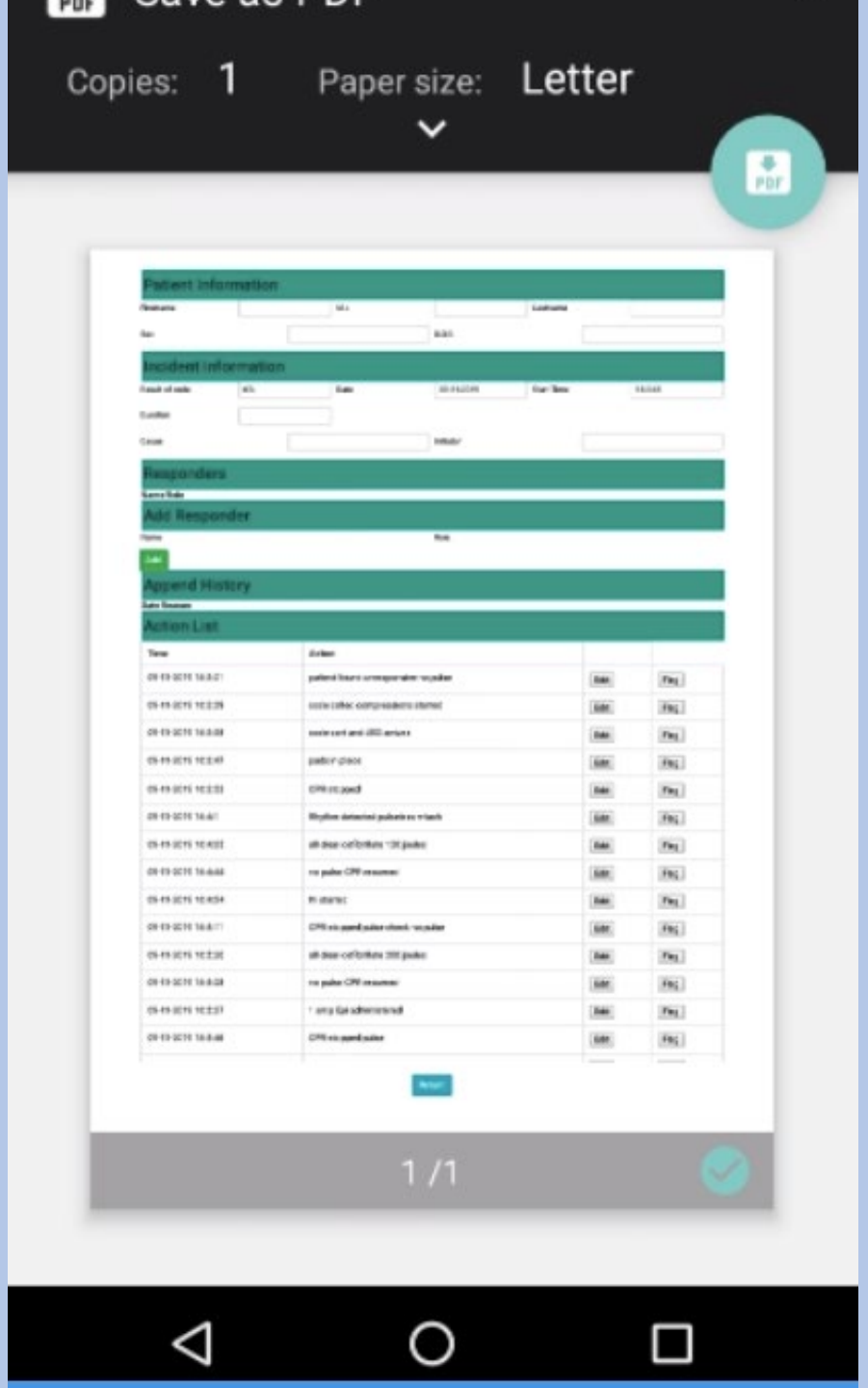

XT1609
12:44
Patient Information
Firstname
first name
M.I.
middle initial
Lastname
last name
Sex
sex
D.O.B.
birth date
Incident Information
Result of code
ICU
Date
09-04-2019



Time	Action		
09-11-2019 16:3:21	patient found unresponsive no pulse	Edit	Flag
09-11-2019 16:3:29	code called compressions started	Edit	Flag
09-11-2019 16:3:38	code cart and AED arrives	Edit	Flag
09-11-2019 16:3:47	pads in place	Edit	Flag
09-11-2019 16:3:53	CPR stopped	Edit	Flag

09-11-2019 16:6:38	defibrillated 360 joules	Edit	Flag
09-11-2019 16:6:48	post returns normal sinus rhythm	Edit	Flag
09-11-2019 16:6:56	stat 12-lead EKG ordered	Edit	Flag
09-11-2019 16:7:5	epinephrine drip started	Edit	Flag
09-11-2019 16:7:13	code ended transfer to ICU	Edit	Flag

Confirm Export Return



Thank you

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- QUESTIONS ??????????