

CLARION INTERPROFESSIONAL CASE COMPETITION

CLARION

An Interprofessional Student Committee of the
Center for Health Interprofessional Programs (CHIP)

UNIVERSITY OF MINNESOTA

Suspected overdose at Arizona General Hospital

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Case Study Assignment

In *Crossing the Quality Chasm*,ⁱ the Institute of Medicine proposes that healthcare in the 21st century must be “delivered by systems that are carefully and consciously designed to provide care that is safe, effective, patient-centered, timely, efficient, and equitable. Such systems must be designed to serve the needs of patients, and to ensure that they are fully informed, retain control and participate in care delivery whenever possible, and receive care that is respectful of their values and preferences.” As described in Berwick (2002),ⁱⁱ the underlying logical framework for the *Quality Chasm* lays out the changes needed in the American healthcare system at four levels: 1) the experience of the patients and communities; 2) the microsystems of care; 3) the health care organizations; and 4) the health care environment.

This framework is particularly important for improving the healthcare system’s ability to serve patients with chronic mental illness. In addition to suffering from discontinuities in patient care, persons with chronic mental illness often struggle to maintain the basic necessities of employment, food, and shelter. This is the situation that occurred to the patient described in this case. The patient, suffering from schizophrenia, was admitted to Arizona General Hospital hospital, where she experienced a sentinel event. Within sixty days of discharge, she showed up in the emergency department and was readmitted.

The CEO of Arizona General Hospital has asked your interprofessional team to study the sentinel event and the readmission of the patient to understand how and why these events occurred, and to develop a set of recommendations and a plan of action to prevent them from occurring in the future. A cost analysis of your recommendations must also be included. In studying the event, your team should make sure that your analysis, findings, and recommendations focus on systems and processes that need to be improved, changed or eliminated, or new systems and processes that need to be implemented, rather than looking to

place blame on individuals. You will be presenting your findings, conclusions, and recommendations to the Patient Safety Committee of Arizona General Hospital.

Background

Arizona General Hospital

Arizona General Hospital is a fully accredited private not-for-profit tertiary care center in Phoenix, Arizona. Originally founded in 1900 as a 10 bed acute care facility, the hospital is licensed for 620 inpatient beds. Special units in the hospital include a medical/surgical ICU with 25 beds, a cardiac ICU with 40 beds, an OB unit with 65 beds, a rehabilitation unit with 37 beds, and a psychiatric unit with 97 beds. Activity and financial information for Arizona General Hospital can be found in Tables 1 through 3.

The hospital offers a full range of tertiary care inpatient and outpatient services including:

- Complete medical, surgical and critical care;
- Level I trauma services;
- Multi-specialty care and clinical expertise centers of excellence in behavioral health, cardiovascular services, medical/surgical services, neuroscience, oncology, orthopedics, rehabilitation, spine care and women's health;
- Outpatient care in more than 50 different specialty areas;
- Education programs, support services and public health screenings.

The mission of Arizona General Hospital is to make a difference in patients' lives by providing high quality care to all, regardless of their ability to pay. The hospital's vision is to be a community focused health care system that is passionate about improving patient care, enhancing work life quality and collaborating with others in the community to provide high quality care that enhances the health and well being of all that are served. The values of Arizona General Hospital include:

- Dignity – Respecting the inherent value and worth of each person.
- Collaboration – Working together with people who support common values and vision to achieve shared goals.
- Stewardship – Cultivating the resources entrusted to the hospital to promote healing and wholeness.
- Excellence – Exceeding expectations through teamwork and innovation.

Arizona General Hospital is part of the Southwest Healthcare (SWH) System. In addition to Arizona General Hospital, SWH owns and operates ten clinics throughout Maricopa County and surrounding areas. Physicians at the clinics primarily admit patients to Arizona General Hospital, although as a community hospital there are a number of other physician groups throughout Phoenix who retain privileges and also admit patients to the hospital. The hospital and the clinics are operated as separate strategic business units with a high degree of autonomy, so while the hospital leadership has input to system strategy and objectives, ultimately, the hospital has no control over the clinics.

In pursuit of excellence in clinical care, Arizona General Hospital uses hospitalists to deliver care to medical and surgical patients in the facility. The hospital contracts with two hospitalist groups that provide round-the-clock coverage throughout the facility. It has full-time intensivists in the ICUs, and also has a residency program with 40 medical residents.

Nurse staffing on the general medical/surgical units is typically 4:1 to 5:1 (4 or 5 patients per nurse). During day and evening shifts, for a unit with 28 patients, there will generally be 8 nurses working, one of whom is the charge nurse and not assigned to any patients. There are also two certified nursing assistants and one health unit coordinator (HUC) during these shifts. The two nursing assistants on each shift are evenly split between the nurses, and each reports to the nurses to whom s/he is assigned. On the night shift, there will typically be seven nurses for

a patient census of 28, one of whom is the charge nurse and not assigned to individual patients. In addition, on the night shift there is one paraprofessional who works at the desk and as a nursing assistant combined. In an effort to contain nursing costs, one of the nurses on each shift is an LPN rather than an RN. For the LPN on each shift, an RN is assigned to their patients for any duties that require an RN by licensing requirements to administer such care.

Arizona General Hospital is staffed with 35 FTE pharmacists and 40 FTE pharmacy technicians. Its inpatient pharmacy is located on the first floor of the hospital and is open 24 hours a day. The floors have decentralized pharmacists. Each medical unit has Pyxis Medstation 2000 automated medication management systems. A pharmacist is on call 24 hours a day for the code blue team. The pharmacy has a unit dose system, IV sterile products and specialty compounding areas. The pharmacists actively participate on the Pharmacy and Therapeutics, formulary and quality improvement committees. The hospital has a closed formulary. In addition, there is an outpatient pharmacy with durable medical supplies and limited nonprescription medications.

Each unit has a social worker and a care coordinator to aid in discharge planning for patients. The social worker and care coordinator review the new admissions each morning and divide them up accordingly. Patients that are likely to need transitional care placement or have been admitted from a nursing home or other care facility are followed by the social worker. Other patients are generally followed by the care coordinator, although decisions are made on a patient-by-patient basis. The social worker or care coordinator meets with the patient and/or their family within 24-36 hours of admission to begin assessing anticipated discharge needs, and often leaves a note in the chart. The social worker and care coordinator also try to meet with the attending physician to discuss each patient, but often communication takes place only within the chart.

Arizona General Hospital and Arizona General Medical Clinics have recently engaged in a project to improve health information management system-wide. Computerized Physician Order Entry (CPOE) was implemented last year at Arizona General Hospital. Implementation of an Automated Medical Record (AMR) at Arizona General Hospital is just beginning. Full scale implementation is currently in its second week, after an initial pilot implementation on one of the units. All clinicians are using the system – nurses, physicians, pharmacists, social workers, care coordinators, etc. Unfortunately, the learning curve has been steep. Because of unfamiliarity with the AMR, it has taken nurses longer to complete their documentation, as well as increased time for them to search for needed information in the AMR. As a result, the nurses are complaining that they have less time to spend with patients and interact with the physicians. Physicians and other clinicians have also reported that documentation and decision making are taking more time than with the previous paper chart because they are still unfamiliar with the new AMR system. The ten SWH clinics do not currently have an AMR, although implementation is planned for the first quarter of 2006.

Arizona Healthcare Reimbursement

Arizona General Hospital operates in a challenging healthcare environment. Approximately 902,400 Arizonans do not have health insurance. This represents about 19% of its population.ⁱⁱⁱ Arizona's Medicaid Program is administered as a mandatory managed care enrollment program for most populations, with approximately 89% of its Medicaid enrollees in a managed care plan.^{iv} It is known as the Arizona Health Care Cost Containment Systems (AHCCCS).^v In FY 2003, Arizona spent approximately \$4.2 billion dollars on Medicaid.^{vi} Acute care health services are administered through AHCCCS.

AHCCCS was created in 1982, but the decision was made to leave behavioral health services separate at that point to allow the acute care system to stabilize. Thus, responsibility for mental health services is delegated to the Arizona Department of Health Services, Division of Behavioral Health Services (ADHS/DBHS).^{vii} DBHS was created in 1986 to coordinate, plan,

administer, regulate, and monitor the state public health behavioral health system. Beginning in 1990, the state began a five-year phase-in to incorporate behavioral health for Medicaid patients into the AHCCCS system. While ADHS/DBHS still has authority for administering behavioral health for Medicaid patients, a managed care model similar to that for acute care is now in place for behavioral health services as a carve out.

ADHS/DBHS contracts with community-based organizations called Regional Behavioral Health Authorities (RBHA) to administer behavioral health services across the state. Each RBHA functions as a health maintenance organization (HMO) for mental health. There are five RBHAs in Arizona serving six geographic areas. Maricopa County is a one of the services areas. The Maricopa County RBHA contracts with ValueOptions to provide behavioral health services for Medicaid members in the county.^{viii} ValueOptions is responsible for providing a full-range of behavioral health services for adults and children living in Maricopa County.

Sentinel Event

Thursday, 9 am

Mr. Mike Wright, a bus driver for one of the main routes in Phoenix, Arizona, was being yelled at by one of his passengers. He had picked up the woman a few blocks back, and had immediately thought that she “might be trouble.” The woman had stumbled onto the bus, and sat muttering incoherently; the other passengers moved as far away as possible.

Fifteen minutes later, the woman demanded that Mike stop the bus at a liquor store. As it was not a stop, Mike politely told her that she could get off at the next bus stop. The woman then began yelling at Mike, used profanity, and accused Mike of talking about her to the other passengers behind her back. Mike had had enough. He threw the woman off the bus at the next stop and radioed to his supervisors, asking them to call the police.

When the police arrived a few minutes later, they found the passenger lying on the bench at the bus stop. However, when they attempted to ask her about her side of the story, they were unable to wake her up. She was breathing and had a good pulse. They called the paramedics.

When the paramedics arrived, they noted that the patient was confused and somnolent. Her vital signs revealed a pulse of 88 beats per minute, respirations of 14 per minute, a blood pressure of 140/88, and a temperature of 98.6F. She was taken to the Emergency Department at Arizona General Hospital for further care. She did not have any identification on her.

Thursday, 10 am

Upon arrival at Arizona General Emergency Department (ED), the patient was lethargic and unable to give a history. Two ED physicians quickly evaluated her. She had pin-point pupils and a dysconjugate gaze. She was given naloxone (Narcan), glucose IV, and oxygen, none of which had any effect upon her mental status. Her lung and heart sounds were normal. Her abdominal exam was normal as well. The physicians could not perform a full neurologic exam due to the patient's mental status, but she did have normal reflexes and withdrew from pain. She was intubated as she was not able to protect her airway from her own secretions.

Ruth Burns, RN, the nurse assigned to care for her in the ED, found a bottle of pills in her slacks, with the name Tina Norman on them. The pill bottle was from a local pharmacy, and it was evident from the label on the bottle that it had been filled that day. It was noted to be clozapine (Clozaril), 100mg tablets. The directions were to take one tablet per day, and the label noted 12 had been dispensed. There were only seven pills left in the bottle. Ruth Burns, RN let one of the ED doctors know this information right away.

A head CT was done and was negative for any acute stroke or bleeding. A complete blood count and electrolytes were also done and were normal. A urine toxicology screen and a urine pregnancy test were performed and both were negative. An electrocardiogram was normal.

The presumptive diagnosis was a Clozaril overdose, and the patient was admitted to the Medical/Surgical Intensive Care Unit (ICU) for further care. All of her belongings were placed in a plastic Arizona General Hospital bag and sent with her to the ICU.

Thursday, 2 pm

The intensivist in the ICU, Katie Simmons, MD called the ICU pharmacist, Laurel Portland, Pharm. D. Dr. Simmons asked Dr. Portland if 500mg of Clozaril would account for Ms. Norman's symptoms and presentation. Laurel was a bit skeptical, since the therapeutic dose of Clozaril was usually 25 to 900 mg per day.

In the ICU, Ms. Norman remained intubated. A lumbar puncture revealed a cerebrospinal fluid (CSF) glucose of 74mg/dL (40-70mg/dL), and protein of 40mg/dL (15-60mg/dL). The bacterial smear did not reveal any organisms, and there were no white blood cells or red blood cells seen. A chest x-ray was also normal.

A serum toxicology panel was sent from an extra tube of blood obtained from the ED. The psychiatry team at the hospital was notified of Ms. Norman's admission. At this point, Dr. Simmons assumed that Ms. Norman had overdosed on her Clozaril, but still suspected that she had taken another medication or an illicit drug.

At 3 pm the evening shift ICU nurses came on duty. The charge nurse assigned the patients to the nurses, and then the evening nurses listened to the report on their patients. Jean Jackson, RN, the nurse who took care of Ms. Norman during the day, briefly reported about the patient to the evening nurse, Craig McDonald, RN. Ms. Norman had been quite stable from a nursing standpoint. She had undergone a lumbar puncture that day, and was intubated. Nurse Jackson also told Nurse McDonald that Ms. Norman had been admitted for a presumed overdose, and that the psychiatry team would be seeing the patient in the morning. Nurse McDonald was also assigned one other patient, as the ICU was full that night and Ms. Norman had not needed

especially demanding care, although the other patient he was caring for did. The ICU staffing policy is that there are usually one or two patients per nurse depending upon patient severity.

Thursday, 11 pm

Nurse McDonald had noticed that throughout the evening Ms. Norman was slowly becoming more awake, and became increasingly agitated as she did so. He let Mike Freeland, MD, the intensivist on the shift know about the patient's increasing agitation. Dr. Freeland ordered 2 mg IV haloperidol (Haldol) to be given every two hours as needed because of the continued concern that Ms. Norman had possibly taken other drugs. Dr. Freeland felt he needed to be very careful about how much sedation he gave the patient.

A few hours later, at 1:30 am, Ms. Norman was very agitated despite the Haldol. While alone in her room, she managed to pull out her breathing tube ("self-extubate"). Sensors immediately went off at the monitoring station in the center of the ICU. Dr. Freeland, Nurse McDonald, and two other available nurses rushed to the room immediately. Ms. Norman was very agitated and still quite confused, so they successfully sedated her with more IV Haldol. She was then re-intubated.

Friday, 7 am

At 7 am, Dr. Simmons heard briefly about the patients from Dr. Freeland, who was just finishing for the night. Dr. Freeland let Dr. Simmons know that Ms. Norman had an eventful night, with the self-extubation. The nurses were also undergoing shift change at this time. Dr. Simmons then started rounding on patients.

When she got to Ms. Norman, Dr. Simmons saw that the patient seemed less agitated now, and her sedation was wearing off. She could respond to yes and no questions. Her vital signs and morning lab results were all within the normal range, so Dr. Simmons decided to extubate Ms. Norman.

After Ms. Norman was extubated, she was able to give a little more of her history. She said that she thought that she was supposed to be on 500mg of Clozaril, and that she was only following what she thought were her doctor's orders when she took that amount. She adamantly denied taking any other medications or illicit substances. She seemed rational and was very cooperative.

The psychiatry team, consisting of a student, resident, and an attending physician, came by at 10 am to see Ms. Norman. Ms. Norman stated that she was first diagnosed with schizophrenia 20 years ago, at the age of 16. She said that she had been on several medications, but none has worked terribly well or terribly long. She quit high school at 17, and was currently working as a janitor at a local mall. She stated that although the janitorial position does not pay well, in that she makes approximately \$875 per month, it provides her with enough money to rent a small studio apartment and also provides her with private healthcare insurance. She stated she only drinks when her psychiatric illness is out of control. For the past week she had been drinking about one fifth of vodka per day. She stated that she has no family or close friends.

Friday, 11 am

Dr. Simmons checked in on Ms. Norman again. She seemed to be doing fine. Dr. Simmons spoke with Gary Perkins, RN, the nurse taking care of Ms. Norman for the day shift. They both felt that she was stable, and could be transferred out of the ICU to free up the ICU bed. She was to be transferred to ward 10A, an unmonitored medical unit.

The hospital had Family Medicine residents on the medical units. The on-call attending for the unit to which Ms Norman was being transferred called Dr. Simmons about the admission, and Ms. Norman was discussed with him. He then called the senior resident on his team to notify him of the admission. The senior resident, James Martin, MD, went to the ICU to meet the patient. Dr. Martin talked with Ms. Norman in the ICU, who by this time was alert and sitting

up in bed, eating lunch. Dr. Martin typed the transfer orders into the AMR and then went back to caring for his other patients and new admissions. There was still no bed for Ms. Norman, so she remained in the ICU until a bed was available.

Friday, 4 pm

At 4 pm Anne Brown RN, the charge nurse on ward 10A, called the ICU to let them know that a bed was finally available for Ms. Norman. It was a double room, near the nursing station. Linda Larkin, RN, Gary's replacement and Ms. Norman's current nurse, called 10A to report to Susan Hunt, RN, the nurse assigned to care for Ms. Norman on 10A. Linda let Susan know that although there was a concern that Ms. Norman may have tried to intentionally hurt herself through the extubation, Ms. Norman was very cooperative and denied that she was trying to harm herself.

Ms. Norman was then transferred upstairs to her room on 10A. Her belongings were transferred with her, which were still in the bag with her name on it from ICU. The bag was placed in the cupboard in her room. She settled in, had an early dinner, and again briefly talked to Dr. Martin.

At this point, Dr. Martin ordered a normal diet, and activity as tolerated. After consulting with his attending, he decided to continue to withhold the Clozaril. The psychiatry team stopped by briefly, and agreed with Dr. Martin. The psychiatry team was still not clear that Clozaril was the only drug taken that could have caused Ms. Norman's condition, as the dose was not that large. They planned to come back in the morning to see how Ms. Norman's condition progressed overnight.

Friday, 6:30 pm

At 6:30 pm Michelle Robbins, Ms. Norman's roommate, rang for the nurse. Michelle said that she saw her roommate take some medication from her closet. Nurse Susan Hunt went to the

room once she had completed doing a complicated dressing change on one of her other patients, which was about 7 pm. There was indeed an empty bottle of Clozaril on Ms. Norman's bed, the same bottle that she had with her when she arrived. Ms. Norman nodded affirmatively when she was asked if she took the medicine. The nurse paged the on-call intern, Norma Grant, MD, to describe to her what had happened. Nurse Hunt requested that she come to assess Ms. Norman. Dr. Grant told her that she was admitting a critical patient and would be there as soon as she could. By the time Dr. Grant arrived, about 7:30 pm, Ms. Norman was very lethargic and unable to answer questions. She was drooling a bit and coughing lightly. She had a gag reflex, and her pupils were equal sized and responsive to light. Dr. Grant quickly called her senior resident, Abel Payne, MD, for help.

Dr. Payne arrived about 5 minutes later. Ms. Norman seemed to be choking a bit on her secretions, so anesthesia was called stat. They reintubated Ms. Norman and transferred her back into the ICU.

Next three weeks

In the ICU, Ms. Norman had another uneventful stay. She was extubated about 24 hours later, after regaining consciousness. The psychiatry service saw her again and on Monday she was transferred to the inpatient psychiatry unit for further care. Also on Monday, the ICU called the psychiatrist who prescribed the Clozaril. He returned the call on Tuesday and confirmed that the dose was only 100mg per day.

Over the next three weeks, Ms. Norman underwent therapy and was started on olanzapine (Zyprexa). Her mental state improved. Towards the end of her stay, she called her employer, but was told that because she had not reported for work nor let them know where she was or when she was coming back, she had been terminated. She expressed concern over her job loss to her nurse, who was not quite sure where to record this information in the new AMR system. While she was trying to figure it out, she became distracted with another patient's family who

wished to leave the locked unit, and subsequently forgot to record this information. As a result, the care coordinator who assisted Ms. Norman in her discharge was not aware of the job loss, and Ms. Norman did not convey this information to her. Ms. Norman was discharged to home. She was never able to relate exactly why she took the extra Clozaril each time, other than to say that she thought she was supposed to take that dose and she wanted to stop the voices.

Post-discharge

Upon discharge, Ms. Norman received a 30 day supply of Zyprexa, which she took as indicated on the prescription. When her prescription was gone, she went to the local community pharmacy to get it refilled. She told the pharmacist that she did not have any money to pay for the prescription because she no longer had health insurance. The pharmacist told her that she could not get the prescription filled if she couldn't pay for it.

Three weeks later, a disheveled Ms. Norman was picked up by the police and taken to the emergency department of Arizona General Hospital because in her drunken state, while yelling at people in the city park, she had fallen and suffered a severe head laceration that required stitches. When she was asked at the emergency department to verify her home address and insurance as shown in the computer system, she told them that she had no home or healthcare insurance because she had lost her job. The ED physician saw from the AMR that Ms. Norman had been discharged from the hospital within the past 60 days. He admitted Ms. Norman to the psychiatric unit, because she appeared to be a danger to herself.

Table 1: Arizona General Hospital 2004 Activity

Total Admissions	37,032
Inpatient Surgical Operations	12,899
Emergency Department Visits	40,145
Births	4,812
Outpatient Visits	194,0311
Outpatient Surgical Operations	9,277

Table 2: Arizona General Hospital Balance Sheet, December 21, 2004

Assets	
Cash and Cash Equivalents	\$ 10,792,201
Patient Accounts Receivable, net	254,000,000
Investments	<u>1,106,629,873</u>
Total Current Assets	1,371,422,074
Assets Whose Use is Limited	63,571,145
Property, Plant, and Equipment, net	252,373,056
Other Long-Term Assets	<u>(128,792,867)</u>
Total Assets	<u>\$ 1,558,573,408</u>
Liabilities and Net Assets	
Accounts Payable and Accruals	\$ 23,641,078
Accrued Salaries and Benefits	17,597,516
Current Portion of Long-Term Debt	93,377
Other Current Liabilities	<u>982,876,245</u>
Total Current Liabilities	\$ 1,024,208,216
Long-Term Debt	<u>23,788,645</u>
Total Liabilities	<u>1,047,996,861</u>
Net Assets:	
Unrestricted	447,473,652
Temporarily Restricted	43,678,257
Permanently Restricted	<u>19,424,638</u>
Total Net Assets	<u>510,576,547</u>
Total Liabilities and Net Assets	<u>\$ 1,558,573,408</u>

Table 3: 2004 Income Statement, Arizona General Hospital

Revenue	
Gross Inpatient Revenue	\$ 1,190,980,000
Gross Outpatient Revenue	478,297,000
Other Operating Revenue	<u>28,200,000</u>
Gross Patient Services and Other Revenue	1,697,477,000
Less Contractual Allowances	<u>(954,000,000)</u>
Net Patient Services and Other Revenue	743,477,000
Expenses	
Salaries, Wages, and Benefits	326,847,000
Supplies, Equipment and Other Expenses	329,834,000
Depreciation and Interest Expense	<u>49,852,134</u>
Total Expenses	<u>706,533,134</u>
Net Income	<u><u>\$ 36,943,866</u></u>

References

ⁱ Institute of Medicine, *Crossing the Quality Chasm: A New Health System for the Twenty-first Century* (Washington: National Academy Press, 2001)

ⁱⁱ Berwick, DM (2002). A User's Manual for the IOM's 'Quality Chasm' Report. *Health Affairs*:21(3):80-90.

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^{iv} [Hhttp://www.statehealthfacts.kff.org/cgi-bin/healthfacts.cgi?action=profile&area=Arizona&category=Medicaid+%26+SCHIP&subcategory=Medicaid+Managed+Care&topic=Managed+Care+as+a+Percent+of+Total+Enrollment](http://www.statehealthfacts.kff.org/cgi-bin/healthfacts.cgi?action=profile&area=Arizona&category=Medicaid+%26+SCHIP&subcategory=Medicaid+Managed+Care&topic=Managed+Care+as+a+Percent+of+Total+Enrollment)H

^v [Hhttp://www.ahcccs.state.az.us/site/H](http://www.ahcccs.state.az.us/site/H)

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