Development of a Rapid Response Team in an Outpatient Free-Standing National Cancer Institute–Designated Comprehensive Cancer Center

KIM BLUMENFELD, RN, BS, CCRN, IRIS DELFAKIS, RN, BSN, OCN®, SANDRA E. KURTIN, RN, MS, AOCN®, ANP-C, PATRICIA STUMBO, RN, OCN®, MBA, KIRSTEN JONASSON, RN, MARGARET MILLER, MD, DANIEL BUTCHER, PHARMD, ANNA GLENNIE, RN, MSN, FNP, and AGNES SHARIFI, RN, MSN, FN

From the Arizona Cancer Center, Tucson.

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Correspondence to: Sandra Kurtin, RN, MS, AOCN, ANP-C, Arizona Cancer Center, 3838 N. Campbell Ave, Tucson, AZ 85719. E-mail: skurtin@umcaz.edu

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Improved symptom management strategies and transfusion services have shifted the bulk of cancer treatment to the outpatient setting. Many outpatient oncology centers provide high-acuity services on a daily basis to reduce the need for hospitalization and to improve continuity of care. Most outpatient oncology practices rely on community-based emergency medical services for the management of acutely ill patients or medical emergencies.

As a National Cancer Institute (NCI)-designated Comprehensive Cancer Center, the Arizona Cancer Center provides outpatient services to a high-acuity population. This includes daily management of high-acuity patients, e.g., those in outpatient bone marrow transplant and leukemia programs, those requiring the administration of blood products, and those participating in clinical trials (including phase I experimental therapies). Considering the high-acuity population and the relocation of the clinic to a free-standing site several miles from the nearest inpatient or emergency center, the development of a medical emergency program was required. The process of developing a rapid response team (RRT) for a free-standing NCI-designated Comprehensive Cancer Center will be described in this article.

The Origination of Rapid Response Teams

In 2005, the Institute for Healthcare Improvement initiated a campaign called *100,000 Lives*. The primary goal of this campaign was to reduce hospital-associated mortality in the United States (Institute for Healthcare Improvement, 2010). The development of RRTs was a primary component of the plan to achieve this goal. Rapid response teams are often part of programs that meet The Joint Commission's National Patient Safety Goals, which mandate a system for immediate staff assistance when a patient experiences clinical deterioration (Jenkins & Lindsey, 2010).

Numerous inpatient programs have been developed over the past 5 years, with conflicting data relative to reducing hospital mortality (Chan et al., 2008; Chan, Jain, Nallmothu, Berg, & Sasson, 2010; Halvorsen, Ga-

rolis, Wallace-Skrogs, Stenstrom, & Maunder, 2007). A meta-analysis of 18 studies evaluating rapid response teams from 17 publications, involving approximately 1.3 million hospital admissions, reported a 33.8% reduction in the rate of cardiopulmonary arrest outside the intensive care unit (relative risk, 0.66; 95% confidence interval, [0.54, 0.80]), but no reduction in hospital mortality rates. The lack of identified benefit in reducing hospital mortality rates has led to further evaluation of the role of the RRT in the inpatient setting.

Donaldson and colleagues (2009) evaluated the effect of the nurse-initiated RRT by using a qualitative evaluation of 56 registered nurses (RNs) in an acute-care setting. In the RN interviews, the key benefits of activating the RRT were identified: obtaining physical assistance, having an "extra pair of hands," a single call bringing immediate assistance by experienced personnel, and being able to expedite patient transfer to a higher level of care. Advanced practice nurses are commonly identified as key members of the RRT, as they provide leadership, education, communication, and evaluation, including quality improvement and regulatory compliance initiatives (Jenkins & Lindsey, 2010). At this time, there is a lack of published data specific to the effectiveness of RRTs in outpatient oncology settings.

Adapting the RRT Model to an Outpatient NCI-Designated Comprehensive Cancer Center

The Arizona Cancer Center (AZCC) is an NCI-designated Comprehensive Cancer Center. The outpatient clinical services were relocated to a new facility located on the north campus of University Medical Center (UMC), an American Nurses Credentialing Center Magnet Hospital. AZCC-UMC North is a two-story, 82,000 square foot outpatient facility that houses multiple patient care areas, including three specialty pavilions on the first floor, each with a courtyard, separate entrance, and waiting area, and a number of examination rooms, procedure rooms, and satellite laboratory facilities. There are several general areas on both the first and second floors, including a café, a boutique, an education area, a laboratory, a waiting area, basic radiology services, classroom space, a pharmacy, and research areas. Two large infusion areas (a total of 32 chairs, a 6-chair observation area, and 7 beds) are located on the second floor. The clinic averages 250 patient visits per day, with 80 patients seen in the infusion area. In addition to patient care services, several support groups, educational groups, volunteers, and visitors may be in the general use areas during business hours. Staff and volunteers are located throughout the facility.

The high volume of patients, family members, and visitors in this large, decentralized, freestanding outpatient cancer center creates the potential for an emergency situation anywhere in the building. Establishing a RRT similar to an inpatient code triage team was identified as a key safety initiative. A planning committee was established to outline key members of the RRT, coordinate efforts with local first responders, and develop policies, algorithms, standing order sets, and a documentation tool. Local and national standards for levels of care, liability, medical transport, and compliance with accreditation agencies were incorporated throughout the process.

The RRT model had been established in the inpatient setting at the main campus of UMC. The policy was adapted for use in the outpatient setting. The purpose of the RRT is to respond to any person with deteriorating clinical status and to ensure that cardiopulmonary resuscitation is available to every patient, visitor, and staff member at AZCC-UMC North. The policy includes definition of RRT members, including role delineation (Table 1), criteria, and procedures for activation of the RRT (Figure 1). Any staff member may activate the RRT. A documentation tool modeled after the Situation, Background, Assessment and Recommendations (SBAR) process of communications provides a summary of the RRT event (Figure 2). The tool is included in the patient's electronic medical record, is sent with any patient transported by medical emergency services, and is included in the AZCC-UMC North RRT summary reported at the system-wide RRT and quality improvement meetings.

A critical step in developing a successful RRT program was evaluating the current recommendations for prehospital management of cardiac

Table 1. Rapid response team at AZCC-UMC North: Members and delineation of roles

Team member	Role
Licensed providers: MD (1), NP (4), PA (1)	Carry RRT-designated pager during business hours Immediately respond to RRT Assess patient and initiate treatment RRT member most familiar with the patient assumes the lead role of the RRT until patient is stabilized or transferred Complete SBAR form and send to Medical Records for scanning into the electronic record
Clinical leaders (2)	Carry RRT-designated pager during business hours Immediately respond to RRT Delegate staff assignments to maintain care of all patients in the area Notify the security guard if EMS is activated Assist with RRT if needed Document the SBAR during the RRT call
Clinical manager (1)	Carry RRT-designated pager during business hours Immediately respond to RRT Delegate staff assignments to maintain care of all patients in the area Assist family members or staff Assist RRT if needed
Pharmacist (1)	Carry RRT-designated pager during business hours Immediately respond to RRT, including transport of the code cart on the second floor (located in the pharmacy) Provide assistance with pharmacologic management and evaluation
Medical assistants (3)	Carry RRT-designated pager during business hours Immediately respond to RRT, including transport of the code cart, and oxygen on the first floor (located in the pharmacy)
Registered nurse (1)	Remain with the patient; continue to monitor for airway and vital signs Initiate standing orders for hypersensitivity reactions, if appropriate Give report to the RRT on arrival: patient history, symptoms, and interventions prior to RRT arrival If in the immediate area, assist with other patients and family members or with the RRT If needed
Staff member initiating RRT call	Give report to the RRT on arrival: reason for the call, events witnessed prior to RRT arrival
Security guard	Meet EMS personnel and assist with directions to the designated area

Note: AZCC-UMC = Arizona Cancer Center University Medical Center; EMS = emergency medical services; MD = physician; NP = nurse practitioner; PA = physician assistant; RRT = rapid-response team; SBAR = Situation, Background, Assessment and Recommendations.

arrest, including the role of defibrillator use (Johansen et al., 2007; Box, Watson, Addison, Clegg, & Robertson, 2008), cardiocerebral resuscitation (Kellum, Kennedy, & Ewy, 2006), and administration of intravenous (IV) antiarrhythmics or vasopressors (Zed et al., 2008). The prehospital coordinator for the Tucson Fire Department, the fire chief for the station in closest proximity to the clinic, the prehospital coordinator, and the nurse manager of the emergency department (ED) at UMC were invited to a meeting to discuss the role of the first responders, their ability to continue any interventions initiated in the clinic during transport, as well as the recommendations for prehospital management by the medical director of the ED.

The distance from AZCC-UMC North to the UMC ED is 4 miles, 6 stoplights/intersections, with moderate to heavy traffic during clinic hours. The average time for response by the emergency medical services (EMS) personnel is 1 minute. The average time for transport by EMS to the ED once the patient is in the transport vehicle is 10 minutes. The levels of transport, defined based upon the scope of practice of the medical transport personnel as defined by the Arizona Administrative Code, Department of Health Services for Emergency

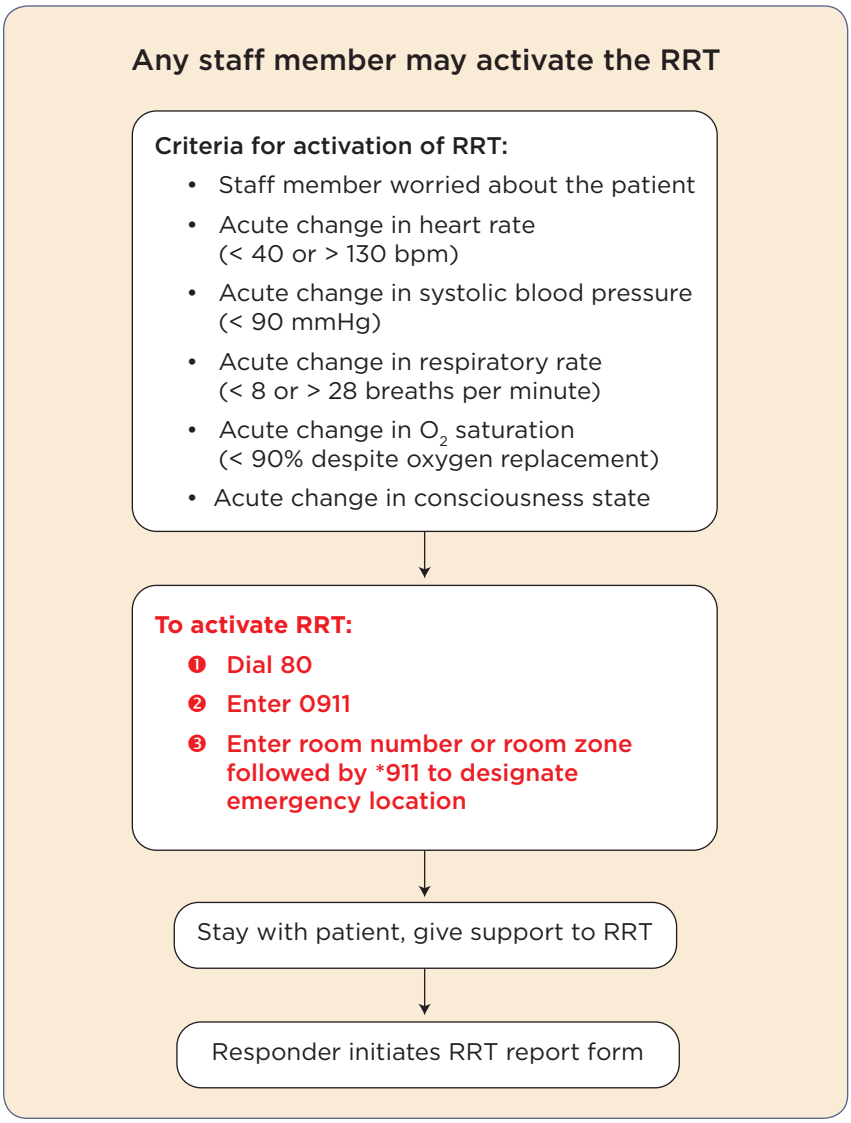

Figure 1. AZCC-UMC North Rapid Response Team (RRT) algorithm

Medical Services, include basic life support or advanced life support, otherwise referred to in the clinic as "lights and sirens." It is important to note that the clinic is not equipped with telemetry capabilities.

Based on the input from this meeting and a review of current literature specific to prehospital management of cardiopulmonary arrest, the contents of the code carts were modified to include only medications and equipment that would allow immediate management, continuation of care, and safe transport. The fire department personnel from the two stations closest to the clinic were invited to tour the facility and identify the preferred access area and the elevators; they were provided with maps of the facility as well. As a part of the RRT activation, a member of the clinic security team was designated to meet the EMS staff and direct them to the RRT call location.

The AZCC-UMC North Experience: RRT Data From the First 12 Months

Data collected from the documentation tools submitted in the first 12 months of the RRT (February 2009 through March 2010) reported 25 RRT activations. The primary reason for the calls included syncope or light-headedness (10), falls (3), acute mental status changes (3), respiratory distress (3), hypersensitivity (2), chest pain (2), acute left-sided weakness (1), and severe pain (1). The average time for response by the RRT is 1 minute. Having multiple licensed providers on the RRT ensures that there will always be a provider available in the event that other members of the RRT are in procedures or otherwise not able to respond immediately. A system for signing out to a member of the RRT when leaving the building is also in place. In the 3 years since moving to the outpatient facility, only two patients have required CPR. Additional events for which the forms were not completed and submitted were not represented in this set of data.

A physician who is employed full time to facilitate treatment of non-oncology infusion patients is often contacted directly for management of events such as hypersensitivity reactions. Other events are managed by directly paging on-site providers who may have seen the patient during a visit that day. This variability in use of the RRT has been identified as an area with potential for improvement, in the form of a review of what constitutes a RRT call and the importance of consistent documentation for all events meeting criteria for a RRT call.

An additional factor that may have reduced the number of calls to the RRT is the establish-

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MEDICAL RECORD #
DOB
NAME
VISIT #

RAPID RESPONSE TEAM RECORD

RRT MEMBER FILLS OUT FORM (MD, NP, RN)

Date: _____ Location: _____Time Called: _____ RRT arrival Time (Military) _____

Primary Reason for Call:
□ Staff concerned/worried: Specify _____

□ Decreased HR
□ Increased HR
□ Decreased RR
□ Increased RR
□ Low SBP
□ Acute mental status change
□ Failure to Respond to Treatment
□ SaO2 < 90%
□ Seizures
□ Syncope
□ Chest Pain
□ Hypersensitivity

Recommendations/Intervention

□ No intervention
□ Oral Airway
□ Suctioned
□ Nebulizer Treatment
□ O2 mask/Nasal Cannula
□ IV Fluid Bolus
□ Blood
□ EKG
□ Chest X-ray
□ Other: _____

Medications Given: _____

Disposition:
□ No change
□ Transferred to hospital: _____
□ Other: _____

Situation: _____

Background: _____

Assessment:
BP _____ **Temp** ____**HR** ____ **RR** _____ **SaO2** _____
BP _____**BP** _____

Recommendation: _____

RRT MD/NP/or RN Signature: _____ Date: _____ Military Time: _____

Figure 2. Rapid Response Team documentation tool. Reprinted with permission from the authors and the Arizona Cancer Center.

ment of an algorithm and standing order set for the management of hypersensitivity reactions. The standing orders are initiated with all new orders for chemotherapy or other treatments, including IV iron or immune globulin, and allow the initiation of antihistamines, corticosteroids, supplemental oxygen, and epinephrine while waiting for the RRT to arrive.

Summary and Recommendations

Implementation of a RRT provided an invaluable service for effective triage and management of patients and visitors at AZCC-UMC North, a NCI-designated outpatient cancer center. The participation of advanced practice oncology professionals is a key component in managing emergent situations in this setting, including daily participation in the RRT. The development of algorithms for activation of the RRT allows any member of the staff to activate the service. The team includes a physician, all nurse practitioners/physician assistants in the clinic, charge nurse, medical assistant, and a pharmacist who wears a separate pager for immediate response. Time to response averages 1 minute. Algorithms and standing order sets that provide a standardized approach to management have been developed for the RRT (including hypersensitivity reactions). Collaboration with community providers, first responders, and the affiliated emergency department is critical to effective patient triage and management. Ongoing evaluation of the RRT calls and outcomes will identify areas for continued improvement.

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