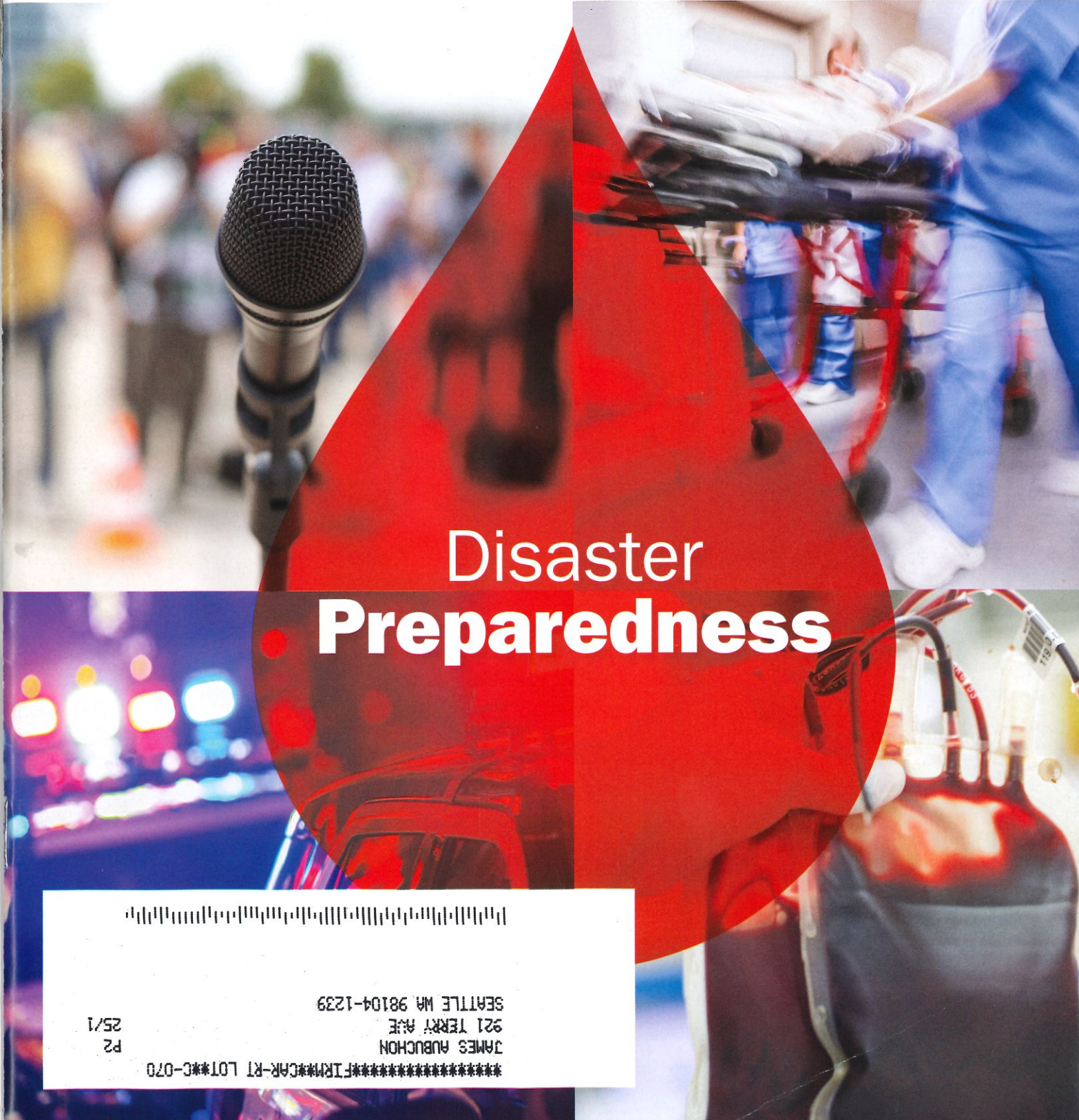


JANUARY 2019
Vol. 21 No. 1

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Disaster Preparedness



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A Contingency Plan Can Be the Difference Between Life and Death After a Disaster

By Theresa Nester, MD
Guest Writer



Theresa Nester, MD

My interest in the question: “What does successful management in a disaster situation look like?” started many years ago, while I was jogging through the parks of my sister’s hometown of Glenwood Springs, Colo. Glenwood Springs and Pineville, Ore. will be forever linked in my mind by the loss of 14 woodland firefighters — nine of whom were from Pineville — to the Storm King Mountain fire near Glenwood Springs in 1994. Although the fire was years ago, the faces of the young men and women who lost their lives will remain eternally young on the memorial in Two Rivers Park. I have read some of the articles written about the fateful decisions made by the leader of that emergency response and about the intensive training that now takes place in the curriculum for firefighters, as homage to the lessons learned. I return to the city of Seattle, where I have no doubt that those lessons have benefit off the mountain. When you live in one place long enough and see it change and become more crowded, with infrastructure failing to keep up with the throngs of people relocating there, the thought of a disaster of any kind becomes worrisome. It does not help when the *The New Yorker* takes an interest in the earthquake fault lines that run under your state and starts making predictions about the scale of the certain destruction to come. In addition, my readings regarding a remote forest fire and review of the literature on man-made disasters — such as the subway bombings in Spain — have reinforced for me the idea that clear assignment of a leader, successful communication, accurate information and developing a mitigation plan for loss of infrastructure are fine goals in the effort to save lives. Each of these aspects takes thoughtful consideration, well ahead of an event.

Kudos to the smart, collaborative people at Minnesota Department of Health who, because of multiple events including pandemics and regional disasters, developed “Patient Care Strategies for Scarce Resource Situations” (<http://www.health.state.mn.us/oep/healthcare/crisis/standards.pdf>). The pages of this document are cards covering many topics, including ventilator support, renal replacement therapy, oxygen and blood products. The cards are intended to help define how the health care community will respond to conserve scarce resources in a disaster.

Response Network

In the Puget Sound region of western Washington, the Northwest Healthcare Response Network (www.nwhrn.org) is the nonprofit organization that spearheads the effort to build a disaster-resilient health care system, including developing a framework for managing scarce resources in disaster response. Several years ago, the Network began pulling together a group of clinicians to form a Disaster Clinical Advisory Committee (DCAC) for King and Pierce counties. These two counties comprise Washington state’s medical services epicenter, with nearly 50% of the state’s hospital beds. The DCAC consists of 47 clinicians from 15 different specialties, representing all the major health care systems as well as some private health care clinics in King and Pierce counties. Included on this committee are clinicians with a variety of specialties, such as infectious disease, pediatrics, trauma and transfusion medicine. In addition, there are medical ethicists, legal experts and public health and clinical administrators who bring additional perspective and important input, especially when it comes to allocating scarce resources.

BLOOD PRODUCTS
STRATEGIES FOR SCARCE RESOURCE SITUATIONS (cont.)

MINNESOTA HEALTHCARE SYSTEM
PREPAREDNESS PROGRAM

Category	RECOMMENDATIONS	Healthcare Facility	Blood Center	Strategy	Conventional	Contingency	Crisis
	<ul style="list-style-type: none"> Though not true substitute, consider use of desmopressin (DDAVP) to stimulate improved platelet performance in renal and hepatic failure patients 	✓		Substitute			
	<ul style="list-style-type: none"> May use leukoreduced whole blood pooled platelets (and, if required, consider non-leukoreduced whole blood pooled platelets) 		✓	Adapt	Leukoreduced		(Non-leukoreduced)
	<ul style="list-style-type: none"> Convert less needed ABC/Whole Blood to Apheresis 		✓	Adapt			
	<ul style="list-style-type: none"> Transfuse platelets only for active bleeding, further restrict to life-threatening bleeding if required by situation 	✓		Conserve			

BLOOD PRODUCTS
STRATEGIES FOR SCARCE RESOURCE SITUATIONS

MINNESOTA HEALTHCARE SYSTEM
PREPAREDNESS PROGRAM

Category	RECOMMENDATIONS	Healthcare Facility	Blood Center	Strategy	Conventional	Contingency	Crisis
All Blood Products	<ul style="list-style-type: none"> Increase donations if required, and consider local increase in frozen reserves Increase O positive levels Consider maintaining a frozen blood reserve if severe shortage Increase recruitment for specific product needs Consider adjustments to donor HGB/HCT eligibility Relax travel deferrals for possible malaria and BSE (bovine spongiform encephalitis)* 		✓	Prepare			
	<ul style="list-style-type: none"> Use cell-saver and auto-transfusion to degree possible 	✓		Re-use			
	<ul style="list-style-type: none"> Limit O negative use to women of child-bearing age Use O positive in emergent transfusion in males or non-child bearing females to conserve O negative 	✓		Conserve			
	<ul style="list-style-type: none"> Change donations from whole blood to 2x RBC apheresis collection if specific shortage of PRBCs 		✓	Adapt			
	<ul style="list-style-type: none"> More aggressive cryofiltration resuscitation prior to transfusion in shortage situations (blood substitutes may play future role) 	✓		Conserve			
Pooled Red Blood Cells	<ul style="list-style-type: none"> Long-term shortage, collect autologous blood pre-operatively and consider cross-over transfusion Enforce lower hemoglobin triggers for transfusion (for example, PGB 7) Consider limiting high-consumption elective surgeries (elect cardiac, orthopedic, etc) Consider use of erythropoietin (EPO) for chronic anemia in appropriate patients Further limit PRBC use, if needed, to active bleeding states, consider subsequent restrictions including transfusion only for end-organ damage, then to shock states only Consider Minimum Qualifications for Survival (MQS) limits on use of PRBCs (for example, only initiate for patients that will require < 6 units PRBCs and/or consider stopping transfusion when > 6 units utilized. Specific MQS limits should reflect available resources at facility. Reduce or waive usual 56 day inter-donation period* based upon pre-donation hemoglobin Reduce weight restrictions for 2x RBC apheresis donations according to instruments used and medical director guidance 	✓	✓	Conserve			
	<ul style="list-style-type: none"> Though not true substitute, consider use of fibrinolytic inhibitors or other modalities to reverse coagulopathic states (tranexamic acid, aminocaproic acid, activated coagulation factor use, or other appropriate therapies) 	✓		Substitute			
	<ul style="list-style-type: none"> Consider reduction in red cell: FFP ratios in massive transfusion protocols in consultation with blood bank medical staff 	✓		Conserve			
	<ul style="list-style-type: none"> No anticipatory use of FFP in hemorrhage without documented coagulopathy 	✓		Conserve			
	<ul style="list-style-type: none"> Obtain FDA variance to exceed 24 collections per year for critical types* 		✓	Adapt			
Fresh Frozen Plasma	<ul style="list-style-type: none"> Obtain FDA variance to exceed 24 collections per year for critical types* 		✓	Adapt			

*FDA approval/variance required via American Association of Blood Banks (AABB) MINNESOTA DEPARTMENT OF HEALTH
DIVISION OF EMERGENCY PREPAREDNESS
425 Robert Street, N.E., 1st Floor, St. Paul, MN 55104
www.health.state.mn.us/dep/healthcare TEL: 651.201.5700 / TDD: 651.215.8988
MDH DEPARTMENT OF HEALTH

As a subject matter expert for the Blood Products card, it has been helpful to sit with this group and hear the things that they consider when a scenario is presented to them. It could be a prediction of how the upcoming flu season will impact the region or the process by which decisions will be made when a limited number of ventilators are available in a prolonged pandemic. The more senior physicians in the room, those who have helped with disasters in other countries or those adept at medical history, may come up with improvisation strategies that could be used if a crisis were to force us to operate outside of the usual standard of care.

The cards are intended to push the group to consider strategies for three types of capacity situations: conventional, contingency and crisis. In the contingency situation, the usual standard of care is maintained, although the space, staff and supplies used to maintain this standard may be stretched beyond daily practice. A transfusion example would be supporting male children requiring uncrossmatched blood, and possibly those who are known to be RhD negative, with RhD positive red cells. The switch to RhD positive cells does not typically pose a short-

term risk, but it is not our usual practice outside of a disaster. In a crisis capacity situation, the usual standard of care cannot be accomplished, but an effort is made to provide the best care under the circumstances. A transfusion example would be to limit the issue of a set number (such as a maximum of 6 units) of RBCs to those patients meeting agreed-upon minimum qualification for survival (also known as establishing an MQS limit). When one compares this to routine trauma care in our area, it is unusual to curtail the life-saving efforts of a trauma team based on a red cell limit for one patient, unless the red cell inventory is dangerously close to depletion. In a crisis situation, where multiple traumas are expected, setting limits may be the way to achieve the greatest good, for the greatest number of people. My experience with helping to tailor this card to our region



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—Theresa Nester, MD

reinforced the fact that, as stewards of the community supply, blood bank staff regularly use rationing (particularly for platelets) as a conventional strategy. In addition, we get frequent practice in thinking through—and occasionally implementing—contingency strategies. When thinking about crisis strategies, it is helpful to have ethicists in the room, as the crisis scenarios require a different level of consideration.

This card is an example of what could be used as the scarce resource card for blood for your community. The hospitals in our region have seen this card, and the blood center is aware that the community will be looking to implement these strategies based on a specific event. It made the most sense to consider the following scenarios: mass casualty, pandemic and extreme weather conditions, as we worked through the card. A prolonged pandemic that affects blood suppliers in many parts of the country, for example, will require different strategies compared to an earthquake that affects only western Washington. This card is tailored to our health care community. Not all strategies will work in all communities, and therefore contents must be reviewed by local clinicians.

Strength of the System

Although we have not had a significant natural disaster that has pushed us to use these conservation strategies, we have had events that prompted us to come together as a health care community to review or develop a plan. When the Ebola scare arose in 2014, the Network held a teleconference for medical professionals, which proved useful in the effort to obtain accurate information about issues such as: how to distinguish the common flu from Ebola; how one might triage patients in the Emergency Department; what we knew so far about Ebola and the blood supply; and re-

sources for developing decontamination protocols. The group has worked to understand the legal protections afforded to individuals who extend themselves to operate in conditions far outside of the normal standard of care and to understand the potential psychological effects of disasters on both victims and responders. We have tested phone trees, text messages and the electronic portals that have been set up to provide hospital data during a big event. We receive regular communications from the Network when large gatherings of people are expected at events that have resulted in violence in the past.

All of this is excellent work, but I believe that the Network’s biggest strength is in prompting dialogues among multiple representatives from the region’s health care systems. The cards have been a way to discuss collective mitigation strategies with one scarce resource at a time. This in turn has helped to set expectations. We, as a region, have yet to require a ban on elective surgery during disaster response, as was implemented by Florida in 2004 after four hurricanes struck within a six-week span. If an event of that magnitude impacts our region, we will need all hospitals to respond collaboratively and collectively. I trust that the Network’s ongoing work will go far in ensuring that this occurs. The Network has helped foster the collaboration needed to better prepare, respond and recover from a disaster. Members of the Network work tirelessly to ensure that successful communication, accurate information and mitigation plans are in place. It is a comfort to know that in my crowded city, when disaster strikes, I will know where to turn. ■

Theresa Nester, MD, is the medical director of Integrated Transfusion Services and the associate medical director of the immunohematology reference laboratory at Bloodworks Northwest.