

April 21, 1981

The Honorable Sylvia H. Rambo  
U.S. District Court  
Middle District Federal Building  
3rd and Walnut Street  
Harrisburg, PA 17103

Dear Judge:

This letter is for the purpose of requesting information.

Several months ago your court made an important ruling relative to the owners of the Three Mile Island Nuclear Power Station. It is my recollection that part of that decision established a fund for the purpose of research on the impact of accidents at TMI.

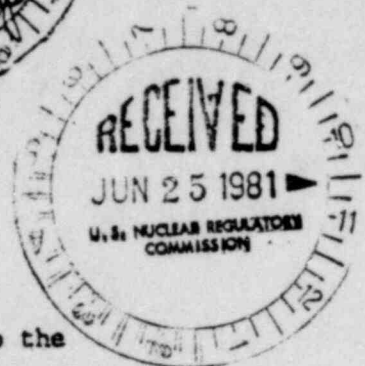
There are many of us in the Health Care Delivery Field who since March of 1979 have been concerned about the ability of hospitals to be evacuated if required to do so by the governor's office. As you will recall, our hospitals were on stand by alert to be evacuated within four to eight hours of notification. There is reason to believe that our institutions would not be able to comply particularly with regard to those patients on life support systems when the evacuation is mandated by surface means. Although this matter has been of great concern to many organizations and many individuals, two years have now elapsed since the events which triggered this concern and to date no effective study of this problem has been mounted. To the best of my knowledge no such study is contemplated.

This letter therefore is for the purpose of determining if this subject is one which might be considered appropriate under the condition of the ruling of your court. If so, could you please advise the mechanism by which one should initiate a request for consideration of this subject. Thank you, sincerely for your help.

Sincerely,

*gef*  
George L. Jackson, M.D.

cc Jack Semanko  
Bob Ball  
Jon Anderson  
Larry Crowell



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Rec'd - 6-8-81

## Three Mile Island

### The Silent Disaster

J Stanley Smith, Jr, MD, James H. Fisher

• From Wednesday, March 28, 1979, to Wednesday, April 4, 1979, Dauphin County, Pennsylvania, was in a state of near-panic in response to the Three Mile Island nuclear accident. The Dauphin County Office of Emergency Preparedness quickly attempted to develop a plan to evacuate not only the population of an area 20 miles in radius from the plant but the short-term and long-term care medical facilities as well. For medical evacuation, a system of classification of patients was defined and matched to needed transportation. Furthermore, a critical coordinating link was established with the Hospital Association of Pennsylvania to identify and categorize relocation beds in receiving hospitals far from the incident site in the event of evacuation. Just as this incident was unusual, so too were the planning activities unique since they were never before conceived or accomplished.

(JAMA 1981;251:1656-1659)

ON MARCH 28, 1979, the potential for the worst peacetime nuclear disaster ever recorded surfaced in central Pennsylvania, when the Three Mile Island Nuclear Generating Station (TMI) experienced a malfunction of its cooling system, allowing leakage of radiation to the environment. During the malfunction and subsequently over the next three days, serious problems arose with the nuclear core that could have led to the evacuation of the surrounding area's populace.

The offending agent was radiation, which served only to cause panic because it could not be seen, felt, or sensed in any way. Suddenly, Harrisburg and Middletown, Pa, became known worldwide, as emergency planners met to deal with any contingency.

We do not propose to discuss the incident nor the pros or cons of nuclear power, but now that the incident is over, we must share our experiences and lend our knowledge to others who may someday face a similar situation. The unique aspect in our experience entailed planning to evacuate numerous hospitalized pa-

tients to areas outside our region. Previously when hospitals were evacuated, the patients were moved to temporary shelters within the disaster area, but that would not suffice for a radiation leak.

Therefore, the problem we faced was how to evacuate, orderly and peacefully, nearly 200,000 residents, including those in the short-term and long-term care medical facilities of the county. This task became the responsibility of the Dauphin County Office of Emergency Preparedness (OEP) (formerly Civil Defense). The job of evacuating short-term care patients from hospitals was delegated to the county's medical coordinator, James H. Fisher. A medical command team was formed, consisting of Fisher, J Stanley Smith, Jr, MD, Joel E. Grottenthaler, Pennsylvania Emergency Health Services Council director, and Harrisburg Hospital ambulatory care director, John H. Semanko. The medical command team's responsibilities during the TMI incident included notification and coordination of 22 ambulance services and the development of a plan to evacuate the four short-term care hospitals and 15 long-term care facilities in Dauphin County.

On Wednesday, March 28, 1979, the first day of the incident, the Pennsylvania Emergency Management Agency (PEMA) notified the Dauphin

County OEP of a controlled on-site radioactive release from TMI. During the first 48 hours of the incident, the public was informed that everything at the plant was under control; then, on Friday, evidence to the contrary came over the news wire services. The Nuclear Regulatory Commission (NRC) was sending a special emissary to TMI, and Walter Cronkite was talking about a possible "melt-down" occurring in Harrisburg, Pa. Pennsylvania Governor Richard Thornburgh recommended that all pregnant women and preschool-aged children within a 5-mile radius of TMI relocate outside the endangered zone, and people voluntarily began evacuating. Outgoing roads became jammed, gas lines seemed longer than those experienced during the recent fuel crisis, and commercial flights out of Harrisburg International Airport were booked solid.

Following notification from the PEMA, Dauphin and surrounding York, Lancaster, and Cumberland counties began preparation for an initial 5-mile evacuation involving more than 25,000 residents. The very next teletyped communication received from PEMA on Friday, March 30, ordered the endangered counties to plan for evacuation of areas both 10 and 20 miles from the incident site.

With all of Dauphin County's short-term care hospitals and a majority of its long-term care medical facilities being contained within the 10-mile perimeter, the medical command team advised these facilities to begin preparation for possible evacuation. After further media announcements that the nuclear incident had gone critical, the four hospitals (Harrisburg Hospital, Polyclinic Medical Center, Community General Osteopathic Hospital, and the Hershey Medical Center), in consultation with the county's medical command team, voluntarily started to reduce their patient census. While this decision was met with mixed emotions from the hospital medical staffs because there was as yet no "declared" emergency, the facilities began to discharge as many patients as possible, place restrictions on all but emergency admissions, and cancel all elective surgery and diagnostic test-

From the Polyclinic Medical Center, Harrisburg, Pa (Dr Smith), and the Emergency Health Services Federation of South Central Pennsylvania, Camp Hill (Dr Fisher).

Reprint requests to 2945 N Third St, Harrisburg, PA 17110 (Dr Smith).

## County Hospitals

Time: \_\_\_\_\_

Date: \_\_\_\_\_

Patient Class	Hospital and Telephone No.	Total	Ambulance	Truck	Bus
Medical/Surgical	Hospital A				
	Hospital B				
	Hospital C				
Pediatric	Hospital A				
	Hospital B				
	Hospital C				
Intensive Care Unit/Coronary Care Unit	Hospital A				
	Hospital B				
	Hospital C				
Intermediate	Hospital A				
	Hospital B				
	Hospital C				
Maternity*	Hospital A				
	Hospital B				
	Hospital C				
Neonatal	Hospital A				
	Hospital B				
	Hospital C				

Hospital Patient Color Coding: Blue (Ambulance Cases)  
 Blue/Black (Ambulance With Life-support Equipment)  
 Green (Trucks—Litters and Beds)  
 Yellow (Bus—Ambulatory and Wheelchair)  
 Red (Discharge—Bus if Needed)

Note: In Event of Evacuation—Hospital A Emergency Care Unit to Remain Open UNTIL  
 Evacuation of Medical Facilities Is Complete.

\*Mothers and Newborns Count as ONE.

Fig 1.—Transport status form for classification of patient types, county hospitals.

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On Friday morning, March 30, there were 1,308 short-term care patients within the four hospitals and 2,400 nursing home patients to prepare for evacuation. The complexity of care varied from ambulatory to total-body support; in addition, there were approximately 30 outpatients requiring renal dialysis on a regular basis.

The hospitals were extremely suc-

cessful in reducing patient census to a low of 621 short-term care patients on April 4, which is recognized as the last day of the crisis; however, a sense of urgency competed with the feeling of uncertainty during this task.

To prepare further the remaining patients for evacuation, the hospital nursing staffs coded patients' charts to correspond with the transport status according to a patient grouping supplied by the medical command

team. Patients were first classified into types, ie, medical/surgical, obstetric/gynecologic, pediatric, neonatal, intensive care, and intermediate care. These patient groups were further subdivided by the required mode, ie, ambulance, ambulance with life-support equipment including monitors and respirators, trucks for patients requiring special handling (eg, Stryker frames), and buses for ambulatory or partially ambulatory



patients (Fig 1 and 2).

Thus, to facilitate rapid processing, color codes were assigned to the patient categories and modes of transportation. These colored strips were applied to both the patient wristbands and their charts. Debar-kation areas corresponding to each of the color codes were also established in each hospital to allow faster loading. Staff assignments were also made to correspond with the color codes. Thus, in the event of an evacuation, both patients and staff could proceed to the appropriate colored areas.

At this point, a critical coordinating link was established with the Hospital Association of Pennsylvania (HAP). The HAP was able to identify receiving hospitals to accept the Harrisburg-area patients based on our patient classifications. These receiving hospitals extended for an area more than 100 miles long and at least 50 miles from the incident site (Fig 3). Unlike in previous disasters,<sup>14</sup> reliance could not be placed on temporary shelters within the danger zone, so the decision was made to evacuate to short-term care facilities outside

our area.

During this planning process, a new problem arose—the exodus of people included physicians, nurses, and technicians required to staff both the short-term and long-term care medical facilities. Not only would the census be reduced at the facilities, but at the same time, staff shortages would become critical. Three long-term care facilities (Frey Village, Old Fellows, and Homeland) had to be relocated solely on the basis of unavailable staff. Reduction of patient census by more than 50%, requests for off-duty personnel, personnel willing to work in some cases around the clock, and consolidation of nursing units seemed temporarily to relieve the immediate critical staff shortage.

The medical evacuation plans were presented to the administrative, medical, and nursing staffs of each short-term and long-term care medical facility. An additional request was made also that staff members be assigned to accompany patients to the receiving hospitals since they would be overburdened by the sudden influx of short-term care patients. The plan

met with an excellent response, owing in part to the cooperation and communal spirit emanating from the facilities during its preparation.

To maintain current status, each facility nursing director was asked to conduct a census and patient classification every 24 hours and report this information to the medical command team. This information was then coordinated with the availability of receiving hospital beds and transportation. Additionally, every 24 hours a reassessment of the numbers and types of receiving hospital beds was made.

The medical command team also designated two hospital emergency departments that would remain open during the evacuation process to receive emergency cases. On completion of the county evacuation, these emergency departments would be closed and the responsibility of providing further emergency services would be turned over to the PEMA for those few remaining in the evacuation zone.

Planning during this period of uncertainty continued vigorously, even though we had no definitive word from the governor's office on the incident status. Finally, after seven days from the initial event, the governor placed our planning efforts on hold, with his announcement that schools outside the 5-mile radius would be allowed to reopen. The governor further advised emergency workers to return to standby status. The emergency was not clearly over, but the governor had been assured by the NEC that further danger to the public was negligible. People slowly started to return to their homes to resume the normal routine of life.

#### Comment

In the midst of all this planning, certain needs were identified, the

County Nursing Homes

Home	Total	Ambulance	Truck	Bus
Home A				
Telephone No.				

Patient Color Coding: Blue (Ambulance Cases)  
 Blue/Black (Ambulance With Life-support Equipment)  
 Green (Truck—Litters and Bed Cases)  
 Yellow (Bus Cases—Ambulatory and Wheelchair)  
 Red (Family Taking Patient)

Time: \_\_\_\_\_

Date: \_\_\_\_\_

Fig 2.—Transport status form for classification of patient types, county nursing homes.

Relocation Hospitals

Hospital	Medical/Surgery	Pediatric	Intensive Care Unit/Coronary Care Unit	Intermediate	Maternity	Neonatal
Hospital A						
Telephone No.						

Time: \_\_\_\_\_

Date: \_\_\_\_\_

Fig 3.—Classification form for relocation hospitals.

most pressing being that areas surrounding nuclear power facilities must recognize the possible extent of a nuclear incident and plan for evacuation of areas both 10 and 20 miles distant, not just the 5-mile radius previously recommended by the NRC. In addition, lines of communication must be established between local districts and county and state emergency management agencies and must be used both ways to inform the agencies of the latest news. Cooperation of the agencies along these lines of communication must be fostered also to promote a unified effort. Furthermore, a central coordinating agency must be identified to act as an information processor to integrate the needs with the available resources.

Each county must be responsible for delineating its own reception area, which must not conflict with any other county surrounding a nuclear facility. Thus, evacuation should be in radial directions and not crossing other involved counties. In other words, the northern counties go north and the western counties go west.

For medical evacuation a system must be defined to categorize and classify patients so that they are transferred to a facility providing equivalent care. Plans for reduction of patient census must be prepared also to decrease transportation requirements. Patients must be grouped according to medical classification and categorized for available modes of transportation. Staging areas at each hospital must be identified for debarkation such that there is a separate staging area for each available mode of transportation.

Required transportation must be gathered from outside the incident area so that police, fire, and emergency medical services within the affected area can respond to local emergencies that will undoubtedly occur during the incident duration. Furthermore, medical transport vehicles must be routed along different highways so as not to conflict with civilian evacuation, this being especially applicable to the critical care patients for whom a delay could be fatal.

Local plans for reorganization and redeployment of emergency services around the perimeter of the evacuation area should be developed to

decrease possible radiation exposure.

Along with the needs we also encountered problems. The problems we identified rather early dealt with three common areas: communications, transportation, and manpower resources. Communications and reliable information were scarce regarding the status of the nuclear incident and the probability of activating our plans. We maintained an extreme-readiness posture throughout the entire seven-day period. Our primary source of information became the network news and not the PEMA, as established procedures required. There was no constant flow of information to the Dauphin County OEP. Many times we had to call other agencies to confirm reports we had heard from the news media. As the team responsible for formulating and carrying out a massive evacuation, it was essential that we be kept informed.

The communication problem encountered during preparation of the disaster response mechanism is attributed to the resulting upset in the chain of command on arrival of the NRC on March 30. Under normal circumstances, the agency in charge would have been the PEMA. But when the NRC arrived, authority shifted to the governor's office and communication difficulties resulted.

The second problem area was in the location and guarantee of medical transport vehicles. The PEMA could not guarantee transportation until an evacuation order was issued. Thus, we continually sent PEMA our requirements for transportation, but were never sure whether we would get what we needed when we needed it. Furthermore, we estimated that it would take approximately 36 hours to accomplish evacuation of all medical facilities, not the four to eight hours continually quoted by the governor's office.

Our third problem area, available manpower resources, at times was identified as critical. With the extent of voluntary evacuation approaching 40% to 50% of the populace, medical care staffing was critically short. Our only saving factor was decreasing patient census by more than 50% to keep up with the staffing shortage. We were also concerned that should an evacuation order come, medical

staffing would be even more difficult to maintain. Therefore, we had requested military medical staff support to keep the facilities open during the evacuation process, but the PEMA chose to deny our request. As it was, one hospital was on the verge of evacuation because of limited staff coverage necessary to maintain quality medical care. Certainly, better communications regarding the actual status at the site would have helped alleviate the fears that were forcing people out of the area.

In response to the nuclear incident at TMI, the Dauphin County OEP's Medical Command Team has prepared a plan outlining nuclear incident emergency medical procedures. The plan outline is intended to provide county emergency management agencies (civil defense) with a format to develop localized disaster plans for emergency medical response to fixed-facility nuclear incidents and evacuation of short-term/long-term care medical facilities. While the Dauphin County OEP had previously prepared a disaster relocation plan for the 5-mile radius from TMI, the 5-mile plan did not address medical facility evacuation, since the nearest facility was 8 miles distant.

Within the context of detailing total short-term care medical facility evacuation, the plan is considered unique. However, the emergency medical plan must be considered as only one component of the total response and evacuation plan. A total county nuclear incident disaster plan must encompass identification of exit corridors, traffic control, public notification, and public safety agency coordination, as would be included in any other disaster plan.

Copies of the *Nuclear Incident Emergency Medical Plan Outline* are available on request to the Emergency Health Services Federation of South Central Pennsylvania, 3514 A Trindle Rd, Camp Hill, PA 17011. To defray the cost of publication, handling, and postage, a contribution in the amount of \$10 made payable to the EHS Federation for each copy of the plan is requested.

#### References

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