2014 Ebola Virus Disease in Dallas: The Dallas Fire-Rescue Experience

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By three methods we may learn wisdom:

First, by reflection, which is noblest;

Second, by imitation, which is easiest;

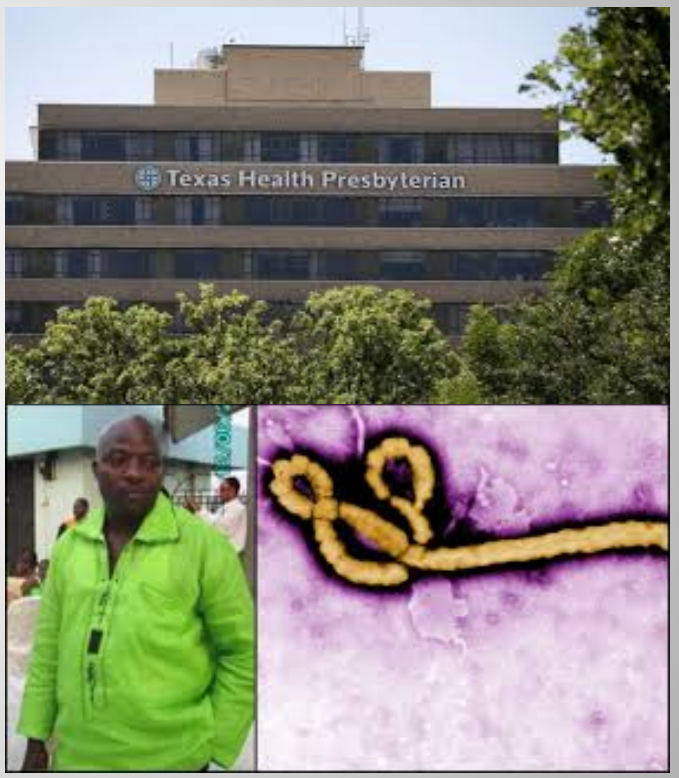
And third by experience, which is bitterest. -Confucius

Background

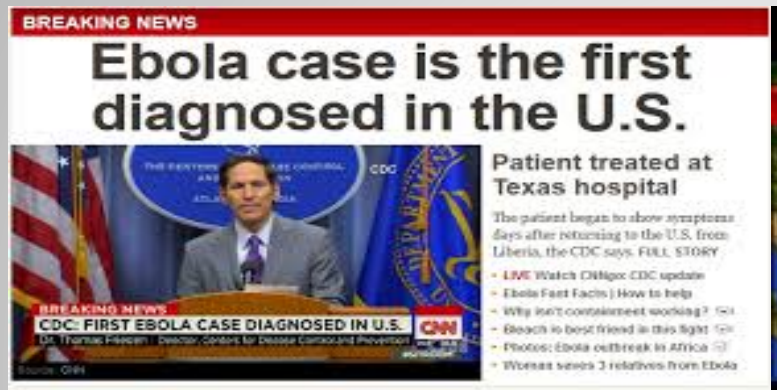
- First Africa outbreak in 1976
- WHO reports 24 previous outbreaks
- Current African outbreak involves the Ebola-Zaire strain
- 55-60% fatality rate
- Total cases: 13,567
- Lab confirmed cases: 7,728
- Total deaths: 4,951

First Notification

- Transport Sunday, October 28, 2014
- Dallas County HHS interviewed index patient
- Index patient was tested for Ebola on Monday October 29, 2014
- DFR was notified of suspicion of Ebola at approximately 0900 Tuesday October30
- Positive test result confirmed at approximately 1600 Tuesday October 30

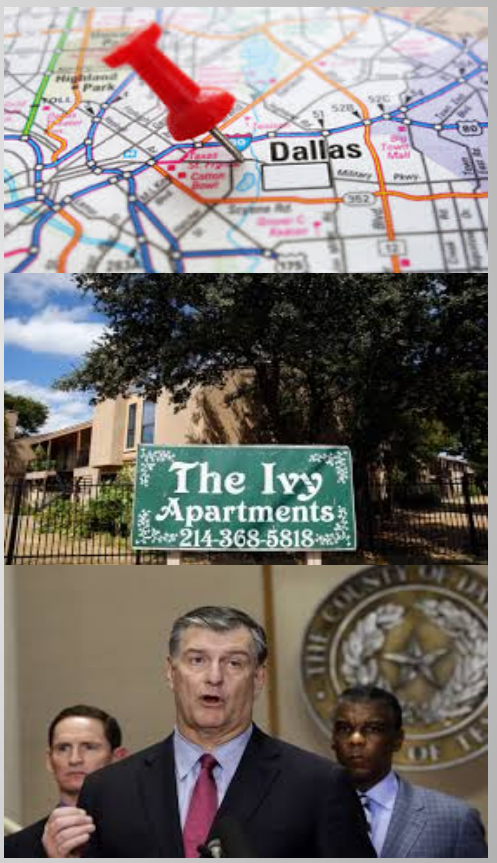


The First 24 Hours



Initial Action Plan

- City of Dallas Emergency Operations Center (EOC) briefing
- Plan for paramedics
- Initial actions by City of Dallas



DFR Personnel

- DFR personnel involved
  - Two paramedics
  - One paramedic intern
- Baseline medical exam
- 21-day in-home monitoring
  - DFR medical direction team
  - CDC or DCHHS
  - Family stayed in the home and were free to come and go

Media

The First Few Days

UTSW/BioTel EMS TRAINING BULLETIN

October 2014

EMS TB 14-006

Ebola Virus Disease (EVD)

Purpose:

1. To inform & provide management recommendations to UTSW/BioTel EMS System EMS Providers about Ebola Virus Disease (**EVD**).

Background:

1. A patient with **EVD**, also known as Ebola Hemorrhagic Fever, was recently evaluated & transported to Texas Health Presbyterian Hospital by Dallas Fire-Rescue paramedics.

EVD Transmission:

1. Ebola virus can be transmitted ONLY via DIRECT contact with the bodily fluids (e.g. blood, saliva, emesis, feces, urine or semen) of a SYMPTOMATIC, INFECTED person.
2. Ebola virus CANNOT be transmitted by casual contact, such as being in the same room with a patient.
3. Persons infected with Ebola virus are ONLY contagious when they are SYMPTOMATIC. In other words, patients infected with Ebola virus are NOT contagious during the asymptomatic incubation period immediately following infection (which ranges from 2 to 21 days, with an average 8 to 10 days).

Patient Signs and Symptoms of EVD that suggest the possibility that a patient may be potentially contagious:

1. Fever
2. Headache
3. Malaise
4. Body aches
5. Fatigue
6. Nausea
7. Vomiting
8. Diarrhea
9. Bleeding or bruising of unknown cause

UTSW/BioTel EMS System
October 2014

Amended Caller Interrogation and Dispatch Procedures: Dallas Fire-Rescue

Purpose:

To provide UTSW/BioTel EMS agencies with amended caller interrogation and dispatch procedures to screen for patients with signs/symptoms suggestive of possible Ebola Virus Disease (EVD), so that EMS providers will be dispatched with appropriate Personal Protective Equipment (PPE) and other protective measures.

Background:

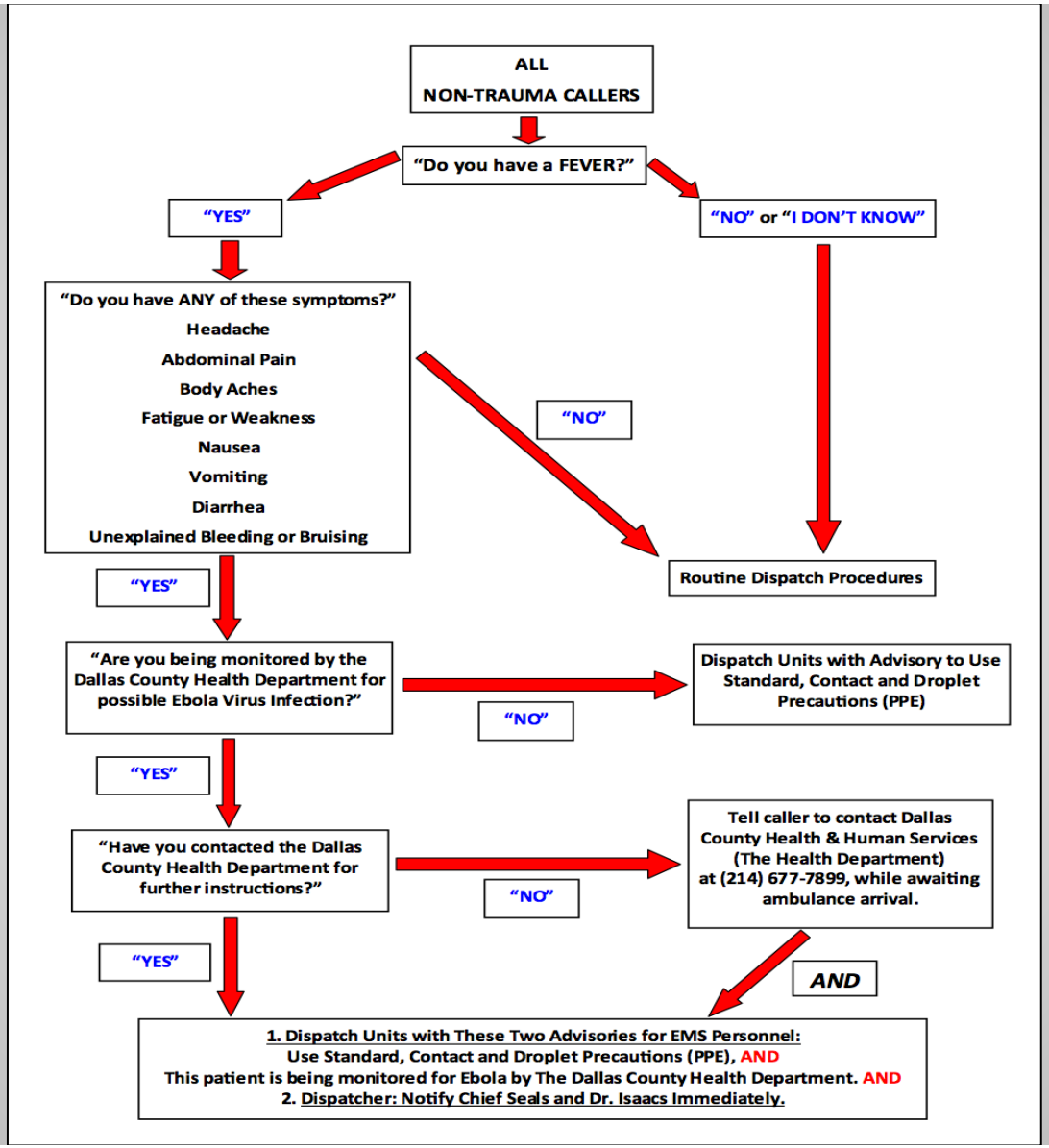
A patient with **Ebola Virus Disease** was recently evaluated & transported to Texas Health Presbyterian Hospital by Dallas Fire-Rescue paramedics.

Detailed Caller Interrogation and Dispatch Procedures:

DEFINITIONS and ABBREVIATIONS:

- **"The Health Department" or "Dallas County Health Department" = Dallas County Health and Human Services**

Refer to the flow chart on the next page.


ALL
NON-TRAUMA CALLERS
"Do you have a FEVER?"
"YES"
"NO" or "I DON'T KNOW"
"Do you have ANY of these symptoms?"
Headache
Abdominal Pain
Body Aches
Fatigue or Weakness
Nausea
Vomiting
Diarrhea
Unexplained Bleeding or Bruising
"NO"
"YES"
Routine Dispatch Procedures
"Are you being monitored by the Dallas County Health Department for possible Ebola Virus Infection?"
Dispatch Units with Advisory to Use Standard, Contact and Droplet Precautions (PPE)
"NO"
"YES"
"Have you contacted the Dallas County Health Department for further instructions?"
Tell caller to contact Dallas County Health & Human Services (The Health Department) at (214) 677-7899, while awaiting ambulance arrival.
"NO"
"YES"
AND
1. Dispatch Units with These Two Advisories for EMS Personnel:
Use Standard, Contact and Droplet Precautions (PPE), AND
This patient is being monitored for Ebola by The Dallas County Health Department. AND
2. Dispatcher: Notify Chief Seals and Dr. Isaacs Immediately.

UTSW/BioTel EMS System
October 2014

EMS TB 14-007:
Use of Medical Personal Protective Equipment (PPE)

Purpose:

To provide UTSW/BioTel EMS agency EMS Providers with guidelines for the proper use and removal/disposal of Personal Protective Equipment (PPE).

Background:

Recent events surrounding the confirmed case of Ebola Virus Disease (EVD) in Dallas mandate refresher training and review of Department Policies in the proper use of PPE for all EMS Providers.

The type of PPE components varies according to the mode of disease transmission. These PPE components are deployed within four different, partially overlapping levels of "Isolation Precautions" for treating the patient and interacting with the patient's environment of care: Standard, Contact, Droplet and Airborne.

PPE is the "what", and Isolation Precautions are the "how" of personal protection in healthcare.

The procedure for putting on (donning) and removing (doffing) PPE is likewise tailored to the specific type of PPE needed for each level of Isolation Precautions.

A Buddy System with a second EMS Provider observing the first EMS Provider during donning and doffing can help to ensure proper PPE use, if staffing allows.

Infection Control & Prevention Items Needed Prior to Patient Contact:

- **Hand hygiene supplies**
- BioHazard bags & other infection control supplies

PPE Selection Recommendations:

NOTE: EMS Providers may always exercise clinical judgment to don a HIGHER level of PPE, especially RESPIRATORY Protection, if the clinical scenario warrants.
NOTE: This table does NOT include specific recommendations for the management of the patient's environment of care (e.g. handling and disinfection of medical equipment, environmental surfaces, ambulance surfaces, etc.) – Refer to UTSW/BioTel EMS TB 14-008.

PPE Component	PPE Selection According to Clinical Scenario		
	ALL Patient Encounters	**Patients with fever and/or other signs/symptoms, with any known or suspected infection, such as Ebola,** Influenza & other viruses, Plague, Hepatitis B/C	**Patients with fever and/or other signs/symptoms & known or suspected infection with airborne-spread organism,** such as TB, measles, or chickenpox; or unknown history
	"Standard Precautions"	**"Contact and Droplet Precautions"**	**"Airborne Precautions"**
DISPOSABLE GLOVES	**YES**	**YES**	**YES**
GOWN (Impermeable or Fluid Resistant)	**As needed**	**YES**	**YES**
EYE + FACE PROTECTION OPTIONS: **1) 1-Piece Combined Face Shield with Surgical Mask, *OR*** **2) Face Shield/Eye Shield & Surgical Mask, *OR*** **3) Wraparound Goggles and Face Mask***	**As needed**	**YES**	**SEE BELOW**
RESPIRATORY PROTECTION			
• **Standard Surgical Face Mask***	**As needed**	**YES**	**NO**
• **N95 or N100 Respirator*** **(Must be worn with Eye Protection)**	**NO**	**YES, *IF* "High-Risk" or "Aerosol-Generating" Procedures (AGP†), e.g. CPR, Airway interventions**	**YES**
(If available) • **Air-Purifying Respirator*** **(Must be worn with Eye Protection) *OR* SCBA**	**NO**	**NO**	**YES, *IF* "High-Risk" or "Aerosol-Generating" Procedures (AGP†), e.g. CPR, Airway interventions**
SURGICAL FACE MASK for PATIENT?	**NO**	**YES**	**YES**

Special Circumstances:

- CPR, Airway Interventions and other procedures (known as "Aerosol Generating Procedures", "AGP"†) may generate large volumes of patient body fluids (vomit, saliva, sputum, etc.)
  - Performance of these procedures in a moving vehicle or under other relatively less controlled conditions increases the risk of EMS Provider exposure
    - When possible, these procedures should be performed under safer conditions, such as: Stopped vehicle, or at the receiving hospital
  - ADDITIONAL PPE that may be needed under these circumstances:
    - Double GLOVES
    - Disposable shoe covers ("BOOTIES")
    - Disposable leg covers("LEGGINGS")

UTSW/BioTel EMS TRAINING BULLETIN

October 2014

EMS TB 14-009
Hospital Destination Guidelines for Patients at Risk for Ebola Virus Disease (EVD)

Purpose:

To provide decision-making guidance to UTSW/BioTel EMS Providers regarding receiving-hospital destinations when transporting patients from the field who are known risks, or who may be at risk for Ebola Virus Disease (EVD). This applies only to EMS patient transports resulting from "911" calls, and does not apply to inter-facility transfers.

Background:

Recent events surrounding the confirmed case of Ebola Virus Disease (EVD) in Dallas have prompted minor modifications of the current UTSW/BioTel EMS System Destination Policy. This Training Bulletin includes additional notification procedures to facilitate communication with, and preparations by, between the Dallas County Health and Human Services ("Dallas County Health Department") and receiving hospitals.

Refer to UTSW/BioTel EMS TB 14-006 EBOLA and to the UTSW/BioTel EMS System Destination Policy for additional information.

Destination Guidelines:

1. **NON-CRITICAL patients with fever and flu-like symptoms, or other risk factors for Ebola Virus Disease (EVD), but who report that they are NOT currently being monitored by the Dallas County Health Department for possible EVD:**
    a. Follow the UTSW/BioTel EMS System Destination Policy, per routine.
    b. Notify BioTel and/or the receiving hospital directly, as soon as possible, either on-scene or *en route*.

2. **NON-CRITICAL patients – regardless of symptoms – who report that they ARE currently being monitored by the Dallas County Health Department for possible EVD:**
    a. Contact the Dallas County Health Department directly at 214-677-7899 for assistance with destination decision-making.
    b. Notify BioTel and/or the receiving hospital directly, as soon as possible, either on-scene or *en route*.

3. **CRITICAL patients with fever and flu-like symptoms, or other risk factors for EVD:**
    a. Follow the UTSW/BioTel EMS System Destination Policy, per routine.
    b. Limit invasive procedures, especially Aerosol Generating Procedures (such as intubation, CPAP or airway suctioning) and vascular access procedures, ONLY to those patients for whom they are critically necessary.
    c. Notify BioTel and/or the receiving hospital directly, as soon as possible, either on-scene or *en route*.
    d. If information is available that the patient is being monitored by the Dallas County Health Department for possible Ebola Virus Disease, this information MUST ALSO be communicated immediately to BioTel and/or directly to the receiving hospital, either on-scene or *en route*.
    e. Once patient care has been transferred to the receiving hospital, EMS Providers shall immediately contact both the Dallas County Health Department directly at 214-677-7899 **and** their EMS Supervisor.

UTSW/BioTel EMS System
October 2014

EMS TB 14-008:
Ambulance and Medical Equipment Disinfection & Personnel Decontamination Procedures

Purpose:

To provide UTSW/BioTel EMS agencies guidance for standardized disinfection procedures for the ambulance and medical equipment, and for basic personnel decontamination procedures used during patient assessment, management and transport.

Background:

Recent events surrounding the confirmed case of Ebola Virus Disease mandate refresher training and Departmental Policy reviews for all EMS providers in the adherence to standardized disinfection procedures for ambulances and medical equipment, and to personnel medical decontamination procedures. The following procedures are consistent with & derived from the Centers for Disease Control and Prevention's (CDC) current guidelines for disinfection and decontamination.
(Casualty and Mass Casualty decontamination are not covered in this Training Bulletin.)

Definitions:

- **Disinfection:** The act or process of killing or rendering inert pathogenic organisms through a specialized cleansing technique with heat or chemicals. This is specific to biologic agents (bacteria, viruses, fungi, etc.). It is less lethal to pathogenic organisms, as some types (e.g. bacterial spores) may not be killed.
- **Decontamination:** The act or process of removal, inactivation or destruction of foreign material and/or contaminating substances from equipment, vehicles, patients or personnel. This more broadly includes both biologic substances (e.g. blood, body fluids, secretions & excretions) containing pathogenic organisms, as well as other contaminants (e.g. chemicals or radioactive materials). For disease-causing organisms, decontamination renders them incapable of transmitting infectious particles; the decontaminated surface or item is rendered safe for handling, use, or disposal.

Turning the Corner (We Thought)

- Fear vs. Fact
- Media driven event
- Politics

Nurse 1

- Nina Pham, R.N.
- Treated index patient
- Tested positive on 10/12
- Flown to NIH Hospital in Baltimore on 10/16
- Declared virus free on 10/24

Waiting for the Other Shoe To Drop: Nurse 2

- Amber Vinson
- Trip to Cleveland 10/10-13
- Diagnosed with Ebola 10/15
- Flown to Emory University Hospital in Atlanta 10/15
- Declared virus free 10/22

NYC's Turn

- Craig Spencer, M.D.
- Worked with Doctors without Borders in Guinea
- Arrived in U.S. 10/17
- Diagnosed with Ebola 10/23

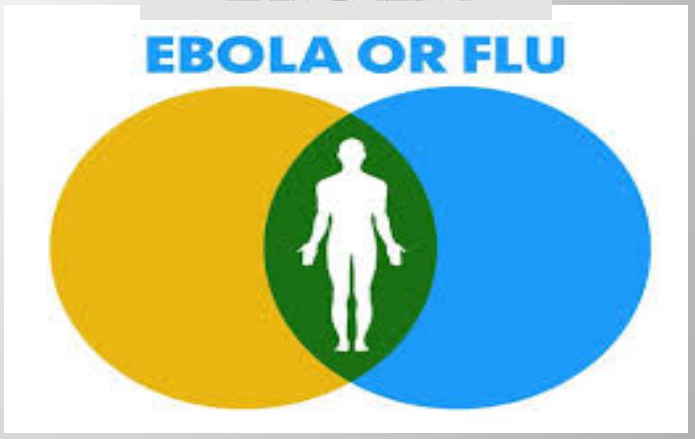
Week 5

Things We Did Well

- Action plan for three directly impacted medics
- Rapid order for PPE
- Information action plan
- Rapid review and update of PPE and Decon SOP's
- Rapid changes to dispatch procedures
- Daily coordination meetings
- City media plan
- Involved regional partners

Lessons Learned

- It's a full department issue – not just EMS or Haz-Mat
- It's a regional issue, not just local
- It's hard to overcome the media – go with the science
- Face-to-face education – early and continuous
- Expect the politicians to overreact
- Expect your firefighters/paramedics to follow suit
- Ebola Virus is spread by direct contact with infected body fluids, nothing more & nothing less
- If diagnosed early, Ebola appears to be very treatable in the U.S.
- Review and update your PPE and procedures as needed
- Train, train, train
- Perhaps this episode will remind all of us to utilize PPE more appropriately



Long experience has taught that to be criticized is not always to be wrong.

-Anthony Eden

Acknowledgments

- Dallas Fire Chief Louis Bright, III
- DFR EMS Deputy Chief George Gamez
- DFR Assistant Medical Director Dr. Thomas Kofoed
- DFR Infection Control Nurse Allison Greene
- Dr. Fernando Benitez, Dr. Ronna Miller and Dr. Matt Lawrence
- DFR EMS Command Staff
- DFR EMS Supervisors
- DFR Command Staff and officers
- The Ebola 3 (No, we're not naming them…)
- The brave and dedicated men and women of the Dallas Fire-Rescue Department

And

- Dallas City Manager AC Gonzales
- Dallas Mayor Mike Rawlings
- The Dallas County Health Authority
- Dallas Office of Emergency Management's Ricky Vas and staff
- UT Southwestern Department of Emergency Medicine Chair Dr. Deborah Diercks and the EM faculty and residents
- City of Dallas Director of Medical Emergency Services Dr. Paul Pepe
- Parkland Memorial Health and Hospital System's Dr. Fred Cerise, Kris Gaw, Clifann McCarley Dr. Alex Eastman, Dr. John Pease, Jorie Klein, Kathy O'Dell, Chris Noah, David McCartey) and the dedicated nurses and staff
- BioTel's LuAnn McKee and Wayne Hillary
- The UTSW/BioTel EMS Medical Direction Team (Dr. Ray Fowler, Dr. Ray Swienton, Dr. Fernando Benitez, Dr. Gil Salazar, Dr. Thomas Kofoed, Dr. Alex Eastman, Dr. Jeff Metzger, Dr. Kelly Klein, Dr. Kathy Rinnert, Dr. Ronna Miller, Rick LaCance)
- Dallas Fort Worth Hospital Council
- Dallas County Medical Society
- North Central Texas Trauma Regional Advisory Committee (NCTTRAC)
- The dedicated staff of Texas Health Resources Presbyterian Medical Center Dallas
- The family of Thomas Eric Duncan


Questions