PolyHeme®
Trauma Trial
Community Consultation
UCSD Medical Center
July 30, 2003

Clinical Investigator
- David B. Hoyt, M.D., FACS
- Vice Chair, Department of Surgery
- Chief, Division of Trauma
- Director, Surgical Intensive Care

Study Sponsor
Northfield Laboratories Inc.
- Developer of the oxygen-carrying blood substitute called PolyHeme®
- Conducted multiple studies with PolyHeme over the past decade
- Most studies have been with injured trauma patients
- Company website: www.northfieldlabs.com

Study Purpose
To evaluate the life-saving potential of PolyHeme® when given to severely injured and bleeding patients in "hemorrhagic shock," starting at the scene of injury

What is Hemorrhagic Shock?

Hemorrhagic: massive loss of blood
Shock: life-threatening condition
- Dangerously low blood pressure
- Internal organs don't receive enough oxygen and have difficulty functioning
- Might lead to death

Need for Improved Outcome
- The Center for Disease Control (CDC) lists trauma as the leading cause of death among Americans under age 45
- Thousands of trauma patients die each year
- Many of these patients die because the "standard of care" cannot reverse the damaging effects of hemorrhagic shock
What is the Standard of Care?

*Represents the current treatment*

**In the Ambulance**
The patient receives salt water.
(blood is not available)

**In the Hospital**
The patient receives salt water and donated blood.

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**Standard of Care Limitations**

**In the Ambulance**

- Salt water does not carry oxygen, unlike blood.
- Without enough oxygen, the body and its internal organs have difficulty functioning and can stop working (organ failure).

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**In the Hospital**

- Donated blood takes time (45-60 minutes) to be matched for each patient.
- Patients who receive more than 6 units of donated blood in the first 12 hours have an increased risk of organ failure.

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**What is PolyHeme®?**

*A blood substitute that carries oxygen*

1 unit of PolyHeme = 1 unit of blood.

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**Why Use PolyHeme®?**

- PolyHeme was developed to treat blood loss when blood is not available.
- Blood is not available in the ambulance.
- PolyHeme will be immediately available in the ambulance and carries oxygen.
- PolyHeme can reduce the use of donated blood in the first 12 hours after injury, and might avoid potential organ failure.

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**Why Use PolyHeme®?**

- PolyHeme can reduce the use of donated blood and might avoid potential organ failure.
Why Use PolyHeme®?

To improve survival of severely injured and bleeding patients

PolyHeme® Experience

- PolyHeme has been studied in more than 300 individuals and 5 different clinical trials
- PolyHeme has been extensively studied in hospitalized trauma patients
- PolyHeme has kept trauma patients alive when they have lost all of their own blood

Past studies have shown that PolyHeme
- Carries as much oxygen as blood (1 unit of PolyHeme = 1 unit of blood)
- Reduces need for donated blood
- Has not caused organ damage
- Has replaced up to two times a person's entire blood volume (2 x 10 units = 20 units)

Trial Design: Before the Hospital

Severely injured trauma patients will be assigned to either one of two groups by chance

Control
Receive salt water

Test
Receive PolyHeme®

Trial Design: At the Hospital

Control
- Salt water for hydration
- Donated blood to boost oxygen levels

Test
- Salt water for hydration
- PolyHeme® to boost oxygen levels
- Maximum dose of 6 units during first 12 hours
- Donated blood will be used thereafter
### Hospital Infusion

#### Who Would Be Excluded?
- Patients who are obviously pregnant
- Patients who have severe head or brain injuries
- Patients who have "unsurvivable" injuries
- Patients who require CPR
- Patients with known objections to blood transfusions
- Patients with known orders not to resuscitate

#### What is Informed Consent?
A process by which patients make informed decisions about participating in research studies
- Traditionally required for all research studies
- Research studies compare 2 treatments (standard vs. investigational)
- Doctors describe each of these potential treatments

#### Who Would Be Included?
- Patients at risk of dying
  - Who have sustained severe injuries
  - Who have lost a large amount of blood and are in shock
  - Who are at least 18 years old
  - Who are of either gender (male or female)

#### FDA Review
- Northfield Laboratories received clearance to proceed with this study from the Food and Drug Administration (FDA)
- The FDA authorized the use of an exception from informed consent requirements for this study

#### What is Informed Consent?
A process by which patients make informed decisions about participating in research studies
- Patients are informed of the potential risks and potential benefits associated with each of these treatments
- Patients choose whether to participate in the study
What is Exception from Informed Consent?

Patients are enrolled in a research study without giving their informed consent

How Can That Be?

A federal regulation (21 CFR 50.24), created in 1996, allows certain studies that meet the following criteria to use this exception

- Patients' lives must be at risk
- Available treatments are not satisfactory
- Patients are unable to give consent
- Potential risks are reasonable

Consent Safeguards

- If possible, the patient or a legally authorized representative (LAR) can give consent before the patient is enrolled in the study
- If consent cannot be obtained before enrollment, frequent attempts will be made to contact the patient’s LAR and family to describe the study

Potential Benefits of PolyHeme®

- Might increase the likelihood of survival
- Can enhance the amount of viral oxygen in the patient’s blood
- Is compatible with all blood types
- Is immediately available
- Has reduced risk of viral disease (viral load reduced over a billion times)

Consent Safeguards

The patient, family members, or a legally authorized representative may decide to withdraw the patient at any time
Potential Risks of PolyHeme®

- Rash
- Increased blood pressure
- Kidney or liver damage
- Viral infection (HIV, hepatitis, etc.)
- Unforeseen happenings

Patient Protection

The Institutional Review Board (IRB) is a group of medical, scientific, and non-scientific members of the community

- Reviews all proposals for research on humans
- Assures patient safety
- Monitors community feedback

If We Participate...

- The results of the study will be revealed to the community after the trial has been completed
- Those who do not want to participate in the study can [wear a special bracelet] to exclude themselves

Questions or Comments?
PolyHeme®
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August 6, 2003

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**What is PolyHeme®?**

- Made from human blood
- Compatible with all blood types
- Immediately available
- Reduced risk of viral disease (viral load reduced over a billion times)

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- Patients are unable to give consent
- Potential risks are reasonable

How Can That Be?

A federal regulation (21 CFR 50.24), created in 1996, allows certain studies that meet the following criteria to use this exception:

- Participation in the research could provide a direct benefit (increased survival) to the patient
- The research could not be practically carried out without an exemption

Consent Safeguards

- If possible, the patient or a legally authorized representative (LAR) can give consent before the patient is enrolled in the study
- If consent cannot be obtained before enrollment, frequent attempts will be made to contact the patient’s LAR and family to describe the study

Consent Safeguards

*The patient, family members, or a legally authorized representative may decide to withdraw the patient at any time*

Potential Benefits of PolyHeme®

- *Might increase the likelihood of survival*
- Can enhance the amount of vital oxygen in the patient’s blood
- Is compatible with all blood types
- Is immediately available
- Has reduced risk of viral disease (viral load reduced over a billion times)
Potential Risks of PolyHeme®

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Patient Protection

- The IRB will decide whether or not to allow this hospital to participate in the PolyHeme® trial
- An independent data monitoring committee will oversee the trial
- The FDA will be kept informed of the trial's progress

If We Participate...

- The results of the study will be revealed to the community after the trial has been completed
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Questions or Comments?