Case Studies

By John Soltys

About me


00 NEG
SGH LABS PRESENT JOHN SOLTYS AS 00NEG COMING STAT TO A THEATRE NEAR YOU
GOLDEN HOUR


Diagnostics

Agenda

Moms

"Blood like Gatorade"

HELLP!

TTTS

Return of the D

Think Fast

Dodeca-octaplex

Sickle Surprise

Platelet Possibilities

Exotic Cases

Anti-cE

IgA eh?

Food for Thought

Surprise Phone Call

O? NO!

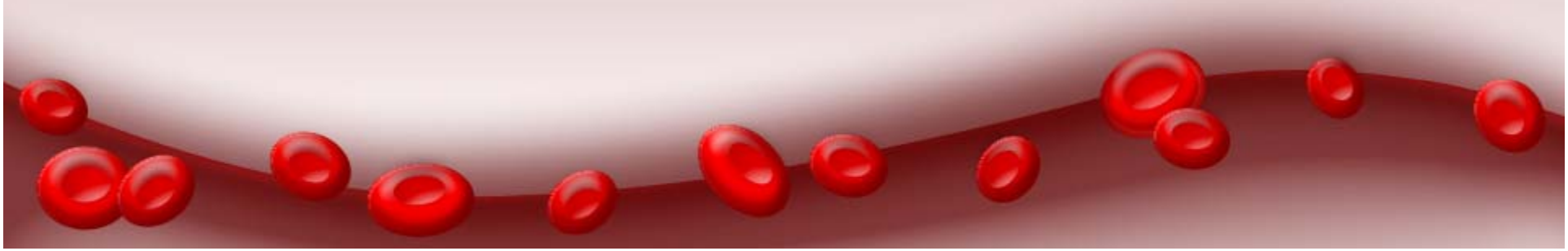
Moms

“Blood like Gatorade”

HELLP!

TTTS

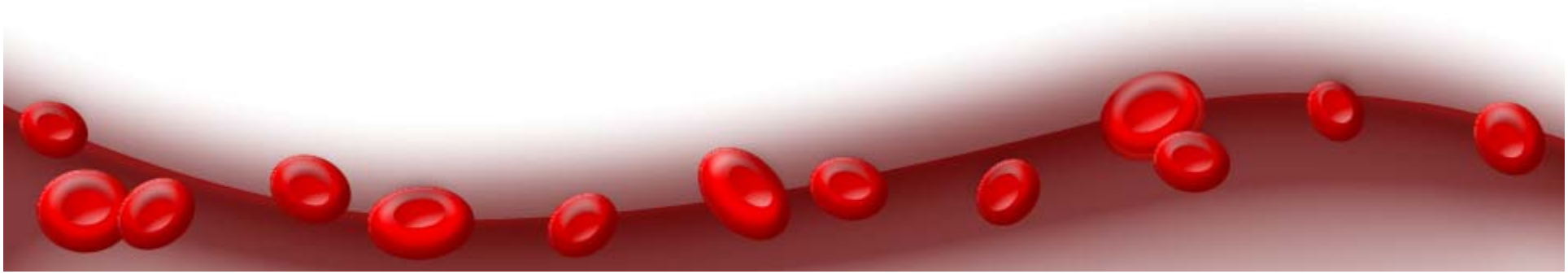
Return of the D



“Blood Like Gatorade”

The Situation

- Weekday night shift (surprise!)
- Stat blood work ordered on a newborn
- Very difficult draw
- Nurse calls lab tells you only 1.5mL of blood is available the following tests are ordered: DAT, Type and Screen, CBC, Retics, INR, PTT, Lactate.



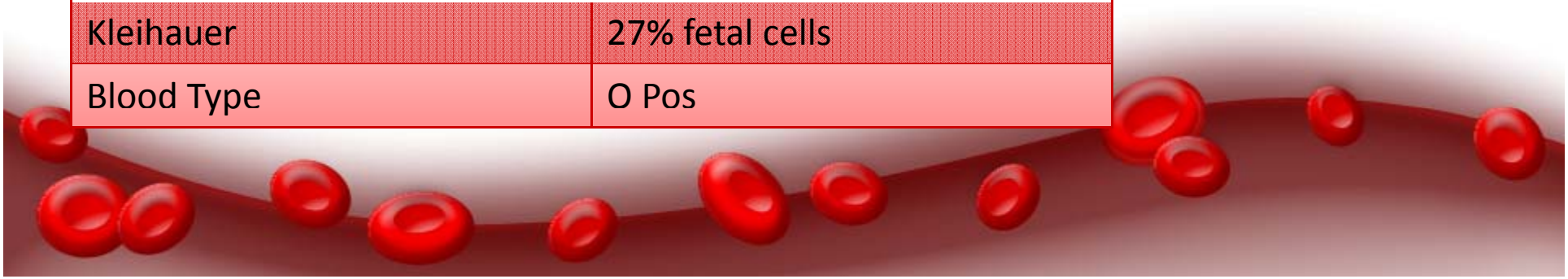
What Was Run:

Baby

Test	Result
Coag	Not drawn (NSQ)
Lactate	22 mmol/L
CBC	Hgb 46!!!
Retics	Send away test
Blood type	O Pos
Cord Gasses	pH <6.8, CO2 63mmHg

Mom

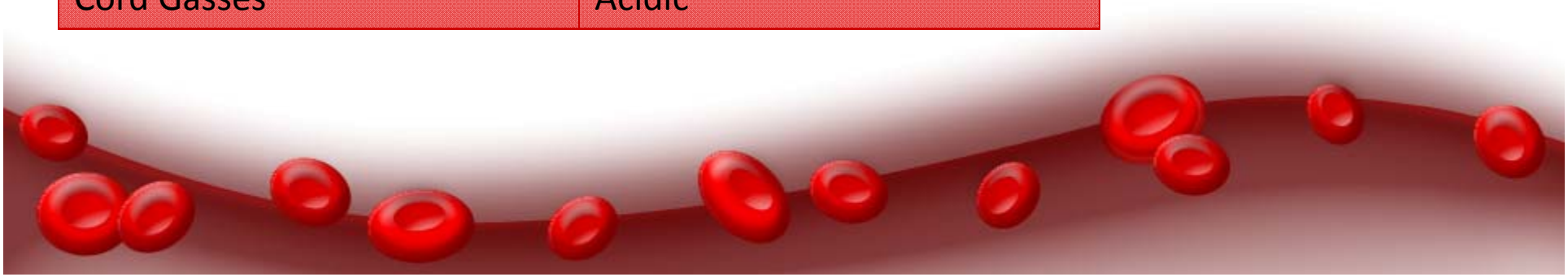
Test	Result
Kleihauer	27% fetal cells
Blood Type	O Pos



Massive Placental Hemorrhage

- Estimated 83% of pregnancies result in some FMH[1]
- Causes of FMH include: Trauma, Placental abnormalities, Spontaneous
- Extent of FMH greater in ABO/Rh compatible baby/moms
- Definition of “massive FMH” is unclear
- Pre delivery FMH difficult to diagnose
- Typical lab results of a baby post delivery:

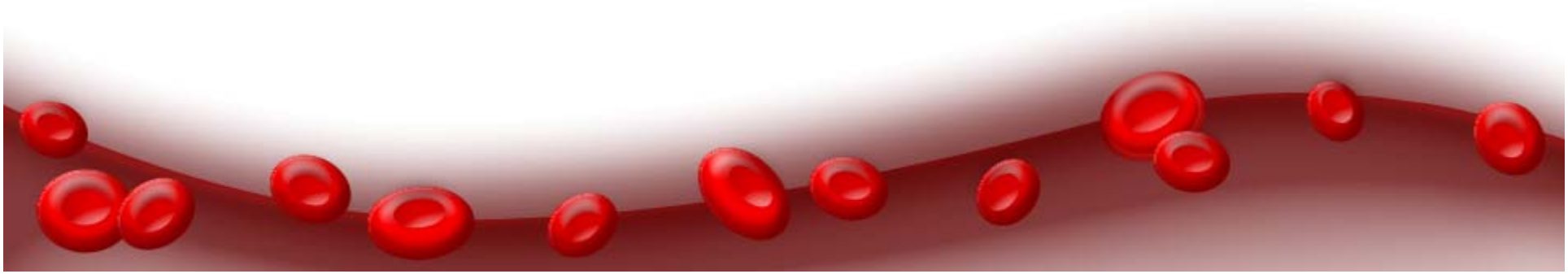
Test	Result
Hemglobin	Low
Retics/NRBCs	Elevated
Cord Gasses	Acidic



How Our Lab Responded

- Middle of the night CBS Brampton 2+hrs away no special blood in stock
- Emergency issued fresh O-Neg blood
- Did follow up cross match using mom's sample

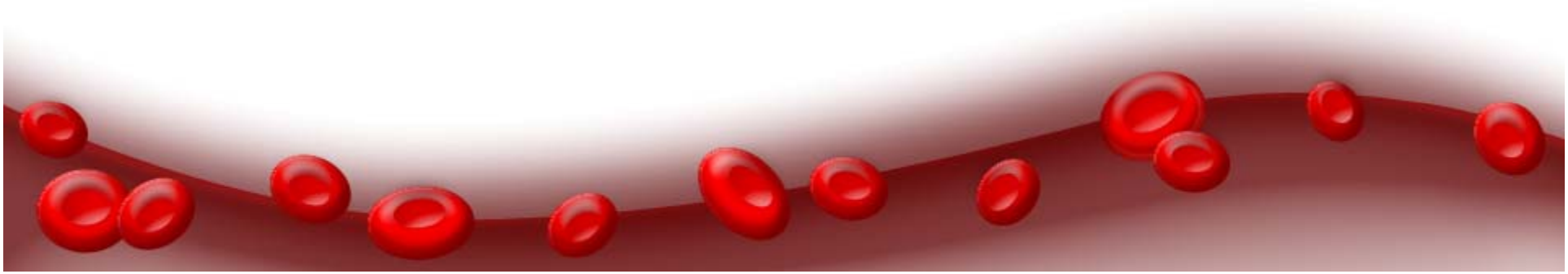
- Shipped baby and mom off to LHSC



HELLP!

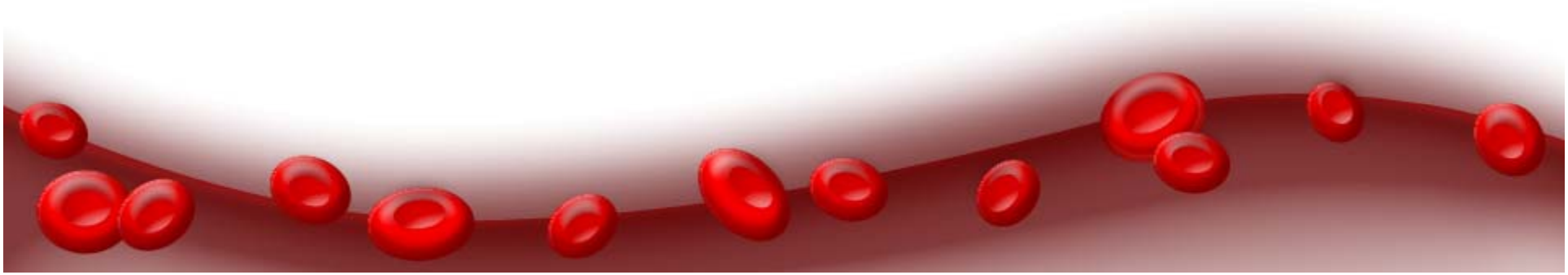
The Situation

- Evening shift
- Coag 1 on mom hemolyzed
- Coag 2 also hemolyzed
- Coag 3 hemolyzed too!
- Phlebotomist says they had no trouble drawing the blood
- Tech immediately calls the doctor…



Lab Results

Test	Result
MCHC	370 g/L
RDW	22%
Platelets	24 x 10^9/L
D Dimer	4000 ug/L
Liver Enzymes	All Elevated
Uric Acid	Elevated



HELLP
(Atypical pre-eclampsia)

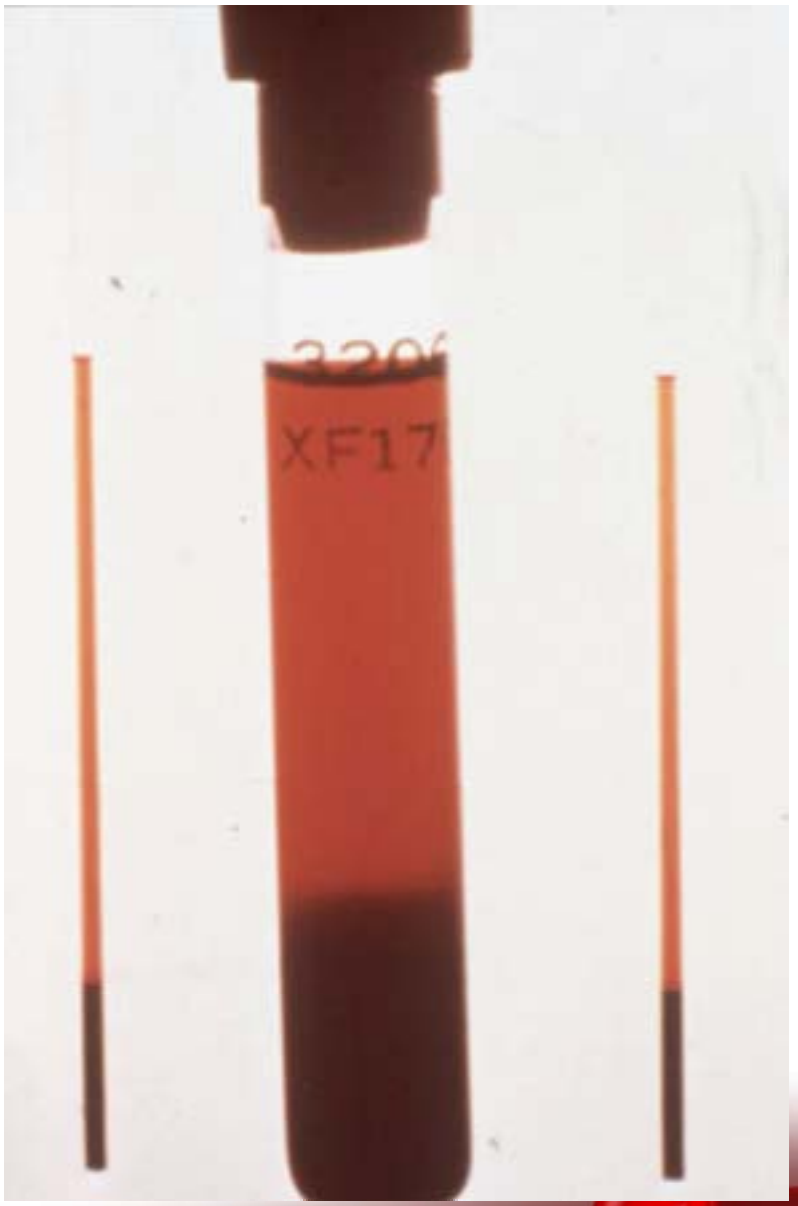
Hemolysis

Elevated

Liver Enzymes

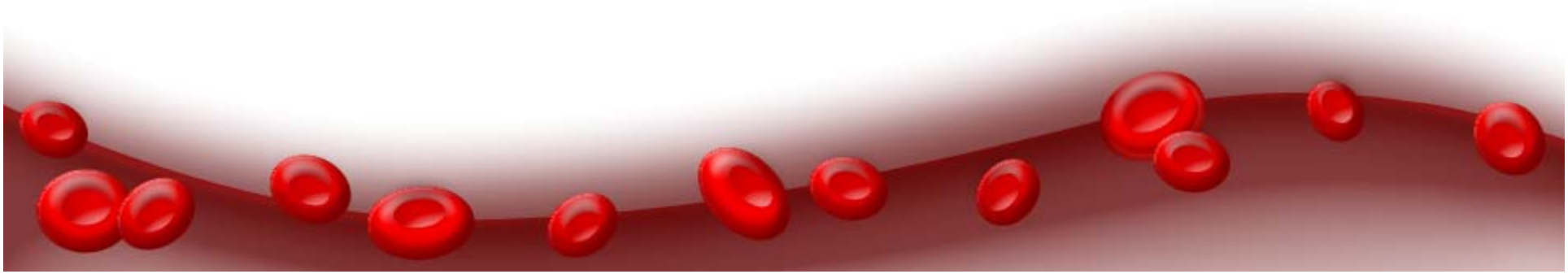
Low

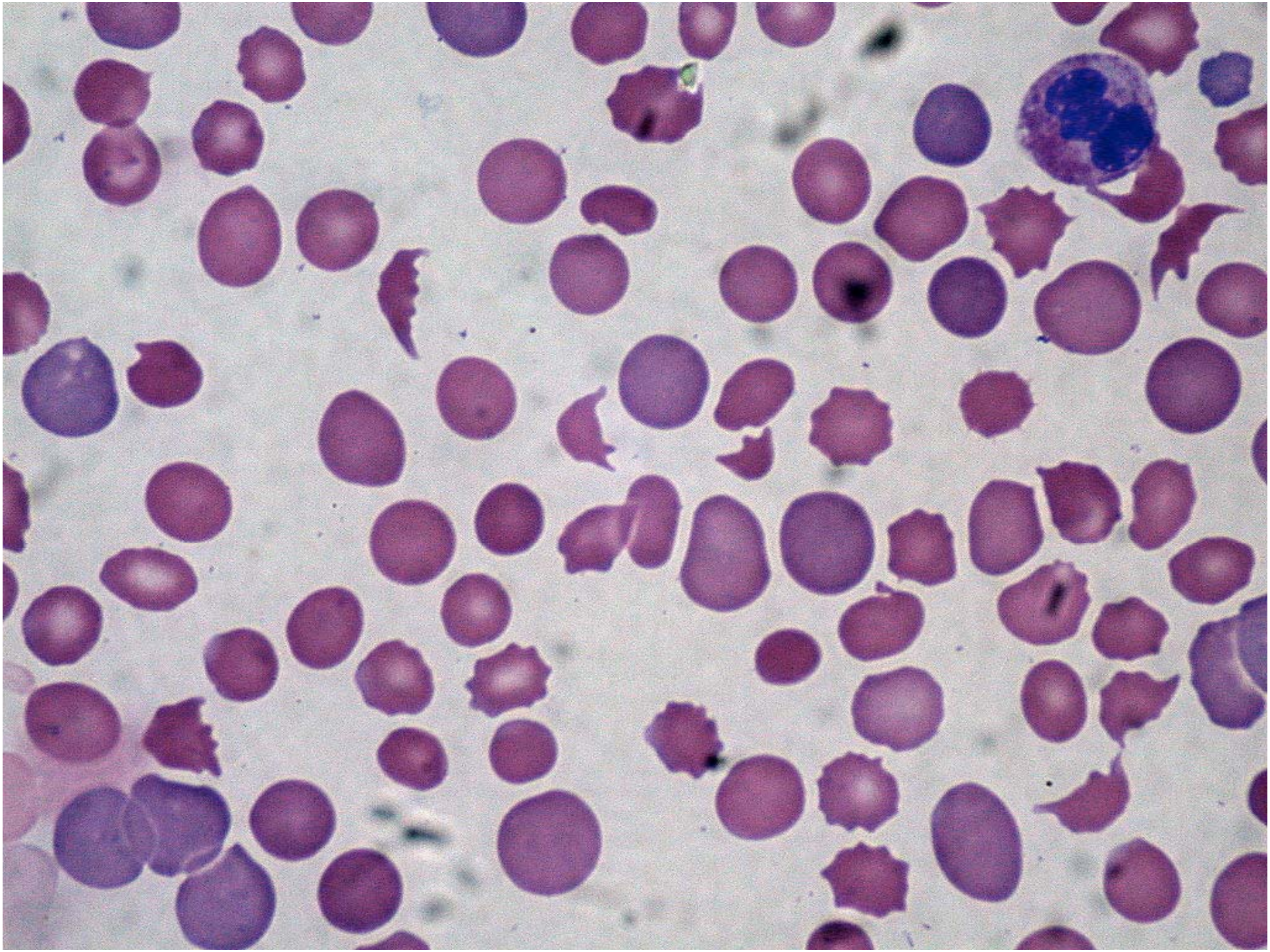
Platlets



HELLP

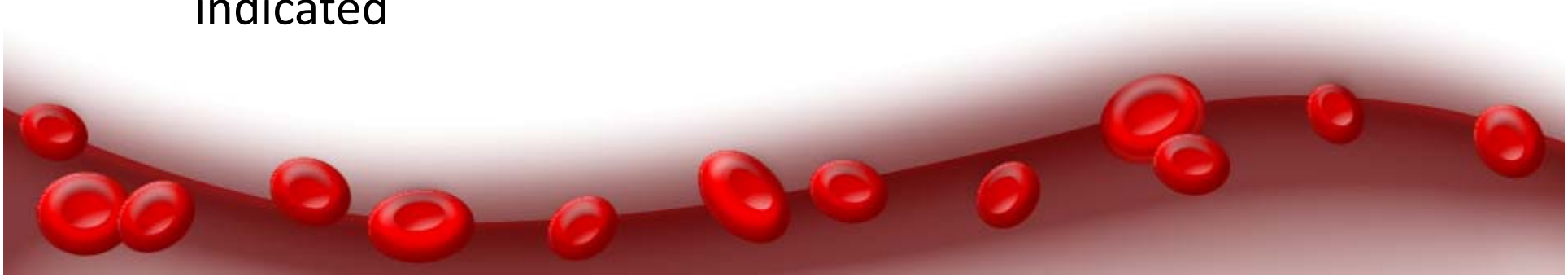
- Cause uncertain (speculation)
- Can lead to DIC and Renal failure
- Hemolysis
  - Chemistry
    - Increased Lactate, LDH, Bilirubin, Potassium, Uric Acid
  - CBC
    - Low Hgb, Low Platelets, High RDW
    - Schistocytes (fragments), Spherocytes, achinocytes (burrs)



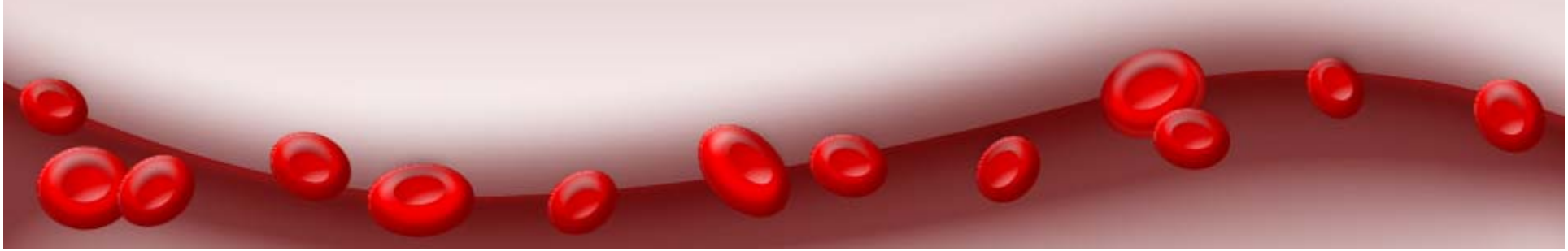


Lab's Response

- Supportive Therapy for a patient suffering from MAHA due to DIC
- Maintain platelets and coagulation factors using platelets and FP
- Monitor using PT, PTT and Fibrinogen test
- Bring in Cryo from CBS STAT
- Symptoms typically dissipate after delivery of baby if natural birth not imminent an emergency C section indicated

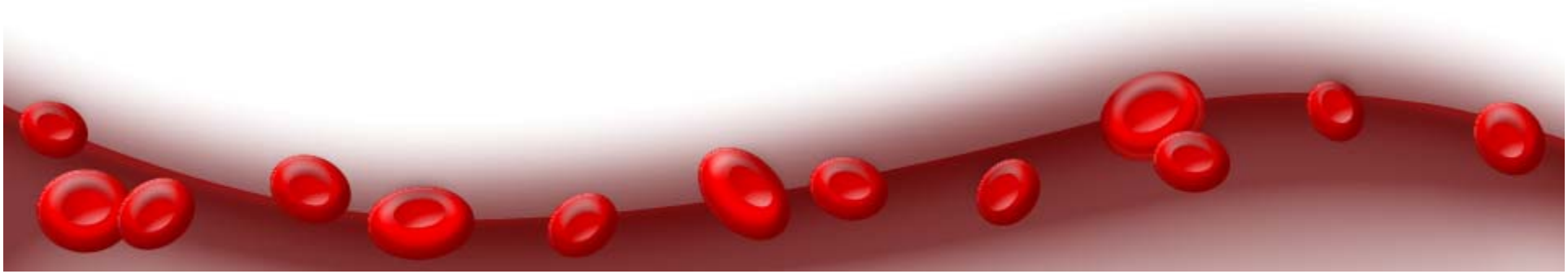


TTTS



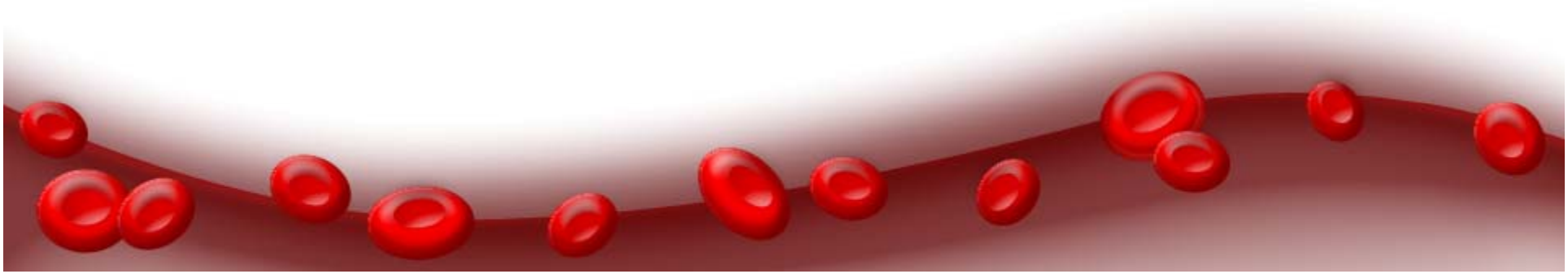
Case

- One twin born with hemoglobin well over 200 other was dramatically anemic



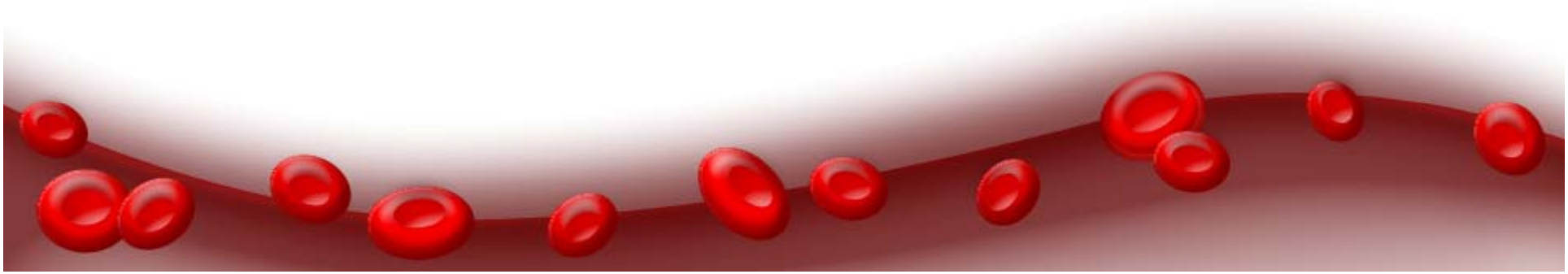
Twin Twin Transfusion Syndrome

- Complication of Monochorionic twin pregnancies
- Characterized by unbalanced chronic blood transfer from one twin to the other
- Survival rate for both twins is from 76-88% depending on intervention chosen
- Prognosis can be poor, one survey showed 100% mortality rate for untreated diagnosed twins before 28 weeks



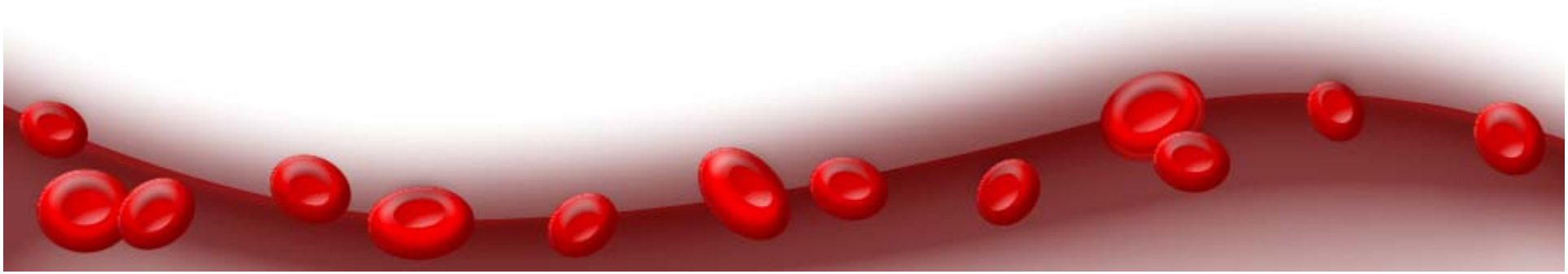
Diagnosis

- Ultrasound
- Amniotic fluid discordance
- Weekly follow ups



Treatment

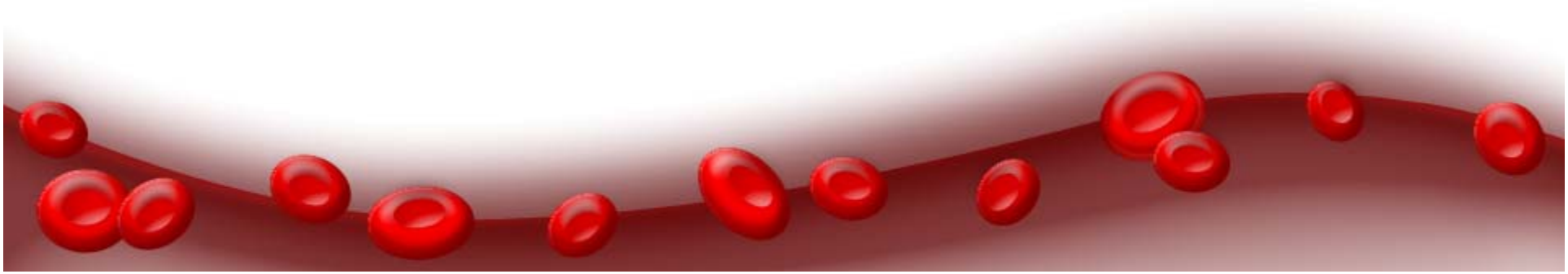
- Treatment of choice “Fetoscopic laser coagulation”
- “Amniodrainage”
- Cord Occlusion



“Return of the D”

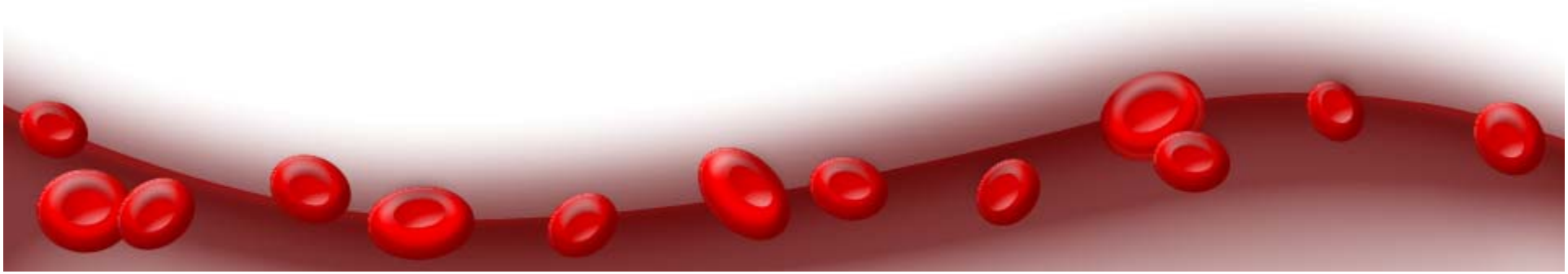
Situation

- Rh Neg mom comes in for pre-natal blood work, everything is normal (screen is negative)
- Receives dose of RhIG
- Weeks later she returns to hospital, antibody screen shows 4+ in all screen in panel cells with D



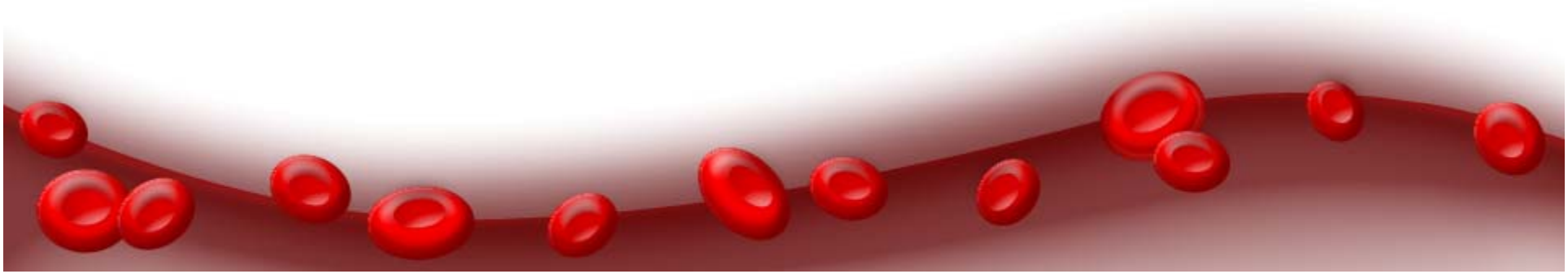
What's Going On?

- Mom must have been sensitized to D at some other point in life (aborted pregnancy? Transfusion?), the screen was below titre at the time of prenatal blood work but must have been triggered as the baby developed



Treatment

- Perform titres on mom
- Repeated in utero transfusion
- Exchange transfuse the baby at birth



Think Fast!

Dodeca-octaplex

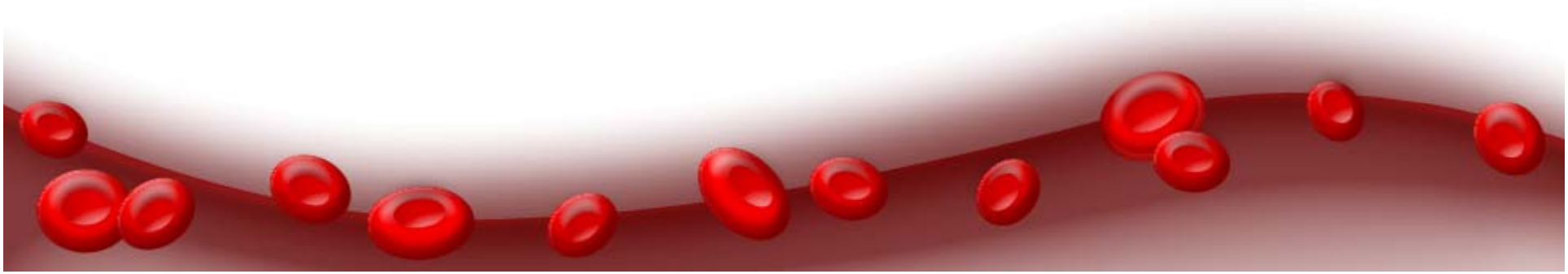
Sickle Surprise

Platelet Possibilities

Dodeca-octaplex

The Situation

- Weekend Evening Shift
- Doc calls:
  - Wants 12 doses of Octaplex for Rivaroxaban reversal Patient needs surgery immediately.
  - Knows its not indicated but read a paper somewhere that shows evidence of this working
  - Wants to know your thoughts…

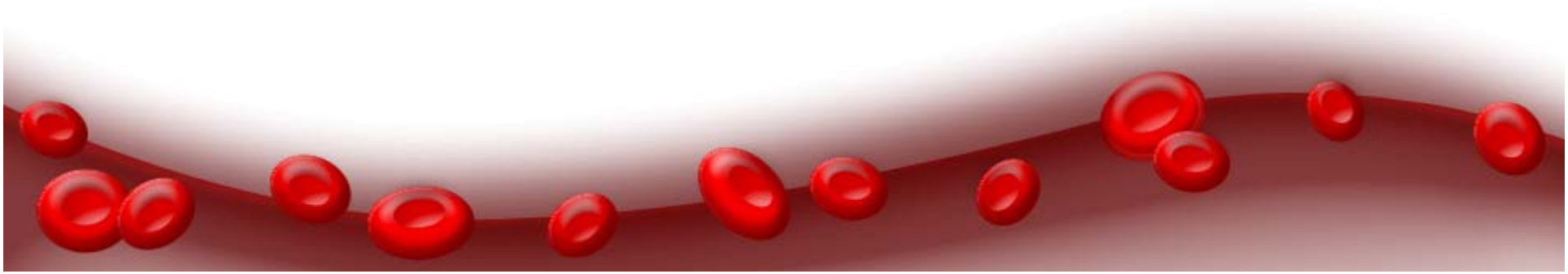


The Response

- Call Everyone!
- Call for back up
- Go to the package insert

“ Maximum total dose should not exceed 120 mL (3000 IU).”

- $720*6 = $4,320



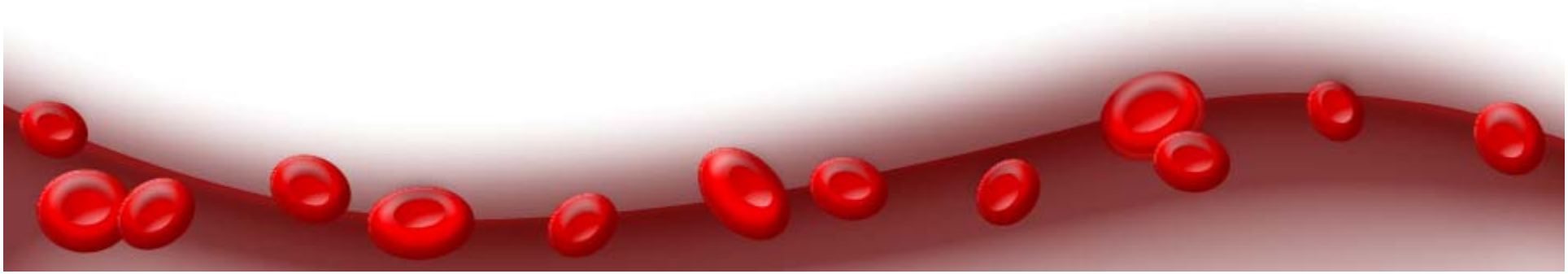
More Research…

Vascular Medicine

Reversal of Rivaroxaban and Dabigatran by Prothrombin Complex Concentrate

A Randomized, Placebo-Controlled, Crossover Study in Healthy Subjects

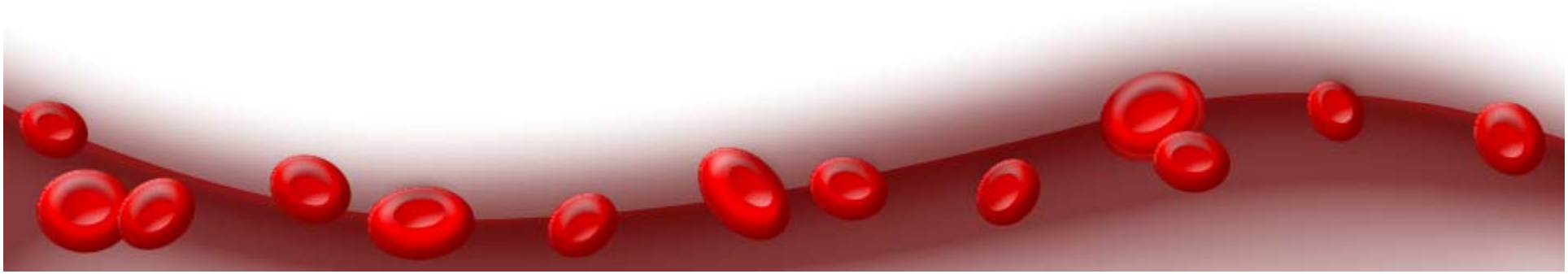
Elise S. Eerenberg, MD; Pieter W. Kamphuisen, MD; Meertien K. Sijpkens, BSc;
Joost C. Meijers, PhD; Harry R. Buller, MD; Marcel Levi, MD



Sickle Surprise!

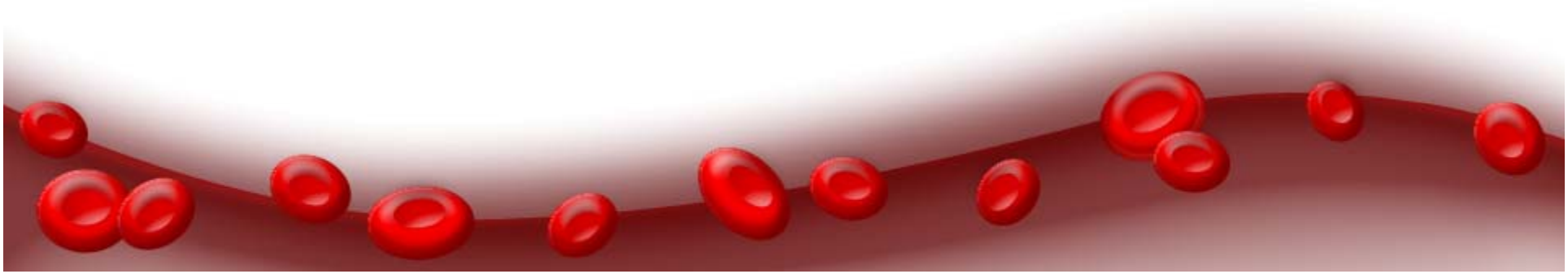
The Situation

- Night Shift
- Patient in 30's with Hgb of 58 shows up in Emerg
- Known history of Sickle cell anemia BUT you have no access to any history



The Response

- Type and Screen (A Pos, no antibodies)
- IS XM and Tx 2 units
- What's Missing?



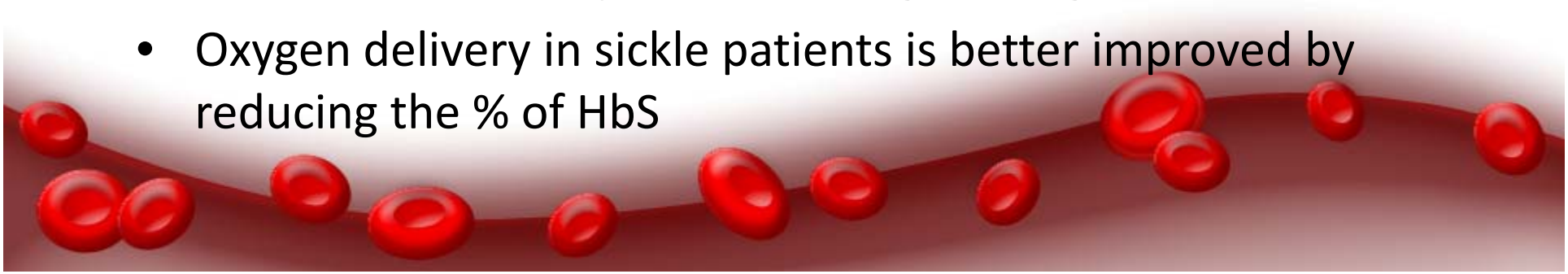
Sickle Cell Patients

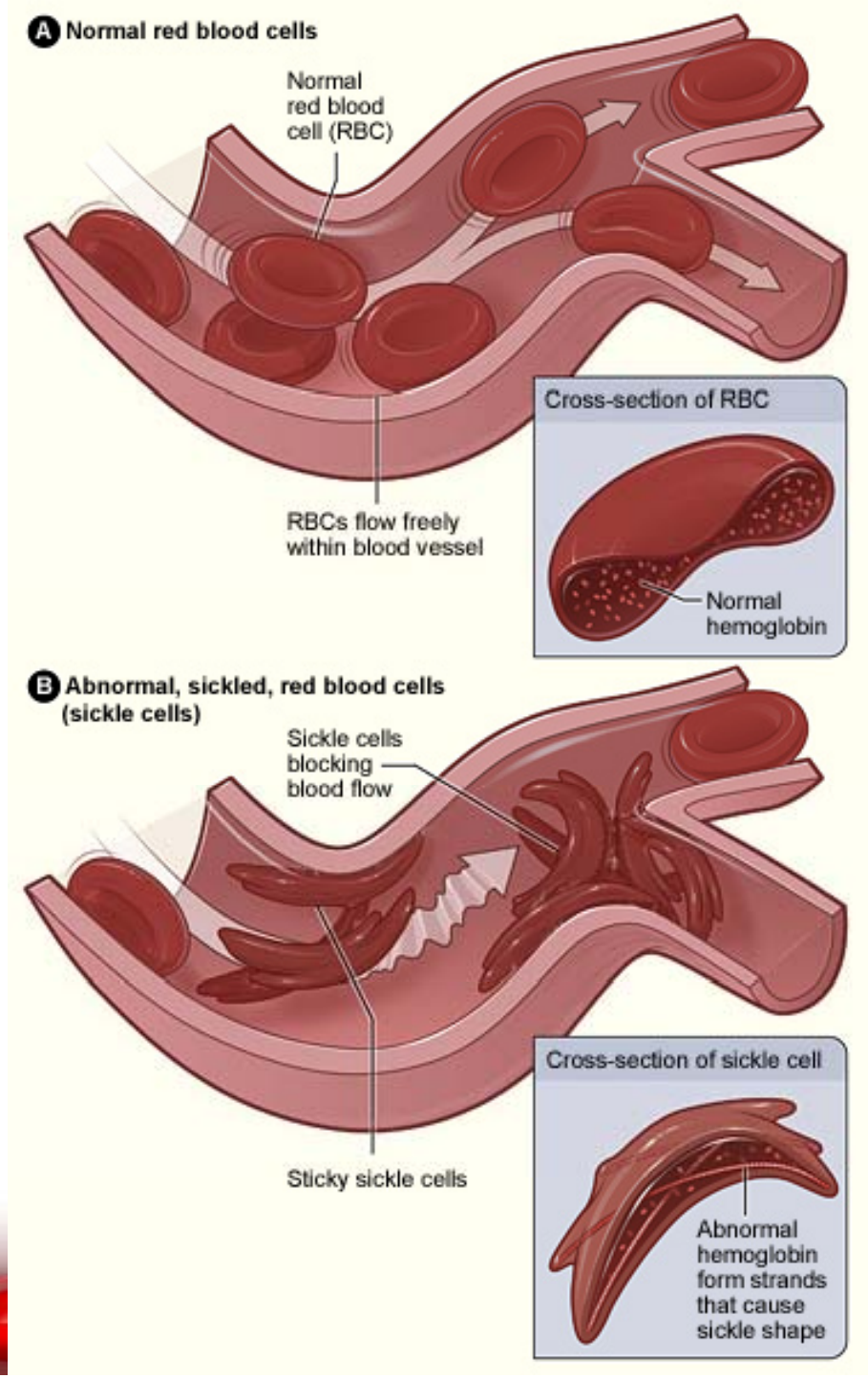
Special Transfusion Requirements

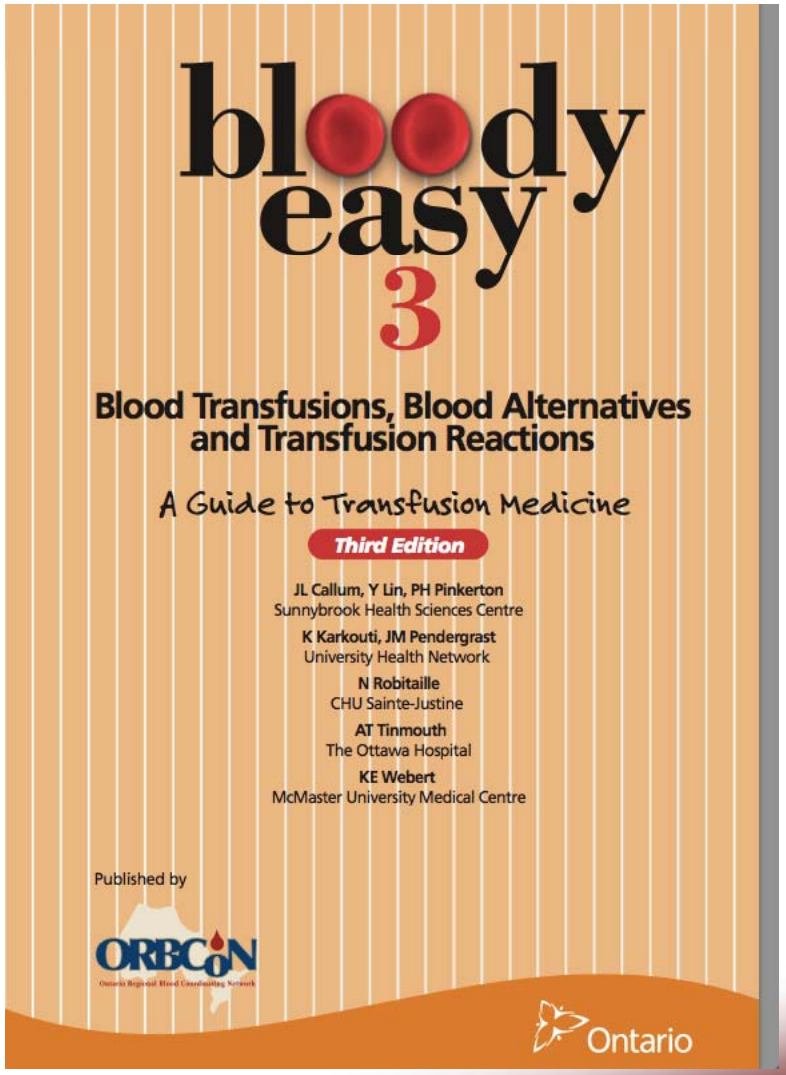
- Phenotype specific units
- Full cross match (last transfusion unknown)
- Use leukocyte reduced units
- Sickledex negative units if possible

Different Goals for Transfusion

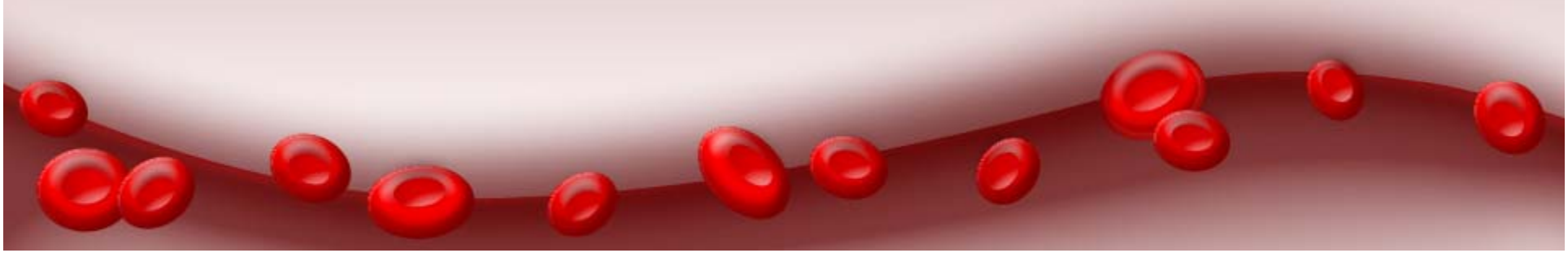
- Hgb >50g/L
- Never transfuse beyond 100-110 g/L of Hgb
- Oxygen delivery in sickle patients is better improved by reducing the % of HbS




A Normal red blood cells
Normal red blood cell (RBC)
RBCs flow freely within blood vessel
Cross-section of RBC
Normal hemoglobin
B Abnormal, sickled, red blood cells (sickle cells)
Sickle cells blocking blood flow
Sticky sickle cells
Cross-section of sickle cell
Abnormal hemoglobin form strands that cause sickle shape


bloody easy
3
Blood Transfusions, Blood Alternatives and Transfusion Reactions
A Guide to Transfusion Medicine
Third Edition
JL Callum, Y Lin, PH Pinkerton
Sunnybrook Health Sciences Centre
K Karkouti, JM Pendergrast
University Health Network
N Robitaille
CHU Sainte-Justine
AT Tinmouth
The Ottawa Hospital
KE Webert
McMaster University Medical Centre
Published by
ORBCoN
Ontario

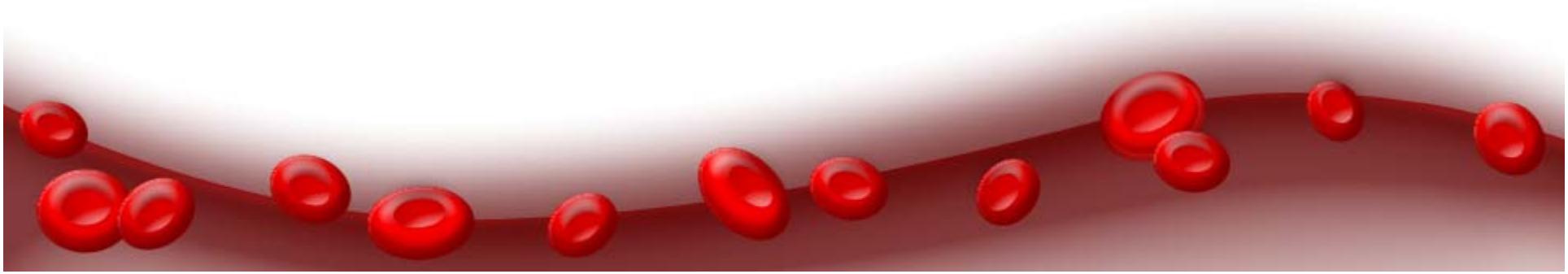
Platelet Possibilities



Platelets indicated or not?

Patient going in for emergency surgery platelet count is 330x 10^9/L

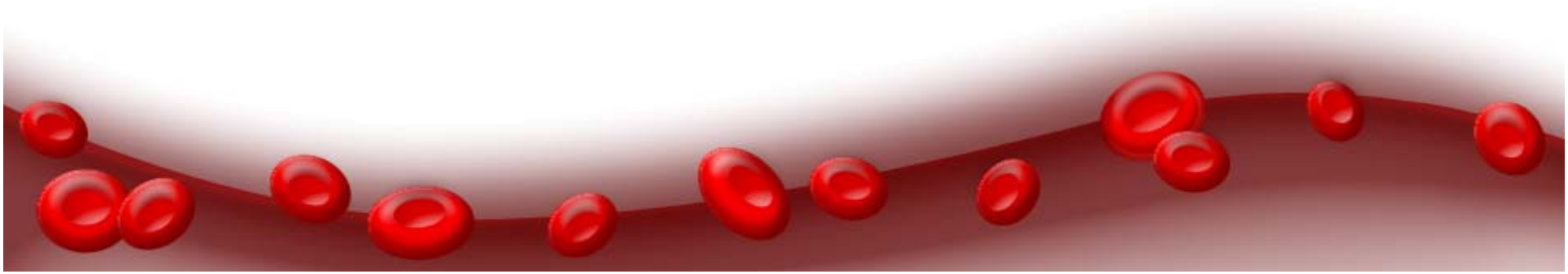
- Do they have a platelet disorder?
- Are they on Aspirin or other platelet inhibiting drugs?



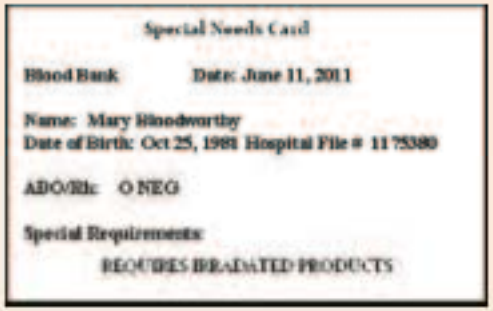
Irradiated Platelets indicated or not?

Chemo Patient platelet count of $10 \times 10^9/L$

- Congenital immunodeficiency
- Lymphoproliferative diseases
- Undergoing bone marrow or stem cell transplants
- Patients treated with purine analogues, purine antagonists, alemtuzumab and anti-thymocyte globin



- Notify patient in need of irradiated blood and provide a card for the patient to carry in their wallet.

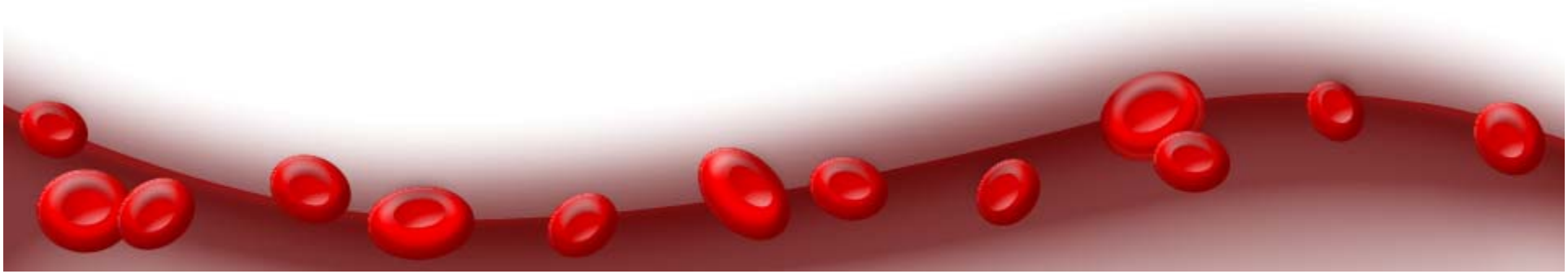

Special Needs Card

Blood Bank Date: June 11, 2011

Name: Mary Bloodworthy
Date of Birth: Oct 25, 1981 Hospital File # 1175380

ABO/Rh: O NEG

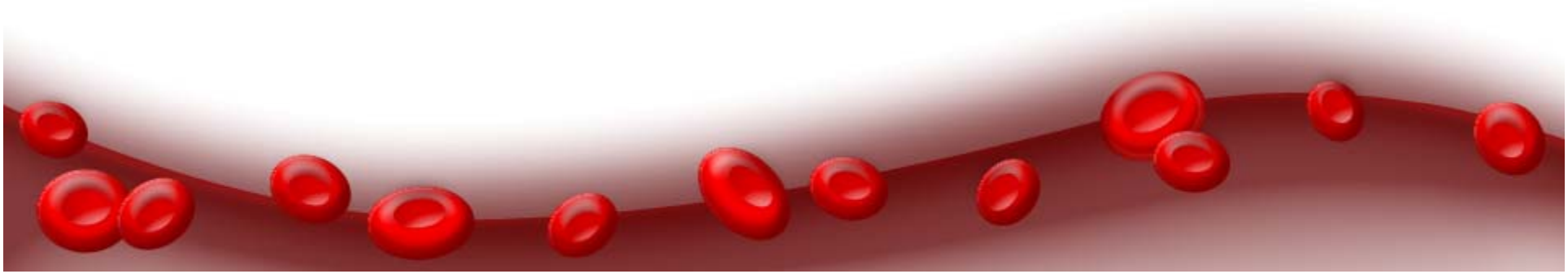
Special Requirements:
REQUIRES IRRADIATED PRODUCTS



The Situation

Platelets Indicated or not?

- Patient in DIC platelet count of 10x 10^9/L
  - What is the cause?
  - What are the surrounding circumstances?
  - In general, if the patient is not actively bleeding or at high risk of bleeding then prophylactic platelet transfusion is not indicated

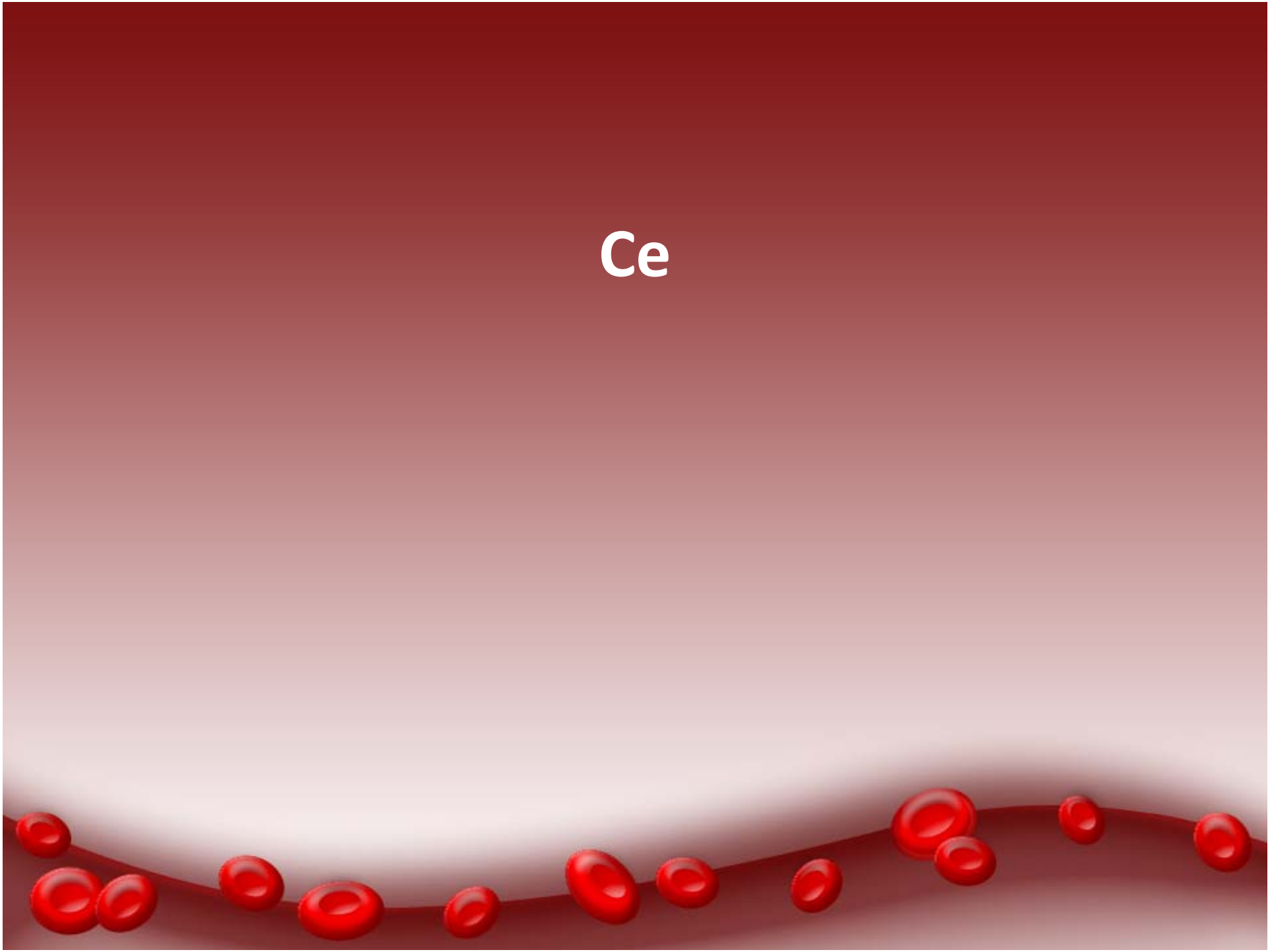


Exotic Cases

Ce

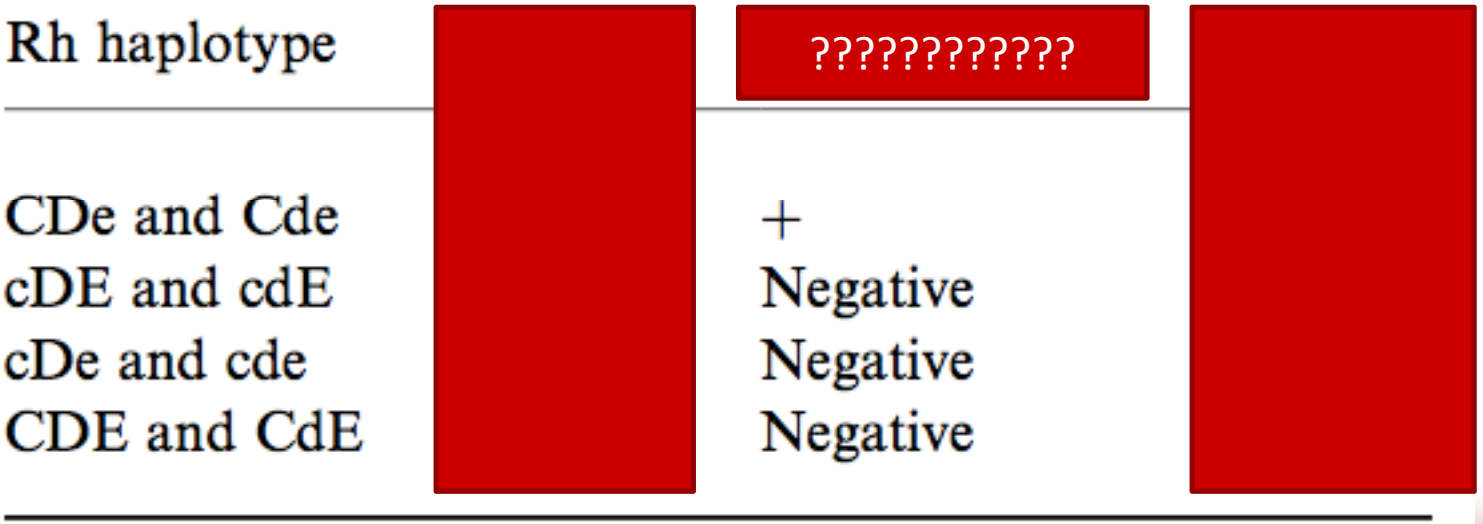
IgA eh?

Ce



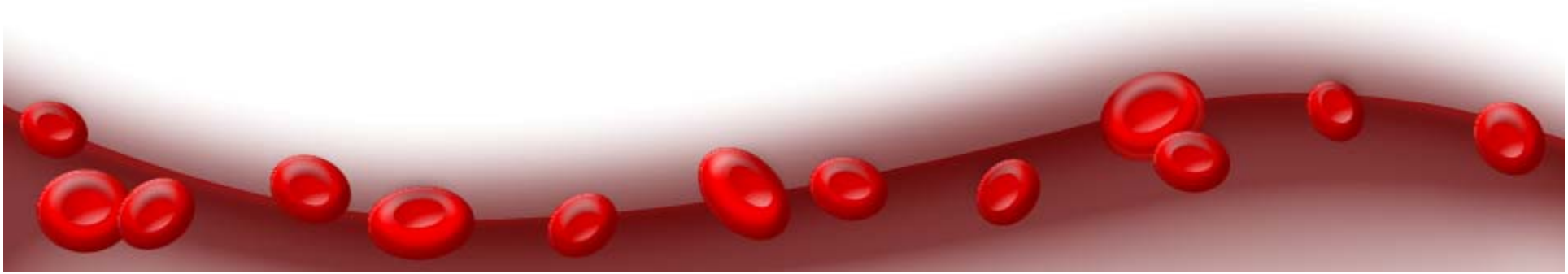
The Situation

- Patients' antibody panels:

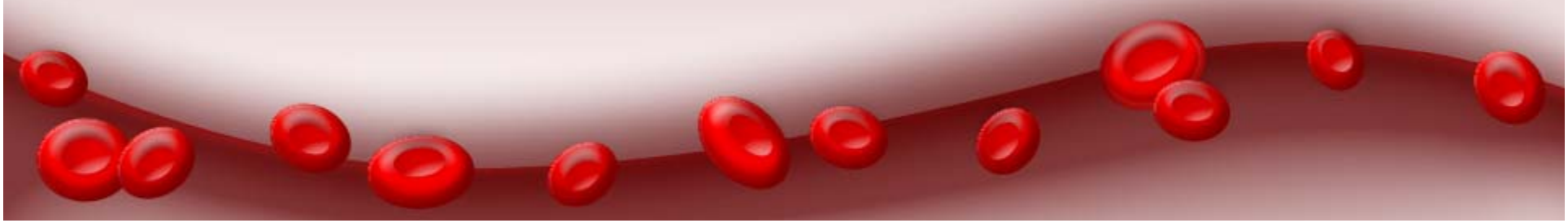


Anti-Ce

- Individuals with Rh haplotypes R_1 (CDe) or r’ (Cde) express the Ce antigen (along with C and e)
- Anti-Ce can cross placenta and cause HDN (Very Rare)
- Produced by R_2R_2 (cDE/cDE) individuals

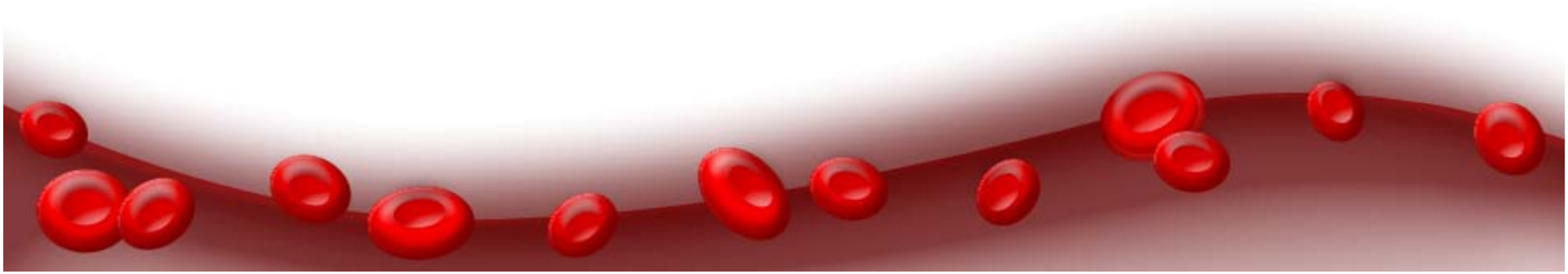


IgA eh?



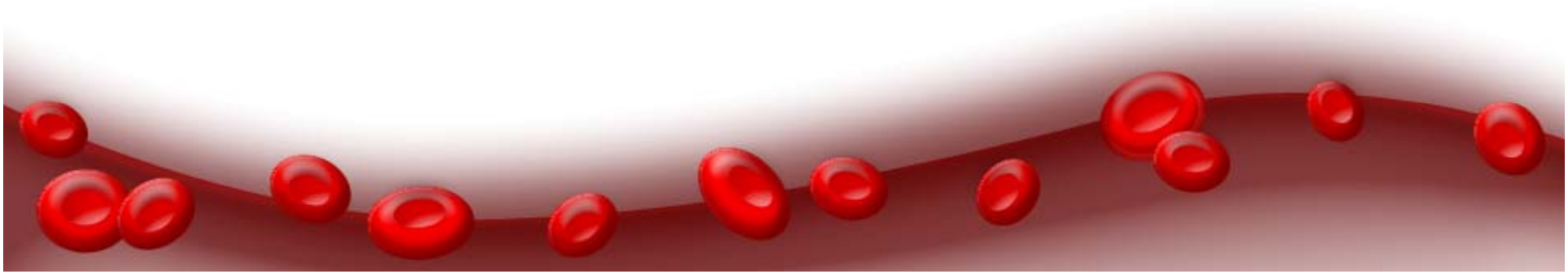
The Situation

- Call from a neighboring hospital
- They would like to know if we have results for anti-IgA antibody titre on a patient they need to transfuse



Anti-IgA

- Is linked to severe anaphylactic transfusion reactions
- Patients with a low titre of IgA can develop anti-IgA
- Not all patients with anti-IgA have tx rx, testing usually only indicated if individual has history of an anaphylactic tx rx



Washed Cells

RBCs

- give RBCs from unselected donors after washing with 0.9 % NaCl
- if reaction recurs, give frozen-thawed-deglycerolized RBCs
- alternatives (where available/appropriate)

– autologous RBCs or RBCs from IgA deficient donors

Platelets

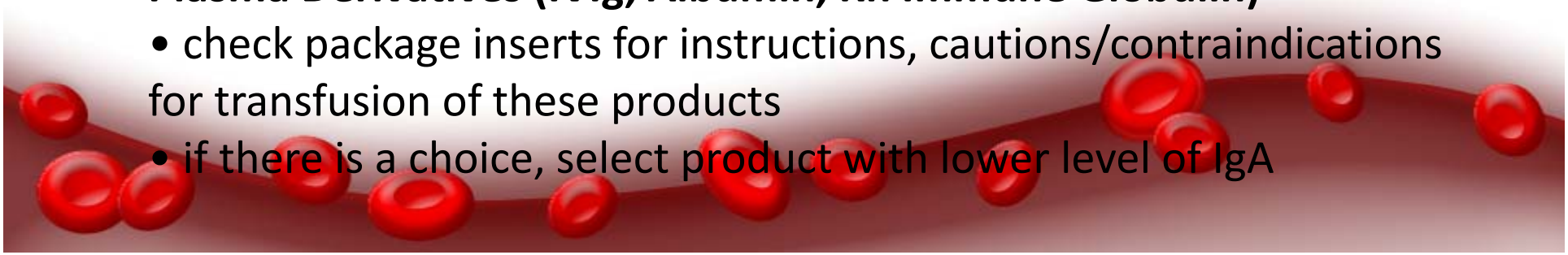
- use platelets, apheresis collected from IgA deficient donors
- alternatively, give platelets from unselected donors after washing with 0.9% NaCl

Fresh Frozen Plasma, Frozen Plasma and Cryoprecipitate

- use components collected from IgA-deficient donors

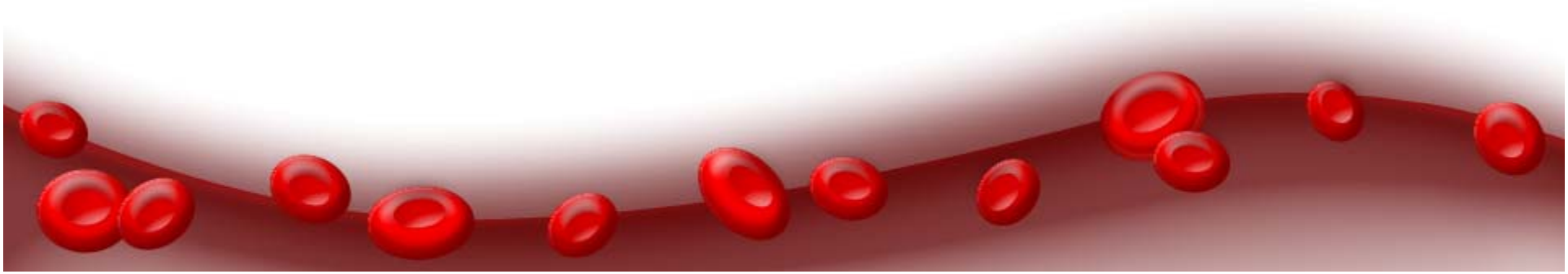
Plasma Derivatives (IVIg, Albumin, Rh Immune Globulin)

- check package inserts for instructions, cautions/contraindications for transfusion of these products
- if there is a choice, select product with lower level of IgA



Should Washed Cells be given as a Precaution?

- Shelf life of washed blood products much lower than unwashed
- IgA deficient blood products are rare
- Risks involved in cell washing
- Patients with low IgA and even with anti-IgA may not necessarily have a reaction



Food for Thought

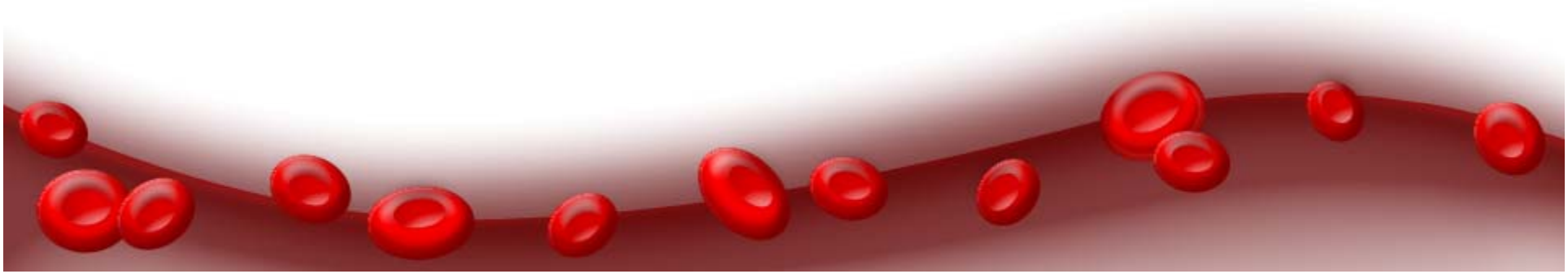
Surprise Phone call

O? No!

Surprise Phone Call

The Situation

- Answer the phone during a day shift
- Patient has some questions:
  - Received a letter telling him he has an antibody, he has only ever been transfused at your hospital questions include:
    - What does this mean?
    - Is this bad for my health?
    - Did someone make a mistake?
    - What can I do about this?

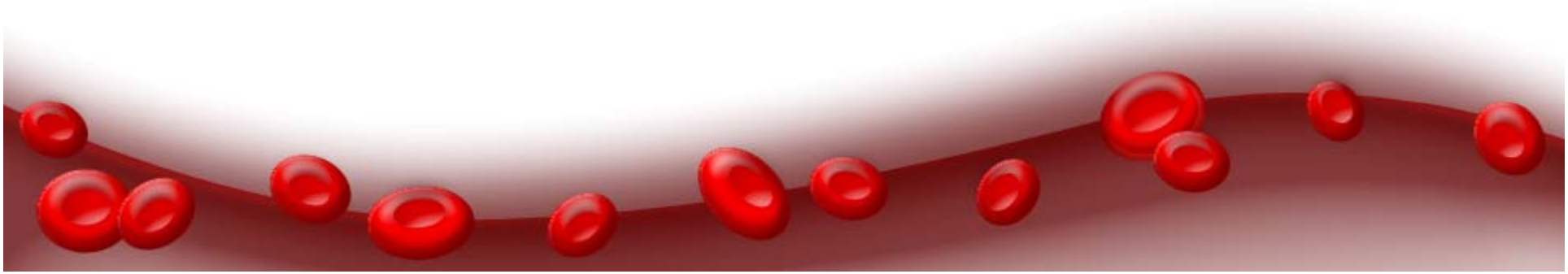



HELP

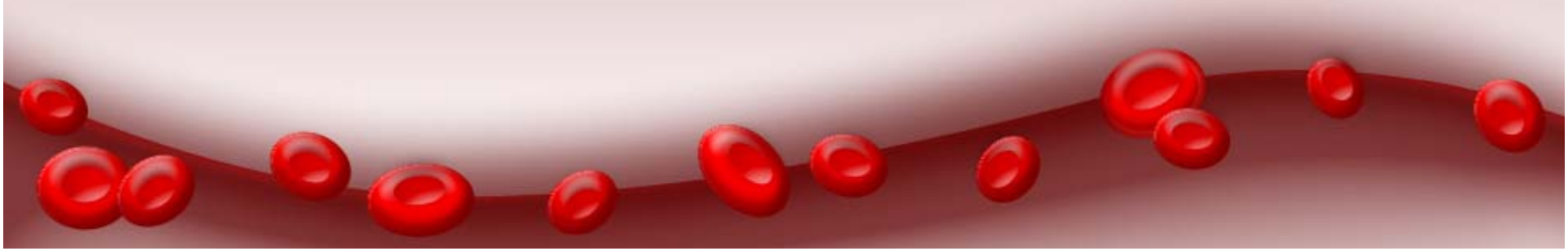
Reasons Not To…

“We’re not supposed to”

- “1. Communicating to the individual or his or her personal representative a diagnosis identifying a disease or disorder as the cause of symptoms of the individual in circumstances in which it is reasonably foreseeable that the individual or his or her personal representative will rely on the diagnosis.”

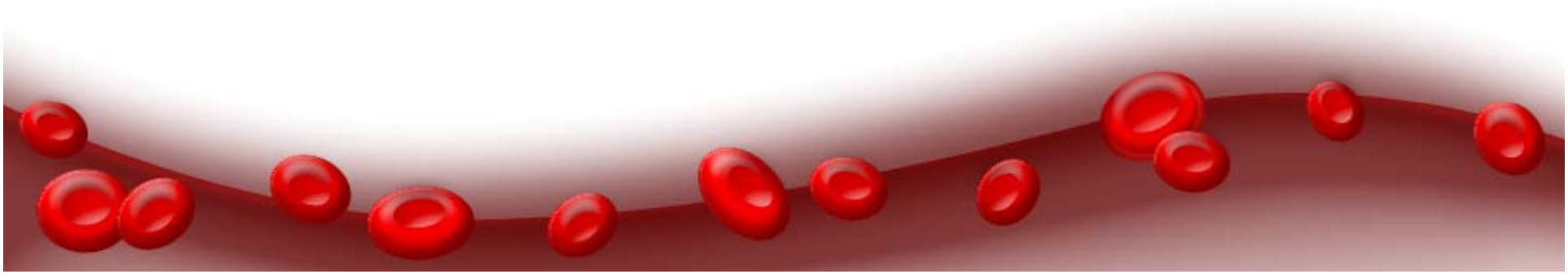


O? NO!



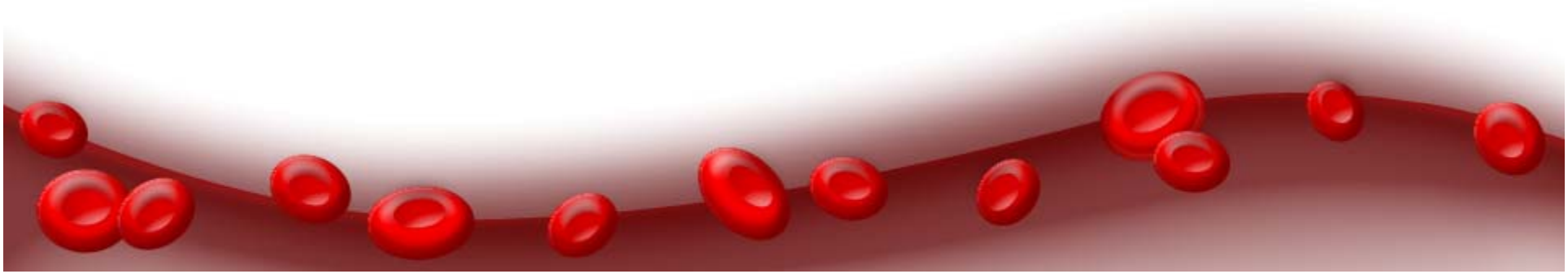
The Situation

- Receive a blood order requesting a 2 unit XM with a special note “Patient requests no O-Type blood”
- Patient is A Pos
- Patient has a hemoglobin of 69
- You have two O Neg units that will expire today (everything else is fresh)



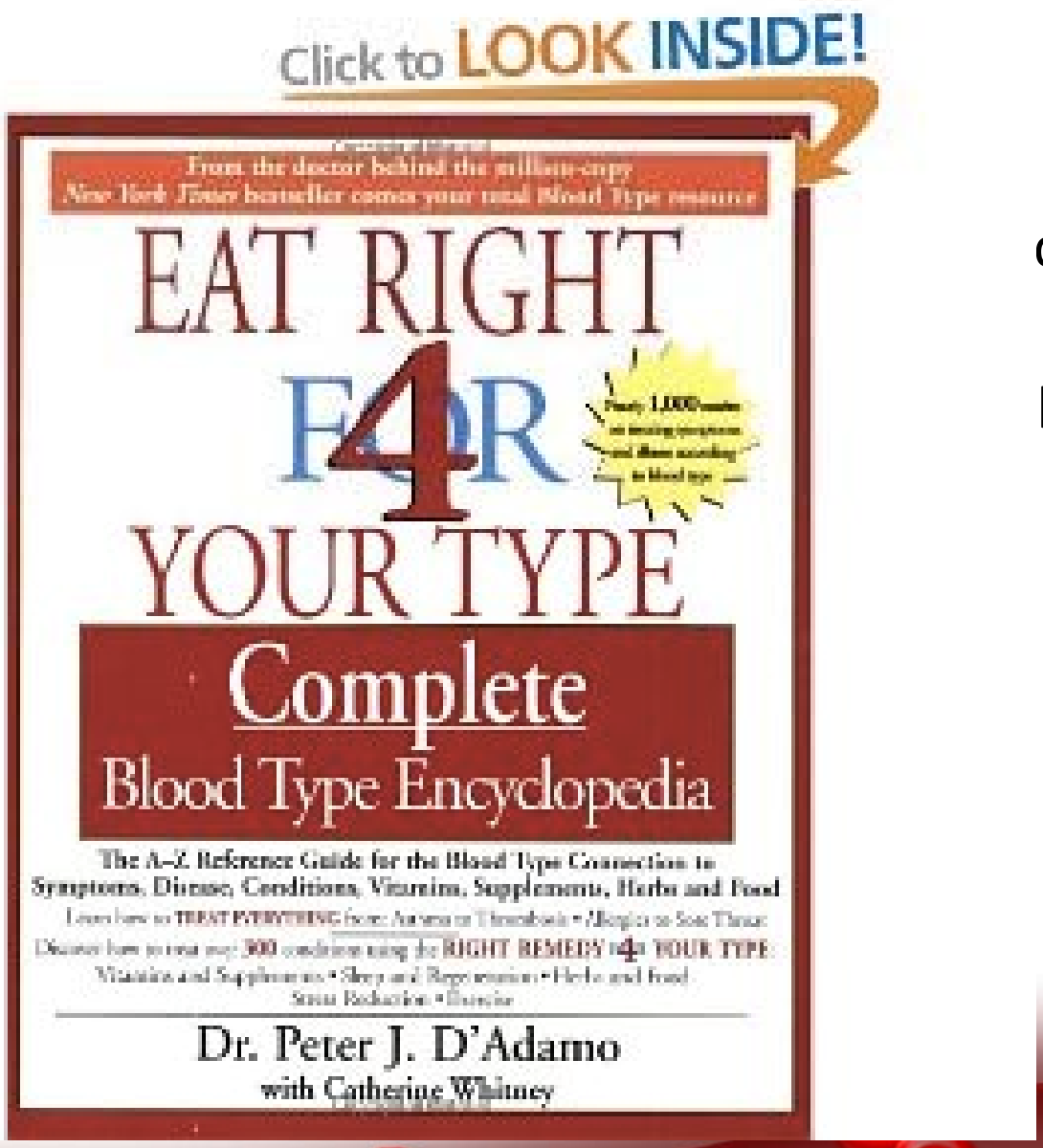
The Situation

- What if the patient was B Neg and you had no B units in stock?



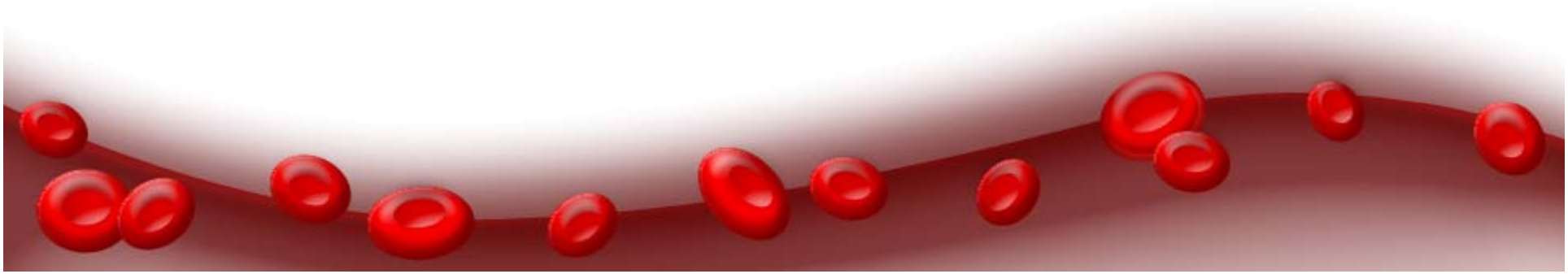
Qu

- What if [illegible] d did not want the
- What if [illegible] by being transfus



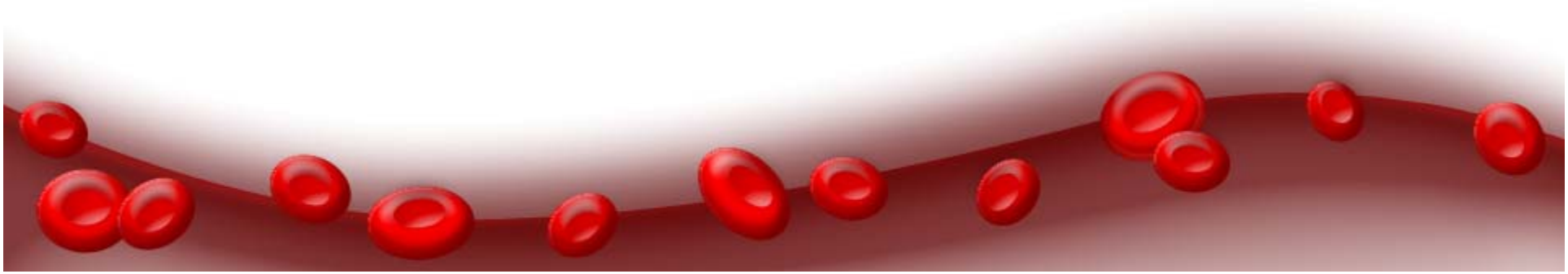
Why is talking to patients scary?

- They Bite
- We don’t have the training
- We don’t want to misinform them



Where should we go with this

- Offer education on educating to MLTs
- Offer MLT consults to patients
- Would this be good for patients?
- Would this be good for the MLT profession?



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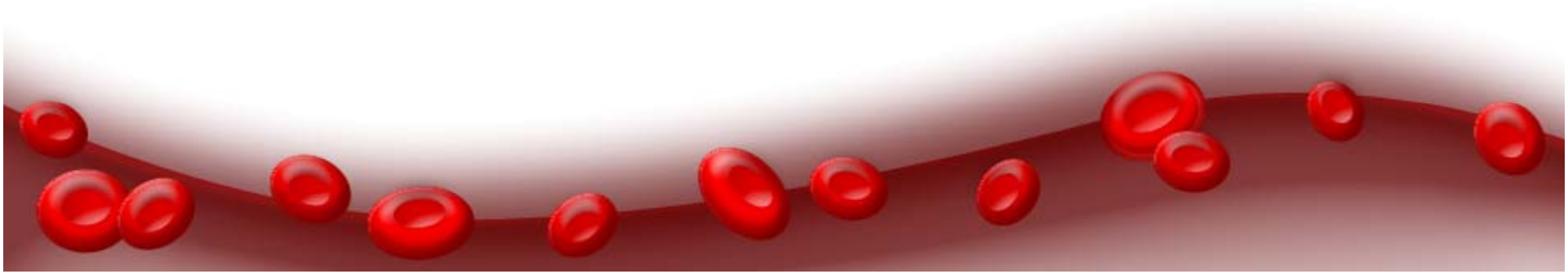

Questions?