

Testing a Clot Buster

Teacher Information

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Summary

Blood clots that block blood vessels to parts of the brain may cause serious brain damage. Clot-X is a simulated clot busting drug that dissolves blood clots.

- Analyze patients' stories to learn about strokes and the use of "clot buster" drugs.
- Conduct simulated laboratory experiments to determine the concentration of Clot-X that is effective for treating strokes.
- Analyze data from research on the safety and effectiveness of Clot-X by creating a data table and a bar graph.
- Use models to engineer (design and evaluate) mechanical tools for restoring blood flow to blood vessels blocked by clots.

Time Required

3-4 forty-minute class periods, if all parts are done in class. Parts 1 and 3 may be done for homework.

Core Concepts

- Strokes occur when blood clots cut off blood flow to parts of the brain.
- Stroke symptoms provide evidence that the body is composed of interacting systems.
- Prompt use of clot dissolving drugs may reduce the risks of serious disability or death from strokes.
- Planning and carrying out investigations can produce data on the effectiveness of medicines.
- Data tables, graphs, and diagrams may be used to show the risks and benefits of medical procedures.
- Scientific principles can be used to engineer mechanical ways to open blocked blood vessels.

Warning: Choking Hazard

This Science Take-Out kit contains small parts. Do not allow children under the age of seven to have access to any kit components.

Kit contains

- 4 tubes containing “clotting protein”
- Graduated dropper labeled “Artificial Blood”
- Tube of “Artificial Blood”
- 1 microtube of water
- 3 microtubes of Clot-X (1, 5, and 10 mg/liter)
- 1 stir stick
- 4 straws and 4 compressed sponges – to model clogged blood vessels
- 4 brain labels
- Bag of materials for engineering tools to open clogged blood vessels

Teacher Provides

- Instructions and containers for disposal of the contents of the 4 tubes containing “clots.” (*See Teacher Suggestions below*).
- Access to calculators
- Transparent tape or masking tape
- Safety goggles
- Cup or beaker containing tap water
- Paper towels for clean-up
- Optional: test tube rack or beaker to support the tubes in Part 2.

Teacher Suggestions

- **IMPORTANT:** Do not discard the “blood clotting proteins” (the contents of tubes A–D) down the drain. The “clots” may continue to expand and clog pipes. Put clots in a plastic bag and discard in the classroom trash.
- To save class time, Parts 1 and 3 may be done for homework.
- Consider asking four students in your class to play the roles of the four patients in Part 1.
- To increase the design difficulty level, consider requiring that students make their surgical tool by combining at least 2 types of materials.
- Consider asking students to use the information in their answers to questions 10 a, b, and c on page 9 to create a written experimental procedure.

Teacher Resources

- **WebMD Stroke Health Center** provides a slide show, a video, and many other resources about strokes and stroke treatments. <http://www.webmd.com/stroke/>
- The **Know Stroke** website from the National Institutes of Health includes a video and community education kit. <http://stroke.nih.gov/>
- National Institute of Neurological Disorders and Stroke (NINDS) **Stroke Information Page** has links to numerous resources. <http://www.ninds.nih.gov/disorders/stroke/stroke.htm>

Reusing the kit

Teachers will need to instruct students on how to handle clean-up and return of the reusable kit materials. For example, teachers might provide the following information for students:

Discard	Wash, dry and return to kit	Return to kit bag
<ul style="list-style-type: none"> • Contents of 4 tubes of clotting protein* • 4 translucent straws with sponge “clots” <p><i>* Do NOT pour contents down the drain! The simulated clotting proteins may continue to absorb water, swell and block plumbing.</i></p>	<ul style="list-style-type: none"> • 4 tubes of clotting protein (ABCD) and red lids <p>Rinse the insides of the tubes thoroughly but do NOT get the labels wet. You may cover the labels with clear tape to protect them.</p>	<ul style="list-style-type: none"> • 4 tubes for clotting protein (ABCD) and red lids • Dropper for artificial blood • Tube for artificial blood • Tubes for 4 different Clot-X concentrations (0,1,5,10 mg/liter) • All items in the bag labeled “For Clot Removing Devices” • The “For Model Arteries and Clots” bag

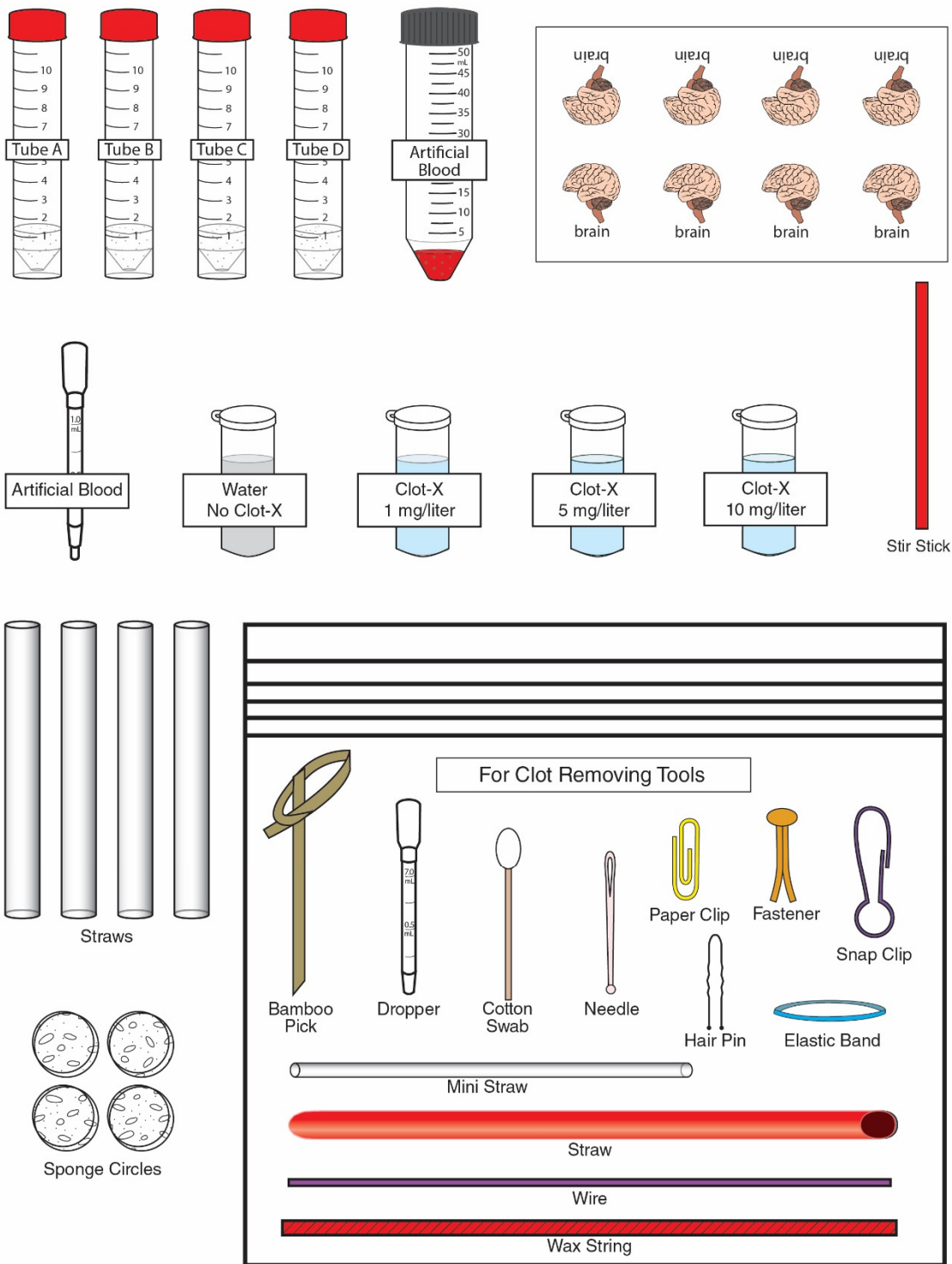
Refills for **Testing a Clot Buster** kits are available at www.sciencetakeout.com. The **10 Kit Refill Pack** includes the following materials:

- Instructions and Quick Guide for refilling kit
- Clotting Protein (simulated)
- Artificial Blood (simulated)
- 2 small spoons
- 25 mL of “Water (No Clot X)”
- 25 mL of “Clot-X 1 mg/liter”
- 25 mL of “Clot-X 5 mg/liter”
- 25 mL of “Clot-X 10 mg/liter”
- 4 transfer pipets for refilling tubes
- 40 compressed sponges
- 40 translucent straws
- 40 brain labels
- 10 paper clips
- 10 brass paper fasteners
- 10 hair pins

Extension Activities (optional)

1. Blood clots can form in in the brain or other parts of the body. Create a brochure that explains the types of medical problems that can result when clots form in other parts of the body such as the lungs, the legs, or the heart.
2. Clot busting drugs are only effective if they are administered soon after the beginning of stroke symptoms. Use the Internet to learn more about stroke symptoms and design a poster to make people aware of the need to seek immediate medical treatment for these symptoms.
3. Use the Internet to find out what kinds of care and rehabilitation are given to stroke patients to help them recover.
4. Develop a list of questions that the class would like to ask a doctor who treats patients who have a stroke and/or provides stroke rehabilitation. Then, arrange for a Skype interview with the doctor or doctors to have the class questions answered.

Kit Contents Quick Guide



Read these instructions before using Science Take-Out kits

Parental or Adult Supervision Required

This kit should be used only under the supervision of an adult who is committed to ensuring that the safety precautions below, and in the specific laboratory activity, are followed.

Safety Goggles and Gloves Strongly Recommended

We encourage students to adopt safe lab practices, and wear safety goggles and gloves when performing laboratory activities involving chemicals. Safety goggles and gloves are not provided in Science Take-Out kits. They may be purchased from a local hardware store or pharmacy.

Warning: Choking and Chemical Hazard

Science Take-Out kits contain small parts that could pose a choking hazard and chemicals that could be hazardous if ingested. Do not allow children under the age of seven to have access to any kit components. Safety Data Sheets (SDS) provide specific safety information regarding the chemical contents of the kits. SDS information for each kit is provided in the accompanying teacher instructions.

Chemicals Used in Science Take-Out Kits

Every effort has been made to reduce the use of hazardous chemicals in Science Take-Out kits. Most kits contain common household chemicals or chemicals that pose little or no risk.

General Safety Precautions

1. Work in a clean, uncluttered area. Cover the work area to protect the work surface.
2. Read and follow all instructions carefully.
3. Pay particular attention to following the specific safety precautions included in the kit activity instructions.
4. Goggles and gloves should be worn while performing experiments using chemicals.
5. Do not use the contents of this kit for any other purpose beyond those described in the kit instructions.
6. Do not leave experiment parts or kits where they could be used inappropriately by others.
7. Never taste or ingest any chemicals provided in the kit – they may be toxic.
8. Do not eat, drink, or apply make-up or contact lenses while performing experiments.
9. Wash your hands before and after performing experiments.
10. Chemicals used in Science Take-Out experiments may stain or damage skin, clothing or work surfaces. If spills occur, wash the area immediately and thoroughly.
11. At the end of the experiment, return ALL kit components to the kit plastic bag. Dispose of the plastic bag and contents in your regular household trash

No blood or body fluids from humans or animals are used in Science Take-Out kits. Chemical mixtures are substituted as simulations of these substances.

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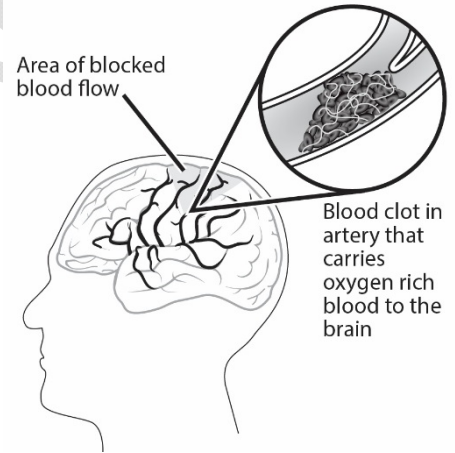
Part 1: Meet the Stroke Patients

Read each of the patients' stories below. Write two things that you learned about strokes from each of the stories.

Casey (age 78)



I was admitted to the hospital because I suddenly lost the ability to move my arm and leg on the right side of my body. The doctors said that I was paralyzed because I had a stroke. They explained that a blood clot formed in an artery somewhere in my body. A stroke occurred when the blood clot traveled to my brain and blocked an artery that supplies oxygen-rich blood to parts of my brain. The stroke had damaged the part of my brain that sent signals to the muscles in my arms and legs.



1. List two things you learned about strokes from Casey's story.

- _____
- _____

Maya (age 48)



My doctor warned me that I had a high risk of having a stroke because I am an African-American woman who smokes and is overweight. My blood pressure, blood sugar level, and cholesterol levels are high. My doctor prescribed medicine to reduce my blood pressure and cholesterol level. She also told me I need to quit smoking, lose weight, and keep my blood sugar level controlled. I tried to follow the doctor's advice but after a while I slipped back into my old habits. This morning I started having trouble with my vision and my speech. I thought I might be having a stroke so I called an ambulance to take me to the emergency room.

2. List two things you learned about strokes from Maya's story.

- _____
- _____

Neal (age 35)



My wife called 911 because she noticed that the right side of my face was drooping. I tried to explain that I was fine but my speech was slurred and my wife was having trouble understanding me. When the ambulance arrived, the EMT's told me that I was having a stroke and it was critical that I go to the hospital immediately. They said that many strokes could be treated with clot buster drug injections. Clot buster drugs dissolve blood clots and restore blood flow to the brain. I was lucky that my wife immediately called for an ambulance. The clot buster drugs needed to be given within 3 hours of the first stroke symptoms.

3. List two things you learned about strokes from Neal's story.

- _____
- _____

Denise (age 20)



I was teaching a yoga class when I suddenly developed a severe headache, dizziness, and nausea. I was too confused to drive so one of my students drove me home. Several hours later I called for an ambulance because my legs were becoming numb. When the doctors at the hospital did a brain scan, the scan revealed that I had a stroke. Because it was more than 3 hours after my stroke symptoms started, it was too late for them to use clot busting drugs to dissolve the blood clot in my brain. I needed emergency surgery to remove the blood clot.

4. List two things you learned about strokes from Denise's story.

- _____
- _____

5. Why would using clot busting drugs or clot removal surgery be beneficial for the patient?

6. If a patient with a stroke chooses to not have clot busting drugs or clot removal surgery, what negative impact might there be on the nervous system?

7. Strokes do not damage muscles, but parts of the body may become paralyzed for some stroke patients. How would you explain this?

8. Strokes do not damage the eyes but some stroke patients lose their vision. How would you explain this?

Part 2: Testing Clot Buster Drugs

A stroke occurs when blood flow to the brain is interrupted. Strokes may be caused by blood clots that block blood vessels in the brain or by ruptured blood vessels that cause bleeding in the brain.

When a stroke is caused by a blood clot, dissolving the clot to restore blood flow to the brain may prevent long-term brain damage or even death. “Clot buster” drugs are medications given in the hospital to break up or dissolve a blood clot that is blocking a blood vessel. Clot buster drugs should only be used to treat strokes that are caused by blood clots.

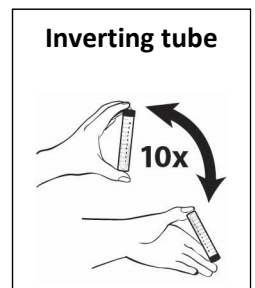
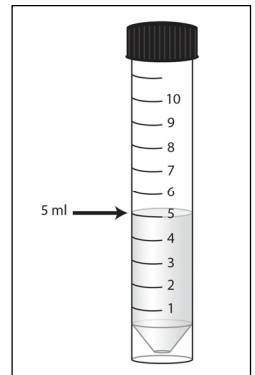
Chemists have created a new drug called Clot-X that they hope will dissolve blood clots. You have been asked to conduct laboratory tests to determine the concentrations of Clot-X that are effective in dissolving blood clots. Follow the instructions below to test three different concentrations of Clot-X.

1. You first need to make artificial blood.

- a) Fill the tube labeled “Artificial Blood” to the 45 mL line with tap water.
- b) Put the lid on the artificial blood tube and tighten the lid completely.
- c) Shake the tube of artificial blood for 1 minute.

2. Next, you need to make blood clots. Use four tubes labeled “Tube A”, “Tube B”, “Tube C”, and “Tube D. Each tube contains 0.1 gram of blood clotting protein. The blood clotting protein in the tubes will interact with enzymes in the artificial blood to form blood clots.

- a) Use the large dropper labeled “Artificial Blood” to add artificial blood to fill each of the tubes (A, B, C, and D) to the 5 ml line. *See the diagram on the right.*
- b) Put a red lid on each of the four tubes and tighten the lids completely.
- c) Gently invert (flip) each of the four tubes ten times to mix the clotting protein with the artificial blood. *See the diagram on the right.*
- d) Let the four tubes sit for 2–3 minutes. What did you observe happening in the tubes?

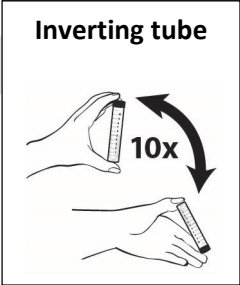


- e) Save these four tubes that contain blood clots. You will use them to test the new clot busting drug.

Concentration - Amount of substance per unit volume.
For example: 1 mg Clot-X/liter

3. You will now add different concentrations of **Clot-X** to each of the four tubes that contain blood clots:

- a) Use the large tube labeled “**Tube A.**” Pour the entire contents of the small tube labeled “Water (No Clot-X)” into tube A. Screw the red lid on tightly.
- b) Use the large tube labeled “**Tube B.**” Pour the entire contents of the small tube labeled “Clot-X 1 mg/liter” tube into tube B. Screw the red lid on tightly.
- c) Use the large tube labeled “**Tube C.**” Pour the entire contents of the small tube labeled “Clot-X 5 mg/liter” tube into tube C. Screw the red lid on tightly.
- d) Use the large tube labeled “**Tube D.**” Pour the entire contents of the small tube labeled “Clot-X 10 mg/liter” tube into tube D. Screw the red lid on tightly.
- e) Be sure the red lids are screwed tightly onto each of the four tubes that contain blood clots. Gently invert (flip) each tube ten times to mix the contents of the tubes. *See the diagram on the right.*
- f) Set the tubes aside for 5 minutes. While you wait, use the time to answer questions 4 through 6.



4. Which tube is the control tube—A, B, C, or D? _____

Explain why you selected this tube.

5. Explain why it is important to have a control tube.

6. Predict what you will observe in tubes that contain an effective concentration of clot busting drugs.

7. After 5 minutes, observe the contents of the 4 tubes for evidence of clot busting action. Record your observations in the chart below.

	Observations - Evidence for Clot Busting Action
Tube A Water	
Tube B Clot-X 1 mg/liter	
Tube C Clot-X 5 mg/liter	
Tube D Clot-X 10 mg/liter	

8. Which Clot-X concentrations (mg/liter) are effective in dissolving blood clots? Support your answer with evidence from the observation chart.

9. Clot-X is expensive, and high concentrations of Clot-X are more likely to cause harmful side effects including severe nausea and headaches. Based on this information, which Clot-X concentration (mg/liter) would you recommend be used to treat stroke patients? Explain why you selected this concentration.

Important! Follow the clean-up instructions provided by your teacher.

10. The Clot-X concentration that you selected in question 9 may not be the lowest concentration that works to dissolve clots while also minimizing costs and harmful side effects. You are asked to design a controlled experiment to determine more precisely the lowest concentration of Clot-X that is effective for dissolving blood clots.

- Supplies available for your experiment:**
- Artificial blood
 - Blood clotting protein
 - Five 10 mL tubes with lids
 - Water
 - Solutions with different concentrations of Clot-X (0-10 mg/liter)

Answer the following questions to explain how you would design your experiment.

a) What would you add to each of the five tubes? Be specific about the types, amounts and concentrations of substances you would put in each of the tubes that you would use.

b) How would you collect data or make observations for your experiment?

c) How would you identify the lowest concentration of Clot-X that is effective?

Part 3: Analyzing Data about Clot-X Effectiveness

Scientists know that Clot-X works to dissolve clots in a test tube. They now want to know how well Clot-X works in people. Scientists conducted a research study to determine how effective Clot-X is for treating strokes.

- 150 stroke patients were given a 1 mL injection of placebo (water) within 3 hours of the start of their stroke symptoms.
- 200 stroke patients were given a 1 ml injection of 3 mg/liter Clot-X within 3 hours of the start of their stroke symptoms.

Placebo - A fake medication that looks like the real medication but does not contain any substance likely to have an effect.

1. What treatment was given to the control group in this research study?

Six months later, scientists tested and recorded the level of disability for the living patients in both groups. They also recorded the number of patients in each group who had died. The data table below summarizes the results of this research study.

Effect of Treatment with Clot-X or Placebo on Level of Disability and Death

Treatment	Total Patients	Effect of Treatment after 6 Months Number of Patients with:			
		No disability	Mild disability	Severe disability	Death
Placebo	150	30	45	45	30
Clot-X	200	80	40	34	46

2. Notice that the Placebo (control) group included 150 patients and the Clot-X (experimental) group included 200 patients. Explain why this might make it difficult or misleading to use the data table above to compare the effects of the Placebo and Clot-X.

3. To more accurately compare the control group and the experimental group, scientists often use a data table with percentages of patients instead of a data table with numbers of subjects. Use the information from the data table on the previous page to complete the data table below.

$$\text{Percentage} = \frac{\text{Number of patients for category}}{\text{Total patients in treatment group}} \times 100$$

Effect of Treatment with Clot-X or Placebo on Level of Disability and Death

Treatment	Effect of Treatment after 6 Months PERCENTAGE of Patients with:			
	No disability	Mild disability	Severe disability	Death
Placebo				
Clot-X				

4. Do Clot-X treatments reduce the risks of death from a stroke? Support your answer with evidence from the percentages data table in question 3.

5. Do Clot-X treatments reduce the risk of mild and severe disability caused by a stroke? Support your answer with evidence from the percentages data table in question 3.

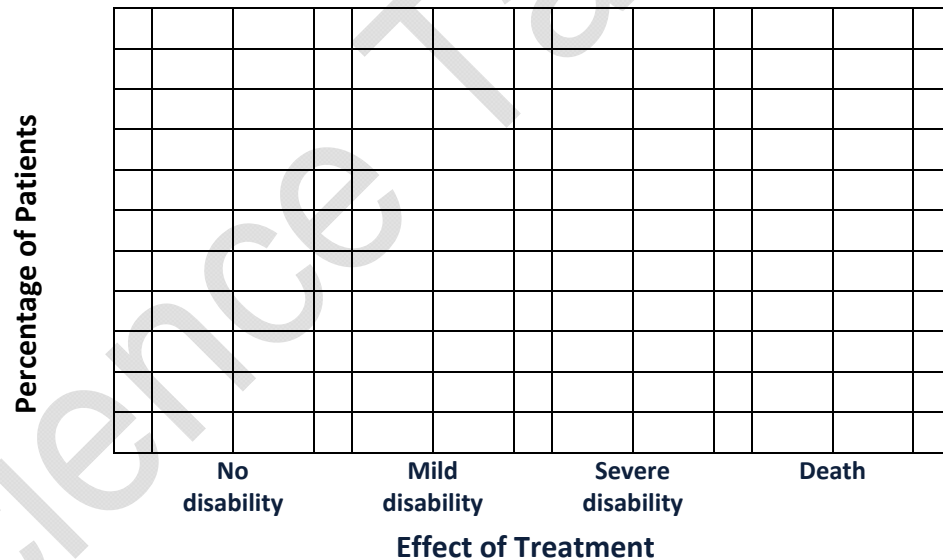
When patients and their family members need to make decisions about whether to have Clot-X treatments, it is important that they understand and be able to interpret information about the effectiveness of Clot-X. The information in a data table may be difficult for some patients and their families to understand. A **bar graph** can be used to make it easier to visualize the data.

6. Use the information in the percentages data table (question 3 on page 9) to complete the bar graph below.

- Write a title for the bar graph. *Hint: Look at the data table titles.*
- Write a scale on the y-axis (vertical axis).
- Complete the bar graph key.
- Plot the data for Clot-X and for the placebo.

Title: _____

Bar Graph Key: Clot-X Placebo



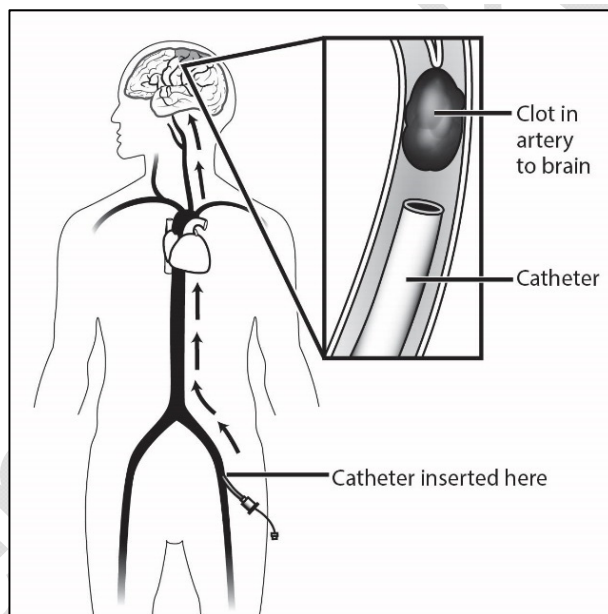
7. Explain why a bar graph may make it easier for patients and their families to understand the results of the experiment.

Part 4: Engineering a Tool for Removing Blood Clots

Clot busting drugs cannot be used to treat some patients. Clot busting drugs increase bleeding; therefore they cannot be used for patients who have bleeding problems or for patients who had recent surgery. Clot busting drugs travel through the blood to all parts of the body and may cause harmful side effects in many parts of the body.

Doctors would like to be able to do surgery to remove blood clots, instead of using clot busting drugs. You have been asked to engineer a surgical tool that can remove blood clots that block arteries that carry blood to the brain.

The technology to deliver a surgical tool to an artery in the brain already exists. Doctors can insert a catheter (a thin flexible tube) into a blood vessel in the leg. The catheter is then threaded through the heart and blood vessels to reach the clogged arteries near or in the brain. You may assume that a catheter could be used to deliver your surgical tool to the artery that contains the clot.

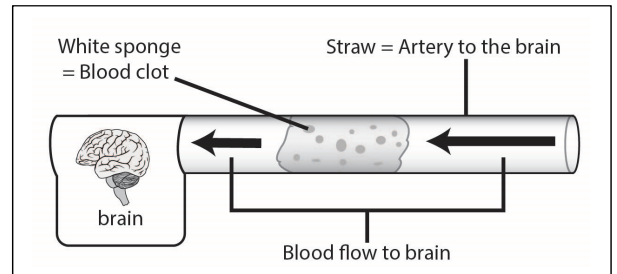


1. Look at the diagram of a blood clot above. Should your clot removing tool push the clot toward the brain or pull the clot out of the artery? Explain your reasoning.

Typically, engineers do not start by testing or trying out possible tools on people or on animals. Instead, they first try the tools out using **models**. You will need to make models of clogged blood vessels that you can use for testing to see how well your ideas for surgical tools work.

2. Use the materials in the bag labeled **For Model Arteries and Clots** to make 4 models that you can use for testing the surgical tools. *Refer to the diagram below.*

- a) The 4 straw pieces represent arteries that conduct blood to the brain. Attach a “brain” label to one end of each straw.
- b) The white sponge circles represent “clots.” Dip each of the sponge circles in water so that it expands to form a cylinder. Insert one white sponge cylinder into the middle of each of the four straw pieces. The red stir stick can be used to push the sponge “clot” into the straw “artery.”



Engineers begin their design work by considering all of the materials available for a task. They eliminate materials that are unlikely to work and select materials that are likely to work. They may also combine two or more materials to create something that works better than individual materials.

- 3. Observe the materials in the bag labeled **For Clot Removing Tools**. Do NOT open this bag. The things in the bag can be used to make surgical tools that could be used to remove the blood clots from the artery models.
- 4. **Without removing the materials from the bag**, select three materials that you think will NOT work to make a surgical tool or part of a surgical tool for removing blood clots. Record the names or make simple drawings of the materials you selected in the first column. Provide a reason for each of your choices in the second column

Materials that will NOT work	Reason for <u>eliminating</u> these materials

5. **Without removing the materials from the bag**, select three materials OR combinations of materials that you think are likely to be effective surgical tools for removing blood clots. Record the names or make simple drawings of the materials you selected in the first column. Provide a reason for each of your choices in the second column.

Note: You may plan to use tape to combine materials.

Materials or combinations that are likely to work	Reason the materials are likely to be effective tools

6. **Now you may remove the materials that you listed in question 5 from the bag.** Record the names or make simple drawings of the materials you selected in the first column. Test each of the materials or combination of materials that you selected. Provide an explanation of why each of the materials worked or did not work.

Note: You may use tape to combine materials. You may provide information on how the materials could be modified to improve their function.

Materials or combinations that you tested	Did the materials work? Provide evidence from your testing.

7. Based on your tests, which material or materials would make the best surgical tool for removing blood clots? Support your answer with information from your testing.

8. You may have a better idea for a surgical tool to remove blood clots. Think of something in everyday life that could be used to simulate your idea. What other material or materials would you use if you could use things that were not included in the bag of materials? Explain (or draw) how the material or materials would work to remove blood clots.

9. State one reason a doctor might use Clot-X instead of using clot removing surgery to treat a blood clot in the brain of a stroke patient.

10. State one reason a doctor might use clot removing surgery instead of using Clot-X to treat a blood clot in the brain of a stroke patient.

Section 1 Chemical Product and Company Information

Science Take-Out
80 Office Park Way
Pittsford, NY 14534
(585)764-5400

**CHEMTREC 24 Hour Emergency
Phone Number (800) 424-9300**
For laboratory use only. Not for drug, food or household use

Product	Water; Water with food coloring
Synonyms	Water (No Clot-X); Clot-X 1 mg/liter

Section 2 Hazards Identification

This substance or mixture has not been classified at this time according to the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals.

Signal word: Not classified
Pictograms: Not classified
Target organs: None known

GHS Classification: Not classified
GHS Label information: Not classified
Precautionary Statement: Not classified

Supplementary information:

Do not breathe vapors, spray or mist. Do not get in eyes, on skin, or on clothing. Wear protective gloves/protective clothing/eye protection/face protection. Wash hands thoroughly after handling. Get medical attention if you feel unwell.

Ca Prop 65 - This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

Section 3 Composition / Information on Ingredients

Chemical Name	CAS #	%	EINECS
Water	7732-18-5	>99.99%	231-791-2
Food coloring		<0.01%	

Section 4 First Aid Measures

INGESTION: MAY BE HARMFUL IF SWALLOWED. Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: MAY BE HARMFUL IF INHALED. MAY CAUSE RESPIRATORY TRACT IRRITATION. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: MAY CAUSE EYE IRRITATION. Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: MAY CAUSE SKIN IRRITATION. Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Use any media suitable for extinguishing supporting fire.

Protective Actions for Fire-fighters: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

Specific Hazards: In fire conditions, water may evaporate from this solution which may cause hazardous decomposition products to be formed as dust or fume.

Section 6 Accidental Release Measures

Personal Precautions: Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Absorb with inert dry material, sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

Section 7 Handling and Storage

Precautions for Safe Handling: Read label on container before using. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale vapors, spray or mist. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse.

Conditions for Safe Storage: Store in a cool, well-ventilated area away from incompatible substances. Protect from light.

Section 8 Exposure controls / Personal Protection

Exposure Limits:	Chemical Name	ACGIH (TLV)	OSHA (PEL)	NIOSH (REL)
	N/A	N/A	N/A	N/A

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If misty conditions prevail, work in fume hood or wear a NIOSH/MSHA approved respirator.

Section 9 Physical and Chemical Properties

Appearance: Liquid, clear, colored. Odor: No odor. Odor threshold: Data not available. pH: Data not available Melting/Freezing point: Approx. 0°C (32°F) (water) Boiling point: Approx. 100°C (212°F) (water) Flash point: Data not available	Evaporation rate (Water = 1): <1 Flammability (solid/gas): Data not available. Explosion limits: Lower/Upper: Data not available Vapor pressure (mm Hg): 14 (water) Vapor density (Air = 1): 0.7 (water) Relative density (Specific gravity): Approx. 1.0 (water) Solubility(ies): Complete in water.	Partition coefficient: Data not available Auto-ignition temp.: Data not available Decomposition temp.: Data not available Viscosity: Data not available. Molecular formula: Mixture Molecular weight: Mixture
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Section 10 Stability and Reactivity

Chemical stability: Stable

Hazardous polymerization: Will not occur.

Conditions to avoid: Excessive temperatures which cause evaporation. Protect from light.

Incompatibilities with other materials: Data not available.

Hazardous decomposition products: Data not available.

Section 11 Toxicological Information

Acute toxicity: Data not available

Serious eye damage/irritation: Data not available

Germ cell mutagenicity: Data not available

Skin corrosion/irritation: Data not available

Respiratory or skin sensitization: Data not available

Carcinogenicity: Data not available

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Data not available

STOT-single exposure: Data not available

Aspiration hazard: Data not available

STOT-repeated exposure: Data not available

Potential health effects:

Inhalation: May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

Skin: May cause irritation.

Eyes: May cause irritation.

Signs and symptoms of exposure: To the best of our knowledge the chemical, physical and toxicological properties have not been thoroughly investigated. Specific data is not available. Exercise appropriate procedures to minimize potential hazards.

Additional information: RTECS #: Data not available

Section 12 Ecological Information

Toxicity to fish: No data available

Toxicity to daphnia and other aquatic invertebrates: No data available

Toxicity to algae: No data available

Persistence and degradability: No data available

Bioaccumulative potential: No data available

Mobility in soil: No data available

PBT and vPvB assessment: No data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13 Disposal Considerations

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: Not applicable

Shipping name: Not Regulated

Hazard class: Not applicable

Packing group: Not applicable

Reportable Quantity: No

Marine pollutant: No

Exceptions: Not applicable

2012 ERG Guide # Not applicable

Section 15 Regulatory Information

A chemical is considered to be listed if the CAS number for the anhydrous form is on the Inventory list.

Component	TSCA	CERLCA (RQ)	RCRA code	DSL	NDSL	WHMIS Classification
N/A						

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees.

NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook.

Section 1 Chemical Product and Company Information

Science Take-Out
80 Office Park Way
Pittsford, NY 14534
(585)764-5400

**CHEMTREC 24 Hour Emergency
Phone Number (800) 424-9300**
For laboratory use only. Not for drug, food or household use

Product	Sodium Bicarbonate, 4% solution + food coloring
Synonyms	Clot-X 5 mg/liter; Clot-X 10 mg/liter

Section 2 Hazards Identification

This substance or mixture has not been classified at this time according to the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals.

Signal word: Not Classified
Pictograms: None required
Target organs: None known

GHS Classification: Not classified

GHS Label information: Hazard statement(s): Not classified

Precautionary statement(s):

Do not breathe dust. Do not get in eyes, on skin, or on clothing. Wear protective gloves/protective clothing/eye protection/face protection. Wash hands thoroughly after handling. Get medical attention if you feel unwell.

Ca Prop 65 - This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

Section 3 Composition / Information on Ingredients

Chemical Name	CAS #	%	EINECS
Water	7732-18-15	96%	231-791-2
Sodium Bicarbonate	144-55-8	4%	205-633-8
Food coloring		<0.01%	

Section 4 First Aid Measures

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Use any media suitable for extinguishing supporting fire.

Protective Actions for Fire-fighters: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

Specific Hazards: During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material is commonly used to extinguish fires.

Section 6 Accidental Release Measures

Personal Precautions: Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Absorb with inert dry material, sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

Section 7 Handling and Storage

Precautions for Safe Handling: Read label on container before using. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale vapors, spray or mist. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse.

Conditions for Safe Storage: Store in a cool, well-ventilated area away from incompatible substances.

Section 8 Exposure controls / Personal Protection

Exposure Limits:	Chemical Name	ACGIH (TLV)	OSHA (PEL)	NIOSH (REL)
	Sodium bicarbonate	None established	None established	None established

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If misty conditions prevail, work in fume hood or wear a NIOSH/MSHA approved respirator.

Section 9 Physical and Chemical Properties

Appearance: Clear, colorless liquid. Odor: No odor. Odor threshold: Data not available. pH: 8.2 (1% solution) Melting/Freezing point: Data not available Boiling point: Decomposes Flash point: Not combustible	Evaporation rate (Water = 1): Data not available Flammability (solid/gas): Data not available. Explosion limits: Lower/Upper: Data not available Vapor pressure (mm Hg): Negligible Vapor density (Air = 1): Data not available Relative density (Specific gravity): Data not available Solubility(ies): Complete in water.	Partition coefficient: Data not available Auto-ignition temp.: Data not available Decomposition temp.: Data not available Viscosity: Data not available. Molecular formula: Mixture Molecular weight: Mixture
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Section 10 Stability and Reactivity

Chemical stability: Stable

Hazardous polymerization: Will not occur.

Conditions to avoid: High temperature causes decomposition to sodium carbonate, water and carbon dioxide.

Incompatibilities with other materials: Reacts with acids to yield acid salts, water and carbon dioxide.

Hazardous decomposition products: Gaseous carbon dioxide.

Section 11 Toxicological Information

Acute toxicity: Oral-rat LD50: 4220-4400 mg/kg

Serious eye damage/irritation: Eye-rabbit – not irritating

Germ cell mutagenicity: Data not available

Skin corrosion/irritation: Skin-rabbit – not irritating

Respiratory or skin sensitization: Data not available

Carcinogenicity: Data not available

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Data not available

STOT-single exposure: Data not available

Aspiration hazard: Data not available

STOT-repeated exposure: Data not available

Potential health effects:

Inhalation: Excessive dust may irritate respiratory tract.

Ingestion: May cause gastrointestinal disturbance if ingested.

Skin: No hazard known.

Eyes: May cause very slight irritation.

Signs and symptoms of exposure: To the best of our knowledge the chemical, physical and toxicological properties have not been thoroughly investigated. Specific data is not available. Exercise appropriate procedures to minimize potential hazards.

Additional information: RTECS #: VZ0950000

Section 12 Ecological Information

Toxicity to fish: *Gambusia affinis* (fish, freshwater) LC50: 7550 mg/l/24 hours

Toxicity to daphnia and other aquatic invertebrates: *Daphnia magna* (Crustacea) EC50: 2350 mg/l/48 hours

Toxicity to algae: *Nitzschia linearis* (Algae) LC50: 650 mg/l/5 day

Persistence and degradability: No data available

Bioaccumulative potential: No data available

Mobility in soil: No data available

PBT and vPvB assessment: No data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13 Disposal Considerations

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: Not applicable

Shipping name: Not Regulated

Hazard class: Not applicable

Packing group: Not applicable

Reportable Quantity: No

Marine pollutant: No

Exceptions: Not applicable

2012 ERG Guide # Not applicable

Section 15 Regulatory Information

A chemical is considered to be listed if the CAS number for the anhydrous form is on the Inventory list.

Component	TSCA	CERLCA (RQ)	RCRA code	DSL	NDSL	WHMIS Classification
Sodium bicarbonate	Listed	Not Listed	Not listed	Listed	Not listed	Uncontrolled product

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees.

NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook.

Section 1 Chemical Product and Company Information

Science Take-Out
80 Office Park Way
Pittsford, NY 14534
(585)764-5400

**CHEMTREC 24 Hour Emergency
Phone Number (800) 424-9300**
For laboratory use only. Not for drug, food or household use

Product	Instant Snow Polymer – Aqua Keep
Synonyms	Clotting Protein (<i>simulated</i>)

Section 2 Hazards Identification

This substance or mixture has not been classified at this time according to the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals.

Signal word: None required
Pictograms: None required
Target organs: None known

GHS Classification:
Not classified

GHS Label information: Hazard statement(s):
None

Precautionary statement(s):
Call a doctor if you feel unwell.
Product become slippery when it absorbs water

Ca Prop 65 - This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

Section 3 Composition / Information on Ingredients

Chemical Name	CAS #	%	EINECS
Acrylic Acid Polymer Sodium Salt	9003-04-7	>90%	
Water	7732-18-5	<10%	231-791-2

Section 4 First Aid Measures

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Use any media suitable for extinguishing supporting fire.

Protective Actions for Fire-fighters: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

Specific Hazards: IN the presence of an ignition source, dust can form explosive mixture with air (in an enclosed space). At temperatures above 200 degrees Fahrenheit: Thermal decomposition can give toxic products, organic derivatives, and carbon monoxides. Fight fire from windward direction if possible. Sprinkle the container with water if not possible to move.

Section 6 Accidental Release Measures

Personal Precautions: Avoid contact with skin and eyes. Prohibit inhalation of dust.

Environmental Precautions: Product becomes slippery when it absorbs water. Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Sweep or vacuum up and place in a suitable container for proper disposal.

Section 7 Handling and Storage

Precautions for Safe Handling: Avoid dust formation. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale vapors. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse. Keep away from heat, sparks, flames, and all other ignition sources.

Conditions for Safe Storage: Store in a cool, well-ventilated area. Avoid humidity, especially direct contact with water.

Section 8 Exposure controls / Personal Protection

Exposure Limits:	Chemical Name	ACGIH (TLV)	OSHA (PEL)	NIOSH (REL)
	Acrylic Acid Polymer Sodium Salt	None established	None established	None established

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves, and non-skid boots. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If dusty conditions prevail, work in fume hood or wear a NIOSH/MSHA approved respirator.

Section 9 Physical and Chemical Properties

Appearance: Solid, granular white powder.
Odor: No odor.
Odor threshold: Data not available.
pH: 6 to 8
Melting/Freezing point: Data not available
Boiling point: Data not available
Flash point: Data not available

Evaporation rate (Water = 1): Data not available
Flammability (solid/gas): Data not available.
Explosion limits: Lower/Upper: Data not available
Vapor pressure (mm Hg): Data not available
Vapor density (Air = 1): Data not available
Relative density (Specific gravity): Data not available (water)
Solubility(ies): Swells in water.

Partition coefficient: Data not available
Auto-ignition temp.: Data not available
Decomposition temp.: Data not available
Viscosity: Data not available.
Molecular formula: Mixture
Molecular weight: Mixture

Section 10 Stability and Reactivity

Chemical stability: Stable at room temperature

Hazardous polymerization: Will not occur.

Conditions to avoid: Product becomes slippery when it absorbs water. Keep away from heat and sources of ignition.

Incompatibilities with other materials: Data not available.

Hazardous decomposition products: Thermal decomposition gives toxic products, organic vapors, and carbon monoxide gas.

Section 11 Toxicological Information

Acute toxicity: Oral rat LD50 > 1,600 g/kg, mouse LD50 >3,200 g/kg

Skin corrosion/irritation: None (Human, Rabbit)

Serious eye damage/irritation: None (Rabbit) **Respiratory or skin sensitization:** Data not available

Germ cell mutagenicity: Data not available **Carcinogenicity:** Data not available

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Data not available

STOT-single exposure: Data not available

Aspiration hazard: Data not available

STOT-repeated exposure: Data not available

Potential health effects:

Inhalation: May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

Skin: May cause mild irritation.

Eyes: May cause mild irritation.

Signs and symptoms of exposure: To the best of our knowledge the chemical, physical and toxicological properties have not been thoroughly investigated. Specific data is not available. Exercise appropriate procedures to minimize potential hazards.

Additional information: RTECS #: Data not available

Section 12 Ecological Information

Toxicity to fish: No data available

Toxicity to daphnia and other aquatic invertebrates: EC50 48 hours >100 mg/L, Daphnia magna

Toxicity to algae: No data available

Persistence and degradability: Not biodegradable

Bioaccumulative potential: No data available

Mobility in soil: No data available

PBT and vPvB assessment: No data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13 Disposal Considerations

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: Not applicable

Shipping name: Not Regulated

Hazard class: Not applicable

Packing group: Not applicable

Reportable Quantity: No

Marine pollutant: No

Exceptions: Not applicable

2012 ERG Guide # Not applicable

Section 15 Regulatory Information

A chemical is considered to be listed if the CAS number for the anhydrous form is on the Inventory list.

Component	TSCA	CERLCA (RQ)	RCRA code	DSL	NDSL	WHMIS Classification
Acrylic Acid Polymer Sodium Salt	Listed	Not Listed	Not Listed	Listed	Not Listed	Uncontrolled Product

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees.

NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook.

SAFETY DATA SHEET

GENERAL STORAGE CODE GREEN

Section 1 Chemical Product and Company Information

Science Take-Out
80 Office Park Way
Pittsford, NY 14534
(585)764-5400

**CHEMTREC 24 Hour Emergency
Phone Number (800) 424-9300**
For laboratory use only. Not for drug, food or household use

Product	Food Color – Red Powder
Synonyms	Artificial Blood (<i>simulated</i>)

Section 2 Hazards Identification

This substance or mixture has not been classified at this time according to the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals.

Signal word: None required
Pictograms: None required
Target organs: None known

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

GHS Classification:
Not classified

GHS Label information: Hazard statement(s):
None

Precautionary statement(s):
Call a doctor if you feel unwell.

Ca Prop 65 - This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

Section 3 Composition / Information on Ingredients

Chemical Name	CAS #	%	EINECS
Food Color – Red Powder	Not available	100%	Not available

Section 4 First Aid Measures

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Use any media suitable for extinguishing supporting fire.

Protective Actions for Fire-fighters: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear.

Specific Hazards: In the presence of an ignition source, dust can form explosive mixture. At high temperatures, fire is possible:

Section 6 Accidental Release Measures

Personal Precautions: Avoid contact with skin and eyes. Prohibit inhalation of dust.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Sweep or vacuum up and place in a suitable container for proper disposal.

Section 7 Handling and Storage

Precautions for Safe Handling: Avoid dust formation. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale vapors. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Keep away from heat, sparks, flames, and all other ignition sources. Keep away from incompatibles such as oxidizing agents, alkalis.

Conditions for Safe Storage: Store in a cool, well-ventilated area.

Section 8 Exposure controls / Personal Protection

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, and appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If dusty conditions prevail, work in fume hood or wear a NIOSH/MSHA approved respirator.

Section 9 Physical and Chemical Properties

Appearance: Solid, red powder.

Odor: No odor.

Odor threshold: Data not available.

pH: Data not available

Melting/Freezing point: Data not available

Boiling point: Data not available

Flash point: Data not available

Evaporation rate (Water = 1): Data not available

Flammability (solid/gas): Data not available.

Explosion limits: Lower/Upper: Data not available

Vapor pressure (mm Hg): Data not available

Vapor density (Air = 1): Data not available

Relative density (Specific gravity): Data not available (water)

Solubility(ies): Dissolves in water.

Partition coefficient: Data not available

Auto-ignition temp.: Data not available

Decomposition temp.: Data not available

Viscosity: Data not available.

Molecular formula: Mixture

Molecular weight: Mixture

Section 10 Stability and Reactivity

Chemical stability: Stable at room temperature

Hazardous polymerization: Will not occur.

Conditions to avoid: Keep away from heat and sources of ignition. Keep away from incompatible materials.

Incompatibilities with other materials: Reactive with oxidizing agents, alkalis.

Hazardous decomposition products: Data not available.

Section 11 Toxicological Information

Acute toxicity: Data not available

Skin corrosion/irritation: Data not available

Serious eye damage/irritation: Data not available

Germ cell mutagenicity: Data not available

Respiratory or skin sensitization: Data not available

Carcinogenicity: Data not available

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Data not available

STOT-single exposure: Data not available

Aspiration hazard: Data not available

STOT-repeated exposure: Data not available

Potential health effects:

Inhalation: May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

Skin: May cause mild irritation.

Eyes: May cause mild irritation.

Signs and symptoms of exposure: To the best of our knowledge the chemical, physical and toxicological properties have not been thoroughly investigated. Specific data is not available. Exercise appropriate procedures to minimize potential hazards.

Additional information: RTECS #: Data not available

Section 12 Ecological Information

Toxicity to fish: No data available

Toxicity to daphnia and other aquatic invertebrates: No data available

Toxicity to algae: No data available

Persistence and degradability: Not biodegradable

Bioaccumulative potential: No data available

Mobility in soil: No data available

PBT and vPvB assessment: No data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13 Disposal Considerations

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: Not applicable

Shipping name: Not Regulated

Hazard class: Not applicable

Packing group: Not applicable

Reportable Quantity: No

Marine pollutant: No

Exceptions: Not applicable

2012 ERG Guide # Not applicable

Section 15 Regulatory Information

A chemical is considered to be listed if the CAS number for the anhydrous form is on the Inventory list.

Component	TSCA	CERLCA (RQ)	RCRA code	DSL	NDSL	WHMIS Classification
Food Color – Red Powder	Not Listed	Not Listed	Not Listed	Listed	Not Listed	Uncontrolled Product

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees.

NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook.