



Green Solutions Group, LLC

Safest Choice...by Design



GreenMBalm™ Protocol

APPLICATION, USE, AND MAINTENANCE

METRIC VERSION INCLUDED

Embalming Process

The embalming process for GreenMBalm™ is not significantly different than the process with standard anatomical fluid, however the process with standard anatomical fluid is not universal across institutions. When embalming a standard anatomical donor, use the super-saturation method of embalming. The following protocol is designed for an optimal result with GreenMBalm™ fluid to ensure saturation of the tissues. It is recommended to use GreenMBalm™ Pre-Injection Fluid to flush coagulated blood from the vascular system prior to beginning the embalming process. This is an outline of best practices for best results.

- 1) As with any anatomical embalming, selection of the donor is critical. The donor weight is not as important as the BMI. A donor that is 200 lb. could be in excellent shape or terrible shape depending on the BMI. Ideally, the donor should have a BMI under 27 with no pathologies that would limit distribution and diffusion of the fluid, and no damage to the anatomical structures for study.
- 2) Prior to embalming, thoroughly wash the donor. This includes hands, feet, mouth, and genital area. Many contamination issues can arise from external contamination that is present on the body prior to embalming. A complete wash can prevent issues during the holding period.
- 3) The body can be embalmed from the access point of choice. This is commonly either the carotid or the femoral arteries.
- 4) Drainage must be taken. The ideal avenues for drainage are either the internal jugular vein on the right side, or the superior sagittal sinus. If you choose the superior sagittal sinus, use a small drill bit to access the site. This will force the fluid into the cranial cavity to increase preservation to the area. After embalming, you can insert added fluid into the cavity, and seal with a trocar button.
- 5) As you embalm, the drainage will look similar to a liquid red sawdust. This is a forced hemolysis upon contact with the embalming fluid and is normal.
- 6) Prior to injecting the GreenMBalm™ fluid, application of the Green Solutions pre-injection fluid will break up clots and condition the vessels for embalming. Application is 16 oz/1 gallon of total solution with water (0.5 Kilograms/ 3.785 Liters of total solution with water).
- 7) For injection, use 2.5 gallons (9.46353 Liters) of a 1:1 dilution of fluid with water for every 50 lb. (22.6796 Kg) of body weight. This is a critical dilution standard. If the fluid is too strong, you will face issues with lipid solvency, and if it is too weak, you will lessen the preservative abilities of the fluid.

- 8) When many anatomical embalmers inject with standard solution, they will use a high pressure and rate of flow to force the fluid through. This is not needed with GreenMBalm™. Begin with a low pressure and rate of flow and increase according to case analysis and effect of the body. Giving a starting point for pressure and rate of flow is not possible due to the variations with different machine calibrations.
- 9) It is advisable to perform an intestinal cleanse with the donors after embalming, to remove as much solid waste as possible prior to dissection. The water hose can be inserted into the anus, with a low-pressure flow of water to cleanse the intestinal tract.

Signs of Preservation

With standard anatomical fluid, you see the typical signs of preservation, such as the firming and bleaching of tissues. With GreenMBalm™, the signs will be slightly different.

- 1) Rather than looking for the firmness of tissues, you will look for the fullness of tissues. A good comparison would be an orange and a stress ball. With standard anatomical fluid, the skin will feel like an orange, which is firm and rough. With GreenMBalm, the tissue will feel “full”, but not exactly firm, similar to what a stress ball filled with sand would feel like.
- 2) As the fluid diffuses into the tissues, you may see a few white spots start to surface on the skin. This is normal, and the white spots will fade as the donor cures for use, and diffusion is complete. It is also advisable to massage the body during the embalming process to assist in diffusion of the fluid.
- 3) Curation time for a standard embalming donor can typically be around 1-3 months, but GreenMBalm™ can cure from 1 week, to 6 months depending on the needs of the program. The longer the donor cures, the more solid the tissue will feel. There is no problem from a preservation standpoint in using a shorter curation time.
- 4) When you begin dissection of the donor, the tissues will be moister than a formaldehyde donor. This is typical, and not a cause for concern. The tissues (especially vasculature) will be softer and more pliable, with more natural coloration. This is not a sign of poor preservation, just the difference between GreenMBalm™ and standard anatomical fluids.

Maintaining the Donors

There is a significant difference between maintaining a formaldehyde donor and maintaining a GreenMBalm™ donor. Some of the typical maintenance methods used for

formaldehyde donors can damage GreenMBalm™ donors, so it is important to follow protocol.

- 1) Refrigeration of the donors is not needed, and unless your lab environment is excessively warm, or has a large amount of natural light exposure, is not recommended. If you do use refrigeration, do not consistently move the donors in and out of the cooler. The temperature changes, refrigeration vent contamination, as well as the moisture changes can cause drying and mold concerns.
- 2) Best practice is to cover the hands, feet, and head with plastic sheeting or bags that are secured to the body until these areas are ready for dissection.
- 3) Do not shroud GreenMBalm™ donors. Using towels can dehydrate the donors. Store donors in a body bag only.
- 4) If you face dehydration for any reason, submersion of the donor in a 1:3 dilution with water can reconstitute the tissues if it is addressed prior to the tissues becoming hard.
- 5) Do not fully drain excess fluid from the bag. Leaving a small amount is good for the donor and will not cause an issue with off-gassing like formaldehyde does.
- 6) As said previously, natural color, pliability, and moisture of tissues is normal.
- 7) There is no need to use a wetting solution with these donors. If needed, you may use GreenMBalm™ fluid in a 1:3 dilution with water if you are concerned about the tissues becoming too dry.
- 8) Always close the body bag when the donor is not being used.
- 9) Avoid substantial amounts of airflow over the body. This can be necessary with formaldehyde donors but can dry GreenMBalm™ donors. The airflow is used to control off-gassing, which is not an issue with GreenMBalm™ donors.
- 10) Ensure that users change gloves between donors just as they would with a patient, to control cross contamination. Always practice universal precautions.

Any technical questions can be sent to Shawna Rodabaugh via email at rodabaughllc@gmail.com (direct account) or beerodabaughllc@gmail.com (assistant account). Please copy larry@gogreensolutionsgroup.com on any correspondence.

If you need a more immediate response, call, or text 248-259-3352. If I don't answer immediately, you will receive a return call within an hour.