

Embalming Resources

A Guide to Organ & Tissue Donation for Funeral Directors

INTRODUCTION

The availability of organs and tissue for transplantation provides a source of life for ill, injured and dying Americans. Every year, tens of thousands of people are treated for life-threatening conditions with the gift of donated organs. Hundreds of thousands more benefit from healing and function-restoring transplants of donated tissues.

Donation and transplantation are processes involving many professionals, and no one is more important to this process than the funeral director/embalmer. You are the individuals who help the families of donors through their most painful period of grieving, and your involvement is essential to make the donation experience a positive one for family members and friends. The positive attitude you convey about donation will impact a family's feelings about their decision to donate.

We understand that funeral service professionals are affected by changes in medical practice and the mechanisms of death. Rapid developments in medical technology, high-speed accidental deaths, and organ and tissue donation all impact your services. Medication s, hydration, transfusions, surgical intervention and prolonged hospitalization can cause difficulties in embalming and funeral planning.

Organ and tissue donation present its own special challenges to embalming and preservation. These difficulties may necessitate some changes in funeral service protocols and modifications of embalming techniques that enable you to provide the services your clients want, including open casket viewing.

Every effort will be made in the procurement process to minimize additional procedures on the part of the embalmer and to preserve as much of the circulation and natural appearance of the body as possible. In detailing procedures, we have provided an overview of the donation process as well as specific treatment information for the embalmer. Embalming techniques included here represent generally accepted procedures but should not be regarded as absolute.

Recognizing the integral role of the funeral professional in the donation process, it is our desire to support you in your efforts to serve the donor families.

HELPING THE DONOR FAMILY

Donation is a humanitarian gift. It also provides the families of donors with the comfort of knowing that their loved ones have contributed so much to the lives of others in need. With the

support of caring funeral service and health care professionals, families can gain enormously from the consolation that donation provides.

When the entire donation process, including funeral arrangements and services, is handled with care and sensitivity, donor families can achieve important immediate and long-term benefits.

For virtually all donor families, donation affirms the fundamental humanity and generosity of their loved ones. In many cases, particularly the deaths of children and young people, donation gives parents and family members the comfort of knowing that some good has resulted from their tragic and seemingly pointless loss.

Organ and tissue procurement organizations make every effort to fully inform families about the donation process before it takes place, and to follow up with post-donation information about results of their gifts.

As a care-giving professional, the funeral director can provide critical support to donor families by providing information to help families with their decisions and by respecting the family's donation decision and their confidentiality. Although donation could affect the appearance of the body to some degree (depending on the nature and extent of the donation), families should be assured that the body has been reconstructed as completely as possible, and that donation itself should not interfere with plans for open casket services. Questions about scheduling of visitation and services will also be discussed and need to take the donation process into account. By understanding the donation process and maintaining communication with procurement agencies, funeral service professionals can help clients resolve their concerns and affirm their decision to donate.

Many recovery agencies also provide support services for donor families or can help families contact community-based services - grief counseling, support groups, education programs, etc. Funeral directors can assist families by encouraging them to utilize the resources available through the procurement organizations.

RELIGIOUS ATTITUDES TO DONATION

Religious beliefs are a primary concern for many families as they consider donation and after they give consent. Most major religions support donation, and it is generally held that donation for the benefit of others is a demonstration of faith and love for one's fellow man. If questions arise, you may wish to refer your clients to their own clergy.

BEST PRACTICES FOR ORGAN & TISSUE DONATION

In order to facilitate the organ/tissue donation process and accommodate the specific requirements of a funeral service and burial, the American Association of Tissue Banks (MTB) [hereafter referred to as "recovery agency"] and the National Funeral Directors Association (NFDA) have adopted the following " Best Practices." Mutual support and recognition of the roles each organization plays in the donation process is imperative in order for any of these "Best Practices" to succeed. In achieving the goals outlined in these "Best Practices," we not only strengthen our individual organizations, but we form together a strong cord that will better serve the families that we mutually share and, ultimately, each recipient in the transplant communities.

Support

The NFDA will publicly support and encourage its members to support the concept of donation. The funeral director should respect the family's wishes to donate and use his/her relationship with the donor family to facilitate the donation recovery process. If the funeral director takes exception to a specific donation, he/she should communicate his/her concerns to the tissue bank/OPO before expressing them to the donor family. Ideally, the funeral director will view donation as an integral part of the donor family's efforts to deal with the loss, and as an aid in the progression of the grieving process. All recovery agency members have an obligation to be cognizant of the manner in which donation and its effects on the donor body are discussed with families. The recovery agency should refrain from telling families that absolutely no change to the donor's appearance is guaranteed. The recovery agency should also be aware of the timing of the donation process and its effect on the funeral service itself.

USES FOR DONATED ORGANS & TISSUES

Most people are familiar with the dramatic advances made in organ transplantation since the 1960s. Less publicized, but equally impressive, are the medical uses for transplanted tissues. The first transplants recorded in modern times were skin grafts in the mid-19th century. Early tissue banks were initially associated with the U.S. military, or with orthopedic departments at major university hospitals. The early 1980s ushered in the concept of free-standing tissue banks.

Uses for Donated Organs

Heart - Orthotopic heart transplant; heterotopic heart transplant; heart/lung transplant; aortic valve replacement; pulmonary valve replacement; research

Liver - Orthotopic liver transplant; heterotopic liver transplant; research

Lung - Single and double lung transplant; heart/lung transplant; research

Kidney - Renal transplant; research

Pancreas - Pancreas transplant; islet cell transplant; research

Small Bowel - Small bowel transplant; research

Viscera- Transvisceral transplant; research (liver, stomach, small and large intestine, etc.)

SOURCES & APPLICATIONS OF DONATED TISSUE

Eye Tissue

Eye

Bone Tissue

Humerus

Femur

Tibia

Fibula

Iliac

Acetabulum

Rib

Radius/Ulna

Cardiovascular Tissue

Heart Valves

Saphenous Vein

Thoracic Aorta

Connective Tissue

Patellar Tendon

Achilles Tendon

Cartilage

Fascia Lata

Rotator Cuff

Other Tissues

Nerve

Pericardium

Skin

RECOVERY & EMBALMING

Long Bone and Connective Tissue Recovery and Embalming

Long bone recovery is the most dramatic of all tissue recovery. It involves a great amount of time, not only for the procurement, but for the treatment by the embalmer. When the remains are received by the funeral home, the long incisions on the arms, shoulders, thighs and lower legs are sutured. There may be strings or plastic "tags" protruding from the incisions marking the major arteries of the extremities, and perhaps any artery severed during the recovery process. The embalmer may encounter some leakage from the incision sites when he initially receives the body from the hospital. The body has form because the bones have been replaced with prostheses by the recovery team at the hospital. The extent of the donation and tissue recovery will influence the embalmer's plan as he performs his pre-embalming assessment. If there has been an autopsy, or if other visceral organs have been removed for transplantation, regional injection may well be necessary. If there has been no autopsy and no other organs have been donated, standard embalming injection sites can be used. Consider using the tagged arteries as readily accessible injection sites.

Prior to arterial injection, open all incisions and remove the prostheses to assess the extent of tissue damage and vascular disruption. Drain any excess body fluids encountered. Pack all exposed tissue with phenol cauterant soaked cotton packs. Allow these packs to work on the tissue during the embalming process. Because of the postmortem delay and the potential for significant circulatory disruption, a higher than normal index embalming fluid in a more concentrated solution should be used, and pre-injection solutions should be avoided.

Dye may be added to the arterial solution to help monitor the degree of fluid distribution. Arterially inject as though it was an autopsied case, clamping leaking vessels to help build intravascular pressure. Utilize additional arteries distally as necessary to achieve maximum distribution, followed by supplemental hypodermic injection as indicated. Tissue donors will undoubtedly require hypo- injection from the ankles distally in most every case.

Upon completion of the embalming process, remove the cauterant packs and assess the degree of tissue fixation. Additional localized hypodermic injection may be necessary at this time. Apply hardening compound/drying agents and sealants as indicated. Replace the prostheses and tightly suture all incisions. You will want to cover all incisions with cotton and incision seal to insure a watertight closure.

Additional drying compound in the plastic garments may be beneficial, both as added insurance against leakage, and to counteract the condensation that normally occurs inside plastic garments.

Visceral Organ Removal and Embalming

Bodies in which one or more organs have been removed from the thoracic or abdominal cavity must be considered separately, in light of several factors:

1. Heparin has been run through the vascular system. This decreases postmortem clotting.
2. There has been a delay between death and embalming. Consequently, a more concentrated, higher index arterial solution is required.
3. Circulation may be interrupted, requiring multi-point injection with drainage at the injection site using moderate to strong arterial solutions. Tracer dyes may be needed to determine the extent of fluid distribution. You may follow autopsy protocols utilizing internal arteries with which you are familiar.

Heart/Lung Removal and Embalming

An embalmer may use the following protocol in embalming a body following heart-lung removal:

1. Inject, from inside the thoracic cavity, the right and left subclavian arteries to preserve the arms and shoulders.
2. Inject the right and left common carotid arteries to preserve the head.
3. Inject down the abdominal aorta to preserve the abdominal viscera, trunk walls and legs OR inject down the right femoral artery distally to embalm the right leg and then inject superiorly toward the trunk. Clamp off the abdominal aorta in the thoracic cavity. This procedure embalms both legs, abdominal contents and trunk walls.
4. If the walls of the thoracic cavity require additional fluid; use hypodermic injection.
5. Fill the thoracic cavity with hardening compound. The walls may also be painted with autopsy gel.
6. Be sure that all cavities have been injected, re-aspirated, treated and readied for closure.

Eye Enucleation and Embalming

One of the tissues most commonly transplanted today is the human cornea. Approximately 40,000 individuals undergo corneal transplantation every year. The need for corneal tissue, like

all other organs and tissues, continues to grow. Although the cornea itself can be removed from the organ donor, the entire eye is usually enucleated.

The first step in excising the eye is separation of the conjunctiva from the eyeball. Next, the four rectus muscles and the two oblique muscles that control eyeball movement are cut. The final step in removing the eyeball from the orbital cavity is to cut the optic nerve. This procedure can be carried out under nonsterile conditions and is one of the few procedures performed in this manner. The eye is then placed in a container, refrigerated and immediately delivered to an eye bank.

Swelling is the most common problem encountered in treatment of the enucleated eye. In addition, bruising may be present, and there is always the possibility of small lacerations. To help control swelling of the eyelids during the embalming, and to prevent leakage following embalming, the following procedures are recommended:

1. KEEP THE HEAD ELEVATED AT ALL TIMES DURING TRANSPORT TO THE FUNERAL HOME AND DURING THE EMBALMING PROCESS. The elevated head minimizes swelling, leakage and bruising of the eye tissues from blood gravitation into the orbital cavity.
2. Remove all packing from the orbital cavities.
3. Saturate pieces of cotton with phenol cauterant or autopsy gel and pack the orbital cavity.
4. Fill the orbital cavity with enough cotton to recreate the normal appearance of the closed eye.
5. Apply liberal amounts of massage cream to the eye area.
6. Avoid excessive manipulation of the lids prior to and during embalming.
7. Avoid lanolin containing or humectant type fluids.
8. Use restricted cervical injection, with the previously mentioned fluids, via the carotid arteries to control swelling.
9. After arterial injection, remove the cauterant packs and dry out the orbit.
10. Use a small trocar button or mortician's putty to seal the orbit.
11. Insert cotton ball or mortician's putty to reconstruct the contour of the eye.
12. Adjust the height of the eyes as appropriate with additional cotton or putty.
13. Use eye cap as indicated and approximate the lids with gentle stretching and adhesive cream to maintain closure.

Cornea Removal and Embalming

When only the cornea has been removed, the preparation work is greatly reduced. The body can be embalmed using whatever injection technique and arterial solution strength the embalmer feels necessary. The eyes should always be set prior to the arterial injection, even if this is a temporary procedure.

As the front of the eye is opened when the cornea is removed, the embalmer may aspirate the fluids from the eye to prevent leakage, if necessary. A hypodermic needle can be used to aspirate these fluids through the opening created by the removed cornea. The eye is then filled with mortician's putty. An eye cap can then be placed over the eyeball to recreate the natural convex curvature of the eye. The height of the eye can be adjusted using additional putty or cotton as needed.

Skin Recovery and Embalming

The entire skin recovery site is shaved and disinfected. Generally, skin is recovered from the nipple line area to mid-thigh on both the anterior and posterior sides of the body. An instrument called a "dermatome" is used to remove very thin layers of skin approximately 10-20/1000 of an inch thick and approximately 4 inches wide. These layers are about as thick as layers of skin overlying a blister.

The recovery of skin from the dead human body for transplantation, or for temporary dressing to speed healing, is not as dramatic as may be inferred. The skin removed is "tissue paper" in thickness and does not significantly alter the appearance of the body. Skin recovery presents two major problems for the embalmer:

(1) drying of the areas from which the skin has been removed and (2) control of leakage from the areas where the skin has been removed. The body should be unwrapped, and the surface sprayed with a disinfectant. Next, the body should be bathed with a liquid soap and water. This solution removes the prep material that was applied to the recovery sites from which the skin was removed. In addition, bathing removes fluid or blood that may have seeped through the regions where the skin was removed.

Before arterial injection is initiated, several techniques can be utilized to treat the raw skin recovered areas, depending on the chemicals available:

1. Paint the raw tissue with a phenol cauterant. This chemical works very rapidly to dry tissue. The area should be cauterized in 20 minutes. It can be painted on or applied in surface packs and covered with cellophane or plastic to enhance penetration and decrease the irritating fumes.
2. Cavity packs can be applied to the raw skin areas. Undiluted cavity fluid can be difficult to work with because the embalmer is exposed to hazardous fumes. To minimize chemical fumes, simply cover the treated area with plastic. (Check OSHA regulations of formaldehyde use.) The packs should remain in place several hours.

3. Autopsy gel can be painted over the raw skin or applied on a cotton surface pack and, again, covered with plastic. The gel should be given time to penetrate.

Body conditions dictate the fluid strength; however, a degree of body tissue dehydration is desirable in order to prevent leakage from skin-recovered surfaces.

Consequently, a stronger-than-average solution is recommended. A special-purpose high index fluid can be utilized along with a suitable co-injection chemical. Lanolin as well as humectant co-injections should be avoided. If restricted cervical injection is used, a separate, milder solution may be injected to embalm the head.

During injection, some of the fluid may seep from the skin recovery sites. This enhances the preservation and drying of the tissue.

In all the preceding treatments, the tissues should be dried after the surface applications have been removed. A hair dryer can be used to speed the drying process.

Drying helps to prevent further leakage. The body should also be elevated on slats across the embalming table to allow air to circulate around the entire body. Plastic coveralls and stockings should be placed on the body, and a drying powder/compound sprinkled inside. The plastic garments serve as added protection against leakage.