



After the Gift

A guide to organ & tissue donation for funeral directors

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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. Medications, hydration, transfusions, surgical intervention and prolonged hospitalization can cause difficulties in embalming and funeral planning.

Organ and tissue donation presents 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.

This manual is intended to assist you with the management of donors, services for donor families, and your interactions with hospitals, organ and tissue procurement organizations and other related agencies. 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. This guide is one of many resources and supports we wish to offer you.

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.

By state and federal law, hospitals must report all deaths to their local organ procurement organization (OPO) who will then determine if a person may be eligible to donate organs and/or tissues. In those cases where a deceased person may be a potential donor, donation options will be presented to the family. Donation is the legal right of every American. In some instances, donation requires the consent of the donor's next-of-kin, while some states provide for first person consent through a donor registry. In either case, the families of the deceased are very much involved in the donation process.

Recently, a number of studies have been conducted regarding the attitudes of families toward organ and tissue donation. These studies clearly demonstrate that 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 gift. While the names of organ and tissue recipients are not revealed, procurement agencies will provide information about organ recipients (age, career field, family, health status, etc.) and about the disposition of donated tissues.

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.

In surveys and focus group studies, donor families have repeatedly stated that they want, need and can handle full information about the donation both before and after they give consent. Answering their questions directly and completely should be an integral part of the services provided by their health care professionals, procurement agencies and funeral directors. 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. Many people, however, do not know the position their faith takes regarding donation. If questions arise, you may wish to refer your clients to their own clergy. You may also want to provide information materials about donation (available from your local procurement agency or hospital) to clients during pre-need planning. This review of religious attitudes and teachings may help you as you work with your clients and their clergy.

THE FOLLOWING INFORMATION IS BASED ON MATERIAL PREPARED BY THE AMERICAN COUNCIL ON TRANSPLANTATION.

AME & Zion AME (African Methodist Episcopal) – Organ and tissue donation is viewed as an act of neighborly love and charity by these denominations. They encourage all members to support donation as a way of helping others.

Amish – The Amish consent to donation if they know it is for the health and welfare of the transplant recipient. They may be reluctant to consent if the transplant outcome is known to be questionable.

Assembly of God – The Church has no official policy regarding donation and leaves the decision to donate up to the individual. Organ and tissue donation is highly supported by the denomination.

Baptist – The Church leaves the decision up to the individual and donation is supported as an act of charity.

Buddhism – Buddhists believe that organ donation is a matter that should be left to the individual's conscience. There is no written resolution on the issue. Rev. Gyomay Masao, president and founder of the Buddhist Temple of Chicago, says, "We honor those people who donate their bodies and organs to the advancement of medical science and to saving lives."

Catholicism – Roman Catholics view donation as an act of charity, fraternal love and self sacrifice. Transplants are ethically and morally acceptable to the Vatican.

The Church of Christ Scientist – Christian Scientists do not take a specific position on transplants or donation. Christian Scientists normally rely on spiritual rather than medical means of healing. The question of donation is left up to the individual church member.

Episcopal – The Episcopal Church passed a resolution in 1982 that recognized the life-giving benefits of organ, blood and tissue donation. All Christians are encouraged to become donors "as part of their ministry to others in the name of Christ, who gave his life in its fullness."

Greek Orthodox – According to Rev. Dr. Milton Efthimiou, a spokesman for the Greek Orthodox Church of North and South America, "We are not against organ donation provided the organs in question are used for the purpose intended—and not for research or experimentation."

Gypsies – Gypsies are, on the whole, against donation. Although they have no formal resolution, their opposition is associated with their belief about the after-life. Gypsies believe that for one year after a person dies, the soul retraces its steps. All of the body parts must be intact because the soul maintains a physical shape.

Hinduism – Hindus are not prohibited by law from donating, according to the Hindu Temple Society of North America. The act is an individual decision.

Independent Conservative Evangelical – Generally, Evangelists have no opposition to organ and tissue donation. Each church is autonomous and leaves the decision up to the individual.

Islam – In 1983, the Moslem Religious Council initially rejected organ donation by followers of Islam, but it has revised its position, provided donors consent in writing before their death. The organs of Moslem donors must be transplanted immediately and not stored in organ banks.

Jehovah's Witnesses – According to the Watch Tower Society, the legal corporation for the religion, Jehovah's Witnesses do not encourage organ donation but believe it is a matter best left to an individual's conscience. All organs and tissues, however, must be completely drained of blood before transplantation.

Judaism – Judaism teaches that saving a life takes precedence over maintaining the sanctity of the human body. A direct transplant is preferred. According to Rabbi Moses Tendler, PhD, Professor of Biology, Yeshiva University, New York, and an expert on medical ethics, "If one is in a position to donate an organ to save another's life, it's obligatory to do so, even if the donor never knows who the beneficiary is." All segments of the Jewish religion including Orthodox Jews support donation, although there may be some reluctance among Hasidic Jews.

Lutheran – Lutherans passed a resolution in 1984 stating that donation contributes to the well-being of humanity and can be "an expression of sacrificial love for a neighbor in need." They call on "members to consider donating...and to make necessary family and legal arrangements, including the use of a signed donor card."

Mennonite – There is no prohibition against donation and transplantation in the Mennonite faith. Church officials state such decisions are individual ones.

Mormons – The Church of Jesus Christ of the Latter Day Saints issued a policy statement in 1974 which stated that the "question of whether one should will bodily organs to be used as transplants or for research after death must be answered from deep within the conscience of the individual involved."

Presbyterian – Presbyterians encourage and support donation. They respect a person's right to make decisions regarding their own body.

Protestantism – Protestants generally encourage and endorse organ donation. The Protestant faith respects an individual's conscience and a person's right to make decisions regarding his or her own body. Lutheran Rev. James W. Rassbach of the Board of Communication Services, Missouri-Synod, says, "We accept and believe that our Lord Jesus Christ came to give life and to give it in abundance. Organ donations enable more abundant life, alleviate pain and suffering, and are an expression of love in times of tragedy."

Quakers – Officials for the Quaker faith do not oppose organ donation and transplantation. The decision, they say, is an individual one.

Seventh-Day Adventist – Donation and transplantation are strongly encouraged.

Unitarian Universalist – Organ and tissue donation are widely supported by Unitarian Universalists. They view it as an act of love and selfless giving.

United Methodist – The Church issued a policy statement that the "United Methodist Church recognizes the life-giving benefits of organ and tissue donation and thereby encourages all Christians to become organ and tissue donors"...as a part of their ministry to others in the name of Christ, who gave His life in its fullness.



LEGAL DETERMINATION OF DEATH & THE CONSENT PROCESS

In law, there are three primary areas governing donation: the definition, documentation and pronouncement of death; consent to donation; and consent from medical examiner or coroner.

Diagnostic criteria for death, based on cessation of neurological functioning (brain death) and cardiopulmonary functioning, are enumerated in state law based on principles approved by the American Medical Association and the American Bar Association. As with all patients, the determination of the death of a potential organ and/or tissue donor is the legal responsibility of the attending physician, medical examiner or coroner.

Organ donation is possible only when the patient has been diagnosed and pronounced brain dead. This will always occur in a hospital where artificial cardiopulmonary support is available. Tissue donation can take place when a donor has suffered brain death (in conjunction with or independent of organ donation) and also when cardiopulmonary death has occurred. This fact substantially enlarges the pool of potential tissue donors to include people who have died in a variety of circumstances and locations including many situations when a medical examiner or coroner has jurisdiction.

All states have enacted the Uniform Anatomical Gift Act (UAGA) which allows all persons aged 18 or older to donate organs and tissues after death for transplantation, research and educational purposes. Signing a Uniform Donor Card indicates a person's wishes regarding donation, and registering with a state's donor registry, where available, is recognized by state law as legal consent. In a few states, instructions regarding donation can also be included in legal Living Will documents.

Where necessary, however, consent must be obtained from the potential donor's legal next-of-kin. In order of priority, the Uniform Anatomical Gift Act lists next-of-kin as spouse, adult son or daughter, either parent, adult sibling, guardian at time of death, and any other person authorized or under obligation to dispose of the body. In cases where none of these are present, consent may be sought from the courts.

In cases when a medical examiner or coroner has jurisdiction, unexplained deaths or deaths by other than natural causes, permission for organ and tissue recovery must be obtained from the medical examiner or coroner.

In all cases, the legal consent forms become part of the donor's permanent record. Postmortem donation of organs and tissues can proceed only after next-of-kin consent and medical examiner/coroner's consent, if required, have been properly completed and witnessed as necessary.

RELATIONS WITH HOSPITALS & PROCUREMENT ORGANIZATIONS

The donation and transplantation process involves many people performing a wide variety of tasks within a short time frame. As funeral service professionals, you are key participants. Your needs and concerns should be considered.

When you receive the remains of an organ and/or tissue donor, you will have important logistical concerns as you deal with hospital personnel, procurement agencies and other authorities including medical examiners. It is important for your business and your clients that lines of communication are open and information is clear. Given the range of situations, it is impossible to lay down hard and fast rules that will work for every funeral director in every community.

Please, do not hesitate to ask questions of, or express concerns to your affiliated hospitals and recovery agencies. Remember, that donation is a complex process accomplished under strict time constraints, and as a participant in the process, your responsibility is to get all the information you need to provide your services efficiently.

Notification

Once you have been notified of the death of an individual, someone from the procurement agency should contact you to inform you that the individual will be an organ or tissue donor. In this initial call, you should be provided with information about the extent of the donation and the estimated time frame for the donation so you can discuss scheduling, preparation, visitation and services with the donor family.

In cases where death occurs outside a hospital or when a body is taken to the medical examiner or coroner for autopsy, your company may be engaged to transport the body to a hospital for the donation. You should get the full details of these transportation requirements in your first conversation with the procurement organization.

A representative of the procurement agency should contact you again when the donation is completed and provide full details about the donation surgery and reconstruction. It is a good idea to get the name of this representative and a number where he/she can be reached in case you need further discussion about the donation. You should also be notified by the hospital in time to arrange removal of the body.

Many procurement organizations, eye banks and tissue banks will place a follow-up call to you some time after the funeral to check on the restoration and any problems you may have encountered. You should be as specific as possible in this conversation because your information is important to improving the services of the agency, hospitals and others in the donation system.

Compensation

Reimbursement for services connected with a donation is a determination you must make. Many funeral homes do not make additional charges for the preparation work associated with a donation; others work with their local procurement organizations to cover costs within "fair and customary" financial guidelines. Expenses and any charges will naturally vary depending on the nature and extent of the donation (single or multiple donation, organs, tissue, etc.), condition of the body, and any transportation related specifically to the donation (for example, transporting the body from the medical examiner or site of the death to the hospital for donation surgery).

Donor families are not billed for any charges associated with the donation. The family is responsible for all normal funeral charges as well as the costs of medical treatment for the donor. Procurement organizations work very hard to assure that no charges associated with the donation appear on any bills to the family. The costs of the donation are passed on to the transplant patient and his insurance company or other third party payer including Medicare and Medicaid.



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 (AATB) and the Association of Organ Procurement Organizations (AOPO) [hereafter referred to as “recovery agency(ies)”] 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.

Each organization will promote and educate its members, state associations and others on its contents. This effort is essential if funeral directors, tissue banks and organ procurement organizations are to successfully meet the goals of the federal government’s initiative to increase organ and tissue donation throughout the United States.

1. NOTIFICATION

- a. The recovery agency(ies) should notify the funeral director handling the funeral arrangements for the donor family as soon as details of the anticipated recovery are known. This notification should follow the consent process for the donation. In the event that a funeral home is not known at the time of consent, this notification will take place as soon as the donor family has determined a funeral home.
- b. The recovery agency(ies) handling the donation should, at the time of the initial contact, notify the funeral director of the following:
 - I. The nature of the donation;
 - II. The geographic location of the donation recovery;
 - III. The anticipated timing of the donation recovery;

- IV. A contact person or number for the funeral director to call for updates, questions or concerns; and
- V. Next of kin information.
- c. Further, the recovery agency(ies) should contact the funeral director as the situation develops or changes, especially as it relates to the pick-up time and/or location of the donor body. This is especially important when a donor body is to be transported to a medical examiner/coroner for tissue recovery, autopsy or other purpose.
- d. The recovery agency’s representative will ensure that the medical examiner/coroner has the name and phone number of the funeral director/home (if known), and that the funeral director should be notified when the body is ready for pick-up.
- e. Finally, the recovery agency(ies) should contact the funeral director/home when the body is ready for pick-up.

2. DISCLOSURE

- a. Once a donor has been medically qualified, the recovery agency’s representative who interviews the donor family should inform them that there are many factors that may impact the timing of the funeral, including the timing of the recovery procedure and/or autopsy that need to be completed.
- b. The consent process discussion or the consent form where applicable, should also include an explanation regarding the impact that the donation process may have on burial arrangements and on the appearance of the body. The family will be encouraged to discuss any particular needs in relation to the timing of the funeral, clothing preferences and other related issues with their funeral director.
- c. Any consent for anatomical gift form signed by a family should be specific in describing the organs/tissues/eyes to be recovered.

3. RECOVERY PROCEDURES

To facilitate the embalming and preparation process, the following procedures are recommended:

- a. All involved major arteries should be ligated to ensure the integrity of the vascular system;
- b. Replace all recovered bones with prostheses;
- c. Contact the funeral director to determine the preferred type of incision closure prior to the completion of the recovery;
- d. Consider using a U or Y chest incision rather than a midline opening for the chest;
- e. Elevate the head with a head block especially with eye recovery or a prolonged recovery process; and
- f. No facial bone recovery if a viewing (private or public) is planned.

4. REIMBURSEMENT

Every recovery agency should establish a policy regarding compensation of funeral directors if additional time and materials are required to prepare a donor body for embalming and/or viewing. The funeral home should not assess the donor family any additional charges resulting from the donation.

5. COMMUNICATION/EDUCATION

The most important and essential aspect of a successful relationship between funeral directors and recovery agencies is communication and a better understanding by each of the operational aspects of the other. Therefore, to ensure and facilitate successful organ and tissue donation and the funeral and burial processes for the families we all serve, it is imperative that funeral directors and recovery agencies reach out to each other and establish those lines of communication. By doing so, the issues and concerns of each can be addressed and resolved. This outreach should also include actual visits by each to the other’s place of business. These visits may promote a greater appreciation for each entity’s role and contribute to a strong, lasting relationship.

6. 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(ies) should refrain from telling families that absolutely no change to the donor’s appearance is guaranteed. The recovery agency(ies) 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. Over the last ten years, we have seen more organ procurement organizations becoming involved in tissue recovery, and currently, over 80% of OPOs recover tissue in addition to organs.

In 2002, almost 25,000 successful organ transplant surgeries were performed in the United States. More than 700,000 donated tissue allografts are distributed for transplantation annually. The most frequent transplant procedures performed today use donated bone, tendons and ligaments. Bone and soft tissue transplants provide healing, repair and restoration of physical function for a rapidly expanding variety of conditions, often saving patients from the need for amputation of limbs. Human skin grafts promote faster, safer healing for burn victims. Some 46,000 Americans receive corneal transplants each year restoring vision.

The challenge is to encourage more Americans to make the gift of donation. While the vast majority of Americans approve of donation, the need for donated organs and tissues far exceeds the supply. The United Network for Organ Sharing (UNOS) reports that there are 83,000 people on its national waiting list. Literally hundreds of thousands of tissue transplants are performed each year with many more patients waiting.

The following list of uses for donated organs and tissue illustrates the extent to which donation can save and enhance lives for people in need:

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

Donor Tissue	Transplanted Tissue	Typical Applications	Benefits to Recipients
E Y E T I S S U E			
Eye	Sclera	Repair eyelid, reinforce wall of eye.	Prevents blindness, restores vision.
	Cornea	Replace diseased or damaged cornea.	Prevents blindness, restores vision.
B O N E T I S S U E			
Humerus	Whole Proximal, Distal, Shaft	Reconstruction related to trauma, tumors, degenerative diseases and fractures.	Prevents amputation; accelerates, promotes and allows healing.
	Humeral Head	Total hip revision.	Restores mobility.
Femur	Whole, Proximal, Distal, Shaft	Reconstruction related to trauma, tumors, degenerative diseases and fractures.	Prevents amputation; accelerates, promotes and allows healing.
	Femoral Head	Reconstruction of damaged acetabulum, supplement for small defects.	Restores mobility.
	Dowel, PLIF	Spinal fusion.	Prevents collapse of bone, reduces pain, reduces chance of nerve damage.
Tibia	Cancellous	Filling defects, augments prosthetic device implant.	Accelerates, promotes and allows healing.
	Whole, Proximal, Distal, Shaft	Reconstruction related to trauma, tumors, degenerative diseases and fractures.	Prevents amputation; accelerates, promotes and allows healing.
Fibula	Cortical Strut	Augments large grafts and prosthetic implants.	Restores mobility, promotes healing.
	Fibular Shaft	Repair of traumatic bone loss.	Restores mobility, promotes healing.
Iliac	Iliac Crest Wedge, Ilium Strip	Spinal fusion.	Prevents further collapse of bone, reduces pain, reduces chance of nerve damage.
	Cortical Cancellous	Filling defects, augments prosthetic device implant.	Accelerates, promotes and allows healing.
Acetabulum	Acetabulum	Acetabular reconstruction.	Restores mobility.
Rib	Rib	Mandible repair. Augment as a strut graft on long bones.	Restores normal facial appearance. Adds structural strength during healing.
Radius/Ulna	Cervical Spacers	Cervical spinal fusion.	Preserves intervertebral space during healing.

SOURCES & APPLICATIONS OF DONATED TISSUE

Donor Tissue	Transplanted Tissue	Typical Applications	Benefits to Recipients
CARDIOVASCULAR TISSUES			
Heart Valves	Aortic & Pulmonary Heart Valve	Replacement for damaged heart valves.	No long-term anticoagulant therapy. Almost no rejection. Allows children to grow into graft (no second surgery for size).
Saphenous Vein	Saphenous Vein	CABG, below knee vascularization.	Vascularization, prevents amputation.
Thoracic Aorta	Thoracic Aorta	Aortic patch grafts.	Superior to synthetic materials.
CONNECTIVE TISSUES			
Patellar Tendon	Patellar Tendon	Replace ACL, PCL.	Returns mobility, restores independence in activities of daily living.
Achilles Tendon	Achilles Tendon	Replace PCL, used as rotator cuff, replace Achilles tendon.	Restores mobility, restores independence in activities of daily living.
Cartilage	Cartilage	Repair damaged cartilage. Repair congenital and traumatic facial deformity.	Reduces joint pain. Restores normal facial appearance.
Fascia Lata	Fascia Lata	Used as tendon to repair injury. Used as suspension for bladder and uterus.	Returns mobility, restores independence in activities of daily living.
Rotator Cuff	Rotator Cuff	Shoulder repair.	Independence in ADLs, mobility and decreases joint pain, i.e., hip, knee, joint, wrist.
OTHER TISSUES			
Nerve	Femoral, Sural Nerve	Neurosurgery in wrist.	Restores feeling and function of the hand.
Pericardium	Pericardium	Neurosurgery (as alternative to using dura mater).	Protective covering replacement.
Skin	Skin	Grafts for burn victims.	Promotes healing, natural barrier to infection.

These Examples Are Not Meant To Be All-Inclusive

RECOVERY & EMBALMING

The following guide to specific organ and tissue removal procedures and treatments by the embalmer was prepared with the assistance of funeral directors, embalmers, mortuary scientists and organ and tissue procurement professionals. We gratefully acknowledge the participation of:

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This section addresses recovery and treatment of:

- Long Bone
- Visceral Organ and Heart/Lung
- Eye Enucleation
- Cornea
- Skin



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 hypodermic 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 water tight 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 coinjection chemical. Lanolin as well as humectant coinjections 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.



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