BOARD OF DIRECTORS

• Mark Bolander, M.D.
  Mayo Clinic

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  UCLA Medical Center

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  LifeSource

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  (Vice-Chairman)

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  Carolina Donor Services

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  University of Arkansas for Medical Sciences

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  Vanderbilt University Medical Center

• Dan Spengler, M.D.
  Vanderbilt University Medical Center

• William Tomford, M.D.
  (Chairman)
  Massachusetts General Hospital

Eleven Orthopaedic Surgeons
from highly respected academic centers
MISSION STATEMENT

MTF IS A NON-PROFIT SERVICE ORGANIZATION DEDICATED TO PROVIDING QUALITY TISSUE THROUGH A COMMITMENT TO EXCELLENCE IN EDUCATION, RESEARCH, RECOVERY AND CARE FOR RECIPIENTS, DONORS AND THEIR FAMILIES.
MTF donor activity has grown substantially over time to nearly 7,000 recoveries in 2008.
MTF provided over 400,000 allografts and helped approximately 300,000 recipients in 2008.
CORPORATE CAMPUSES

185,000 SQUARE FEET OF OFFICES, LABORATORIES AND PROCESSING SPACE IN NEW JERSEY, PENNSYLVANIA AND CALIFORNIA
24-member process engineering staff
120 process technicians
16 Class 10 Clean Rooms
Dedicated Service

MTF maintains a team of highly-trained, dedicated Allograft Consultants across the country.
CORPORATE PARTNERS

- SYNTHES®
- ORTHOFIX
- ETHICON
  a Johnson & Johnson company
- Spineology

DENTSPLY TULSA DENTAL SPECIALTIES
RECEIVE THE GIFT
MTF RECOVERY NETWORK

MTF has recovery agreements in place with more than 35 Organ Procurement Organizations, Eye Banks and Tissue Banks.
The vast majority of MTF recovery agreements are:

**Right of 1st Refusal**
Donors, only when deferred by MTF, can be sent to a secondary processor.
ACADEMIC MEMBERS

Comprised of representatives from over 40 academic institutions

Primary Charter
Establish donor acceptance criteria
Approve all changes to donor criteria
Approve bylaws and changes to bylaws
Review major processing protocols
<table>
<thead>
<tr>
<th>Academic Members</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Albany Medical College</strong></td>
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<tr>
<td><strong>Baylor College of Medicine</strong></td>
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<tr>
<td><strong>Bowman Gray School of Medicine</strong></td>
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<tr>
<td><strong>Brooke Army Medical Center</strong></td>
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<tr>
<td><strong>Case Western Reserve University</strong></td>
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<tr>
<td><strong>The Cleveland Clinic Foundation</strong></td>
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<tr>
<td><strong>Duke University Medical Center</strong></td>
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<tr>
<td><strong>Henry Ford Health System</strong></td>
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<tr>
<td><strong>NYU Hospital for Joint Diseases Institute</strong></td>
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<tr>
<td><strong>Loma Linda University Medical Center</strong></td>
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<tr>
<td><strong>Louisiana State University Medical Center</strong></td>
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<tr>
<td><strong>Mayo Foundation</strong></td>
</tr>
<tr>
<td><strong>M.D. Anderson Cancer Center</strong></td>
</tr>
</tbody>
</table>
ACADEMIC MEMBERS

Medical College of Georgia
Medical College of Wisconsin
Medical University of South Carolina
Memorial Sloan-Kettering Cancer Center
Mount Sinai Medical Center
Ochsner Clinic Foundation

Ohio State University Medical Center
The Queens Medical Center
Stanford University Hospital
Tripler Army Medical Center
Tulane University School of Medicine
Academic Members

University of Arizona College of Medicine
University of Arkansas For Medical Sciences
University of California-Davis Health System
University of California-Los Angeles Medical Center
University of California-San Francisco
U.M.D. - New Jersey Medical Center
UMDNJ – Robert Wood Johnson Medical School
University of Connecticut
University of Minnesota
University of Mississippi Medical Center
DONOR SCREENING

Screening performed by highly qualified personnel
Highly trained RN screeners, on-call 24/7
4 Medical Directors, on-call 24/7
2 Infectious Disease Specialists
2 Pathologists
DONOR SCREENING

All donor referrals come through valid channels with appropriate systems of checks & balances

• Hospitals

OR

• Medical Examiner / Coroner’s Office

MTF does not accept direct referrals from Funeral Homes
MTF never accepts donors that have been rejected by other banks
MTF TESTING PROTOCOL

HIV
ANTI-HIV1-2
HIV NAT

HEPATITIS
HEP B SURFACE ANTIGEN
HEP B CORE ANTIBODY
HEP C ANTIBODY
HCV
NAT

BLOOD & TISSUE CULTURES
ANAEROBIC
AEROBIC

OTHER
SYPHILIS
HTLV1 & 2 ANTIBODY
DONOR CRITERIA

AGE CRITERIA

Male & Female Donors, 12-65 yrs of age, up to 66th birthday

Medical & Social History Evaluation

Must have a known cause of death
Numerous exclusions based upon comprehensive review of
Past medical history
Current medical status
DEFERRAL STATISTICS

We defer more donors than we accept.

60% of the donors referred to MTF are deferred for specific medical reasons.

Donors deferred by MTF are frequently recovered by other tissue banks.
POINTS OF DIFFERENTIATION

Illegal Drug Use
Cancer
Infection
Conditions affecting tissue quality
Infectious disease risk of cadaveric tissue donors who used non-injected illicit drugs

David Gocke, M.D. & Linda Silvay, R.N.
Cell & Tissue Banking, 2005

Results:
Donors with history of drug-use were more than twice as likely to be seropositive for one or more markers.

A review of >12,000 donors recovered assessed correlation between non-injection drug use and the presence of markers for: HIV-1, Hepatitis B, Hepatitis C, Syphilis, Human T Lymphocyte Virus Types I-II

MTF Criteria is more rigorous than many other U.S.A. tissue banks. MTF defers:

- donors with any history of I.V. or Heroin drug use
- donors with a history of crack cocaine, meth, etc. in the past twelve months
## Cancer Criteria

<table>
<thead>
<tr>
<th></th>
<th>MTF</th>
<th>Bank A</th>
<th>Bank B</th>
<th>Bank C</th>
<th>Bank D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Melanoma</strong></td>
<td>DEFER</td>
<td>Accept (if no reoccurrence in five years)</td>
<td>DEFER</td>
<td>Accept (if no reoccurrence in five years)</td>
<td>Accept (if no reoccurrence in five years)</td>
</tr>
<tr>
<td><strong>Cancer, Metastatic</strong></td>
<td>DEFER</td>
<td>DEFER</td>
<td>Accept (if no reoccurrence in five years)</td>
<td>DEFER</td>
<td>DEFER</td>
</tr>
<tr>
<td><strong>Cancer, Infiltrating</strong></td>
<td>DEFER</td>
<td>Accept (if no reoccurrence in five years)</td>
<td>Accept After MD review</td>
<td>Accept (3 yr. disease free, 5 yr BR/PR)</td>
<td>Accept (if no reoccurrence in five years)</td>
</tr>
<tr>
<td><strong>Cancer, Heme</strong></td>
<td>DEFER</td>
<td>DEFER</td>
<td>Accept (if no reoccurrence in five years)</td>
<td>DEFER</td>
<td>DEFER</td>
</tr>
<tr>
<td><strong>Cancer, Skin</strong></td>
<td></td>
<td>Accept BCC (if no reoccurrence in six months)</td>
<td>Accept</td>
<td>Accept SCC after incision</td>
<td>Accept</td>
</tr>
<tr>
<td><strong>Cancer, Brain</strong></td>
<td>Defer GBM, Others case by case</td>
<td>Defer GBM, Accept Grade 1 &amp; 2</td>
<td>Defer GBM, Accept if no shunt/surgery</td>
<td>Accept if no shunt/surgery</td>
<td>Accept (if no mets)</td>
</tr>
</tbody>
</table>

*Adapted from Trainor, et al, 2009 AATB public meeting*
MTF DEFERRAL EXAMPLES

INFECTION

BOWEL PERFORATION
PERITONITIS
ISCHEMIC BOWEL IF LESS THAN 6 HOURS FROM TIME OF DEATH
POSITIVE BLOOD CULTURE ON UNLESS ON ANTIBIOTICS FOR 48 HOURS
ACUTE RESPIRATORY DISTRESS SYNDROME
DEFERRAL EXAMPLES
Conditions Affecting Tissue Quality

Hemodialysis
Long term steroid use
“Inactive / burnt-out” RA
Osteoporosis
AN ANECDOTAL EXAMPLE

THIRTY-NINE (39) DONORS REJECTED BY MTF
THIRTY SIX (36) WERE ACCEPTED BY “TISSUE BANK X”
  16 DONORS > 70YRS OLD
  5 DONORS > 80YRS OLD
  15 DONORS WITH
    CANCER, UNKNOWN JAUNDICE, CHRONIC DIALYSIS, INFECTION,
    PNEUMONIA, HIGH STEROID USE, ETC.
THREE (3) DONORS ACCEPTED BY “TISSUE BANK Y”
  2 DONORS ON CHRONIC DIALYSIS
  1 DONOR WITH HISTORY OF CRACK COCAINE USE
**Tissue Bank Practices Regarding Donor Screening and Tissue Processing of Structural Allograft Bone**

R. Hart, M.D. and D. Jurgensmeier, B.S.

2008 AAOS Abstract

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**Key Points**

5 of 14 Accept donors up to age 85 or have NO upper age limit

7 of 14 Accept donors diagnosed with osteoporosis

2 of 13 Accept donors with history of chronic steroid use

**Conclusion:** Current practices among AATB accredited tissue banks vary widely

MTF **DOES NOT** accept these types of donors

(14 of 16 banks responded)
PRESERVE AND PROTECT

PRESERVE AND PROTECT
MTF PHILOSOPHY

MTF takes great care to preserve and protect the natural integrity of tissue

A Balance between Safety and Clinical Performance
“THE EFFECT OF ALLOGRAFT BONE PROCESSING ON STRUCTURAL CORTICAL ALLOGRAFTS A COMPARISON OF THREE PROPRIETARY METHODS”

MICHAEL G. DUNN, PH.D., ET AL

UMDNJ – ROBERT WOOD JOHNSON MEDICAL SCHOOL

2008 NORTH AMERICAN SPINE SOCIETY POSTER PRESENTATION
Study Objective

To determine the effect of bone cleaning processes on the remodeling properties of cortical bone allografts.
Study Hypothesis

The processing of cortical bone, intended to remove undesirable immunologically active elements, may also remove desirable elements (including endogenous growth factors) and affect the osteoinductivity and the bone’s ability to undergo creeping substitution.
MATERIALS & METHODS

Cortical allograft tissue from five groups was made into a formulation of DBM using the standard Urist\textsuperscript{1} method.

**Group 1-** MTF ATP™ treated tissue  
**Group 2-** RTI BioCleanse™ treated tissue  
**Group 3-** LifeNet Allowash® treated tissue  

**Control Groups:**  
**Positive Control:** MTF DBX ® Putty  
**Negative Control:** Heat Inactivated MTF DBX Putty

\textsuperscript{1}Urist, Science. 150 893-899, 1965.
Osteoinductivity of the DBM tissue was assessed using an intramuscular athymic mouse model. There were 8 samples per experimental group. Samples were randomized and implanted bilaterally in the biceps femoris (hamstring) muscle of the athymic mouse. Animals were sacrificed at 4 weeks post-implantation and implants were retrieved. Decalcified histology was performed on the explanted samples; hematoxylin and eosin staining was used.
Materials & Methods

The identity of the histological slides was blinded to the examiner who ranked osteoinduction using a semi-quantitative scoring system:

0 = No evidence of new bone formation
1 = 1-25% of the section is covered by new bone
2 = 26-50% of the section is covered by new bone
3 = 51-75% of the section is covered by new bone
4 = >75% of the section is covered by new bone
# RESULTS

<table>
<thead>
<tr>
<th>Test Group</th>
<th>Average OI Score</th>
<th>Std Dev</th>
<th># of Samples Demonstrating Osteoinductivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Control: DBX Putty</td>
<td>2.55</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Negative Control: Heat-Inactivated DBX Putty</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>MTF ATP Tissue</td>
<td>2.17</td>
<td>0.82</td>
<td>7 out of 7</td>
</tr>
<tr>
<td>LifeNet Allowash Tissue</td>
<td>0.57</td>
<td>0.74</td>
<td>3 out of 7</td>
</tr>
<tr>
<td>RTI BioCleanse Tissue</td>
<td>0.00</td>
<td>0.00</td>
<td>0 out of 7</td>
</tr>
</tbody>
</table>
RESULTS

MTF ATP
AVG SCORE = 2.17
7 OF 7 SAMPLES WERE OSTEOINDUCTIVE

LIFE.Net ALLOWASH
AVG SCORE = 0.57
3 OF 7 SAMPLES WERE OSTEOINDUCTIVE

RTI BioCleanse
AVG SCORE = 0.0
0 OF 7 SAMPLES WERE OSTEOINDUCTIVE
SUMMARY

PROCESSING AFFECTS MECHANICAL AND BIOLOGICAL PERFORMANCE

PROCESSING METHODS ARE NOT CONSISTENT ACROSS THE INDUSTRY. SOME TISSUE BANKS MUST BE MORE AGGRESSIVE WITH PROCESSING & STERILIZATION DUE TO THE DONOR SOURCES THEY ACCEPT.
GIVING BACK
SERVICE

DONOR TISSUE IS MADE AVAILABLE

1st To any participating hospital in the service area of the local recovery organization

2nd To any participating hospital in any MTF participating area

3rd To all other hospitals throughout the country

4th To hospitals outside the U.S.
MTF has the broadest range of tissue forms available, with over 950 grafts, including large grafts, OA’s, OC’s, Spinal spacers, Machined Spinal spacers, ligaments, tendons, meniscus, DBX, Trinity Evolution, Acellular Dermis, Morselized chips, Cortical struts, and other specialty forms.
PROFESSIONAL EDUCATION

MTF Allograft Consultants are certified to offer nursing continuing education programs that present facts regarding tissue banking.
TISSUE TRACKING SOFTWARE

**Saves Time:** Self-populates and transfers MTF tissue data with barcode scanning

**Reduces Cost:** Streamlined ordering process, notification of tissue expiration and reduced labor hours

**Ensures Compliance:** Follows all Joint Commission requirements from purchasing through implantation
Large Graft Program

MTF offers a large variety of grafts, enabling the surgeon to choose the right graft to match the patient's anatomy.

Dr. Richard Nicholas,
Chairman of the MBOT and
Member of Board of Directors,
with large graft recipient
COMMITTED TO ACADEMIC RESEARCH

Since 1993, the MTF grant program has awarded over $20 million for allograft and bioconstruct research to investigators from more than 112 institutions across the globe.

Scientific Peer-Reviewed Grants
Career Development Grants
Resident Research Grants

Non-transplantable Tissues
Directed Research Grants
OREF Grants
CHARITABLE OUTREACH PROGRAMS

MTF GENEROUSLY PROVIDES TISSUE UPON REQUEST FOR PHYSICIANS INVOLVED IN CHARITABLE OUTREACH.

2008 Project Health for Leon Mission Trip to Nicaragua
SUMMARY

MTF is the only tissue bank where you will get the most clinically sound, safe allografts processed from the most carefully selected donors.

Better Standards
Better Donors
Better Processing
Better Allografts

MTF, The Better Approach