Who’s guarding safety of human tissue?

The tissue industry is more regulated than ever. Then why can an incident happen like the one involving Biomedical Tissue Services (BTS)? BTS’s owner and 3 other men were indicted in February 2006 in Brooklyn, NY, for allegedly operating an illegal ring that stole tissue from cadavers of persons who never gave permission to be donors. The men are accused of selling the tissue to companies that processed it for use as tissue grafts. About 25,000 BTS-recovered tissue products were distributed to all 50 states and internationally from June 2002 to October 2004, according to the Food and Drug Administration (FDA), which shut BTS down in January 2006.

Could more be done to make the tissue supply safer? Are there more steps surgeons and OR managers can take?

The tissue industry is regulated by the FDA and voluntary organizations that set standards and guidelines. The Association of periOperative Registered Nurses (AORN) advises verifying that tissue from outside sources comes from tissue banks that are registered with the FDA, licensed by state agencies if applicable, and accredited by the appropriate organization (sidebar). The AORN recommended practices provide a guide to evaluating tissue banks and establishing policies and procedures.

Standards violated

“What the people at BTS are accused of doing is an aberration. This has never occurred before in our 30-year history,” says P. Robert Rigney, Jr, JD, CEO of the American Association of Tissue Banks (AATB). “There are standards for in-formed consents, but those folks forged them.” They altered medical records to make the donors seem younger and healthier than they were.

AATB has appointed an expert panel to review the incident to see if changes are needed in its standards.

A lawyer formerly on the staff of the FDA who worked on the agency’s good tissue practices regulation thinks that, despite this incident, oversight has improved.

“We’re definitely getting there. The industry is safer, better regulated, and better able to regulate itself than ever before,” says Areta Kupchyk, JD, who now represents tissue banks and related clients at the law firm, Reed Smith, Washington, DC.

Major incidents

The BTS scandal is the second major incident the industry has seen in 5 years. In that time, there have been about 5 million tissue transplants, Rigney estimates.

In 2001, a healthy 23-year-old man, Brian Lykins, died in Minnesota after receiving a knee graft that turned out to be contaminated with the bacterium *Clostridium sordelli*.

The graft came from CryoLife, which used a processing method not validated for spore-forming organisms, according to the *New England Journal of Medicine*. In all, 14 patients were identified with allograft-associated *clostridium* infections from tissue processed by CryoLife.

“When CryoLife happened, the FDA was becoming more savvy about fungal and bacterial infections as well as the traditional communicable diseases like HIV
and hepatitis,” says Kupchyk, who also served as the FDA’s attorney on the CryoLife case.

“The whole industry was shaken by that incident. I think everyone, including the FDA and CryoLife, learned from it.”

She says the industry is still learning how to be more regulated. “I see the industry working hard at trying to understand what is expected of them and trying to do the right thing,” she says.

Still, Kupchyk expects there will be more events with contaminated tissue, “though hopefully with less severity,” she says.

The tissue industry is profitable, tempting newcomers, and some are unscrupulous. Technically, tissue cannot be bought or sold, but firms can charge fees, and there is no regulation over the fees they can charge.

On the plus side, Kupchyk says “the industry is now hypersensitive” to improper behavior. “There is more of an incentive for tissue processors to deal only with banks that are registered, AATB accredited, and inspected.

“That won’t stop fraud. But the more oversight you have, the less likely someone will get away with it—the more cops on the road, the fewer speeders.”

Advice for facilities, physicians

The best advice for physicians and nurses, says Rigney, “is to see that the tissue banks you deal with are accredited by AATB.” All 5 tissue banks that received tissue from BTS are AATB accredited. They were LifeCell, Los Mountain Tissue Bank, Blood and Tissue Center of Central Texas, Tutogen Medical, and Regeneration Technologies, Inc. BTS itself was not accredited.

Rigney says the BTS discrepancies were discovered because the tissue banks followed AATB standards, which involve testing of tissue and review of records.

Another step physicians and health care facilities can take is to insist that the tissue banks they use obtain tissue only from sources that are also accredited. AATB standards don’t require tissue banks to use accredited sources, but they do require banks to audit their sources at least every 2 years to see that they are in compliance with the standards.

BTS was registered with the FDA as well as New York State and had been inspected. But that didn’t detect the forged documents.

Risk to patients from the BTS tissue appears small. “The biggest processors all have systems to inactivate viruses and bacteria,” Rigney says.

At least a dozen people claim they have contracted diseases from contaminated BTS tissue, according to press reports. Several dozen have filed lawsuits, seeking class action status for hundreds of other patients. But the Centers for Disease Control and Prevention (CDC) has not confirmed any cases of disease transmission from BTS tissue, Rigney says.

Could more be done to inactivate microorganisms in tissue?

The overwhelming majority of tissue distributed is bone, which is irradiated, he says. Bone accounts for 75% to 80% of the approximately 1 million grafts distributed annually.

“The majority of bone is irradiated at a dose far exceeding what is needed to destroy microorganisms,” he says. “We also have standards that rule out using grafts with certain types of bacteria.” Irradiation cannot be used in all tissue types because it can affect the integrity of the tissue.

How many banks are accredited?

What percentage of tissue banks are accredited isn’t clear.

About 2,300 banks are registered with the FDA, but not all are actually tissue banks or need to be registered, Rigney says. “We think the overwhelming majority of tissue supplied for transplant in the US is coming from tissue banks accredited by AATB,” he says. There are 92 accredited banks, and he estimates about 150 are operating.

The overall record for tissue transplants is good, he points out. The only reports of TB and hepatitis B transmission through tissue grafts occurred more than 50 years
ago. The only reported transmissions of HIV through tissue grafts were 15 to 20 years ago.

Transmission of hepatitis C from 1 donor to 8 patients was reported in 2003. The donor was negative for HCV antibodies at the time of death. Of the 44 allografts transplanted from the donor, all of the transmissions were in organs or soft tissues; none were found in patients who received skin or irradiated bone (MMWR 52[13]:273-276).

AATB now requires use of more accurate nucleic acid testing (NAT) for detecting HIV and HCV in cadaveric tissue. The test narrows the window from when a person contracts the virus to when the test can detect it.

“The industry is still learning how to be compliant,” Kupchyk says. “Even if we don’t see out-and-out fraud, we still will see people making mistakes.

“But as the years go by, we will see a better and stronger tissue supply.”

The CDC has frequently asked questions about tissue transplants, including testing for BTS tissue recipients, at www.cdc.gov/ncidod/dhqp/tissueTransplantsFAQ.html

References


Who sets tissue standards?

American Association of Blood Banks
Develops standards, accreditation, and education programs for transfusion medicine and related therapies.

—www.aabb.org

American Association of Tissue Banks
Sets voluntary standards for tissue establishments.

—www.aatb.org

Eye Bank Association of America
Sets standards for procurement and distribution of corneal tissue and accreditation of eye banks.

—www.restore.org

Food and Drug Administration
The FDA has 3 rules regulating the tissue processing industry:
• Registration. Requires tissue facilities to register and list their products.
• Donor eligibility. Sets criteria for donors of human cells, tissues, and cellular and tissue-based products.
• Good tissue practices. Requires manufacturers to recover, process, store, label, package, and distribute human cells, tissues, and cellular and tissue-based products in a way that prevents the introduction, transmission, or spread of communicable disease. Covers musculoskeletal tissue, corneas, human heart valves, dura mater, and cellular therapies, among others.

—www.fda.gov/cber/tissue/docs.htm

Joint Commission on Accreditation of Healthcare Organizations
Has standards for tissue handling and tracking within health care facilities.

—www.jcaho.org
What is AATB accreditation?

The American Association of Tissue Banks (AATB) accredits tissue banks that engage in any 1 or more of 5 processes:

- retrieval
- storage
- donor eligibility screening
- processing
- distribution.

Accreditation process

New accreditation typically takes 9 months and includes:

- application
- review of standard operating procedures (SOPs) by independent reviewers (most former FDA officials)
- self-audit by the tissue bank
- inspection by independent contractors
- blind review of application documents by the AATB Accreditation Committee.

Accreditation must be renewed every 3 years.