

CONTROL OF AIDS IN CADAVERIC TESTING:
PRELIMINARY GUIDELINES

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Presented at the 15th Annual International Workshop on
Human Subjects for Biomechanical Research
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INTRODUCTION

Since 1982, the CDC (Center for Disease Control) has issued several infection control guidelines (1,2,3,4) for dealing with blood and body fluids of known or suspected carriers of the virus that causes AIDS. These infection control precautions are largely the same precautions that are recommended by the CDC in dealing with patients who have hepatitis B. Recently, these guidelines have been consolidated and updated (7) and the CDC has stressed that AIDS blood and body fluid precautions should be used for all patients, since the infection status of a patient cannot be known with certainty. The updated CDC guidelines state:

Since medical history and examination cannot reliably identify all patients infected with HIV or other blood-borne pathogens, blood and body-fluid precautions should be consistently used for all patients. This approach, previously recommended by CDC, and referred to as "universal blood and body-fluid precautions," or "universal precautions," should be used in the care of all patients, especially including those in emergency-care settings in which the risk of blood exposure is increased and the infection status of the patient is usually unknown. (7)

These precautions extend to mortuary workers:

In addition to the universal blood and body-fluid precautions ...the following precautions should be used by persons performing postmortem procedures:

1. All persons performing or assisting in postmortem procedures should wear gloves, masks, protective eyewear, gowns, and waterproof aprons.
2. Instruments and surfaces contaminated during postmortem procedures should be decontaminated with an appropriate chemical germicide (7).

The Bioengineering Center at Wayne State University has been following the CDC guidelines when testing unembalmed human cadavers. In addition, we have taken certain measures to screen cadavers for the AIDS virus before accepting the cadaver for

biomechanical studies. Risk factors similar or greater than those of health care and mortuary workers exist in these biomechanical tests, particularly in regard to exposure to blood and body fluids and the risk of accidents with sharp instruments. One factor which may be less of a risk in biomechanical testing than in pathology or mortuary science is the viability of the virus at the time of exposure. In biomechanical testing, the specimen is often several days post-mortem, whereas in pathological and mortuary science exposure to the specimen often occurs much sooner after death. More research on the survivability of the AIDS virus in post-mortem specimens is recommended. For now, the W.S.U. Bioengineering Center is assuming a worse case scenario: that the AIDS virus may survive long enough in a post-mortem specimen to be infectious to those involved in biomechanical testing. Also, most of the infection control precautions we have developed in cadaver testing and handling are good universal infection control precautions, and are applicable for other microorganisms besides the virus that causes AIDS. In dealing with the issue of infection control and AIDS this paper will address the following:

- 1) What is AIDS?
- 2) How infectious is the AIDS virus?
- 3) What precautions should be taken in cadaveric testing to safeguard against AIDS?

WHAT IS AIDS?

AIDS stands for "Acquired Immunodeficiency Syndrome." It is caused by the Human Immunodeficiency Virus (HIV). The HIV virus binds to a receptor protein, the T4 protein, on the surface of certain target cells. The target cells include T4 lymphocytes, which the HIV virus can destroy. In AIDS it appears that depleting the T4 lymphocytes plays the key roll in compromising a person's immune response to infections. The depletion of T4 lymphocytes results in an immune system which is deficient in fighting off certain diseases. Thus, the term "acquired immunodeficiency" is used to describe this disease. The word "syndrome" is used because the harmed immune system results in a multitude of opportunistic infections with their accompanying signs and symptoms that constitute the "syndrome" of AIDS. The signs and symptoms of AIDS include: fever, enlarged lymph nodes, weight loss, opportunistic infections (such as candidiasis, Pneumocystis carinii pneumonia, and Kaposi's sarcoma). Other signs and symptoms are described in the CDC surveillance definition of AIDS, shown in Fig. 1. Earlier definitions of the infection have their limitations. Several hierarchical classification systems have been proposed to account for the progressive stages of the disease. One, from Haverkos et al (12) is shown in Fig. 2.

It is estimated that more than 1.7 million people (21) in the U.S. are infected with HIV. The eventual rate of conversion from a symptomless carrier state to that of fully developed AIDS may depend upon certian risk factors. Up to 35% of homosexual men

who have had an HIV infection for five years have been reported to develop AIDS. The rate of conversion over the long term is largely unknown, but probably exceeds 35% (14). Why do some people with HIV infection develop AIDS while others do not? This appears to be due to the ability of the virus to remain dormant in the human chromosome. As a retrovirus, the HIV virus can act in a latent manner by entering the cell without immediately replicating or injuring the cell. It is hypothesized that the latent form of the virus is activated by exogenous stimuli, resulting in replication of the virus, and the development of AIDS. The rate of development of AIDS in those infected with HIV due to blood transfusions is less than had been predicted (13). Thus, there may be factors in semen or blood or other pathogens (ie. herpesvirus) that play a role in activating the latent form of the HIV virus, putting some populations infected with HIV at a higher risk of developing AIDS than other populations.

As a retrovirus, HIV carries the genetic information for an enzyme called reverse transcriptase. This enzyme catalyzes the synthesis of double-stranded DNA complementary to the virus RNA. This DNA moves into the host nucleus and becomes integrated into the host chromosome. DNA is the carrier of genetic information in cells. The viral DNA, incorporated into the human chromosome carries the information to make more copies of this virus. This happens as follows: The integrated DNA is used as a template to make RNA, which is translated into the virus proteins. The viral RNA and proteins are packaged, incorporate into the host cell membrane and bud off, leaving the host cell. These budding

particles become new virus. The process of incorporating into a host cell and replicating is illustrated in Fig. 3 and described in more detail elsewhere (11, 20).

particular become new virus. The process of incorporating into a host cell and releasing is illustrated in Fig. 1 and described in more detail elsewhere (11, 20).

HOW INFECTIOUS IS THE HIV VIRUS?

Nonsymptomatic carriers of this virus are infectious, as well as those with fully developed AIDS. Risk factors of infection include transmission from infected individuals to sex partners, I.V. drug abuse, and blood transfusions. Casual contact does not spread the virus. Saliva and tears do not appear to spread the virus (17). Accidental needle stick rarely causes infection. The findings in several studies show that in cases where a health care worker has been exposed to a known carrier of the HIV virus through needle stick injury the rate of conversion to a positive HIV test is low. In one study (5), one of 298 workers seroconverted (0.3%). In another study of 863 healthcare workers the rate of transmission was 0.35% (21). These included needlestick and permucosal exposures. Overall, at least 15 cases of HIV transmission to health care workers has been reported (21). Nine of these appeared to be due to a puncture wound with a contaminated needle or instrument. Based on the above statistics it appears that the risk of HIV transmission to health care workers is relatively small but the documented cases show that there is still a risk. The risk can be minimized further by conscientiously observing certain procedures, including the infection control procedures recommended by the CDC for healthcare and mortuary workers. The CDC guidelines are also important because they help control the spread of other infections. For example, the rate of transmission of hepatitis B from a single needlestick injury involving a hepatitis B carrier is 12 % (21), in contrast to the 0.35% for HIV transmission.

What is the relevance of HIV infection controls in dealing with a cadaver rather than a living subject? After death, body-wide translocation of microbes can occur. It is possible that HIV translocates from blood to many other body fluids and tissue reservoirs as membrane and tissue barriers break down. CDC guidelines for mortuary workers (7) include the use of gloves, gowns, and other infection control procedures discussed in the final section of this paper. Morticians and funeral directors are addressing the risk of HIV infection in their profession (14).

Morticians, pathologists and bioengineers involved in cadaveric testing need information on the survivability of the HIV virus in the body after death. There are very few studies which address HIV survivability. There is some scientific evidence for the continued survivability of the virus after heating and drying, and even greater survivability under cell-free wet conditions as is shown by the study of Resnick et al (18). A table from this study is shown in modified form (Fig. 4). In the wet environment, virus infectivity was seen up to 15 days at room temperature. Limitations of this study are that the amount of virus used greatly exceeded concentrations seen in patient specimens. Also, only the presence or absence of viral infectivity was measured, not the amount of infective virus.

WHAT PRECAUTIONS CAN BE TAKEN TO SAFEGUARD AGAINST HIV INFECTION IN CADAVERIC TESTING ?

The following steps are recommended in working with cadavers:

1. Screen cadavers before using them. Do not use those that test positive for HIV (or hepatitis B).
2. Follow CDC infection control guidelines during procedures.
3. Clean up after procedures.

Cadaver Screening:

Cadavers can be screened for possible HIV infection by doing the following: 1) If possible, obtain a medical history from the subject's physician. 2) Perform a cursory physical exam of the cadaver before procuring it. 3) Test the cadaver for the presence of antibodies to HIV by drawing blood and having the blood tested for the presence of antibodies to the HIV virus.

Medical History: It may be possible to review with the subject's physician the signs and symptoms the subject had before death, particularly if suspicions are aroused while inspecting the cadaver. Signs and symptoms from the history which should arouse suspicion include: immune thrombocytopenic purpura (ITP), unexplained enlarged lymph nodes, low grade fever (intermittent or continuous for more than one month), night sweats, unexplained oral candidiasis or other opportunistic infection, sustained weight loss of more than 10% of body weight, watery diarrhea, and Kaposi's sarcoma. It may also be possible to determine if the subject was from a higher risk group than the general population. These include homosexual and bisexual men, IV drug abusers, hemophiliacs, heterosexual partners of a risk group member, blood

transfusion recipients of blood containing HIV, recipients of an organ transplant from an HIV infected person, recent immigrants from Haiti and Central Africa, and infants born to an HIV-positive woman (17). It has been recently reported that those with AIDS have an increased risk of tuberculosis (TB) (9), giving more reason not to use cadavers infected with TB.

Physical Exam: Findings which should arouse suspicion include enlarged lymph nodes (particularly of the inguinal, axillary and posterior cervical nodes), apparent weight loss, the purple to brownish yellow skin discolorations of idiopathic thrombocytopenic purpura (ITP) (which have no anatomic predilection, but are often seen on the extremities), and the lesions of Kaposi's sarcoma (manifested by reddish, bluish or purplish macules or papules, primarily located on the face and neck). Typical locations of the lesions of Kaposi's sarcoma are the tip of the nose, the outer third of the eyelid, and the hard palate. White patches in the mouth are seen in those who have oral candidiasis or hairy leukoplakia, two of the opportunistic infections of AIDS. For an excellent review of physical findings seen in AIDS one is referred to "Clinical Clues to AIDS," by Cunha and Strampfer (10).

Blood Test: Perform a venous cutdown at the jugular or femoral vein. Draw up approximately 3 cc of blood with a syringe and transfer to a test tube and cap it. Do not poke needles through the caps of vacutainer tubes, as this will increase the risk of needlestick injury. An alternate approach is to draw

blood by inserting a large guage needle into the heart through the left 4th intercostal space. If the biomechanical test to be performed requires a perfused heart this last approach should be avoided. After the blood is obtained, centrifuge the blood and submit the clear supernate, the serum, for HIV antibody testing. Hemolysis may make the separation of serum from blood cells impossible, in which case submit the hemolyzed sample. Unfortunately, the results of a hemolyzed sample cannot be judged with the same confidence as a non-hemolyzed sample. The serum sample can be submitted to certain labs for HIV antibody testing. Wayne State uses the American Red Cross, which gives negative results in less than 24 hours. Positive results take longer because they require a series of confirmatory tests, as discussed below.

HIV infection is determined by testing for antibody to HIV, not by testing for the virus itself. The antibody is produced by a person's immune system in response to the virus, and is not part of the virus. The test presently used to screen antibody to HIV is an enzyme-linked immunosorbent assay (ELISA). Repeatedly reactive ELISA's are confirmed with another test, usually the Western Blot. The predictive value of this combined array of tests is greater than 99% (8). During the first 4 to 12 weeks after infection with HIV, the antibody to HIV may not be at detectable levels. Thus, a cadaver of a recently infected individual may not give a positive test result. Also, there is no literature regarding the reliability of these tests on a cadaver. In addition, there are other infectious microbes that

may be transmitted from cadaver to researcher. Therefore, it is recommended that all the infection control guidelines described below be followed for all cadavers, even those that have tested negative for HIV. The purpose of the blood test is to reject those cadavers that test positive, not to feel safe with those that test negative.

In our screening protocol, the blood sample drawn for HIV antibody testing is also tested for hepatitis B. The test for hepatitis B is a test for an antigen, a part of the hepatitis B virus itself, not an antibody to the virus. The antigen tested for in a hepatitis B screening test is a surface antigen (HBsAg). It has been reported to us by testing labs that the hemolysis often present in a cadaveric blood specimen can result in a false positive test for HBsAg. It is recommended that questionably positive tests be discussed with the testing lab involved. If a test is considered a true positive for hepatitis B, that cadaver should be rejected for biomechanical studies. A hepatitis B infection does not result in death at nearly the same rate as an HIV infection, but hepatitis B is more transmissible than HIV (12% versus 0.35% as discussed above), and is more widespread in the population.

Infection control guidelines during cadaver handling:

CDC guidelines for HIV infection control are outlined in reference 7. We have incorporated these guidelines into our infection control procedures for cadaveric handling. We have also added procedures that we feel are appropriate to our particular work environment. The procedures we use are described below.

Designated rooms should be set up for specific tasks that involve the handling of cadavers. These rooms should be designed to be easily cleaned. These rooms shall be considered contaminated while being used to perform studies on a cadaver, and shall be off limits to those not wearing protective clothing. For example, when performing instrumentation procedures on a cadaver in a designated prep room, that room shall be considered off limits to those not wearing the required protective clothing. When performing impact tests on a cadaver in an impact lab, that lab shall be considered off limits to all those not wearing protective clothing. Any room used for cadaver handling or testing shall remain off limits until the room has been decontaminated with the appropriate germicides. Before moving on to other activities, those in the contaminated room shall discard their protective clothing at the exit to the room and wash their hands with a biocidal soap immediately.

During the handling of a cadaver the following protective procedures are recommended:

1. All those who will be exposed to the blood or body fluids of cadavers or who touch cadavers in the course of their work should wear gowns, gloves and shoe coverings. All of these should be waterproof.
2. If the procedure can generate aerosols (ie. cutting of bone) molded surgical masks, protective goggles, and surgical caps should also be worn. These should all be waterproof. MacArthur and Schneiderman (15) suggested using a transparent plastic bag sealed around the cadaver's neck

and the experimenter's wrist to confine the aerosols emitted during bone sawing (Fig. 5). Studies are needed to determine the likelihood of generating aerosols in cadaveric impacts. We clothe the cadavers in two sets of nylon body stockings to reduce possible aerosolization during impact. Experiments that may generate aerosols should be set up to confine the aerosols to easily cleanable or disposable surfaces. Ideally, there should be a method to contain the aerosols so that they will not make contact with the experimenters or surrounding surfaces during a test.

3. Use care to prevent punctures or cuts caused by needles, scalpels and other sharp instruments. Wear double gloves if procedures are being performed that can result in tears or punctures of a single glove. If very sharp instruments are used which can readily cut through two or more layers of gloves, it is suggested that the hands be protected in metal mesh gloves as are sometimes used in autopsy procedures. Wear a rubber glove over and under each mesh glove.
4. Do not recap or bend needles. Dispose of them in a puncture-proof container.
5. Wash hands or other skin surfaces with a biocidal soap immediately if they come in contact with the blood or body fluids of a cadaver. Use only foot-operated sinks.

Clean-up after procedure:

Upon completion of cadaver handling, discard protective clothing in a trash container lined with two plastic bags for

waste disposal, and wash hands with a biocidal liquid soap. Wash floors, tables, countertops, and other hard surfaces with a 1 to 10 dilution of 5.25 % sodium hypochlorite (liquid bleach) or a broad-spectrum biocidal cleaning solution. Disinfect instruments with 2 % glutaraldehyde or autoclave the instruments. Before applying bleach, glutaraldehyde, or a biocidal solution scrub off dirt, tissue and other debris from the surface to be decontaminated with a detergent. Disinfection of different types of equipment is described by Simmons (19).

Blood testing of workers at risk:

There has been controversy regarding the testing of health care workers or others who consider themselves to be at risk because of working conditions. The CDC has not recommended mandatory testing of health care workers for HIV antibody, but has recommended that persons who consider themselves at risk be given the opportunity for counseling and HIV antibody testing (6), and that efforts should be made to improve the confidentiality of test results.

Other infections:

Many of the infection control guidelines outlined above were originally formulated for the prevention of the spread of the hepatitis B virus. These guidelines also apply to other viruses such as non-A non-B hepatitis and herpes virus. Also, researchers are exposed to other potentially infectious microbes during certain preparation, testing or autopsy procedures. Again, this emphasizes the need for universal infection control precautions in dealing with all cadavers.

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Fig. 1. CDC surveillance definition of AIDS. (From reference 16)

CDC Surveillance Definition of AIDS (Revised August 1986)

1. A disease, at least moderately predictive of a defect in cell-mediated immunity, occurring in a person with no known cause for diminished resistance to that disease. Such diseases include Kaposi's sarcoma (KS), *Pneumocystis carinii* pneumonia (PCP) and other serious opportunistic infections.*
2. Diagnoses are considered to fill the case definition only if based on sufficiently reliable methods (generally histology or culture).
3. In adults with HIV seropositivity, additional diseases include disseminated histoplasmosis (not confined to lungs or lymph nodes), diagnosed by culture, histology or antigen detection; isosporiasis, causing chronic diarrhea (over one month), diagnosed by histology or stool microscopy; bronchial or pulmonary candidiasis, diagnosed by microscopy or characteristic white plaques of bronchial mucosa (not by culture alone); non-Hodgkin's lymphoma of high-grade pathologic type (diffuse, undifferentiated) and of B-cell or unknown phenotype, diagnosed by biopsy; histologically confirmed KS in patients 60 years or older.
4. Lymphoreticular malignancies, diagnosed more than three months after any of the above diagnoses, will no longer be excluded as AIDS cases.

*These infections include specified syndromes involving specific anatomical sites due to one or more of the following agents: candidiasis, cryptococcosis, cytomegalovirus, nocardiosis, strongyloidosis, toxoplasmosis, or atypical mycobacteriosis (species other than tuberculosis or lepra); esophagitis due to candidiasis, cytomegalovirus or herpes simplex virus; progressive multifocal leukoencephalopathy; chronic enterocolitis (more than four weeks) due to cryptosporidiosis; or unusually extensive mucocutaneous herpes simplex of more than five weeks duration.

Fig. 2. Hierarchical classification of HIV infection. (From reference 12).

Proposed Stratification of HTLV-III/LAV-Related Illness for Clinical Trials*

Category	Clinical Features†
1	Asymptomatic
2	Immune Thrombocytopenic Purpura (ITP)
3	Unexplained‡ palpable lymphadenopathy at two or more noncontiguous, noninguinal sites, of greater than four months duration A Systemic symptoms absent B Fevers low grade (38.5 C), intermittent, or continuous for greater than one month or night sweats (four or more nights in the last month)
4	Minor Opportunistic Infection (OI), unexplained oral candidiasis or herpes zoster in individuals less than 60 years of age A No adenopathy B Adenopathy as above
5	Systemic prodrome defined as intermittent or continuous fevers over 38.5 C for one or more months, or watery diarrhea two or more weeks, or sustained weight loss of 10% or more of body weight; no etiology established
6	AIDS with Kaposi's sarcoma, no OI
7	AIDS with OI with or without Kaposi's sarcoma

Fig. 3. HIV virus entering cell, replicating and leaving cell. (From ref. 11).

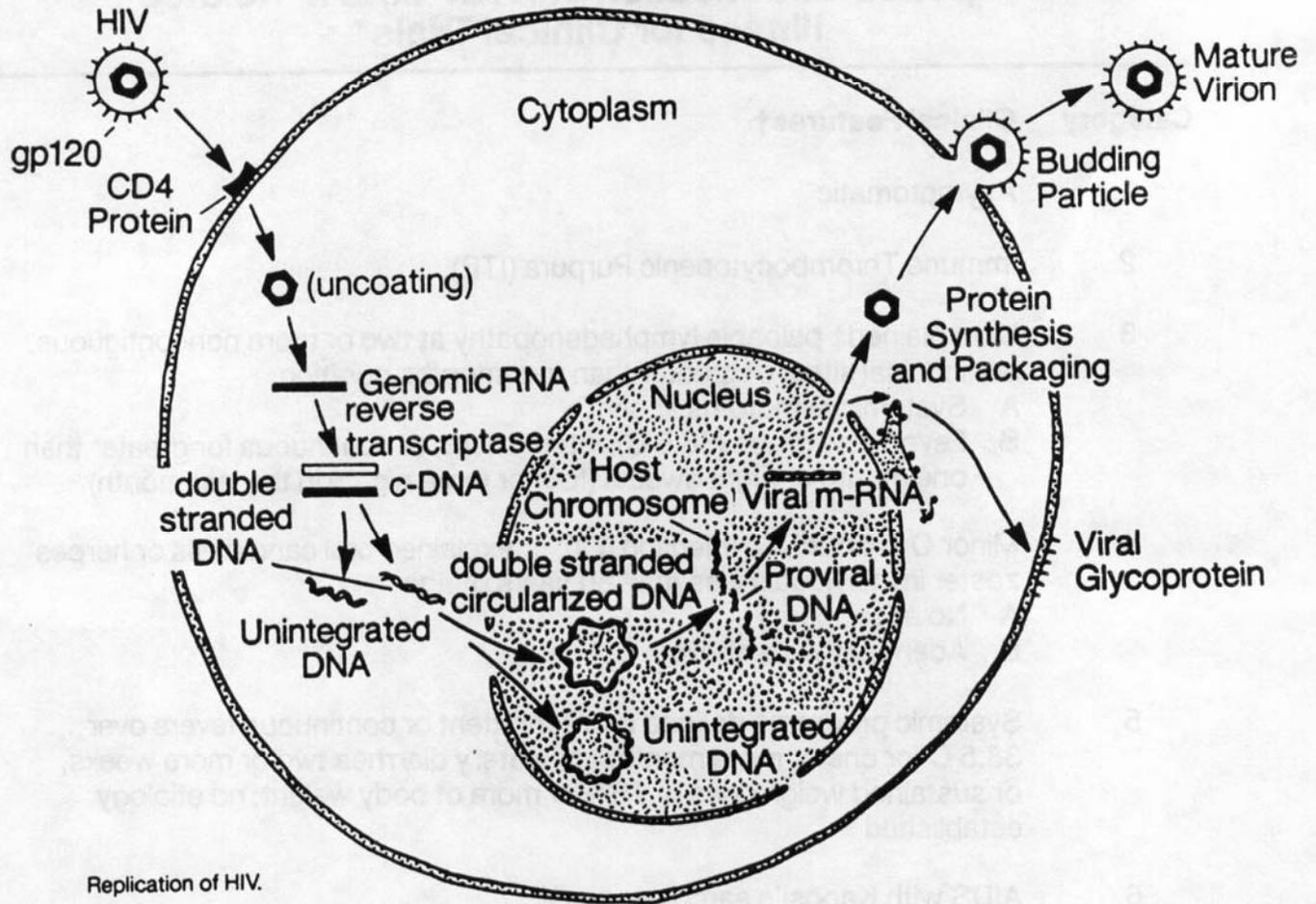


Fig. 4. A table modified from Resnick et al (18) showing the survivability of HIV virus up to fifteen days. Plus sign indicates infectivity detected. Minus sign indicates no infectivity detected.

Stability of Human T-Cell Lymphotropic Virus Type III (HTLV-III) After Exposure to Environmental Conditions				
Day	Cell Free		Cell Associated (Drying [30 °C])	
	23-27 °C (Room Temperature)	37 °C		
1	+	+		+
3	+	+		-
5	+	+		-
11	+	+		-
15	+	-		-

Fig. 5. A suggested method of confining bone dust and aerosols. (From ref. 15).

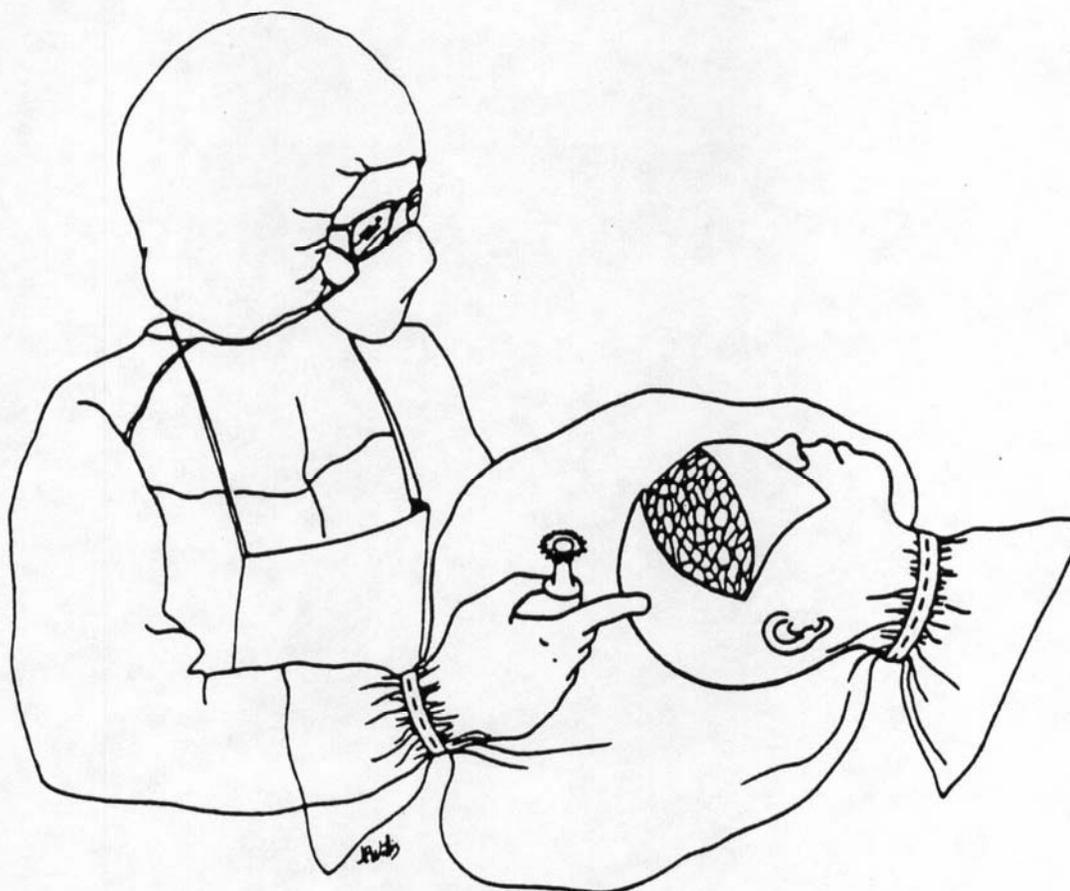
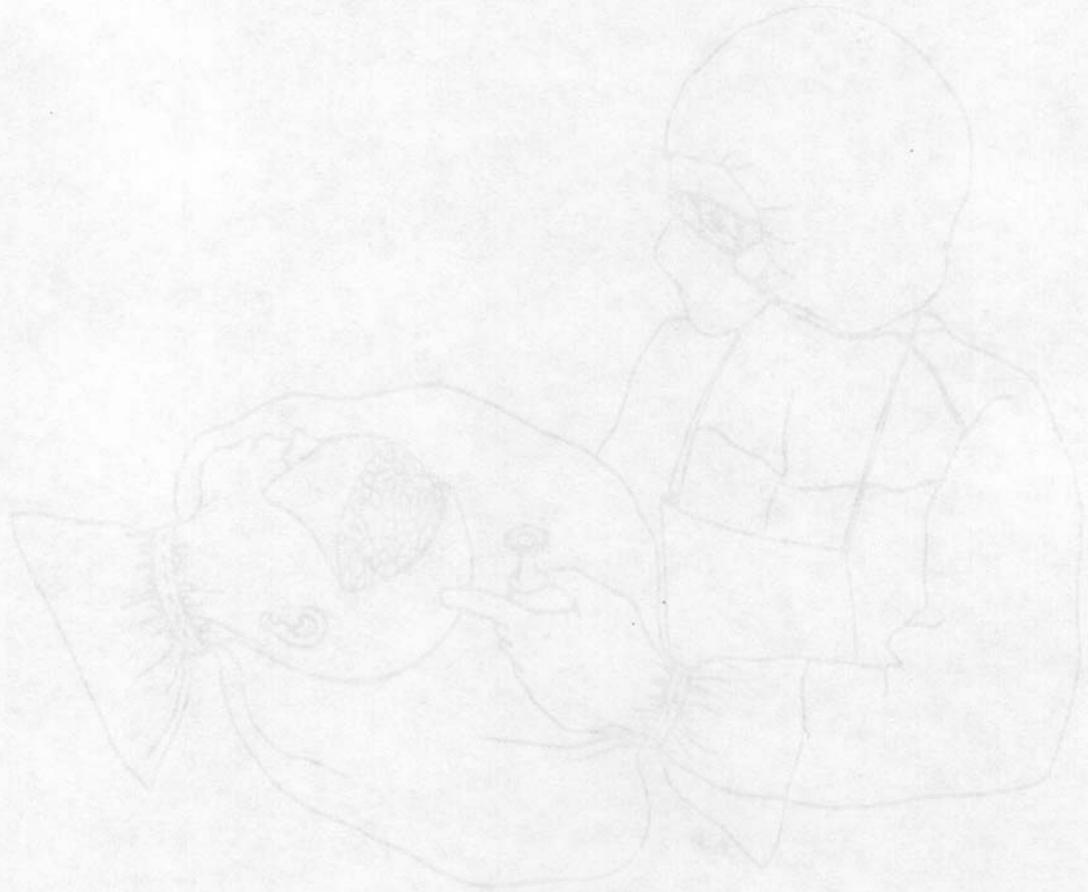


Fig. 4. A table modified from Kessell et al. (18) showing the stability of HIV virus up to fifteen days. Plus signs indicate infectivity detected. Minus signs indicate no infectivity detected.

Stability of Human T-Cell Leukemia Virus Type II (HTLV-II) After Exposure to Environmental Conditions	
Day	Cell Virus
	HTLV-II From (Temperature) 37°C
1	+
2	+
3	+
4	+
5	+
6	+
7	+
8	+
9	+
10	+
11	+
12	+
13	+
14	+
15	+

Fig. 5. A suggested method of containing bone that may contain HTLV-II.



DISCUSSION

PAPER: Control of AIDS in Cadaveric Testing:
Preliminary Guidelines

SPEAKER: John Cavanaugh, Wayne State University

Q. Roger Daniel, Ford Motor Company

Is there anything that has been done with radiation or microwave to kill the virus? Your slide shows heat is effective. Can the cadaver be passed through a radiation or microwave source and come out still usable and yet free of hepatitis or the HIV? Has anything been tried on that?

One thing that has been shown is that freezing does not kill the virus. In fact, the virus are frozen in some laboratory studies just to keep them ready to be used, so freezing the cadavers until you want to use them a month later wouldn't help.

Q. Jeff Marcus, NHTSA

I was curious about the exposure statistics you gave. You said that out of 800 cases of accidental needle sticks only 4 cases have developed. Are those just testing positive for the virus or are they full cases of AIDS?

A. That's just testing positive for the virus.

Q. So that means there have been 800 cases and 796 have not shown positive for the virus.

A. Yes, in that particular study. There have been other studies where, say, 3 out of 300 will convert to a positive reaction. They all appear to be about 1 percent or less at this point.

Q. Guy Nusholtz, UMTRI

Just a couple of comments. One of the things that we use is a plastic disposable gown which covers the entire body from foot to neck. Another thing is that we have a shroud which goes over the Stryker bone saw and that's connected to a vacuum cleaner so any dust or other particles that are generated in the process of cutting is brought through there and then filtered, ending up in a container. Normally we have bleach. One thing that disturbed me a little bit is that you pointed out that the virus can survive for more than 15 days at room temperature. This is not too bad for something like an autopsy room, which is where we do our preparations, because we can flood that. In fact, that's what we do, but it's very difficult to clean up things like sleds and impact laboratories. Under those conditions you can even get biological materials on the ceiling and 15 days is a long time when you can accidentally have people touch the walls and all the surfaces that are in that room. Do you have similar problems with cleaning the areas where you actually do the impact?

A. Yes, we basically do the best job we can, using a bleach solution to clean any surfaces we can. One good thing about this is the 15 day study was for viruses in a liquid medium. Studies have also been done on viruses in a dry environment and they die off a lot more quickly, on the order of 3 or 4 days. Those studies have used really high concentrations of viruses, which are somewhat unrealistic, but there still is concern. It appears there needs to be some further studies done on how viable the virus is in a realistic setting. Not just a set-up where the viruses are incubated in a test tube, for instance.

Q. Most of the research that I've read has shown that the virus certainly doesn't survive more than 12 to 48 hours. This is completely different from the information that I have currently so I'd really be looking forward to that particular information when your paper comes out.

A. Another comment concerns radiation treatment of the virus. Currently, the only way you can do it is with a cobalt 60 source or a very powerful x-ray machine. However, you would have to develop procedures for handling cobalt 60 and all the dangers that entails.

Q. Chan Ewing, Snow Memorial Foundation
You mentioned that only 4 out of 800 people tested positive for the virus but you said earlier that you don't actually test for the virus, you test for the antibody. Please elaborate.

A. Those were tests for the antibody. Having a positive antibody is assumed to be the same as having an active infection.

Q. Why?

A. Because the antibody develops after invasion of the virus and the virus can actually incorporate itself into these T-4 lymphocytes and in the lymphocytes they are protected from the antibodies. Practically speaking, direct testing for the virus is in an experimental stage. It is quite difficult and time consuming, consequently, most tests are for the antibody.

Q. But you could have a situation in which the cadaver might be infected with the virus but has not yet produced the antibody. There must be a lag period between the time of infection and the development of the antibody, so you don't have a 100 percent safe approach.

A. That's very true. It takes 4 to 12 weeks for the antibody to develop so it isn't 100 percent safe and that underlies the other precautions that should be taken. Perhaps someone will eventually develop a direct test for the virus that's practical and that's user friendly.

Q. Nusholtz

This is a retro virus which means it can hide inside of a cell and so it can go for years without producing antibodies and

it's almost impossible to detect a retro virus. Thus, it's very difficult to test for the virus. It's a lot easier to test for antibodies. It may be that only the antibodies can be detected.

A. Yes. That is the only practical way of testing it now.

Q. Pat Kaiker, UMTRI

Is Wayne screening the laboratory staff with blood tests regularly, or would you even recommend that?

A. As far as testing for antibodies to the HIV virus, we considered it and after talking to the CDC we decided not to. The CDC doesn't recommend screening hospital workers either. What the CDC has recommended is that if there's an incident that occurs where somebody has been stuck with a needle for instance or cut, then that person can be followed for the HIV antibody for his own peace of mind and for possible future treatment.

Q. So you're handling it like an industrial accident rather than any precautionary regular procedure, other than cleansing the lab?

A. Yes, as far as screening the workers is concerned.

Q. Right. It's the sensible thing for universities to do to take some responsibility in looking forward for potential lawsuits.

A. One problem is determining how a person became positive. Was it in the workplace or was it in their private life? It can be very complicated.

Q. Bob Levine, Wayne State University

I think the thing we have to do is test our cadavers. If they're positive, not use them, if they test negative still pretend they're positive and just be extremely cautious. We're all faced with this every day in the lab and in our working environment when we're dealing with patients. We all have to be much more cautious now than we were, say, 10 years ago. Of course, we were worrying more then about hepatitis, now we are worrying about AIDS.

Note: An article reviewed since this discussion stated that HIV was inactivated by heating at 56 degrees C for 30 minutes, and was not inactivated by 200,000 rad gamma irradiation or 5000 J/square meter ultraviolet irradiation. 10,000 or more J/square meter of ultraviolet irradiation and 250,000 rad or more gamma irradiation inactivated the virus. This last figure is generally at least ten times the radiation used to inactivate foodstuffs. (ref: Inactivation of LAV by Heat, Gamma Rays, and Ultraviolet Light by Spire et al, The Lancet, January 26, 1985, pp 188-189.)

