Infected Physicians and Invasive Procedures: Safe Practice Management

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There is currently no public policy that provides guidance concerning whether and when physicians infected with hepatitis B virus (HBV), hepatitis C virus (HCV), and/or human immunodeficiency virus (HIV) can safely perform invasive procedures. A committee of experts in the fields of medicine, law, and biomedical ethics and 1 community member, aided by an advisory board, was established to produce recommendations for policy reform. An extensive literature review was conducted for these 3 infectious diseases, medicine, surgery, epidemiology, law, and bioethics to gather all relevant data. Special recommendations are made regarding the management of physicians who are infected with HIV, HBV, and/or HCV. This policy proposal includes a list of exposure-prone procedures and a decision chart that indicates under what conditions infected physicians can practice beyond the need for disclosure of their serological status.

The question of whether physicians infected with blood-borne pathogens should perform invasive procedures—and, if so, under what conditions—was raised by reports of the transmission of hepatitis B virus (HBV) [1–14], hepatitis C virus (HCV) [15–21], and HIV [22–24] from health care workers to patients during invasive procedures. Despite evidence of such transmissions, there is no uniform national policy that provides definitive guidance concerning whether and under what conditions infected physicians can practice. The lack of a uniform national policy means that patients’ rights and the viral transmission risks patients assume do not depend on a national standard but on the state or even the institution where treatment is provided.

In response to the HIV and HBV transmission problem, the Centers for Disease Control and Prevention (CDC) issued Recommendations for Preventing Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Patients During Exposure-Prone Invasive Procedures [25]. (Although the CDC has stated for years now that it is in the process of revising the 1991 guidelines, proposed drafts of the recommendations are embargoed, and there is no projected publication date for revised guidelines as of this writing.) The CDC recommendations impose no restrictions on infected health care workers with regard to performance of specific invasive procedures. Instead, the CDC recommendations state that infected health care workers “should not perform exposure-prone procedures unless they have sought counsel from an expert panel and notify prospective patients of the health care worker’s seropositivity prior to undergoing an exposure-prone procedure.” This expert panel should consist of health professionals from a variety of medical backgrounds. The CDC rejects mandatory testing (but encourages voluntary testing) of health care workers who perform invasive procedures. A 1998 document published by the CDC on prevention and control of HCV infection states that there are no recommendations that restrict the professional activities of health care workers with HCV infection [26]. The American College of Surgeons (ACS), the largest and arguably most influential professional organization to represent surgeons in the United States, recently made a statement about surgeons who are infected with HBV and/or HCV. Other than encouraging surgeons to know their immunization status, the ACS does not suggest any practice restrictions for infected surgeons [27].

Federal legislation requires states to adopt the CDC recommendations or their equivalents. The CDC recommendations define characteristics of exposure-prone
procedures but do not identify specific procedures. This is left to state health departments to decide. Also left to the discretion of the states is the issue of disclosure. In some states, infected physicians must inform patients of their infection status before undertaking an invasive procedure. Others leave it to the discretion of the review panel to determine whether physicians must disclose their infection status. Of course, this is all dependent on voluntary reporting of infectious status.

There is a wide variation in the proposed management of infected physicians [28–38]. Most guidelines offer no, minimal, or fairly nonspecific guidance as to what constitute exposure-prone procedures. Meanwhile, the issue of disclosure remains controversial. Most organizations do not recognize a need for disclosure; some guidelines still favor either postexposure or preprocedure disclosure and/or identification of the source of infection. Our committee has attempted to move the issue beyond disclosure of the physician’s serological status. Disclosure is an unnecessary, ineffective, and inappropriate remedy for guiding the practice of infected physicians. The significance of the potential for harm, we argue, is not mitigated nor remedied by disclosure of a physician’s viro-serological status to a patient. Others have argued that the law should not require health care workers to disclose their HIV status (or HBV or HCV status), because this is an invasion of privacy [39]. Perhaps most importantly, serostatus disclosure, as proposed by the CDC, does not improve patient safety, as was previously argued by Closen [40, 41] and others. It has been duly noted that the acknowledged social risks of disclosure could be avoided by refraining from performing procedures that expose patients to the risk of transmission [42].

In those cases in which the risk of viral transmission is deemed to be negligible and in which procedures can thus be performed safely, a priori informing of patients of their physicians’ serostatus is unnecessary and will only cause more harm in the form of patient anxiety and physician stigmatization. In the unlikely event that a “bleedback” injury does occur during such safe procedures and an infection becomes a theoretical possibility, a posteriori patient notification is in order for timely serological testing and prophylaxis. Identification of the source of the potential viral transmission is not appropriate, because it does not serve a medical purpose. This approach is in agreement with the official guidelines from both the UK Department of Health [43, 44] and the Canadian Medical Association [29]. In a recent publication, a European Consensus Group left disclosure of serostatus up to the health care worker performing exposure-prone procedures. The same group advocated limited practice restrictions for HBV-infected health care workers, but they could not reach a consensus on HCV-infected health care workers [45].

METHODS

In 1999, one committee member (P.M.T.) and colleagues undertook a legal and policy analysis of this issue, which concluded that both legal and medical realities call for a straightforward policy that provides clear guidance. The current project is a continuation of this previous work [46]. Recognizing that an essential component of future policy development is a balanced approach that fosters representation and protection of all of the parties involved, a multidisciplinary national committee was established.

Members of this committee were selected by the principal investigators (P.M.T. and J.D.M.) in consultation with several experts in the relevant fields. The 2 meetings of the committee were semiopen (i.e., they were open to interested professionals in relevant fields of expertise). The committee comprised attorneys, biomedical ethicists, and physicians. One physician committee member was a plastic surgeon who has publicly disclosed that he was occupationally infected with HCV. An advisory board of faculty was also established to provide further guidance. Other committee members are listed at the end of the text.

A first draft of the consensus statement was a synthesis of specific information gathered and provided by the individual committee members, who presented their evidence during the first meeting of the committee on 10 November 2001. This version was discussed at the second committee meeting on 18 September 2002, during which consensus was achieved on the decision chart and on the issue of disclosure. There was no significant disagreement on the statement, and further comments were incorporated into a final draft. This final consensus statement incorporates all relevant evidence obtained by the literature search in conjunction with final consensus recommendations supported by all committee members.

CURRENT EVIDENCE: COMPILED VIRAL TRANSMISSION RISKS

Hepatitis B. During the period of 1972–1994, there were $>$375 patients with documented transmission of disease from 42 HBV-infected health care workers (primarily surgeons or dentists) [47]. Additional clusters of HBV transmission have occurred in Europe [48] and Canada, and an outbreak of 75 cases of HBV infection occurred in the Toronto, Canada, area [49].

Transmission of HBV to patients from HBV-infected surgeons who have hepatitis B e antigen (HBeAg) present, a marker for high infectivity, has been widely documented [2–5, 10, 50]. In addition, there has also been documentation that HBV-positive surgeons without detectable levels of HBeAg transmitted HBV to patients during invasive procedures [14]. It now appears that a subset of persons infected with HBeAg-negative mutants may be as infectious as those who are HBeAg positive [51, 52], and HBeAg-negative mutants have been associated with fulminant hepatitis and more-severe chronic hepatitis than nonmutant HBV [53].
transmission have tended to be those with the highest rates of percutaneous injuries and recontact. These recognized cases probably represent an underestimation of the extent of transmission, because only approximately one-half of patients with acute HBV infection are symptomatic; isolated, sporadic cases may be more difficult to link with an health care worker; and completeness of surveillance may vary among jurisdictions. Although reporting is certainly not complete, both outbreaks and sporadic transmission of HBV from surgeon to patient appear to be relatively uncommon but still greatly exceed reports of HIV and/or HCV transmission. This amounts to evidence that transmission risk is low but does exist, given the estimated pool of infected surgeons. Practice restrictions seem appropriate and required for evidence-based limits to the practice of HCV infected physicians.

**Hepatitis C.** To date, 5 health care workers are documented to have transmitted HCV infection to a total of 232 patients [15–21]. In one case in which transmission could be traced, the infection risk amounted to somewhere between 0% and 5%. Although the true frequency of infection is unknown, the risk of transmission is probably related to the nature of the procedure and to the viral load of the infected physician. Ross et al. [18] designed a formula to predict the transmission risk per procedure and over the course of a (hypothetical) career. Interpretation of these numbers requires some caution and scrutiny, because risks are indicated per procedure/per career but not per individual patient, which, from the patient’s perspective, is the truly important issue.

HCV infection is a serious danger to both health care workers and patients alike. To date, to our knowledge, far more patients have been proven to have acquired HCV infection from a health care worker, compared with HIV infection. It is thus appropriate to set evidence-based limits to the practice of HCV infected physicians.

**HIV infection.** To date, there have been 8 confirmed cases of transmission of HIV infection from 3 health care workers (a dentist, an orthopedic surgeon, and a nurse) to patients. The risk of transmission of HIV from surgeons to patients is unknown, although several estimates have been made. To date, studies have not implicated HIV-infected surgeons in the transmission of disease to their patients, and the CDC, with use of modeling techniques, estimated that the average risk of sporadic HIV transmission from an HIV-infected surgeon to a patient during an invasive procedure was 2.4–24 episodes of transmission per million procedures [54]. HIV transmission from (asymptomatic) health care workers to patients using standard antiseptic technique is quite unlikely. In the ~20 years that HIV/AIDS has been known and studied, only 8 patients have been proven to be infected by a health care worker, one of whom was treated under questionable antiseptic circumstances [23] and another whose treatment involved a surgeon with symptomatic AIDS [22].

Practice restrictions for HIV-infected physicians are prudent, but they should necessarily be less extensive than restrictions for HBV and HCV infection because HIV is less transmissible and because of the availability of HIV postexposure prophylaxis, which appears to be more effective than postexposure prophylaxis for HCV.

**DISCUSSION**

We propose a decision-making chart that consists of 3 different classes of procedures (categories I–III) and the 3 pathogens (and, for the hepatitis viruses, 2 groups of serostatus [A and B]), resulting in a matrix that entails a gradation of the separate risks, each accompanied by a specific practice recommendation. The recommendations are based on procedures being performed under standard antiseptic technique, with infected physicians wearing double gloves and observing universal precautions. Physicians whose serostatus is unknown should wear a single pair of gloves during invasive procedures unless they would usually wear double gloves as standard clinical practice.

Procedures, as illustrated by tables 1–3, are divided into 3 categories.

**Category I.** This category entails all procedures that pose de minimis risk of viral transmission to patients. In the frank absence of documented cases of viral transmission, and considering the technical aspects of these procedures, they are considered to be safe until proven otherwise. The practical nature of these procedures is such that risk of blood-blood contact between physician and patient is minimal. The surgical field and the physicians’ hands are well visualized at all times. The location of the procedures is either superficial, with minimal involvement of sharps, or there are no sharps

### Table 1. Category I: a list of categories of procedures with de minimis risk of viral transmission.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Regular history-taking and/or physical examinations, including gloved oral examination with a mirror and/or tongue depressor</td>
</tr>
<tr>
<td>I</td>
<td>Routine rectal or vaginal examinations</td>
</tr>
<tr>
<td>I</td>
<td>Minor surface suturing</td>
</tr>
<tr>
<td>I</td>
<td>Elective peripheral phlebotomy&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>I</td>
<td>Lower gastrointestinal tract endoscopic examinations and procedures, such as sigmoidoscopy and colonoscopy</td>
</tr>
<tr>
<td>I</td>
<td>Hands-off supervision during surgical procedures and computer-aided remote or robotic surgical procedures</td>
</tr>
<tr>
<td>I</td>
<td>Psychiatric evaluations&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> If done in an emergency situation (e.g., during acute trauma or resuscitation efforts), peripheral phlebotomy moves to category III.

<sup>b</sup> If there is no risk present of biting or of otherwise violent patients.
Table 2. Category II: a list of categories of procedures for which viral transmission is theoretically possible but unlikely.

Procedures that warrant general attention
- Locally anesthetized ophthalmologic surgery
- Minor local procedures (e.g., skin excisions, abscess drainage, biopsies, and use of laser) under local anesthesia (often under bloodless conditions)
- Percutaneous cardiological procedures (e.g., angiography and catheterization)
- Percutaneous and other minor orthopedic procedures
- Subcutaneous pacemaker implantation
- Bronchoscopy
- Insertion and maintenance of epidural and spinal anesthesia lines
- Male urological procedures (excluding transabdominal intrapelvic procedures)
- Upper gastrointestinal tract endoscopic procedures
- Minor vascular procedures (e.g., embolectomy and vein stripping)
- Mammoplasty
- Minimum-exposure plastic surgical procedures (e.g., liposuction, minor skin resections for reshaping, face lift, brow lift, blepharoplasty, and otoplasty)
- Thyroidectomy and/or biopsy
- Endoscopic ear, nose, and throat surgery and simple ear and nasal procedures (e.g., stapedectomy/stapedotomy and insertion of tympanic tubes)

Procedures that warrant special attention
- Assistance with at uncomplicated vaginal delivery
- Laparoscopic procedures
- Thoracoscopic procedures
- Nasal endoscopic procedures
- Routine arthroscopic procedures
- Plastic surgery
- Insertion of, maintenance of, and drug administration into arterial and central venous lines
- Endotracheal intubation and use of laryngeal mask

NOTE. In the case of the French nurse who infected a female patient with HIV during routine nursing care, the hypothetical (but unproven) mode of viral transmission involved breaking open a glass vial by hand and injecting its contents into a venous line [24]. In 2 of the cases involving HCV transmission [16, 18], there were distinct breaks with universal precautions. In the first case, the anesthesiology assistant did not wear gloves and had an oozing abrasion on his finger. In the second case, the narcotics-addicted anesthesiologist auto-injected narcotic drugs before administering drugs to patients. Obtainment and use of venous and arterial access still are considered to be fairly safe for the purposes of our decision chart, provided these occur under complete antiseptic technique, with universal precautions, and with newly gloved hands. Ideally, no-sharp techniques should be used at all times.

Category II. This category lists procedures for which viral transmission from health care worker to patient is unlikely, although it is theoretically not impossible. Transmission has never been documented for these procedures. The presumed low likelihood of transmission was determined on the basis of extrapolated data and procedure characteristics. The practical nature of these procedures is such that risk of blood-blood contact between physician and patient is minimal, because the operative field and the physicians’ hands are well visualized, and no deep spaces are reached other than with devices (e.g., scopes and catheters); therefore, the physician’s fingers and sharps are never unseen in close proximity.

Category III. This category consists of those procedures that have proven to be exposure-prone—in other words, they are procedures during which a laboratory-confirmed clinical case of viral transmission from a health care worker to a patient...
Table 3. Category III: a list of categories of procedures for which there is definite risk of viral transmission or that are exposure-prone procedures.

<table>
<thead>
<tr>
<th>Procedure or field</th>
<th>Specific procedures and incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal surgery</td>
<td>For HBV, elective nephrectomy, small bowel resection, elective cholecystectomy, subtotal thyroidectomy (2 patients [14] and 3 patients [5]); unspecified surgery (3 patients [6]); other elective open abdominal surgery</td>
</tr>
<tr>
<td>Anesthesiology</td>
<td>For HCV, administration of general anesthesia, preparation of narcotic drugs, placement of venous and arterial catheters, intubation of patients, and artificial respiration (5 patients [18] and 217 patients [16])</td>
</tr>
<tr>
<td>Cardiothoracic surgery</td>
<td>For HBV, unspecified procedure (5 patients [4]), valve replacement, coronary artery bypass grafting, other bypass surgery, orthoptic heart transplantation, repair of congenital heart defects, thymectomy, open-lung biopsy (17 proven infected patients of 361 researched cases of potential viral transmission [2] and 19 of 144 [9]); for HCV, unspecified (1 patient [20]; 1 patient, for a 0.36% transmission rate [17]; 3–7 of 3000 [21]) and valve replacement (5 of 222 [15])</td>
</tr>
<tr>
<td>Open extensive head and neck surgery</td>
<td>Oncological procedures and amputations</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>Craniotomy and intracranial procedures and open-spine surgery</td>
</tr>
<tr>
<td>Nonelective procedures performed in the emergency department</td>
<td>Open resuscitation efforts, vaginal or rectal examination in presence of pelvic fracture, deep suturing to arrest hemorrhage, and internal cardiac massage</td>
</tr>
<tr>
<td>Obstetrical/gynecological surgery</td>
<td>For HBV, Caesarean section, forceps delivery, episiotomy, cone biopsy, and ovarian cyst removal (22 of 247, for a 9% overall transmission rate [1], 2 patients [14]); other unspecified gynecological surgery (8 of 589 and 9 of 1020 [6]); for HCV, unspecified (1 patient [19]) and other transvaginal obstetrical and gynecological procedures involving hand-guided sharps (e.g., cone biopsies involving suturing, administering local anesthetic to cervix, and attaching scalp electrodes to baby’s head during delivery)</td>
</tr>
<tr>
<td>Orthopedic procedures</td>
<td>For HBV, total knee arthroplasty [8]; for HIV, total hip arthroplasty (1 of 983 [22]), major joint replacement surgery (e.g., hip, knee, shoulder, and elbow), open spine surgery, and open pelvic surgery</td>
</tr>
<tr>
<td>Plastic surgery</td>
<td>Extensive cosmetic procedures (e.g., abdominoplasty, breast reduction, and thigh plasty)</td>
</tr>
<tr>
<td>Psychiatric evaluations and care of violent and/or biting patients</td>
<td>...</td>
</tr>
<tr>
<td>Transplantation surgery</td>
<td>...</td>
</tr>
<tr>
<td>Trauma surgery</td>
<td>Including open head injuries, extensive soft-tissue trauma, and ophthalmic trauma</td>
</tr>
<tr>
<td>Interactions with patients in situations during which risk of biting of physician is significant</td>
<td>For example, interactions with violent patients or patients experiencing an epileptic seizure</td>
</tr>
<tr>
<td>Any open surgical procedure of &gt;3 h in duration, probably necessitating glove change</td>
<td>...</td>
</tr>
</tbody>
</table>

**NOTE.** Procedures are listed per specialty. Shown are the type of procedure, virus transmitted, number of patients infected (when available), denominators (when available), transmission rate (when available), and reference. HBV, hepatitis B virus; HCV, hepatitis C virus.

has occurred. Documented risks are quantified, and the original literature is referred to in the list of such procedures. This category also includes those procedures that are highly likely to be exposure-prone—that is, viral transmission is theoretically possible but has not been documented to date. Transmission risks are extrapolated from available data on the basis of similarities in mechanical aspects of procedures for which viral transmission has occurred, or the practical nature of the procedures is such that needle-stick injuries are likely to occur. These procedures are not proven to be unsafe, but the risks are considered comparable to those that are. These procedures are considered dangerous when performed by infected personnel and are off-limits for infected physicians.

The committee acknowledges that there is a frank absence of data for categorizing most surgical and medical procedures. However, by consensus it decided to arrange procedures by these 3 categories, as presented in tables 1–3, on the basis of its interdisciplinary expertise. Items can move between categories in the face of new data.

The decision chart, as illustrated by table 4, combines the transmission risks per procedure as outlined in the categories of tables 1–3 and the viral characteristics for each pathogen, which groups infected physicians in group A or group B. For the hepatitis viruses, a specific boundary was set between low and increased infectivity. Infectivity of viruses is thought to be related to the volume injected and the viral titer of the donor [55].

For HIV, no separate groups have been
made. The committee recognizes that HIV loads are important when assessing infectivity. Higher viral loads have been proven to be more infectious than lower loads, both for maternal-fetal transmission and transmission between heterosexual partners. Yet determining where the cutoff lies in the health care setting is an impossible task. Although there admittedly are no definitive data on immune impairment and transmissibility, HIV load is a more important issue to consider than symptomatic AIDS, because viral loads during asymptomatic (but treated) AIDS may be lower than viral loads during the episode of asymptomatic but untreated HIV infection. However, a physician with symptomatic AIDS may be too debilitated to practice and is susceptible to infection. Such physicians should be subjected to regular medical evaluations by their treating physician to assess their overall competence to practice. HIV-positive physicians who adhere to the guidelines can practice with certain restrictions, unless they have symptoms of AIDS, as defined by the CDC [56], and are too debilitated.

Group A includes HBV-positive physicians who are negative for HBeAg and whose serum samples yield <10^5 genome equivalents/mL [57]. Serum samples obtained from HCV-positive physicians may not yield >10^6 virions/mL for the physician to be included in group A. Admittedly, nondetectable virus does not equate with cure or noninfectivity, but transmission risks under such circumstances are exceedingly small.

Group B includes those physicians with the following viral characteristics: for HIV-infected persons, the group includes persons who are HBeAg or HBV DNA positive or whose serum samples yield >10^4 genome equivalents/mL; and for HCV-infected persons, the group includes those with a high viral load (defined as >10^6 virions/mL). The rationale here is the fact that vertical transmission of HCV has only occurred when maternal serum titers were >1 X 10^4 viral equivalents/mL. [58]. Admittedly, this boundary is arbitrary, but it is based on reasonable available data and expert consultation (by B.W., R.G.S., and R.L.N.).

The decision chart was created with 2 different risks weighed: the risk of blood-bone contact between physician and patient, and conversely, the risk of viral transmission per virus. If a physician has active disease, no procedure of any category should be performed, and full practice restrictions should take effect until recovery (or remission to a chronic, less infectious phase of disease). Active disease is defined by an AIDS-defining syndrome for HIV-positive physicians [56] and by active hepatitis with abnormal liver enzyme findings for HBV- and/or HCV-infected physicians.

**CONCLUSIONS**

We believe that these recommendations are reasonable because they are based on a compilation of historic and recent scientific data, as well as on the guiding principles and considerations considered by experts from a variety of disciplines who reviewed the issue from different vantage points. A limitation of our proposal is the fact that the categories of procedures are admittedly rudimentary and ideally require a far more detailed and extensive inventory. Also, because our committee did not have a dentistry representative during the development of this article, we did not feel qualified to address dentists.
Acknowledgments

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Potential conflicts of interest. All authors: no conflicts.

References

29. Canadian Medical Association. HIV infection in the workplace. Available at: http://www .cma.ca/multimedia/staticContent/HTML/N


In the list of authors, the footnotes indicating the affiliations for Melanie M. Taylor are incorrect. Her name should be listed as “Melanie M. Taylor**2,a**” (not “Melanie M. Taylor**2**”). Footnote a should read “**Assigned to Los Angeles County Department of Health Services, California (N.E.L. and M.M.T.)**” (not “**Assigned to Los Angeles County Department of Health Services, California [N.E.L.]; assigned to Arizona Department of Health Services, Phoenix, Arizona [M.M.T.]**”), and footnote b should read “**Present affiliations: Los Angeles County Department of Health Services, California (N.E.L.); private practice, West Hollywood, California (P.J.R.); Arizona Department of Health Services, Phoenix, Arizona (M.M.T.)**” (not “**Present affiliations: Los Angeles County Department of Health Services, California [N.E.L.]; private practice, West Hollywood, California [P.J.R.]**”). The journal regrets these errors.

The second sentence in the Methods section should read “For each case, we selected from clinic schedules up to 3 control subjects who were HIV-positive MSM without skin symptoms” (not “For each case, we selected up to 3 control subjects from clinic schedules who were HIV-positive MSM without skin symptoms”). The journal regrets this error.

There are 2 errors that appear in table 1. The units for CD4 cell count should be given as “cells/mm³” (not “cells/mL”), and the units for viral load should be given as “copies/mL” (not “copies/mm³”). The corrected table appears below. The authors regret these errors.

### Table 1. Demographic characteristics of case patients and control subjects in a case-control study of community-associated methicillin-resistant *Staphylococcus aureus* skin infections among HIV-positive men who have sex with men.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Case patients</th>
<th>Control subjects</th>
<th>(P^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, median years (range)</td>
<td>38 (31–57)</td>
<td>40 (22–64)</td>
<td>.139</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>24 (68.6)</td>
<td>34 (44.7)</td>
<td>.013</td>
</tr>
<tr>
<td>Hispanic</td>
<td>8 (22.9)</td>
<td>23 (30.3)</td>
<td>.434</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>3 (8.6)</td>
<td>13 (17.1)</td>
<td>.072</td>
</tr>
<tr>
<td>Asian</td>
<td>0 (0.0)</td>
<td>2 (2.6)</td>
<td>.225</td>
</tr>
<tr>
<td>Other</td>
<td>0 (0.0)</td>
<td>4 (5.3)</td>
<td>.248</td>
</tr>
<tr>
<td>Insurance status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No insurance</td>
<td>10 (28.6)</td>
<td>31 (40.9)</td>
<td>.238</td>
</tr>
<tr>
<td>Private insurance</td>
<td>10 (28.6)</td>
<td>21 (27.6)</td>
<td>.858</td>
</tr>
<tr>
<td>Public insurance<strong>b</strong></td>
<td>15 (42.9)</td>
<td>24 (31.6)</td>
<td>.231</td>
</tr>
<tr>
<td>Unemployed</td>
<td>14 (40.0)</td>
<td>29 (38.2)</td>
<td>.714</td>
</tr>
<tr>
<td>History of sexual contact</td>
<td>27 (77.1)</td>
<td>59 (77.6)</td>
<td>.778</td>
</tr>
<tr>
<td>CD4 cell count, median cells/mm³  (range)</td>
<td>338 (&lt;10 to 1424)</td>
<td>409.5 (0 to 1424)</td>
<td>.736</td>
</tr>
<tr>
<td>Viral load, median copies/mL</td>
<td>8154 (25 to 657,000)</td>
<td>594.5 (25 to 750,000)</td>
<td>.460</td>
</tr>
</tbody>
</table>

**NOTE.** Data are no. (%) of patients, unless otherwise indicated.

* Cochran-Mantel-Haenszel statistic, stratified by match groupings of case patients and control subjects.

b Medicare, Medicaid, or AIDS Drug Assistance Program.
An error appeared in an article published in the 1 June issue of the journal (Reitsma AM, Closen ML, Cunningham M, et al. Infected physicians and invasive procedures: safe practice management. Clin Infect Dis 2005;40:1665–72). In the list of authors, Patricia M. Tereskerz should be listed as the last author (not Paul A. Lombardo, who should be listed between Marshall Cunningham and Henry N. F. Minich). The list of authors should read “Angelique M. Reitsma,1 Michael L. Closen,4 Marshall Cunningham,5 Paul A. Lombardo,1 Henry N. F. Minich,8 Jonathan D. Moreno,1 Ronald L. Nichols,3 Richard D. Pearson,5 Robert G. Sawyer,2 Brian Wispelwey,3 and Patricia M. Tereskerz1.” The journal regrets this error.