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## Long-Acting Injectable Antiretroviral Therapy: An Opportunity to Improve Human Immunodeficiency Virus (HIV) Treatment and Reduce HIV Transmission Among Persons Being Released From Prison Facilities

To the Editor—Antiretroviral therapy (ART) has decreased human immunodeficiency virus (HIV) morbidity and mortality [1]. However, efficacy is dependent upon adherence, which is influenced by behavioral, social, and structural factors. Among these, incarceration can negatively impact ART adherence [2–4]. The time after release from incarceration, termed community reentry, can be a period of poor ART adherence, subsequent viral rebound, and potential HIV transmission to sexual and substance-using partners [3, 5, 6]. A recent review demonstrated that linkage to care and adherence were significantly worse during community reentry compared to the periods prior to and during incarceration [2]. Innovative approaches to improve adherence to ART during community reentry are urgently needed given that criminal justice populations have an increased prevalence of HIV compared to the general population [7, 8].

Long-acting injectable (LAI) ART is a future alternative to oral ART that can address the challenges of daily adherence [9]. LAI ART should be considered for individuals who are leaving correctional institutions in an effort to maintain viral suppression. The use of LAI medications has been successful for many other indications [10–12]. Now, similar drug delivery technology has been developed for ART that allows for dosing every 4–8 weeks, bringing hope of consistent therapeutic ART levels between doses, viral suppression, and lower risk of transmission. Clinical trials have demonstrated similar potency, efficacy, and side effect profiles between LAI and oral ART [13–17]. However, to be eligible for LAI, one must first achieve viral suppression using oral ART.

Given that most HIV-infected individuals in prison have access to oral ART and more often achieve viral suppression [2] but have poor adherence during community reentry, LAI ART should be investigated as an option for persons being released from prison. Individuals could be transitioned to LAI ART prior to release, thus providing uninterrupted ART during community reentry. Following linkage to community care, LAI ART could be continued or a transition to oral ART could occur.

However, there are potential challenges to this approach that must be investigated. Linkage to HIV care is necessary, yet remains an obstacle for this population. Therefore, any LAI ART intervention should be offered in combination with supportive services. There will also be practical considerations such as determining patient eligibility and training correctional and community providers. The cost of LAI ART, which is currently undetermined, may also pose challenges to constrained correctional budgets. Additionally, a number of ethical concerns should be considered, including the need to assure voluntary decision making among patients regarding HIV treatment options. Finally, use of LAI ART would likely be limited to persons who are incarcerated for at least 6 months to sufficiently confirm viral suppression on oral ART and the ability to transition patients to LAI ART prior to release.

Considering the potential benefits, use of LAI ART should be explored among incarcerated persons nearing release. First, though, we must identify how to successfully implement LAI ART programs in correctional settings with linkage to treatment in the community. Therefore, research investigating the feasibility, acceptability, and efficacy of LAI ART in this population must be prioritized.

### Notes

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## Does the Centers for Disease Control and Prevention's Ventilator-Associated Event Definition Unintentionally Contradict Its Antimicrobial Stewardship Initiative?

To the Editor—The Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN) introduced a ventilator-associated event (VAE) definition in January 2013 in an effort to provide an objective, reliable approach to surveillance for ventilator-associated pneumonia (VAP) [1]. Prior definitions for pneumonia (PNEU definition) contained many subjective elements including requirement for chest radiographic evidence of pneumonia, which drew criticism and skepticism from care providers [2, 3].

The VAE algorithm has 3 tiers: tier 1, ventilator-associated condition (VAC); tier 2, infection-related ventilator-associated complication (IVAC); and tier 3, possible VAP (PVAP) [4]. The first 2 tiers were developed by CDC/NHSN to be appropriate for the potential future uses of public reporting and pay-for-performance programs [1]. CDC/NHSN has also developed a VAE calculator that has made surveillance of VAE as objective as possible, provided the right data are entered into the calculator [5].

Transition from VAC to IVAC requires that the patient meet the following criteria: temperature >38°C or <36°C *or* white blood cell count ≥12 000 cells/μL or ≤4000 cells/μL, *and* a new antimicrobial agent(s) is started and is continued for ≥4 calendar days within 2 calendar days before or after the onset of worsening oxygenation. Table 1 outlines VAE elements for 2 examples where patients were both intubated for pneumonia and met the definition of IVAC and subsequently PVAP. In both cases, broad-spectrum antibiotics were started because of a history of hospital exposure and were de-escalated to cefazolin once cultures confirmed growth of methicillin-sensitive *Staphylococcus aureus*. VAE definition categorized patients as having VAC based on increased positive end-expiratory pressure (PEEP) and fraction of inspired oxygen ($FiO_2$) as it is designed to do. It then categorized patients into IVAC because cefazolin was started as a new antibiotic regardless of de-escalation.

Most patients respond to treatment within 72 hours [6]. Worsening in respiratory status may be related to noninfectious causes such as heart failure or an infectious complication due to the same infection such as a mucous plug or development of empyema [6, 7]. Another consideration is that the increase in PEEP after 2 days of stability may be just due to delay in host response to treatment. None of these is a reason to continue broad-spectrum treatment once the culture result is available. Guidelines recommend prompt de-escalation of antibiotics in an appropriate manner based on cultures, as seen in these 2 cases [6]. VAE definition was developed for potential future uses of public reporting and pay-for-performance programs [1]. The real problem is that clinicians may face a dilemma on whether to de-escalate antibiotic if penalty results from categorization of patients into IVAC because of their appropriate practice of de-escalation. Hence VAE definition directly contradicts CDC's other laudable initiative of antimicrobial stewardship, which actively advocates prompt de-escalation of antibiotics when appropriate [8].

While it is true that the new VAE definition has improved objectivity of the definition, it may have swung the pendulum too far. It is prudent that NHSN reexamine this definition of VAE before using it for public reporting and pay-for-performance programs.

### Note

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