# Infectious Diseases Physicians' Approach to Antiretroviral Therapy (ART) in HIV/AIDS Patients Admitted to an ICU

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## ABSTRACT

**Background:** There is increasing emphasis in treatment guidelines on the use of antiretroviral therapy (ART) at all stages of HIV infection. However, little is known regarding appropriate administration of ART regimens in the setting of critical illness. We developed a survey to better understand how infectious diseases (ID) experts approach use of ART in critically ill HIV/AIDS patients admitted to an ICU.
**Methods:** Web-based surveys were distributed in October 2010 to the 1080 adult ID physician members of the Emerging Infections Network. Responses were stratified by region, practice type, years of HIV experience and by a cumulative HIV medicine score developed to measure expertise in managing HIV. Results were analyzed using the Pearson Chi-square test with Bonferroni correction (alpha level < 0.001).
**Results:** A total of 503 members (46%) responded. Most respondents (58%) saw 5 or fewer HIV patients per month in their ICUs. Respondents from academic institutions were significantly more likely to indicate that HIV medicine was a considerable part of their practice. In both ART-naïve and -experienced patients, respondents were more likely to initiate or continue ART during treatment of an opportunistic infection (OI), (36% and 63.1%, respectively) than for low CD4 count/high viral load (21.4% and 58.7%, respectively). City/county hospital providers were the most likely to initiate or continue ART in critically ill HIV patients. The practioner level of expertise in managing HIV did not have a significant effect on decisions on when to initiate or continue ART. The OIs for which respondents would most likely start or continue ART included *Pneumocystis jiroveci* pneumonia (PJP), cytomegalovirus, and cryptococcal meningitis. Commonly reported barriers for use of ART in the ICU included immune reconstitution syndrome (IRIS; 48.3%), drug interactions (48.1%), and post-hospital follow up (44.3%).
**Conclusions:** ID specialists were most likely to initiate or continue ART in the ICU setting when the patient is being treated for an OI. Among OIs, respondents would most likely initiate ART for PJP. IRIS, drug interactions, and outpatient follow-up were the most common reported barriers to use of ART in the ICU. Further studies are needed to provide better guidance on ART use in critically ill patients.

## OBJECTIVE AND METHODS

**Primary Objective: To evaluate how ID experts across a range of practice settings approach use of ART in critically ill HIV/AIDS patients admitted to an ICU**

**In September 2010, an 11 question web-based survey was distributed to the 1080 members of the Emerging Infections Network (EIN) who see adult ID patients. The network is funded by the Centers for Disease Control and Prevention and sponsored by the Infectious Diseases Society of America. It is a sentinel network of ID consultants who regularly engage in clinical activity and whose participation is voluntary. Data on geographic location and practice type are maintained for all members. Staff at the coordinating center of the Emerging Infections Network (in Iowa City, Iowa) sent the initial survey invitation by e-mail or facsimile, followed by 2 reminders to non-responders at one and two weeks following the initial mailing.**

**Development of HIV medicine score**

| | | |
|---|---|---|
| Number of HIV-infected patients treated in a usual month | | |
| None | **add 0** | 35 (27%) |
| 1-20 | **add 1** | 192 (38%) |
| 21-50 | **add 2** | 115 (23%) |
| >50 | **add 3** | 59 (12%) |
| Portion of practice which HIV medicine constitutes | | |
| None to very little (0-4%) | **add 0** | 52 (10%) |
| Some (5-25%) | **add 1** | 82 (17%) |
| Moderate (26-50%) | **add 2** | 190 (38%) |
| Considerable (≥50%) | **add 3** | 177 (35%) |

**Summary HIV medicine score**

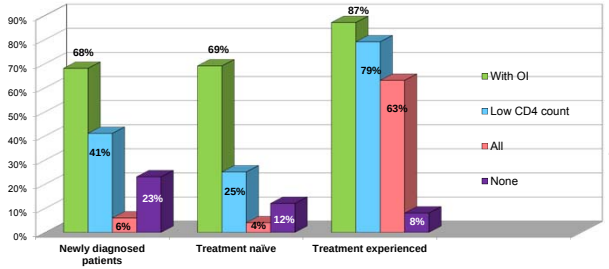
| | | |
|---|---|---|
| No HIV | **total score 0 or 1** | 177 (35%) |
| Some HIV practice | **total score 2, 3 or 4** | 253 (51%) |
| Considerable HIV practice | **total score 5 or 6** | 71 (14%) |

## RESULTS

| Demographic Characteristic | N = 501 |
|---|---|
| ***Years of experience since ID fellowship*** | n (%) |
| < 5 years (includes fellows) | 133 (27) |
| 5-14 years | 121 (24) |
| 15-24 years | 158 (31) |
| ≥25 years | 89 (18) |
| ***Type of practice*** | |
| Academic | 203 (41) |
| Non-academic | 298 (59) |
| ***Average number of HIV cases seen per month in institution's ICU(s)*** | **N = 371** |
| None | 32 (9) |
| <5 | 216 (58) |
| 5-10 | 58 (16) |
| 11-20 | 19 (5) |
| >20 | 12 (3) |
| Don't know | 34 (10) |

**Survey Question:**
**In which of these HIV patient populations would you consider ART while a patient is in the ICU?**

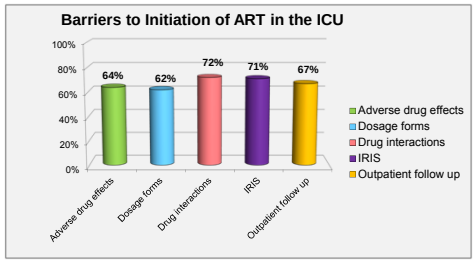
**Total Respondents N = 501**



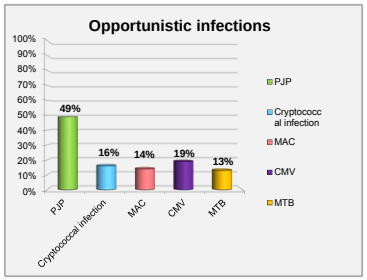

*Instructions were to check all that apply, so percentages add to more than 100%.*

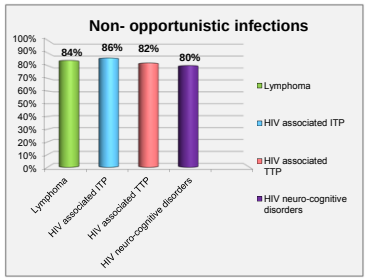
| Survey Question | Practice Type: Academic | Practice Type: Non-academic | HIV Medicine Score: 0-1 | HIV Medicine Score: 2-4 | HIV Medicine Score: 5-6 |
|---|---|---|---|---|---|
| ***In which of these HIV patient populations would you consider ART while a patient is in the ICU?*** | n(%) | n(%) | n(%) | n(%) | n(%) |
| **Newly diagnosed patients** | **N=98** | **N=163** | **N=24** | **N=182** | **N=55** |
| **With OI** | 70 (71) | 107 (66) | 15 (62) | 122 (67) | 40 (73) |
| **With low CD4 count** | 32 (33) | 75 (46)* | 9 (37) | 74 (41) | 24 (44) |
| **All** | 5 (5) | 11 (7) | 2 (8) | 10 (5) | 4 (7) |
| **None** | 25 (25) | 35 (21) | 6 (25) | 46 (25) | 8 (14) |
| **Treatment naïve patients** | **N=99** | **N=155** | **N=22** | **N=180** | **N=52** |
| **With OI** | 70 (71) | 106 (68) | 14 (64) | 125 (69) | 37 (71) |
| **With low CD4 count** | 40 (40) | 74 (48) | 11 (50) | 81 (45) | 22 (42) |
| **All** | 4 (4) | 13 (8) | 2 (9) | 10 (5) | 5 (10) |
| **None** | 24 (24) | 32 (21) | 5 (23) | 40 (22) | 11 (21) |
| **Continue therapy in treatment experienced patients** | **N=126** | **N=209** | **N=34** | **N=232** | **N=69** |
| **With OI** | 105 (83) | 185 (88) | 25 (73) | 204 (88) | 61 (88) |
| **Low CD4 count** | 96 (76) | 169 (81) | 21 (62) | 187 (81) | 57 (83)* |
| **All** | 75 (59) | 136 (65) | 21 (62) | 150 (65) | 40 (58) |
| **None** | 11 (9) | 17 (8) | 5 (15) | 19 (8) | 4 (6) |

*p<0.05
Note: Instructions were to select all that apply, so numbers add to more than the total respondents. Bolded "N" represents the actual respondents to that question out of the total respondents.




**Opportunistic and Non-opportunistic infections for which physicians would initiate ART while in the ICU**




## CONCLUSIONS

- **Our survey revealed a wide variability in self-reported practice patterns for the critically ill patient with HIV**
  - **When asked in which patients ART should be considered while in the ICU, responses varied from none to all HIV patients.**
  - **HIV medicine score and type of practice did not significantly impact the ID physician's approach in this patient population**
- **The majority of practitioners would initiate ART in a patient presenting with *Pneumocystis jiroveci pneumonia* (PJP).**
- **The most commonly reported barriers to initiation of ART included IRIS, drug interactions, and outpatient follow-up; other frequently mentioned barriers included variable drug absorption, lack of baseline genotype, and organ failure**
- **The issues surrounding the initiation or continuation of ART in the critically ill remain controversial.**
- **The lack of consensus suggests the need for well-designed studies to provide better guidance on ART use in critically ill patients. Additionally, these issues should be specifically addressed in the major guidelines for use of ART.**

## CONFLICTS OF INTEREST

**The investigators do not have any conflicts of interest to disclose**

**Survey link: http://www.int-med.uiowa/research/ein/HIV_ICUHAART_finalsurvey.pdf**

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