Randomized trial of HIV-ASSIST versus guidelines for ART selection by trainees

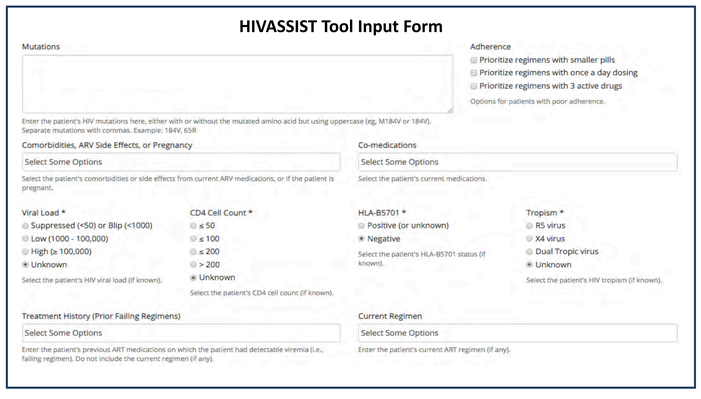
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BACKGROUND

- Support for primary care clinicians in HIV medicine is critical in light of national HIV-provider shortages.
- **HIV-ASSIST (www.hivassist.com)** is a free, online tool providing individualized ART decision-support and education. HIV-ASSIST:
  - Couples guideline content delivery with decision-support
  - Employs a multi-criteria decision analysis framework to evaluate ~2000 two-, three-, and four-drug combinations in a ranked list
- **Hypothesis:** Trainees using HIV-ASSIST in conjunction with guidelines would be more likely to make appropriate ART selections, compared to those using DHHS guidelines alone



METHODS

- Randomized controlled trial of medical students and Internal Medicine residents at Johns Hopkins University
- Participants were asked to select an ART regimen for 10 HIV case scenarios through an electronic survey
- Interventions to support ART selections
  - Participants were randomized to receive either:
    - DHHS guidelines alone (with video tutorial), or
    - DHHS guidelines and HIV-ASSIST (with video tutorial)
- Outcomes: proportion of 'appropriate' ART responses
  - ART selections were graded 'appropriate' if consistent with DHHS guidelines, or concordant with regimens selected by HIV experts at four academic institutions.
  - A questionnaire was used to assess user experiences with DHHS guidelines and HIV-ASSIST

ACKNOWLEDGEMENTS:

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Trainees using HIV-ASSIST were significantly more likely to choose appropriate ART regimens compared to using guidelines alone.

Figure 1: Median Percent appropriate ART Selection (Q1, Q3) comparing usage of DHHS guidelines to HIV-ASSIST

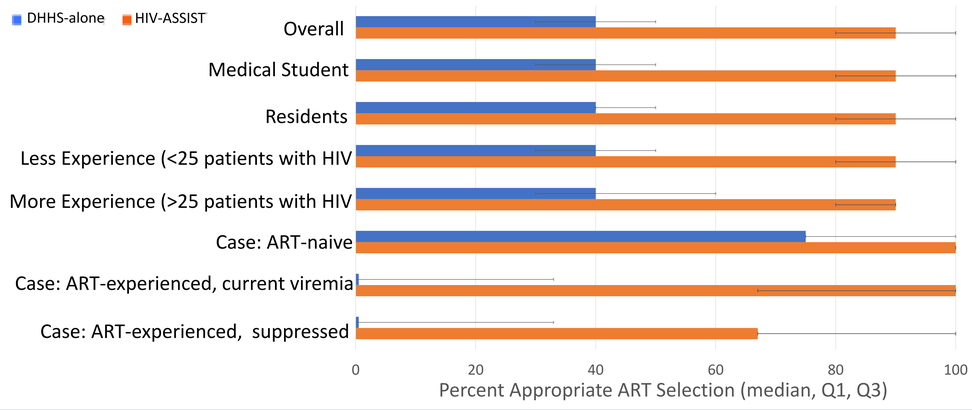


Figure 2: Trainee feedback on usefulness of DHHS guidelines or HIV-ASSIST
Trainees were asked whether DHHS guidelines or HIV-ASSIST "was useful for [case-scenario]"

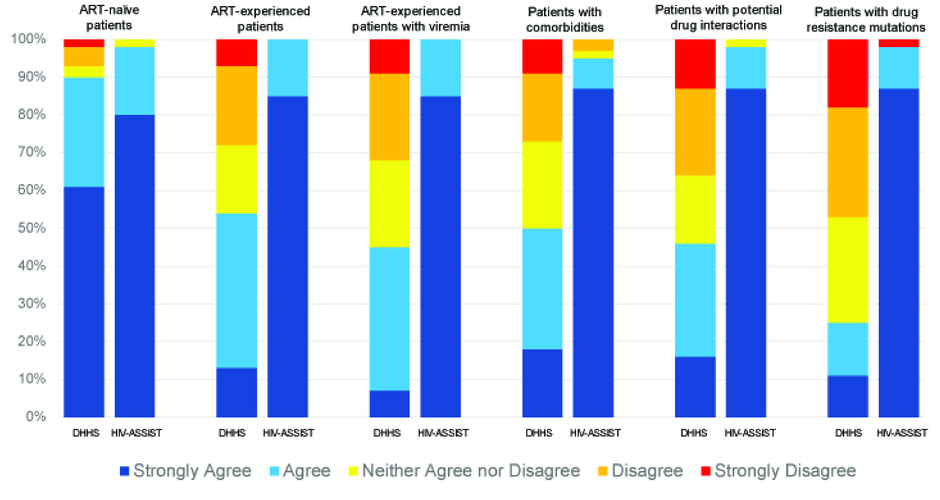


Table 1: Participant Characteristics and appropriateness of ART selections for ten survey based patient scenarios

		DHHS-alone arm	HIV-ASSIST arm	P
N		56	62	
Training	MS1	14 (25%)	12 (19%)	0.816
	MS2	6 (11%)	11 (17%)	
	MS3	10 (18%)	7 (11%)	
	MS4	15 (27%)	17 (27%)	
	PGY1	4 (7%)	7 (11%)	
	PGY2	4 (7%)	4 (7%)	
	PGY3	3 (5%)	4 (6%)	
Time (median, [Q1, Q3])		36 minutes [21, 51]	21 minutes [16, 29]	<0.001
Percent 'appropriate' median [Q1, Q3]	Overall	40% [30%, 50%]	90% [80%, 100%]	<0.001
	MS	40% [30%, 50%]	90% [80%, 100%]	<0.001
	Residents	40% [40%, 50%]	90% [80%, 100%]	<0.001
Percent 'appropriate' ART, by case-scenario: median [Q1, Q3]	ART naïve	75% [75%, 100%]	100 [100%, 100%]	<0.001
	ART experienced—current viremia	0% [0%, 33%]	100 [67%, 100%]	<0.001
	ART experienced—suppressed	0% [0%, 33%]	67 [67%, 100%]	<0.001

Example of HIV-ASSIST RESULTS PAGE



- HIV-ASSIST algorithmically ranks ART regimens by quantitatively evaluating individual covariates (e.g., resistance mutations, concurrent medications, and more) to generate a composite 'weighted utility score' that attempts to maximize likelihood of viral suppression while optimizing tolerability (e.g., minimizing drug interactions, pill burden, comorbidities).
- Each regimen is accompanied by dosing information, summary of guidelines and clinical trial evidence, and annotated explanation of decision-rules leading to the final weighted score.

RESULTS AND CONCLUSIONS

- Among 118 trainees, participants randomized to HIV-ASSIST had significantly higher percentage appropriate ART selections than those using DHHS guidelines (DHHS vs HIV-ASSIST: median 40%,vs 90%, p<0.001)
- The effect was pronounced for complex cases involving ART-experienced, viremic patients (DHHS vs HIV-ASSIST: median 0% vs 100%, p<0.001)
- Significantly more participants felt HIV-ASSIST was useful for making ART selections than DHHS guidelines, particularly for ART experienced cases (DHHS vs HIV-ASSIST 53% vs 85%)
- **Interactive decision-support tools may be important to ensure appropriate implementation of HIV guidelines.**