

Laboratory Methodology Testing Change Due to Increase in HIV Screening in Emergency Department



Renuka Malenie¹, Aisha Kousar¹, Ciarra Dortche², Timothy Reeder³, Chris Miller¹ and Richard Baltaro¹

¹Department of Pathology and Laboratory Medicine, ²Department of Internal Medicine, Division of Infectious Diseases, ³Emergency Medicine, East Carolina University, Greenville, NC, USA

BACKGROUND

Human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) remain leading causes of illness and death in the United States. As of December 2004, an estimated 944,306 persons had received a diagnosis of AIDS, and of these, 529,113 (56%) had died. Screening for a disease is one of the most basic tools of modern public health and preventive medicine. Screening programs control epidemics of infectious diseases by detection in a population group and targeting early treatment.

Based on CDC recommendations in 2006; HIV screening is recommended for patients in all health-care settings after the patient is notified that testing will be performed unless the patient declines (opt-out screening).

Implementation of opt-out screening in the emergency department affected the routine workflow of the chemical laboratory in our center. It was a challenge to incorporate the increased testing in the laboratory workflow utilizing the existing resources to detect HIV-positive patients and link them for long-term care while in the emergency department. In addition a grant was received to perform HIV screening on all patients who had no insurance. We switched from manual testing by Alere Determine™ HIV-1/2 Ag/Ab Combo to automated testing on Abbott platform, ARCHITECT i2000SR immunoassay analyzer HIV Ag/Ab Combo. An automated line was also added which significantly reduced the workload and improved the turn around time leading to proper and timely management of positive cases in the emergency department and labor and delivery.

PROJECT AIM

To incorporate HIV screening test as a routine opt-out blood test to the patients in the emergency department in order to provide better care to the patients without affecting the routine workflow of the laboratory.

PROJECT DESIGN/STRATEGY

Opt-out HIV testing was implemented for patients between 18-65 years of age requiring blood work with no previous documented HIV testing in their electronic medical record. Testing was performed as per CDC algorithm. The screening was initially done by manual HIV 4th generation Ag/Ab assay but with the increasing workload and with the installation of new automated line and change over to ARCHITECT i2000SR from Abbott i1000 the average time per manual test was compared with the time taken to perform the same test by the automated line.

CHANGES MADE

To improve the workflow, the laboratory switched from manual testing by Alere Determine™ HIV-1/2 Ag/Ab Combo to automated testing on Abbott platform, Abbott i-1000 AG/AB Combo. Between March 2017 and July 2018, over 7000 HIV tests were performed which is an average of 591 tests/ month compared to a previous average of 10 tests/month. Testing has increased over 58 times compared to tests done in the previous two years. Nineteen HIV-positive specimens were identified by antigen/antibody combination immunoassay and confirmed as HIV-1 by antibody immunoassay. Among the 14 newly diagnosed, 12 were linked into HIV care; 2 known positives were re-linked to care from emergency department due to improved turnaround time.

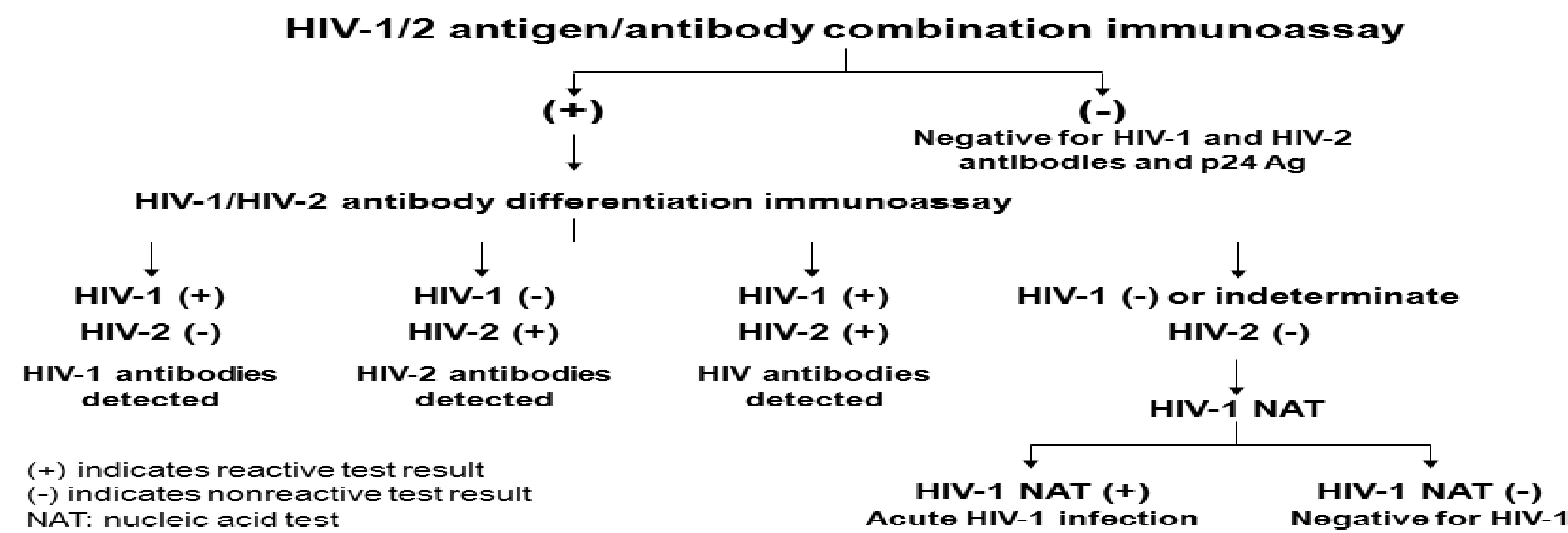
Our study demonstrates the feasibility of incorporating routine HIV testing within existing laboratory infrastructure by just changing the testing methodology. Although laboratory workload increased it helped in early HIV-detection and appropriate and timely long-term care services.

RESULTS/OUTCOMES

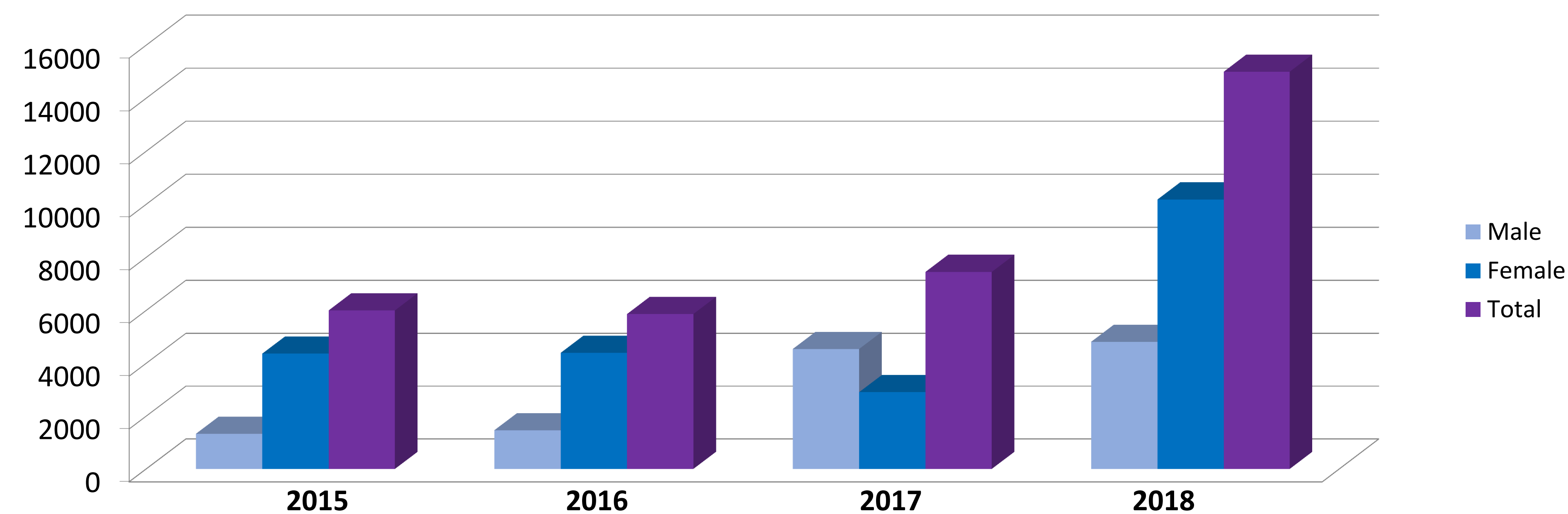
Every single manual test performed by the technologist took 25minutes/test. After the automated line was installed and the Abbott i1000 was switched to iAbbott2000 that time was reduced to 1minute/test so a total of 24 minutes were saved per technologist per test.

The cost per test also decreased substantially. Manual testing by Alere Determine™ HIV-1/2 Ag/Ab Combo cost 16.48 per test as compared to automated testing on Abbott platform, ARCHITECT i2000SR immunoassay which costs 5.99 per test.

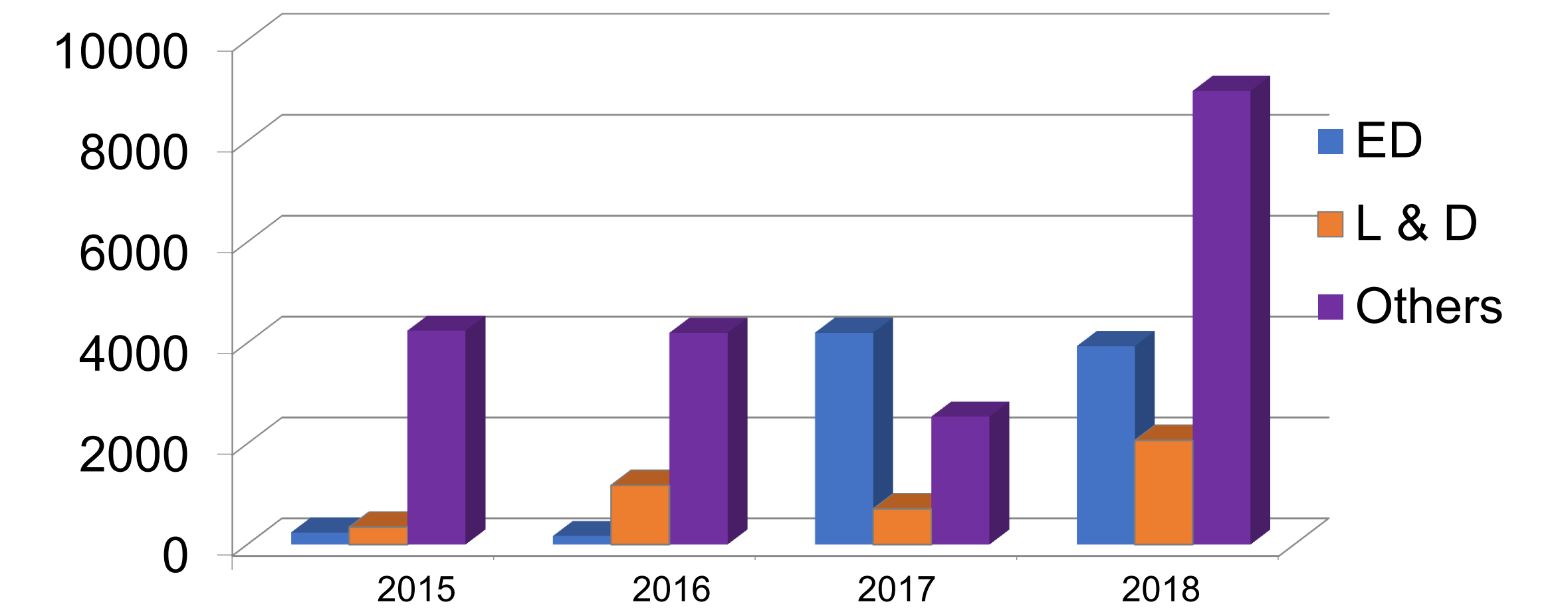
Recommended Laboratory HIV Testing Algorithm for Serum or Plasma Specimens



Workload



Workload in different settings



	2015-2017 (Abbott i1000)	Dec 2017 -July 2018 (Abbott i2000SR)
Total number of tests	19,309	14,998
Time taken to perform one test	25 minutes/test	1 minute/test
Total time taken to perform all the tests in minutes	482,725 minutes	14,998 minutes
Total cost	\$ 318,212.32	\$ 89,838.02

LESSONS LEARNED

Even though the number of tests doubled during this time the time taken to perform a test was significantly reduced without any additional burden to the technologist; which improved their morale as well. The results were encouraging, this not only saved the technologist's time and labor but also made them available to perform other tasks in the meantime. This change in our laboratory protocol improved the turnaround time for HIV screening reports thus providing better patient care. Some patients were linked in to HIV care from the emergency department itself. Our study demonstrates the feasibility of incorporating routine HIV screening test within existing laboratory infrastructure by just changing the testing methodology. Although laboratory workload increased it helped in early HIV-detection and appropriate and timely long-term care services. Future plans include expanding testing among adolescents and utilizing similar methods to integrate Hepatitis C testing.

NEXT STEPS

- To determine the false positive rate of the automated line ARCHITECT i2000SR and compare it to the manual Abbott i1000.
- To expand testing among adolescents (started)
- To utilize similar methods to integrate Hepatitis C testing (started)