



2017 Annual Meeting of the ASCLS  
San Diego, CA



Effects of Blood  
Banking Advanced  
Technology Practice  
Prior to Clinical  
Rotations on CLS  
Student Outcomes

Teresa S. Nadder, PhD, MLS(ASCP)<sup>TM</sup>  
Dept. of Clinical Laboratory Sciences  
Virginia Commonwealth University



## Metrics: Student Feedback 2 Cohorts of Juniors (N=65)

CLLS 306: Survey on Solid Phase Testing in the Student Laboratory

It was helpful to be exposed to the solid phase testing equipment as a learning experience.

Strongly Agree	Agree	Disagree	Strongly Disagree
50 (76.9%)	15 (23.1%)	0	0



7

## Background and Research Problem

- ❖ 2+2 CLS program: 32 new students each year
  - Laboratory practice in CLS major disciplines
    - First year: student laboratory sessions
    - Second year: clinical rotations (3 weeks in Transfusion Medicine)
- ❖ Budget restraints
  - Limited automated equipment
    - Blood Banking student labs: 2 gel technology units
      - No solid phase technology or cell washers
      - Manual tube methodologies

2

## Background and Research Problem

- ❖ Need for additional exposure to advanced technology in Blood Banking
  - Student evaluations
    - Feedback from clinical supervisors
- ❖ Would increase in exposure to BB advanced technology prior to clinical rotations generate positive student outcomes?

## Capital Grant Funding

- ❖ November 2014: \$77,779.00

Item	Quantity (Location)	Unit Price	Total Price
Capture Workstation (Solid Phase Technology)	1 (Richmond) 1 (Abingdon)	\$5,066.33	\$10,132.66
UltraCw Cell Washer	4 (Richmond) 2 (Abingdon)	\$5,608.10	\$33,648.60
Serofuge	3 (Richmond)	\$3,475.00	\$20,775.00
Apple iPad 2 Wi-Fi with cases and warranty	6 (Abingdon)	\$394.99	\$ 2,369.94
Reagents/Supplies			\$ 3,627.57
<b>Total</b>			<b>\$77,763.77</b>



5

## Metrics: Student Feedback 2 Cohorts of Juniors (N=65)

CLLS 306: Survey on Solid Phase Testing in the Student Laboratory

The student laboratory exercise for antibody screening helped me to understand the principle of solid phase testing.

Strongly Agree	Agree	Disagree	Strongly Disagree
43 (66.2%)	21 (32.3%)	1 (1.5%)	0



8

## Metrics

Objective	Metric	Expected Delivery Date(s)
Increase preparedness of CLS students for clinical rotations and workforce placement.	Student feedback: assess satisfaction with preparedness for the Transfusion Medicine clinical rotation. Clinical coordinators/trainers feedback: evaluate student performance in the Transfusion Medicine clinical rotation.	May 15, 2015 March 15, 2016
Improved student performance in clinical rotations and employer evaluations of recent graduates	Clinical coordinators/trainers feedback: evaluate recent graduate performance in Transfusion Medicine Laboratory. Employer feedback: evaluate recent graduate performance in Transfusion Medicine Laboratory.	November 30, 2016
Provide comparable educational experience at Southwest Virginia campus.	Student feedback: assess satisfaction with preparedness for the Transfusion Medicine clinical rotation. # students in CLS program enrolled in Abingdon.	May 15, 2016 November 30, 2016



6

## Metrics: Student Feedback April 16, 2015 (N=31)

CLLS 306: Survey on Solid Phase Testing in the Student Laboratory

Using solid phase testing equipment in the student laboratory was a valuable experience.

Strongly Agree	Agree	Disagree	Strongly Disagree
43 (66.2%)	22 (33.8%)	0	0



9

## Metrics: Student Feedback 2 Cohorts of Juniors (N=65)

### CLLS 306: Survey on Solid Phase Testing in the Student Laboratory

I was able to compare the principles, methods and interpretation of results using solid phase testing versus tube technique and gel technique for antibody identification.

Strongly Agree	Agree	Disagree	Strongly Disagree
41 (63.1%)	23 (35.4%)	1 (1.5%)	0



10

## Metrics: Student Feedback Seniors (N=36)

### Survey II on Solid Phase Testing in the Student Laboratory

The student laboratory exercise utilizing solid phase testing helped me to understand the principle of this technique.

Strongly Agree	Agree	Disagree	Strongly Disagree
24 (66.7%)	12 (33.3%)	0	0



13

## Metrics: Student Feedback Seniors (N=36)

### Survey II on Solid Phase Testing in the Student Laboratory

I felt more confident in my abilities to perform solid phase testing as a result of exposure to the technique the previous year.

Strongly Agree	Agree	Disagree	Strongly Disagree	N/A
19 (52.8%)	16 (44.4%)	1 (2.8%)	0	0



16

## Metrics: Student Feedback 2 Cohorts of Juniors (N=65)

### CLLS 306: Survey on Solid Phase Testing in the Student Laboratory

The student laboratory session on antibody identification gave me a better appreciation for the advantages and disadvantages of solid phase testing.

Strongly Agree	Agree	Disagree	Strongly Disagree
39 (60.0%)	26 (40.0%)	0	0



11

## Metrics: Student Feedback Seniors (N=36)

### Survey II on Solid Phase Testing in the Student Laboratory

Using solid phase testing equipment in the student laboratory was a valuable experience in preparation for the clinical rotation in Transfusion Medicine.

Strongly Agree	Agree	Disagree	Strongly Disagree	N/A
22 (61.1%)	12 (33.3%)	1 (2.8%)	0	1 (2.8%)



14

## Metrics: Student Feedback Seniors (N=36)

### Survey II on Solid Phase Testing in the Student Laboratory

Adequate time was spent on exposure to solid phase testing the junior year in preparation for clinical rotation in Transfusion Medicine.

Strongly Agree	Agree	Disagree	Strongly Disagree	N/A
15 (41.7%)	16 (44.4%)	4 (11.1%)	0	1 (2.8%)

• 2<sup>nd</sup> cohort were given the opportunity to use solid phase testing more frequently prior to entering the clinical rotation based on feedback received from 1<sup>st</sup> cohort.



17

## Metrics: Student Feedback Seniors (N=36)

### Survey II on Solid Phase Testing in the Student Laboratory

It was helpful to be exposed to the solid phase testing equipment as a learning experience during the junior year of the program.

Strongly Agree	Agree	Disagree	Strongly Disagree
24 (66.7%)	12 (33.3%)	0	0



12

## Metrics: Student Feedback Seniors (N=36)

### Survey II on Solid Phase Testing in the Student Laboratory

I felt more confident in my understanding of solid phase testing during the clinical rotation in Transfusion Medicine as a result of exposure to the technique the previous year.

Strongly Agree	Agree	Disagree	Strongly Disagree	N/A
20 (55.6%)	13 (36.1%)	1 (2.8%)	0	2 (5.5%)



15



18

## Metrics: Clinical Coordinators Feedback

- ❖ Annual Clinical Meeting: 2016
  - "Students seem very well prepared for the solid phase when they rotate."
  - Familiar with initial concepts of "sandwich technique" and grading solid phase reactions
    - Interpreted reactions with confidence
    - Comfortable with ID of antibodies with solid phase reactions and they quickly catch on to the automated testing on the ECHOs...I think it's definitely a plus for the students to be exposed to solid phase techniques and reading/grading reactions."



19

## Follow-up

- ❖ Secured additional funding for solid phase equipment
- ❖ 2017 Survey I results consistent with 2015-2016
  - Additional questions
    - Cell washers gave better appreciation for importance of thorough washing of cell suspension
    - 96% agreed or strongly agreed



22

## Metrics: Clinical Coordinators Feedback

- ❖ Annual Advisory Committee Meeting: 2017
  - Addition of solid-phase technology in the Blood Bank student laboratory has better prepared the students for the Blood Bank clinical rotation. Incorporation of gel technology in student laboratory is also "great exposure before the clinical rotation."
  - Currently, Transfusion Medicine at VCUHS has 3 new student workers
    - "top-notch individuals"



20

## Follow-up

- ❖ Additional questions
  - Advantages to using advanced technology
    - Faster TAT
    - No competition for resources
    - Reduced clerical errors
    - Workflow efficiency
    - Real-life adaptability
    - Less chance of bloodborne pathogen exposures
    - More time to learn/understand concepts



23

## Conclusions

- ❖ Positive student and clinical supervisor feedback using two cohorts of students
- ❖ Incorporating advanced technology in the student laboratory sessions was valuable in preparation for the clinical rotation in Transfusion Medicine and for subsequent employment
- ❖ Faculty pleased with introduction of solid phase equipment in the student laboratory session



21



## Acknowledgements:

Dr. Melissa Jamerson  
Ms. Lisa Perkins  
Dept. of Clinical Laboratory Sciences  
Virginia Commonwealth University

Funding for this project received from  
Commonwealth Transfusion Foundation

24