Imagine Saving a Life.

Puget Sound Blood Center

Bacterial Detection

New AABB Standard 5.1.5.1

The blood bank or transfusion service shall have methods to limit and detect bacterial contamination in all platelets

1 MAR '04

PSBC Plan

- **Apheresis Platelets**
  - BacT/Alert
  - Held until 24 hours for sampling
  - Released for transfusion after sampling
  - Positive units quarantined/recalled/cultured
  - Additional charge
- **Whole blood platelets**
  - Testing by transfusion service
  - Multi-reagent strips
    - pH > 6.0
    - Glucose > 0

BacT/Alert System

Current BacT Testing

June through February 2004

- **8979 negative**
- **15 false positives**
  - 7 Growth in BacT/ALERT bottle only. Bacillus or Coagulase Negative Staph
  - 8 No organisms (4), defective cells (4)
- **5 true positives**
  - Listeria Monocytogenes, Staph Aureus, Coag Negative Staph
- **38 discards due to processing loss in IP related to BacT sampling**

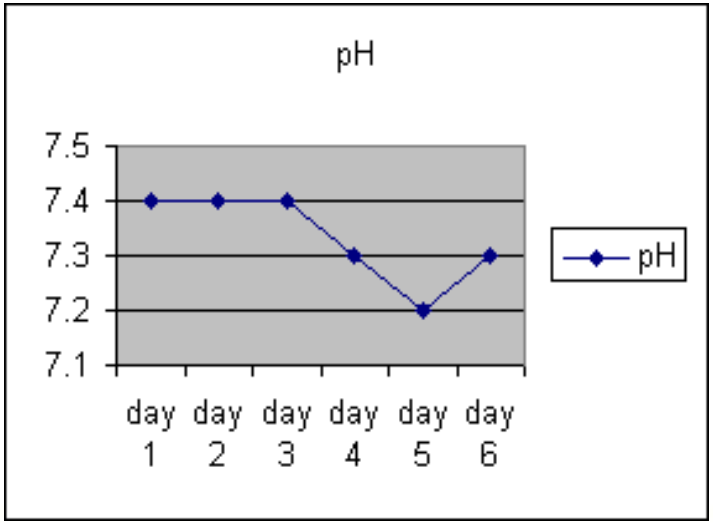
Baseline

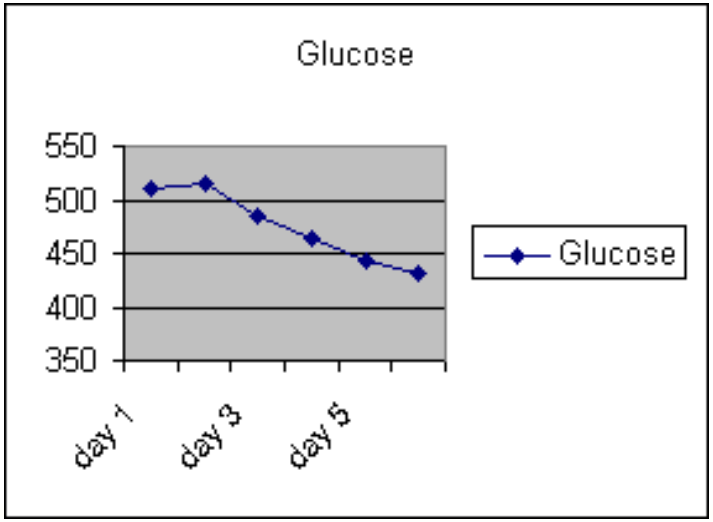
Baseline averages (50 units)

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
pH	**7.4**	**7.4**	**7.4**	**7.3**	**7.2**	**7.3**
Glucose	**510**	**515**	**485**	**464**	**444**	**432**

Comparison data provided by Terumo (65 units from 6 sites)

	Day 1	Day 5
pH	7.2	7
Glucose	340	249





Dipstick Validation –

Whole Blood Platelets

50 units – pH >7.0, Glucose >250 mg/dl

- 7 failed all culture negative

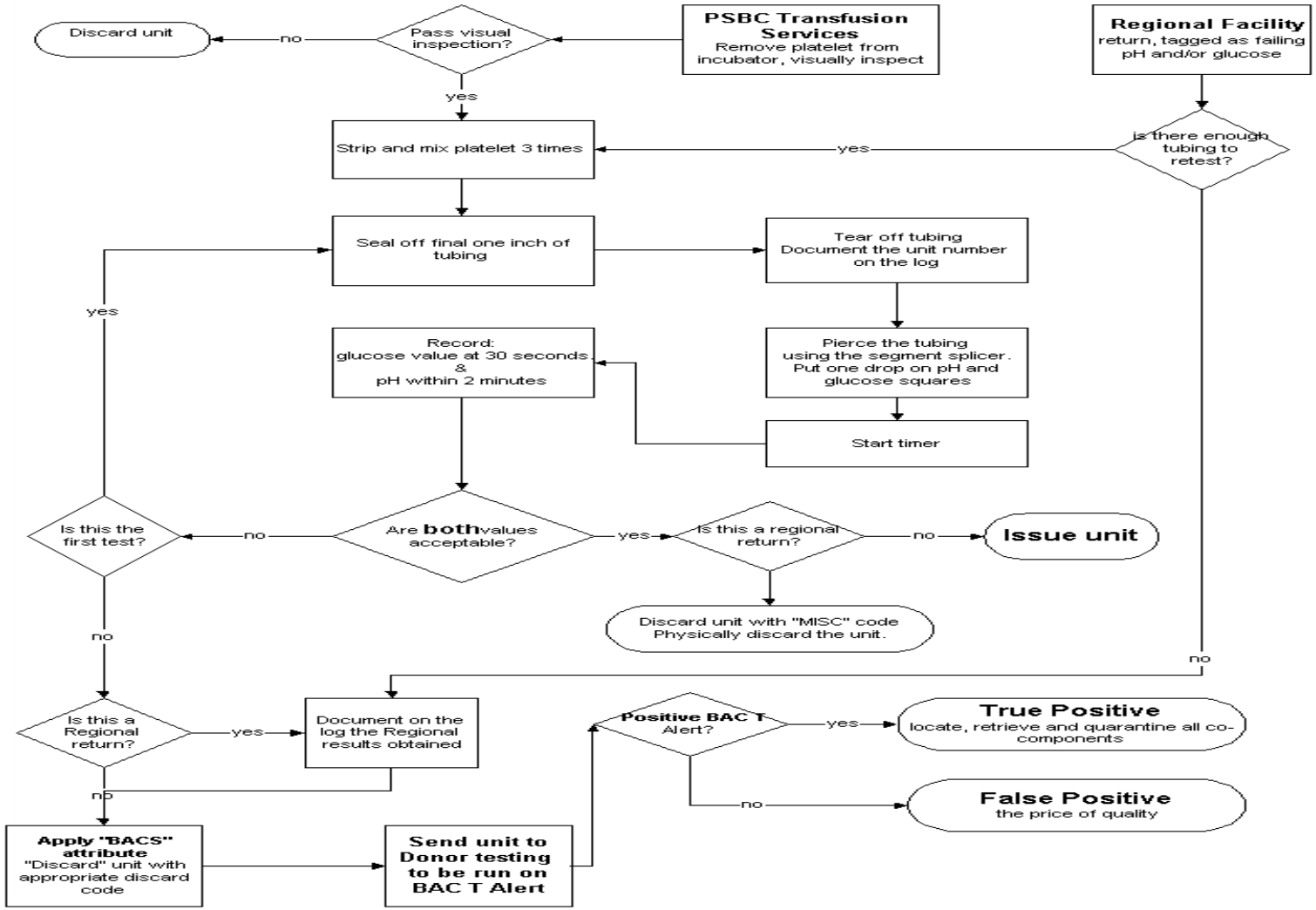
24 units, 12 pools of two

- 6 E-coli seeded (10 & 100 cfu/ml)
  - Positive days 4, 5
- 6 Staph epi. (10 & 100 cfu/ml)
  - All negative

50 Units – pH >6.0, Glucose >0 mg/dl

- All passed (5 units at pH 6.5)
- Mean pH 7.32, mean glucose 500 mg/dl

Dipstick Procedure Flow



Ph and Glucose testing of WB platelets

March 11-21, 2004

Total tested:

- Central = 474 with 1 positive for glucose
  - tested negative on BAC-T Alert.
- UDL = 495 with 4 positive
  - 3 failed for glucose, 1 failed for glucose and pH
  - all four tested negative on BAC-T Alert.
- 1 unit was returned from a Regional hospital
  - their testing failed for pH and glucose
  - unit passed the PSBC criteria.

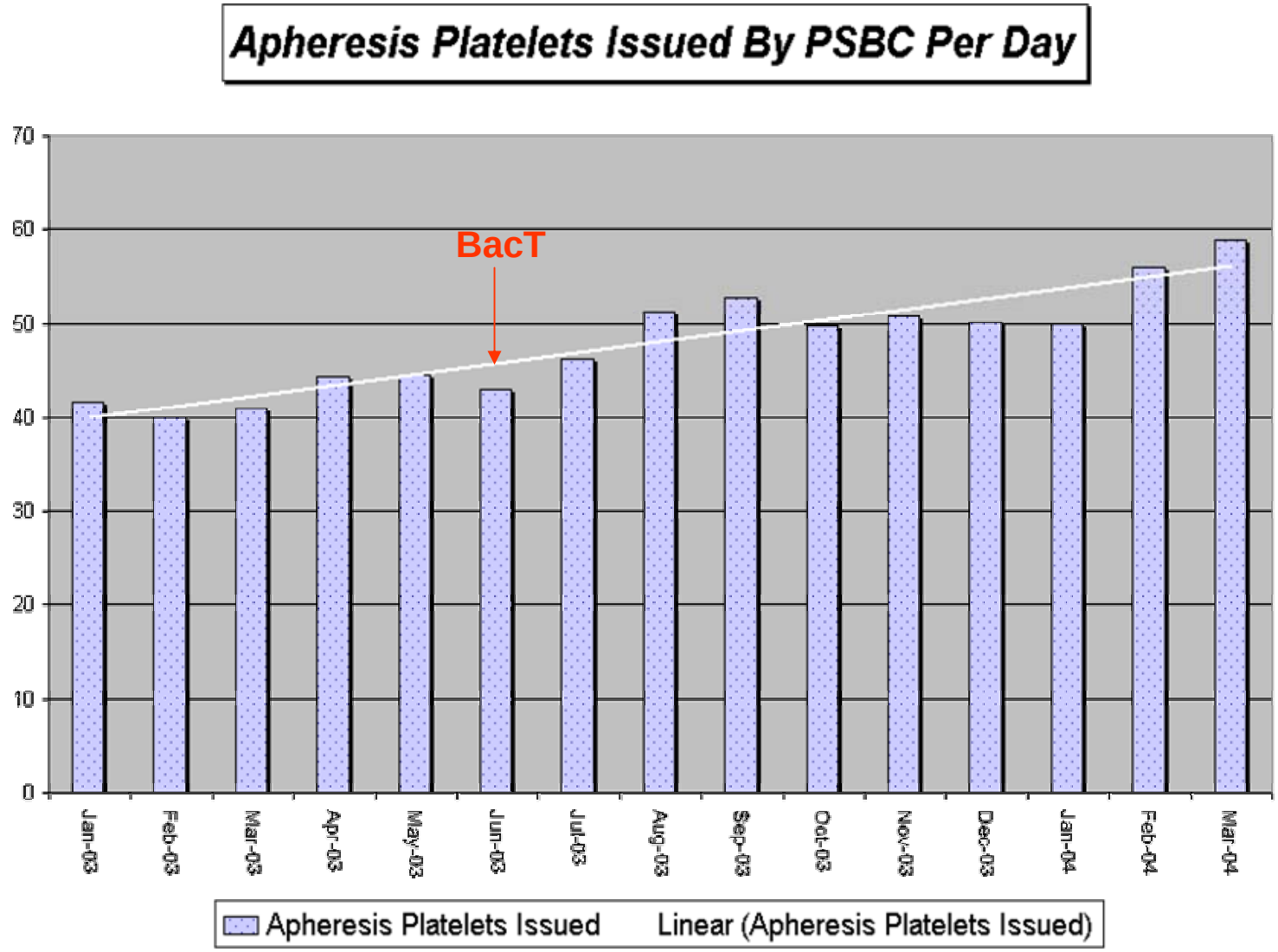
Testing for 6 units (the average pool size) is about 15 minutes if everything meets criteria. (If anything fails testing the first time through, repeat testing must be performed, which adds time, but with the failure rate so low it hasn't been an issue.)

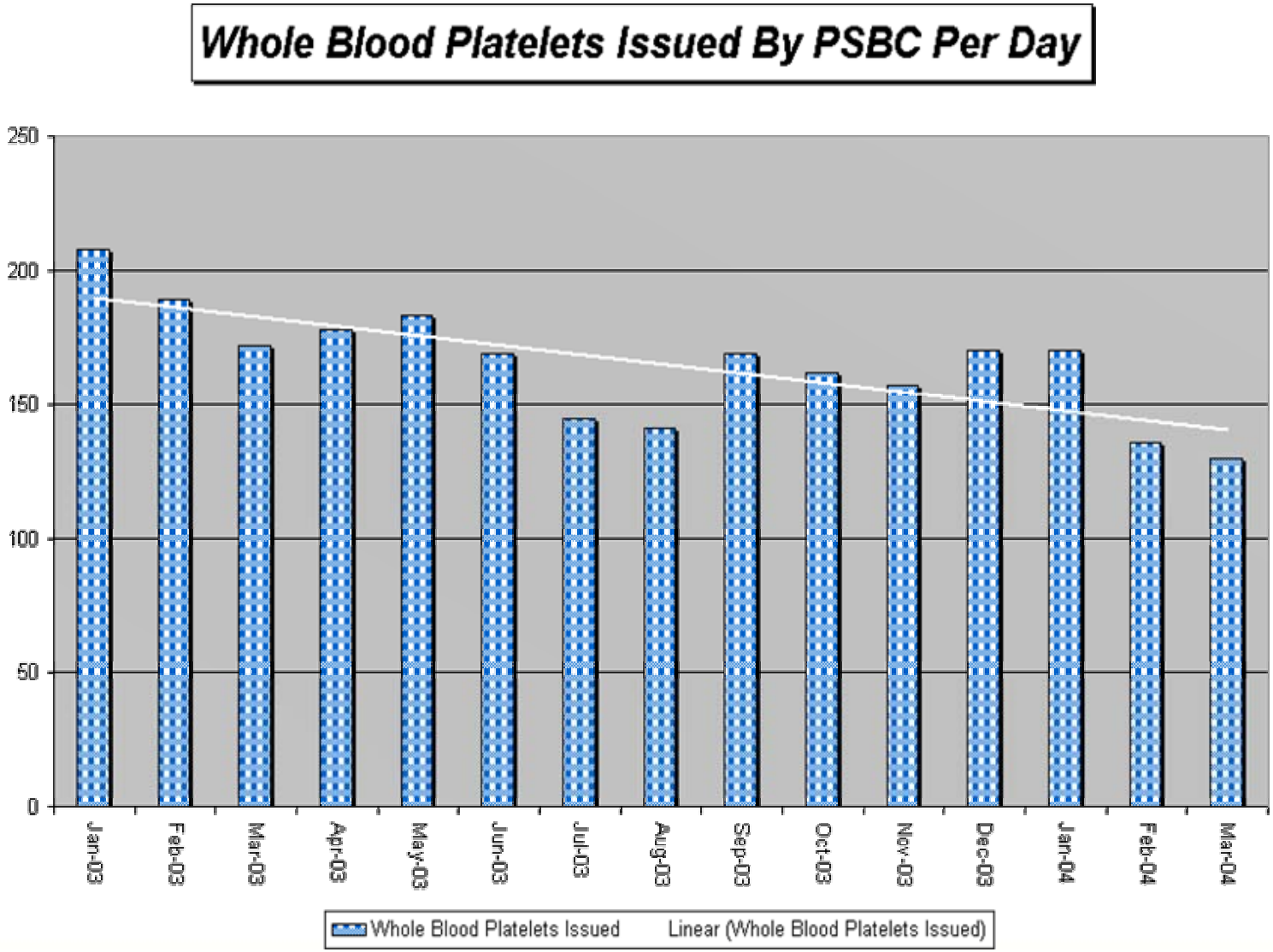
Impact of Bacterial Testing

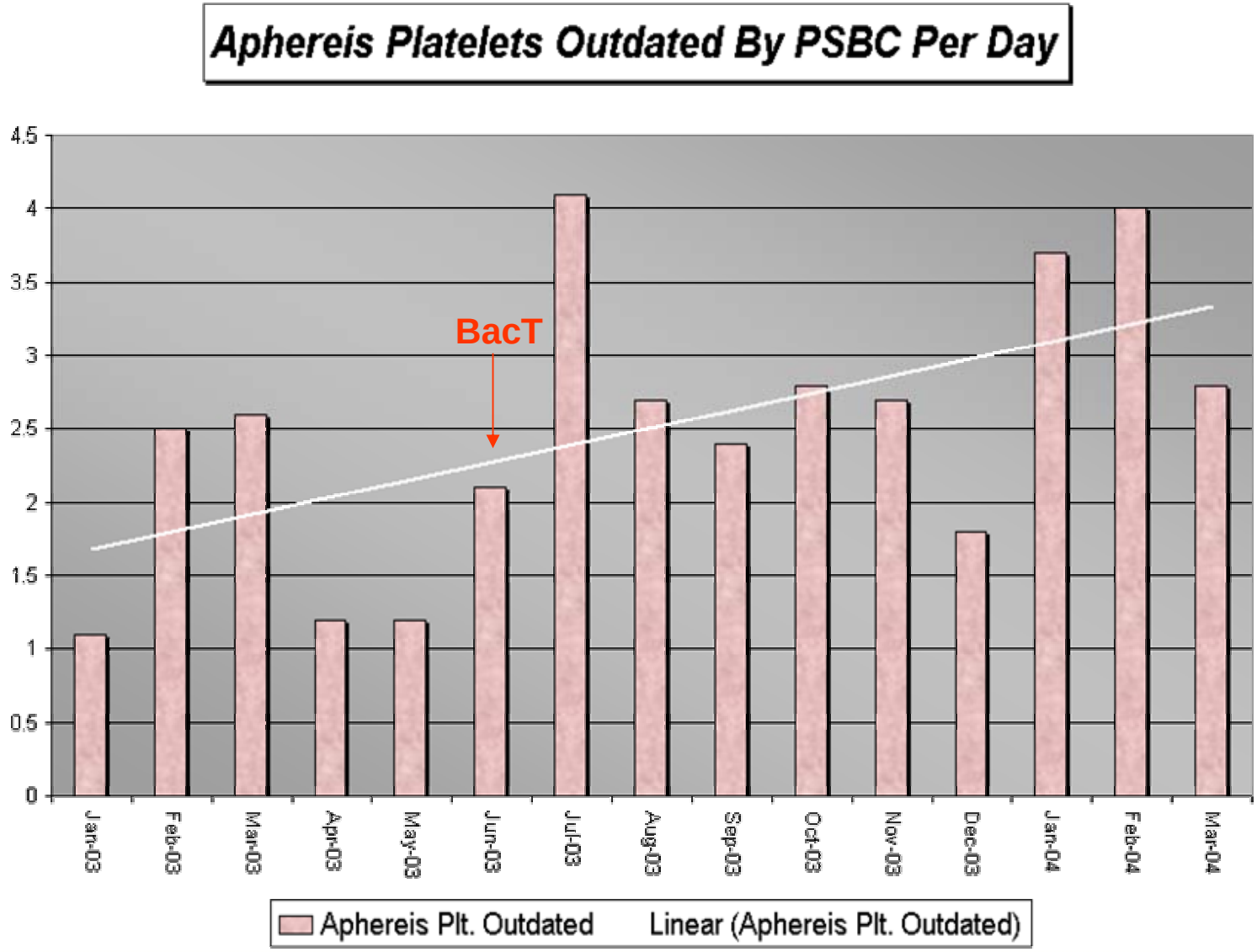
- Reduced shelf life for RAPs
- Increased outdates/ wastage
- Increased costs
- Changed ordering practices by hospitals
  - More RAPs
  - Fewer WBPs, increasing RBC cost
- Inventory challenges and shortages
- Older platelets transfused
- Increased turn-around time for WBPs
- Identification of positive units

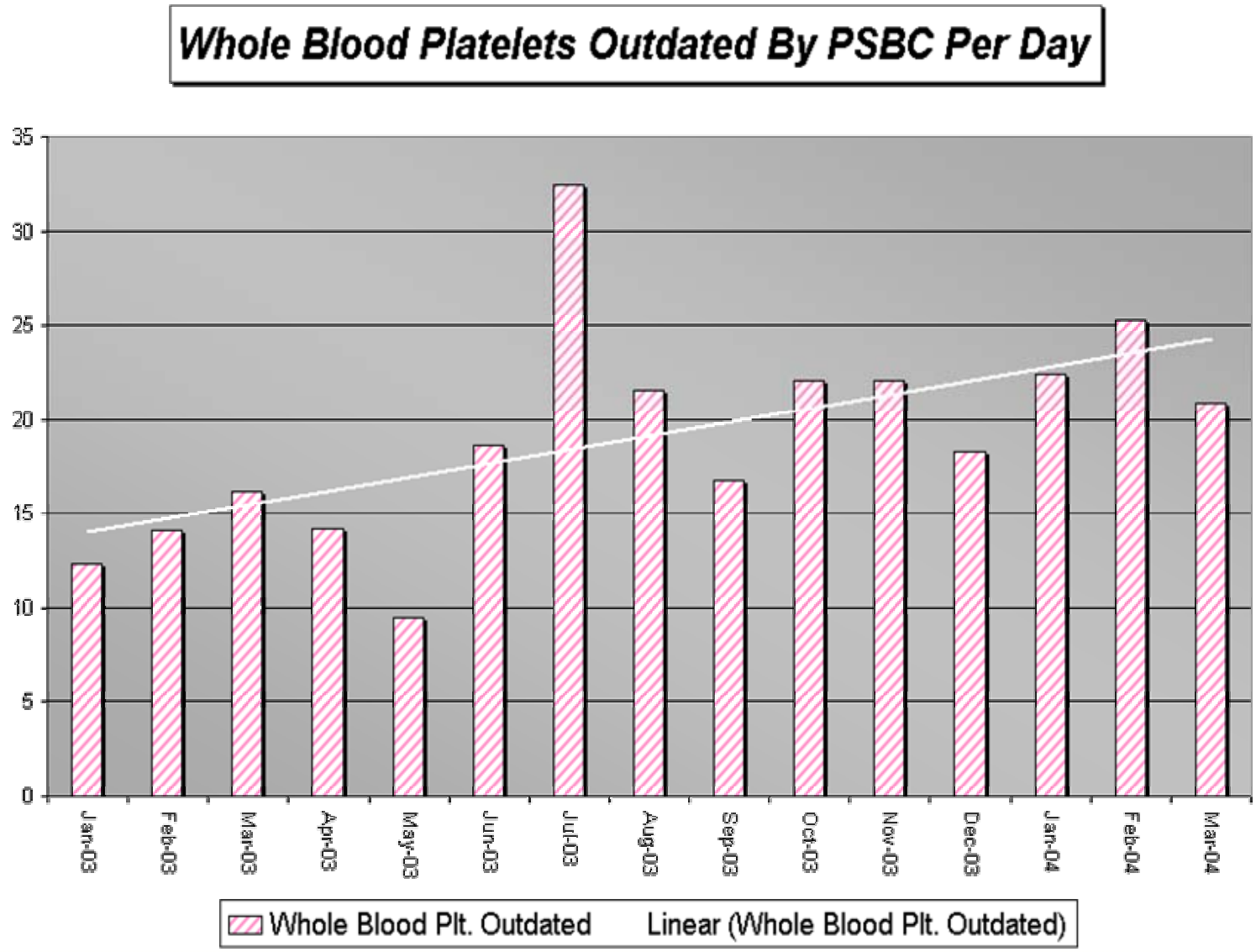
Annual Cost of Platelet Bacterial Testing

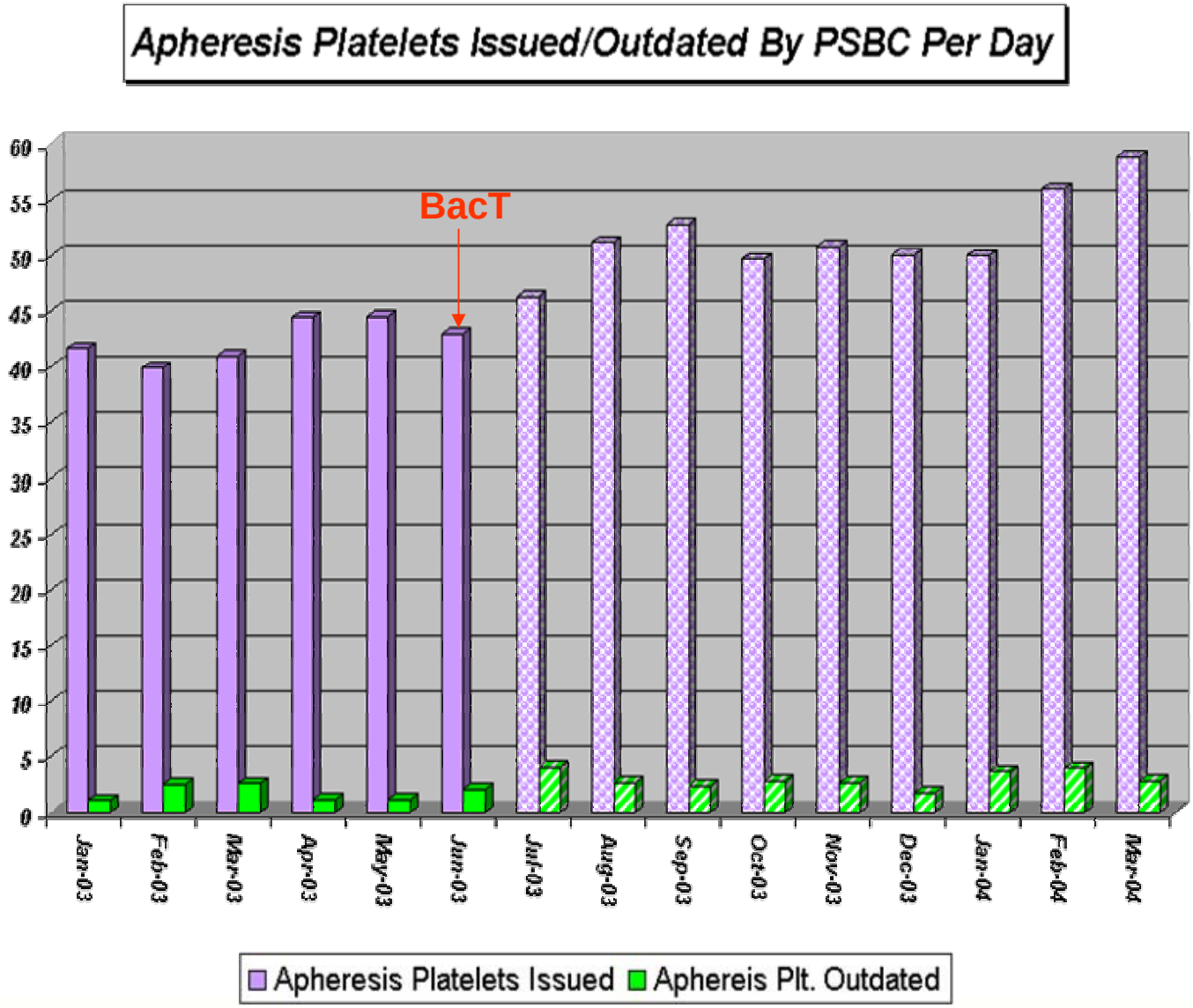
Outdates / Waste		
RAPs	$236,673	
WBPs	$118,023	
Testing Cost		
RAPs	$287,500	
WBPs	$203,375	
QC Loss		
RAPs	$26,488	
WBPs	$30,262	
	$902,301	**(+10%)**
Annual Revenue		
RAPs	**$7,830,000**	
WBPs	**$3,050,000**	

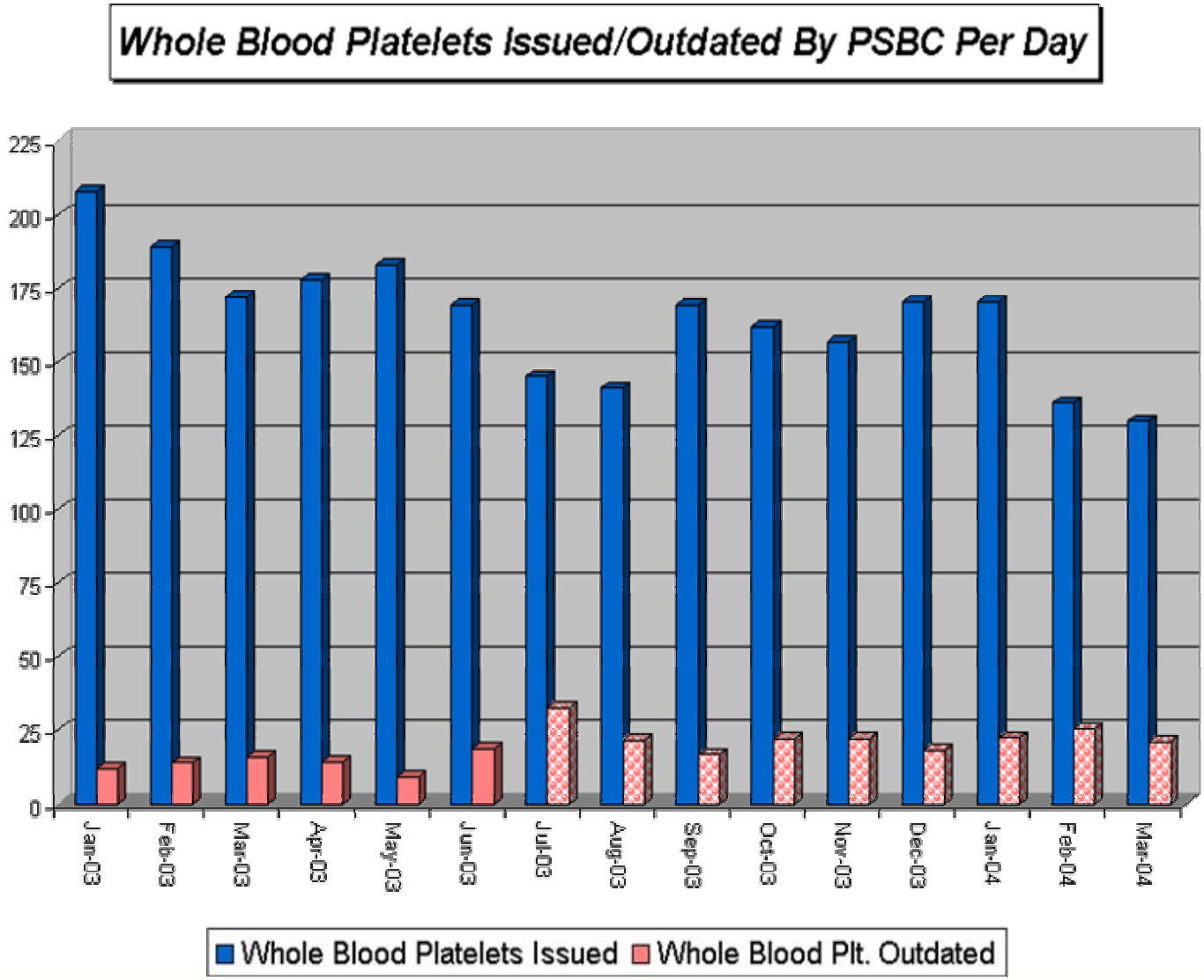

Apheresis Platelets Issued By PSBC Per Day
70
60
50
40
30
20
10
0
BacT
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Apheresis Platelets Issued
Linear (Apheresis Platelets Issued)


Whole Blood Platelets Issued By PSBC Per Day
250
200
150
100
50
0
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Whole Blood Platelets Issued
Linear (Whole Blood Platelets Issued)

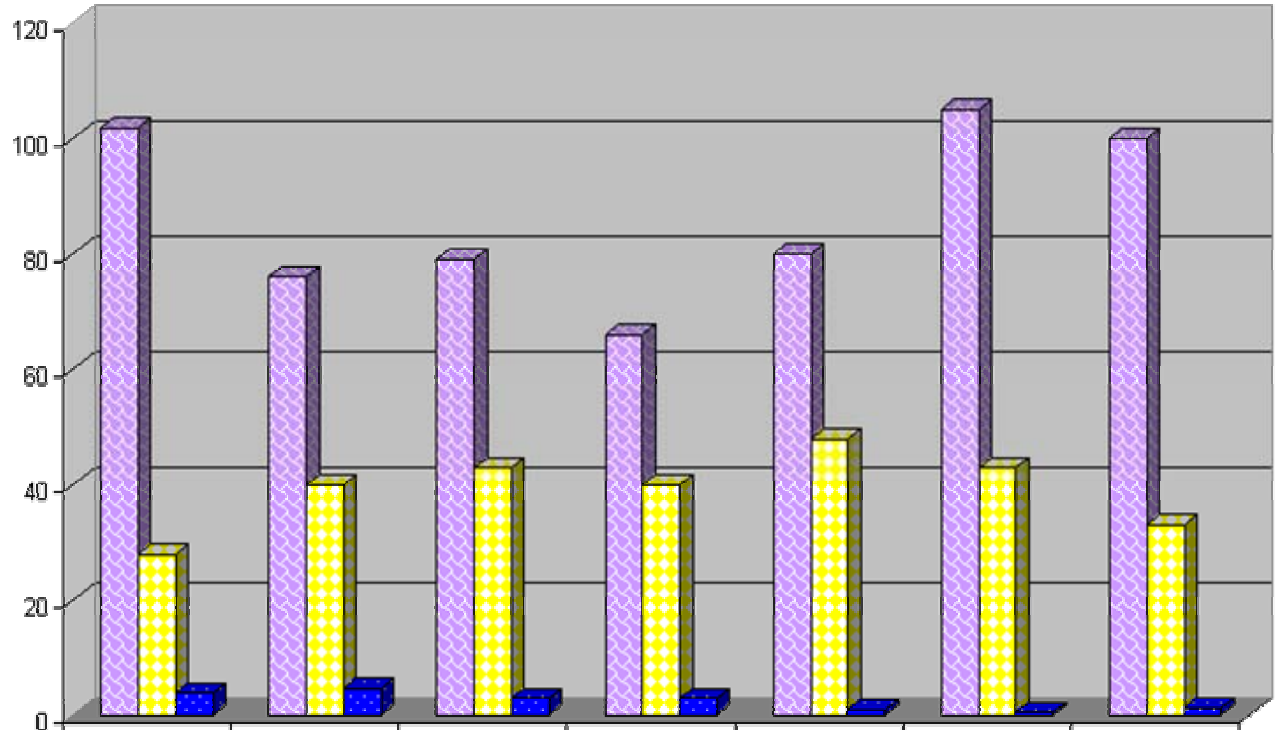

Aphereis Platelets Outdated By PSBC Per Day
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
BacT
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Aphereis Plt. Outdated
Linear (Aphereis Plt. Outdated)


Whole Blood Platelets Outdated By PSBC Per Day
35
30
25
20
15
10
5
0
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Whole Blood Plt. Outdated
Linear (Whole Blood Plt. Outdated)


Apheresis Platelets Issued/Outdated By PSBC Per Day
BacT
60
55
50
45
40
35
30
25
20
15
10
5
0
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Apheresis Platelets Issued
Aphereis Plt. Outdated


Whole Blood Platelets Issued/Outdated By PSBC Per Day
225
200
175
150
125
100
75
50
25
0
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Whole Blood Platelets Issued
Whole Blood Plt. Outdated

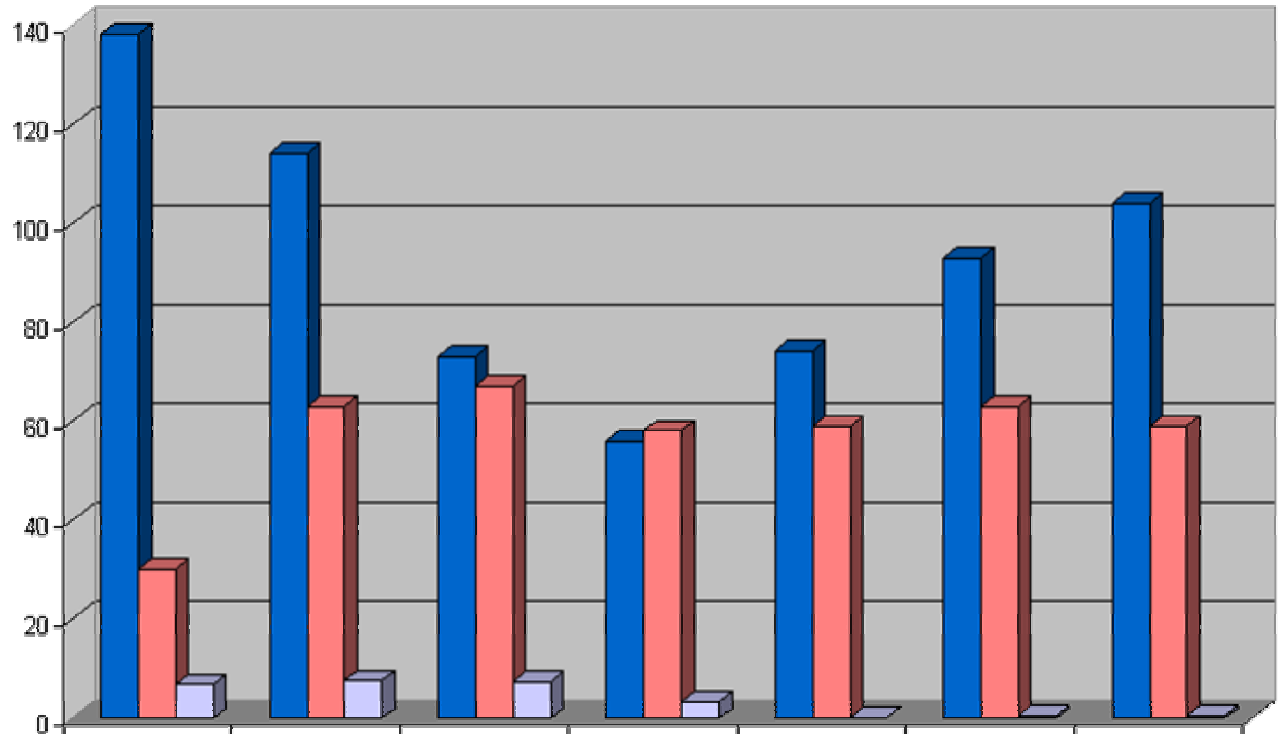
February 2003 RAP Inventory/Issues/Outdates Per Day



	SUN	MON	TUE	WED	THU	FRI	SAT
0900 labeled RAP Inv	102	76	79	66	80	105	100
RAPs Issued	28	40	43	40	48	43	33
RAPs Outdated	4	4.75	3	3	1	0.5	1.25

0900 labeled RAP Inv RAPs Issued RAPs Outdated

February 2004 RAP Inventory/Issues/Outdates Per Day



	SUN	MON	TUE	WED	THU	FRI	SAT
1100 labeled RAP Inv	138	114	73	56	74	93	104
RAPs Issued	30	63	67	58	59	63	59
RAPs Outdated	7	7.7	7.5	3.5	0.25	0.5	0.6

1100 labeled RAP Inv | RAPs Issued | RAPs Outdated

Changes Needed

- **Pooled whole blood platelets at production**
  - Buffy coat
- **Increased shelf life**
  - > 7 days
- **Better tests**
  - Quick
  - High specificity
  - Adequate sensitivity
  - Point of care