NHS Blood and Transplant

Bacterial Screening of NHSBT Platelet Components

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Bacterial Screening of Platelet Components in NHSBT

- **NHSBT Board Meeting in January 2010**
- **Decision was made to implement bacterial screening within 12 months**

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BacT/ALERT System

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BacT/ALERT Sampling

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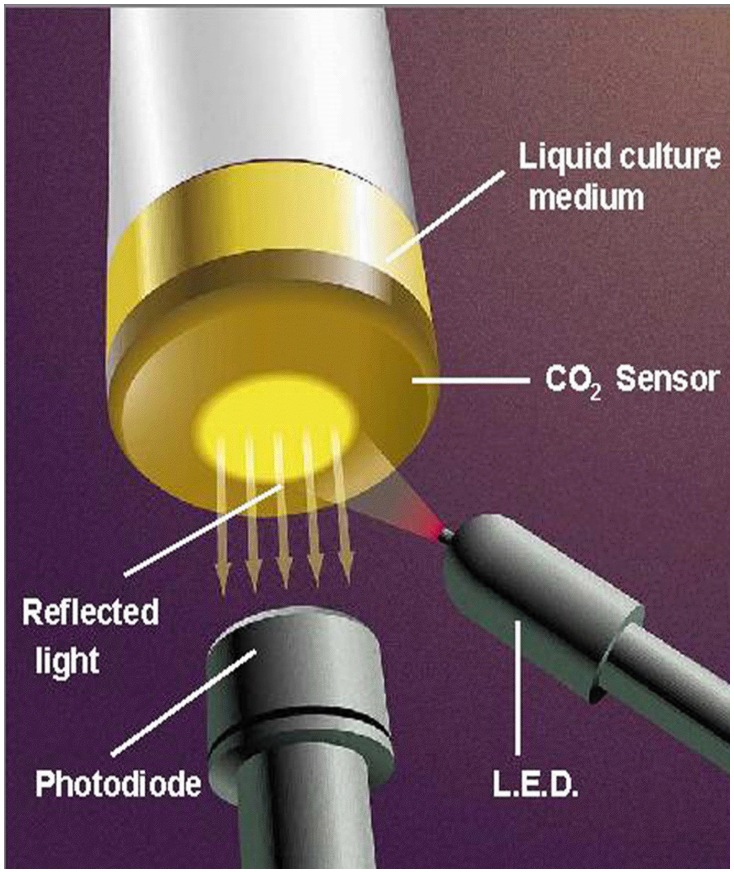
BacT/ALERT Culture Bottles

Reflectance Measurement

- LED illuminates sensor
- Continuous monitoring: bottles are read every 10 minutes (144 times/day)
- Photodiode collects reflected light
- Signal transmitted to computer
- “Reflectivity Units” plotted over time



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NHSBT Test Protocol

(1 test, Extension Shelf Life to 7 Days)

1. Platelet components held for ≥ 36hrs – 48hrs after collection
2. Platelet components sampled and tested
3. Held for 6hrs (12hrs within building)
4. Released with a 7 day shelf life
5. Monitored for the component shelf life
6. Positives recalled

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Bacterial Screening Sites:

- Colindale
- Filton
- Manchester
- Newcastle
- Sheffield

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Bacterial Screening Number of Tests (Feb 2011 – June 2012)

Site	Apheresis	Pooled	Total Platelets
Colindale	68987	15884	84871
Filton	87409	14514	101923
Manchester	37538	7158	44696
Newcastle	13962	0	13962
Sheffield	57261	9664	66925
NHSBT Total:	**265157**	**47220**	**312377**

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Bacterial Screening Process

Day	0	1	1	2	2	2	2	3	4	5	6	7
Task	Bleed	Process	Hold	Sample	Hold & Incubate	Validate	Stock & transport to SHU's	Issue	Issue	Issue	Issue	Issue
Time		AM →		AM →		PM	PM & Overnight					
	Min 36 hours				Min 6 hours							

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BacT/ALERT System

- **Required:**
  - **16 controller modules**
  - **63 incubators**
  - **1 additional incubator NBL**

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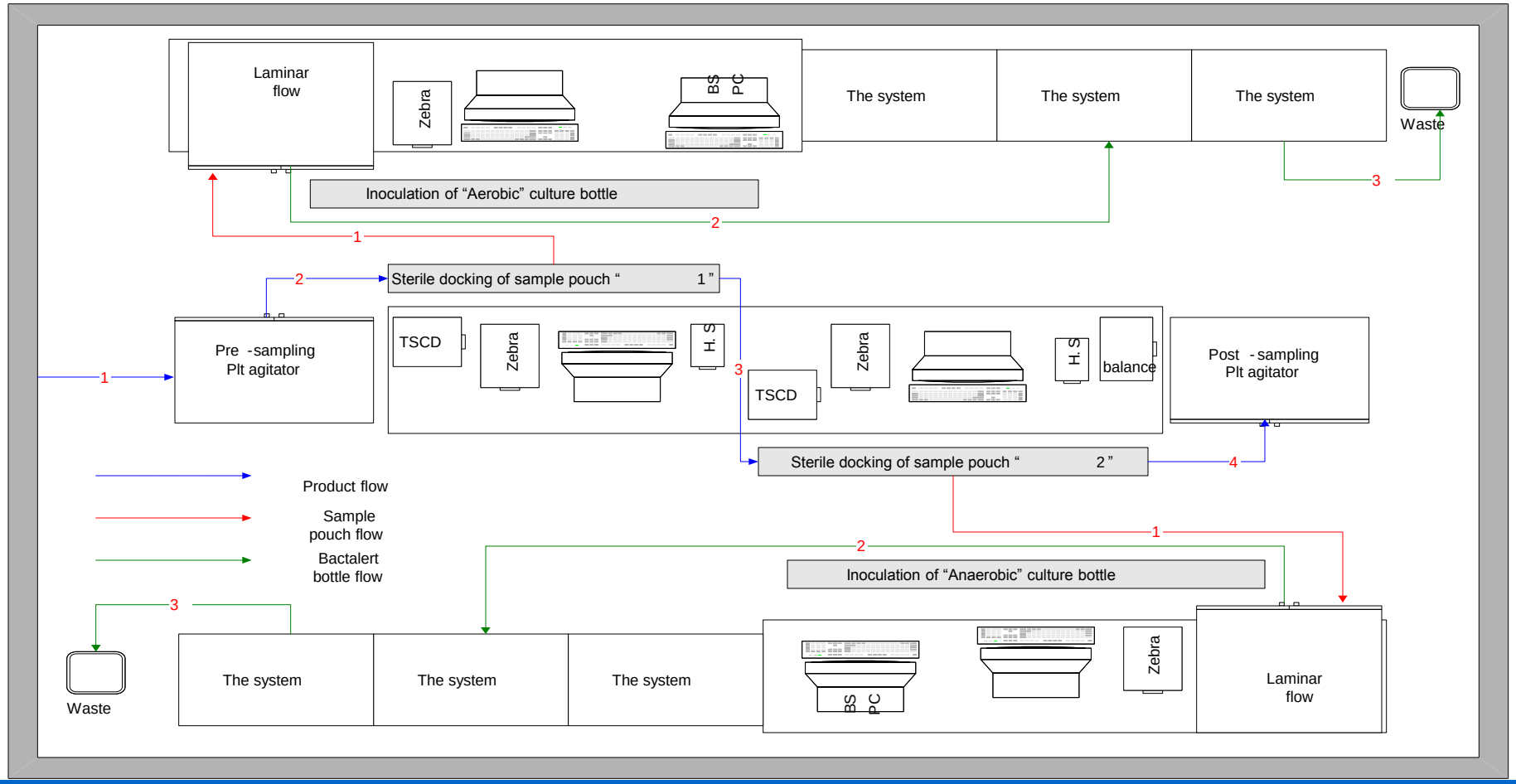
Outcome of 2P event



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Bacterial Screening in Testing

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Bacterial Screening Roll Out

• Manchester	Feb 2011
• Newcastle	April 2011
• Sheffield	May 2011
• Colindale	May 2011
• Filton	May 2011

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Pooled Platelet Concentrates

- **Software bug detected**
- **Delay until June 2011**
- **Roll out in June 2011 (Colindale and Sheffield)**
- **All testing sites in July 2011**

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WHAT HAPPENED?

What every office needs

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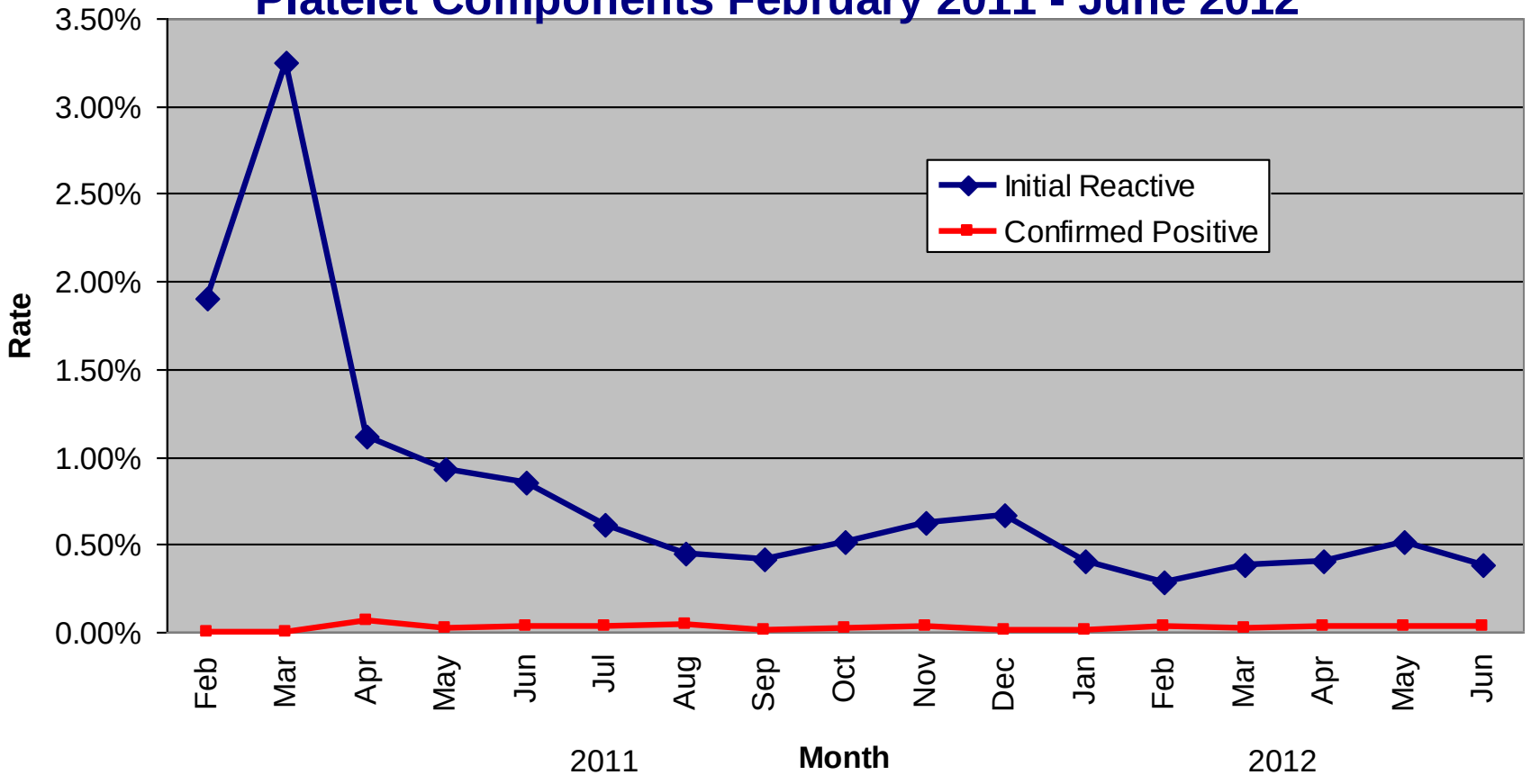
Initial Reactive and Confirmed Positive Rates for NHSBT Platelet Components February 2011 - June 2012



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High False Positive Rate

- **Facility issues:** Air conditioning
  Electrical surges
- **Staff:** Training
- **BacT/ALERT:** Anaerobic bottle
  Calibration issues

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Initial Screen: Bottle Reactivity

(February 2011 – June 2012)

Bottle Type	Initial Reactive	False Positive
Anaerobic	75%	64%
Aerobic	23%	58%
Both	2%	10%

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Corrective Action

- Training review
- Electrical line conditioners installed
- Calibration and ‘flag’ checking
- BacT/ALERT bottle new loading pattern

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New Bottle Loading Pattern

- Devised by the Irish Blood Service (Dublin)
- 20 bottles per incubator module drawer
- Incubator module drawer once loaded not opened for 48 hrs
- Extra incubator modules and space

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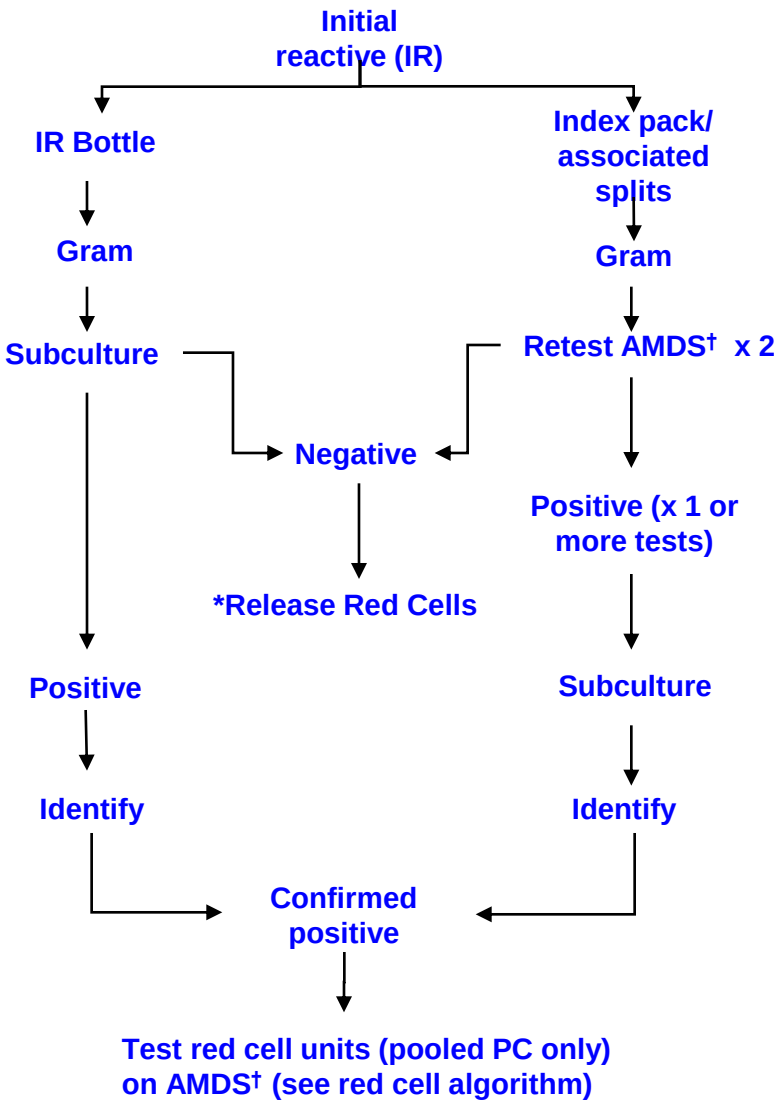
NHSBT: National Bacteriology Laboratory Involvement

Responsible for:

- Confirmatory
- Reference work
- Donor follow up
- Testing time expired platelets
- Batch acceptance testing
- Proficiency panels
- Expert advice and training

Platelet Components (PC) Testing Algorithm



***Release of red cells requires a negative result from both the index culture bottles and testing of the platelet component.**

†AMDS: Automated microbial detection system, retest aerobic and anaerobic culture in duplicate.

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Initial Reactive and Confirmed Positive Rates (cumulative Feb 2011 – June 2012)

	Number	Initial Reactive Rate	Confirmed Positive Rate
Apheresis*	265,157	0.60%	0.02%
Pooled*	47,220	0.40%	0.08%
Total	312,377	0.57%	0.03%

*Apheresis from February to June 2012
*Pooled from February to June 2012

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Confirmed Positives
(February 2011 – June 2012)

- 86 confirmed
- 82 Gram positives
- 4 Gram negatives

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Confirmed Organisms (February 2011 – June 2012)

Gram Positives:

***Propionibacterium* spp. = 42**
***Staphylococcus* spp. = 18**
***Streptococcus* spp. = 14**
***Lactobacillus* sp. = 1**
***Lactococcus* sp. = 1**
***Corynebacterium* sp. = 1**
***Listeria monocytogenes* = 1**
***Aggregatibacter* sp. = 1**
***Granulicatella* sp. = 1**
***Peptostreptococcus* sp. = 1**
Actinomyces sp. = 1
Total = 86

Gram Negatives:

***Klebsiella pneumoniae* = 2**
***Escherichia coli* = 2**

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Indeterminate Organisms (February 2011 – June 2012)

***Propionibacterium* spp. = 71**
***Staphylococcus* spp. = 38**
***Bacillus* spp. = 8**
***Corynebacterium* spp. = 8**
***Streptococcus* spp. = 5**
***Micrococcus* spp. = 3**
***Bifidobacterium* spp. = 3**
***Dermacoccus* spp. = 2**
***Peptostreptococcus* sp.= 1**

Total = 145

***Arcanobacterium* sp. = 1**
***Brevibacillus* sp. = 1**
***Kocuria* sp. = 1**
***Rothia* sp. = 1**
***Gordonia* sp. = 1**
***Kytococcus* sp. = 1**

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Detection Times Confirmed Positives (February 2011 – June 2012)

Gram Positives:	Range:
Propionibacterium spp. (42)	74 – 132 hrs
Staphylococcus spp. (18)	15 – 69 hrs
Streptococcus spp. (14)	7 – 41 hrs
Lactobacillus sp. (1)	37 hrs
Lactococcus sp. (1)	21 hrs
Corynebacterium sp. (1)	71 hrs
Listeria monocytogenes (1)	14 hrs
Peptostreptococcus sp. (1)	60 hrs
Granulicatella sp. (1)	20.2 hrs
Actinomyces sp. (1)	40.5 hrs
Aggregatibacter sp. (1)	50 hrs

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Detection Times: Confirmed Positives (February 2011– June 2012)

Gram Negatives:

***Escherichia coli*:**	**3.6 hrs**
***Escherichia coli*:**	**4.0 hrs**
***Klebsiella pneumoniae*:**	**4.0 hrs**
***Klebsiella pneumoniae*:**	**11.0 hrs**

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Confirmed Positives - Bottle Type (February 2011 – June 2012)

- **Anaerobic bottle 65%**
- **Aerobic bottle 7%**
- **Both bottles 28%**

N.B. all Gram negatives detected in both bottles.

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Bacterial Screening: 'Pathogenic Organisms' Potential Patient Morbidity and Mortality (February 2011 – June 2012)

Organism	Detection Time	Pack Type	Nos. Components Contaminated
E. coli	4.0 hrs	Apheresis	3
E. coli	3.6 hrs	Apheresis	3
Klebsiella pneumoniae	4.0 hrs	Pooled	1
Klebsiella pneumoniae	11.0 hrs	Apheresis	2
Group G strep.	7.0 hrs	Pooled	1
Listeria monocytogenes	14.4 hrs	Apheresis	1

Total components contaminated n = 11


MoneyGram
CASA DAVID

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The Transmission of Bacteria by Transfusion remains a significant Problem in Transfusion Medicine

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THANK YOU

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