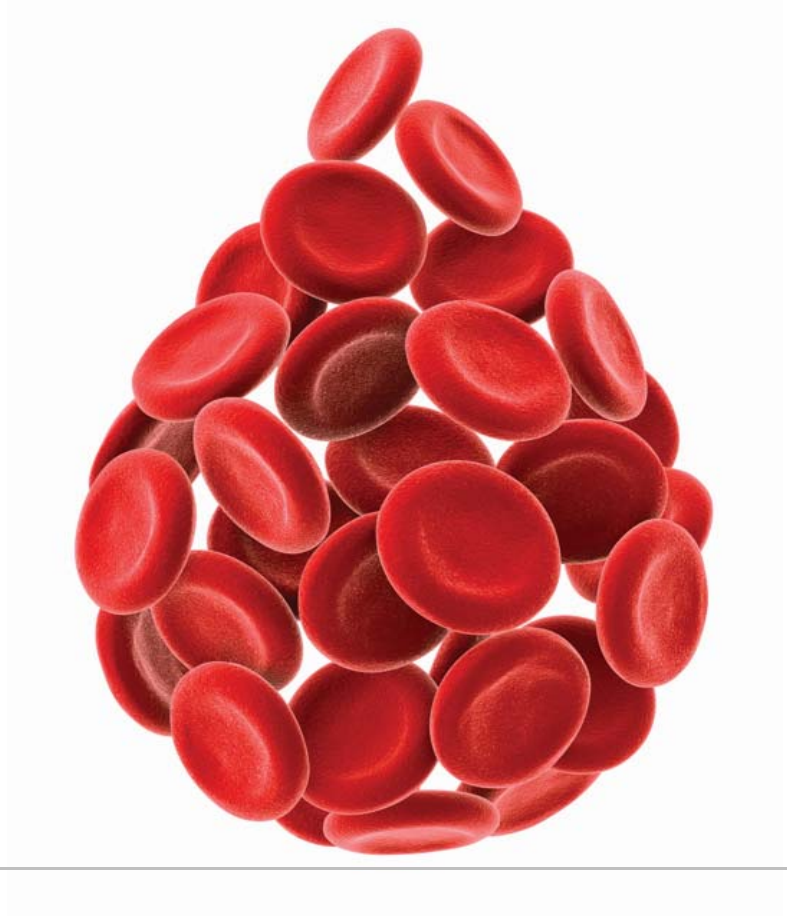
The Science of INTERCEPT

A Paradigm Shift In Transfusion Medicine

1992



2014

Laurence Corash, MD

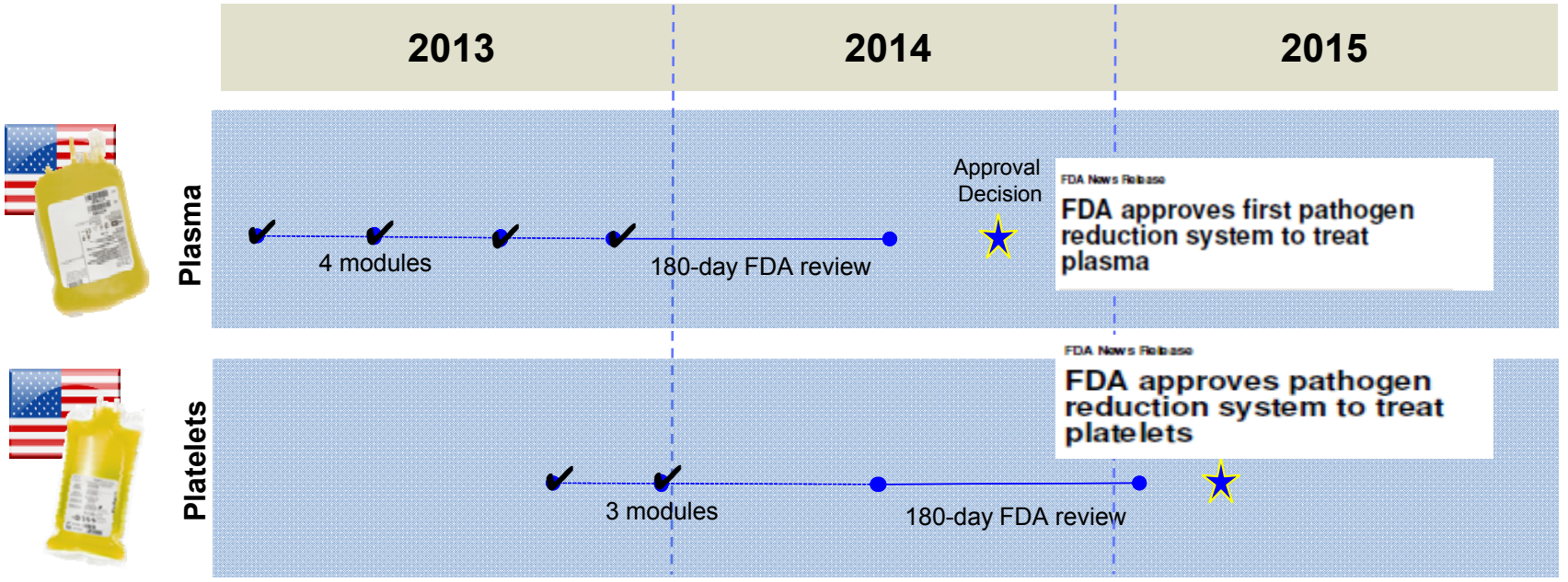
CERUS

Agenda

- FDA Approvals of INTERCEPT Technology
- Product Extensions
- Clinical Value Propositions
  - Blood Centers
  - Hospitals
- Phase IV
- Impact of Pathogen Inactivation Technology

US INTERCEPT Plasma and Platelet Approval By U.S. FDA December 2014

- Plasma & platelet modular PMA submissions initiated in 2013; approval decision as early as 2014
  - Plasma: 4 modules (February, May, August, November)
  - Platelets: 3 modules (September & December 2013; final submission Q2-2014)



Indications: INTERCEPT Platelets

Release

The U.S. Food and Drug Administration yesterday approved the Intercept Blood System for platelets, the first pathogen reduction system to treat single donor apheresis platelets. The system is for use by blood establishments that collect and manufacture blood and blood components to prepare pathogen reduced platelets for transfusion to reduce the risk of transfusion-transmitted infections.

"The Intercept Blood System for platelets represents an important advancement in improving platelet safety, both in reducing the risk of contamination with bacteria and other pathogens and in lowering the risk of transfusion-associated graft-versus-host disease," said Karen Midthun, M.D., director of the FDA's Center for Biologics Evaluation and Research.

Examples of some of the pathogens that may be reduced using the Intercept Blood System include HIV, hepatitis B and C viruses, West Nile virus and gram-negative and gram-positive bacteria. The Intercept process also reduces the number of T cells (a type of white blood cell) to a level that lowers the risk of transfusion-associated graft-versus-host disease (TA-GvHD). TA-GvHD is a rare, but often fatal, complication

FDA Label Indications For Plasma Without Population Exclusions Referenced to AABB Circular of Information

Indications

FFP is indicated in the following conditions:

1. Management of preoperative or bleeding patients who require replacement of multiple plasma coagulation factors (eg, liver disease, DIC).
2. Patients undergoing massive transfusion who have clinically significant coagulation deficiencies.
3. Patients taking warfarin who are bleeding or need to undergo an invasive procedure before vitamin K could reverse the warfarin effect or who need only transient reversal of warfarin effect.
4. Transfusion or plasma exchange in patients with thrombotic thrombocytopenic purpura (TTP).
5. Management of patients with selected coagulation factor deficiencies, congenital or acquired, for which no specific coagulation concentrates are available.
6. Management of patients with rare specific plasma protein deficiencies, such as C1 inhibitor, when recombinant products are unavailable.

- Thawed plasma held for 24 hours at 4C – seeking 5 days
- Liquid plasma for storage up to 21 days at 4C
- Preparation of cryoprecipitate

FDA Licensure

- INTERCEPT Platelets and Plasma
  - Effective
  - Safe

INTERCEPT Blood System (IBS) for Platelets

Step 1 Amotosalen | **Step 2** Illumination | **Step 3** CAD | **Process Complete** Storage

INTERCEPT Blood System (IBS) for Plasma

US INTERCEPT Platelet Components Label Indications

- Indications as for conventional PC
  - Apheresis PC all platforms with PAS-3
  - Single and double dose (2.9 - 8 x 10^{11})
- No age or population exclusions
- Support Establishment License Amendments:
  - Replacement of bacterial detection
  - Replacement of gamma irradiation
  - Replacement of CMV serology
- 5 day storage

Additional Pending Claims

- Apheresis PC all platforms in 100% plasma
  - TRUE IDE active with ARC in Puerto Rico 100% plasma
  - Replaces 3 day administrative quarantine for CHIKV
  - Extension submission to FDA March 2015
- Whole blood derived PC, pooled pre-storage
  - 100% plasma
- 7 day storage
- Other platforms with PAS-3
  - Dependent on manufacturer to notify customers

Joint Cerus / Terumo Customer Letter

CERUS

TERUMOBCT

February 9, 2015

INTERCEPT Treatment of Apheresis Platelets Collected on the Trima Accel System

Dear Valued Customer,

The purpose of this letter is provide clarification to the use of the Trima Accel® Automated Blood Collection System* to collect platelets stored in PAS-3 for treatment by the INTERCEPT® Blood System for Platelets†.

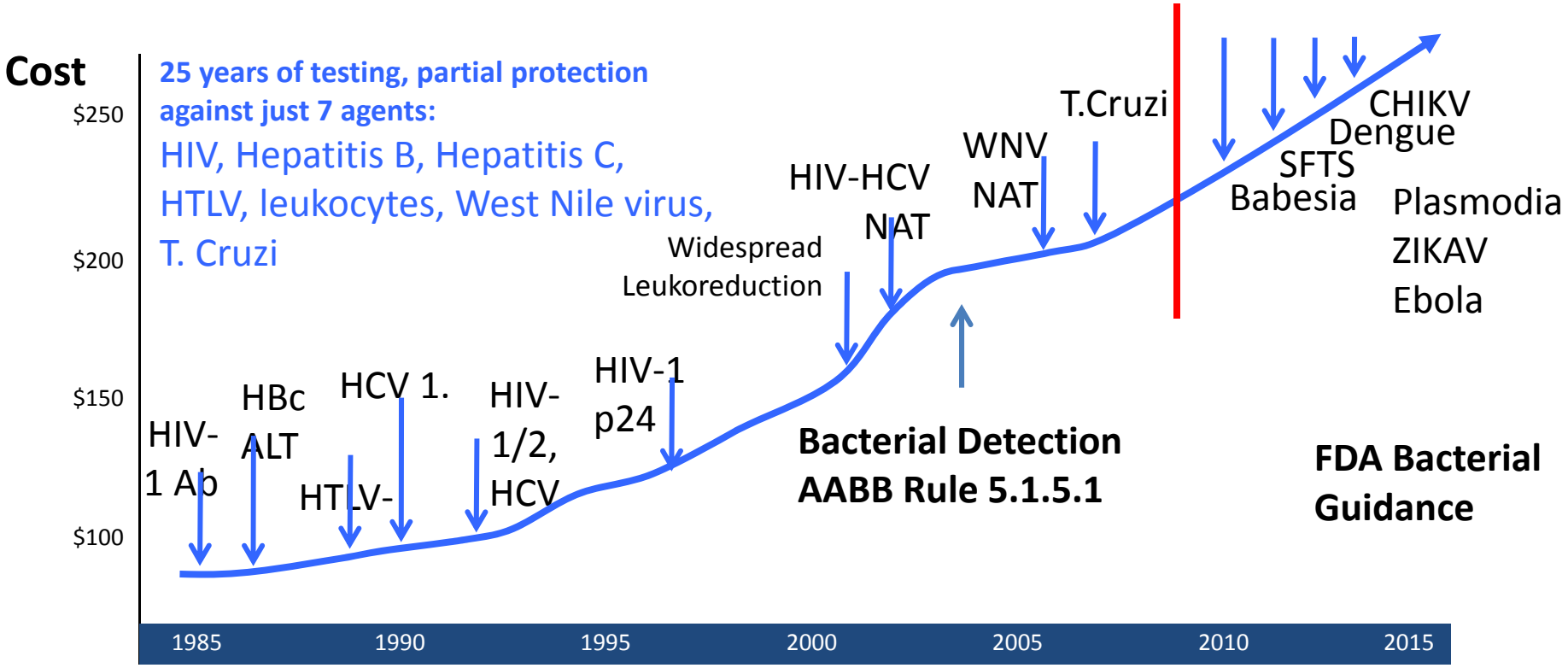
As stated in INTERCEPT Blood System for platelets package insert, the Intended Use calls out "apheresis platelet components":

Clinical Value Proposition

- Blood centers
- Hospitals and patients

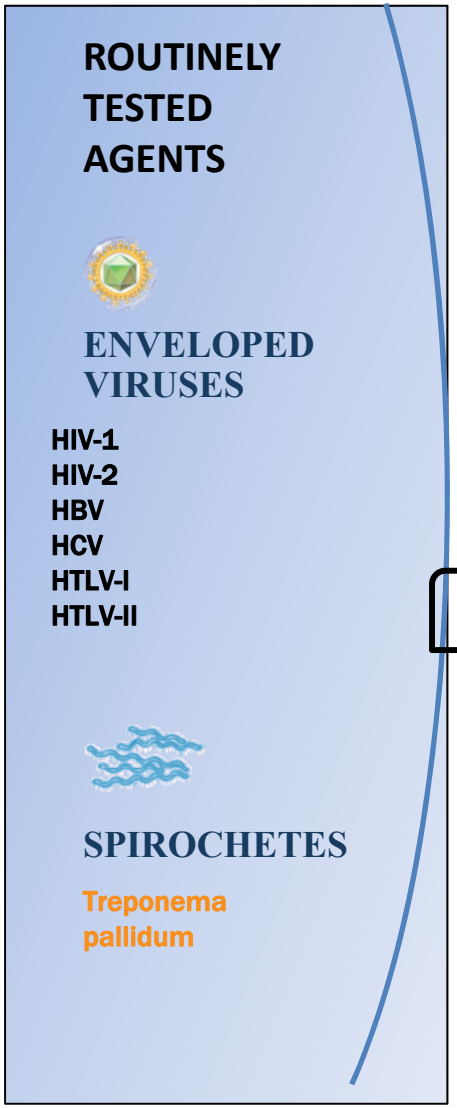
The Past: Reduction In The Risk of Transfusion Transmitted Infection Has Required Continual Addition of New Tests

AN INCOMPLETE EXPENSIVE SOLUTION



RBC price data adapted from B Custer & JS Hoch, *Transfusion Medicine Reviews*, 23, No 1 (January), 2009: pp 1-12

INTERCEPT Pathogen Inactivation Proactive Prospective Alternative To Testing



VS.

ENVELOPED VIRUSES

HIV-1
HIV-2
HBV
HCV
HTVL-I
HTLV-II
DHBV
BVDV
CMV
WNV
SARS
Vaccinia[1]
Chikungunya
Dengue[2]
Influenza A

NON-ENVELOPED VIRUSES

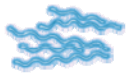
Bluetongue virus, type 11
Simian Adenovirus-15
Feline calicivirus
Parvovirus B19
Human adenovirus 5

GRAM-NEGATIVE BACTERIA

Klebsiella pneumoniae
Yersinia enterocolitica
Escherichia coli
Pseudomonas aeruginosa
Salmonella choleraesuis
Enterobacter cloacae
Serratia marcescens
Anaplasma phogocytophilum
Orientia tsutsugamushi[3]

GRAM-POSITIVE BACTERIA

Staphylococcus epidermidis
Staphylococcus aureus
Streptococcus pyogenes
Listeria monocytogenes
Bacillus cereus (vegetative)
Bifidobacterium adolescentis
Clostridium perfringens
Corynebacterium minutissimum
Lactobacillus sp.
Propionibacterium acnes



SPIROCHETES

Treponema pallidum
Borrelia burgdorferi

PROTOZOA

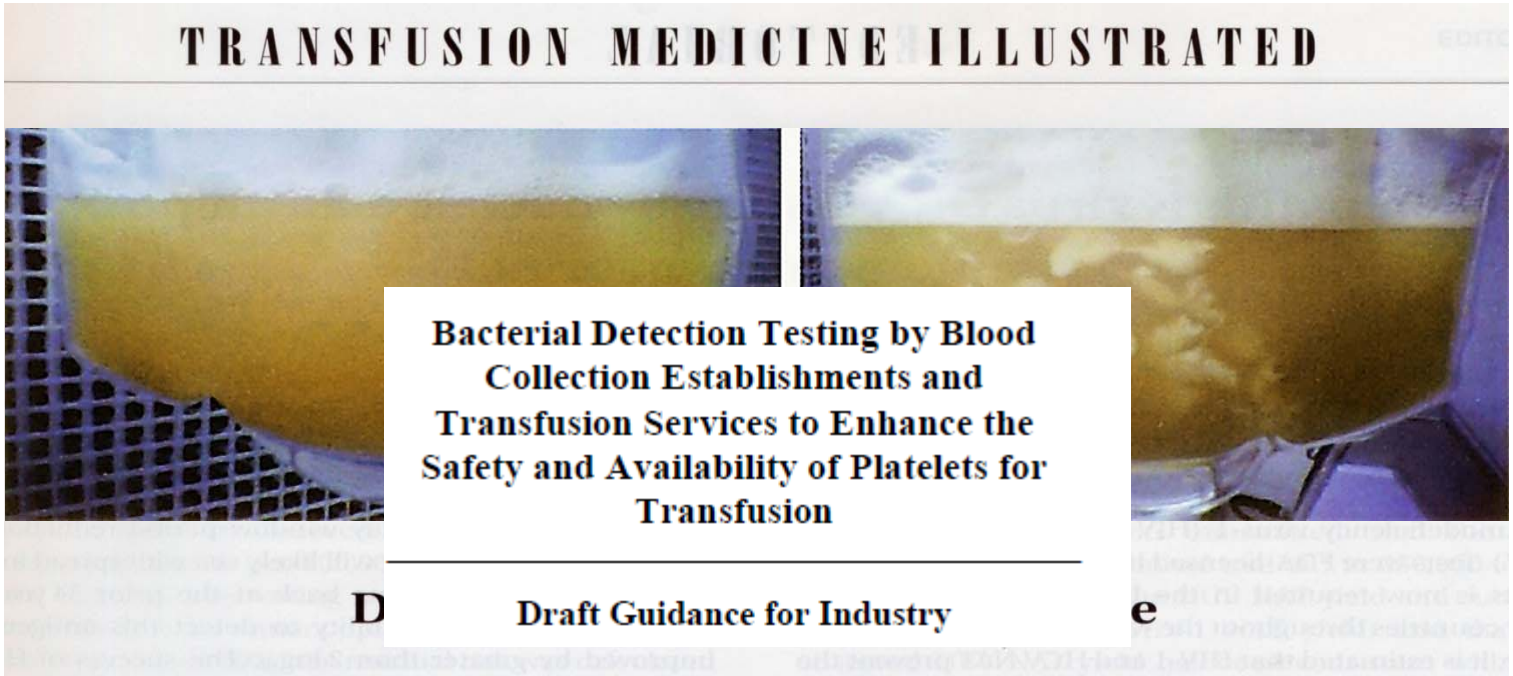
Trypanosoma cruzi
Plasmodium falciparum
Leishmania sp.
Babesia microti

LEUKOCYTES

T-cells

(1) Sampson-Johannes A, et al. 2003. *Transfusion*. 43:83A; (2) Lam S, et al. *Transfusion* 2007;47:131A;
(3) Rentas F. *Transfusion* 2004;44:104A.

Bacteria: an unresolved risk



We, FDA, are issuing this guidance document to provide blood collection establishments and transfusion services with recommendations for initial testing (primary testing) for bacterial contamination of platelets intended for transfusion, and additional considerations for blood collection establishments and transfusion services for subsequent retesting (secondary testing)

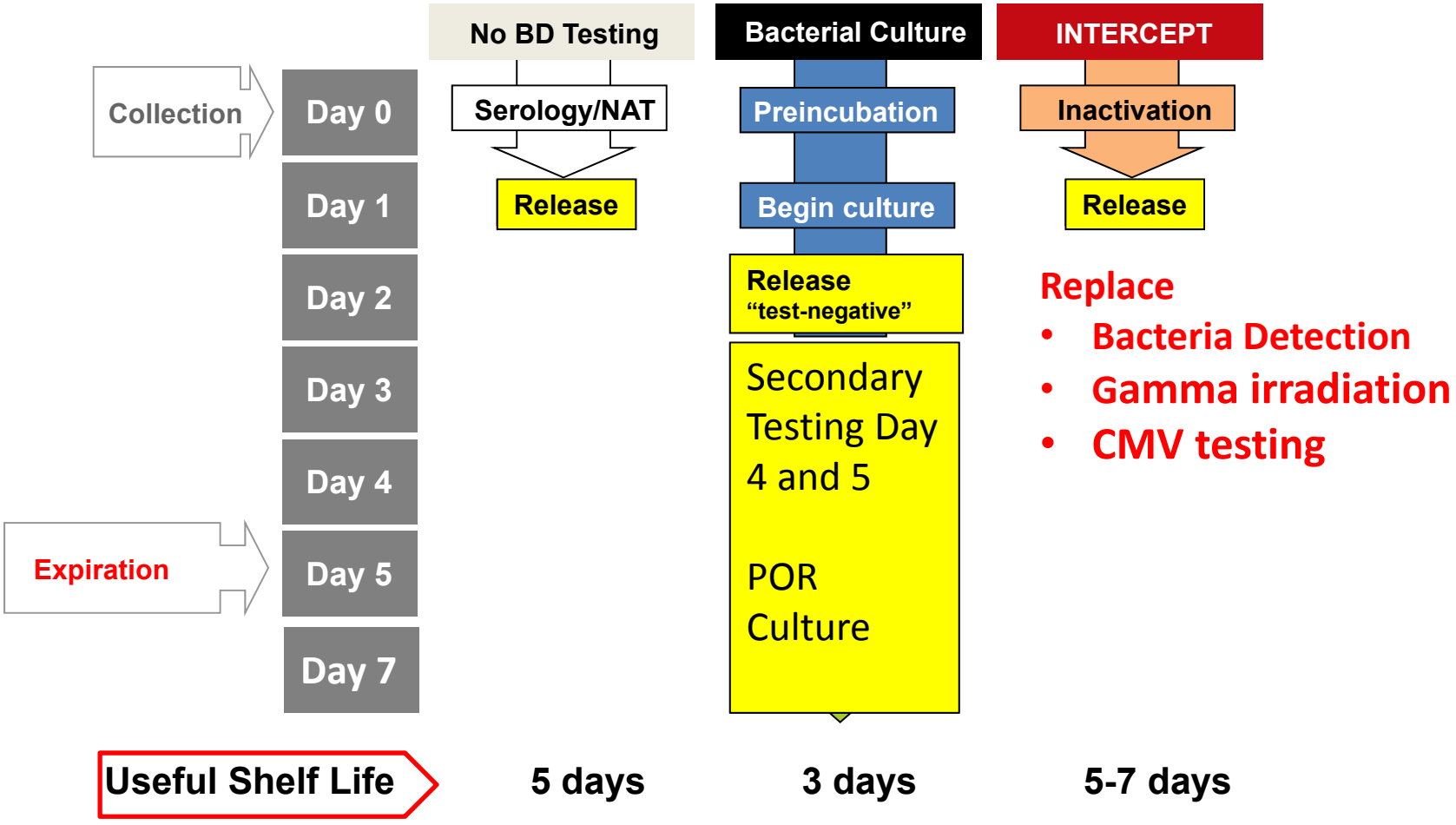
TTTI Risks From A Patient Perspective

(Kleinman, 2013 ;53:1603-18)

Contamination	Per Component Estimated 	Per Patient Estimate (6 PC Exposure)
Residual Bacterial Contamination (Clinical Sepsis)	1 in 1500 (1 in 5,000-1 in 8,000)	1 in 250 (1 in 1,000)
Transfusion Transmitted Cytomegalovirus	1 in 1000	1 in 300 (50% susceptible)
Emerging agent	1 in 14,000 – 1 in 1,250	1 in 2,400 – 1 in 210
Total	**1 in 583 – 1 in 400**	**1 in 250 (bacteria)** **1 in 80 (bacteria, CMV, and EIA)**

Real Life Examples of TTI Risk from Acute and Chronic EIAs		
HIV In San Francisco Early 1980s	Up to 1%	Up to 6%
Dengue in PR: Sept, 2010	Up to 0.35%	Up to 2.1%

Operational Logistics and Pending Impact of FDA Draft Guidance



Impact of IBS On Transfusion Transmitted Bacterial Infection

	Conventional PC			INTERCEPT-PC		
Year	PC (n)	TTBI*	TTBI / 10^4 PC	PC (n)	TTBI	TTBI / 10^4 PC
2006	231,849	4 (0)	0.17	6,420	0	0
2007	232,699	9 (2)	0.39	15,393	0	0
2008	239,343	6 (1)	0.25	15,544	0	0
2009	241,625	9 (0)	0.37	21,767	0	0
2010	253,145	2 (1)	0.08	22,632	0	0
2011	267,782	3 (1)	0.11	22,392	0	0
2012	275,979	7 (2)	0.25	24,849	0	0
2013	278,230	4 (1)	0.14	25,089	0	0
Total	2,020,652	44 (8)	0.22	154,086	0	0
2005-10	151,889	16 (3)	1.1	0	0	0
2011	6,613	0	0	26,587	0	0
2012	0	0	0	34,265	0	0
2013	0	0	0	34,663	0	0
Total	158,502	16 (3)	1.0	95,515	0	0
TOTAL	2,179,154	60 (11)	0.28	249,601	0	0

- **Transfusion Transmitted Bacterial Infections** (Fatalities)

France: p = 0.039 / Combined p = 0.006

Benefits for Blood Center, Hospital and Patients

- Replace bacterial detection
  - Earlier release of platelet components
  - Reduced outdating
  - Avoid POI testing if FDA required
- Replace gamma irradiation
- Replace CMV serology
- Reduced risk of bacterial contamination
- Reduced allergic transfusion reactions
- Reduced febrile transfusion reactions

INTERCEPT Components Have Undergone Extensive Regulatory Review – 10 years of use

PLATELETS

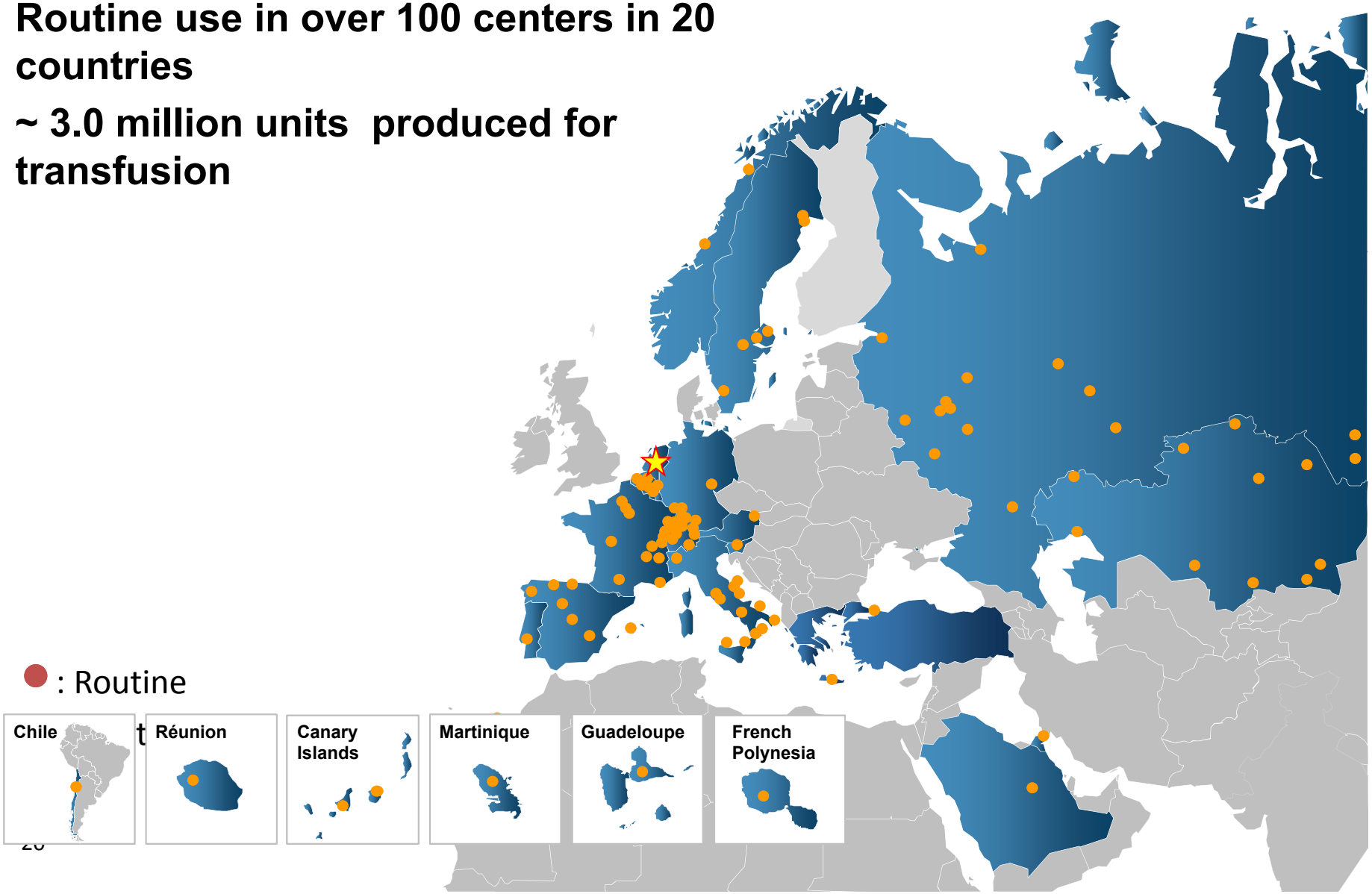
2002	2003	2007	2009	2010
Class 3 CE Mark Approval	Afssaps Approval	PEI Approval	Swissmedic Approval	Austrian AGES Approval

PLASMA

2006	2007	2010	2011
Class 3 CE Mark Approval	Afssaps Approval	Swissmedic Approval	PEI Approval

INTERCEPT Platelet and Plasma Use

- **Routine use in over 100 centers in 20 countries**
- **~ 3.0 million units produced for transfusion**



ANSM Controlled Data

Trends for Lower Reaction Rates With INTERCEPT PC

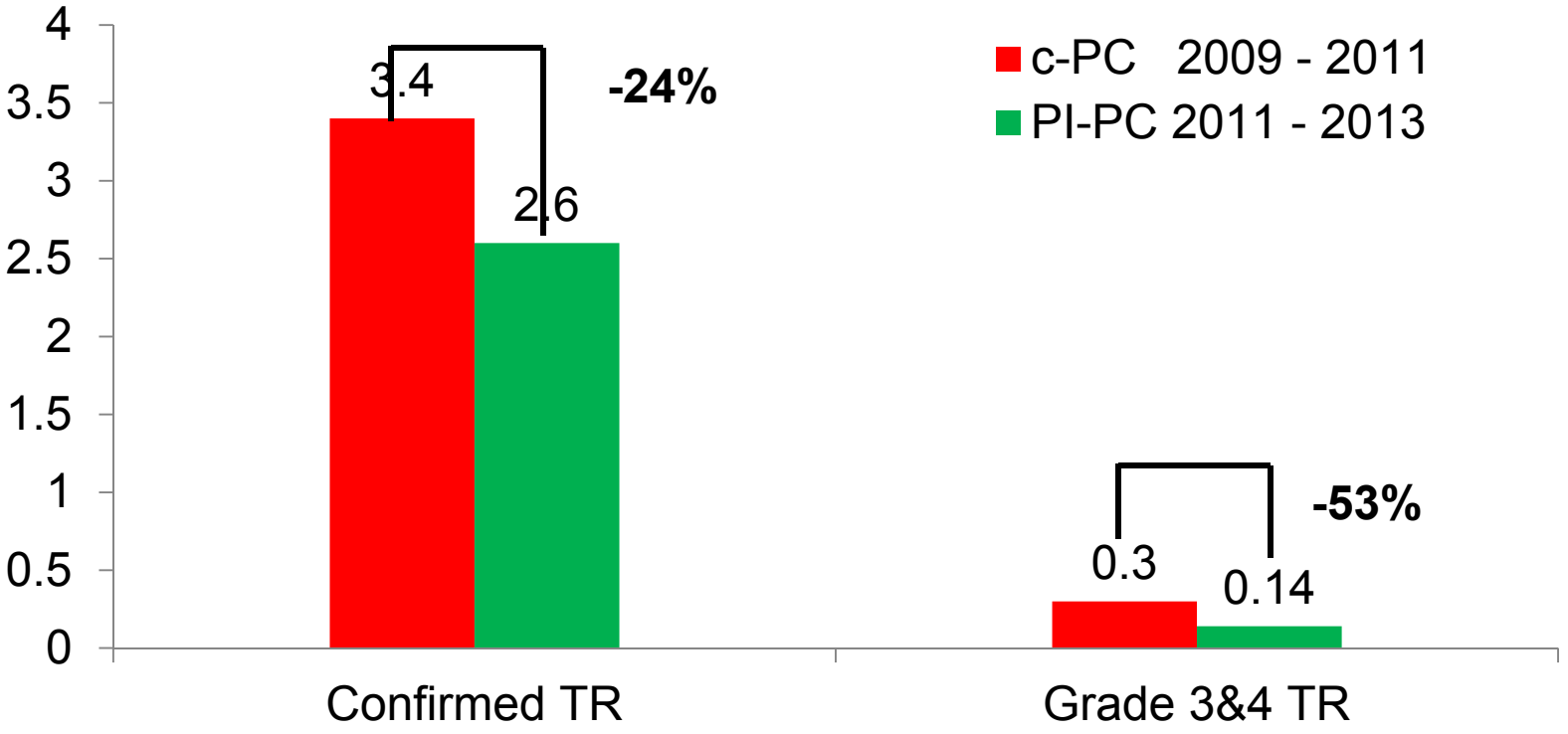
Table 75 Acute Transfusion Reactions (France HV): All Platelet Components

	PCs transfused	ATR	ATR/ 1000 PC
2009 IBS PC	21767	51	2.34[a]
2009 All other PC	241634	576	2.38[a]
2010 IBS PC	21897	34	1.55[b]
2010 All other PC	256200	1434	5.60[b]
2011 IBS PC	23179	10	0.43[c]
2011 All other PC	269467	451	1.67[c]
2012 IBS PC	24849	269.1	0.98
2012 All other PC	275,834		

[a]ATR: Acute transfusion reaction, all grades, imputability 2-4
[b]ATR: Acute transfusion reaction, all grades, imputability 1-3
[c]ATR: Allergic transfusion reactions only, all grades, imputability 2-3

Three Years of Swiss Data Indicate Reduction in Acute Transfusion Reactions of all Grades Including ALI and ARDS

66,000 Conventional PC and 60,765 INTERCEPT PC



Cerus European Post Marketing Active Hemovigilance Studies Supporting US Licensure

Study	PCs	Patients	Intervention	Outcome	Timing
Total	**20,326**	**4,493**	**IBS all Types**	**Safety**	**Unlimited**

- Routine use without gamma irradiation
- Broad patient populations
- Large proportion of immune suppressed patients
- Longitudinal study over multiple years
- No cases of TA-GVHD

Investigator Post Marketing Observational Studies Supporting US Licensure

Study	Patients	Intervention	Comparison	Outcome	Timing
EFS Alsace	2069	IBS-Plasma	Conventional	Utilization	3 years
MG-BTC	795	IBS all Types	Conventional	Utilization	3 years

- Longitudinal study over multiple years
- Large proportion of immune suppressed patients
- Routine use without gamma irradiation
- No increase in platelet component utilization
- No cases of TA-GVHD

Demographics of Patients Transfused With IBS PC Routine Practice Alsace, France (2006 -2011)

Patient Age	0-3 Years		3- 17 Years		> 17 Years	
PC TYPE	Patients	Units	Patients	Units	Patients	Units
Total Exposure	**498**	**2,169**	**513**	**5,124**	**18,384**	**82,272**

- **19,395 patients supported with IBS PC**
- **89,565 PC transfused**
- **Without use of gamma irradiation**
- **1,011 children transfused with 7,293 IBS PC**
- **Supported PMA label for no patient exclusions**
- **PEDIATRIC EXPERIENCE**
- **NO UNEXPECTED ADVERSE EVENTS**
- **NO CASES OF TA-GVHD**

Phase IV Study for IBS Platelet Components In Routine Use

PIPER

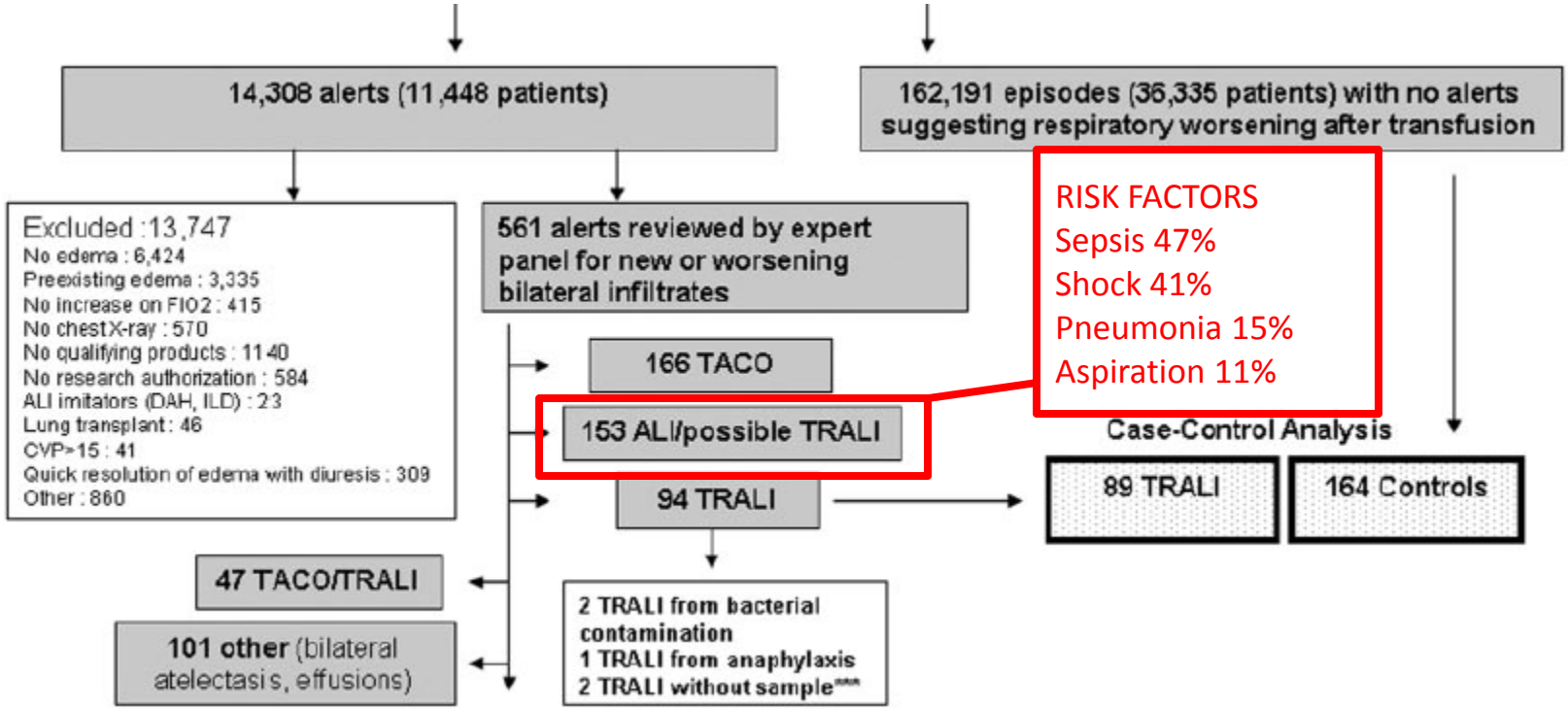
(Phase IV INTERCEPT Platelets Entering Routine)

Why Phase IV?

- FDA requires Phase IV studies to expand the safety profile for marketed products
- FDA requested a powered study with a control group
- There are unanswered questions in transfusion medicine that can be addressed in large Phase IV studies

Transfusion-related acute lung injury: incidence and risk factors

Pearl Toy,[1] Ognjen Gajic,[2] Peter Bacchetti,[1] Mark R. Looney,[1] Michael A. Gropper,[1] Rolf Hubmayr,[2] Clifford A. Lowell,[1] Philip J. Norris,[1,3] Edward L. Murphy,[1,3] Richard B. Weiskopf,[1] Gregory Wilson,[2] Monique Koenigsberg,[1] Deanna Lee,[1] Randy Schuller,[4] Ping Wu[1], Barbara Grimes,[1] Manish J. Gandhi,[2] Jeffrey L. Winters,[2] David Mair,[4] Nora Hirschler,[1,5] Rosa Sanchez Rosen,[1,3] and Michael A. Matthay,[1] for the TRALI Study Group



- Possible TRALI is defined as ALI concurrent with transfusion
- Recognized clinical factors other than transfusion cause ALI
- ALI CONCURRENT WITH TRANSFUSION IS MORE COMMON THAN TRALI

Additional risk factors for ALI in the setting of transfusion

TABLE 2. Multivariate model of recipient and transfusion risk factors for pTRALI by survey logistics analysis

Variable	OR	Lower 95% CI	Upper 95% CI	p value
Candidate recipient factors, in addition to the ALI risk factor(s) clearly temporally related to the onset of ALI				
Chronic alcohol abuse	12.5	2.8	55	<0.001
Current smoker vs. never or former smoker	4.2	1.67	10.8	0.0024
Shock before transfusion	4.6	2.0	10.7	<0.001
Fluid balance before transfusion, increment per liter	1.32	1.20	1.44	<0.001
Peak airway pressure > 30 cm H_2O within 12 hr after intubation and before transfusion	[illegible]	[illegible]	[illegible]	[illegible]
Liver surgery (transplantation)	0.77	0.08	7.7	0.82
Results of single additions of transfusion factors to the above multivariate model:				
Receipt of plasma or whole blood from female donor(s)	0.82	0.29	2.3	0.70
Number of units (any component) transfused during or within 6 hr of ALI	0.99	0.89	1.10	0.86
Number of RBC and whole blood units transfused during or within 6 hr of ALI	0.78	0.59	1.03	0.079

Recipient clinical risk factors predominate in possible transfusion-related acute lung injury

Pearl Toy,[2] Peter Bacchetti,[6] Barbara Grimes,[6] Ognjen Gajic,[4] Edward L. Murphy,[2,3] Jeffrey L. Winters,[8] Michael A. Gropper,[5] Rolf D. Hubmayr,[4] Michael A. Matthay,[1] Gregory Wilson,[7] Monique Koenigsberg,[2] Deanna C. Lee,[2] Nora V. Hirschler,[2,10] Clifford A. Lowell,[2] Randy M. Schuller,[9] Manish J. Gandhi,[8] Philip J. Norris,[2,3] David C. Mair,[9] Rosa Sanchez Rosen,[2,3] and Mark R. Looney[1,2]

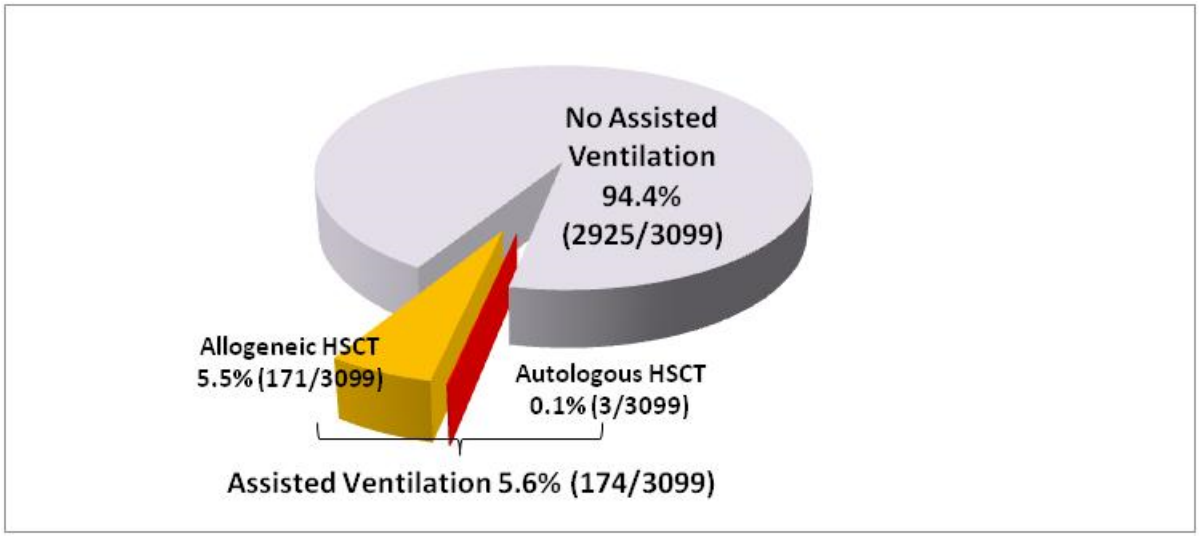
Potential Pulmonary Injury Signal In SPRINT For 2 Preferred Terms
No difference for Grade 3&4 Respiratory AE or Mortality

Adverse Event	INTERCEPT	Control	P Value
Pneumonitis NOS	7/318	0/327	< 0.01
ARDS	5/318	0/327	0.03
All Grade 3 &4 Respiratory AEs	63/318 (20%)	63/327 (19%)	0.92
Mortality	11/318 (3.5%)	17/327 (5.2%)	0.34

- When SPRINT was conducted there was no MedDRA code for Acute Lung Injury (ALI)
  - Only for ARDS (Acute Respiratory Distress Syndrome)
  - Mortality data were inconsistent with the initial reported ARDS incidence
- The American European Consensus Criteria (AECC) for diagnosis of ALI and ARDS were not used for transfusion monitoring until 2004
- Cerus/Baxter sponsored the SPRINT re-analysis study
  - FDA reviewed the protocol
  - Independent expert panel – blinded to treatment, conducted the study
  - Utilized primary patient medical records
  - Used AECC defined criteria for ALI and ARDS

Fred Hutchinson Cancer Research Center (FHCRC)
Assisted ventilation as a marker for ALI in HSCT

- Frequency of assisted ventilation in HSCT patients
- Retrospective survey of assisted ventilation at FHCRC 2001-2009
- Patients transfused with conventional PC within 30 days of HSCT
- 60% of patients had allogeneic, and 40% had autologous HSCT



Assisted ventilation is more common in allogeneic HSCT and very infrequent in autologous HSCT.
FDA has agreed that the objective criteria of assisted ventilation is a suitable endpoint.

Sprint Pulmonary Injury Reanalysis

- Population: all patients in SPRINT
  - 148 patients with Grade 2 and higher pulmonary AE
  - 100 patients with clinically serious pulmonary AE (CSPAE)
- Intervention: INTERCEPT PC
- Comparison: Conventional PC
- Outcome: CSPAE, ALI, ARDS, Mortality
- Timing: 49 days after first platelet transfusion

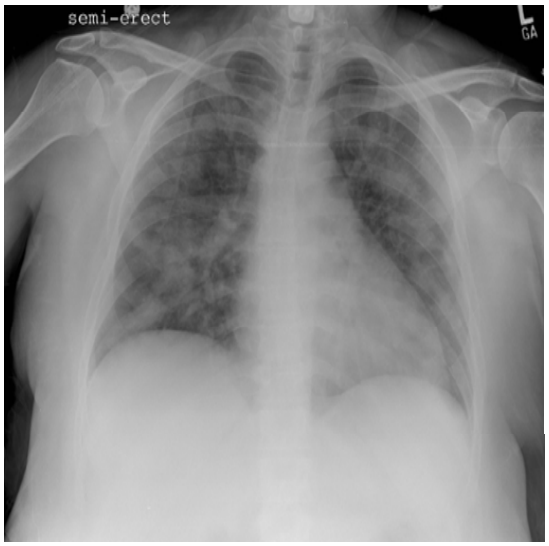
Results of SPRINT Re-Analysis

Adverse Event	INTERCEPT (318)	CONTROL (327)	P Value
Any CSPAE ≥ Grade 2	55 (17.3%)	45 (13.8%)	0.232
Pneumonitis	39 (12.3%)	32 (9.8%)	0.379
ALI + ARDS (P:F < 300)	19 (6.0%)	16 (4.9%)	0.604
ALI (P:F < 300 > 200)	7 (2.2%)	11 (3.4%)	0.475
ARDS (P: F < 200)	12 (3.8%)	5 (1.5%)	0.088
Mortality CSPAE	14 (25.4%)	17 (37.8%)	0.200
Mortality of ALI	0	6 (54.5%)	0.04
Mortality of ARDS	9 (75%)	5 (100%)	0.52

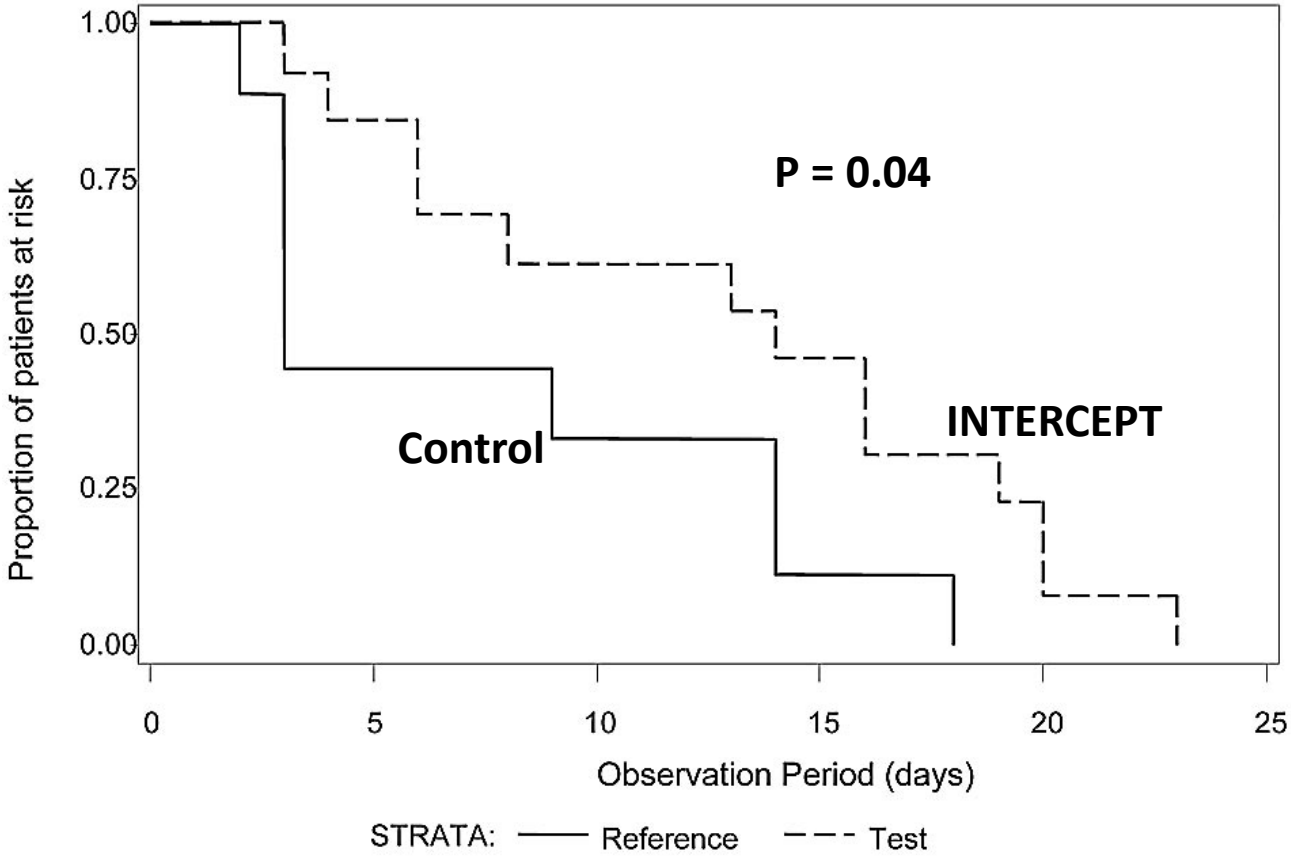
FDA

ALI. In addition, ARDS diagnoses were only given to ventilated subjects even if they met the AEACC criteria. The true incidence of ARDS may have been underestimated beacuse of the lower power of the reanalysis.

Relation of Platelet Transfusion and Onset of ALI In SPRINT
INTERCEPT group had less days on ventilator



Time to mechanical ventilation after first PC transfusion



Corash et al Blood 2011; 117:1014

Study Design

- Population: Hematology-Oncology patients requiring 1 or more PCs
- Intervention: IBS platelet components (1466 patients)
- Comparison: Conventional platelet components (1466 patients)
  - Non-inferiority design with 90% power
- Outcome: Incidence of Assisted ventilation
  - Intubation
  - Tight fitting mask with PEEP or BPAP > 5 cm H_2O
- Timing: Platelet support for up to 21 days
  - Sequential cohorts: conventional PC followed by IBS PC
  - Assisted ventilation for 7 days after last PC transfusion up to day 21
  - AE (including transfusion reactions) 24 hours after each study PC transfusion
  - SAE for 7 days after last PC transfusion up to day 21

Summary

- The precise frequency of ARDS (ALI) is not well characterized in hematology-oncology patients
- PIPER is a powered study to determine the frequency of ARDS as well as other adverse events in the setting of repeated platelet transfusion in a population with risk factors for pulmonary injury
- Large post marketing studies can provide important information on the safety and efficacy of platelet transfusion.
- PIPER is the first study of this type in transfusion medicine

Supplemental Slides

Study Design - II

- Pilot phase for logistic evaluation (at least 5 patients per center)
- Controlled, open label
- Sequential cohort design: conventional PC > INTERCEPT PC
- Stratified for:
  - Primary hematologic disease (initial or relapse)
  - Type of chemotherapy (induction, consolidation, relapse)
  - Type of transplant
    - Autologous
    - Allogeneic
      - Matched
      - Matched unrelated
      - Haplo-mismatched
      - Cord blood

Secondary Outcome Measures

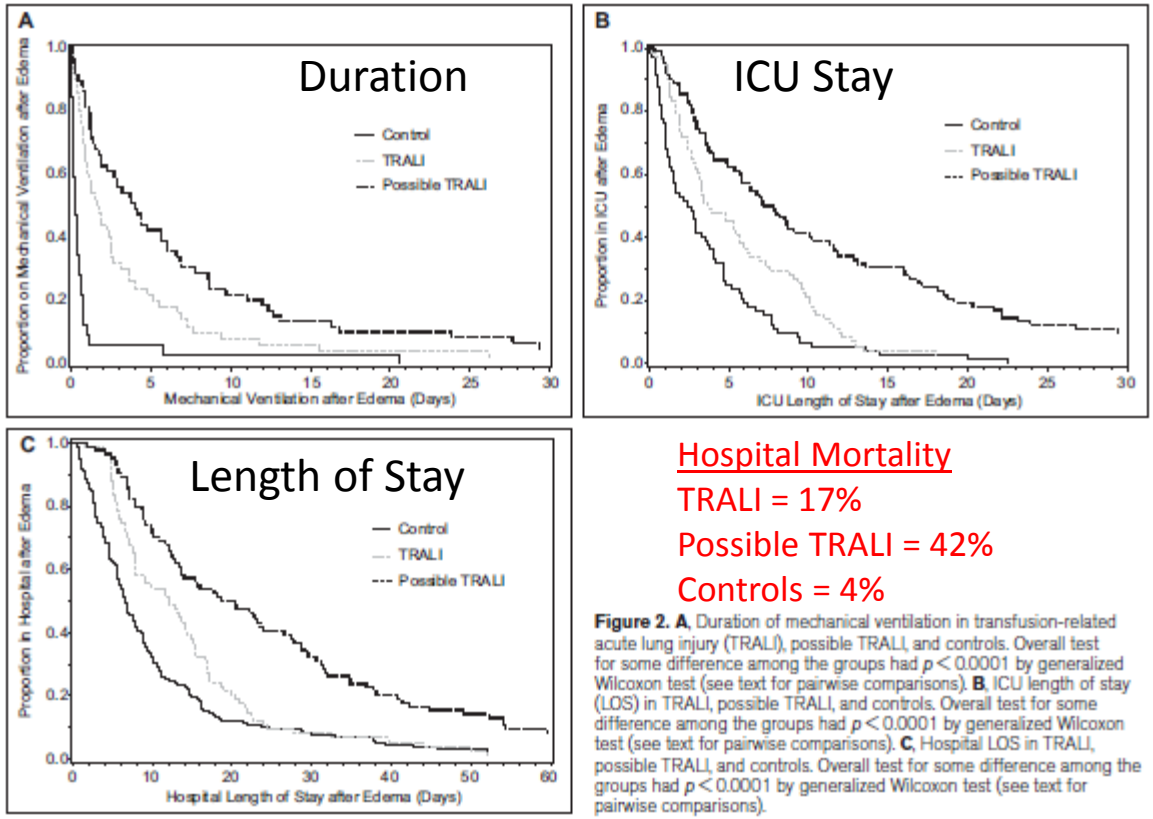
- Adverse events within 24 hours of PC transfusion through study day 21
- Serious Adverse Events within 7 days of PC transfusion including study day 21
- Acute transfusion reactions defined as a subset of AE and SAE
- ARDS (Berlin Criteria) inclusive of acute lung injury
  - Concurrent morbidity associated with ARDS
  - Sepsis, pneumonia, pulmonary GVHD, aspiration, pancreatitis, massive trauma
  - ARDS with transfusion
  - Intubation required for airway protection
  - Independent expert panel for adjudication of ARDS and ALI diagnosis
- Clinically Serious Pulmonary Adverse Events (≥ Grade 2)
  - Grade 2: Moderate requiring minimal or non-invasive intervention
  - MedDRA: Respiratory, or a pulmonary event within the SOC of Infections, Cardiac, and Procedural Complications
- Mortality up to 7 days after last PC exposure with cause of death and relation to ARDS

Study Logistics

- Blood centers provide both types of PC
  - Routine donor procedures
  - No donor data collected
    - Appropriate evaluation for suspected immune TRALI
  - Product specific data collected: suspension media, gamma, dose
  - IBS replaces bacterial detection, gamma irradiation, CMV serology
  - Blood centers pay for platelets and IBS technology
- Clinical sites administer transfusions
  - All transfusions per standard of care for PC transfusion
  - Clinical research coordinator collects data
  - Investigator reviews SAE and criteria for assisted ventilation endpoint
  - Investigator reviews criteria for ARDS diagnosis and severity level
  - Investigator classifies acute transfusion reactions
  - Investigator determines CSPAE Grade and provides verbatim term for review by research coordinator

Prospective Study on the Clinical Course and Outcomes in Transfusion-Related Acute Lung Injury*

A novel finding of this study is that possible TRALI patients had worse outcomes including a higher mortality compared with TRALI patients. The likely explanation for the worse clinical outcomes is that by definition, there was a temporal relationship to an alternative ALI risk factor in possible TRALI



Hospital Mortality
TRALI = 17%
Possible TRALI = 42%
Controls = 4%

Figure 2. A, Duration of mechanical ventilation in transfusion-related acute lung injury (TRALI), possible TRALI, and controls. Overall test for some difference among the groups had $p < 0.0001$ by generalized Wilcoxon test (see text for pairwise comparisons). **B**, ICU length of stay (LOS) in TRALI, possible TRALI, and controls. Overall test for some difference among the groups had $p < 0.0001$ by generalized Wilcoxon test (see text for pairwise comparisons). **C**, Hospital LOS in TRALI, possible TRALI, and controls. Overall test for some difference among the groups had $p < 0.0001$ by generalized Wilcoxon test (see text for pairwise comparisons).

Looney et al. 2014 Critical Care Medicine. 42: 1676

INTERCEPT BLOOD SYSTEM

INTERCEPT Implementation

March 9, 2015
Blood Centers of California

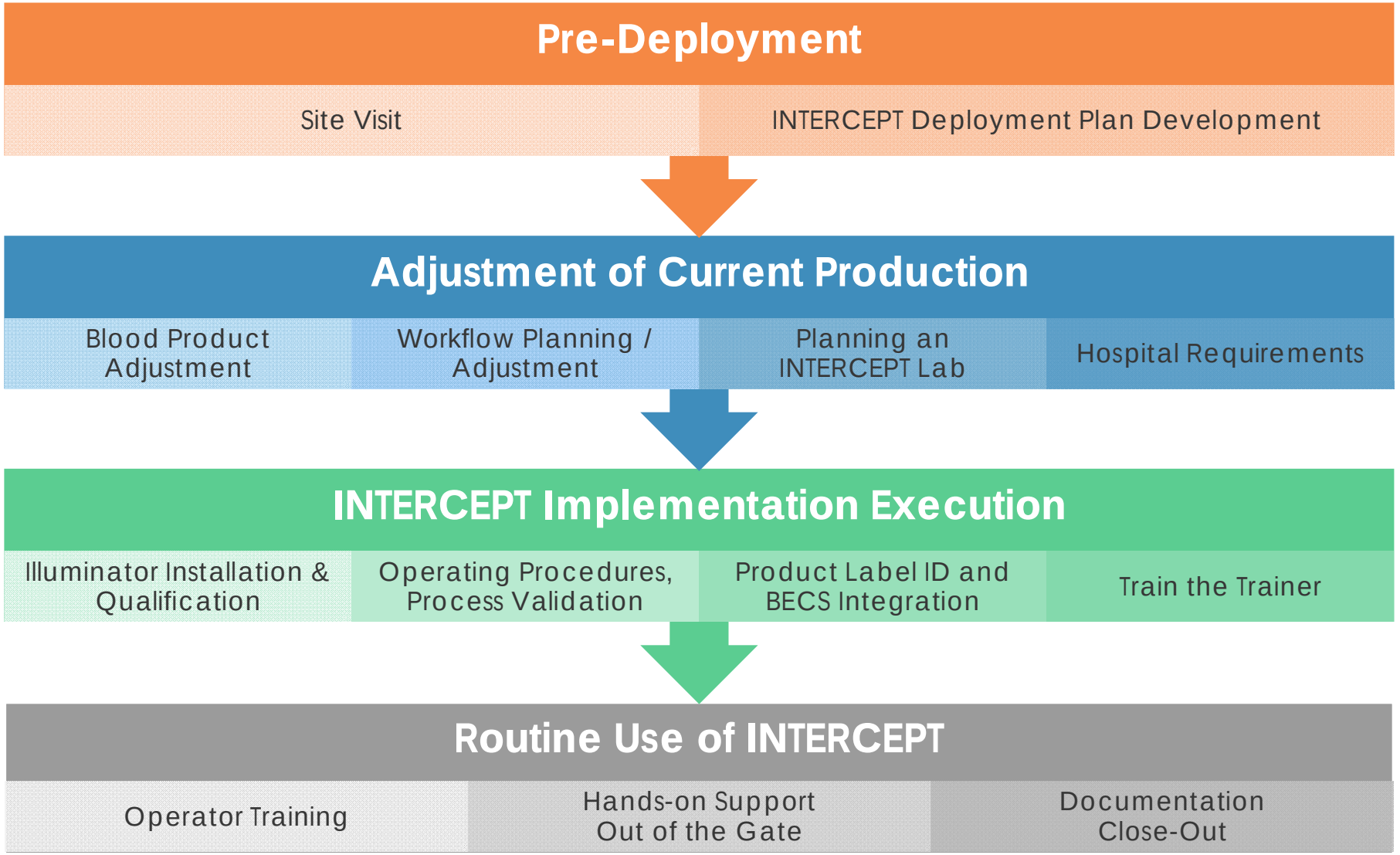
Melody Holtan
Sr. Director
Product Management & Deployment

INTERCEPT Implementation

- Facilitated by the Cerus Deployment team
- Deployment process established over 10+ years leveraging implementations in EU, Asia, and LatAm
- Deployment team members come from respected blood banks and leading medical device companies
  - Required to have experience working in US blood banks
  - Active in transfusion medicine community
- Expertise in:
  - Apheresis collection
  - Whole blood processing
  - GMP, quality
  - Workflow optimization
  - Laboratory planning
  - Device qualification and validation
  - Product licensure support

INTERCEPT BLOOD SYSTEM

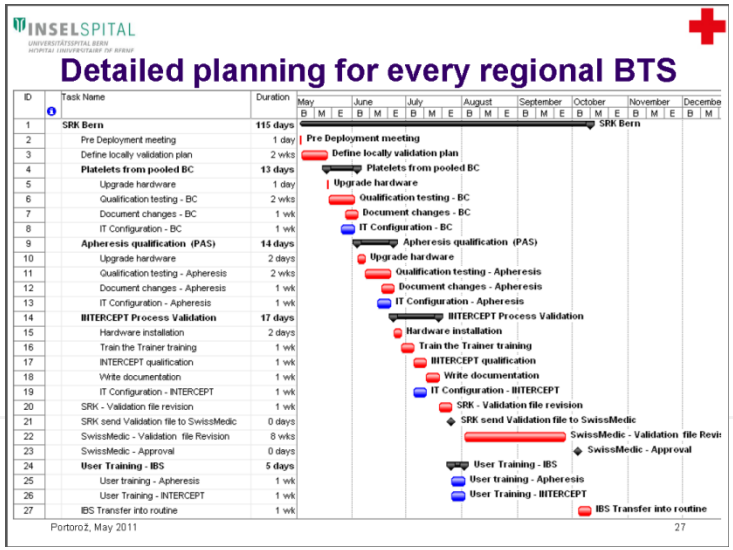
INTERCEPT Deployment Process



INTERCEPT BLOOD SYSTEM

Pre-Deployment

- Pre-Deployment site visit
  - Every blood center is different…
  - Understand current operations & the “why”
  - Discuss staffing, workflow, space considerations, change control process, etc.
  - Look at current collection profiles
- Prepare blood center specific implementation plan



Blood Product Adjustment

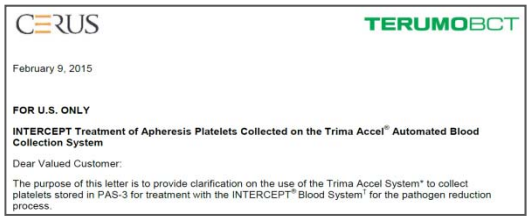
- Robustness of the pathogen reduction process is ensured by adhering to the INTERCEPT processing specifications
- Deployment staff work with centers to ensure the incoming blood products meet specifications
  - Plasma: Volume, RBC content
  - Platelets: Volume, Yield, RBC content

	Plasma	Small Volume	Large Volume	Dual Storage
Platform	• Apheresis • Whole blood	Apheresis (InterSol)	Apheresis (InterSol)	Apheresis (InterSol)
Input Volume (mL)	585-650	255-325	300-390	300-420
Platelet Dose ($x10^{11}$)	NA	2.9-5 x 10^{11}	3 - 6 x 10^{11}	3 - 8 x 10^{11}
RBC Content (/mL)	<4x10^6	<4x10^6	<4x10^6	<4x10^6

INTERCEPT BLOOD SYSTEM

Common Questions

- **Can I use Trima with InterSol?**
  - Yes, if your collections are INTERCEPT treated
  - Cerus/Terumo customer letter



CERUS TERUMOBCT

February 9, 2015

FOR U.S. ONLY

INTERCEPT Treatment of Apheresis Platelets Collected on the Trima Accel® Automated Blood Collection System

Dear Valued Customer:

The purpose of this letter is to provide clarification on the use of the Trima Accel System* to collect platelets stored in PAS-3 for treatment with the INTERCEPT® Blood System† for the pathogen reduction process.

- **Can I use platelets suspended in 100% plasma?**
  - FDA submission planned this month…approval decision anticipated by late summer

- **What about triple dose platelet collections?**
  - A new processing set is currently in development. Watch for abstracts with preliminary data at AABB

- **What about pooled RDPs?**
  - We are preparing a development and registration proposal for FDA

INTERCEPT BLOOD SYSTEM

Planned Product Extensions to Expand Processing Specifications

	Plasma	Small Volume	Large Volume	Dual Storage	Triple Storage
Platform	Apheresis - *freeze w/in 8 hrs* *Freeze w/in 24 hrs* WB - *freeze w/in 24 hrs*	Apheresis / PAS-3	Apheresis / PAS-3	Apheresis / PAS-3	Apheresis / PAS-3 & 100% Plasma *Pooled RDP?*
Input Volume (mL)	585 - 650	255 - 325	300 - 390	300 - 420	~420 – 650
Platelet Dose ($x10^{11}$)	NA	2.9 - 5	3 - 6	3 - 8	7 – 12
RBC Content ($x10^6$/mL)	< 4	< 4	< 4	< 4	< 4
Shelf Life	1 year frozen storage	5d	5d	5d	7d

Apheresis 100% Plasma

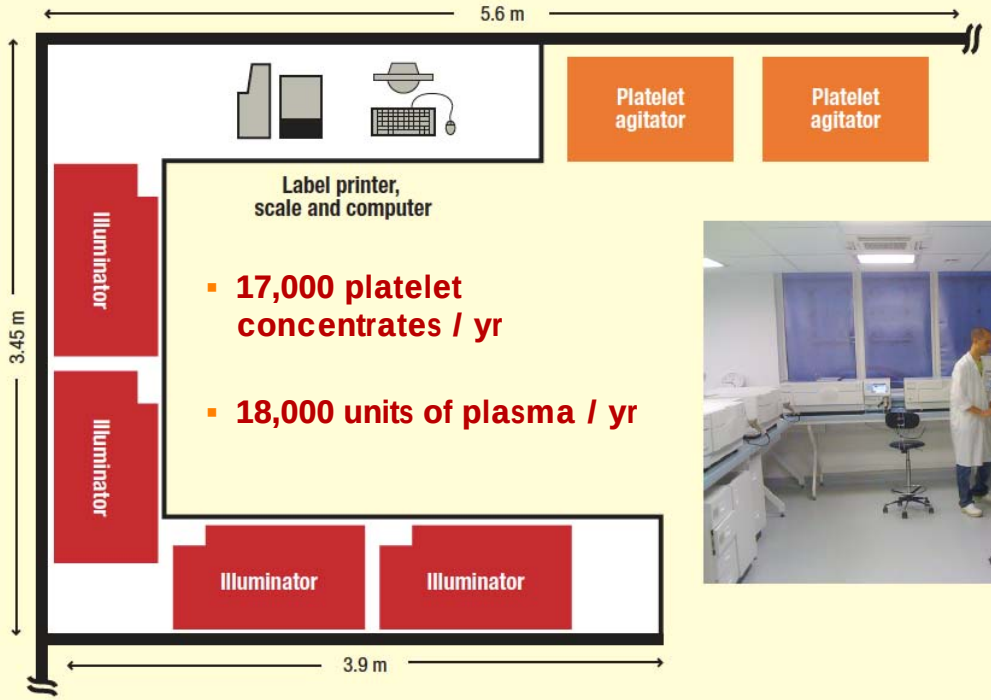
Pooled RDP

7d Shelf Life

INTERCEPT BLOOD SYSTEM

Space Planning, Throughput

Sample Layout: EFS Alsace



- **17,000 platelet concentrates / yr**
- **18,000 units of plasma / yr**

Stackable

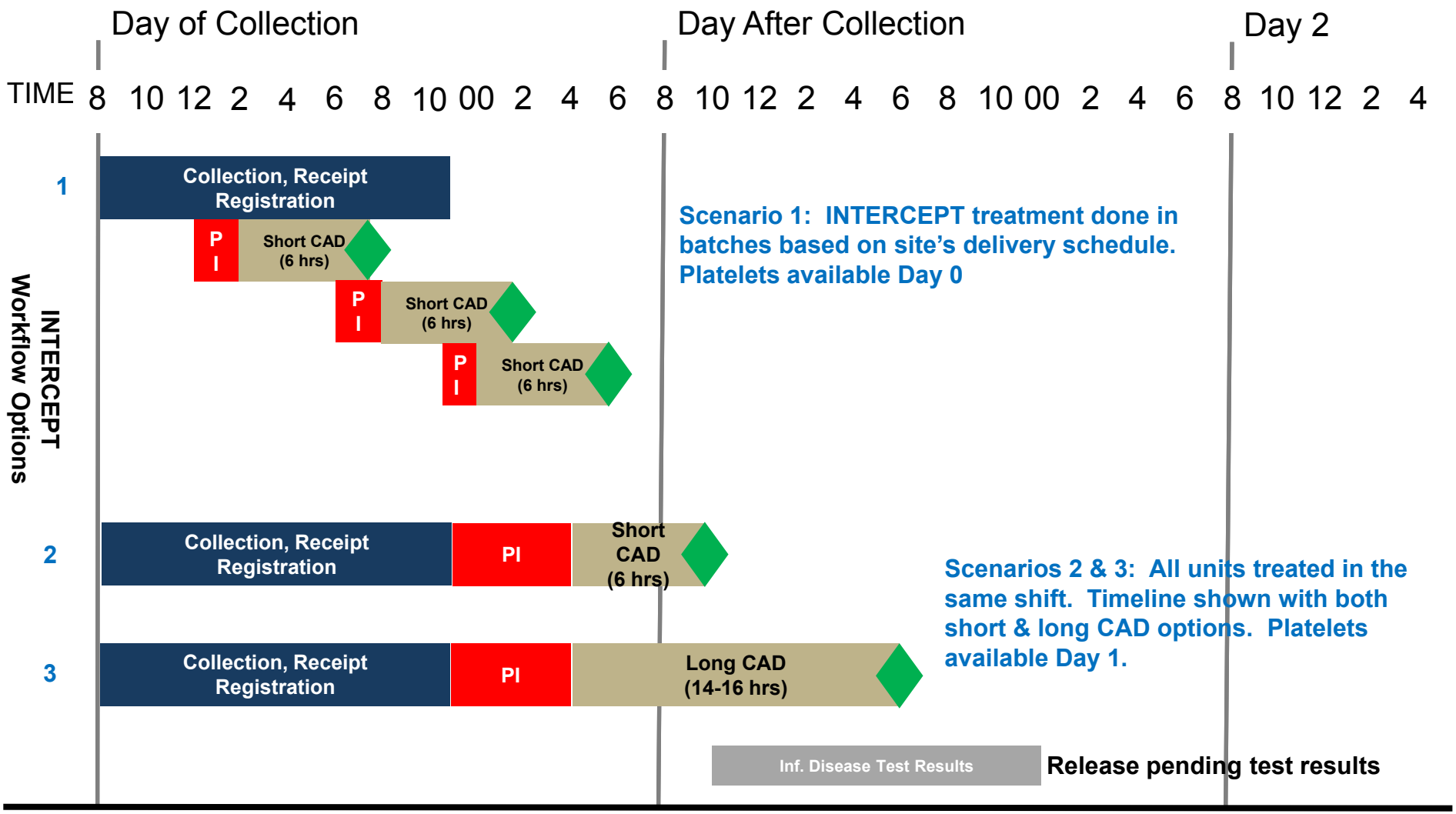
Plasma: Up to **36 units/hr** (288 units/8hr shift)

Platelets: Up to **40 units/hr** (320 units/8hr shift)

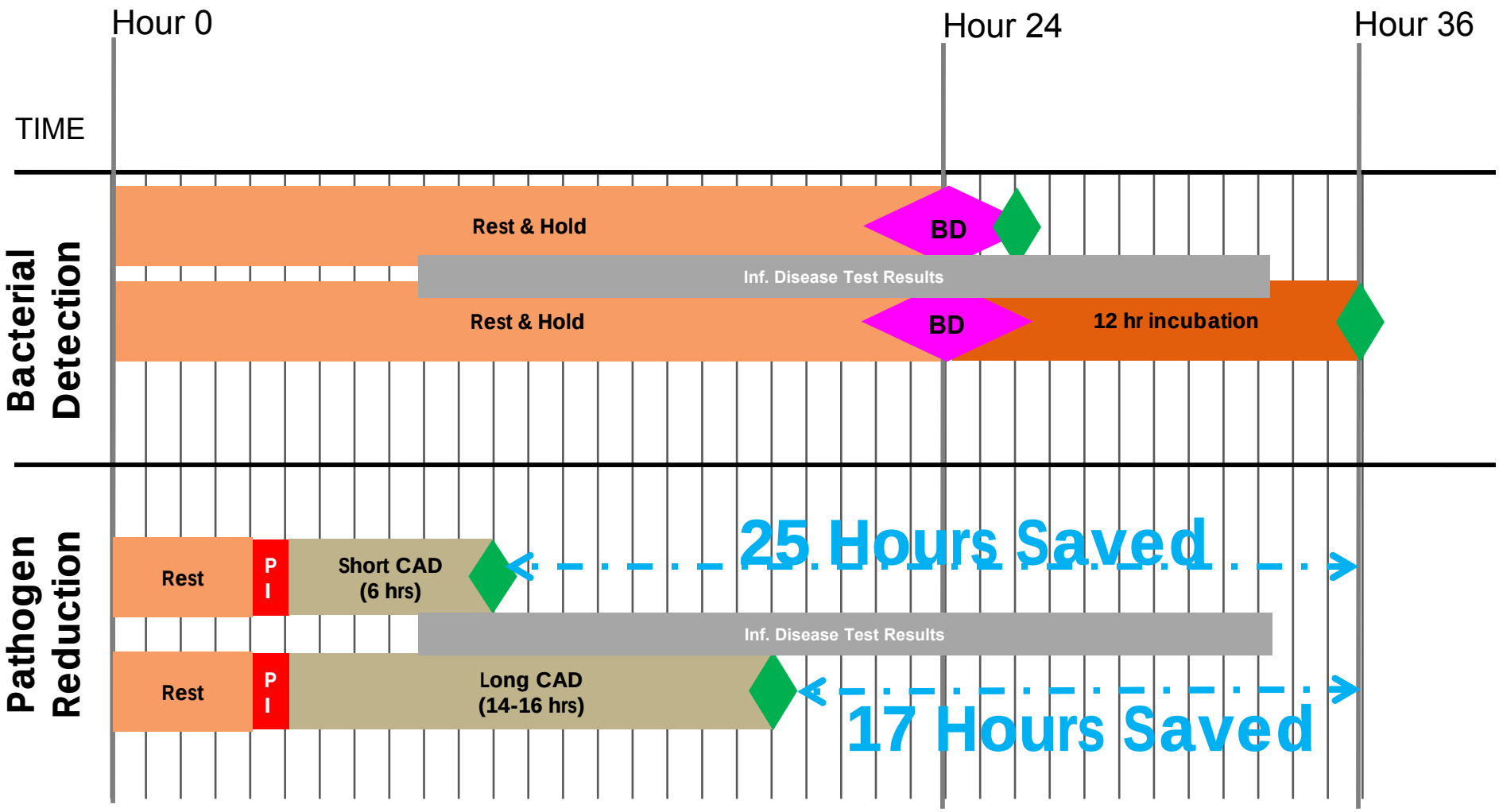
W: 45” H: 14.5” D: 29”
Weight: 152 lbs

INTERCEPT BLOOD SYSTEM

Workflow:
INTERCEPT Platelets Available on Day 0 or Day 1



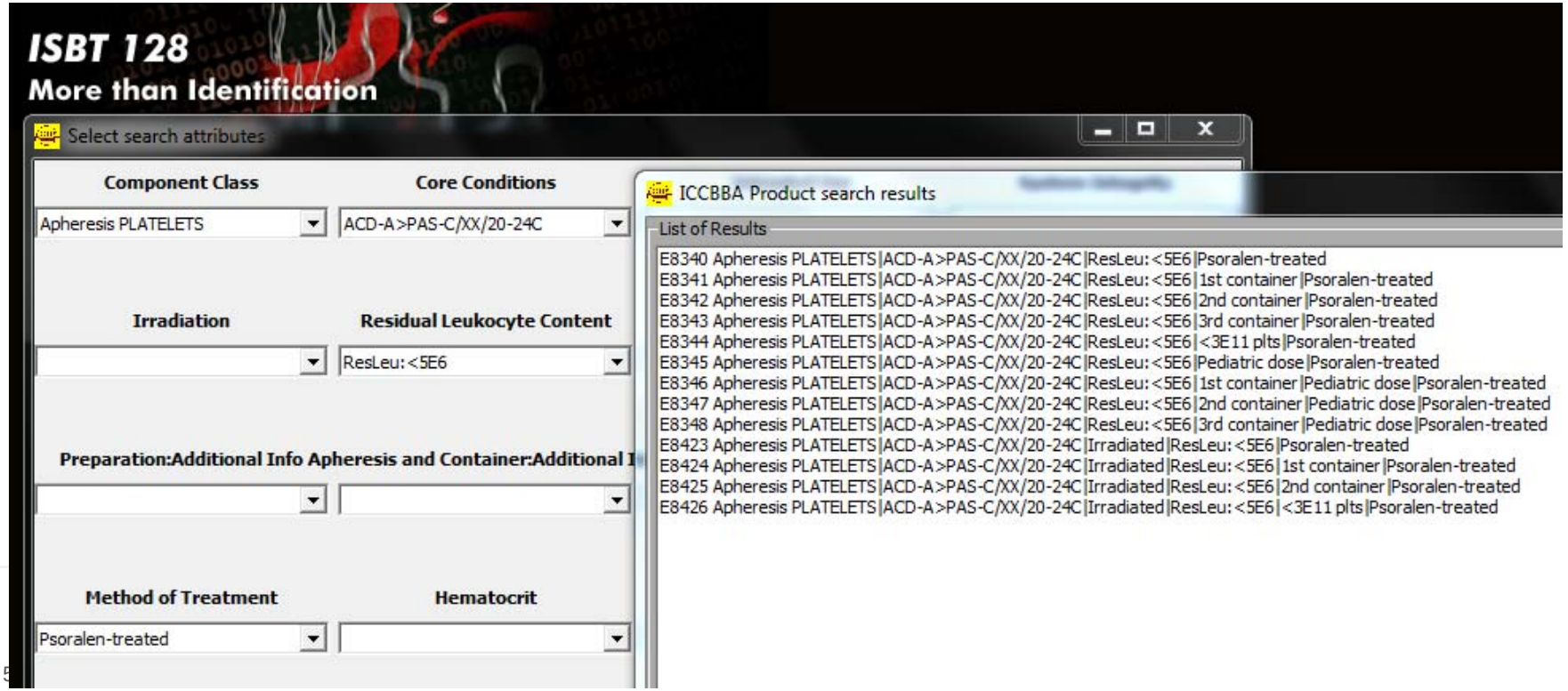
Earlier Platelet Release → Fresher Platelets



INTERCEPT BLOOD SYSTEM

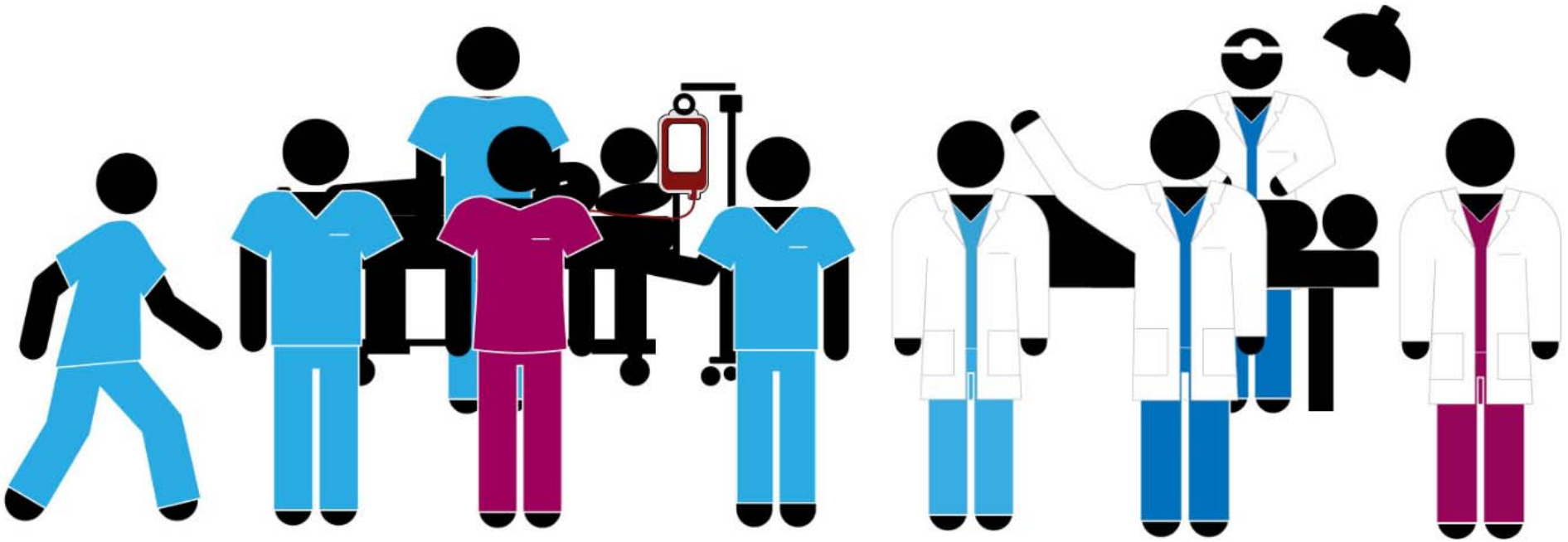
Blood Product Codes

- Blood product codes for INTERCEPT components are available in the ICCBBA database
- Search for “psoralen treated”
- Deployment team can provide list of codes



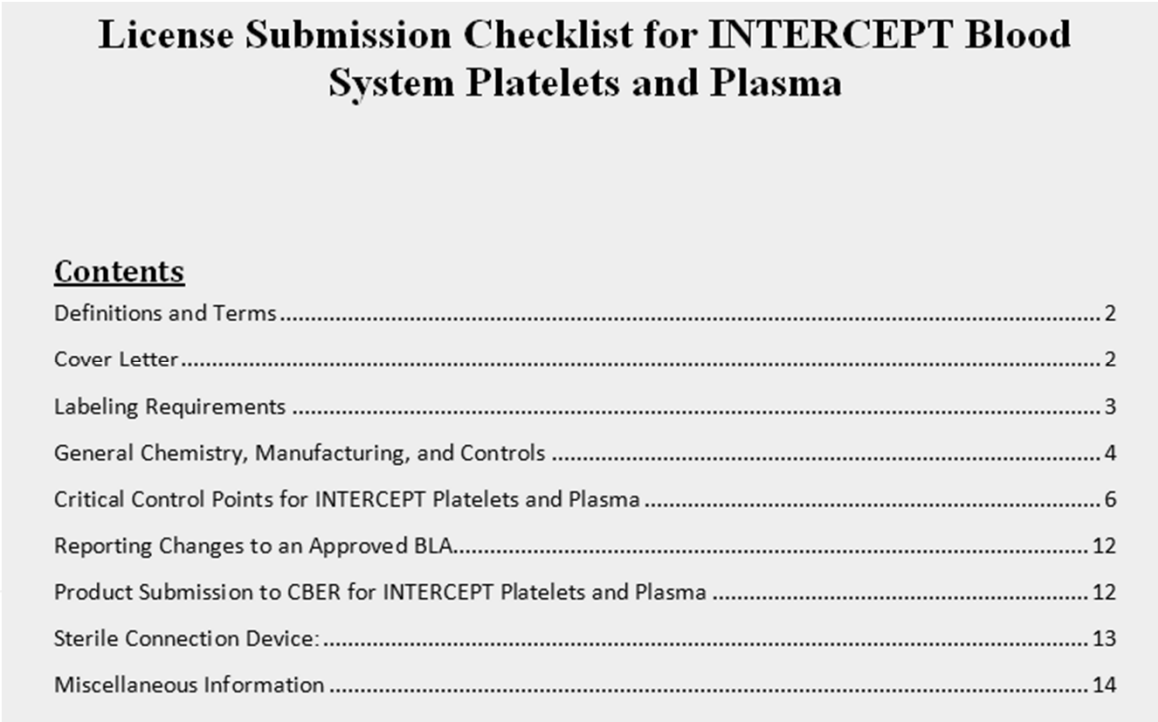
Hospital Readiness

- Identify target hospitals
- Determine hospital requirements for new products
- Develop educational materials and forums
- Prepare notification materials



Product Licensure / BLA Amendment Support

- Cerus is working in collaboration with FDA to develop a standardized validation plan and BLA package in an effort to reduce approval timelines
- Cerus is able to provide resource support for the preparation of licensure submissions



License Submission Checklist for INTERCEPT Blood System Platelets and Plasma

Contents

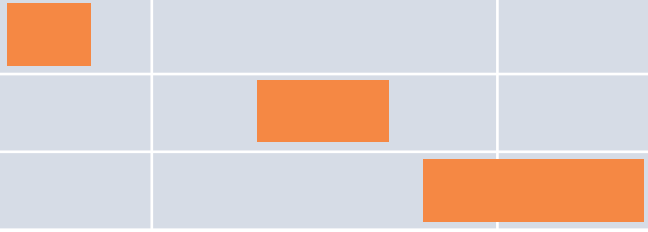
Definitions and Terms 2
Cover Letter 2
Labeling Requirements 3
General Chemistry, Manufacturing, and Controls 4
Critical Control Points for INTERCEPT Platelets and Plasma 6
Reporting Changes to an Approved BLA 12
Product Submission to CBER for INTERCEPT Platelets and Plasma 12
Sterile Connection Device: 13
Miscellaneous Information 14

Early Adopter Program

INTERCEPT BLOOD SYSTEM

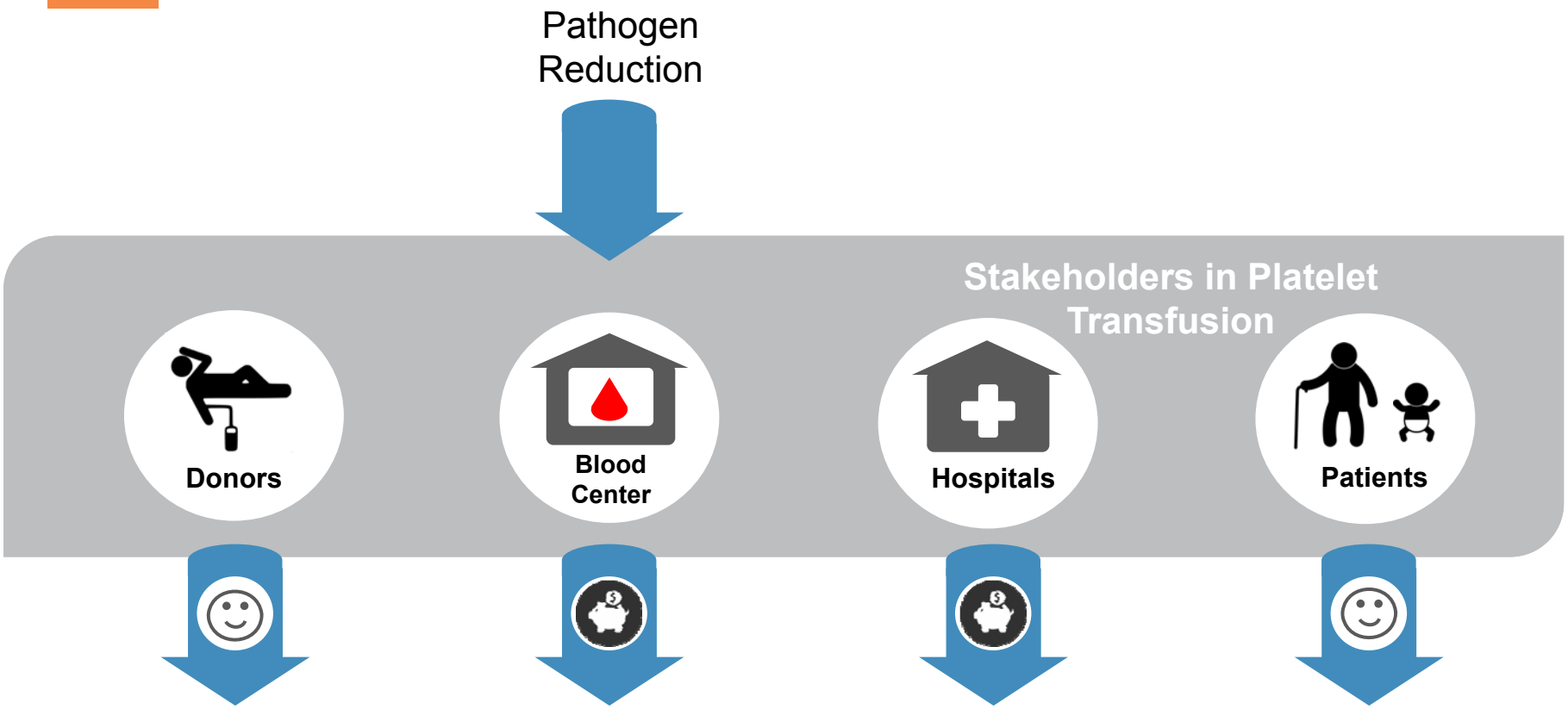
Projected timelines for product extensions

	2014	2015	2016	2017
Plasma	√ Approved			
Platelets				
PAS-3	√ Approved			
100% Plasma				
7 day				
XLV				



INTERCEPT BLOOD SYSTEM

Benefiting Stakeholders with INTERCEPT



- Potential impact to deferral policies

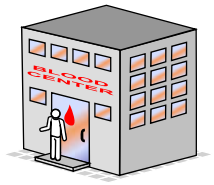
- Mission
- Cost-offsets
- Revenue/margin

- Treatment costs (reduced TA-GvHD, TTI)
- Waste Reduction
- Quality metrics
- Avoid POI testing

- Safer platelets (reduced TA-GvHD, TTI)
- Patient outcomes

INTERCEPT BLOOD SYSTEM

Premium priced line extension

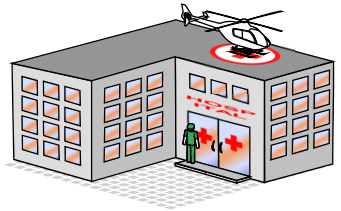


INTERCEPT
Platelets
$600 - $650

Price to Hospital

CMV/gamma
$575

Standard Platelets
$500



Avoid point of release tests

Risk mitigation

Cost offsets
- **Treatment costs**
- **Waste**
- **Simplified inventory**
- **Quality metrics**

INTERCEPT BLOOD SYSTEM

Early Adoption

Considerations

- Dedicated Deployment Support
  - Custom Workflow & Implementation Plan
  - Implementation & Validation Support
  - SOP Support
  - BLA Support
- Dedicated Medical Science Liaison Support
  - Clinical Education
  - Support Hospital Adoption
- Incentive program for 3 year agreement
  - Illuminators & kits
  - No volume commitments
  - No penalties