

# POOL DI PIASTRINE DA BUFFY COAT



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# Metodi per la preparazione di concentrati piastrinici (PC)

- **Platelet Rich Plasma (PRP-PC)**

Concentrato piastrinico da singola unità di sangue intero

- **Buffy coat (BC-PC)**

Concentrato piastrinico da pool di buffy coat

- **Apheresis (AP-PC)**

Concentrato piastrinico da aferesi

## **Gli albori della terapia con concentrati piastrinici**

Freireich EJ, Kliman A et al.

***Response to repeated platelet transfusions from the same donor.***

Ann Intern Med 1963;59:277-287.

Mourad N.

***A simple method for obtaining platelet concentrates free of aggregates.***

Transfusion 1968;8:48.

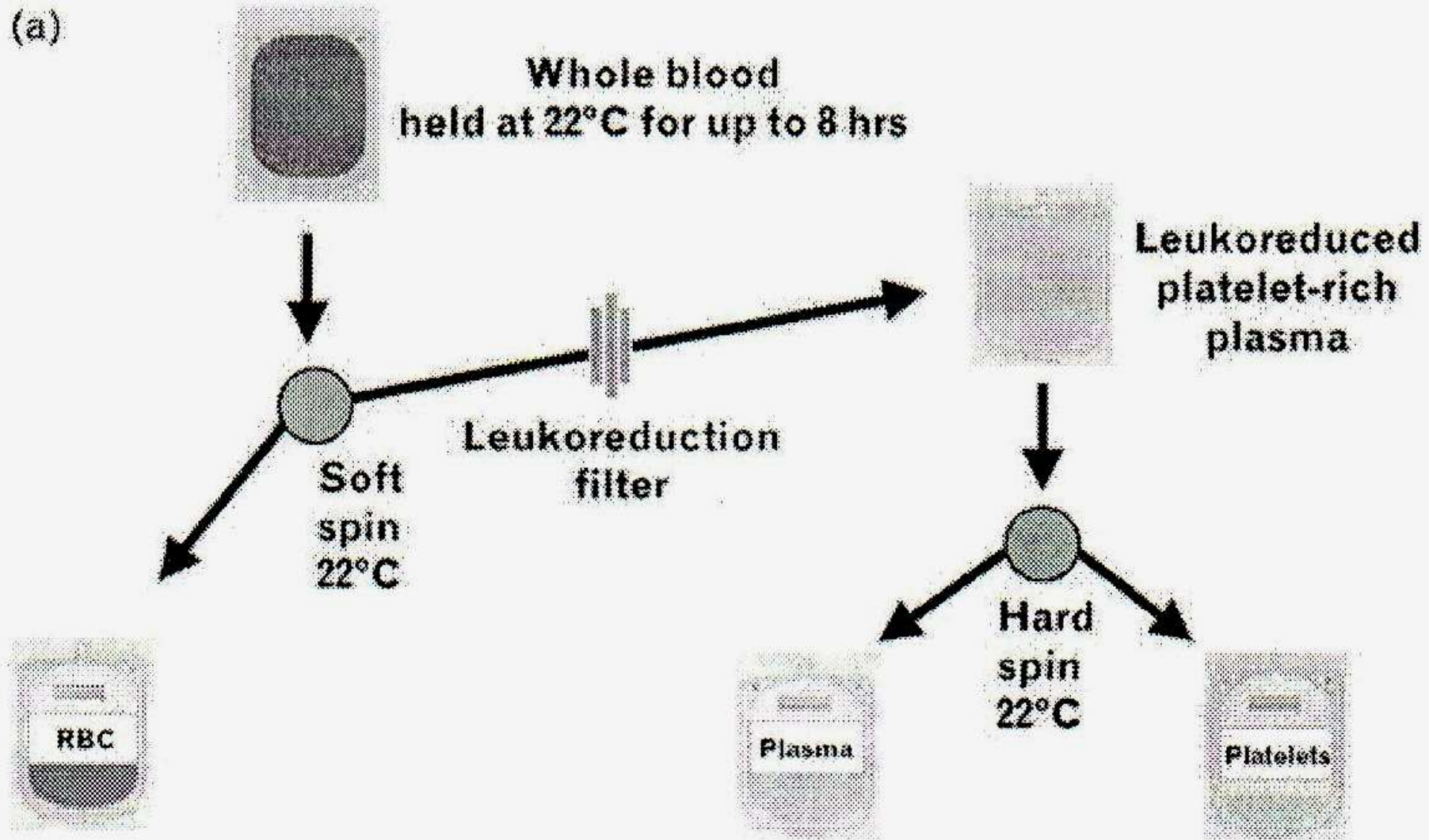
Murphy S, Gardner FH.

***Effect of storage temperature on maintenance of platelet viability – deleterious effect of refrigerated storage.***

N Engl J Med 1969;280:1094-98.

# Standard North American method

(a)



***Reduction of the maximum platelet storage period to 5 days in an approved container.***

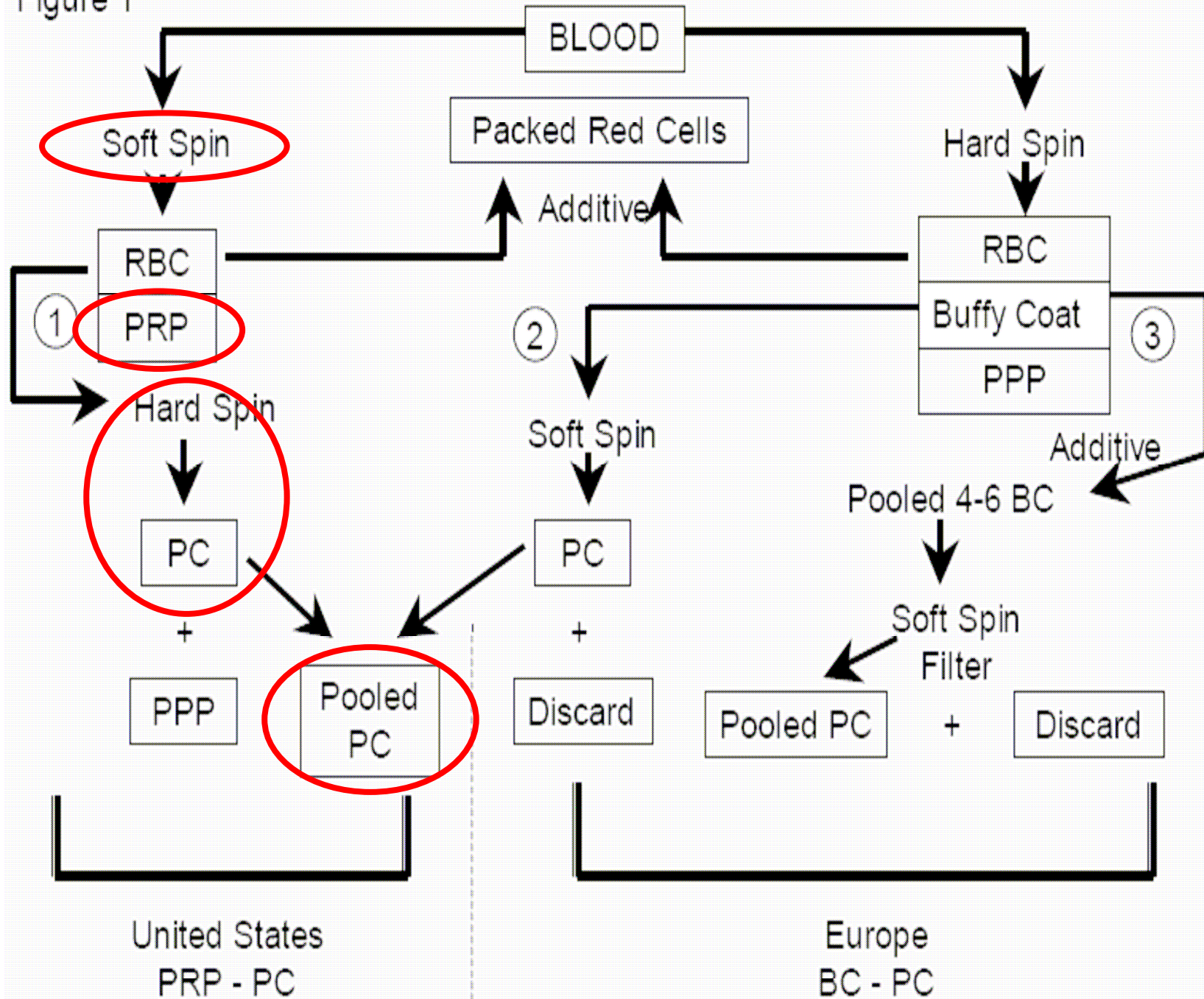
Rockville, MD: Food and Drug Administration; CBER Office of Communication, Training and Manufacturer's Assistance: June 1986.

Heddle NM, Cook RJ, Blajchman MA et al.

***Assessing the effectiveness of whole blood-derived platelets stored as a pool: a randomized block non-inferiority trial.***

Transfusion 2005;45:896-903.

Figure 1



# Origin of the buffy coat method

Murphy S, Heaton WA, Rebutta P.

***Platelet production in the old world – and the new.***

Transfusion 1996;36:751-4.

Brittingham TE, Chaplin H jr.

***Febrile transfusion reactions caused by sensitivity to donor leucocytes and platelets.***

JAMA 1957;165:819-25

Prins HK, de Bruijn JC, Heinrichs HP, Loos JA.

***Prevention of microaggregate formation by removal of buffy coat.***

Vox Sang 1980;39:48-51

Sweeney JD, Holme S, Heaton WA et al.

***White cell-reduced platelet concentrates prepared by in-line filtration of platelet-rich plasma.***

Transfusion 1995;35:131-6.

1. Whole blood unit    2. Centrifuged unit    3. Transfer of additive solution into red cells



Manual preparation of blood components

Pietersz RN, Loos JA, Reesink HW.

***Platelet concentrates stored in plasma for 72 hours at 22°C prepared from buffy coats of citrate-phosphate-dextrose blood collected in a quadruple-bag saline-adenine-glucose-mannitol system.***

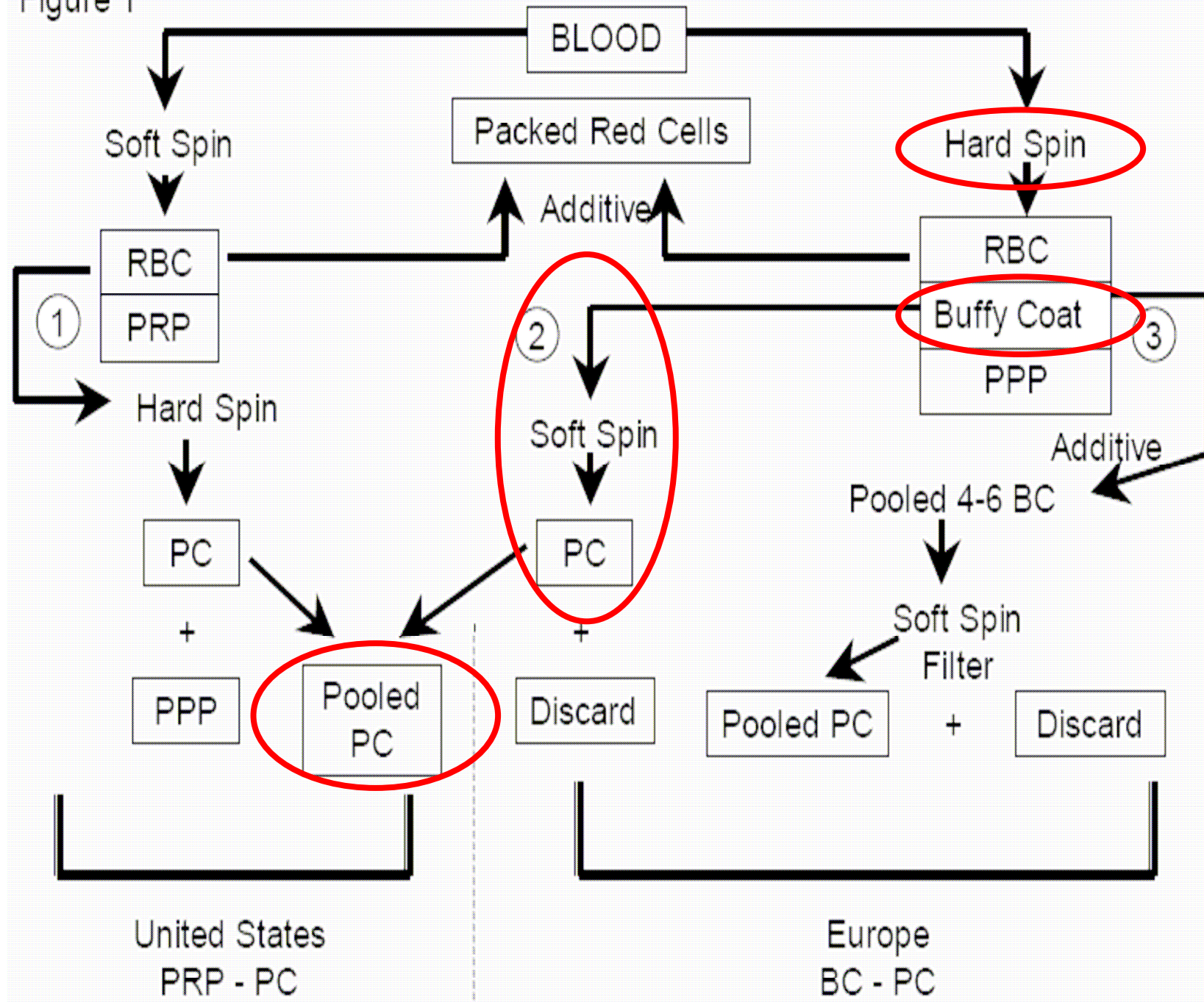
Vox Sang 1985;49:81-5.

Janetzko K, Kluter H, van Waeg Geert Eichler H.

***Fully automated processing of buffy coat-derived pool platelet concentrates.***

Transfusion 2004;44:1052-8.

Figure 1



Pietersz RN, deKorte D, Reesink HW et al.  
***Storage of whole blood for up to 24 hours  
at ambient temperature prior to component  
preparation.***  
Vox Sang 1989;56:145-50.

Moroff G, AuBuchon J et al.  
***Preparation of components from units  
of whole blood held for 24 hours at 20-24°C .***  
ISBT Abstract book 1996;0252:48.

Bertolini F, Rebullà P, Riccardi D et al.

***Evaluation of platelet concentrates prepared from buffy coats and stored in a glucose-free crystalloid medium.***

Transfusion 1989;29:605-9.

Eriksson L, Hogman CF.

***Platelet concentrates in an additive solution prepared from buffy coats.***

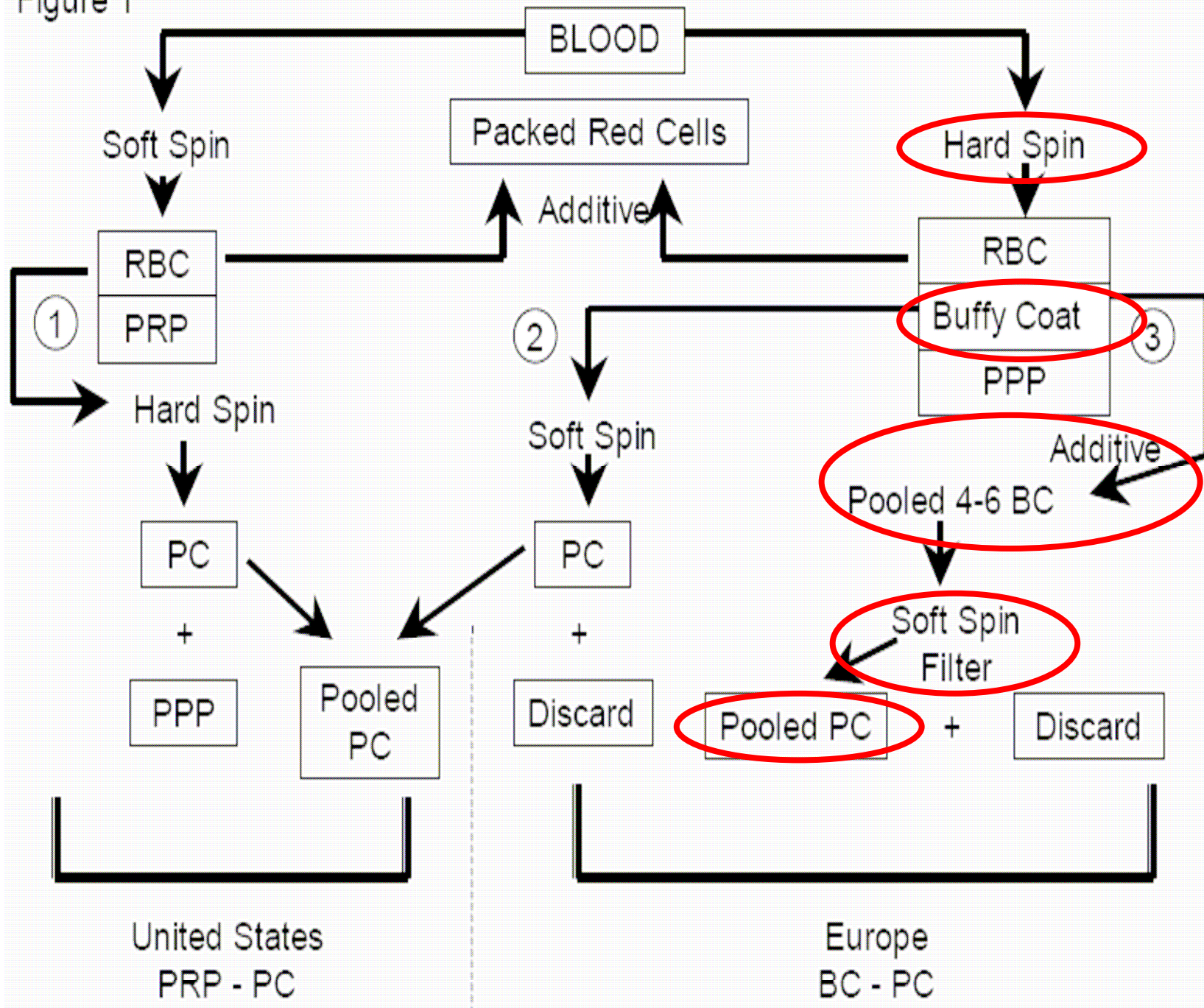
Vox Sang 1990;59:140-5.

Bertolini F, Rebullà P, Marangoni F, Sirchia G.

***Platelet concentrates stored in synthetic medium after filtration.***

Vox Sang 1992;62:82-6.

Figure 1



Rock G, Swenson SD, Adams GA.

***Platelet storage in a plasma-free medium.***

Transfusion 1985;25:551-6.

Bertolini F, Murphy S, Rebullia P, Sirchia G.

***Role of acetate during platelet storage in a synthetic medium.***

Transfusion 1992;32:152-6

Gulliksson H, AuBuchon J et al.

***Storage of platelets in additive solutions: a pilot in vitro study of the effects of potassium and magnesium.***

Vox Sang 2002;82:131-6.

**TABLE 1. PLT storage media\***

Component (mmol/L)	Medium				Composol
	PlasmaLyte A	PAS-II	PAS-III	PAS-IIIM	
NaCl	90.0	115.5	77.0	69.0	90.0
KCl	5.0			5.0	5.0
MgCl <sub>2</sub>	3.0			1.5	1.5
Na <sup>3</sup> -citrate		10.0	11.0	10.0	11.0
Na-phosphate			28.0	26.0	
Na-acetate	27.0	30.0	33.0	30.0	27.0
Na-gluconate	23.0				23.0

Murphy S, Kahn RA, Holme S et al.

***Improved storage of platelets for transfusions in a new container.***

Blood 1982;60:194-200.

Eriksson L, Eriksson G, Hogman CF.

***Storage of buffy coat preparations at 22°C in plastic containers with different gas permeability.***

Vox Sang 1997;73:74-80.

Hogman CP, Eriksson L, Hedlund K, Wallvik J.  
***The bottom and top system: a new technique for blood component preparation and storage.***

Vox Sang 1988;55:211-7.

van der Meer P, Pietersz R, Hunloopen B et al.  
***Automated separation of whole blood in top and bottom bags into components using the Compomat G4.***

Vox Sang 1999;76:90-9.

Janetzko K, Kluter H, van Waeg Geert Eichler H.  
***Fully automated processing of buffy coat-derived pool platelet concentrates.***

Transfusion 2004;44:1052-8.

1. Plasma removal 2. Buffy coat removal 3. Transfer of additive solution into red cells



Automated preparation of blood components

# Scelta del prodotto

Uso obbligatorio di AP-PC in caso di

- necessità di selezionare piastrine HPA/HLA compatibili per pazienti refrattari
- trombocitopenia neonatale alloimmune (NAITP)
- porpora post-trasfusionale (PTP)
- necessità di emocomponenti privi di IgA in pazienti con reazioni trasfusionali anafilattiche alle IgA

# BC-PC versus PRP-PC

- Vantaggi logistici
- Minor attivazione piastrinica
- Basso costo e miglior utilizzo
- Contenuto quasi equivalente di piastrine
- Minor contaminazione leucocitaria
- Maggior recupero di plasma
- Minori complicanze da plasma
- Adatto all'automazione e all'inattivazione virale
- Perdita di emazie

Bock M, Rahrig S et al.

***Platelet concentrates derived from buffy coat and apheresis: biochemical and functional differences.***

Tranfus Med 2002;78:171-75.

Krailadseri P, Seghatchian J.

***Are all leucodepleted platelet concentrates equivalent? Comparison of Cobe LRS Turbo, Haemonetics MCS+ LD, and filtered pooled buffy-coat-derived platelets.***

Vox Sang 2000;78:171-75.

Arnold DA, Heddle Nmet al.

***In vivo recovery and survival of apheresis and whole blood-derived platelets: a paired comparison in healthy adults.***

Transfusion 2006; 46:257-64.