



Blood bank information systems

Attention to errors linked to usefulness of wares

Suzanne Butch, CLDir(NCA)

Just as the chameleon adapts to its environment, blood bank vendors must adjust to the changes precipitated by customer desires for new software features to prevent and detect errors. To thrive in today's marketplace, blood bank vendors must adapt to the requirements of such offerings as positive patient identification from specimen collection to transfusion, instrument interfaces, ISBT 128, and computerized donor interviews.

♥ The niche market of point-of-care software to enhance patient safety through positive patient identification using bar codes or radio frequency identification technology continues to expand. Some of these vendors offer products that are limited to point-of-care specimen labeling and that do not interact with transfusion service software. Others provide products that interact with transfusion software to ensure patient identification and create an electronic medical record from specimen collection to transfusion. At least one vendor has obtained FDA 510(k) clearance for its software, and others are expected to seek FDA clearance for their products during the coming year.

Positive patient identification products that can interface with transfusion service software, and potentially prevent a hemolytic transfusion reaction, obviously offer advantages over stand-alone products that were originally designed for a single purpose—to trace specimen collection or to document medication administration.

♥ A growing number of hospital transfusion services are purchasing semi-automated or fully automated immunohematology testing systems, and subsequently realizing the difficulties of interfacing these instruments to blood bank software. Such interface issues, long dealt with by laboratorians in other sections of the clinical laboratory, are new to the hospital transfusion service. Some facilities must use middleware products, such as Dawning Technologies' JavaLin clinical interface, to bridge the gap between the automated instrument and the information system. In other cases, facilities must upgrade to the latest version of blood bank software to get an operational interface.

Vendors should address the topic of interfacing instruments at software user group meetings to further providers' knowledge of this emerging software issue in the blood bank.

♥ While ISBT 128, the international standard for the transfer of information on transfusion medicine and tissue transplantation, awaits a conversion date from the American Red Cross, some donor collection and transfusion service facilities have converted and found that software thought to be ISBT 128-ready needs tweaking. ICCBBA, the nonprofit company that manages ISBT 128, has submitted to the FDA for review a revised version of the "United States Industry Consensus Standard for the Uniform Labeling of Blood and Blood Components Using ISBT 128." This version includes the use of flag characters for process control functions. (The Web site of the ICCBBA—www.iccbba.com—has also

been revised to help blood bankers with the conversion process. Web site users can click on "what's new" and "other validation tools" for a program to convert Codabar product bar codes to ISBT 128 bar codes.)

On-demand labeling of modified blood components is one solution to the April 26, 2006 FDA requirement for hospitals to issue all blood components with a bar-code readable facility identifier, donor identification number, product code, and donor ABO and Rh.¹ Ideally, vendors would have integrated the production of bar-coded blood component labels into the process of documenting component modification. Since it is necessary to validate new equipment and processes to meet the new regulation, some hospitals might choose to use ISBT 128 bar-code labeling to satisfy the regulation and to take the opportunity to verify their software's ability to use ISBT 128.

Using a uniform donor unit number format such as ISBT 128 throughout the United States and Canada would simplify the transfer of donor unit testing information to another facility. Some form of unit or specimen renumbering is needed when the testing facility computer format for donor unit bar-code labeling is incompatible or would result in duplicate processing numbers. Because blood banks increasingly are consolidating their services and because demand has grown for disaster planning and centralized testing, it is increasingly important that information systems allow for testing to be performed at multiple sites.

♥ Several vendors now provide software for self-administered computerized donor screening and Web-based connections to donor deferral files. Computerizing the donor screening process has been shown to be at least as effective as reviewing each screening question with a donor screener face-to-face. Because donor screening questions are often modified in response to an emerging infectious disease threat, blood banks should seek software that offers the flexibility to add or revise questions as needed or a vendor that will respond rapidly to changes in donor screening criteria.

On the following pages is CAP TODAY's annual lineup of blood bank software. The products featured are at various stages in addressing such growing areas as positive patient identification, instrument interfacing, ISBT 128, and computerized donor screening.

The profiles presented herein were generated from vendors' responses to a questionnaire. Please verify the accuracy of vendors' claims before making a purchase.

Reference

1. Department of Health and Human Services, Food and Drug Administration. Bar Code Label Requirement For Human Drug Products and Blood. 21 CFR parts 201, 606, and 610 [Docket No. 02N-0204], RIN 0910-AC26.

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SYSTEM
REVIEW SERIES

Blood bank information systems

Part 1 of 7 See accompanying article at left	Blood Bank Computer Systems Arlene Magdamit amagdamit@bbcsinc.com 1002 15th St. SW, Ste. 120 Auburn, WA 98001 253-333-0046 www.bbcsinc.com
Name of blood bank system	Blood Bank Control System
First ever blood bank system installation First/most recent installation of <i>current</i> blood bank system No. of contracts signed since July 1, 2004 Total number of contracts for operational sites •U.S. hospitals—donor and transfusion service •U.S. hospitals—transfusion service only •U.S. regional blood centers—donor service only •U.S. regional blood centers—donor and transfusion service •Centralized transfusion services in the U.S. •Foreign hospitals/foreign regional blood centers Total number of sites operational Installations underway that are not yet live (hospitals/RBCs*) Percentage of installations that are stand-alone systems	1987 2005/2005 2 23 0 0 19 4 0 0 ~108 4 (1/3) 100%
Staff to develop/install/support/other** •In entire company/in blood bank systems	14-2-3-5
No. of different versions of software installed •Versions of product covered by FDA 510(k) clearance •Versions of product that did not require FDA 510(k) clearance	2 BBCS release 4.4, BBCS release 5.0 0
Range in No. of terminals/workstations in live sites (ave.)	10–150 (ave., 40)
Central hardware/computer platform or services Terminals/workstations Central hardware redundant/fault-tolerant?	IBM iSeries IBM 5250-compatible workstations and PCs yes
Software programming language(s) Operating system(s) Database platform Full transaction logging?	RPG/400, Java OS/400 IBM DB2 yes
Features (listed as percentage of live installs or based on availability) •Unit inventory •Autologous and directed unit tracking •Crossmatch results •Print donor unit labels—bar coded •Full support of ISBT 128 unit labeling •Donor recruitment/donor questionnaire •Mobile scheduling •Interface with automated type and screen instruments •Source/recovered plasma management •Bar-code reading of donor and unit information •Ad hoc report writer •Accounts receivable •Management reports •Direct entry of test results •Electronic crossmatch decisionmaking •Laptop-based mobile donor registration module •Track all steps in production of product •Antigen typing •Interface with blood irradiator/centrifuges •Centralized transfusion services •Integrated bedside check for transfusion •Hand-held devices for positive patient ID	100% 100% 20% available available 100%/available 90% 80% 100% 100% 100% 100% 100% 100% 5% 90% 100% 100% available in 2006 5% — —
System provides standard ASTM/HL7 interface? Functioning interfaces to automated instruments Connectivity Tools to help clients validate their systems	yes uni- and bidirectional to Ortho, Immucor; others Telnet, local client, remote client, Web client department dedicated to development of validation protocols, flow charts, management guides, validation guide documents, 24/7 client support
Complete blood bank ASP solution? Method of charging for ASP service Client software required ASP information conduit Client contracts supported from data center not operated by client How data center is operated	yes transaction based browser based, requires software be installed on client PC, uses dumb terminals operates over Internet or requires use of private, dedicated circuit 2 by a third party (blood bank or Manage Inc.)
System provides indexed field in each test definition for LOINC code? Provide LOINC dictionary for each new installation?	no no
HIS and LIS interfaces	Cerner, Mediware, IDM, Meditech
User group? Source code? Can user modify screens? User-defined report writer?/custom programming?	yes (meets online as well) escrow no yes/yes
Cost (hardware/software/monthly maintenance) •Smallest:largest	—
Distinguishing features (supplied by vendor) <i>*RBCs=regional blood centers</i> <i>**other=sales, marketing, administration, other company functions</i>	• leading the way in risk management • system is highly configurable • user group interaction and direction in product development

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Survey editor: Raymond D. Aller, MD





SYSTEM
REVIEW SERIES

Blood bank information systems

Part 2 of 7	Cerner Corp. Angela Betts abetts@cerner.com 2800 Rockcreek Parkway Kansas City, MO 64117 816-201-2771 www.cerner.com	Cerner Corp. Angela Betts abetts@cerner.com 2800 Rockcreek Parkway Kansas City, MO 64117 816-201-2771 www.cerner.com	GE Healthcare Information Technologies Larry Wimberly larry.wimberly@med.ge.com 3100 Steeles Ave. East, Ste. 900 Markham, Ontario, Canada L3R 8T3 905-305-0041 www.gehealthcare.com
See accompanying article on page 20			
Name of blood bank system	Cerner Millennium Blood Bank Donor	Cerner Millennium Blood Bank Transfusion	Centricity Ultra Transfusion Medicine
First ever blood bank system installation	1985	1985	1998
First/most recent installation of <i>current</i> blood bank system	2003/2004	1997/2005	2005/2005
No. of contracts signed since July 1, 2004	10	26	1
Total number of contracts for operational sites	50+	400+	11
•U.S. hospitals—donor and transfusion service	50+	50+	0
•U.S. hospitals—transfusion service only	—	350+	1
•U.S. regional blood centers—donor service only	0	0	0
•U.S. regional blood centers—donor and transfusion service	1	4	0
•Centralized transfusion services in the U.S.	0	0	0
•Foreign hospitals/foreign regional blood centers	0	40+	10
Total number of sites operational	50+	400+	11
Installations underway that are not yet live (hospitals/RBCs*)	12+ (12+/0)	129+ (129/0)	3 (3/0)
Percentage of installations that are stand-alone systems	—†	—†	0
Staff to develop/install/support/other**			
•In entire company/in blood bank systems	800+-1,900+-800+-1,300+/15-24-10-15	800+-1,900+-800+-1,300+/15-24-10-15	45-40-12-9/4-3-3-0
No. of different versions of software installed	—	—	5
•Versions of product covered by FDA 510(k) clearance	Classic, Millennium	Classic, Millennium	v 4.0
•Versions of product that did not require FDA 510(k) clearance	n/a	n/a	v 2.5, v 3.1, v 3.2, v 3.3
Range in No. of terminals/workstations in live sites (ave.)	5–500+ (ave., 10–20)	5–500+ (ave., 10–20)	10–100 (ave., 20)
Central hardware/computer platform or services	HP, IBM RS/6000	HP, IBM RS/6000	IBM, Sun, HP
Terminals/workstations	Intel Pentium PCs	Intel Pentium PCs	Intel PCs
Central hardware redundant/fault-tolerant?	yes	yes	yes
Software programming language(s)	Visual Basic, C++, Cobol (Classic)	Visual Basic, C++, Cobol (Classic)	Unify Vision, C
Operating system(s)	Open VMS, AIX	Open VMS, AIX	AIX, Solaris, HP/UX
Database platform	Oracle (Millennium), Cerner proprietary (Classic)	Oracle (Millennium), Cerner proprietary (Classic)	Unify DataServer
Full transaction logging?	yes	yes	yes
Features (listed as percentage of live installs or based on availability)			
•Unit inventory	expected in 2006	100%	100%
•Autologous and directed unit tracking	expected in 2006	100%	36%
•Crossmatch results	expected in 2006	100%	100%
•Print donor unit labels—bar coded	expected in 2006	100%	not available
•Full support of ISBT 128 unit labeling	expected in 2006	available in 2006	not available
•Donor recruitment/donor questionnaire	expected in 2006/100%	not available	not available
•Mobile scheduling	100%	not available	not available
•Interface with automated type and screen instruments	expected in 2006	20%	36%
•Source/recovered plasma management	expected in 2006	not available	not available
•Bar-code reading of donor and unit information	expected in 2006	100%	100%
•Ad hoc report writer	expected in 2006	100%	100%
•Accounts receivable	expected in 2006	15%	available
•Management reports	expected in 2006	100%	100%
•Direct entry of test results	expected in 2006	100%	100%
•Electronic crossmatch decisionmaking	not available	100%	36%
•Laptop-based mobile donor registration module	planned for future	not available	not available
•Track all steps in production of product	expected in 2006	100%	not available
•Antigen typing	expected in 2006	100%	100%
•Interface with blood irradiator/centrifuges	not available	not available	not available
•Centralized transfusion services	not available	100%	not available
•Integrated bedside check for transfusion	not available	available in 2007	not available
•Hand-held devices for positive patient ID	not available	10%	not available
System provides standard ASTM/HL7 interface?	yes	yes	yes
Functioning interfaces to automated instruments	—	—	bidirectional to Ortho, Immucor, Stratec; others
Connectivity	Telnet, local client, remote client	Telnet, local client, remote client	local client
Tools to help clients validate their systems	solution validation guidelines, support guide, application consultants, others	solution validation guidelines, support guide, application consultants, others	validation guidelines and validation test plans for safety critical control checks
Complete blood bank ASP solution?	yes	yes	no
Method of charging for ASP service	fixed fee	fixed fee	—
Client software required	requires software be installed on client PC	requires software be installed on client PC	—
ASP information conduit	requires use of private, dedicated circuit	requires use of private, dedicated circuit	—
Client contracts supported from data center not operated by client	—	—	—
How data center is operated	by vendor	by vendor	—
System provides indexed field in each test definition for LOINC code?	yes	yes	yes
Provide LOINC dictionary for each new installation?	yes	yes	no
HIS and LIS interfaces	multiple vendors	multiple vendors	ADAC, Compucare, Eclipsys, Epic, IDX, MediSolutions, Meditech, Siemens, McKesson
User group?	yes (meets online as well)	yes (meets online as well)	yes (meets online as well)
Source code?	escrow	escrow	escrow
Can user modify screens?	yes	yes	no
User-defined report writer?/custom programming?	yes/yes	yes/yes	yes/no
Cost (hardware/software/monthly maintenance)			
•Smallest:largest	—	—	not avail./\$25k/\$.375k:not avail./\$80k/\$1.2k
Distinguishing features (supplied by vendor)	• flexible online standard operating procedures • clinical validation planned for 2006 • advanced blood bank donor quality control planned for 2006	• flexible online standard operating procedures • clinical validation new in 2005 • advanced blood bank transfusion quality control new in 2005	• provide industry-leading technologies • product fully integrated into Centricity Ultra LIS • meet all regulatory requirements of North America, European Union, Australia, New Zealand
<i>*RBCs=regional blood centers</i>			
<i>**other=sales, marketing, administration, other company functions</i>	<i>tavailable standalone or integrated</i>	<i>tavailable standalone or integrated</i>	

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**SYSTEM
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Part 3 of 7	Information Data Management Susan McBride slm@idm.com 9701 W. Higgins Rd., Ste. 500 Rosemont, IL 60018 847-825-2300/800-249-4276 www.idm.com	Information Data Management Susan McBride slm@idm.com 9701 W. Higgins Rd., Ste. 500 Rosemont, IL 60018 847-825-2300/800-249-4276 www.idm.com	Mak-System Corp. Stephane Sajot sales.us@mak-system.net 2720 River Rd., Ste. 225 Des Plaines, IL 60018 847-803-4863 www.mak-system.net
	See accompanying article on page 20		
Name of blood bank system	IDM Select Series	IDM Surround	Progesa
First ever blood bank system installation	1991	1991	1985
First/most recent installation of <i>current</i> blood bank system	1999/2002	2000/2005	1985/2004
No. of contracts signed since July 1, 2004	0	7	32
Total number of contracts for operational sites	7	23	—
•U.S. hospitals—donor and transfusion service	0	0	1
•U.S. hospitals—transfusion service only	0	0	0
•U.S. regional blood centers—donor service only	6	19	5
•U.S. regional blood centers—donor and transfusion service	0	3	—
•Centralized transfusion services in the U.S.	0	0	—
•Foreign hospitals/foreign regional blood centers	1	1	547
Total number of sites operational	7	25	—
Installations underway that are not yet live (hospitals/RBCs*)	0	3 (0/3)	17 (8/9)
Percentage of installations that are stand-alone systems	100%	76%	100%
Staff to develop/install/support/other**			
•In entire company/in blood bank systems	27-8-9-19	27-8-9-19	102-45-48-55
No. of different versions of software installed	6	6	—
•Versions of product covered by FDA 510(k) clearance	—	—	4.4
•Versions of product that did not require FDA 510(k) clearance	DMIS 1.2.2, DMIS 2.0, CDIS 1.1.2, CDIS 2.0, InTouch 1.5, InTouch 2.0	3.6.1, 3.7, 4.0, 4.1, 4.2, 4.3	—
Range in No. of terminals/workstations in live sites (ave.)	4–80 (ave., 30)	3–40 (ave., 5)	10–1,000 (ave., 100)
Central hardware/computer platform or services	HP NetServers, HP 9000 business servers	Intel Pentium server	no restrictions (any hardware with Unix)
Terminals/workstations	Unix terminals/X-terminals, PCs, workstations	PC workstation	Wyse, HP, IBM, DEC, PCs
Central hardware redundant/fault-tolerant?	yes	yes	yes
Software programming language(s)	C++, C	Java	C, C++, Pro/5, Java
Operating system(s)	Unix	Windows NT, 2000, 2003	Unix, Web technology, client servers
Database platform	Oracle	Oracle	Oracle, C-ISAM
Full transaction logging?	yes	yes	yes
Features (listed as percentage of live installs or based on availability)			
•Unit inventory	100%	not available	100%
•Autologous and directed unit tracking	100%	not available	100%
•Crossmatch results	not available	not available	100%
•Print donor unit labels—bar coded	100%	not available	100%
•Full support of ISBT 128 unit labeling	not available	100%	installed
•Donor recruitment/donor questionnaire	100%/not available	not available	100%/100%
•Mobile scheduling	100%	not available	100%
•Interface with automated type and screen instruments	available through IDM Surround	100%	100%
•Source/recovered plasma management	100%	not available	100%
•Bar-code reading of donor and unit information	100%	100%	100%
•Ad hoc report writer	100%	not available	100%
•Accounts receivable	not available	not available	100%
•Management reports	100%	100%	100%
•Direct entry of test results	100%	100%	100%
•Electronic crossmatch decisionmaking	not available	not available	100%
•Laptop-based mobile donor registration module	not available	not available	100%
•Track all steps in production of product	100%	not available	100%
•Antigen typing	100%	not available	100%
•Interface with blood irradiator/centrifuges	not available	not available	100%
•Centralized transfusion services	not available	not available	—
•Integrated bedside check for transfusion	not available	not available	40%
•Hand-held devices for positive patient ID	not available	not available	100%
System provides standard ASTM/HL7 interface?	no	no	yes
Functioning interfaces to automated instruments	—	unidirectional to Ortho, Immucor, others	uni- and bidirectional to Ortho, Immucor; others
Connectivity	Telnet, remote client	Telnet, remote client	Telnet, remote client, Web client
Tools to help clients validate their systems	product user manuals, product validation guide, configuration workshops, automated testing tools, training classes and materials, others	product user manuals, product validation guide, configuration workshops, automated testing tools, training classes and materials, others	user guides, hazard analysis, training manuals, data conversion, validation, scenario samples
Complete blood bank ASP solution?	yes	yes	no
Method of charging for ASP service	fixed fee	fixed fee	—
Client software required	uses dumb terminals	requires software be installed on client PC	—
ASP information conduit	requires use of private, dedicated circuit	requires use of private, dedicated circuit	—
Client contracts supported from data center not operated by client	0	0	—
How data center is operated	by vendor	by vendor	—
System provides indexed field in each test definition for LOINC code?	no	no	no
Provide LOINC dictionary for each new installation?	no	no	no
HIS and LIS interfaces	IDM Surround	BBCS, Cerner, Mak-System, Mediware, Wyndgate	no restrictions
User group?	yes (online forum available)	yes	yes (meets online as well)
Source code?	escrow	escrow	escrow
Can user modify screens?	no	no	no
User-defined report writer?/custom programming?	yes/yes	yes/yes	—
Cost (hardware/software/monthly maintenance)			
•Smallest:largest	—	—	—
Distinguishing features (supplied by vendor)	• 27+ years experience in regulated software • 24/7 customer support services • large customer base and financial stability	• 27+ years experience in regulated software • 24/7 customer support services • large customer base and financial stability	• fully integrated application with abundant functionality • highly customizable through parameters
*RBCs=regional blood centers	See "Newsbytes," page 103, for a peek at Prelude, IDM's latest blood bank software, released at CAP TODAY press time.		
**other=sales, marketing, administration, other company functions			

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Part 4 of 7	Medical Information Technology (MEDITECH) Paul Berthiaume pberthiaume@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com	Medical Information Technology (MEDITECH) Paul Berthiaume pberthiaume@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com	Mediware Information Systems Sam Cummings sam.cummings@mediware.com Blood Bank Division, 1900 Spring Rd. Oak Brook, IL 60523 630-218-2112 www.mediware.com
	See accompanying article on page 20		
Name of blood bank system	LIS Blood Bank Application (client/server)	Laboratory Information System—Magic	HCLL (Hemocare LifeLine)
First ever blood bank system installation	1981	1981	1978
First/most recent installation of current blood bank system	1997/2005	—/2005	2000/2005
No. of contracts signed since July 1, 2004	39	21	68
Total number of contracts for operational sites	170	587	525
•U.S. hospitals—donor and transfusion service	—	—	102
•U.S. hospitals—transfusion service only	—	—	414
•U.S. regional blood centers—donor service only	—	—	2
•U.S. regional blood centers—donor and transfusion service	—	—	2
•Centralized transfusion services in the U.S.	—	—	2
•Foreign hospitals/foreign regional blood centers	—	—	3
Total number of sites operational	170	587	444
Installations underway that are not yet live (hospitals/RBCs*)	36 (36/0)	25 (25/0)	105 (102/3)
Percentage of installations that are stand-alone systems	2%	2%	100%
Staff to develop/install/support/other**			
•In entire company/in blood bank systems	2,170 total	2,170 total	68-39-41-69/25-14-20-25
No. of different versions of software installed	2	2	6
•Versions of product covered by FDA 510(k) clearance	Magic, client/server	Magic, client/server	all
•Versions of product that did not require FDA 510(k) clearance	—	—	0
Range in No. of terminals/workstations in live sites (ave.)	—	—	2–60 (ave., 16)
Central hardware/computer platform or services	HP, Dell, EMC, IBM	HP, Dell, EMC, IBM	Dell, Compaq models, qualified models based on customer configuration
Terminals/workstations	HP, Dell, EMC, IBM	HP, Dell, EMC, IBM	PC based
Central hardware redundant/fault-tolerant?	yes	yes	yes
Software programming language(s)	Windows NT	Magic	Visual C++, Visual Basic with component architecture
Operating system(s)	Windows NT	Magic	Windows NT 4.0, 2000 server, 2000 advanced, 2003 server, Enterprise
Database platform	SQL server	Magic	SQL Server 2000, Seagate Crystal Reports
Full transaction logging?	yes	yes	yes
Features (listed as percentage of live installs or based on availability)			
•Unit inventory	100%	100%	installed
•Autologous and directed unit tracking	100%	100%	installed
•Crossmatch results	100%	100%	installed
•Print donor unit labels—bar coded	installed	installed	installed
•Full support of ISBT 128 unit labeling	installed	100%	installed
•Donor recruitment/donor questionnaire	installed	installed	installed/not available
•Mobile scheduling	installed	installed	not available
•Interface with automated type and screen instruments	installed	installed	installed
•Source/recovered plasma management	installed	installed	not available
•Bar-code reading of donor and unit information	installed	installed	installed
•Ad hoc report writer	100%	100%	installed
•Accounts receivable	installed	installed	not available
•Management reports	100%	100%	installed
•Direct entry of test results	100%	100%	installed
•Electronic crossmatch decisionmaking	not available	not available	installed
•Laptop-based mobile donor registration module	installed	installed	not available
•Track all steps in production of product	installed	100%	installed
•Antigen typing	installed	installed	installed
•Interface with blood irradiator/centrifuges	not available	not available	not available
•Centralized transfusion services	installed	100%	installed
•Integrated bedside check for transfusion	available	available	not available
•Hand-held devices for positive patient ID	installed	installed	not available
System provides standard ASTM/HL7 interface?	yes	yes	yes
Functioning interfaces to automated instruments	bidirectional to Ortho, Immucor	bidirectional to Ortho, Immucor	uni- and bidirectional to Ortho, Immucor
Connectivity	local client, remote client, Web client, other	Telnet, local & remote client, Web client, other	Telnet, local client, remote client
Tools to help clients validate their systems	comprehensive manual to address validation issues, application consultants	comprehensive manual to address validation issues, application consultants	validation service, validation scripts, consultation services
Complete blood bank ASP solution?	no	no	no
Method of charging for ASP service	—	—	—
Client software required	—	—	—
ASP information conduit	—	—	—
Client contracts supported from data center not operated by client	—	—	—
How data center is operated	—	—	—
System provides indexed field in each test definition for LOINC code?	yes	yes	no
Provide LOINC dictionary for each new installation?	no	no	no
HIS and LIS interfaces	Cerner, Siemens, McKesson, Misys	Cerner, Siemens, McKesson, Misys	any vendor that supports HL7 protocol
User group?	yes (meets online as well)	yes (meets online as well)	yes
Source code?	yes	yes	escrow
Can user modify screens?	yes	yes	yes
User-defined report writer?/custom programming?	yes/no	yes/no	yes/yes
Cost (hardware/software/monthly maintenance)			
•Smallest:largest	—	—	\$10k/\$35k/\$8k:\$10k/\$450k/\$128k
Distinguishing features (supplied by vendor)	• fully integrated applications • developed in-house by Meditech • 35 years of LIS experience	• fully integrated applications • developed in-house by Meditech • 35 years of LIS experience	• expanded patient safety checks throughout system • online exception reporting • real-time patient inventory, testing monitors
*RBCs=regional blood centers **other=sales, marketing, administration, other company functions			



SYSTEM
REVIEW SERIES

Blood bank information systems

<div>Part 5 of 7</div> <div>See accompanying article on page 20</div>	<div>Mediware Information Systems</div> <div>Sam Cummings</div> <div>sam.cummings@mediware.com</div> <div>Blood Bank Division, 1900 Spring Rd.</div> <div>Oak Brook, IL 60523</div> <div>888-633-4927 www.mediware.com</div>	<div>Netlims</div> <div>Avi Allerhand/Brian Davis</div> <div>brian@netlims.com</div> <div>96 Engle St.</div> <div>Englewood, NJ 07631</div> <div>201-894-5300 www.netlims.com</div>	<div>Psyche Systems Corp.</div> <div>Patricia Salem</div> <div>pattys@psychesystems.com</div> <div>321 Fortune Blvd.</div> <div>Milford, MA 01757</div> <div>800-345-1514 www.psychesystems.com</div>
Name of blood bank system	LifeTrak Donor Software Suite	AutoFusion	Systematic Blood Bank-Hosted Transfusion System
First ever blood bank system installation	1978	2001	1987
First/most recent installation of <i>current</i> blood bank system	1999/2005	2002/2002	2001/2005
No. of contracts signed since July 1, 2004	3	10	2
Total number of contracts for operational sites	10	10	10
•U.S. hospitals—donor and transfusion service	0	0†	0
•U.S. hospitals—transfusion service only	0	0†	10
•U.S. regional blood centers—donor service only	6	0	0
•U.S. regional blood centers—donor and transfusion service	4	0	0
•Centralized transfusion services in the U.S.	0	0	0
•Foreign hospitals/foreign regional blood centers	0	10 (Israel)	0
Total number of sites operational	51	10+	7
Installations underway that are not yet live (hospitals/RBCs*)	3 (3/0)	3 (2/1)	3 (3/0)
Percentage of installations that are stand-alone systems	100%	2%	20%
Staff to develop/install/support/other**			
•In entire company/in blood bank systems	68-39-41-69/25-14-20-25	200-50-25-10/5-5-3-1	9-5-11-8/3-2-3-2
No. of different versions of software installed	2	3	1
•Versions of product covered by FDA 510(k) clearance	2.03, 3.01	0†	SBB 3.0
•Versions of product that did not require FDA 510(k) clearance	—	0	0
Range in No. of terminals/workstations in live sites (ave.)	12–200 (ave., 50)	3–15 to 25 (ave., 7)	1-6 (ave., 3)
Central hardware/computer platform or services	HP 9000 series	multiple platforms, Windows based	HP Alpha
Terminals/workstations	PCs	PC Windows-based NT 2000 through XP	PCs
Central hardware redundant/fault-tolerant?	yes	yes	yes
Software programming language(s)	Oracle Developer 2000, PL/SQL	C++, Object-oriented design, Visual Basic	Visual Basic VI, Fortran
Operating system(s)	HP-UX, Linux	Windows NT, Windows 2003, vLinux, others	Open VMS
Database platform	Oracle	Oracle 9i, SQL, MSQl, DB2, others	proprietary
Full transaction logging?	—	yes	yes
Features (listed as percentage of live installs or based on availability)			
•Unit inventory	85%	80%	100%
•Autologous and directed unit tracking	85%	50%	100%
•Crossmatch results	not available	60%	100%
•Print donor unit labels—bar coded	90%	100%	not available
•Full support of ISBT 128 unit labeling	available in 2005	100%	100%
•Donor recruitment/donor questionnaire	90%/15%	60%/50%	not available
•Mobile scheduling	60%	90%	not available
•Interface with automated type and screen instruments	100%	—	10%
•Source/recovered plasma management	90%	—	not available
•Bar-code reading of donor and unit information	90%	100%	100%
•Ad hoc report writer	installed	80%	100%
•Accounts receivable	not available	0	not available
•Management reports	100%	90%	100%
•Direct entry of test results	installed	40%	100%
•Electronic crossmatch decisionmaking	not available	100%	100%
•Laptop-based mobile donor registration module	installed	90%	not available
•Track all steps in production of product	100%	100%	100%
•Antigen typing	installed	100%	100%
•Interface with blood irradiator/centrifuges	not available	—	available
•Centralized transfusion services	not available	60%	100%
•Integrated bedside check for transfusion	not available	available in 2006	not available
•Hand-held devices for positive patient ID	not available	100%	not available
System provides standard ASTM/HL7 interface?	yes	yes	yes
Functioning interfaces to automated instruments	unidirectional to Ortho; others	uni- and bidirectional to Ortho, Immucor, others	bidirectional to Immucor
Connectivity	Telnet, local client, remote client, Web client	local client, remote client, Web client, other (ODBC)	Telnet, local client, remote client, Web client
Tools to help clients validate their systems	telephone support, full contracted services, validation templates, scripts	—	software validation guidelines
Complete blood bank ASP solution?	no	no	yes
Method of charging for ASP service	—	—	fixed fee
Client software required	—	—	browser based
ASP information conduit	—	—	operates over Internet
Client contracts supported from data center not operated by client	—	—	4
How data center is operated	—	—	by vendor
System provides indexed field in each test definition for LOINC code?	no	yes	yes
Provide LOINC dictionary for each new installation?	no	yes	no
HIS and LIS interfaces	Cerner	SCC Soft Computer, McKesson, Eclipsys, Cerner, Meditech, Misys	CPSI, Meditech, Siemens, McKesson, Cerner, Misys, Psyche, others
User group?	yes	no	yes (meets online as well)
Source code?	escrow	no	escrow
Can user modify screens?	no	yes	yes
User-defined report writer?/custom programming?	yes/yes	yes/yes	yes/no
Cost (hardware/software/monthly maintenance)			
•Smallest:largest	\$15k/\$50k/\$2.7k:\$250k/\$700k/—	\$20k-\$30k/\$150k/18%:\$30k\$50k/\$250k/18%	0/\$10k/\$0.5k:\$3k/\$50k/\$1k
Distinguishing features (supplied by vendor)	<div>• cGMP/manufacturing and process control</div> <div>• on-site registration for computer-assisted interview</div> <div>• LifeWebb integrated Web-based donor scheduling</div>	<div>• single database and free choice of database</div> <div>• C++, true Object-oriented design</div> <div>• multiple platform choices and support</div>	<div>•complete, affordable blood bank system</div> <div>• flexible and easy to use</div> <div>• securely hosted system</div>

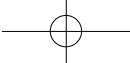
*RBCs=regional blood centers

**other=sales, marketing, administration, other company functions

†waiting for FDA 510(k) clearance

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SYSTEM
REVIEW SERIES

Blood bank information systems

Part 6 of 7	SCC Soft Computer Ellie Vahman ellie@softcomputer.com 34350 U.S. Highway 19 North Palm Harbor, FL 34684 727-789-0100 www.softcomputer.com		SCC Soft Computer Ellie Vahman ellie@softcomputer.com 34350 U.S. Highway 19 North Palm Harbor, FL 34684 727-789-0100 www.softcomputer.com	
	See accompanying article on page 20			
Name of blood bank system		SoftBank II		SoftDonor
First ever blood bank system installation		1992		1992
First/most recent installation of <i>current</i> blood bank system		2004/2005		2004/2004
No. of contracts signed since July 1, 2004		14		3
Total number of contracts for operational sites		113		2
•U.S. hospitals—donor and transfusion service		2		2
•U.S. hospitals—transfusion service only		105		0
•U.S. regional blood centers—donor service only		0		0
•U.S. regional blood centers—donor and transfusion service		0		0
•Centralized transfusion services in the U.S.		0		0
•Foreign hospitals/foreign regional blood centers		6		0
Total number of sites operational		203		2
Installations underway that are not yet live (hospitals/RBCs*)		15(15/0)		4 (4/0)
Percentage of installations that are stand-alone systems		4%		0
Staff to develop/install/support/other**				
•In entire company/in blood bank systems		573-80-169-139/21-7-12-22		573-80-169-139/21-7-12-22
No. of different versions of software installed		6		3
•Versions of product covered by FDA 510(k) clearance		19.1, 21, 22, 23, 23 with SoftScape, 23 with DMSI		4.1, 4.2, 4.3
•Versions of product that did not require FDA 510(k) clearance		0		0
Range in No. of terminals/workstations in live sites (ave.)		1–90+ (ave., 8)		8
Central hardware/computer platform or services		IBM pSeries, F620 model 6F1, HP		IBM pSeries, F620 model 6F1, HP
Terminals/workstations		PCs, ASCII terminals, Weiss		PCs, ASCII terminals, Weiss
Central hardware redundant/fault-tolerant?		yes		yes
Software programming language(s)		C		C
Operating system(s)		Unix AIX		Unix
Database platform		Centura's Raima-db-Vista, Oracle		Centura's Raima-db-Vista
Full transaction logging?		yes		yes
Features (listed as percentage of live installs or based on availability)				
•Unit inventory		100%		100%
•Autologous and directed unit tracking		100%		100%
•Crossmatch results		100%		not available
•Print donor unit labels—bar coded		30% (component labels only)		available in 2006
•Full support of ISBT 128 unit labeling		70%		installed
•Donor recruitment/donor questionnaire		not available		100%/100%
•Mobile scheduling		not available		available in 2006
•Interface with automated type and screen instruments		2%		100%
•Source/recovered plasma management		50%		100%
•Bar-code reading of donor and unit information		100%		100%
•Ad hoc report writer		100%		100%
•Accounts receivable		95%		100%
•Management reports		100%		100%
•Direct entry of test results		100%		100%
•Electronic crossmatch decisionmaking		70%		not available
•Laptop-based mobile donor registration module		not available		100%
•Track all steps in production of product		100%		100%
•Antigen typing		100%		100%
•Interface with blood irradiator/centrifuges		available in April 2006		available in 2006
•Centralized transfusion services		30%		not available
•Integrated bedside check for transfusion		available in April 2006		not available
•Hand-held devices for positive patient ID		available in April 2006		not available
System provides standard ASTM/HL7 interface?		no (planned for April 2006)		yes
Functioning interfaces to automated instruments		uni- and bidirectional to Ortho, Immucor		—
Connectivity		Telnet, local client		Telnet, local client
Tools to help clients validate their systems		critical control points and instructions on how to write test cases with electronic screen capture		critical control points and instructions on how to write test cases with electronic screen capture
Complete blood bank ASP solution?		yes		yes
Method of charging for ASP service		fixed fee		fixed fee
Client software required		requires software be installed on client PC		requires software be installed on client PC
ASP information conduit		operates over Internet		operates over Internet
Client contracts supported from data center not operated by client		—		0
How data center is operated		by vendor		by vendor
System provides indexed field in each test definition for LOINC code?		no		no
Provide LOINC dictionary for each new installation?		no		no
HIS and LIS interfaces		Meditech, McKesson, Siemens, IDX, Cerner, CPSI, Quadramed Affinity, others		any vendor that supports HL7 protocol
User group?		yes		yes (meets online as well)
Source code?		escrow		escrow
Can user modify screens?		no		no
User-defined report writer?/custom programming?		yes/yes		yes/yes
Cost (hardware/software/monthly maintenance)				
•Smallest:largest		\$30k/\$30k/\$0.6k:\$75k/\$150k/\$3k		\$30k/\$50k/\$1k:\$75k/\$300k/\$6k
Distinguishing features (supplied by vendor)		• interfacing to all major vendors • management tools, including audits and reporting • development, support, and implementation through blood bankers		• interface with all major vendors • 25 years of leading clinical software solutions • development, support, and implementation by donor specialists
*RBCs=regional blood centers				
**other=sales, marketing, administration, other company functions				

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SYSTEM
REVIEW SERIES

Blood bank information systems

Part 7 of 7	Wyndgate Technologies Noah Bentley bentleyn@wyndgate.com 4925 Robert J. Mathews Parkway, Ste. 100 El Dorado Hills, CA 95762 916-404-8400 www.wyndgate.com	Wyndgate Technologies Noah Bentley bentleyn@wyndgate.com 4925 Robert J. Mathews Parkway, Ste. 100 El Dorado Hills, CA 95762 916-404-8400 www.wyndgate.com
<i>See accompanying article on page 20</i>		
Name of blood bank system	SafeTrace	SafeTrace Tx
First ever blood bank system installation	1996	1996
First/most recent installation of <i>current</i> blood bank system	1996/2005	1999/2005
No. of contracts signed since July 1, 2004	5	46
Total number of contracts for operational sites	41	125
•U.S. hospitals—donor and transfusion service	9	10
•U.S. hospitals—transfusion service only	0	93
•U.S. regional blood centers—donor service only	22	0
•U.S. regional blood centers—donor and transfusion service	8	7
•Centralized transfusion services in the U.S.	0	11
•Foreign hospitals/foreign regional blood centers	2	4
Total number of sites operational	216	119
Installations underway that are not yet live (hospitals/RBCs*)	7 (3/4)	63 (61/2)
Percentage of installations that are stand-alone systems	100%	100%
Staff to develop/install/support/other**		
•In entire company/in blood bank systems	23+-12-14-25	23+-12-14-25
No. of different versions of software installed	2+	2+
•Versions of product covered by FDA 510(k) clearance	all	all
•Versions of product that did not require FDA 510(k) clearance	0	0
Range in No. of terminals/workstations in live sites (ave.)	3–200+ (ave.,~40)	1–75+ (ave.,~8)
Central hardware/computer platform or services	HP, IBM, Sun	Intel-based servers, Unix-based servers
Terminals/workstations	PCs	PCs
Central hardware redundant/fault-tolerant?	yes	yes
Software programming language(s)	Delphi, PL/SQL, .Net, C, 4GL	Delphi, SQL
Operating system(s)	Unix	Windows XP Professional, Windows 2003, Windows 2000 (Unix optional)
Database platform	Oracle	Oracle
Full transaction logging?	yes	yes
Features (listed as percentage of live installs or based on availability)		
•Unit inventory	100%	100%
•Autologous and directed unit tracking	100%	100%
•Crossmatch results	not available	100%
•Print donor unit labels—bar coded	100%	installed
•Full support of ISBT 128 unit labeling	100%	100%
•Donor recruitment/donor questionnaire	100%/future release	not available
•Mobile scheduling	100%	not available
•Interface with automated type and screen instruments	100%	installed
•Source/recovered plasma management	100%	not available
•Bar-code reading of donor and unit information	100%	100%
•Ad hoc report writer	100%	installed
•Accounts receivable	not available	not available
•Management reports	100%	100%
•Direct entry of test results	100%	100%
•Electronic crossmatch decisionmaking	not available	installed
•Laptop-based mobile donor registration module	installed	not available
•Track all steps in production of product	100%	100%
•Antigen typing	100%	100%
•Interface with blood irradiator/centrifuges	future release	installed
•Centralized transfusion services	not available	installed
•Integrated bedside check for transfusion	not available	available through business partners†
•Hand-held devices for positive patient ID	not available	available through business partners†
System provides standard ASTM/HL7 interface?	yes	yes
Functioning interfaces to automated instruments	unidirectional to Ortho, Immucor, Gambro, Olympus, Abbott, Hitachi; bidirectional to Gambro	uni- and bidirectional to Ortho, Immucor
Connectivity	Telnet, remote client	local client, remote client, Web client
Tools to help clients validate their systems	validation and sample test cases	validation guidelines, templates and validation test plan for safety critical control checks
Complete blood bank ASP solution?	yes	yes
Method of charging for ASP service	fixed fee, transaction based	fixed fee, transaction based
Client software required	browser based, uses dumb terminals	browser based
ASP information conduit	operates over Internet, requires use of private, dedicated circuit	operates over Internet, requires use of private, dedicated circuit or VPN connection
Client contracts supported from data center not operated by client	6	1
How data center is operated	by a third party (Hemo-Net)	by a third party (Hemo-Net)
System provides indexed field in each test definition for LOINC code?	no	no
Provide LOINC dictionary for each new installation?	no	no
HIS and LIS interfaces	Misys	McKesson, Siemens, GE Medical, CPSI, Meditech, Keane, Misys, Cerner, Sysmex, others
User group?	yes (meets online as well)	yes (meets online as well)
Source code?	yes†	escrow
Can user modify screens?	no	no
User-defined report writer?/custom programming?	yes/yes	yes (through third party software)/yes
Cost (hardware/software/monthly maintenance)	—	—
•Smallest:largest	—	—
Distinguishing features (supplied by vendor)	• strong implementation, education, and support services with focus on customer and quality • outstanding record of safety compliance • complete Vein-to-Vein tracking	• excellent safety and service record with strong focus on customers, service, and quality • patent pending for CTS and other transfusion service functionality • comprehensive Vein-to-Vein tracking
*RBCs=regional blood centers		
**other=sales, marketing, administration, other company functions	† for most modules; otherwise escrow	† McKesson, Lattice, Care Fusion, HealthCare ID

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