



**UCSF Benioff Children's Hospital
Oakland**

BIOMEDICAL EQUIPMENT

USERS

REFERENCE MANUAL

Children's Hospital Oakland

Biomedical Engineering Department

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510-428-3610

(After Hours pager # 7566)

BIOMEDICAL EQUIPMENT USERS REFERENCE MANUAL

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(Available on K: Environment of Care/Medical Equipment Management)

References for this guide:

Administration and Environment of Care Policy and Procedures...

EC 505	Biomedical Equipment Repair
EC 503	Cellular Phone Ban in Critical Care Areas
EC 502	Patient Owned Electrical Equipment
EC 501	Equipment Involved in Patient Injury (SMDA)
AD 21.1	Unusual Occurrence Report (UOR)

1. The BIOMEDICAL ENGINEERING DEPARTMENT - Who we are, What we do:

Biomedical Engineering (Biomed) is a team of technical and engineering professionals working in a clinical environment to resolve clinical equipment technology issues related to patient care.

Our goal is to reduce risks associated with medical technology, improve patient outcomes, provide support to the technology based clinical equipment used in the delivery of healthcare, and to enhance patient care in the most efficient manner possible. We accomplish this through the cost-effective acquisition, maintenance, and repair of all clinical technology and the proper management of the clinical technical resources.

It is the goal of the Biomedical Engineering Department to be THE technical liaison, reference, and resource for all clinical equipment that may be used in the facilities.

The Biomedical Engineering department oversees all biomedical equipment repairs, maintenance and service, independent of ownership or service methodology. Biomedical Equipment includes any device used for therapy, treatment or diagnosis, as well as devices that are used within the direct patient care area.

The Biomedical Engineering department must approve all medical devices before they are used in the clinical environment. If in doubt, look for a CHO Equipment Control # (metallic-silver barcode tag).



Departments **must** notify Biomed when medical devices enter or leave the hospital, regardless of ownership. This includes demonstration and loaner equipment.

Exception: Rental Equipment provided by an "Approved Rental Vendor" – see the Approved Rental Vendor Policy section in the manual.

Examples of Services Offered

- ✓ Regular Preventive Maintenance/Safety/Performance Testing & Calibrations.
- ✓ Biomedical equipment repairs
- ✓ Pre-purchase evaluations and consulting.
- ✓ Equipment recommendations.
- ✓ Consultation on Purchasing (including service options such as manuals, other service media, training classes, and specialized equipment).
- ✓ Incoming Biomedical equipment inspections.
- ✓ Service Biomedical equipment (specialized test equipment, parts inventory).
- ✓ Medical equipment maintenance service contract support.
- ✓ User error tracking and reporting
- ✓ User (In-service) training on biomedical equipment.
- ✓ Recalls and Alerts (manufacturer, FDA, ECRI, Sentinel Alerts, etc.)
- ✓ Service History File on every Biomedical device used, regardless of ownership.
- ✓ Obsolescence notifications and replacement recommendations
- ✓ Biomedical equipment risk assessment program
- ✓ Equipment incident investigations/consultations

Examples of Biomedical Equipment:

Defibrillators, patient vital signs monitors, IV pumps, angiographic injectors, Lab equipment, Lasers, X-ray, Sterilizers, Surgical tables, Surgical Lights, Incubators, ECG, C-Arms, Microscopes, Cryosurgery, Ultrasound, Sphygmomanometers, Pulse Oximeters, Anesthetic Gas Analyzers, Anesthesia machines, Ventilators, hypo/hyperthermia units, Electro-surgical units, Centrifuges, Muscle/Nerve stimulators, Microtomes, non-invasive blood pressure (NIBP) machines, patient thermometers, oto/ophthalmoscopes, ...

2. "HOW DO I KNOW IF A MEDICAL DEVICE IS SAFE TO USE?"

1. Operators should always perform a safety inspection of each medical device before use.

This entails visually looking over the device for obvious signs of damage (exposed wire, cracked housing, etc.) before plugging the unit in, turning it on, and/or connecting it to the patient.

If there is a problem, or you are concerned for any reason, remove the device, submit a Work Request (Novell window), and have it delivered to Biomedical Engineering.

2. When first powered on, electronic medical devices go through a startup "self-check" procedure.

If the device passes the operator safety inspection and self-check startup, you may safely use the device. Always be sure to submit a Work Request if you suspect a problem of any kind.

3. Operators of medical devices can verify that the device they are about to use is included in the organization's medical equipment database by finding the CHO Equipment Control Number.

To verify if a device is in the hospital's medical equipment database, find the Equipment Control # on the silver CHO tag affixed to the device. Equipment Control numbers always have 3 letters (A-Z), with the first

3-4 characters designating the owning department, such as ICU1234.



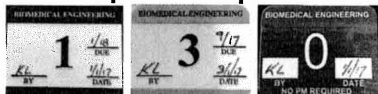
Asset Tags (used by Accounting) use only numbers, such as 1-12345,

If a clinical device, or any electric/electronic device used in the direct patient care area does not have a CHO Equipment Control #, or is not included in the "Approved Rental Equipment Vendor" list, remove the device from service, submit a Work Request (Novell window), and have the unit delivered to Biomedical Engineering for processing.

Patient owned electrical devices (radio, TV, laptop PC, etc.) must be approved by Biomed before it can be used in the patient care area. Battery operated devices may be approved, so long as they are not plugged into an electrical outlet in the room. See Administrative P&P 5.1 Electrical Equipment – Patient Owned.

Cell phones can interfere with electronic medical equipment. For the Safety of our Patients, please be sure to familiarize yourself with Administrative P&P 3.4 "Cell Phone Ban in Critical Care Areas". Note signage restricting cell phone use in certain restricted areas, and kindly remind others of this important safety policy.

4. Beginning January 1st 2017 new inspection stickers are being attached to all Equipment upon completion of preventative maintenance.



Tag will include Date the last inspection was completed, Date the next inspection is Due and tech. initials Large number indicates month completed, Tags with a "0" have no PM required.

5. If an inspector from an Authority Having Jurisdiction (AHJ) wishes to see more detailed information than is provided on the Work Request screen, please contact BioMed or Engineering.

Biomed (and Engineering) can generate detailed service history reports and the maintenance procedures for specific devices, as needed. AHJ's include JCAHO, DHS, CAP, FDA, etc.

Department Manager can request an updated Biomedical Equipment Inventory report. Call Biomedical Engineering at x3610.

3. EMERGENCY BIOMEDICAL EQUIPMENT REPAIR REQUEST PROCEDURES

For biomedical equipment *emergencies*, always inform your supervisor to appraise them of the event

Biomedical Engineering should be called ASAP (x3610). During Biomedical Engineering's normal hours of operation (M-F, 6:30 am – 3:00 pm), a Biomedical Engineer should be onsite at the Main Hospital. Biomed may also be present during evening hours, M-F up until 11pm.

AFTER-HOURS BIOMEDICAL EQUIPMENT EMERGENCIES

Inform your immediate Supervisor to first see if they are able to resolve the issue. There should be a backup system or backup procedures that can be implemented for equipment emergencies.

Inform the Nursing Supervisor of the situation to see if they are able to resolve the issue.

If necessary, call (x3291) or page (7566) the Watch Engineer. The Watch Engineer will assist in front line troubleshooting and reaching Biomed for support

- a) First determine if there is a clinically acceptable backup device, system or procedure that may be implemented until the next Biomedical Engineering work day (see Biomed Dept. hours of operation).
- b) Evaluate the problem with clinical staff's help/guidance, to see if the problem can be handled without calling in Biomed. (call Back) (i.e. with assistance from staff or the Nursing Supervisor),
- c) The Watch Engineer is responsible to coordinate contact with a Biomedical Engineer. A Biomed Technician will call back to support.
- d) If the Watch Engineer is unable to reach a Biomed tech, and service is critically required, the OEM (original equipment manufacturer) may be called in for emergency service after the requesting department has secured proper Supervisory authorization. The cost of OEM service will be paid by the department requiring service.

As soon as possible (after the immediate problems relating to the emergency are resolved), a Work Request should be entered into the system by the person who first noticed the problem.

It is critical that the **Equipment Control #** and **specific information on the equipment failure** is entered by the equipment user who first noticed the problem into the **"Eng & BioMed Work Request"** program for the Biomedical Engineers to effectively handle the problem. This Work Request program is found on networked hospital computers, via the Novell Application Launched Window.

If the problem is not an emergency, but requires prompt attention, please enter the Equipment Control # and other pertinent information into the "Eng & BioMed Work Request" program, **before** placing a phone call to the Biomed department.

4. PRIORITY AND ROUTINE BIOMEDICAL EQUIPMENT REPAIRS

REPAIR REQUEST PROCEDURES:

1. Remove defective biomedical equipment from service.
2. Submit a work request via any networked hospital PC, through the Novell Application Launched Window's "**Eng & BioMed Work Request**" icon. If you need help entering a work order, there is a help file in the program, or you may call the Biomed department (x3610) or Engineering department (x3291).

Important:

Include as much information as possible in the fields provided, especially the **Equipment Control #** (silver colored barcode ID). The Equipment Control # that you enter must **exactly** match what is on the barcode label, or you will get an error message. The most common mistakes are inserting an extra space or dash, or not including a required space or dash. Also include name of the person who originally identified the problem, their extension, and a detailed description of the problem (**not** just the word "*broken*" please).

3. A copy of the work request will print in Biomed/Engineering, and at your local network printer (must select).
4. Please attach your copy of the Work Request to the defective device (or area). You may want to make/keep an additional copy of the Work Order for future reference, tracking, or follow up purposes.
5. Before having the defective equipment delivered to Biomed, make sure the device is properly **cleaned and disinfected**, per Hospital policy.
6. Defective Biomedical devices should be delivered to Biomedical Engineering for service, with a Work Order attached. Biomed is located on the ground floor of the main hospital, near the loading dock. The sooner the device is delivered, the sooner it can be repaired and returned to active service!

Note: If the unit is not portable, and onsite service is requested, please make sure to note it's EXACT location in the "Area" field in the Work Order. In those instances Biomed will come to the location specified to service the device.

7. Please make sure to include any accessories used when the problem occurred. If possible, do not change any settings on the device. Your help here greatly improves the Biomedical Engineering department's ability to diagnose problems and provide efficient service for you, our customer.

5. POSSIBLE PATIENT HARM INCIDENTS INVOLVING BIOMEDICAL EQUIPMENT

Safe Medical Device Act (SMDA)

If possible, use other equipment to finish the procedure.

Do NOT change any settings or move any accessories unless absolutely necessary. As long as it does not pose a risk, leave the unit in question plugged in and turned on. This could help determine what went wrong.

Call Biomed at x3610. Biomed can provide much more help if informed immediately. If no answer in Biomed (e.g. during off-hours) call x3291 or page the Watch Engineer on pager #7566. Make sure you inform the Biomed-Engineer that the device is involved in an incident.

As soon as practical, isolate the equipment and enter a work request with as much detail as possible. Please be sure to attach your copy of the Work Request to the device. You MUST include the Equipment Control # in the Work Request. If no Control number is visible, you must enter the make, model and serial # in the notes field of the Work Request.

If there is a probability that the device in question has caused or contributed to the death or serious injury of a patient, immediately notify your supervisor and follow the hospital's policy **EC-601 "Equipment Involved in Patient Injury (SMDA)**. If this is not an SMDA reportable incident, but conditions are (or were) present for possible patient or staff harm involving equipment, then follow the "EVENT REPORTING SYSTEM. Icon found on novell application window.



Details are very important. It is critical that you include the device's Equipment Control Number (silver colored CHO tag) on Incident/UOR's as well, so that the Work Order and Incident/UOR Report can be matched up. If there is no Equipment Control number available, then you must record the exact make, model and serial number in that document as well. Without this specific information, there may be no easy way of tracking the specific device involved in the incident.

6. INSPECTION REQUIREMENTS FOR NON-HOSPITAL OWNED EQUIPMENT (NEW, DEMONSTRATION, LOANER, RENTAL, PATIENT, OTHER)

All Biomedical Equipment, or other devices used in the patient care area, regardless of ownership, must be held to the same safety and performance standards. Clinical departments are required to notify Biomed when a patient care medical device enters or leaves the facility. Even non-medical equipment that is intended for use in the direct patient care area must meet stringent “hospital grade” standards.

1. Biomedical Engineering should inspect all biomedical equipment entering the facility prior to use. This includes new equipment purchases, demo, rental, loaner, patient or staff owned equipment.
2. Biomed will perform an incoming inspection procedure that will include a safety test. All of these devices must pass the Biomed-Engineering safety inspection before being used in the facility, which (if applicable) includes an electrical safety inspection per NFPA99, Title 22, and other applicable regulatory authorities.
3. After the device passes the incoming safety inspection, Biomed will assign an equipment control number (silver color barcode sticker) indicating the device has been evaluated, and is considered electrically safe.
4. The equipment shall be returned to the original requesting department. The requesting department/user is responsible for performing an operational check, and ensuring in-service and operator-training requirements have been met before the device is used.
5. Departments should inform Biomed when such a device leaves the facility in order to accurately maintain the biomedical equipment inventory. Regular reviews of the equipment inventory should be done in order to help departments maintain their non-hospital owned equipment inventory.

Approved Rental Equipment Vendors:

Children’s Hospital Oakland Biomedical Engineering department has allows specified vendors (“*Approved Rental Equipment Vendors*”) to bring in their rental or leased biomedical equipment into the facility for use without having to be seen by Biomed first, assuming certain specified criteria is met.

An **Approved Rental Equipment Vendor** has agreed to provide biomedical equipment that meets all applicable safety standards, and the hospital ensures the integrity of the program by regular and unscheduled on-site inspections of the preferred vendor’s operations and inspection of testing procedures and records. The Approved Vendor’s equipment will be readily identifiable by their own unique ID sticker.

All Rental equipment documentation must be maintained on-site by the requesting department, so that it may be referenced as needed by CHO, or Authorities Having Jurisdiction (JCAHO, DHS, CAP, etc.).

Hill-Rom, UHS, KCI and SRC are currently recognized as “Approved Rental Equipment Vendors” for rental or leased Medical Equipment. The Approved Rental Equipment Vendor list may be updated by contacting the Biomedical Engineering department.

Why is this important? Rented Medical Equipment may not have a CHO Control #. By noting an Equipment Control # from one of the Approved Rental Equipment Vendors, you know that that device is authorized to be used within the facility.

IMPORTANT EXCEPTION: ALL INFUSION THERAPY DEVICES MUST BE INSPECTED BY BIOMED PRIOR TO USE, AND MUST HAVE A CHO EQUIPMENT ID#. This is necessary to ensure that the software revisions and medication libraries match the hospital’s current settings, helping us to meet the highest equipment standards in patient medication administration safety.

7. BIOMEDICAL EQUIPMENT INVENTORY REPORT - LEGEND

Upon request, the Biomedical Engineering department can provide a detailed report showing your department's active biomedical equipment inventory. A copy of this inventory should be kept where staff that uses the equipment may easily refer to it, as needed. Your help in maintaining an accurate inventory is very important. If you know of any biomedical equipment used in the monitoring, diagnoses, or therapy of patients that is not on this list, but resides in your department, please notify Biomed.

IMPORTANT NOTE: You may find out a biomedical device's current status by simply accessing the "Eng & BioMed Work Request" Program and entering the device's Equipment Control #. You can view a synopsis of recent history of the device (repairs and PM's), any open work order, and when it is due for PM (or if it is past due for PM). If you do not see a biomedical device listed in the Work Request program, please contact Biomed at x3610 before using for patient care, or in the patient care vicinity.

The Biomedical Equipment Inventory List should have the following information:

Field Name/ Abbreviation	Explanation
Control #	Biomedical Equipment Control Number (silver colored barcode tag).
Cost Ctr	A 3-letter code representing the Cost Center that is financially responsible for the device. Note: Several "departments" could share the same cost center.
Dept	A 3-letter code typically representing the "user" department.
KnownAs	Name by which the device may be more commonly "known as."
Class	An abbreviation for classification. A generic device name for a group of similar items. Devices with the same classification may have the same Risk score, PM Procedures, Testing Intervals, etc.
Manufacturer	The original manufacturer of device. May not be same as the company that currently provides the same device or service.
Model	The model number or model name of the device.
Serial	The serial number of device.
Last Rep	Last repair, the most recent repair date which also includes an Inspection.
Last Insp	Last inspection, the date of the most recently completed Inspection.
Next Insp	Next Inspection, when the device will come due again for Inspection.
Area	The Room Number (see Engineering room numbering system) describing its location. Note: Area's outside the Main Hospital typically have a 3-letter prefix.
Asset #	The hospital's asset or property ID number (may be green). Used only by accounting.

8. Emergency Backup Medical Equipment

Each department must identify which medical devices in their inventory require a backup on site. The dept should create a list for the staff to reference what backup devices are on site and the location of the backup to be stored. For those devices that a backup is not needed on site, a source of acquiring a backup device should be known.

When a backup device is needed and there is no available device in your dept. consider borrowing from another dept. in your facility. While an exact model may not be obtained, another model might suffice to provide the needed treatment / diagnostics.

If there is no available backup device in your facility, other options might be available at other UCSF facilities:

BCHO Oakland Campus (Main Hospital)	(510) 428-3000	747 52 nd St. Oakland 94609
BCHO Walnut Creek Campus (Shadelands)	(925) 979-3400	2401 Shadelands Dr. Walnut Creek 94598
UCSF Medical Center, Parnassus Campus	(415) 476-1000	505 Parnassus Ave. San Fran. 94143
UCSF Medical Center, Mission Bay Campus	(415) 353-2221	1500 Owens St. San Fran. 94158
UCSF Medical Center, Mount Zion Campus	(415) 567-6600	1600 Divisadero St. San Fran. 94115

For reference, the following table lists all High Risk Medical Devices and a phone number to reach the appropriate vendor that supports each device.

High Risk Medical Equipment Vendor List

9/8/2017

description	manufacturer name	model	department name	vendor 1	vendor phone #
PUMP, INFUSION, RAPID	BELMONT INSTRUMENT CORP	FMS2000	EMERGENCY DEPARTMENT	Belmont	866 663 0212
WARMER, FLUID/BLOOD, BUDDY LITE	BELMONT INSTRUMENT CORP	BUDDY LITE	EMERGENCY DEPARTMENT	Belmont	866 663 0212
VENT, HIGH FREQUENCY, JET, BUNNELL	BUNNELL INCORPORATED.	203	RESPIRATORY THERAPY	Bunnell	(800) 800-4358
WARMER, BLOOD/FLUID PRISMAFLO 2	GAMBRO TECHNICAL SERVICES INC.	PRISMAFLO II	ICU (PICU)	Cardian BCT	(877) 339-4228
WARMER, BLOOD/FLUID PRISMAFLO 2S	GAMBRO TECHNICAL SERVICES INC.	PRISMAFLO IIS	ICU (PICU)	Cardian BCT	(877) 339-4228
VENTILATOR, HIGH FREQ OSCILLATORY 3100	CAREFUSION 209, INC	3100A	RESPIRATORY THERAPY	Carefusion	(800) 637-1500
WARMER, BLOOD/FLUID 333W	CINCINNATI SUB-ZERO PROD	333W	ICN (NICU)	Cincinnati Sub-Zero	(800) 989-7373
ECMO/CAPS INSTRUMENT CONTROL RACK	COBE CARDIOVASCULAR	28-90-07	ICN (NICU)	Cobe Cardiovascular	(800) 221-7943
PUMP, ECMO/BYPASS, COBE	COBE CARDIOVASCULAR	10-60-00	ICN (NICU)	Cobe Cardiovascular	(800) 221-7943
ANESTHESIA VENTILATOR, APOLLO	DRAEGER MEDICAL INC.	APOLLO	OPC SURGERY CENTER - CSC	Drager Medical	800-543-5047
ANESTHESIA VENTILATOR, PERSEUS	DRAEGER MEDICAL INC.	PERSEUS	SURGERY	Drager Medical	800-543-5047
WARMER, BLOOD/FLUID ASTOTHERM PLUS 220	STIHLER ELECTRONIC GMBH	ASTOTHERM PLUS 220	INFUSION CENTER, OUTPATIENTTRF	Future Medical	800-222-6780
HEMODIALYSIS UNIT, PRISMAFLEX	GAMBRO TECHNICAL SERVICES INC.	107493	ICU (PICU)	Gambro	(800) 525-2623
ANESTHESIA VENTILATOR, AESPIRE	GE HEALTHCARE	AESPIRE	ALTA BATES RADIATION ONCOLOGY	GE Healthcare	800-345-2700
ANESTHESIA VENTILATOR, AESTIVA	GE HEALTHCARE	AESTIVA	OPC SURGERY CENTER - CSC	GE Healthcare	800-345-2700
ANESTHESIA VENTILATOR, AESTIVA, MRI	GE HEALTHCARE	AESTIVA	CT SCANNING	GE Healthcare	800-345-2700
NITRIC OXIDE GAS DELIVERY SYSTEM	INO THERAPEUTICS, INC	10007	ARC	Ino Therapeutics	877 566 9466
VENTILATOR, HIGH FREQ. PERCUSSIVE, TYP2D	PERCUSSIONAIRE CORPORATION	TYP-2D	ICN TRANSPORT	International Biomedical	(800) 433-5615
VENTILATORS, CROSSVENT 2I PLUS	BIO-MED DEVICES INC.	CROSSVENT 2I PLUS	ICN TRANSPORT	International Biomedical	(800) 433-5615
ECMO CONSOLE, ROTAFLOW	MAQUET	701051712	ICN (NICU)	Maquet	(888) 627-8383
ECMO PUMP, ROTAFLOW	MAQUET	701022161	ICN (NICU)	Maquet	(888) 627-8383
ECMO PUMP, ROTAFLOW, EMERGENCY	MAQUET	701022162	ICN (NICU)	Maquet	(888) 627-8383
VENTILATOR CONTROLLER	MAQUET CRITICAL CARE AB	06696577	RESPIRATORY THERAPY	Maquet	(888) 627-8383
VENTILATOR, SERVO U	MAQUET CRITICAL CARE AB	SERVO U	RESPIRATORY THERAPY	Maquet	(888) 627-8383
AUTOTRANSFUSION UNIT, AUTOLOG	MEDTRONIC INCORPORATED	AUTOLOG	SURGERY	Medtronic Incorporated	(408) 438-2096
PACEMAKERS, CARDIAC, EXTERNAL INVAS 5388	MEDTRONIC INCORPORATED	5388	CARDIOLOGY	Medtronic Incorporated	(408) 438-2096
PACEMAKERS, CARDIAC, EXTERNAL INVAS 5392	MEDTRONIC INCORPORATED	5392	CARDIOLOGY	Medtronic Incorporated	(408) 438-2096
BRAIN COOLING SYSTEM, COOL CAP	NATUS MEDICAL/INC.	CONTROL UNIT	ICN (NICU)	Natus Medical	888 496-2887
VENTILATORS, TRILOGY 100	PHILIPS RESPIRONICS INC.	TRILOGY 100	5 SURGICAL	Respironics - Novamatrix	(800) 345 6443
DEFIBRILLATOR, AED, PHILIPS	PHILIPS MEDICAL SYSTEMS	861304	ICU (PICU)	Philips Medical	(800) 722-9377
ANALGESIA MIXER, PORTER	PORTER INSTRUMENT CO.	3000	EMERGENCY DEPARTMENT	Porter	(800) 457-2001
VENTILATORS, 1200 LTV	PULMONETICS SYSTEMS, INC.	LTV1200	RESPIRATORY THERAPY	Pulmonetics Systems	(909) 783-2280
VENTILATORS, TRILOGY 202	PHILIPS MEDICAL SYSTEMS	TRILOGY 202	RESPIRATORY THERAPY	Philips Respiroincs Inc.	800 345 6443
HEATER COOLER, CARDIOQUIP	CARDIOQUIP	MCH-1000(I)	SURGERY	Shamrock Surgical	650-388-2494
WARMER, BLOOD/FLUID LEVEL 1 1000	SMITHS MEDICAL	H1000	EMERGENCY DEPARTMENT	Smith Medical	(800) 258-5361
WARMER, BLOOD/FLUID LEVEL 1 1200	SMITHS MEDICAL	H-1200	SURGERY	Smith Medical	(800) 258-5361
WARMER, BLOOD/FLUID LEVEL 1 HL90	SMITHS MEDICAL	HL90	ICU (PICU)	Smith Medical	(800) 258-5361
HEART-LUNG BYPASS CART \$5	STOCKERT-SHILEY	28-98-00	SURGERY	Sorin Group	800 650 2623
WARMER, BLOOD/FLUID	CARIDIAN BCT	953000000	INFUSION CENTER, OUTPATIENTTRF	Terumo	877-339-4228
WARMER, BLOOD/FLUID PRISMAFLO	CARIDIAN BCT	PRISMAFLO	ICU (PICU)	Terumo	877-339-4228
LASERS, SURGICAL	AMERICAN MEDICAL SYSTEMS	AURA XP	ARC	Universal Hospital Services	(510) 232-5335
DEFIB, BIPHASIC, ZOLL, R SERIES	ZOLL MEDICAL (ZMI CORP.)	R SERIES PLUS	3 SURGICAL	Zoll Medical	800-348-9011
DEFIB, BIPHASIC, ZOLL, X SERIES	ZOLL MEDICAL (ZMI CORP.)	X SERIES PLUS	CARDIOLOGY	Zoll Medical	800-348-9011
DEFIBRILLATOR, AED, ZOLL AED PLUS	ZOLL MEDICAL (ZMI CORP.)	AED PLUS	BIOMED-ENGINEERING	Zoll Medical	800-348-9011