It takes a system to save someone having a cardiac emergency.

With cardiac arrests, good CPR, delivered quickly, is vital, but by itself not enough. Prompt defibrillation is essential but can’t stand alone. For myocardial infarctions, rapid 12-leads are irreplaceable but by themselves save no one. Top-notch hospital care is always necessary, but can be futile without good EMS. Quality EMS is indispensable but less valuable without the right hospital care.

To bring that all together and provide our best for patients, providers need the right tools. Those must be simple, portable, fast and easy to use, economically priced and inordinately powerful. And they must link seamlessly to one another to share, transfer and help make the best use of patient information.

Technologies that do that can dramatically change the game of prehospital care.

In this exclusive supplement, we take a look at one of the smallest and lightest full-featured monitor-defibrillators on the market: the ZOLL X Series,™ which recently received FDA clearance.

Approximately half of the size and weight of others, but without compromise in features or capabilities, the X Series boasts a range of advances in addition to the known clinically superior therapeutic capabilities of ZOLL’s defibrillation and pacing, plus advanced monitoring parameters and even integrated WiFi for greater connectivity options.

For a look at these innovations, read on.
EMS keeps getting more complex, and the tools and equipment required to deliver it keep getting more sophisticated. Today our key technologies must be able to quickly obtain and smoothly exchange quantities of data we could scarcely imagine a generation ago, so as to inform better patient care.

At the same time, the packages containing all our powerful new technologies keep getting smaller—think computers, smartphones, etc. That’s a good thing. And when it comes to EMS and essential tools like its monitor-defibrillators, it’s a desire Jon Cloutier, NREMT-P, Marketing Manager for ZOLL Medical Corp., consistently kept hearing from care providers around the country over the last several years.

“I would ask people, if you could create a perfect monitor-defibrillator for your organization, what would it look like? What would it have?” says Cloutier, “Universally, everybody said pretty much the same thing: We want something small, light, durable, easy to use and with a long battery life. It didn’t matter if it was a fire department or ambulance service, transport or non-transport, paid or volunteer organization; those were the main things people wanted. So that’s essentially what we developed.”

All of those concerns—size, weight, portability, ruggedness and power—are addressed in the company’s pioneering new X Series, a monitor/defibrillator that’s about half the size and weight of other EMS models, but with even greater capabilities. It’s the most powerful device out there, without compromise.

The X Series weighs in at 11.7 lbs. (5.3 kg)—roughly half of its competitors. And it achieves that compact size and weight with no sacrifice of power or features. In fact, in numerous critical areas, its attributes exceed what the EMS market has previously seen.

“Space and weight are huge considerations,” says an early X Series user, Kendall David, EMT-P, director of the Wray Ambulance Service in Colorado. “And that’s true not only of the ambulance, but also on scenes. We generally run with two or three crew members, and we don’t have fire department and law enforcement support for our 9-1-1 calls. So the X Series is something in a small package that can be handled safely and easily by our crews.”

Beyond the size and weight, one of the X Series’ most notable assets is its ability to assist and improve CPR. The X Series features ZOLL’s innovative See-Thru CPR® technology, which removes compression artifact on the ECG display and helps reduce compression interruptions by letting rescuers see underlying rhythms without pausing. It also carries over the company’s popular Real CPR Help® feedback technology. With the X Series, ZOLL’s CPR Stat-padz® incorporate an accelerometer that measures rate, depth and recoil and provides real-time feedback, including configurable voice prompts and a metronome, to help keep rescuers within recommended guidelines. All data is provided in a simple real-time visual display through a proprietary CPR Dashboard™. These technologies work together to help care providers deliver effective compressions and minimize unnecessary pauses.
The X Series also has state-of-the-art noninvasive blood pressure technology developed for the Propaq® MD monitor-defibrillator, a favorite of the air-medical industry. This provides more accurate readings, faster, even in noisy prehospital environments.

“We were having a significant problem with noninvasive blood pressures,” says David. “We do a lot of interfacility transports from small hospitals here in rural Colorado to the Denver area, which takes 2½–3 hours by ground. Unfortunately, the roads between here and there aren’t always the smoothest, and when we’d run into a critical patient, like a sepsis patient or someone with abnormal blood pressures, we’d have a heck of a time trying to get accurate readings. We were looking for a solution to that, and found this had upgraded technology compared to its competitors.”

That technology includes the proprietary Smartcuf®, which separates pulses from artifact by synchronizing them with ECG R waves, and Sure BP®, which calculates blood pressure during cuff inflation. ZOLL says the X Series can obtain a blood pressure in about 15 seconds; David found that in good conditions, it can exceed even that: “When it can take the blood pressure as it inflates the cuff,” he says, “which is probably 60% of the time, it takes the BP in about 5 seconds.”

Another leap forward is the X Series’ communication capabilities. It is the first monitor-defibrillator with integrated WiFi, which supplements Bluetooth and USB cellular modem options for transmitting data. Caregivers can stream data ahead to hospitals using the best option even as they’re delivering care, which can help expedite time-critical interventions like catheterization for STEMI patients.

When monitoring a patient, the X Series can display multiple waveforms simultaneously, including up to four physiological waveforms or all 12 ECG leads. Split-screen capability allows simultaneous viewing of dynamic 12-leads and acquired 12-leads or analysis information. And if a provider misses something important on an ECG as it happens, a novel “snapshot” capability lets them, with a simple push of a button, print out the previous 12 seconds, plus the next 12, for a 24-second window of what transpired. Complete events are also preserved for later review using ZOLL’s RescueNet® Code Review.

Other unique features of the X Series include a neonate mode, with alarm parameters adjustable to that patient population, and unsurpassed ruggedness and portability reflecting its air-medical and military roots. Its resistance to dust and water gives the X Series an Ingress Protection rating of IP55. It works with ZOLL’s RescueNet® 12-Lead to manage and distribute patients’ ECGs, and will work with RescueNet® Link to upload and stream real-time care data to key players throughout emergency care systems.

An additional advance is the X Series’ battery. Despite the device’s compact size, its SurePower™ II high-capacity lithium-ion battery offers the longest available run time in the industry, even while sustaining a range of functions. It provides at least six hours of continuous monitoring of ECG, pulse oximetry, capnography, three invasive pressure channels, and two temperature channels, with NIBP measurements every 15 minutes and 10 defibrillation shocks at full energy (200 J).

“It lasts longer than any I’ve ever used,” says David. “We transported an intubated patient a while back, and I was getting blood pressures every five minutes, end-tidal CO₂, pulse oximetry, 12-lead monitoring and central venous pressure monitoring. That unit was fully charged to begin the transport, which was 2½ hours. And by the time we arrived, the meter still read plus-two hours left on the battery. In my experience, on those long transports where we’re using all the monitor’s parameters, I’ve never had a monitor that hasn’t gone through at least one battery.”

For more on ZOLL’s X Series, now available for sale in the U.S., see www.zoll.com.

* Developed by Welch Allyn for the Propaq® MD

This product is not available for distribution in Canada as it has not been reviewed and cleared by Health Canada.
FULLY AWARE: How RescueNet Link Manages All That Information

There’s a lot of information coming at you during patient care, and it can be hard to take it all in. Yet your patient’s welfare depends upon your obtaining, assessing, monitoring and contextualizing these torrents of data to deliver appropriate care.

The goal of ZOLL’s RescueNet® Link is to integrate data and help users utilize key elements of patient information quickly and easily. It seamlessly links data from the company’s monitor-defibrillators, RescueNet® ePCR patient care reporting program and RescueNet® Navigator onboard mobile computer for mapping, routing and dispatch connectivity.

“In the ambulance environment, there’s a lot of data generated, but it’s all in different places and available at different times,” explains Amy Machacek Smith, ZOLL’s Director of Data Integration. “The premise behind RescueNet Link is creating situational awareness in the back of the ambulance, such that all the data being generated is available in one location, presented in a meaningful way, and crews can use it to make decisions about patient care without having to connect data pieces and resources.”

That’s all automatically accomplished and virtually invisible. The only interaction RescueNet Link requires is at the beginning of the shift, when the provider selects the devices to be used from an electronic checklist. ZOLL’s patent-pending Sense ‘n Sync™ technology takes it from there, automatically “listening for” the indicated devices as they turn on, return to the ambulance or have something to say.

Everything is visible on a large display in the back of the ambulance that can be viewed at the same time by ED staff. This is the first time hospital and prehospital operations have been joined with a single system providing real-time access to clinical and incident information.

RescueNet Link has been approved by the FDA and is now available for sale in the United States. For more, see www.zolldata.com/rescuenet-link.

FASTER CARE WHEN IT’S CRITICAL: RescueNet 12-Lead

Of those critical instances in EMS when time really matters, STEMs are near the top. With ST-elevation myocardial infarctions, today’s best guidance suggests an interval of no more than 90 minutes from ED arrival (door) to cardiac catheterization (balloon).

That means the earlier you can identify a STEMI and inform ED personnel of an incoming patient in need of percutaneous coronary intervention, the more time they’ll have to prepare before that patient’s arrival. This shaves precious minutes from that D2B measure. But it requires simple, fast and reliable tools in the field.

ZOLL’s RescueNet® 12-Lead brings mobile computing to the 12-lead ECG acquisition and transmission process. It lets users receive and manage 12-leads from virtually anywhere using any combination of computer, tablet or hand-held devices, e-mail and fax. Its open architecture enables integration with any 12-lead ECG monitor, and sending ECGs quickly ahead to personnel in the ED and cath lab.

“All of our ambulances are hotspots, so we’re able to send all this information right through our hotspot and on to the hospital,” says Mark Swanson, EMS Clinical Services Manager for Florida’s Volusia County. “It’s very quick. From the moment it shows up on the screen, you hit the button, and it’s basically at the hospital.”

Once the 12-lead ECG is in the system, it’s automatically distributed, based on user configuration, to those who need to see it. Remote viewers like physicians and cath lab team members can receive diagnostic-quality images anywhere, along with interpretation and other key measurements. They can add to the patient record later as care progresses.

There’s no cost for EMS to transmit into RescueNet 12-Lead, no matter how many monitor/defibrillators they use, and there’s no cost to hospitals for receiving, distributing, archiving or exporting data. Because RescueNet 12-Lead is hosted, it requires no complex IT involvement. All data is encrypted and password-protected, making it fully compliant with privacy requirements. And it’s scalable to any size system.

“It’s something that’s easily accessible to anyone, large or small,” says Smith. “Because of the hosted nature, it allows an easy implementation for systems that want to get up and running right away.”

©2012 ZOLL Medical Corp. All rights reserved. CPR Dashboard, Real CPR Help, RescueNet, See-Thru CPR, Sense ‘n Sync, Stat-padz, SurePower, X Series and ZOLL are trademarks or registered trademarks of ZOLL Medical Corporation in the United States and/or other countries. Propaq, SmartCuf and Sure BP are registered trademarks of Welch Allyn. All other trademarks are the property of their respective owners.