KNOXVILLE TIMES
Knowledge & truth since 1932

At UCSF Medical Center, robot-aided healthcare is here

By Matt Weinberger

January 31, 2015

A Tug robot at work

When the brand-new UCSF Medical Center at Mission Bay in San Francisco opened on Sunday, patients were greeted by staffers that more strongly resemble R2-D2 than the cast of *Scrubs*.

Twenty-five Aethon "Tug" robots, comprising the largest fleet of free-roaming hospital robots in the world, will haul blood samples, food, medication, biohazardous waste and other materials and supplies around the huge, horizontal facility (about as big as three football fields). The Tugs are designed to reduce workplace injuries among hospital staff even as they let caregivers focus on, well, giving care.

Hospital officials offered some face time with the medical bots at a grand opening press conference Thursday featuring San Francisco Mayor Ed Lee, storied Silicon Valley venture capitalist Ron Conway and Salesforce CEO Marc Benioff.

"Our neighbors in San Francisco and Silicon Valley have shown us how information technology can empower people in so many areas of their day-to-day lives," said Dr. Seth Bokser, UCSF Medical Center's clinical informaticist and Medical Director of IT. "At UCSF Mission Bay, we have partnered with local and international innovators to build leading-edge, patient-facing technology that empowers our families for their health."

UCSF said that hospitals have workforce injury rates four times the average in private industry, largely because humans are expected to lug very heavy things (like hundreds and hundreds of pounds of soiled bedsheets) very long distances. In that way, making the Tugs run these marathons 24/7 is easier on the people who work there, even as a reliance on robots frees up hospital staff for menial tasks.

The robots work largely around the clock, though two of them get nights off at a time. They're keyed to be able to open doors, call elevators and roam around the hospital by themselves, requiring human intervention only if they manage to get stuck. On any given day, UCSF Medical Center's computer simulations estimate that a Tug robot will traverse 12 miles, or about 300 miles a day across the entire fleet.

Over the last several months, an Aethon tech team has been running the robots through their paces, using sonar and laser guidance -- combined with standard and infrared cameras -- to map out every inch of the UCSF Medical Center facility. When Tugs get where they're going, they can say so in one of several voices. (In today's demo the Tug spoke with an Australian accent, but there are other options, including Spanish language voices, a UCSF Medical Center spokesperson said.)

Hospital staffers can also gussy up the robots with decals; the pediatric wards have their Tugs dressed up as cable cars to make them more kid-friendly.

The Tugs are trained to navigate smoothly around people and gurneys in the hallways, and an in-house programmer and technician are tasked with improving their wayfinding. For instance, if a patch of hallway gets especially sunny for an hour or two a day, the Tug's infrared camera might see that as an obstacle; it's the tech's job to teach the fleet to ignore those hurdles and keep going. What one robot learns, they all learn, and the Aethon team supporting the Tugs gets access to all the data, helping refine routes for maximum efficiency.

And no, there is no Skynet contingency plan.

The most striking thing about these robots is how clunky and utilitarian they look. A stationary Tug in the hallway looks like your garden-variety trash cart. Of interest to CIOs is that each class of Tug is completely owned by the department that operates it: Housecleaning services is responsible for the guidance, loading, and scheduling of the linen-hauling robots, while janitorial staffers deal with the trash-hauling robots. IT only steps in when something's actually wrong.

Any robot carrying anything sensitive (medical instruments, blood samples) comes with a combination lock to avoid theft, while pharmaceuticals require a fingerprint on the part of a hospital staffer. In fact, hospital staff training included getting all 3,000 employees' and 500 physicians' fingerprints on file for this exact purpose.

The robots aren't where the cool technology ends at UCSF Medical Center at Mission Bay: Super-swag MRI and CT scan suites feature ambient lighting that brings timing a Virgin America flight, while others are made to look like cable car tracks or San Francisco's Marina neighborhood. The goal: to put patients of all ages at ease (which, in tangible terms, means patients need less anesthesia and can stay still enough for their CT scans the first time).

Just in time for Sunday's big game, UCSF is working to get the Super Bowl streamed from their iPhones to the MRI suites' projector screen for patients.

Projector screens display calming videos at the patient's command from an iPad. Every patient's room comes with a tablet that allows them to order food, email questions to their doctors, or do Skype calls with loved ones (even if they're in the next room, which is important in the cases of immunocompromised patients). There's also a large wall monitor to watch movies or browse the web.

All in all, UCSF Medical Center at Mission Bay isn't the first hospital to modernize its technology or deploy robots. But given its location in the heart of San Francisco, so close to where startups and large enterprises are hard at work changing the face of IT and healthcare alike, the UCSF Medical Center at Mission Bay represents an important step on the road toward the ongoing technology-driven revolution in patient care.