Delivering Safer, More Effective Healthcare with Dependable Wireless Intercoms

Exploiting the capabilities of Clear-Com's CellCom wireless intercom solution for Fink Engineering's state-of-the-art hyperbaric chambers, major medical providers have made significant progress to enhance patient safety and deliver better healthcare during hyperbaric oxygen therapy.

Fink Engineering's Office in Queensland, Australia

EXECUTIVE SUMMARY

ABOUT –Fink Engineering
- Rectangular hyperbaric systems
- Serving hospitals in New Zealand, Singapore, Canada, and USA
- Headquarters at Queensland, Australia

HOSPITAL BUSINESS CHALLENGES
- Construct a danger-free treatment facility
- Minimize crisis
- Connect physicians and nurses for better teamwork

INTERCOM SOLUTION
- CellCom 1.9 GHz wireless intercom system
- CellCom wireless beltpacks
- CEL-TA active transceiver antennas

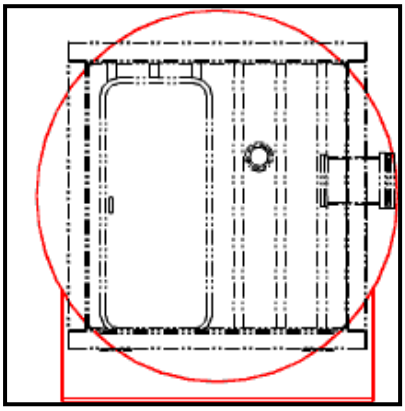
BUSINESS RESULTS
- Reinforced safe medical environment
- Accelerated response to emergencies
- Improved clinical work environment
- More suitable delivery of patient therapy

Background

Especially within the past decade, many healthcare providers have recognized the ground-breaking developments in hyperbaric oxygen therapy, a medical solution that delivers more oxygen to the body's tissues. Hyperbaric medicine is often eagerly adopted by hospitals to complement their existing treatments in vascular medicine, radiology, and reconstructive surgery. Not only does hyperbaric therapy support continued patient recovery, but the treatment is so effective that it can even reverse the effects of life-threatening events.

Fink Engineering manufactures revolutionary, rectangular hyperbaric chambers for some of the world's top hospitals and rehabilitation facilities. Hospitals turn to Fink Engineering for having the right mix of deep industry experience, cutting-edge hyperbaric chambers and flexibility to work with clinics to bring all their hyperbaric requirements together to create a powerful solution. Typical cylindrical hyperbaric chambers, such as those common to other hospitals, are often limited in how they can be used; Fink Engineering's rectangular hyperbaric chambers have transformed the way that hyperbaric medicine is practiced, enabling use for all intents and practices. Today, the company designs the most advanced hyperbaric systems across the globe and

has constructed the largest hyperbaric therapy chambers in the U.S., to cure a growing number of medical conditions for thousands upon thousands of patients each year.



Fink Engineering's Rectangular Hyperbaric Chamber Design

Although the sophisticated, rectangular hyperbaric systems operated flawlessly in nearly every way, Fink Engineering had struggled with one aspect of the design—communications. Hospitals faced the stringent challenge of synchronizing its hyperbaric medical operations, both within and outside the thick walls of the hyperbaric chamber, with utmost safety and efficacy. This can only be accomplished with the help of a strong staff, matched by an equally reliable voice communication system; anything less would render the medical team inadequate to respond to the increasing demands of the information-intensive hyperbaric operations. Nonetheless, the hyperbaric environment presented unique challenges for consideration, primarily those affecting patient and staff safety.

Hospital Business Challenges

Construct a danger-free treatment facility

Completely sealed and filled with hot air and moisture, a hyperbaric chamber is less than ideal for the installation of electronic equipment. Additionally, few technologies are able to withstand the high pressure, which is equivalent to 73 PSIG or 6 Atmospheres Absolute, within the hyperbaric chamber. Medical clinics would need custom-built technologies, safe in high pressure and humidity, to mitigate the risk of ignition.

Minimize crisis

Clear and reliable communication, within and outside of the hyperbaric chamber, is absolutely essential for averting crisis as well as responding promptly to them. Once an emergency situation arises, there is no time to repeat questions and answers. Missing information or delayed action amplifies danger minute by minute. When a patient has a seizure or cardiac arrest in the chamber, the staff inside the chamber must immediately reach the rest of their team in and out of the hyperbaric chamber for additional medical support. Clearly, in these critical situations, the consistent availability of the entire staff is the key to saving lives.

One barrier to this is the thick, ¾ inch steel walls of the hyperbaric chamber, which prevent sound from penetrating into and out of the chamber. Moreover, hospitals are a RF hostile environment unlike any other. Because there are a high number of wireless medical technologies, such as MRI and radiology devices, used in the clinic, wireless intercom systems are bombarded with wireless signals competing for the same frequency band. Not only does this require frequency coordination, but wireless intercoms are commonly and regrettably prone to audio fading and connection loss in such a RF saturated space.

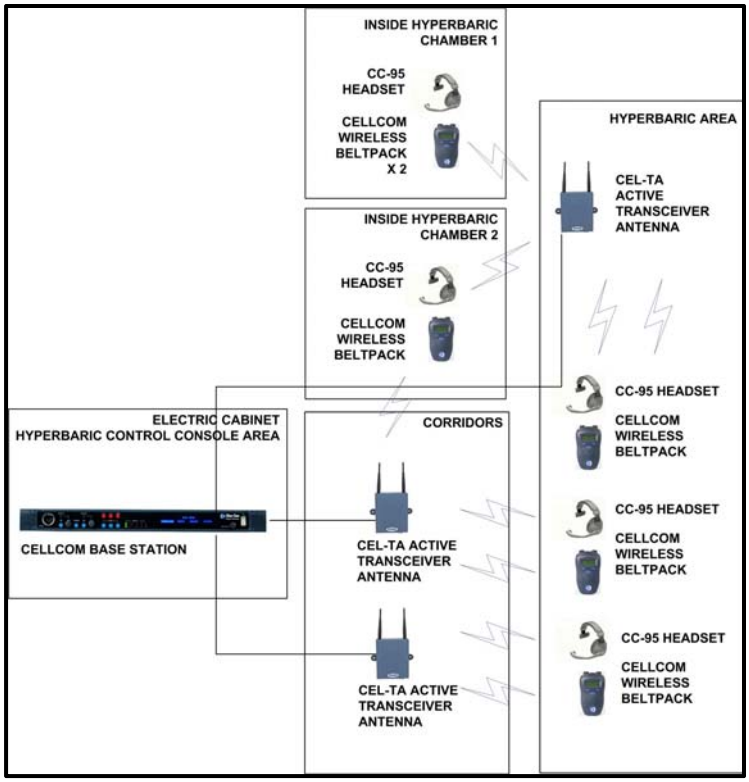
Connect physicians and nurses for better teamwork

The physician and nurse attendant inside the hyperbaric chambers must efficiently coordinate with the hyperbaric circulating nurse and hyperbaric operator outside of the chamber to administer hyperbaric oxygen therapy. Those inside the chamber are assessing and supervising patient treatment while the staff members on the outside are preparing patients for treatment, completing documentation and performing hyperbaric chamber operations and maintenance. A hospital generally requires a large scope of wireless coverage for the entire hyperbaric area including the adjacent corridors and facilities to productively manage operations and work together effectively among the internal team.

The Intercom Solution

Choosing Clear-Com

After 15 years of trial and error with various communication providers, Eric Fink, Managing Director of Australia's Fink Engineering, finally found his answer with Clear-Com. Clear-Com's CellCom was the absolute intercom system of choice for Fink Engineering, not only because it was safe and agile, but it also offered the necessary interconnection and reliability for hospitals to communicate anywhere in the hyperbaric area and could connect to a hospital's general or local paging systems as well. Fink Engineering's hyperbaric chambers with Clear-Com's wireless systems are now installed in hospitals throughout the world.



Application Diagram Highlights an Example of a Hospital Using Clear-Com's CellCom for Its Hyperbaric Therapy Operations

In a general hospital set up, the CellCom 1.9 GHz wireless intercom base station is installed in an electric cabinet at a hyperbaric control console area along with six CellCom wireless beltpacks. CellCom CEL-TA active transceiver antennas are mounted on the outside of a hyperbaric chamber and fixed in nearby corridors to extend the scope of coverage across the entire facility.

Functioning in the 1.9 GHz frequency band, away from the crowded radio spectrum where other hospital equipment operated, the CellCom wireless intercom remains highly secure and free from interference. The extraordinarily clear audio of the CellCom can be further attributed to its unique DECT and cellular auto-roaming technologies, enabling the wireless beltpacks to continuously detect and automatically select the best connection. Moreover, the wireless signal of the CellCom can easily penetrate the dense steel frame of the hyperbaric chambers, delivering high quality audio for conversations between the medical staff, both within and outside of the hyperbaric chamber.

When treatment is only conducted in one hyperbaric chamber, four CellCom wireless beltpacks are commonly utilized by the hyperbaric physician and nurse attendant inside along with the hyperbaric circulating nurse and hyperbaric operator outside the chamber. However, when additional treatments are being conducted simultaneously in other hyperbaric chambers, additional CellCom wireless beltpacks are allocated to the inside nurse attendants and hyperbaric operators.

Business Results

Reinforced safe medical environment

Although many types of electronic equipment and voice communication systems can spark a fire or cause an explosion in the presence of high pressures and dampness, the CellCom, utilizing NiCd batteries, successfully operated in the hyperbaric area without presenting any dangers.

Accelerated response to emergencies

Whether a patient inside the chamber is going into cardiac arrest or is beginning to show symptoms of an oncoming seizure, the CellCom wireless system allows the medical staff to receive relevant information the first time it is said and also gives them efficient mobility, resulting in a more collaborate effort to respond rapidly with life-saving procedures.

Improved clinical work environment

A hyperbaric oxygen therapy session can last between one and two hours. During this period, the healthcare team is monitoring the patient and waiting for the treatment to finish. Instead of working in isolation, the nurse and physician inside the hyperbaric chambers are able to converse with the staff outside of it. With CellCom, they can talk about the medical treatments and patient status. CellCom was easy to integrate into the daily clinical practice of the doctors and hyperbaric medical professionals. In addition, medical clinics often secured a great deal of success by reinforcing a close familiarity between staff and instituting an enjoyable work environment. This has led to an increase in the number of engaged, productive and satisfied staff members.

More suitable delivery of patient therapy

With the use of CellCom, hospitals have created an infrastructure to support a more private delivery of information between staff and healthcare treatment to patients. The CellCom software can be used to assemble up to ten separate conferences at once so that conversations are secluded to only those who need to participate. Hence, medical professionals working on a specific operation at that moment in time can communicate without distraction to other relevant parties.

Additionally, since the staff utilizes personal beltpacks and headsets, they are able to speak confidentially with other attendants regarding patient emergencies. This inhibits the distraction of other patients in the chamber since hearing those conversations would otherwise provoke unnecessary panic and disruption. Hospitals are better serving their patients by supporting the provision of a peaceful therapy session.

Clear-Com and Fink Engineering have helped translate the business needs of medical providers into a robust, functional solution, following through every step of the way. Not only are clinics and hyperbaric operations optimized for patient and staff safety, but the medical staff members also have the capability to handle the unexpected and administer therapy with greater efficiency. Clear-Com's CellCom, coupled

with Fink Engineering's remarkable hyperbaric systems, has enabled the medical professionals to have more time, energy and resources to focus on what truly matters – ensuring the best healthcare for patients.

Note: CellCom® and FreeSpeak® are different brands representing the same digital wireless intercom system (with minor technical differences). Due to trademark limitations, CellCom and CellCom Integra (formerly CellCom50) are only available in the U.S. and Canada; and FreeSpeak and FreeSpeak Integra (formerly FreeSpeak50) are available in all countries other than the U.S. and Canada.

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