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Emergency oxygen, when you need it!

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**BIO:
Richard Imbruce, PhD, CEO**

30 years experience in the medical device industry & co-inventor of R15. Founded Pneumedics, Inc., a developer & manufacturer of heart and lung diagnostic instrumentation and advisor to GE/Versamed Healthcare. Dr. Imbruce is an international expert on breathing mechanics, established Rapid Oxygen Company in 2013 to develop, manufacture and market the R15, portable chemical oxygen generator for emergency use.

CEOCFO: *Dr. Imbruce, what is the concept behind Rapid Oxygen?*

Dr. Imbruce: The purpose and concept of the R15 is to develop & make available to the public, a safe, reliable emergency oxygen system that can be used by anyone, anywhere, to provide emergency oxygen before EMS arrives. The national response time for EMS is eight minutes and eleven seconds & often longer in rural areas. Deterioration of brain function occurs within one or two minutes without oxygen. There is a 10% improvement in survival for each minute improvement in response time. The American Heart Association has diligently worked over the last 20 years creating public awareness & education on the importance of Automated External Defibrillators (AEDs). Airports & many public places locate an AED within one minute's reach to improve emergency response times for the average citizen's use.

There are over ten million AEDs installed, however, you do not see oxygen associated with them. The reason is oxygen is only available as a high pressure gas cylinder that is explosive. Professionals must be certified to use a gas cylinder and since oxygen is a drug, a physician's prescription is also required for its use. The R15 is cleared by the FDA specifically to provide emergency oxygen. It is an OTC (Over The Counter) medical device that does not require a prescription & can be used by anyone without training.

CEOCFO: *How does the R15 emergency oxygen technology work?*

Dr. Imbruce: The more familiar methods of available oxygen are liquid oxygen, high pressure gas cylinders and oxygen concentrators. The R15 produces oxygen by chemical means. Most are familiar with large liquid oxygen cylinders located outside hospitals and smaller portable high pressure gas cylinders. Oxygen concentrators have a motor which requires battery or electrical power to compress & move ambient air through a molecular sieve that separates heavier nitrogen and concentrates oxygen. The concentrator must be placed in a clean air environment.

The R15 is mechanically activated, requires no battery or electrical power and it is not a high pressure device. It produces 100% pure oxygen from powder by the addition of water and a catalyst. Gas cylinders produce cool dry gas that need

accessory humidification to be used effectively. The R15 chemical reaction produces oxygen warmed & humidified to body temperature, the best conditions for breathing.

CEOFCO: *What is the shelf life?*

Dr. Imbruce: The R15 has a two year shelf life. It is a disposable, single use device. There are three cartoons on the label that provide simple instructions for anyone to use. Just lay the unit flat, place the latex free simple breathing mask on the subject, rotate the lever ninety degrees from the three o'clock position to the six o'clock position and oxygen flows within ten seconds. The FDA requires a chemical oxygen generator for emergency use must produce 100% oxygen at a minimum flow of six liters per minute for fifteen minutes. Anyone can use it & anyone can become a Good Samaritan.

An additional benefit is that it does not require the same storage that a gas cylinder requires. A gas cylinder must be stored in a cabinet constructed so it can withstand 500° F for 30 minutes. The R15, because it is at low pressure, can be safely stored on any shelf. Unlike a gas cylinder, the R15 can also be stored and transported in a vehicle, a good solution for police, often they first to arrive on the scene, before EMS arrives!

CEOFCO: *Is there any downside to giving someone oxygen if they do not really need it?*

Dr. Imbruce: In an emergency department, many patients receive emergency oxygen, as initial treatment. This device provides fifteen minutes of oxygen. There is no untoward effect by breathing 100% oxygen for fifteen minutes; it is the best aid for the vital need of oxygen during a cardiac or respiratory emergency. It is safe and it gets you through those initial events. Hearts stop because of lack of oxygen. Brains die because of lack of oxygen. Oxygen is the essential element for cellular respiration. You need oxygen. This is passive oxygenation.

“The R15; emergency oxygen, when you need it, before EMS arrives for anyone to become a “Good Samaritan”.- Richard Imbruce, Ph.D.

The recommendation for CPR is uninterrupted compressions. When using an AED, after placing the electrode pads on a subject, the AED performs an analysis of the ECG waveform before it can issue a shock. During this period, the R15 can be used to provide supplemental oxygen while compressions are applied to the subject. Since the lung is elastic, each time the chest is compressed, the upstroke may allow some oxygen enriched air to enter the lung. At least, it eliminates the deoxygenated air and carbon dioxide in the expired breath. There are so many reasons to use it and to use it early in an emergency. Our mantra is, “Put the ‘P’ back in CPR, Cardio Pulmonary Resuscitation”.

CEOFCO: *Has anything similar been attempted in the past?*

Dr. Imbruce: Yes. There are similar devices that perform at much higher temperatures. For example, on commercial aircraft there are chemical oxygen generators that require a source of ignition & react at higher temperature, more than 500°F. In 1996, the Value Jet crash in the Florida Everglades, resulted from these devices causing a fire in the cargo compartment that resulted in the death of 110 passengers. One year later there was a similar fire on the Mir space station.

The chemical that we use in our device is mechanically activated. It does not have an ignition source. The way in which the valve is patented allows for these reactions to proceed without ignition. Therefore, it is perfectly safe. It burns at a lower temperature; actually at 180° F. Our device is designed so that the surface temperatures are warm to the touch. It is a safe FDA cleared device.

CEOFCO: *What has been the response to R15 from the medical community and the safety community?*

Dr. Imbruce: They are encouraged by it! “It is about time,” is often quoted by the public. Everyone loves the product! We are so proud of the technology! The chemistry has been around for one hundred years except for the patented delivery system, which is new & innovative. It is similar to, for example, an EpiPen or Naloxone administered by the Narcan device. The chemicals are the minor part of cost while the intellectual property contained in the delivery system is what differentiates the R15. The delivery system produces safe oxygen, under all circumstances including transportation.

CEOFCO: *How do we get this device everywhere it should be? What is your plan?*

Dr. Imbruce: The R15 is easy to use & self explanatory. Just visit the website www.rapidoxygen.com & select FAQs for more information. The R15 is available through local and national first aid & emergency suppliers. Education on pool & school safety, the opioid crisis, boys and girls clubs are some of the venues we are targeting.

For example, the opioid tool kit recommends the use of oxygen before, during and after the administration of Naloxone. Due to opioid induced respiratory depression, one is rendered unconscious. The reversal of consciousness when Naloxone is administered awakens the subject while respiration remains depressed. Oxygen supplementation allows better recovery during treatment.

CEO CFO: *Where is it manufactured?*

Dr. Imbruce: It is made in America, in Deep River, Connecticut.

CEO CFO: *It would seem hard to resist. What are you finding? Are some people skeptical?*

Dr. Imbruce: No, I do not find skepticism at all. The cost is \$395. Initial reaction is, "Fifteen minutes of oxygen for three hundred and ninety five dollars, just does not add up". Some find that to be beyond their budgets so we introduced a monthly subscription of \$25 per month for 2-years so that it fits into any budget. It can also be made available with a monthly service agreement, similar to cable or alarm system for \$40-\$50/month. The R15 was on display at the Philadelphia Airport and everyone who visited thought it a great idea that will save many lives.

It is a very safe device. In fact, on commercial aircraft, because of the ignition source of the oxygen generators on passenger aircrafts, the FAA mandated their removal from all lavatories. The R15 can safely replace present devices. Today in a commercial aircraft lavatory, if there is a decompression, there is no oxygen available, so you better get to your seat as quickly as possible.

CEO CFO: *Are you funded for the marketing you need to get the story out? Are you seeking partnerships and investors?*

Dr. Imbruce: We are seeking additional funding to execute marketing & sales.

CEO CFO: *What surprised you throughout the process of getting to where you are today?*

Dr. Imbruce: It is just the difficulty. "Build it and they will come." We built it, however, marketing and sales distribution are critical. Translating it to the public and getting it out there has taken twenty years for AEDs to be distributed as widely as they are today – but that is a totally different device and we think that this simple to use oxygen first aid device will have much greater acceptance and a much more rapid rate – we just need to get the word out! Even today, after twenty years, there is only 34% awareness of AEDs for emergency use.

Some example of areas where it could be beneficial is in public spaces and airports, where there is a defibrillator located every thousand feet, so that within one minute a defibrillator is made available to the public. That is where we want to be located. The nice thing about it is that the defibrillator has defined an emergency location. We now want to identify that location and add emergency oxygen to that location.

In addition, there are "stop the bleed" & tourniquet kits, now being added to these locations. We envision these locations will turn into an emergency kiosk to morph into a hero cabinet location. A hero cabinet will be placed along with the present defibrillator cabinet and it will contain emergency oxygen and a "stop the bleed" tourniquet kit, along with Narcan and EpiPen. You will have available, at these locations more resources for immediate emergency response for any emergency; cardiac, respiratory, trauma or drug related.

CEO CFO: *Are you working on that now and trying to put that together?*

Dr. Imbruce: Yes we are. The 'Hero' cabinet will be the standard for emergency response in all public spaces.

CEO CFO: *Why Rapid Oxygen important?*

Dr. Imbruce: The mission statement is to provide emergency oxygen before the arrival of emergency medical services. It is to make anyone a Good Samaritan, to place the "P" back in CPR and resuscitate, both by compression and ventilation with one hundred percent oxygen.