



Emergency oxygen  
when you need it.™

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This brief is one in a series of non-technical articles that discuss bystander delivery of oxygen during breathing emergencies

## Creating Safe Portable Emergency Oxygen

Oxygen is the most commonly used drug in emergency medicine but until recently, its use has been restricted to trained medical personnel. What has changed is the introduction of the innovative R15™ device that now enables safe emergency oxygen for breathing emergencies by untrained bystanders.

### A Brief History of Oxygen

Oxygen has been present on Earth for about 2.5 billion years<sup>i</sup>, but people didn't identify oxygen as an element until the end of the 18<sup>th</sup> Century. Although the discovery of oxygen is widely attributed to Joseph Priestley, some credit its discovery to pharmaceutical chemist, Carl Wilhelm Scheele.<sup>ii</sup> Scheele reportedly created oxygen in his laboratory by heating several chemicals together.

### Oxygen Medical Use

Within 20 years of its discovery, oxygen was being used for medical therapy, including a mixture with nitrous oxide as an asthma treatment. Near the middle of the 19<sup>th</sup> Century, oxygen was being stored in cylinders for use during the administration of anesthesia and other therapies. Since those early days, researchers and physicians have refined their understanding of the benefits of oxygen and its use across a wide spectrum of therapies.

### How Oxygen is Commercially Created and Stored

Today, oxygen is commercially produced by a complicated process that involves the compressing and extreme cooling of air to liquify and purify the oxygen.<sup>iii</sup> Processed oxygen is stored under pressure in cylinders of various sizes, depending upon the intended use.

Modern hospitals store oxygen as a liquid at very low temperatures in very large tanks located outside the hospital and pipe oxygen to areas inside the hospital from the emergency room to the patient's bedside.<sup>iv</sup>

Ambulances are equipped with small cylinders of compressed oxygen that can be carried to the location of a patient with other critical medical supplies.



Figure 1: paramedic kit with oxygen cylinder

Cylinders of compressed oxygen can present danger of rupture and explosion and so cannot be stored in a public space or used by untrained personnel, and require a prescription for use.

## Now Oxygen is Safely Created On-demand

The chemistry that discovered oxygen has been used to design chemical oxygen generators to produce oxygen from other compounds. Chemical oxygen generators are commonly used on aircraft and provide passengers with oxygen in the event of cabin depressurization.<sup>v</sup> Similar devices are also used on submarines, in mines and on the International Space Station. The R15 portable emergency oxygen device is a unique chemical oxygen generator specifically designed for medical support during airway emergencies.

Cleared by the Food and Drug Administration (FDA) for use by untrained bystanders as an over-the-counter (OTC) device, the R15 device will deliver oxygen to a patient/subject for 15 minutes at a safe, therapeutic rate of 6 liters per minute – nearly 24 total gallons of oxygen. Fifteen minutes is about twice the average time it takes for emergency medical services to arrive on scene. It will continue to produce oxygen at a reduced flow for an additional 30 minutes until it finally stops.

Approximately 7 million breathing emergencies occur every year. The R15 device may be safely placed in public areas like pools and malls for use by untrained bystanders to provide oxygen support during breathing emergencies until trained medical personnel arrive.

To read more articles like this one please visit  
<https://rapidoxygen.com/white-papers>

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<sup>i</sup> [online 28Mar19> <https://www.astrobio.net/news-exclusive/the-rise-of-oxygen/>

<sup>ii</sup> [online 28Mar19> <http://rc.rcjournal.com/content/58/1/18>

<sup>iii</sup> [online 28Mar19> <http://www.madehow.com/Volume-4/Oxygen.html>

<sup>iv</sup> [online 29Mar19> <https://www.chthealthcare.com/blog/medical-gas-systems>

<sup>v</sup> [online 29Mar19> [https://www.skybrary.aero/index.php/Chemical\\_Oxygen\\_Generators](https://www.skybrary.aero/index.php/Chemical_Oxygen_Generators)