

# Editor's Corner

When was the last time you thought about your next breath? Will it happen? Do I need to do something to get it going? Like you, I do not find myself thinking about it. Fortunately, the respiratory center controlling our breathing is in our upper brainstem where the medulla oblongata and the pons send signals to the muscles that control involuntary respiration and cause breathing to occur. Unfortunately, before the discovery of a safe and effective vaccine, some children were infected with the poliomyelitis virus that leads to paralysis. There is no cure for the devastating effects of polio but it can be prevented by the vaccine and the volume of global cases since 1988 have been reduced by 99.9% according to Rotary Club (<https://www.endpolio.org/>). This becomes much more personal and touching after one of our own Editorial Board members shared with me the story, from over a generation ago, about the loss of his sister at the age of 12 from polio.

In 1927 Philip Drinker and Louis Shaw (faculty members at Harvard University) invented a mechanical respirator powered by an electric motor that could temporarily maintain artificial respiration in a person. A couple of years later, calling it the tank respirator, inventor John Emerson refined the design and adopted cost-cutting engineering enabling this "contraption" to become a staple within medical facilities.

The cost of the tank respirator was, at the time, equal to the cost of a house. In the 1930s, Drinker and Harvard University took John Emerson to court, claiming he had infringed on patent rights by altering Drinker's iron lung design. Emerson defended himself by making the case that such lifesaving devices should be freely available to all. Emerson's tank respirator was first used in 1931 in Rhode Island, USA. Years later, when Jonas Salk (inventor of the polio vaccine) was asked whether he would patent his polio vaccine and make a fortune, he replied that the

vaccine belonged to everyone, making the comparison, "How could you patent the sun?"

The first human use of a mechanical ventilator was recorded in 1909 when George Poe, Jr. was able to revive Moses Goodman using the apparatus, he called Machine for Inducing Artificial Respiration that he patented two years earlier. ([https://en.wikipedia.org/wiki/George\\_Poe#/media/File:Poe\\_patent.gif](https://en.wikipedia.org/wiki/George_Poe#/media/File:Poe_patent.gif)). About a century later, due to the coronavirus pandemic, once again the world is becoming concerned over the lack of availability of mechanical ventilators (<https://www.weforum.org/agenda/2020/04/covid-19-ventilator-shortage-manufacturing-solution/>).

The history of the mechanical ventilator is the story of how an engineering solution addressed critical and urgent medical needs and healthcare's growing dependence on technology. Also highlighted was that the technology lifecycle, from innovation to use, and from upgrades to accessibility, must be professionally managed by competently trained experts like clinical engineers. To be considered competent, clinical engineering education and training must include innovation, disaster preparedness, and assets management strategies.

Unfortunately, during this COVID-19 pandemic, like the previous era of the polio virus, lives that technology could have saved, were lost. Yet, the ability to connect challenges with engineering solutions just like John Emerson did about 90 years ago is the contribution to better care that clinical engineers do every day. In the profession that creates and ensures that technological tools are patient-ready there no room for error or mistakes. The professional principals that every engineering training program must incorporate into their curriculum.

Regardless of the era humans live in, they can always find ways to collaborate and disseminate information, and there is no better time than now to appreciate and participate in the Global Clinical Engineering Journal.



Today, there are still few polio-stricken patients like Paul Alexander from Dallas, Texas, who are surviving thanks to the engineers and technicians who can keep old iron lung machines going for over six decades (<https://www.youtube.com/watch?v=gplA6pq9c0s>). Like Paul Alexander says in the linked video “I’m not crippled. I’m a human being.” So, let me ask you again: when was the last time you thought of your next breath? How fortunate we are not having to think about it. I hope you will enjoy reading the rest of this Journal and remember to send me your feedback.

*Today, tomorrow, together!*

Dr. Yadin David

A handwritten signature in blue ink that reads "Yadin David".

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