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Bjørn Lind

“My first appointment as a trained anaesthesiologist was in Stavanger in 1956. Because of this, I came by chance to contribute to the beginnings of cardiopulmonary resuscitation, and to an important part of its development. This was a unique opportunity, which has given me great satisfaction in my further career”, says Bjørn Lind.

The Stavanger story, of the conception of the Resusci Anne training manikin, is well-known history. But, seen in retrospect, the concept was a highly unlikely one. Anaesthesiology was a very young profession in Norway. Lind was the 13th physician to enter the speciality, and the first and only in the field while working in Stavanger—a provincial town with about 50,000 inhabitants and two hospitals ([Fig. 1](#)).

Chiefly because of its long coast, Norway had a long-standing tradition of teaching resuscitation in schools. In 1939, the Holger–Nielsen method – back pressure arm lift – was included in the primary school curriculum and subsequent reports indicated that people would use it without hesitation. But when Peter Safar told the Congress of the Scandinavian Society of Anaesthesiologists at Gausdal in 1958 about his own work on mouth-to-mouth resuscitation, based on his own and James Elam's findings, Bjørn Lind and his colleagues were fascinated, and discussed the possibility of replacing the arm lift back-pressure practice with this new method [\[1\]](#). The question was how the method could be taught, and whether people would be willing to use it. The Norwegian Association of Anaesthesiologists wanted to introduce mouth-to-mouth ventilation, and established a resuscitation committee to study the problems. From 1959, all manuals and pamphlets distributed by the Norwegian Red Cross and the Norwegian Civil Defence included the new method [\[1\]](#). Individual members also worked hard to promote mouth-to-mouth ventilation. Bjørn Lind taught the method to colleagues at hospital meetings in Stavanger, using as subjects anaesthetised patients undergoing minor operations, but without much acceptance. He even used his wife – anaesthetised for the occasion – as a patient for one of these meetings. Then, one day, the toy manufacturer Åsmund S. Lærdal called at his office. Lærdal was making wound imitations for the Red Cross in Sweden and Norway. Having heard about the new method from the medical adviser to the Swedish Red Cross, Dr. Per Stroemback, he saw the need for a training aid. Åsmund Lærdal had had international success with the life-like Anne doll, and thought that a life-size, life-like training manikin would be preferable, especially for psychological reasons. Could Dr. Lind help him address this challenge? “This meeting decided the track of my career”, says Bjørn Lind.

1. Designing the Resusci Anne

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For a whole year, the two were in almost daily contact, working to make every detail simulate the key parts of the anatomy and physiology as realistically as possible. In the process, they became close friends. When the prototype Resusci Anne was finished in May 1960, two major points had to be proved: that the manikin was an effective training aid, and that people would accept the method and be willing to use it.

In September 1960, Bjørn Lind demonstrated the manikin to Professor Ronnie Woolmer in London, who was his friend and very interested in the topic. Woolmer immediately appreciated the great training potential of the manikin.

Back in Norway, Lind showed the manikin to the Director General of the Health Services, and obtained the go-ahead for a pilot project in the county of Rogaland. Together with the County Counsellor for physical training, he started teaching some 200 6th and 7th graders

(13–14-year-olds), using the manikin, with a control group being shown only an instruction film.

The time had come to show the manikin to Peter Safar. Safar immediately grasped its potential, and suggested a metal ring inside the chest, to include training in external compression as well.

The following year, in August 1961, Bjørn Lind and Ivar Lund hosted the First International Symposium on Resuscitation in Stavanger, on behalf of the Norwegian Society of Anaesthesiology. Dr. Woolmer chaired the meeting, and among the attending resuscitation pioneers from Europe and the United States were Peter Safar, James Elam, Archer Gordon, Henning Ruben and Rudolf Frey ([Fig. 2](#), [Fig. 3](#)).



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Fig. 2. Bjørn Lind (no. 3 from right) chairing the panel of the landmark Resuscitation Symposium in Stavanger in 1961.



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Fig. 3. Three “Resuscitation Greats” and great friends; from right: Bjørn Lind, Peter Safar and Åsmund S. Lærdal.

Bjørn Lind presented the results of the school trial, and training with the new manikin. Seventy-three percent of the children who had worked with the manikin, achieved satisfactory ventilation, compared to 37% of the pupils who had only seen the film. The symposium concluded that the entire population should learn mouth-to-mouth ventilation, while external chest compressions should be reserved for helpers who had had special training. These recommendations were published as a supplement to the *Acta Anaesthesiologica Scandinavica* [2]. The supplement raised a great deal of interest in many parts of the world. Bjørn Lind was invited to several European meetings, and even to Cuba to demonstrate the new method and the Resusci Anne manikin.

By October 1960, Norwegian savings banks had donated 650 manikins to primary schools, of which 42 were placed in Rogaland. Bjørn Lind trained 31 first aid instructors, who then taught 765 school teachers how to instruct the children. This made possible the training of 6900 pupils, who represented 80% of their age group, by the spring of 1961. At the same time, a similar programme was started nationwide. This made Norway the pioneer in teaching mouth-to-mouth ventilation to an entire population.

2. Published in JAMA

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Two years later, Lind and his colleague Jacob Stovner presented evidence that the Norwegian population had indeed accepted the method. At that time, the newspapers took a keen interest in resuscitation. Press clippings over two years showed that 40 of 85 reported resuscitation attempts – most of them drowning – had been successful.

Interviewing the rescuers, Lind and Stovner found that only six had hesitated to start resuscitation for hygienic reasons. This analysis was published in *JAMA* in 1963 [3].

Nevertheless, in that same year, when Lind and Lund presented heart–lung resuscitation to the national medical society, the reception was lukewarm, not least among the cardiologists. One declared that if he were ever to suffer a cardiac arrest, he most certainly wanted no attempts at external chest compressions.

In 1967, Lind and Lund organised the second international symposium on resuscitation for the Norwegian Association of Anaesthesiology. To promote CPR around the world, the World Federation of Societies of Anaesthesiologists published a manual written by Peter Safar on cardiopulmonary resuscitation, in accordance with the guidelines from this symposium. This manual was printed in more than 300,000 copies, in 16 different languages [4]. The manual went on to further editions in 1981 and 1987 [5], [6] (Fig. 4).



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Fig. 4. The CPR Manual written by Safar and published by Lærdal for the World Federation of Societies of Anaesthesiology.

Bjørn Lind would never accept any fee from Åsmund S. Lærdal for his contribution. So one day, when they were on a professional visit in London, the industrialist took him into a musical instrument dealer's and presented him with a rare cello. Now in his mid-80s, Lind still enjoys playing this very cello, and has decided that his treasure will eventually go to the Oslo Philharmonic Orchestra (Fig. 5).




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Fig. 5. Sharing a passion for patient care as well as chamber music; Bjørn Lind and Peter Safar.

3. Inspired by a who-done-it

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World War II interrupted higher education in Norway. Bjørn Lind was 28 years old when he graduated from medical school in 1948. Actually, it was a film that pulled him into the field of anaesthesiology. Serving as an intern at the Trondheim hospital, he wanted initially to specialise in ophthalmology—until he saw the thriller “Green for Danger”, where bottles of oxygen and carbon dioxide were switched during an operation. One of the main protagonists was an anaesthesiologist. This was young Lind's first glimpse of an anaesthetist at work, and he was fascinated. “This seemed the closest you could come to a physiology lab. I was very interested in physiology and pharmacology, and decided to make this my specialty.”[1](#)

After spending one year as an intern in the anaesthesiology department at the Ullevål hospital in Oslo, Lind went to Copenhagen to study at the WHO Centre of Anaesthesiology. Here he made important contacts. In 1952, with just two years experience of anaesthesiology, he spent six months during the Korean war at the Norwegian field hospital, “Normash”. On the plane going there, he felt inadequate, wondering “what on earth am I, with my slight background, going to do in the middle of the war zone?” he recalled, over 40 years later.[2](#) But the experience was to stimulate his interest in acute medicine, and in teaching. A study period in Bristol, England, was followed by six months in the anaesthesiology department of the Norwegian state hospital, Rikshospitalet, before he took on a second assignment in Korea. Returning home, he first served as senior registrar at the Haukeland hospital in Bergen, before moving to Stavanger in 1956.

4. Into acute medicine

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As the lone anaesthesiologist in town, he came to work with Åsmund S. Lærdal on top of a very heavy hospital schedule. And yet, while this apparently unassuming man involved himself in a lengthy struggle with the hospital management, to improve work conditions, he also found the time to play a part in the development of the ambulance service.


During his internship in Trondheim in 1949, he had shown a pioneering interest in patient transportation, which strengthened his leaning towards acute medicine. In emergency cases, people living along the coastline and on small islands were offered transport by the Air Force with slow-moving fixed wing aeroplanes as an alternative to sea transportation in small boats. Lind compared transportation time, cost, comfort, and not least flying conditions in relation to the severity of the patients' condition [\[7\]](#). His survey addressed the main questions around the establishment of the Norwegian air ambulance, several decades later.

In 1959, Bjørn Lind took an interest in the ambulance service in Stavanger. He reviewed the records of 1596 patients brought to hospital by ambulance over a 12-month period, to see how many were in need of competent help before or during transportation, and arrived at the number of 107 patients. He also corresponded with colleagues in Sweden, Denmark and Germany, only to find that conditions were similar in these countries. This work promoted demands for trained ambulance personnel, plus sufficient space and appropriate equipment in the ambulances [\[8\]](#). His work led the health authorities to take an interest in the ambulance services, and Bjørn Lind was appointed chairman for a departmental committee on the issue. This committee submitted its recommendations in 1963. However, these recommendations were not implemented until the early 1970s.

In 1972, the Norwegian parliament decided that qualified ambulance services must be capable of reaching 90% of Norway's population within 50 min.[3](#)

By then, Bjørn Lind had continued his development in acute medicine working with Peter Safar in Pittsburgh, in 1970–1971. When it became clear in the late 1960s that Norway was about to lag behind the other Scandinavian countries in the field of anaesthesiology, Bjørn Lind was a member of a committee set up to survey the situation. Norway had no academic positions in anaesthesiology or emergency medicine, and consequently lacked focus on research and the teaching of students. Denmark had three times as many anaesthesiologists per head of population as Norway, and in Sweden, the figure was two and a half. In 1972, Ivar Lund was appointed lecturer in anaesthesiology, and the following year Jacob Stovner was appointed to Norway's first chair in anaesthesiology. Bjørn Lind was appointed a senior lecturer in anaesthesiology in 1977, in connection with medical students' training at the Aker hospital and Sentralsykehuset i Akershus, and took on a professorship in 1979. By then he had served on a committee of three to set up a general plan for anaesthesiology in Norway. The result was the first systematic study of the specialty's status and perspectives, as seen in the context of needs and developments in other fields of medicine.

5. Promoting pain treatment

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In addition to numerous articles on resuscitation and ambulance services, Bjørn Lind has contributed several studies on pharmacological themes.⁴ From 1956, he ran a small evening clinic giving treatments by various nerve blocks. This led to further studies and developments, and in 1959, he lectured at a post-graduate course on alcohol blocks for trigeminal neuralgia, a therapeutic option that Lind was the sole physician to practise in Norway at that time. He also played an important part in the introduction of epidural pain relief in Norway, and published a small book, *Hvordan behandler vi de fødende – How do we treat women giving birth?* – in 1970.


These endeavours resulted in a breakthrough; in 1966, the Norwegian association of Anaesthesiologists devoted an entire autumn meeting to pain and pain management. Inspired by Lind, and two years of training with Peter Safar in Pittsburgh, his colleague Harald Breivik was to become the pioneer of pain treatment in Norway, one of the founding members of the International Association on the Study of Pain (IASP), in 1973, and a central figure in the establishment of the Scandinavian association, SASP, three years later.

Clearly, nurturing – in numerous ways – has been a key trait in the life of Bjørn Lind. In his retirement, he still lives at Fjellhamar, close to the university hospital in Akershus where he invested 25 of his working years. And possibly, since his nurturing no longer involves daily contacts with patients, the plants in his winter garden benefit from even more generous doses than before—as is witnessed by productive vines and ebullient geraniums.

Sailing and chamber music are other passions that fill the time of this active man since his retirement.

However, Dr. Lind's passion for resuscitation keeps burning. At the age of 84, and with the exception of his three years abroad, he has missed only two Autumn Scientific Update meetings of the Norwegian Society of Anaesthesiology over the last 50 years. Stimulated by Bjørn Lind's pioneering work around 1960, Stavanger today has one of the most active EMS systems in Europe, with a particularly well-functioning chain of survival. No wonder, Bjørn Lind – who was then 83 years old – was the obvious choice as an invited lecturer for the opening session of the Scandinavian Congress of Resuscitation held in Stavanger in 2003.

Acknowledgement

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