



Obituary

Peter J. Safar



Fig. 1. Peter Safar

Peter Safar died on the 3 August, 2003. He was 79 years old. World-wide, he was known as “The Father of Modern Resuscitation”, but he was more, very much more, than that.

When he died, literally thousands of E-mails flashed up on computer screens throughout the world within hours of the event, and the global media produced tributes. Many of us had known that it was going to happen, for he had fought a valiant battle against cancer for 15 months with optimism, courage and fortitude. The ghastly reality was upon us* there would be no more Peter Safar* a man we respected, admired and, above all loved. The end of an era starkly was upon us. And yet, there will be still more Peter Safar to come, for the concepts and ideas that he was putting forward just

a few months before his death have still to be introduced into further research and clinical practice, when that happens we will all benefit. It was ever so.

His curriculum vitae runs to well over 120 pages* no embellishments* simply a list of achievements, together with an enormous list of over 1000 scientific publications.

Peter Safar was born in Vienna in 1924 into a medical family. His father, Karl, was a distinguished ophthalmologist and his mother, Vinca, an accomplished paediatrician. There was never any doubt in Peter's mind as a child that he would follow a career in medicine. However, his teenage years were clouded by the disastrous economic and political climate of the 1930s. In 1938, Austria was occupied by Nazi Germany and his parents were dismissed from their jobs because his mother was considered “Non Aryan”. Peter was sent into a labour camp in Bavaria, where he was abused mentally and physically and was destined to be drafted into the German Army. “Our generation was trapped. Active resistance was suicidal... but I was determined not to go to the front to kill and be killed”. He was saved by his initiative and his eczema which he aggravated by rubbing tuberculin cream in to the sores just before each occasion he was to have a medical examination. Eventually the authorities gave up and he achieved his ambition of starting at the medical school in Vienna in 1943. During his student years he saw the ravages of disease and starvation and the trauma of the battle of Vienna in 1945. These were to have a lasting effect on his psyche and he resolved to try to make the world a better place. He achieved this like no other.

There was one bright spot. In 1947 he met Eva. They shared similar values and a love of music and dancing* they fell in love* and married in 1950 and spent a lifetime of happiness together. Peter won a surgical scholarship to study Yale in 1949, a year after he qualified as a doctor, and went to the US, the land of opportunity and hope at the time compared with a Europe still in economic and political turmoil. A year later he returned briefly to Vienna, married Eva, and together they went to Pennsylvania with \$5 and four suitcases. There Peter embarked on a career in anaesthesiology, having been convinced that that was the speciality for him. At the time this was arguably the best

training centre in the world led by Robert Dripps, Leroy Vandam, James Eckenhoff and Julius Comroe.

Because of visa restrictions he went to Peru for a year to teach and support a very rudimentary anaesthetic service there. This was to have a profound effect and he learned that simplicity was no bar to good practice. Returning to the US he was prevented by the US immigration authorities from working in Pennsylvania but was allowed to work in Maryland and was appointed to the Johns Hopkins hospital in Baltimore as an anaesthesiology instructor. After a while he could not tolerate the stultifying medico-political atmosphere there with outmoded and uninformed surgical domination and moved to a happier environment across town to the Baltimore City Hospital. There he began his research career and soon became interested in the management of the airway in unconscious patients. He was able to demonstrate that head tilt, chin lift, and if necessary jaw thrust, would achieve a patent airway in almost all cases. A chance meeting with James Elam led to his classic study documenting expired air ventilation involving his medical and nursing colleagues in Baltimore. They had such trust in Safar that they agreed to be sedated and pharmacologically paralysed and subjected themselves to a comparison of expired air versus a manual method (the Holger Nielsen) of ventilation. No one came to any harm and the case for expired air ventilation was made convincingly.

Across town at Johns Hopkins, William Kouwenhoven during his study of defibrillation had, almost by chance, discovered that external chest compressions could produce a passable artificial circulation in cardiac arrest in animals. Together with Guy Knickerbocker and James Jude, they were able to demonstrate that this could be reproduced in humans. Safar put the two discoveries together to form the ABC of resuscitation, or CPR as it came to be known, which has stood us in good stead for 45 years. The concept and technique was readily accepted and introduced around the world and was married up to defibrillation which had been recently re-introduced by Beck, Kouwenhoven and Zoll and was to be further developed by Lown and Pantridge.

Safar was fortunate that at this time he met Asmund Laerdal, a toymaker from Stavanger in Norway. A lasting friendship and collaboration was to develop, born of a mutual and philanthropic desire to help their fellow human being and a flare for innovation and invention. With significant contributions from Norwegian anaesthesiologist Bjorn Lind manikins for teaching the new CPR technique, impossible in the clinical environment, were designed and tested. Resusci Anne arrived, a stroke of genius, which has allowed resuscitation to be taught in every country of the world.

Ever looking forward, and aware of the work of Bjorn Ibsen in Denmark during the poliomyelitis outbreak there, Safar turned his attention to the longer term

application of ventilation and circulation support with the aim of improving cerebral function during critical illness and injury. This was to dominate his professional career for the next 40 years. Moving to the University of Pittsburgh to take up the Chair of the Department of Anaesthesiology in 1961, he built upon his experience in Baltimore and developed an intensive care unit with multidisciplinary participation and training, probably the first of its kind in the US.

Realising that professional pre-hospital care was vital to bridge the gap between bystander CPR and hospital intensive care he set about creating one of the early paramedic services in the US. But he did not do it the easy way. Ever concerned about the underprivileged, and against phenomenal resistance, he selected unemployed black people from an inner city ghetto and, together with Nancy Caroline, trained them to be paramedics. The pilot project, sponsored by the Falk Foundation, was called the Freedom House Ambulance Service. As with most things he did, his tenacity and example prevailed against the odds and that some aspects of this service continues today under the control of the Pittsburgh City authorities.

Tragedy struck in 1966, when his beloved daughter, Elizabeth, always a frail child, died in status asthmaticus, aged 12 years. Her death inspired Peter to develop research into intensive care and cerebral resuscitation, and encourage organ donation, then in its infancy. Together with Ake Grenvik, he came up with guidelines for brain death which were used by the US Presidential Commission and the Harvard University group.

On the international stage, he was commissioned by the World Federation of Societies of Anaesthesiologists to write a CPR instructor manual in 1968, which blossomed into a booklet in 1982, and a landmark textbook, co-authored by Nicholas Bircher in 1988. In this venture he received substantial help, as always, from Asmund Laerdal. He continued his research into augmenting the meagre blood flow achieved by chest compressions and methods of reversing the dying process, whether this was caused by asphyxia, primary cardiac arrest, exsanguination or pulmonary failure. At this stage he became involved with Negovsky in Moscow and they collaborated on research projects together and he was able to confirm some of the remarkable results that had been achieved in Russia, but which had not been recognised because they had not been published in the western journals. He was almost unique in collaborating with scientists behind the "Iron Curtain" at this time.

In 1979, after much reflection, he decided to relinquish his executive position with the University to devote his academic life completely to research. He founded the International Resuscitation Research Centre at 3434 Fifth Avenue, Pittsburgh on the site of an old coffin (casket) factory. Peter quipped that it was a move

from “resurrection to resuscitation”. His work output there was prodigious and concentrated primarily on brain metabolism and protection during and after cardiac arrest. He and his group studied the effects of hypertensive fluid therapy, cardiopulmonary bypass, barbiturates, calcium channel blockers and, perhaps most significantly, hypothermia on brain recovery. He just lived to see moderate hypothermia recommended after cardiac arrest.

Throughout his life, he had a profound interest in disaster reanimatology, perhaps stimulated by his experience between 1939 and 1945, but more likely arising from his innate love for his fellow man. He had a horror of the carnage that could be produced by both natural and man-made disasters. A founding member of the Club of Mainz with Rudolf Frey in 1976, he studied injuries arising from earthquakes in Peru, Italy and Armenia. Together with Miroslav Klain and Ernesto Pretto, he was able to show that simple first aid provided by uninjured co-victims had considerable life saving potential* probably more than advanced trauma life support. He was elected President of the Club of Mainz, after the tragic death of Rudolf Frey, and has always supported that organisation, now the World Association for Disaster and Emergency Medicine. He was the Editor of the Club’s first journal later to become the Journal of WADEM and subsequently Prehospital and Disaster Medicine under the continuing editorship of Marvin Birnbaum in Madison, WI.

Always a pacifist at heart, and a leading member of the International Physicians for the Prevention of Nuclear War, he nevertheless enjoyed cordial relationships (and research support) from the military. He was instrumental in urging the military to divert at least some of their efforts towards humanitarian aid and care of the injured in major disasters.

In 1994 he “retired” from the directorship of the International Resuscitation Research Centre and handed over control to his friend and colleague, Pat Kochanek, who renamed the institution the “Safar Centre for Resuscitation Research” to mark the contribution that not only Peter, but also his beloved wife Eva had made. In 1988 the Chair of Anaesthesia and Critical Care at the University of Pittsburgh was also named after Peter and Eva.

Peter Safar is a household name throughout the world, not just because of his personal discoveries and research but also because of his inspiration and practical help to friends and colleagues everywhere. We can be grateful that many of the details of his quite remarkable life have been recorded in his autobiography published by the Wood Museum-Library of Anesthesiology. He has been honoured frequently, by many institutions in

the US, and by the universities of Mainz, Magdeburg, Campinas, and Vienna. He is an Honorary Member of the European Resuscitation Council, an organisation he has supported since its outset, and was Consulting Editor and frequent contributor for this journal. The European Resuscitation Council Board, Executive Committee, the Editors and Publishers of Resuscitation, and the entire membership of the ERC will mourn his loss.

Above all Peter was a humanist, a romantic and a man of culture. This was shared, and indeed inspired by Eva, his wife of 53 years. He loved art in all of its forms, be it sculpture, painting or music. He was an accomplished pianist and was enthralled by the works of two Austrian composers, Gustav Mahler and Anton Bruckner. He was a skilled ballroom dancer and the sight of him dancing the waltz with Eva in his native Vienna will live with me always. Eva has been a beautiful person at every stage of her life.

He had many, many friends all of whom adored him. He was just so kind and thoughtful. Tore Laerdal told me how he supported and encouraged him when his father Asmund died 22 years ago. He was always one to support the vigour and passion of youth and his friendship endured for ever. “He sent me a message on my birthday* and on my father’s birthday* during every one of those 22 years”.

A moving service for family and close friends was held in Pittsburgh on August the 9th. It was orchestrated by Peter and Eva’s son Philip, with brother Paul playing his own music, and Peter’s close friend Chuck Brindis playing music by Gustav Mahler. Family members read poems and Ake Grenvik, Pat Kochanek and Tore Laerdal gave personal testimonies. The ceremony continued at a country club in the spirit of celebration of a very special life.

We will always remember those eyes that sparkled with friendship that is beyond words. . . .

Peter Baskett (on behalf of the Board of the ERC)

Further reading

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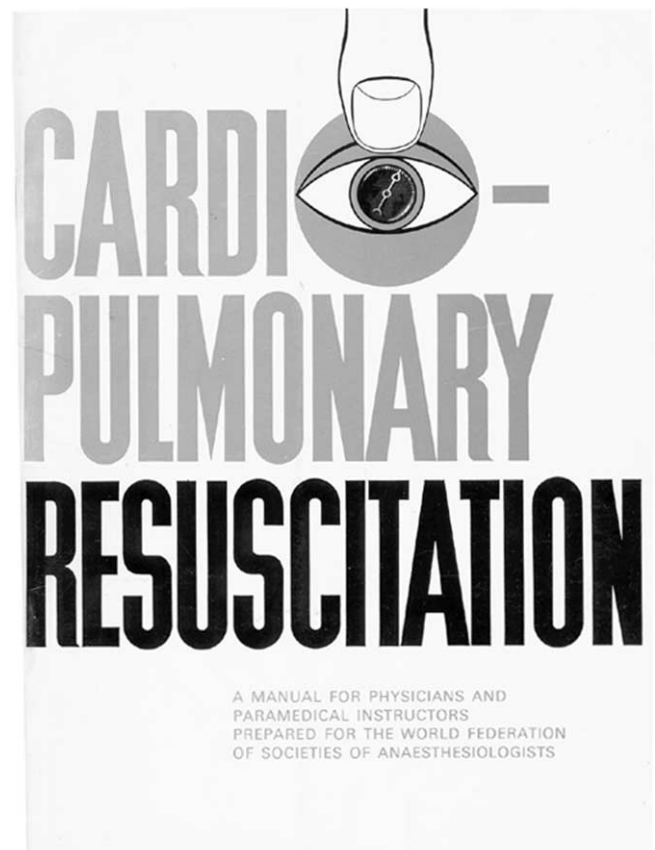
In the field of resuscitation, with the help and inspiration of Asmund Laerdal and Bjorn Lind [3], Safar, Winchell and Berkebille in 1964 [4] studied the acquisition of basic life support skills on a manikin developed by Laerdal* Resusci Anne. This potentially opened the door for citizen CPR which had been advocated by Claude Beck in Ohio. Sadly the American Heart Association refused to endorse citizen CPR training at that time. It was not until the early 1970s that that organisation responded positively and then with a rather detailed and rigid training programme that could only be reached by relatively few people. Only recently has it been realised that the simplicity in training such as advocated by Safar using a basic manikin and flip chart yields the best results [5–7].

On the international stage however, things were moving on. The World Federation of Societies of Anaesthesiology through its CPR committee commissioned Safar to write a CPR instructor manual in 1968 which blossomed into a booklet in 1982, both published by Laerdal in Stavanger. It became a landmark comprehensive text book on Cardiopulmonary Cerebral Resuscitation coauthored by Nicholas Bircher in 1988

[8]. I had the honour to be Chairman of the committee at that time (Figs. 2 and 3).

Despite the enormous clinical and teaching activity time was found for basic scientific research. By his own admission Safar had a naïve attitude towards funding of ‘get it started and later look for the money to finish it’ [9] that somehow worked. Blood flow studies during CPR were difficult in the early days [10,11] as Safar sought to enhance the meagre output produced by standard chest compressions. Gradually his research moved increasingly towards investigating the potential reversibility of the dying process whether this was caused by asphyxia, primary cardiac arrest, exsanguination or pulmonary failure. At this stage he became involved with Negovsky of Moscow and reproduced and confirmed some of his experimental work on exsanguination cardiac arrest [12,13]. He was almost unique in cooperating with scientists behind the ‘Iron Curtain’ at this time.

Safar’s early foray into cerebral resuscitation on ‘brains too good to die’ involved Bjorn Lind, on sabbatical from Stavanger in 1970–1971. Together with Jim Snyder, they were among the first to study cerebral blood flow and metabolism after prolonged cardiac arrest [14]. They demonstrated the transient cerebral hyperaemia followed by protracted hypoperfusion. The efforts of Safar, and many others have been



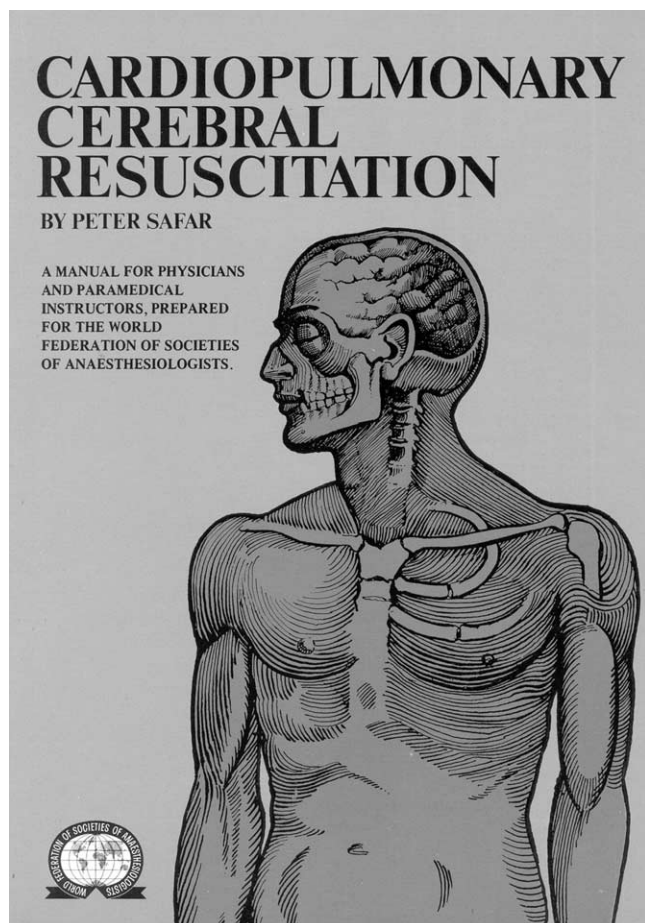


Fig. 3. The third edition of the WFSA CPR manual.

concentrated on overcoming this viscous and destructive sequence.

In 1978, after much reflection Peter decided to relinquish the Chairmanship of the Academic department at the University of Pittsburgh to concentrate on research. His position at the university was filled by Peter Winter in 1979. To mark his enormous achievement for the University of Pittsburgh he was appointed Distinguished Professor of Resuscitation Medicine* a rare honour.

In 1979 Safar, decided to found the International Resuscitation Research Centre (IRRC) at 3434 Fifth Avenue, Pittsburgh. To take this remarkable step into the dark required an enormous amount of courage and dedication. The Centre was housed on the site of an old coffin (casket) factory. Peter quipped that it was a move 'from resurrection to resuscitation'. He obtained priming funding from the Pennsylvania Department of Health and the Rippell Foundation and ongoing running costs from the University at Pittsburgh, the National Institute of Health (NIH) and the Laerdal Foundation. His research there has mainly centered around brain resuscitation. Starting with a monkey (caught in the wild) model, Safar and Gisvold changed

to custom-bred dogs. "I felt that even the food chain cannot justify shortening the lives of animals so close to us ... shortening the lives of custom bred dogs seemed easier to justify ... the reasoning was that, without research, these dogs would not exist" [15]. Large rooms, not cages, were used for holding the animals and I got the impression when I visited the centre that concern for the animals welfare was high on Safar's list of priorities.

The output of scientific papers from the IRRC has been phenomenal, too many to cite here. They included studies of brain metabolism and the influence of hypertensive fluid infusion, cardiopulmonary bypass, barbiturates and calcium channel blockers on brain recovery after cardiac arrest. All of these investigations showed great promise but, sadly, the goal of proven significantly improved outcome has, so far, eluded the researchers. But the background scientific knowledge that has been acquired forms a rock solid foundation for future research that will probably prove successful.

Safar has been interested in the protective and therapeutic effects of induced hypothermia since the 1960s [16] and carried out further enlightening studies in the 1980s [17–19]. The process of inducing moderate hypothermia after cardiac arrest to improve cerebral outcome has always shown promise but the practicalities of producing rapid cooling in the clinical situation had proved difficult. Only now (2000–2002) has the technique returned to the realm of clinical possibility [20,21] and it is likely that the induction of moderate hypothermia will find its way into the official guidelines for post resuscitation care in the near future. With Sam Tisherman and Pat Kochanek, Safar continues to lead investigations into brain protection during cardiac arrest after trauma using profound hypothermia induced rapidly by cold saline infused via an intraaortic balloon catheter. The project has attracted substantial grant funding from the US military.

Safar has always had a strong leaning towards disaster medicine. Perhaps influenced by his experiences between 1939 and 1945, but more likely driven by his love and feeling for his fellow man, his horror of the carnage arising from 'natural' and 'man made' disasters has been channeled into studies of disaster reanimatology. A founder member of the Club of Mainz with Rudolf Frey in 1976, he had studied injuries after earthquakes in Peru [22], Italy [23], and Armenia [24–26]. He and his colleagues, particularly Miroslav Klein and Ernesto Pretto, were able to show that simple first aid by uninjured co-victims had a strong life saving potential* probably more than advanced trauma life support. The Club of Mainz ran, as its successor the World Association for Disaster and Emergency Medicine (WADEM) still runs, biannual congresses. Safar hosted the 1981 congress in Pittsburgh, and during my time as Honorary Secretary of the Association and his Presidency created the journal Disaster Medicine in

1983. This was later to become the Journal of WADEM in 1985 and subsequently Prehospital and Disaster Medicine under the continuing editorship of Marvin Birnbaum in Madison, Wisconsin.

Despite cordial (and research) relationships with the military throughout his career Safar is a pacifist at heart and was a leading member of the International Physicians for the Prevention of Nuclear War (IPPNW). This group encouraged a reduction in nuclear arms (that has now been achieved to some extent) and Safar urged the military to divert some of their efforts, at least, towards assistance with non military mass disasters.

In 1994 Safar (then aged 70) retired from the leadership role at the IRRC and handed over the reins to Pat Kochanek, his collaborator for many years. To mark the occasion Pat Kochanek renamed the institution the 'Safar Centre for Resuscitation Research' to highlight the contribution that both Peter, and his beloved wife of over 50 years, Eva, had made. Safar continues to work productively in the centre. Peter Winter gave up the Chairmanship of the University Department in 1996 and was succeeded by Leonard Firestone as the "Peter and Eva Safar Chairman of Anesthesiology and Critical Care Medicine". In 2002 this position was assumed by John Williams. Safar is less than impressed with modern management involvement in medicine in the United States. He calls it "mismanaged care for managed profit by non professional middlemen" [27].

Peter Safar is a world renowned figure not just because of his personal research and discoveries, but also because of his inspiration and practical help to colleagues and friends throughout the length and breadth of the world. There are few places that he has not visited, there are few places where he has not been honoured. He fostered professional and friendly relations with colleagues in many countries behind the 'Iron Curtain' during the Cold War when it was difficult and unfashionable to do so. He visited Vietnam before the catastrophic war there and, sadly to no avail, advocated peace and cooperation with Ho Chi Minh [28]. He has been influential and hugely supportive in Latin America, the Orient and Africa. He has been a regular and sought after speaker in Australasia and in virtually every country in Western Europe (Fig. 4).

He has published over 1000 scientific papers and is still active at his beloved Safar Center for Resuscitation Research.

Few people have packed more into their life than Peter Safar* the family man, the lover of music and the arts, the inspired creator of ideas, the courageous exposé of the false and the bogus, the great lover of his fellow human beings. I have wonderful personal memories of his boundless energy and enthusiasm, of his simple but capacious plastic shoulder bag packed with an impossible amount of paper, his Viennese accent that never changed in over 50 years of life spent in the United



Fig. 4. Peter Safar in his office at the Safar Centre for Resuscitation

States, his exuberant dancing with Eva to a Strauss waltz in Vienna, and above all, his eyes twinkling with friendship that is beyond words.

Acknowledgements

Many of the facts recounted in this article has been gleaned from Peter Safar's Autobiographical Memoir in the series *Careers in Anesthesiology*, Volume V, published by the Wood Library Museum of Anesthesiology in 2000 and from citations written in relation to his Honorary Degree in Magdeburg, his award of the Austrian Cross of Honour in Vienna, and his election to Honorary membership of the European Resuscitation Council. Aside from those books and documents, Peter has given me a copy of his 120 page Curriculum Vitae and I have had the pleasure of spending many hours with him over the past quarter of a century. I would also like to acknowledge the help given to me by Ake Grenvik, John Zorab and Tore Laerdal with details for the final manuscript.

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