**History of Israel Neonatology and its pioneer physicians in Israel**

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**Abstract**
**Objective**: to explore the circumstances that contributed to the development of neonatology and neonatal units in Israel, and to recognize the key figures who played an essential role in these advancements.

**Methods**: This qualitative study involves in-depth, semi-structured interviews with a purposively selected group of participants, including Pediatrics, NICU managers, managers in the Israel neonatal society, and policymakers from Israel's Health Department. Interviews were conducted in a free narrative setting to encourage open sharing of personal experiences and opinions, with all sessions audio-recorded and transcribed verbatim for accuracy. Thematic analysis was applied to the transcripts to identify recurring patterns and themes, providing an in-depth understanding of participant views. Additionally, text analysis of policy documents and guidelines from Israel's Ministry of Health and other relevant organizations were conducted using content analysis to complement and broaden the insights obtained from interviews. The study adheres to strict ethical standards, including obtaining informed consent and maintaining participant confidentiality.

Introduction:
In the late 1970s, a premature baby girl weighing only 560 grams and small for her gestational age (SGA) was born at Soroka Hospital in Beer Sheva. At the time, the Blood Bank lacked modern pathogen screening, and neonatal care for such small infants was limited. During that same period, the head of the neonatal department, Prof. Michael Karplus[[1]](#footnote-1), was away on a medical mission to Africa, leaving Prof. Asher Tal[[2]](#footnote-2), head of one of Soroka's pediatric departments, to temporarily manage the neonatal unit.

The baby was placed in a separate room, as infants born at such low weights were often given minimal treatment, if any. Fortunately, despite her size, the baby did not display signs of respiratory distress and, apart from anemia, was in relatively good condition. However, she had a rare blood type—A negative—making it difficult to find a suitable donor. By chance, Prof. Tal, the temporary manager of the unit, also had A negative blood. Every other day, Prof. Tal personally donated 20 ccs of his own blood directly into the baby’s circulatory system. Thanks to this remarkable dedication, the infant thrived and was discharged from Soroka’s neonatal unit a few months later, growing up to lead a normal, healthy life.

This story illustrates how medicine adapts to the tools available in pursuit of its fundamental goal—healing. While such a practice would not meet today’s medical standards due to the immense advancements in neonatal care over recent decades, it highlights the significant progress made in the field. This paper aims to explore the circumstances that contributed to the development of neonatology and neonatal units in Israel, and to recognize the key figures who played an essential role in these advancements.

The establishment of Israel's first neonatal unit in the mid-1970s marked a pivotal moment in the development of neonatology in the country. By 2024, the field has expanded to 27 units integrated into nearly every hospital nationwide. This development signified the end of an era where neonatal care often took place outside of hospitals, lacking standard guidelines or regulation. While neonatal care became a routine aspect of medical practice in many hospitals, it was not until 1993 that the Ministry of Health introduced separate funding models specifically for neonates.

Early Neonatology in Israel

The first mention of modern neonatal care in Israeli medical literature appeared on March 3, 1955, in the daily newspaper Davar ("דבר"). The article announced the upcoming opening of a new care center for infants in Jerusalem, scheduled for May 5, 1955. This center was to include 360 beds for babies, 30 of which were designated for neonates, and it would feature newly introduced incubators—devices that provide a stable environment for premature newborns, first invented in 1857 by French physician Jean-Louis-Paul Denucé. The facility was established by the Women's International Zionist Organization (WIZO), a volunteer organization focused on social welfare, the advancement of women, and Jewish education in Israel and globally. Although the article did not provide reasons for the creation of the facility, it marked the first recorded reference to modern neonatal care using incubators in Israeli print media. However, the formal establishment of neonatal units in Israeli hospitals did not take place until the mid-1970s.

Before this period, neonatal care in Israel primarily focused on heat regulation, nutrition, jaundice management, and oxygen supplementation. At the time, childbirth took place in maternity hospitals rather than general hospitals, as is common today, limiting access to medical experts. Even after the hospitalization and medicalization of the labor process, neonates were not treated in-house at the hospitals. Instead, they were transported to centers like those operated by the WIZO organization, which offered very limited treatment options.

Dr. Agneta Golan [[3]](#footnote-3), a leading neonatologist at Soroka Medical Center in Beer Sheva and a specialist on neonatal brain ultrasonography, noted that unlike internal medicine, which was divided into specialties like gastroenterology or neurology, pediatric medicine was initially practiced by general pediatricians. She remarked, “It took a few years until it was understood that caring for newborn neonates required distinct considerations from typical pediatric care, and that it deserved its own specialty”[1]. This recognition came only after persistent efforts to distinguish neonatal care as a specialized field. Previously, pediatric fellowships were conducted through broad internal medicine training rather than focused pediatric training. The establishment of the neonatology specialty required convincing the Scientific Associations Department of the Israeli Medical Association (IMA)[[4]](#footnote-4), a professional organization for physicians in Israel which oversees medical training, to acknowledge and formalize this distinct field. The introduction of specialized neonatal care in Israel was led by professionals who had received training abroad, particularly in countries like England, the United States, and Canada, bringing new medical practices to the country.

To trace the development of neonatal care in Israeli hospitals and to capture the personal stories of key pioneers in the field, we have chosen to focus on the experiences of several significant NICUs across the country. These units were selected to represent diverse geographic regions of Israel and include prominent centers whose founders are still living and able to share their firsthand accounts.

WIZO Institution and Care for Mother and Newborn – out of hospital care center

The “WIZO Institution and Care for Mother and Newborn” was one of the largest baby care centers in Israel before labor and neonatal care were fully integrated into hospitals. Located at 30 Shlomo Ibn Gabirol Street in Tel Aviv, the center also operated as a nursing school. The institution was led by Dr. Israel Levy, a pioneer in early neonatal care in Israel and the author of the first Hebrew medical book on neonatology, הפג – התפתחותו והטיפול בו עד גיל שנה (“The Neonate – Development and Treatment Until the Age of One Year”). Born in Bulgaria in 1925, Dr. Levy survived forced labor camps during the Holocaust. After World War II, he pursued medical studies in Sofia, graduating in 1950. Following his emigration to Israel, he trained at Rambam Hospital in Haifa and worked as a senior physician at Kaplan Medical Center in Rehovot until 1957, when he became the head of neonatal care at the WIZO center, a position he held for over 20 years.
During its years of operation, the WIZO center received infants from various hospitals across Israel, including those from central and southern regions such as Soroka Hospital. A letter from Dr. Levy to Dr. Stern, director of Soroka Hospital, dated April 30, 1973, reveals that the WIZO institute had been admitting neonates from Soroka due to delays in the opening of the Soroka NICU. However, due to the high demand for beds at WIZO, Dr. Levy stated that as of July 1973, they would no longer accept patients from Soroka. This decision highlights a shift towards hospital-based neonatal care, a movement that WIZO itself appeared to be encouraging by limiting the acceptance of neonates from other institutions, likely to promote the development of in-hospital neonatal units.
This transition also had an impact on patient outcomes. The WIZO center began selectively admitting more critically ill neonates, which contributed to a rise in mortality rates, from 16.4% in 1972 to 21.8% in 1973. Another example of this shift can be seen in a letter from Dr. Levy to Dr. Robert Haimov, director of Hillel Yaffe Medical Center in Hadera, dated April 30, 1972, in which Dr. Levy declined to accept approximately 100 neonates annually from their hospital due to overcapacity.
These correspondences illustrate a period in Israeli neonatal care when hospitals were reluctant to manage neonates, likely due to the high costs and intensive care required. Neonates were not yet fully regarded as equal patients within the broader medical system. Consequently, care operated on a regional basis, driven more by hospital incentives and less by centralized planning from the Ministry of Health.
Despite limited resources, equipment, and research, out-of-hospital centers like WIZO provided humane and dedicated care for neonates. A report from WIZO summarizing their work during the 1973 Yom Kippur War offers a glimpse into the challenges they faced. The sudden outbreak of war caught the institution off-guard, and many staff members were urgently called to military service. With a reduced workforce, they had to move the neonatal department to underground shelters. Nurses had to carry multiple babies at once during the transfer, and the shortage of personnel led to an appeal for volunteers. People from diverse backgrounds—students, university staff, and civilians—were quickly trained by nurses to assist with tasks such as administrative duties, distributing medications under supervision, and even sewing clothes for the babies in preparation for the winter.

This historical account of WIZO underscores the resilience and dedication of neonatal caregivers in a time when neonatal care was still developing, while also reflecting the early stages of Israel's evolving approach to neonatology.

Hadassah Mt. Scopus in Jerusalem

 One of Israel's first Neonatal Intensive Care Unit (NICU) established at Hadassah Mt. Scopus Hospital in Jerusalem (founded in 1976). The unit was founded by Professor Eyal G. Fabien, who had trained in Memphis, USA. Despite his expertise, Fabian faced considerable obstacles, not least from within the hospital system, due to the high costs and relatively low financial returns of neonatal care.
At that time, Israel had 28 hospitals, some of which offered obstetric services. However, the majority of births still took place in women’s obstetric centers outside the hospitals, meaning that many neonates did not receive hospital-based medical treatment.

The opportunity for change came with the appointment of Prof. Simon Godfrey, a world specialist in pediatric pulmonary diseases from England, as the new head of the children's department at Hadassah Mt. Scopus in Jerusalem (dates). Fabian persuaded Godfrey to establish Jerusalem's first NICU. Prof. Godfrey’s reputation made it difficult for Hadassah's directing administration to refuse and included this in order to entice him to come from England and direct this new department of pediatrics. So, they also secured funding for a neonatal ambulance, a dedicated ambulance for neonatal patients a concept that was known worldwide for a few decades by then[2], enabling the transport of newborns in need of intensive care from across the region like Ramallah, west bank, and even nationally. However, this progress was hindered by internal conflicts, mainly stemming from the prevailing hospital funding system. Hospital funding were allocated by the national social welfare[[5]](#footnote-5) based on the number of births[[6]](#footnote-6), not considering the complexity or intensity of care required. This system offered little financial motivation for hospitals to invest in advanced neonatal or intensive care, leading to a general neglect of the field.

Consequently, after a few years, the NICU at Hadassah Mt. Scopus faced restrictions on transferring neonates from other hospitals. The neonatal ambulance, managed by the children's department, continued to operate for a while. However, this service too was eventually curtailed due to limitations in nursing staff, reflecting the broader challenges and financial disincentives hospitals faced in supporting advanced neonatal care.[3]

Soroka hospital in Beer Sheva

The neonatal unit in southern Israel, at Soroka Hospital in Beer Sheva, was established by Prof. Michael Karplus, who received his education in England at the universities of Liverpool and Manchester. His training included working under Prof. Edward Osmund Royle Reynolds, a pioneer in neonatal mechanical ventilation. During the Yom Kippur War in 1973, Prof. Karplus coincidentally met Dr. Yaron Cohen, an immunologist from the Weizmann Institute of Science. Dr. Cohen was involved in establishing the new medical faculty at Ben Gurion University alongside Prof. Moshe Prywes. This fortuitous meeting inspired Prof. Karplus to apply his training and establish a neonatal unit at Soroka Medical Center, which would be affiliated with the Ben Gurion University School of Medicine.

Initially, the neonatal unit allocated to Prof. Karplus consisted of only one room, resembling a long corridor, with a nursing unit at the front desk. Neonates were arranged in a sequence from one to nine, with the first position always reserved for the most intensive cases. The modular design allowed for reordering with each new admission. However, the unit faced significant challenges in its early years, particularly in neonatal ventilation due to the lack of essential equipment, such as respirators. "Every piece of new equipment was the result of a long struggle," Prof. Karplus explained, reflecting the financial constraints of the time, as neonatology was not a financially lucrative field for hospitals.[1]

During a visit to Canada, Prof. Karplus managed to secure donations for new oximeters for the unit. To ensure the equipment could be imported, he had to plan a research project to convince customs officials to allow the importation.

Another major challenge was forming an experienced team, as the existing staff had no prior experience in neonatal care. Prof. Karplus was the sole doctor in the unit, but he needed a well-trained nursing staff. He asked for volunteers among the nurses to join the pioneering team, and those who volunteered were sent to a hospital in a different region for two months of training. Most of the new nursing staff were practical nurses, but the head nurse was always a registered nurse. Many of these nurses continued to work in the unit until retirement, eventually extending their training to become registered nurses.

More than a decade after the unit's inception, it became clear that the allocated room was insufficient to accommodate all the neonates. Consequently, the hospital began planning a new space to expand the unit. To ensure the new unit was properly designed, Prof. Karplus traveled to the United States to visit ten leading neonatology centers, gathering knowledge and insights to establish a brand-new neonatal unit at Soroka.

Saint Vincent De Paul French Hospital in Nazareth

In Nazareth, a biblical city in northern Israel there has been three different hospitals but not one neonatal unit. That is why before the establishment of a neonatal care facility at the Saint Vincent De Paul French Hospital in Nazareth, it was often necessary to manually ventilate neonates for 4-5 hours until a nearby hospital with a neonatal department could be found. Dr. Jamalia Jeryes, who completed his pediatric training in the early 1980s, recounts that none of the three private hospitals in Nazareth were willing to establish a neonatal care unit due to the associated financial burdens. Each institution presumably hoped that the others would assume the responsibility for neonatal care. At that time, the Saint Vincent De Paul French Hospital had a monthly birth rate of approximately 120 births. However, collaboration with the obstetrics department improved obstetric care, attracting more births to the hospital.

Dr. Jeryes was tasked with the care of neonates and sought additional experience at a nearby hospital to enhance neonatal care. Despite his efforts, it was only after a change in hospital management that he successfully convinced the new administration to establish a neonatal intensive care unit (NICU). Initially, the NICU comprised just three beds, but it expanded as birth rates increased. Currently, the NICU includes 10 beds. Dr. Jeryes describes the initial setup:

“We started with a small thing when we set up the preemie unit; we didn’t have a dedicated unit at first. We used a baby room, added a respirator and basic equipment, and gradually developed it into a

 comprehensive prematurity care unit.”

When asked how a young pediatric physician managed to establish a new NICU, Dr. Jeryes explained that he consulted extensively with other medical professionals. One notable consultant was a nun with significant experience in a neonatology unit at a French hospital in Bethlehem, whose expertise was instrumental in developing the new unit. Notably, it was only after neonatology was formally recognized as a medical specialty in Israel that Dr. Jeryes had to complete his formal training and obtain his degree in the field. Significantly, it was only after establishing his own neonatal care unit that Dr. Jeryes was required to complete his formal training and obtain his degree in neonatology, ensuring the continued growth and development of neonatal care at the hospital that was formally accepted by the Israeli Ministry of Health (IMA) in the late 1980s.[4]

Meir Medical Center in Kfar Saba

Prof. Tzipora Dolphin, MD, began her career in neonatology at Kaplan Hospital, working under Professor Mario B. Mogilner[[7]](#footnote-7), a pioneer in the field who received his medical trained in Argentina. Reflecting on her early work, she moved to Shamir Medical Center[[8]](#footnote-8) in the early 1980s and later pursued a fellowship at Sick Children Hospital in Toronto.

In 1988, Dr. Shlomi Antebi[[9]](#footnote-9), the new director of Meir Hospital, invited Professor Dolphin to set up a new NICU. At that time, the hospital lacked the necessary equipment and planning. Another pioneer in Israeli neonatology, Prof. Simon Godfrey[[10]](#footnote-10), advised against it, fearing high infant mortality in the new unit.

Despite these concerns, Professor Dolphin decided to take on the challenge. She relied heavily on her extensive knowledge and experience from various neonatal units around the world. There was no collaboration with other hospital departments during the initial setup. The NICU started in 1988 as a single room within the infant department, equipped with just three monitors. She faced major challenges, especially a shortage of qualified medical and nursing staff, prompting her to urgently recruit nurses.

Another significant challenge was the lack of equipment and funding. Unexpected help came from a lawyer friend who helped her establish an external foundation for the hospital. This foundation was crucial because donations to the hospital often didn't fully reach the NICU. The foundation ensured that contributions were used specifically for the unit, helping it become one of the best-equipped in the country. It also funded professional training for the staff, both locally and internationally.

The foundation raised funds through events and connections Professor Dolphin made over the years, as well as individuals specifically interested in supporting the NICU. The hospital administration reportedly did not support the idea of a separate foundation.

One significant result of the staff training was that the NICU became a national leader in the Newborn Individualized Developmental Care and Assessment Program (NIDCAP). This innovative, research-backed approach aimed to reduce stress for premature infants, influencing the NICU's design, caregiving practices, and providing a supportive environment for families.

Over time, the NICU was recognized as the national center for developmental care, offering training and seminars in the field. However, there were ongoing challenges with hospital management, such as recognizing one of the nurses as a doctor in developmental care. Another outcome of the staff training was participation in international neonatology conferences. Professor Dolphin attended these conferences to stay updated on new advancements and identify outdated practices that could be replaced with better, modern care.

Professor Dolphin also established the first cohort of Nurse Practitioners in Israel, supported by the Ministry of Health. However, there are no official positions for Nurse Practitioners, as the Ministry does not fund these roles. Consequently, nurses who complete the course must secure a position themselves or remain in standard nursing roles, unable to practice in the advanced capacity for which they were trained.

Professor Dolphin stresses that without enough doctors specializing in neonatology, the lack of competition will result in inadequately trained individuals managing NICUs. She highlights the importance of international fellowships as a crucial step in the professional development of neonatologists. [5]

The Israel Neonatal Society

The initial efforts in neonatal care led to the formation of the Israeli Association for Neonatology (IAN) in 1984, marking a significant milestone in the evolution of neonatal care in Israel. Prof. Josef Stern (1913-1992), the first medical director of Soroka Medical Center, humorously remarked to the neonatal unit that before their establishment, there weren't any problems with neonates. This statement highlights the environment in which the field of neonatology developed, where the needs and voices of neonates were largely unheard and unaddressed. Established under the auspices of the IMA, the association aimed to be the voice of neonates. It sought to facilitate knowledge sharing among physicians from various hospitals, connect Israeli neonatal physicians with international counterparts, and bring foreign experts to Israel for specialized training instead of sending representatives abroad. Additionally, the association sought to gain financial leverage over medical companies and pharmaceutical firms.

As the association matured, it began to advocate for the status of neonates, engaging in political activities and collaborating with the Israeli health department to advance the field of neonatology. These efforts aimed to create a supportive system that would benefit those investing in neonatal care, thereby significantly boosting the development and recognition of neonatology in Israel. Historically, the Israeli healthcare system's approach to neonatal care was entrenched in an outdated perspective that regarded newborns as less than fully-fledged patients. This view was manifest in the funding model, where both neonates requiring intensive, prolonged care and healthy newborns needing minimal intervention received the same level of resources. In the early 1990s, this inequity was addressed by the neonatal association, led by Prof. Ehud Zmora[[11]](#footnote-11) a former head of the IAN and former head of the NICU at Soroka Medical Center. The association worked with the Ministry of Health to standardize care across neonatal units nationwide. In 1994, they developed a document known as the "Boikes Committee" report named after the head of the committee Prof. Haim Boikes, an Israeli pediatric who served as the Dean of the medical school in Tel-Aviv University (TAU) between 1983 and 1988 [[12]](#footnote-12). Unfortunately, this report was never published, nor were its recommendations funded or implemented. Understanding the necessity to enhance neonatal care, the association recognized that gathering comprehensive data on neonatal outcomes was crucial. They advocated vigorously for these vulnerable patients, emphasizing that the absence of this essential data was a significant barrier to effective advocacy and the improvement of treatment standards.

Prof. Brian Reichman[[13]](#footnote-13), a specialist in neonatology and the general director at The Edmond and Lily Safra Children’s Hospital, along with other neonatal experts, initiated a nationwide survey focused on the treatment outcomes for preterm infants. This survey aimed to gather extensive data from neonatal units, including the number of infants treated, their survival rates, and other critical indicators. It was understood that providing neonatologists with such data was essential not only for evaluating the practices and outcomes across various departments but also for aiding the Ministry of Health. More importantly, it reinforced the campaign to recognize preterm infants as legitimate patients deserving of fair compensation, positing that appropriate financial reimbursement would incentivize hospitals to continually enhance and properly equip their neonatal units.

The impact of these efforts became increasingly recognized within the healthcare system. In 1993, following their persistent advocacy, the Israeli neonatology association (INA) was invited to become a member of the National Council newly established by the Ministry of Health. Initially focused on gynecology and genetics, the council soon expanded to include neonatology, reflecting its growing importance. At the inaugural assembly of the national council in late 1993, the need for a centralized neonatal database was articulated, envisioned as a critical tool for the promotion, enhancement, and progression of neonatal care.

Subsequently, a subcommittee was formed to oversee this initiative, and its recommendations were forwarded to the Ministry of Health in 1994. This groundwork throughout 1994 culminated in the establishment of the database in 1995, under an agreement that data on individual units would remain confidential, accessible internally for developmental purposes. This database not only served the units directly involved but also provided valuable data for the Committees of the Israeli Knesset and the Israeli State Comptroller, who utilized this resource for generating reports and crafting health policy. The database effectively bridged the informational gap that had previously hindered neonatal care advocacy and policy development.

The database initially contained extensive details: operational practices, current standings in neonatal mortality and morbidity, and the incidence of infections, with data pertaining to the neonatal units themselves. This allowed department heads to introspect and drive improvements if, for example, an unusually high number of infants with necrotizing enterocolitis were observed. The prevailing theory was that departments with significant incidences of conditions such as retinopathy would be motivated to seek improvements, armed with actionable data to guide enhancements, embodying the principle, “If you can’t measure it, you can’t fix it.”[6]

The national reports generated from the database were provided to the Ministry of Health without individual departmental details to ensure confidentiality and encourage full and fearless participation by all departments.

A notable finding from the database was the disproportionately high rate of multiple gestations resulting in a considerable number of preterm infants, particularly an anomalously high number of triplets globally. This prompted a reevaluation of IVF protocols, advocating for a shift in focus towards the outcome of one healthy baby, rather than multiple preterm births. Subsequent reports from the database influenced modifications to IVF guidelines, leading to a roughly 70% reduction in triplet preterm births.

Furthermore, the database served as a valuable resource for political advocacy to illustrate the database's impact on neonatology nationwide. The State Comptroller also utilized the data to underscore issues in neonatal care. Additionally, data was disseminated to various legislative committees addressing the condition of preterm infants and neonatal care facilities, facilitating informed policy discussions.

This approach was eventually challenged in 1994 by a group of proactive neonatologists, including Prof. Ehud Zmora from the IAN. They presented a professional stance outlining the specific needs and costs associated with neonatal treatment.

Their advocacy led to significant reforms in the healthcare payment system. In 1993, they persuaded the Ministry of Health to adopt a funding model that recognized and adequately supported neonatal care. This reform introduced the concept of the “social security neonate,” applicable to newborns weighing under 1750 grams who survived for at least four days. Financially, as of 1993, the compensation for a standard birth was set at 2,757 NIS, while the compensation for a neonate falling under the "social security neonate" category was significantly higher at 28,658 NIS. By 1998, these figures had escalated to 5,362 NIS for a standard birth and 55,732 NIS for a neonate. In 2023, the funding further increased to 16,854 NIS for a regular birth and 269,012 NIS for a “social security neonate.”

This new categorization and the subsequent changes in funding were critical steps forward. Although the allocated funds weren’t invested back in the neonatology department and were not always sufficient—for instance, a neonate weighing 1750 grams requiring a few weeks of care versus a 500-gram neonate needing months of therapy—this reform was significant. It marked the recognition of neonates as legitimate and recognized patients, enhancing their status in the healthcare system and ensuring more appropriate allocation of resources for their care.

The lack of a payment-sharing mechanism made hospitals hesitant to transfer neonates to other facilities, leading to significant changes in the landscape of neonatal care. Driven by financial incentives, hospitals across Israel began to establish and equip their own neonatal units to manage newborn care internally. This approach, while expanding services, also presented challenges. This development is reflected in the fact that Israel has 27 NICUs, a number comparable to those found in much larger European countries. The decentralized model led to a high demand for medical professionals, equipment, and other resources. This institutional behavior resulted in a scenario where hospitals of all sizes attempted to treat neonates with varying complexities. However, smaller hospitals, experiencing fewer births, faced difficulties in maintaining adequately trained staff due to the lower volume of cases. This situation underscores the complex balance between expanding access to neonatal care and ensuring the quality and sustainability of services provided.

This situation prompted the association to focus intensively on the quality of care provided by NICUs across the country. Addressing this challenge required the formal establishment of care standards, which had significant implications for staffing, equipment, funding, and training. To set a standard for Israeli neonatology, the Israel Health Department (IHD) convened the "Boikis Committee," which included Prof. Idelman, Prof. Reichman, Prof. Zmora, Prof. Boikis, and others. In 1994, the committee produced a comprehensive report. However, as mentioned, this report was never published, likely due to the reluctance to fund the high standards it proposed. The system could not feasibly meet these standards, given the extensive requirements for additional beds, doctors, and nurses, and the limitations of Israeli medical schools to train the necessary personnel. Consequently, the report was neglected within the halls of the IHD.

The status quo persisted until 2013 when the IHD, under Prof. Ronni Gamzu's leadership, finally published standards for neonatal departments in a document titled "The Recommendation for Managing Human Resources and Infrastructure in Neonatal and Preterm Intensive Care Units." This was a significant advancement for the field, as it established formally agreed-upon standards that hospitals could aim to achieve. These standards initiated a scoring program called the "Stars Model," where hospitals with neonatal units meeting more criteria received additional funding at the end of the year. This funding was allocated to the hospital as a whole, rather than directly to the neonatal department, incentivizing hospital management to invest in their neonatal units. This approach by the IHD was strategic, as it created incentives for investment without directly increasing staff positions.[7]

Over time, this funding model based on neonatal unit standards has undergone several changes under the leadership of Prof. Shmuel Zangen and Prof. Arieh Riskin, who succeeded him as head of the Neonatal Association. Firstly, the system was divided into categories to allow smaller units to compete fairly with larger ones, ensuring nationwide improvement in neonatal care. Additionally, more standards concerning equipment were introduced to address objective constraints such as building limitations. Due to the impacts of COVID-19, political crises, and the regional conflicts, inspections were halted, and hospitals have continued to receive funding based on their 2019 performance. This suspension of inspections has hindered the ability of hospitals to maintain and invest in their neonatal units.

Another significant change involved the shift to monthly rather than annual funding, complicating the ability of neonatology directors to request resources from hospital managers due to the fragmented disbursement of funds. According to Prof. Arieh Riskin, the current head of the INA, the ongoing inspections and formal declarations of capabilities help ensure that neonatal departments remain a prominent aspect of hospital operations, potentially facilitating better resource allocation to these units. [8]

Assuta Ashdod Hospital – The Newest NICU in Israel

Assuta Ashdod Hospital in the city of Ashdod is the newest hospital established in Israel, with its neonatal unit being the latest addition to the country's neonatology facilities. The unit was established by Dr. Omer Globus, MD., who became the first head Neonatology. A significant difference in this establishment is that the last neonatal unit in Israel was founded 40 years prior, so the knowledge and standards of care have evolved considerably since then.

The planning of the building for this new unit was not done by Dr. Globus but by a professional consultant who had been contacted by the directors before Globus joined. There was a strict rule that walls could not be moved or taken down after construction, making the initial planning phase crucial in determining the kind of care the unit would eventually provide.

Dr. Globus emphasized that the approach to establishing this new unit was very different from older units, particularly in terms of equipment availability. Given that the new hospital had to compete with existing hospitals and showcase state-of-the-art care to be deemed a quality institution, there was a greater willingness to invest in advanced equipment. Dr. Globus received an offer from a medical equipment company to supply mechanical respiration equipment for free as a marketing strategy. However, he chose to procure a model he considered the best in the market and and was backed up by the management. He also insisted on having only one type of model to standardize training for the new staff, who mostly came from surrounding hospitals and were accustomed to different equipment.

Training the staff was a crucial aspect, given that they were used to various care methods. New procedures were written and tested using Simulation manikin as patients to validate the procedures and train the staff for the new unit and its care standards. New residents had to start their training at other hospitals so that the unit could operate effectively from day one. They were sent to nearby hospitals for a few months to begin their training.

Recruiting staff was a significant challenge for the entire hospital, particularly for the neonatal unit, as neonatology is recognized as a specialty facing a shortage of qualified personnel. Israel faces a shortage of medical and nursing staff, with most personnel already employed elsewhere. To attract staff from other centers, Dr. Globus promoted the new unit as a groundbreaking initiative, offering not only opportunities for career advancement but also the chance to contribute to a pivotal, Zionist mission. He underscored the importance of being part of something new and historic, while also highlighting modest financial benefits and the convenience of working close to home for those living nearby.

Another modern challenge was verifying and implementing computing software. The new hospital acquired updated versions, but a substantial amount of work was needed to create proper templates for every protocol and medical letter. Realizing that this task would require extensive effort and would not be completed by the hospital's opening day, a compromise was made to purchase pre-made templates from another hospital.[9]

Conclusion

The development of neonatology in Israel reflects a broader narrative of resilience, innovation, and collaboration within the medical field. From the early days, where neonatal care was largely improvised and reliant on the extraordinary dedication of individual physicians, the field has grown into a recognized and highly specialized medical discipline. The stories of pioneers highlight the significant contributions of those who shaped neonatal care by bringing international practices to Israel and advocating for its formal recognition as a medical specialty.

The challenges these early innovators faced, including limited funding, outdated equipment, and a lack of specialized staff, were formidable. Despite this, the establishment of key neonatal units in hospitals across the country in the 1970s and 1980s marked the beginning of a transformation in neonatal care. The introduction of advanced equipment, improved training, and the formal establishment of the Israel Neonatal Society were critical milestones that contributed to the evolution of the field.

Interestingly, many of the most significant leaps in the progress of neonatal care in Israel were driven by political advocacy rather than purely medical advances. The transformation of funding models in the 1990s—led by persistent lobbying from dedicated neonatologists—was key to ensuring that neonatal care received the financial resources it needed. These political efforts, aimed at securing recognition for the specialized needs of neonates, proved to be instrumental in establishing a sustainable framework for the field. The fact that neonates were eventually recognized as legitimate patients deserving of specific funding underscores the importance of political engagement in advancing neonatal care.

However, despite the critical role of politics in shaping the field, it is the personal dedication of individuals that has truly carried neonatology forward The commitment of these professionals to improving neonatal care, even in the face of systemic challenges, have not only saved countless lives but have also ensured that neonatal care in Israel continues to evolve and improve.

As we look towards the future, the lessons from Israel's history in neonatology demonstrate the importance of continued investment in infrastructure, equipment, and personnel. Ongoing challenges, such as maintaining high standards of care, training sufficient numbers of neonatologists and nurse practitioners, and responding to the increasing demand for neonatal services, will require coordinated efforts from healthcare institutions, policymakers, and professional organizations.

The resilience of Israel's neonatal care system, which expanded to 27 units across the country by 2024, underscores the vital role of advocacy and leadership in advancing the field. To maintain the momentum of progress, it is crucial that Israel continues to invest in neonatal research, embrace emerging technologies, and foster international collaboration. The advancements in neonatology not only ensure better outcomes for newborns but also affirm the commitment of the Israeli medical community to the most vulnerable patients—the premature and critically ill infants whose lives depend on this specialized care. This field has been, and likely will continue to be, led by those who are not only medically skilled but deeply dedicated to protecting and improving the lives of the vulnerable.

Reference:

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3. Amitai MN. Professor Fabien G. Eyal Interview. (Jan 1st 2024)

4. Dr Jeryes Jammalieh Interview. (Jan 31st 2024)

5. Professor Tzipora Dolphin Interview. (Apr 12 2024)

6. Professor Brian Reichman Interview. (Nov 8th 2023)

7. Professor Ehud Zmora Interview. (Nov 2nd 2023)

8. Professor Arieh Riskin Interview. (Mar 7th 2024, Mar 10th 2024)

9. Dr Omer Globus Interview. (May 24th 2024)

10. GODFREY S, CARLSEN KH, LANDAU LI. Development of pediatric pulmonology in the United Kingdom, Europe, and Australasia. Pediatr. Res. 2004;55(3):521–7.

1. Prof. Michael Karplus, MD, is a Professor Emeritus of Neonatology, received his medical education at the universities of Liverpool and Manchester in England, where he trained under Prof. Edward Osmund Royle Reynolds, a pioneer in neonatal mechanical ventilation. This specialized training equipped him with the expertise to establish the neonatal unit at Soroka Hospital in Beer Sheva, affiliated with Ben Gurion University's School of Medicine. [↑](#footnote-ref-1)
2. Prof. Asher Tal, MD, is a Professor Emeritus of Pediatrics and the founder of the Pediatric Pulmonary Unit and sleep laboratory at Soroka Medical Center, Ben-Gurion University in Beer-Sheva, Israel. He completed his medical training at the Technion Medical School in Haifa from 1970 to 1975. [↑](#footnote-ref-2)
3. Dr. Agneta Golan, MD, completed her medical education at Ben Gurion University from 1974 to 1980, followed by a residency in pediatrics (1981–1987) and a fellowship in neonatology (1991–1993) at Soroka Medical Center. In 1992, she specialized in neonatal brain ultrasonography at Wilhelmina Children's Hospital in the Netherlands, and from 1994 to 1996, completed a research fellowship in neonatology and perinatology at the University of Toronto’s Sick Children's Hospital. [↑](#footnote-ref-3)
4. The Israel Medical Association’s (IMA) roots date back to 1912 with the founding of the Hebrew Medicinal Society for Jaffa and the Jaffa District, which eventually evolved into the Hebrew Medical Association in the Land of Israel (HMA). [↑](#footnote-ref-4)
5. The National Insurance Law (Consolidated Version), 1995
חוק הביטוח הלאומי (נוסח משולב), התשנ"ה-1995 [↑](#footnote-ref-5)
6. National health insurance contributions are compulsory for all residents of Israel. These payments are determined by the resident's income and status (though even those without income must contribute) and are collected by the National Insurance Institute in accordance with the National Law. Health insurance contributions provide about one-third of the funding for healthcare expenses in Israel, with the remaining two-thirds funded by the state budget. [↑](#footnote-ref-6)
7. Professor Mario B. Mogilner, MD, was the Director of the NICU in Kaplan medical center in Rehovot for over 20 years (1976 – 1996) [↑](#footnote-ref-7)
8. Shamir Medical Center is a teaching hospital in Be'er Ya'akov which was founded in 1918 as a military hospital for the British Army during the final days of the First World War [↑](#footnote-ref-8)
9. Dr. Shlomi Antebi, MD, was a former director of Meir, Kaplan and Haemek hospitals. [↑](#footnote-ref-9)
10. Professor Simon Godfrey, MD, is a leading Neonatologist and one of the founding fathers of the field in Israel, received his training in England[10] [↑](#footnote-ref-10)
11. Professor Ehud Zmora, MD, gained his training in Israel and Rochester New York and is a former head of the NICU in Soroka medical center and former head of the IAN. [↑](#footnote-ref-11)
12. Professor Haim Boikes, MD, also served as the Head of the Medical Professions Division at the Ministry of Health and as the Chairman of the Israeli Pediatric Association between 1988 and 1992 [↑](#footnote-ref-12)
13. Professor Brian Reichman, MD, has served as the Clinical Director of Israel’s National Very Low Birth Weight (VLBW) Infant Database since its inception. [↑](#footnote-ref-13)