Edwards Lifesciences

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Introduction

The story of Edwards Lifesciences is one of vision, grit, and relentless innovation—a distinctly American tale that bridges the worlds of engineering, medicine, and entrepreneurship. Founded in the late 1950s by Miles “Lowell” Edwards, a retired electrical engineer with an unyielding curiosity and passion for invention, the company began with a singularly audacious goal: to develop the world’s first artificial heart. While this initial ambition was soon refined, it set the tone for a pioneering organization that would ultimately transform cardiovascular care across the globe.

Edwards’ partnership with Dr. Albert Starr gave birth to the first commercially successful artificial heart valve, known as the Starr-Edwards valve. This medical breakthrough, achieved in 1960, paved the way for a new era in treating structural heart disease. From its origins as Edwards Laboratories in Santa Ana, California, through subsequent chapters of growth, acquisition, and reinvention, the company maintained a singular commitment to improving patient lives—an ethos woven into its very DNA.

Over the decades, Edwards Lifesciences adapted to an ever-evolving healthcare landscape. It invested deeply in research and development, constantly expanding its product portfolio to address the most urgent unmet needs in heart valve therapy and critical care monitoring. Strategic acquisitions and alliances, as well as a strengthening global presence, allowed Edwards to remain agile and innovative, delivering life-saving and life-enhancing solutions to millions of patients worldwide.

The company’s rise has not been without challenges—competition from global medical device giants, technological hurdles, regulatory scrutiny, and the immense difficulty of consistently developing safe, effective products at scale. Despite these obstacles, Edwards Lifesciences has consistently delivered strong financial performance and maintained a reputation for clinical excellence, ethical conduct, and a profound sense of responsibility to patients, clinicians, and the broader community.

Corporate stewardship, philanthropy, and environmental sustainability are also central to Edwards’ identity. Initiatives like “Every Heartbeat Matters” and strong alignment with global Sustainable Development Goals highlight a commitment to underserved populations and a sustainable future for healthcare. With a talented leadership team, dedicated workforce, and partners across the medical spectrum, Edwards Lifesciences stands as a model of how American innovation, integrity, and compassion can remake an entire field of medicine.

As this book traces the journey of Edwards Lifesciences—from its earliest experiments

to its current status as an S&P 500 leader with a multi-billion dollar portfolio—the aim is to illuminate not only the achievements of a remarkable company, but also the human stories, scientific progress, and bold strategies that shaped it. In chronicling where Edwards has come from, assessing its present, and looking ahead to what the future may hold, we pay tribute to an organization that has not only saved lives, but also redefined what is possible: for patients, for healthcare, and for American enterprise itself.

CHAPTER ONE: Humble Beginnings: Miles "Lowell" Edwards and the Vision for Better Hearts

The story of Edwards Lifesciences begins not in a gleaming corporate campus, but in the mind of a curious and inventive electrical engineer named Miles "Lowell" Edwards. Born in Newberg, Oregon, in 1898, Edwards' early life offered glimpses of the ingenuity that would later define his career. His grandfather, Jesse Edwards, had founded Newberg as a Quaker community in 1880, and his father, Clarence Edwards, ran the town's first electricity-generating business. It was here, climbing poles to repair his father's power lines, that young Lowell likely first honed his practical skills and problem-solving acumen.

A significant personal experience shaped Edwards' future endeavors: as an adolescent, he endured weeks in bed recovering from rheumatic fever. This illness, a common complication of untreated strep throat before the advent of antibiotics, can severely damage heart valves. While seemingly a childhood affliction, this personal brush with cardiovascular vulnerability would resonate decades later, fueling his desire to address such critical medical needs.

Edwards was a diligent and skilled student, and in 1924, he graduated from Oregon Agricultural College, now known as Oregon State University, with a degree in electrical engineering. His talents were quickly recognized, as he won a competition sponsored by General Electric Research Laboratory in Schenectady, New York, and was appointed an engineering apprentice. For three years, Edwards refined his inventive skills, focusing on practical applications for GE's business leaders.

Returning to Oregon in 1927, he married Margaret Watt. The early 1930s saw Edwards as chief engineer at Bingham Pump Company in Portland, where he designed industrial pumps, further solidifying his expertise in fluid dynamics. His inventive spirit continued to flourish, leading him to a position as plant engineer at Weyerhaeuser Timber Company's pulp mill in Longview, Washington, in 1937. There, he conceived and designed a powerful hydraulic tree de-barker, a machine that used a jet of water to strip bark from logs—a major invention that showcased his ability to tackle diverse industrial challenges.

Edwards soon became captivated by centrifugal pumps and began constructing prototypes in his home workshop. His innovative "trick" pump, a flat plate with flanges spinning inside a chamber to force fluid outward, proved particularly useful. During World War II, this expertise found a crucial application when Boeing Aircraft faced a challenge: fuel pumps for their new B-17 bomber failed at high altitudes because

volatile fuel formed gas bubbles. Edwards' centrifugal spinning pump effectively separated the fluid from these vapor bubbles, and his design was subsequently adopted for the majority of American military aircraft for the next decade. This success highlighted his ability to apply fundamental engineering principles to solve complex, real-world problems.

Upon his retirement in 1947, Edwards, along with his wife Margaret, moved to Portland. However, retirement for a man of his inventive nature was merely a transition to new challenges. He began to explore a novel area of investigation, one that circled back to his personal experience with rheumatic fever. Reasoning that the heart was, at its core, a pump, he embarked on designing a prosthetic heart—an audacious and forward-thinking endeavor for the time.

This ambitious project led him to a pivotal meeting in the spring of 1958 with Dr. Albert Starr, a young and innovative heart surgeon at the University of Oregon Medical School. Starr, born in New York City in 1926, had received his medical degree from Columbia College of Physicians and Surgeons in 1949 and completed his residency in general and thoracic surgery before moving to Oregon in 1957. He was an instructor in surgery at the time of their first encounter.

Edwards presented his concept for an artificial heart to Dr. Starr. While Starr initially viewed the complete artificial heart as too complex for immediate realization, he saw an urgent clinical need for a different solution: an artificial heart valve. This collaborative spark, where the engineer's ingenuity met the surgeon's clinical insight, marked the true genesis of what would become Edwards Lifesciences. It was a partnership of complementary minds, with Edwards in his sixties and Starr in his thirties, yet, as Starr himself noted, "there was no generation gap between us."

Over the next two years, Edwards dedicated himself to manufacturing a series of artificial heart valves for Dr. Starr to test. This iterative process of design, development, and testing was crucial in refining the initial concepts into a functional and viable medical device. This period laid the groundwork for a groundbreaking achievement that would revolutionize cardiovascular care. Edwards' ability to focus on building practical prototypes, combined with his skill and curiosity, was instrumental in this early development phase.

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