

CASE STUDY

# Rambam Health Care Campus

Pooling Data to Accelerate Research  
and Improve Patient Care

MDCLONE



**RAMBAM**  
Health Care Campus

# Rambam Health Care Campus

A Pioneering Force in the Field of Big Data for Healthcare

## LOCATIONS

Haifa, Israel

## SIZE

80 Medical Departments and Clinics

1,000 Beds

More than 5,000 Employees

12M Diagnostic Tests Annually

36,000 Surgeries Annually

220,000 ER Visits Annually

Serves 2M+ Residents of Northern Israel

Referral Center for 12 District Hospitals

## SPECIALTIES

Internal Medicine

Surgery

Gynecology

Children

Medical Imaging

Mental Health

Laboratories

Dentistry

## WEBSITE

[rambam.org.il](http://rambam.org.il)

Rambam Health Care Campus was established in 1938 under the British Mandate as the Governmental Hospital. It became an Israeli governmental hospital with the founding of the State of Israel, and over the last 80 years, it has become world renowned for experience and expertise in a wide range of clinical and research endeavors.

Rambam is a 1,000-bed world-class teaching hospital with a diverse patient population, as it is the major tertiary (referral) medical center for all of Northern Israel, including 12 district hospitals and defense and peacekeeping forces stationed in the region. Serving more than 2M residents and others referred from all over Israel, the Mediterranean region, and around the world, Rambam is strategically located in Haifa on the Mediterranean coast and plays a critical role in the healthcare of the region's residents, in addition to making a major contribution to the economy of the north.

Rambam, with the lead of the Digital Information Technology Division, has established itself as a pioneering force in the growing field of Big Data for medical applications, and the hospital is a leader in this field both in terms of data collection and data analysis. Rambam's Digital Information Technology Division established a computerized database of medical records in the early 2000s, and today the database contains more than 20 years' worth of detailed data from patients treated at Rambam since then. Now, the CIO's main goal has been to enable Rambam's researchers to independently study and analyze data.



“The first time I saw the MDClone platform, I felt that my dream had come true. Over the years, we haven't been able to provide a solution for our researchers to be independent. I immediately saw the value in MDClone and recommended to the CEO that we be the first organization in Israel and in the world to adopt the platform. We have one of the broadest electronic medical records systems in the world, and because the system was designed in-house by our division, we can make adjustments very quickly, as required. This makes us an ideal partner.”

Sara Tzafrir, CIO of Rambam

## Challenge

Rambam's electronic medical record (EMR) database contains more than 2.5 million unique patient health records representing 25 million unique visits to the ER and to the hospital's different departments and outpatient clinics. Rambam's Digital Information Technology Division – along with the epidemiology department, who has an extensive knowledge in healthcare information and data – has made huge efforts to create valid, complete, and accurate standardized data. Because a large share of the data is entered by humans and is therefore susceptible to error, Rambam sought to validate the data in order to ensure that answers to queries will be as precise as possible.

Initially, Rambam faced challenges such as:

- + **IRB Approvals**

Running database analyses based on hospital records and information systems was previously a major task for Rambam. With real patient data, they needed to go through an institutional review board (IRB), delaying typical study start times by several months.

- + **Structured and Unstructured Data**

Numerous data types are entered into Rambam's central database every day, both structured and unstructured, such as MRI and CT scan images, EMR tables, bloodwork results, and text from medical reports.

- + **Necessity of IT Staff**

Rambam had to work with IT staff to be able to run queries, leading to a time-consuming and convoluted process.

“I had to work closely with the IT department, back and forth. This process could take me months and months, because these people are all so busy and it’s hard for me to know what data is available,” said Shay Perek, MD, Rambam Health Care Campus.

Although the hospital had full, interconnected electronic medical records, accessing the data was difficult and time-consuming. It required IT staff to provide the data to the researcher — and with several iterations.

## Solution

In 2017, Rambam became the first health system to implement MDClone’s platform. Using MDClone, Rambam’s big data operations could immediately convert personal data into synthetic data, protecting patient confidentiality. The hospital’s management mandated the use of anonymous, synthetic data to alleviate any privacy concerns.

“Studies comparing real data files and synthetic files show that the results are similar,” says Ronit Almog, MD, Director of Rambam’s Epidemiology Unit.

MDClone gives users such as research physicians the ability to access the data in a simple manner without the need for the IT department. Rambam clinicians and researchers can now easily receive answers to such queries as:

- + “During the past five years, what were the lab results of cardiology patients on day two of treatment with a particular drug?”
- + “Do we have enough patients that meet three specific criteria in order to conduct a clinical trial?”
- + “In the last two years, how many chronic kidney disease patients were readmitted to the hospital after an initial admission and follow-on treatment plan?”
- + “What is the door-to-balloon time in primary percutaneous coronary intervention in ST elevation myocardial infarction?”

These and many other questions can be answered quickly and accurately, thanks to big data analysis of the hospital’s vast data bank. Excellent tools have also been developed for retrieving and analyzing the data at Rambam. Substantial resources have been invested to assure that the system is user-friendly, so that doctors and researchers can easily retrieve high-quality data by themselves.

“Electronic medical records [EMR] are a vital component that influence the quality and safety of health care. The EMR enables fulfillment of our second mandate — to push the envelope of health care in the forms of research and innovation. MDClone created the infrastructure and the bridges

to fulfill those goals, starting with structuring the huge database and then creating a user-friendly, excellent search engine that facilitates and extends the capabilities of the researcher. Continuing to be agile, MDClone moved ahead to solve the issue of privacy – one of the major problems of medical data sharing,” explained Miki Herbertal, General Director and CEO of Rambam Health Care Campus.



“MDClone created the ultimate solution by creating synthetic data, totally duplicating the real data set and disabling the ability to track data back to a patient. This feature is a game-changer, transforming our ability to share data and cooperate worldwide. Becoming partners and cooperating with MDClone was a strategic decision of RHCC that has proven itself throughout the years.”

Miki Herbertal, General Director and CEO of Rambam Health Care Campus

Today, Rambam engages in big data and AI collaboration with startups and industry, as well as with academic institutions, HMOs, the Health Ministry, and other hospitals. Researchers from outside Rambam can access the data by partnering with Rambam researchers and receiving approval. Both internal and external users benefit from Rambam’s high-quality medical data, both synthetic and real, which is unique in Israel.

“The use of synthetic data allows us to test, like in a sandbox, certain hypotheses before we decide on the exact protocol of a study. This is extremely helpful, extremely efficient, and also allows the individual doctors and researchers to do it,” explains Rafael Beyar, MD, Former Director of Rambam Health Care Campus

Now users can, with a few clicks within the MDClone ADAMS Platform, see their data and make adjustments on the fly, shortening the research process from months to hours.



“What I really enjoy about MDClone is the very simple and intuitive platform. It’s very easy to understand, and it didn’t take me long to figure it out. It’s quite simple, it’s quite intuitive, and if you work with data and if you work with patients, you quite easily know what are the questions you want to know and how to ask them, then how to receive the output from the system.”

Shay Perek, MD, Rambam Health Care Campus

Rambam was the beta site for MDClone and since 2017 has been influential in perfecting this sophisticated big data tool and making the platform as user-friendly and effective as possible.