



**The Challenges of
Remote Cardiac Monitoring
for Device Nurses and Technicians**

The Growing Adoption of Remote Cardiac Monitoring

At its very beginning, 30 years ago, remote cardiac monitoring was implemented to ensure the **proper technical functioning of implantable cardiac devices**. Then, it turned out that it offered multiple advantages and led to **better care for patients** implanted with these devices.

Today, remote monitoring of implantable cardiac devices represents **the new standard of care**. It has been proven to lead to **earlier detection of clinically actionable events**, **reduce healthcare costs** and **decrease mortality**. Remote monitoring of implantable cardiac devices is therefore a **Class 1A recommendation** from the **Heart Rhythm Society**, the strongest recommendation with the highest level of evidence. This therefore justifies that remote monitoring of implantable cardiac devices be reimbursed in the United States.

Over the past two years, the context of the COVID-19 pandemic has reinforced the importance of this practice, allowing **continuous monitoring** and **reducing the number of physical medical appointments**.

The Benefits of Remote Cardiac Monitoring

Whether technical or clinical, the benefits of remote monitoring have been demonstrated through numerous studies.

- **Almost immediate detection of any failure of the implantable cardiac device:** low battery charge and integrity of the probes {Pron, 2012 #2205}.
- **Identification of atrial fibrillation:** coupled with remote monitoring, implantable cardiac devices, and in particular ILRs (Implantable Loop Recorders), make it possible to diagnose atrial fibrillation in the event of suspicion {Bergau, 2015 #561}.
- **Continuity of care:** patients' heart rhythm can be monitored between each medical visit directly at the patient's home {Mabo, 2012 #1916}.



● **Improved diagnostic and therapeutic efficiency:** remotely, the doctor can identify any heart rhythm disorder early and act accordingly {Landolina, 2012 #518}. Remote monitoring with automatic alerts compared to standard monitoring significantly reduced the time needed for a clinical decision in response to clinical events and was associated with a significant reduction in mean cardiovascular hospital stay {Crossley, 2011 #603}.

● **Reduction of mortality for patients with cardiac implants** {Varma, 2015 #1622} **and for patients with heart failure (TIM-HF2 study)** {Koehler, 2018 #401}: thanks to remote cardiac monitoring, patient safety is reinforced because the remote monitoring teams can be alerted quickly, before the patient is hospitalized.

● **Economic benefits:** the use of remote monitoring is associated with a reduction in healthcare costs {Sydow, 2021 #2252}.

The Challenges of Remote Cardiac Monitoring: A Reality

Human management

Whether remote monitoring is handled by full or part-time teams, this activity creates many challenges on a daily basis. With an aging global population, the number of people with heart rhythm disorders is increasing, as is the number of implanted cardiac devices. This has an impact for the people in charge of remote monitoring who have to monitor an increasing number of patients. This situation often leads to an **overload of work** that weighs on the teams, especially since the data processed has an impact on the health and lives of patients. The responsibility linked to this activity, the fear of not seeing certain important information and the need for reassurance are part of the daily life of remote monitoring teams. The **COVID-19** health crisis has made the situation even more tense since many hospital services have had to deal with an **unprecedented increase in the departure of caregivers**.



Administrative task management

Beyond the human aspect, the tasks related to remote monitoring are undoubtedly **tedious and time-consuming**. Without a dedicated remote monitoring platform, teams have no choice but to consult each of the five implantable cardiac device manufacturer websites to analyze the data, depending on the brand of the device. However, each website presents the data generated by implantable cardiac devices in a different way, forcing remote monitoring teams to familiarize themselves with a **multitude of technical environments** and sometimes waste time searching for information.

By analyzing information from implantable cardiac devices, remote monitoring teams analyze a **considerable flow of data on a daily basis**. For example, ILRs, essential medical devices for detecting arrhythmias, emit a high number of false positive episodes, which make remote monitoring particularly time-consuming. Remote monitoring teams therefore waste a lot of time on non-actionable events.



By analyzing information from implantable cardiac devices, remote monitoring teams analyze a **considerable flow of data on a daily basis**. For example, ILRs, essential medical devices for detecting arrhythmias, emit a high number of false positive episodes, which make remote monitoring particularly time-consuming. Remote monitoring teams therefore waste a lot of time on non-actionable events.

One of the major difficulties related to the practice of remote monitoring remains the **management of disconnected patients**. How many hours do you spend each day establishing the list of patients who are no longer transmitting (and identifying those who have reconnected), calling them to find out the reason for their disconnection and reminding them of the procedure to follow to transmit their data? How many times have you thought that automating this repetitive task could save you valuable time?

Finally, to obtain reimbursement from Social Security, **medical centers must issue remote monitoring reports accompanied by invoices**. Today, no manufacturer offers a tool to perform these tasks, which complicates the activity of **remote monitoring teams who are struggling to obtain their reimbursements**. In addition, other questions arise regarding billing: how to identify eligible patients? When to invoice?

Benefit from Support for Your Daily Remote Monitoring Activity

The challenges you face on a daily basis are shared by many remote monitoring teams. Nevertheless, certain processes and tools can allow you to relieve your workload and save you considerable time.

Organizational aspect

- **A person or team expert in remote monitoring**

In order to gain efficiency and grow the remote monitoring activity, it is recommended to have a person or a team well trained in this area.

- **A clear and precise decision tree**

Have you ever wondered what type of decision to make for a given situation? To know when to seek the advice of a doctor?

In order to facilitate and accelerate decision-making, but also to limit the feeling of information overload, the creation of a decision tree proves to be a particularly effective tool.

- **Simplified communication between nurses and doctors**

It is not always easy to know through which channel or when to contact doctors. Make sure that doctors are well informed about your remote monitoring activity and its challenges, so that they can be responsive when you need their help. For this, it is important to frame in advance the different means at your disposal to contact them.

- **Adequate patient education**

The problem of patient disconnection is sometimes due to the lack of knowledge of these patients on the operation of remote monitoring. In addition, the management of disconnected patients is particularly time-consuming. When handing over the transmitter, it is therefore essential to dedicate time to the patients to explain to them the benefits of remote monitoring and its implications for their daily lives. In particular, you can provide patients with leaflets that will allow them to obtain additional information and know how to react in the event of a problem.

- **A platform dedicated to remote monitoring**

Because the remote monitoring activity can prove to be tedious and take up a significant amount of time, a dedicated platform bringing together data from all manufacturers may appear to be the solution.

Technology at the service of remote monitoring teams

Some platforms, like the IMPLICITITY® one, offer many advantages in terms of time savings and efficiency.

As a universal remote monitoring platform for patients with cardiac implantable electronic devices, IMPLICITITY® brings together device data from all manufacturers.

To optimize the remote monitoring activity, it is necessary to address both clinical and administrative issues. This is why the IMPLICITITY® platform offers features that meet these two challenges:

- Standardized data management on a single platform
- Personalization of alert filtering
- Management of disconnected patients
- Inter-team communication tool
- Automation of medical reports and billing



Thanks to its medical software algorithms based on artificial intelligence, IMPLICITITY® reduces the burden linked to remote monitoring activity and thus optimizes the operating process of medical teams. The ILR ECG Analyzer* algorithm has been designed to significantly reduce the time spent reviewing arrhythmia episodes recorded by the ILRs, which most often turn out to be false positives. This algorithm reduces the number of false positives by 79% by analyzing ECG recordings of patients implanted with Medtronic ILRs, while maintaining a sensitivity of 99%**.

Do you want to know more about IMPLICITITY® solutions?
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About IMPLICIT®

IMPLICIT® is a software company that provides a universal remote cardiac monitoring and research platform to clinics and service companies, helping them provide the best remote care to cardiac patients. As a digital Medtech, IMPLICIT® develops AI and knowledge based algorithms to reduce healthcare professionals' workload and allows them to potentially predict patient health status.

The IMPLICIT® platform aggregates, normalizes and standardizes data from all implantable cardiac electronic device across all major manufacturers. In addition to having an FDA cleared solution and multiple CE markings, IMPLICIT® has been the first private company authorized to access the Health Data Hub***, one of the world's largest patient databases, supporting the development of its AI solutions to improve care for patients with chronic heart failure conditions. IMPLICIT® covers more than 70,000 patients in 100 medical facilities across the United States and Europe.

<http://www.implicit.com>

*FDA cleared Class II medical device and CE marked Class I (under MDD) medical device, see the instructions for use for more information.

**https://academic.oup.com/eurheartj/article/42/Supplement_1/ehab724.0316/6393406?login=true

***Health Data Hub is a health data platform put in place by the French government to combine existing health patient databases and facilitate their usage for research and development purposes.

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