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Not all Ambulatory Cardiac Monitors are the same – What to consider when choosing a solution.

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Ambulatory cardiac monitoring has been slow to evolve. The technology used to detect and diagnose arrhythmias has barely changed for 40 years. The devices traditionally used, Holters, are cumbersome external monitors worn by the patient using lead wires and electrodes. These typically only provide 24 or 48 hours of low yield ambulatory ECG monitoring. Patients often receive inconclusive results and delayed diagnoses due to, not only a brief wear time, but also the resulting artefact and lack of patient compliance. Many ambulatory cardiac monitoring services are limited by inventory with Holters, which results in reduced patient throughput and potentially increases wait times and backlogs.

Over the last few years AI enabled wire-free monitoring has revolutionised the way cardiac arrhythmias are diagnosed. This has been driven by a need to optimise cardiac monitoring services, reduce waiting times and to ensure better clinical outcomes. Often referred to as 'ECG patches', there are now several devices entering the market that claim to improve ECG data collection and interpretation providing a quicker diagnosis.

However, it is important to understand that these devices are not all created equal. Each varies in their application, implementation and in their outcomes, so careful consideration should be made when choosing a solution for your patients.

Here are some thoughts on what to consider when selecting a new ambulatory ECG device:

Patient experience

An optimal patient experience leads to better compliance thus improving the quantity and quality of data used for diagnosis. Ambulatory cardiac monitors are, of course, each designed differently. Understanding placement, preparation and published evidence relating to patient compliance is important. Ultimately the need is for a device that patients will wear for the full prescribed time, uninterrupted, providing the evidence required for diagnosis. Can patients continue with their daily activities (exercising, showering, etc.), knowing the device is still capturing every heartbeat? Do leads/wires or batteries need replacing or recharging during the prescribed wear time, potentially leading to interruptions in data collection? What is the evidence on patient compliance; will my patients wear the device for the prescribed period?

Take Zio; designed with patients in mind, it is a user-friendly monitor that minimises disruption and maximises compliance. 98% of patients wear Zio XT for the prescribed period[1], ensuring you get uninterrupted data to help make a fast and accurate diagnosis.

"It was very comfortable, at times I forgot it was there. I, you know, showered every day; I went running most days; I obviously changed my clothes a lot after that; I have a young child so I was running around after him, so I hardly noticed it"

Charlotte, Zio Patient

Clinician Satisfaction

A major consideration is the quality of the finished report provided. These differ greatly from company to company and provide you with varying degrees of information, having been interpreted in a variety of ways. iRhythm takes pride on the quality of the report; after all it supports the clinical diagnosis so it's essential that the information presented to you is clinically actionable and trusted.

Zio XT provides highly accurate data analysed by our AI algorithm and overseen by iRhythm's highly qualified cardiac physiologists[1]. This process produces a high quality report to help you make the right diagnosis first time. With 99.9% clinician agreement, the accuracy of the Zio report frees-up valuable resources and ultimately expedites patient care[1].

"It makes my workflows so much easier and faster and I [have] already saved a lot of unnecessary clinic appointments and was able to make decisions very quickly based on the Zio report"

Dr Zoltan Borbas, Consultant Cardiologist and Consultant Electrophysiologist at Liverpool Heart and Chest NHS Hospital

Clinical Outcomes

Improved diagnostic yield leads to greater accuracy[2], which in turn can speed up patient care and dramatically reduce waiting times.

AI algorithms based on large volumes of data, provide a high level of accuracy, analysing vast amounts of recorded ECG quickly and effectively leading to improvement in clinical outcomes[6]. But what about the quality of the data being analysed and what is the diagnostic yield?

By monitoring the patient for up to 14 days uninterrupted, Zio provides 3x more diagnostic yield than a Holter for example[2], leading to a faster and more accurate diagnosis[4]. Evidence shows that Zio is x10 more accurate in diagnosing AF than the standard Holter[3].

Not only is Zio NICE recommended, its 30+ peer-reviewed publications demonstrate its ability to support the clinician in providing a faster and more accurate arrhythmia diagnosis leading to improved clinical outcomes[4].

"Prolonged monitoring enables us to pick up more symptomatic episodes, more abnormalities on rhythm, and the pickup rate is vastly higher"

Professor Jay Wright, Liverpool Heart and Chest NHS Hospital

Cost of Care

Price is always a factor when choosing a new device or service for clinics and hospitals. Ambulatory ECG devices are no exception. Zio, has the potential to reduce the overall cost of service as shown by NICE. The array of devices on the market varies greatly in price, but there are many factors to consider when making a choice. Some devices will require ECG electrodes, lead wires and consumables such as prep tape and razors to be added to the cost. There may be additional service costs, such as the software required for analysis and an associated ongoing service contract. If analysis is undertaken by the hospital, the cost of staff resources should also be considered. Another factor is the amount of repeat testing that occurs with Holter devices. This typically runs at around 24% in NHS Trusts which itself has a considerable cost implication. So clearly, cost should not just be attributed to the device, but the value that service provides across the full clinical pathway. This is evident when clinical, operational and financial outcomes are factored into the equation. Only then can one truly demonstrate the value such a service brings to a hospital or clinic.

Zio is already demonstrating how it reduces the cost of care in the NHS[3] in several Trusts across the country. The value it provides is felt across the full patient pathway. It is also having a perhaps unexpected impact by reducing the need for more costly and invasive procedures such as ILRs.

Long Term Sustainability

Further consideration should be given to the company offering the product. Do they have the infrastructure to accommodate the number of tests required in a reasonable timescale? Can they easily scale up their business? Are they CQC registered? Are they a direct operation or a distributor? iRhythm prides itself as the developer of Zio and its AI analysis algorithm. The company has spent many years providing an accurate and reliable service upon which clinical teams can rely[5]. Part of the selection process should always be an assessment of the company itself. Hospitals and clinics want to be safe in the knowledge that the company selected is a secure and trusted organisation with which they can partner for many years.

In Conclusion

Not all ambulatory ECG monitors are created equal. Zio, NHSx AI award winner and the only NICE-recommended service of its kind, as a result remains unrivalled on the market. Given the growth of the backlog across the NHS and the burden it is placing on cardiology services, the need for speed in diagnosis, as provided by Zio, has never been greater. Furthermore, The British Heart Foundation has warned that waiting lists for cardiovascular disease diagnosis and treatment could more than double within two years.

iRhythm is committed to supporting the need for diagnosing arrhythmias fast and accurately. By putting patients first we strive to improve clinical, operational and financial efficiencies. There's no doubt that novel healthcare technology can help many of the NHS' challenges. However, distinguishing between the potential benefits of different solutions and accelerating the path to widespread adoption is critical for success. In the case of ambulatory cardiac monitoring, clearly not all ECG monitors are the same. It's imperative therefore, that careful thought is given to the type of device selected, not just for the short term, but for the long term.

About iRhythm Technologies

iRhythm is a leading digital health care company redefining the way cardiac arrhythmias are clinically diagnosed. The company combines wearable biosensor devices worn for up to 14 days and cloud-based data analytics with powerful proprietary algorithms that distil data from millions of heartbeats into clinically actionable information. The company believes improvements in arrhythmia detection and characterization have the potential to change clinical management of patients.

For further information, please visit irhythmtech.co.uk

1. Data on file. iRhythm Technologies, 2019
2 Turakhia et al; Diagnostic Utility of a Novel Leadless Arrhythmia Monitoring Device. Am J Cardiol 2013
3 NHS Case Study as part of the NHSx AI Award – more information can be provided
4 Clinical Publication Summary, iRhythm Technologies, 2020
5 NICE Guidance on Zio XT: https://www.nice.org.uk/guidance/mtg52/chapter/1-Recommendations
6 Artificial intelligence algorithms optimized from 3M+ patient data curated by certified cardiographic techinicians.