MPBE COVID-19 Rapid Technology Assessment Bulletin

BT Baby Monitor 5000 - Video Intercom Monitors

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"Display Unit"

"Camera Unit"

About MPBE COVID-19 Rapid Technology Assessment Bulletins

As the COVID-19 emergency evolves, an increasingly wide range of technology is being offered for supply to hospitals and other healthcare providers. This technology extends beyond the standard and familiar medical technologies deployed in clinical settings. These 'new' technologies may be completely new innovations targeted at COVID-19, devices previously regarded as niche that are finding a role in COVID-19 applications, medical devices or models that have not been routinely used in Ireland, or consumer devices that have been adopted for COVID-19 applications. It is important that healthcare providers can quickly assess the suitability of these technologies for application in their environment.

The Dept. of Medical Physics and Bioengineering at St. James's Hospital, Dublin Ireland, has been providing a rapid COVID-19 technology assessment service to the hospital in order to quickly evaluate specific technologies and innovations being considered for use in the hospital. Summaries of the evaluations are provided in short Bulletins highlighting the main findings. The Bulletins are intended to assist clinical and other staff assess suitability of the technology, and to highlight any important operational or other issues. These reviews are not presented as exhaustive assessments.

Disclaimer: Bulletins are provided outside St. James's Hospital to assist the wider health service and do not in any way amount to a recommendation of any specific provider, technology, machinery, software or otherwise. Furthermore, the Bulletins are providing a review of usage and are not suggestive as to suitability, transferability or advice. Assessments are considered with regard to the specific physical and clinical environment in St. James's Hospital and not all findings may be transferable. Assessments in these Bulletins focus on technical aspects; clinical efficacy, cost, legal and infection control issues are generally not in the scope of the technical reviews. As such, St. James's Hospital accepts no liability whatsoever in relation to the issue and/or usage of any of the product(s) being reviewed in any particular Bulletin.

1. Device: BT Video Intercom Monitors

The devices reviewed were 2-way communication Video Monitors generously gifted to the hospital as part of the COVID-19 effort (Model: *BT Baby Monitor 5000* manufactured by BT Telecom). These devices were proposed as a solution during the early acute phases of the COVID-19 response (March/April 2020). The aim of using these devices was to support patient/staff communications and interactions, thereby reducing patient isolation, the risk of staff/patient infection and PPE demand when patients were located within isolation rooms due to COVID-19 infection.

2. Classification

A sample of 10 devices were reviewed and assessed. These are consumer grade devices and are not medical grade devices.

3. General Performance & Key Findings

Feedback from staff using these devices at St. James's Hospital during the acute stages of the COVID-19 crisis suggested that a video/audio based intercom approach was found to positively enhance staff-to-patient communications and staff-to-staff communications across a wide range of scenarios, including: reducing patient anxiety, reducing patient isolation, reducing the risk of staff/patient infection, and reducing PPE demand when patients were located within isolation rooms due to COVID-19 infection. However, normally (outside of a national acute emergency) this device would not be considered for use in a clinical environment. Instead, a medical grade communication solution would be more appropriate. Key findings from a review of these devices are listed below:

- **Interference with wireless medical devices:** When tested, the Video monitors produced **<u>significant</u> interference and signal loss** on two wireless ECG devices (ECG telemetry and 12-lead ECG) when used in close proximity (Figure 1 and Figure 2 in Appendix 1). This interference was more likely to increase when mobile telemetry devices were located further away from the nearest telemetry Access Point (AP) or when a high number of video intercoms were in use in a specific area. In the Wireless ECG device example (Figure 2 in Appendix 1), a change in the **morphology of the ECG** was also apparent in simulations, in addition to the drop-out of the signal, which could potentially lead to a misinterpretation of the patient's true ECG rhythm.

- **Interference between 'Display Units':** Following extensive testing, interference between "Display Units" themselves was particularly evident when used in close proximity to one another (>4+). 'Display Units' had to be maintained at least 1-2m apart from each other in order to minimise this interference during continuous use. **Reliable audio/video signals were only obtained with a maximum of 2 Display Units turned on at one time in the same area**. Increasing the number of Display Units in close proximity increased the probability of significant interference and poor audio/video reception. Interference was also likely when Wi-Fi hubs were present in the vicinity of these devices.
- **Not Suitable for Reliable Continuous Monitoring in Healthcare – Video Pausing/Freezing:** While the devices might enable some level of **continuous monitoring** on patient status or alarm sounds from the patient's room, this comes with additional risks since these consumer non-medical grade devices are not designed for such use and could potentially miss events due to interference. That is, in the presence of interference the audio and video signal can stop, or in some cases the video link can **subtly pause/freeze** leaving an image on the screen that appears like a real-time video feed, which obviously can lead to missed actual activities in the room. **A CE marked medical grade solution would be preferred** if this use is required.
- **Balancing Risk:** During the acute COVID-19 crisis, when **balancing the risks** of cross infection, PPE demand, communication and staffing logistics against the risks mentioned above, the devices were considered suitable for use only under specific conditions and controls. However, these consumer devices were **not considered suitable outside of an acute emergency context** (with a medical grade alternative preferred instead)**.**
- **Privacy:** Each **patient should be informed** about the use of the device and consented as appropriate to avoid anxiety, address patient privacy issues and data protection. Use of appropriate settings and appropriate local SOP's can assist in minimizing such issues. Please note that the audio function on the 'Display Unit' still operates even when it is in 'sleep mode' meaning the sound from the patient's room is continuously transmitted even in the absence of visual images/video on screen (both can be terminated by powering off the 'Display Unit' device).
- **Patient Eligibility:** Clinicians should consider if this solution is suitable for patients who may be confused, and/or have cognitive, sensory or anxiety issues for instance. It would be useful to establish a set of **eligibility criteria** for use with specific patient groups.

4. Other Technical & User Considerations

- The BT Video Intercom is **simple to use** and is a robust consumer device. It allows two-way audio communication and one way visual display of the room it is installed in. In a one-to-one scenario (i.e. one 'Camera Unit' and one 'Display Unit') the system was found to transmit reliable audio-visual communications over 40-50 meters range. Nevertheless, even this setup can pose interference issues with medical devices and other risks in a healthcare setting.

- **The Audio quality on the 'Display Unit' was reasonable** when the *Camera Unit* (which houses a microphone see image on page 1) was placed at 2.5m from the user (the patient). However, it was difficult to hear sound from the 'Display Unit' when in a busy environment.
- The BT Baby Monitor 5000 was found to be **electrically safe** once maintained at a distance of 2.5 m from the patient and medical devices.
- Further clinical input would be needed to clinically manage any potential patient implant interference risk, if patient has an implanted device where possible, e.g. pacemaker.
- These devices **are not water, spill and splash proof** and so should be kept away from fluid sources.
- The Video monitor did not appear to produce significant interference on a selection of common medical devices that **do not have** wireless components (e.g. Vital Signs Monitor (Welch Allyn), Philips 12-lead ECG TC 50, Arcomed Infusion pump).
- Manufacturer's recommendations suggest the device should be cleaned with a dry cloth and to avoid wetting significantly. It may be possible to use a damp cloth (well wrung) with detergent to clean these devices. Local **infection control representatives** could be sought to advise on device cleaning to reduce the risk of cross infection - on the 'Control Unit' in particular, as this is handled relatively more often by staff.
- It is also possible (not exhaustively tested) that these devices could interact with Wifi and in-house Security Dept communication devices.
- **Training:** While clinical user training would be required, a *'quick guide information card'* could be placed beside the 'Display Unit' outside of the room as a reference (example available on request) which would also benefit from having local facilitator champions during any rollout.
- The devices are **not suitable** for monitoring changes in **patient colour**, i.e. skin colorimetry as feedback from the trial has indicated.
- If being used, a **clinical SOP** should be developed for the standardised installation and use of these units.

Note: Further installation and setup configuration commentary is available on request. These findings were based on locally conducted simulations and trials of a small number of these devices on a Ward based at St. James's Hospital. **For use in more critical areas, such as ICU, a more in-depth review of device interference would be required in that context, since more sensitive equipment is present in these areas and poses a relatively higher risk.**

APPENDIX 1

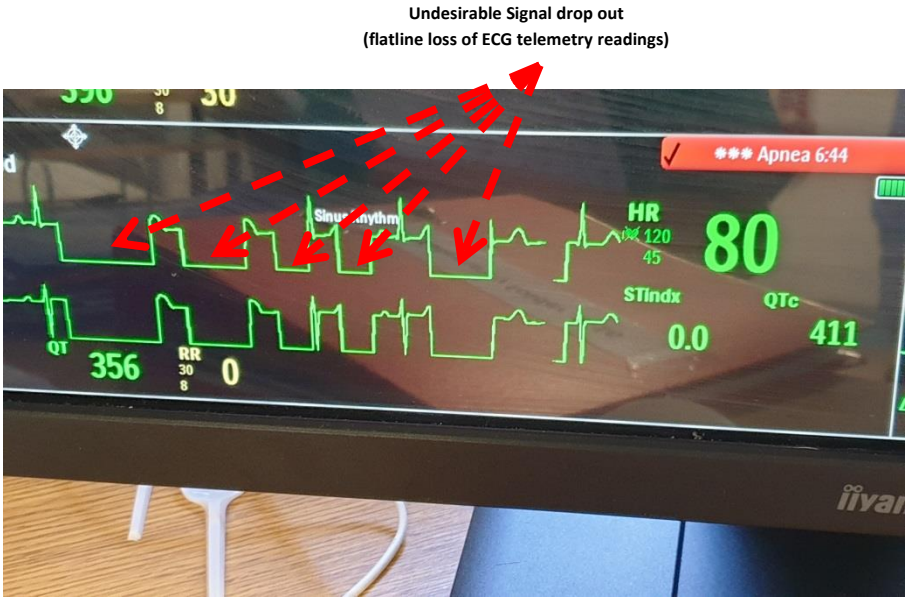

Figure 1: Example of Interference on Telemetry during Simulated Tests.

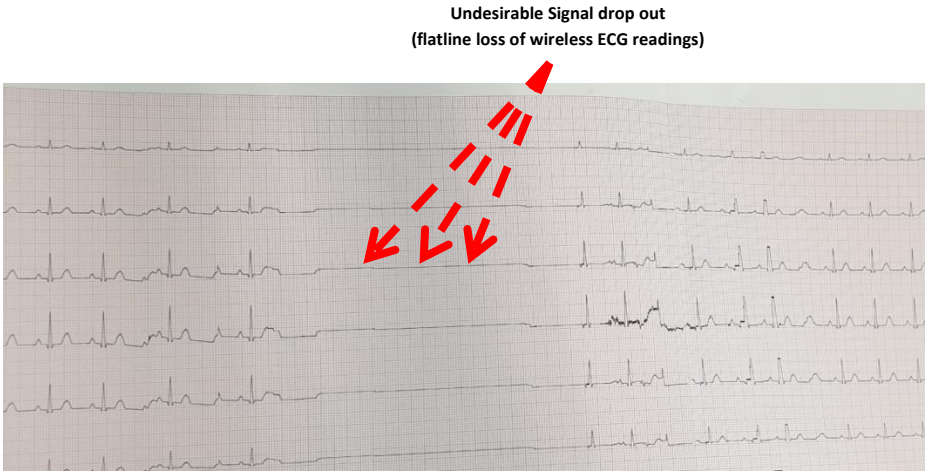

Figure 2: Example of Interference on a Wireless ECG - including morphological changes in rhythm. (Recording above is from a simulated ECG at sinus rhythm of ~80BPM).

APPENDIX 2

Document Log			
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