



Technology can certainly play a part in alleviating the financial and demographic pressures on the care industry, but only when fully adopted by trained staff as an assistance to them in delivering high quality care. Alert-IT has much experience in providing such technology and understands the environment needed for success

## Assistive Technology: Friend or Foe

### What is Assistive Technology?

In the broadest sense it covers all kinds of aids that assist a vulnerable person overcome a disability and lead a more fulfilling life. This can range from Zimmer frames to Wheel Chairs or Pendent Alarms to Virtual Doctors. However in this article a common definition pertaining to monitoring alarms is the subject. To many people this is simply the Telecare Pendent Alarm (or Dispersed Call Alarm) by which a call centre can be contacted in emergency using a radio linked pendant, but there is much more available as we shall see.

This technology was initially targeted at keeping vulnerable people in their own homes by providing a safety net, and as such it has transformed the lives of thousands for the better. Within the sheltered or warden controlled housing the same protection already existed as Warden Call points in the flats, and within care homes and hospitals as the Nurse Call push switches. While there are great similarities to the alarms available in these different social environments, the discussion here will focus on their use in a Care Home environment with local, readily accessible carers (even at night). The final chapter will note some of the differences that will apply to their use in the other situations.

Technology has now extended the functionality of this protection so that the call signal can be initiated automatically, even if the user is unable to press the pendent or switch. These situations can include a seizure, wandering of a dementia sufferer or anyone falling unconscious. This has changed the focus of such technology from assisting the vulnerable user, to assisting their carer deliver appropriate care in a timely manner: a very important distinction as we shall see.

### What is a Care Monitoring System?

In any care monitoring system the most important element is still the carer. Without this person, be it a relative or a professional carer, there is no purpose in any monitoring technology. In the case of the original Call systems these were indeed aids for the vulnerable person to summon assistance at their discretion. The monitors we discuss here are used to alert a carer automatically when a dangerous or distressing condition has occurred. Not only does this improve the quality of care by reducing any delays in response and removing the indignity of invasive surveillance but it also reduces the stress and anxiety for the carer while giving them time for more meaningful care activities.

We have the testimony of many parents who, after installing a monitor, felt they could at last cope with their caring role having spent sleepless nights listening out for a child having an epileptic seizure. The monitors now available can cover the needs of those supporting Dementia, Incontinence, Fall Prevention, Breathing issues and general incapacity as well as Epilepsy.

While improving care quality is the main reason for introducing a care monitor in domestic circumstances, for a care home there will be financial constraints on any such decision. Fortunately there are often potential cost savings for the home in addition to the improved care. These stem from:

- Staff released from routine surveillance tasks to spend time with residents or on other meaningful care activities
- Use of "Sleeping" nights staff rather than "Waking"
- Reduced numbers of night staff
- Less stress on staff
- Improved environment, resulting in higher "customer satisfaction" and hence higher occupancy.
- Less consequential tasks such as bed stripping after an incontinence episode
- Calmer residents who have not been disturbed at night
- Less hospitalisation of residents due to falls

## The perfect Care Monitoring Model for Care Homes?

In truth there is no such thing as a universally perfect solution as the specification for any Care Monitoring system will depend on the needs of the residents, the type of home, the capability of the staff and the expectations of the management, trustees and shareholders. Hence the starting place for any project is an assessment of need. Some typical questions that need asking are:

Is there an established Nurse Call system that needs to be triggered by alarms? If there is, it may still not be suitable to be used if a speedy response is required to an alert (e.g. as in falls prevention) and it does not include paging. If any monitoring is for a life threatening situation then the integrity of the legacy system must also be considered; can it go wrong unnoticed. It should also be realised that most systems can only alert the staff to a need in a room, without knowing the type of alarm or its urgency.

If there is no Nurse Call, or the legacy system is unsuitable, then a radio based notification will probably be the most suitable. There are now many reliable, high performance systems available and using radio reduces disruption during installation and maintains flexibility. However not all offer failsafe integrity<sup>1</sup> suitable for health critical monitors.

Are the staff willing to carry a pager? There is the alternatives of corridor display panels or the use of DECT or mobile phones. However there are compromises with any choice:

- Display panels are not visible when staff is with a client in their room, and audible alerts may not be appropriate, especially at night. There are systems that put a display in every room, but this comes at a cost and still results in blind spots. The advantage is that there are no pagers or phones to lose.
- DECT phones offer the staff voice communications between staff and to outside agencies, and can be used as text or voice prompt pagers. However such telephony can fail to deliver messages for a number of reasons and should not be used for health critical applications without additional "self-check" capabilities (as can be offered in any Alert-iT system)
- Cell phones are even less reliable than DECT and again must be used with caution in any critical application. The move towards internet connected cell phones (GPRS) may offer better systems in the future.

What is the radio range available? The traditional Telecare Dispersed alarm was based on a poor radio platform that only gave 80-100m range and could easily suffer from blocking by another transmitter. While the blocking problem has been reduced (though not eliminated) the range and integrity<sup>1</sup> still remains poor. There are also many cheap systems based on radio door-bell technology, again of limited range and poor integrity<sup>1</sup>. A properly designed alarm monitoring system will give long radio range (probably infinite with repeaters) and have high integrity<sup>1</sup> through self checking concepts.

What selection of monitors does the chosen system offer? There are many vendors of radio linked monitors, especially from overseas suppliers, that offer a single function e.g. a door open alert, or incontinence alarm. These may be fine for limited domestic use but you could end up with staff carrying three or four pagers to cover all the needs in a care home. Some vendors try and lock the customers to their products by using "closed protocols" so that only their range of products work in their network. Other more enlightened vendors will use "open protocols" that allows the customer to choose from an extended range of products. Check you can have the range of monitoring you desire with only one network/pager.

Finally the pagers offered needs to be reviewed. Many are simple text pagers with small screen and complex operator sequences to accept calls. A purpose designed pager for care systems will prioritise the alarms and use a simple acknowledge to ensure the staff can focus on the need, not the technology.

It is worth mentioning here the common practice of using a Baby Monitor as care alarms for vulnerable adults. Their attraction is not only cheapness but also the sense of close personal monitoring that it gives the carer. However they do destroy any semblance of dignity, privacy or confidentiality as not only does the carer hear all the conversations and noises in the room, but so do all the surrounding parents with similar alarms. It is also uncertain that the carer can really be attentive while also sleeping or performing other tasks. They really have no place in professional care.

## What prevents perfection?

Our experience indicates there is just one major factor, poor involvement of the care staff. This occurs typically at two levels, during assessment and training.

The first assessment phase is for the management team to agree the goals for any assistive technology and to choose a system that will meet those requirements. However choosing the monitoring technology to use MUST involve the staff who know their residents intimately. What seems like an excellent technology for detecting the resident being out of bed or incontinent will fail if that person routinely strips their bed at night or sleeps on the floor when upset. It is surprising how much more we (and the managers) learn and have to adapt our monitors once we meet the care staff and try to install the selected equipment.

At the outset there is never any resistance to agreeing to staff training, but it is rarely easy to implement. Rote patterns, staff turnover and daily pressure all interfere with the goal. In an effort to assist we have produced laminated help sheets, training videos and offer a telephone helpline. Yet still, when we do an audit, we find staff unsure of how to respond to alarm messages, how to maintain the equipment (e.g. positioning the incontinence sensing sheet under the Kyle) and may even be turning the pager off rather than resolving the reasons for a persistent alarm.

## Conclusion

The appropriate use of technology will be an essential tool in alleviating the demographic and financial pressures in the care sector. The greatest success in achieving the benefits of Assistive Technology occurs when the care staff are totally involved in specifying the system and receive adequate training and support. Alert-iT are committed to providing that support as well as providing a monitoring system of the highest reliability, integrity and performance.

## Use of Assistive Technology in other Care Sectors

### Monitors for Domestic Use

In general the characteristics needed for a care home apply equally to domestic use as the carer is resident with the user. We find that the domestic carers are more inclined to study the functionality of the monitor and work with the supplier to ensure the best protection possible. Sadly the professional carer is often unable to forge this relationship along with their normal care duties.

It can also be expedient for the domestic alarms to be able to contact outside agencies when the local carer is away. This can involve telephone diallers or Telecare interfaces connected to the radio alarm. Check that your monitor is capable of this extended function.

### Monitors for Hospital Use

In many instances the protection afforded by care monitors has a strong role to play in the hospital environment, especially in fall prevention, seizure detection and bed wetting. However the full potential has yet to be appreciated. The hospital nurse call system can provide the notification link for alarms, but it is often too slow or not monitored continuously, in which case the radio linked pager offers the solution.

## A review of monitors

### Epilepsy

The simplest monitors simply detect a bed shaking at night as the signature of a seizure, but there are many types of seizure that do not cause this. The range of products from Alert-iT, the specialists in Epilepsy support, covers vomiting, incontinence, special sound profiles and breathing issues. There are also monitors to detect falling and dropping both at day and night.

### Dementia

The most usual problems for which alarms can assist the carer covers

- Wandering from a bedroom
- Staying out of bed for too long at night
- Entering danger areas such as kitchens or bathrooms during the day
- Leaving the safety of the home environment.

Thanks to Star Trek and James Bond many carers envisage the perfect solution to be a wristwatch that reports location and dangerous activities while permitting 2-way conversations. Sadly the GPS and GSM technologies cannot deliver truly usable products at this stage. Battery size, recharging, response time to satellite searching, lack of signal indoors and unreliability of cell phones all reduce the capability of technology to help track those with dementia. However there are products capable of assisting in more limited ways.

### Incontinence

Detecting an incontinence episode is relatively easy, being based on moisture reacting with an electrical circuit. Traditionally this has been a plastic sheet on top of the mattress with a printed wiring circuit on it. Sadly these sheets are noisy when moved and disturb restless sleepers. They also cause sweating and with it sores and false alarms. Because Alert-iT products were also required to detect vomit during seizures they were based on a circuit embedded in a cotton sheet which solves all these issues.

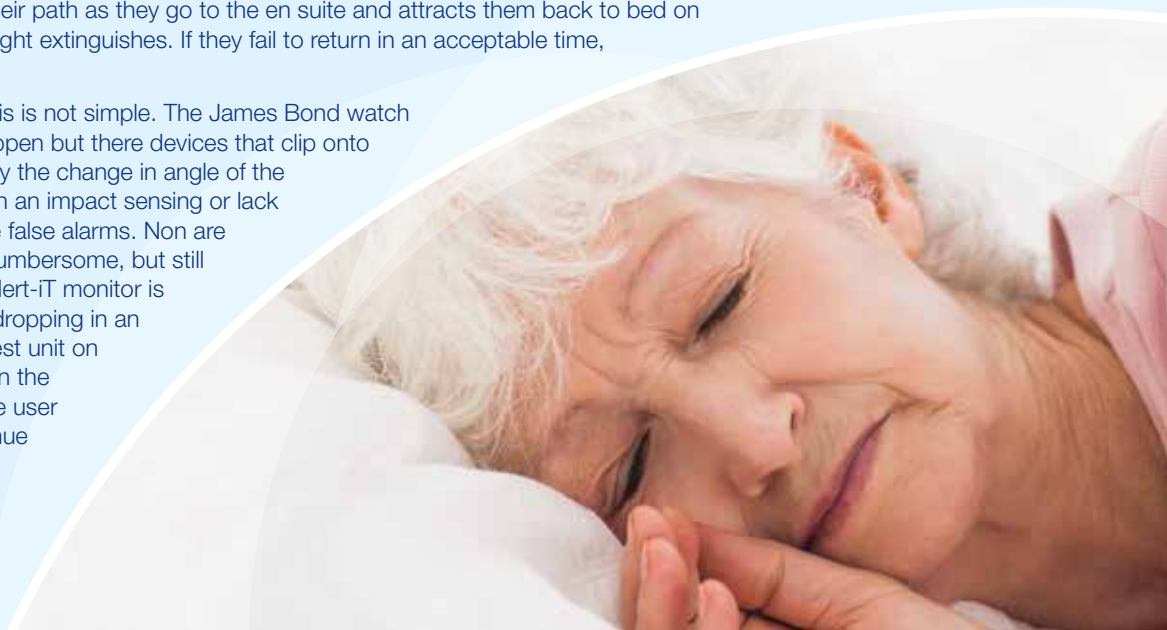
They have also recently introduced a Kyle (waterproof absorbent sheet) with wetness sensing which gives scope to removing the night-time pads and improving the comfort, dignity and rest of the user.

### Falling

Prevention of falling is a most important function in preventing broken bones, hospitalisation and acquired infection for the elderly. This will involve a device to detect the user rising from a chair or bed. The latter is not always easy as it is influenced by the weight of the user, then mattress and the bed. Your supplier needs to be able to offer a range of sensors to match your need.

One proven technique for the infirm with dementia is to illuminate the bed area when the arise (preferably with a blue light). This acts to light their path as they go to the en suite and attracts them back to bed on their return, at which point the light extinguishes. If they fail to return in an acceptable time, then an alarm can be raised.

If a fall occurs then detecting this is not simple. The James Bond watch to detect falls is yet to really happen but there are devices that clip onto clothing that can sense falling by the change in angle of the wearer and often combined with an impact sensing or lack of movement sensing to reduce false alarms. None are 100% effective and many are cumbersome, but still give excellent protection. The Alert-iT monitor is specifically designed for those dropping in an Epilepsy Seizure. It is the smallest unit on the market and depends only on the angle of the wearer because the user may slump gradually and continue to shake after falling.



## Panic and incapacity

The simplest monitor is the neck pendent that triggers a radio alarm. As this was the only Telecare activation device for many years it has been developed to a high level of performance by many companies. Hence this simple component can now:

- Trigger an alarm when pressed
- Provide years of standby life on one small battery
- Allow two way speech with the call centre
- Be wrist or belt worn as well as around the neck
- Used in the shower or bath
- Automatically trigger an alarm on detecting a fall
- Detect Hypothermia risk
- Detect wandering through doors or outside a safe area

Again size can mean everything. Some are cumbersome waist worn boxes with limited battery life, while others are small wrist worn units. The Alert-iT unit (Badge-it) is one of the smallest, with long battery life and can be used in a very low-cost wandering alert.

## Wandering

The James Bond hidden micro-chip that shows the clients position on a moving map display, both indoors and out, does not exist.

The GPS Satellite based units are very effective at passing the map data but only function reliably outdoors, consume batteries very quickly, are quite chunky and can cost a lot to support if regular position updates are requested. The ring fence concept is very effective in passing an alert once the user crosses a boundary. However delays in finding location data when moving from indoors to outdoors as well as failure to deliver timely data by SMS Text can make the system unreliable. The Alert-iT GPS Tracker uses GPS Data Packets to ensure a secure radio internet connection and fast response, but battery charging and size are still to be considered.

The most discrete system available is the doorway trigger offered by Alert-iT using magnets in the shoes of the vulnerable clients to trigger a detector mat in the doorway. No power, no delay, no size but instant response.

The Badge-iT can also supply a very low-cost and effective fence around a geographic area. By simply measuring the radio signal, the Alert-iT pager can warn if the wearer has moved beyond a safe distance. The unit is very small and the battery will last many weeks.

## Conclusion

Assistive Technology can do much to release carers to do their primary function of caring. It can reduce the stress and improve vigilance of the carer while they are engaged in critical support or providing quality human contact to their clients.

