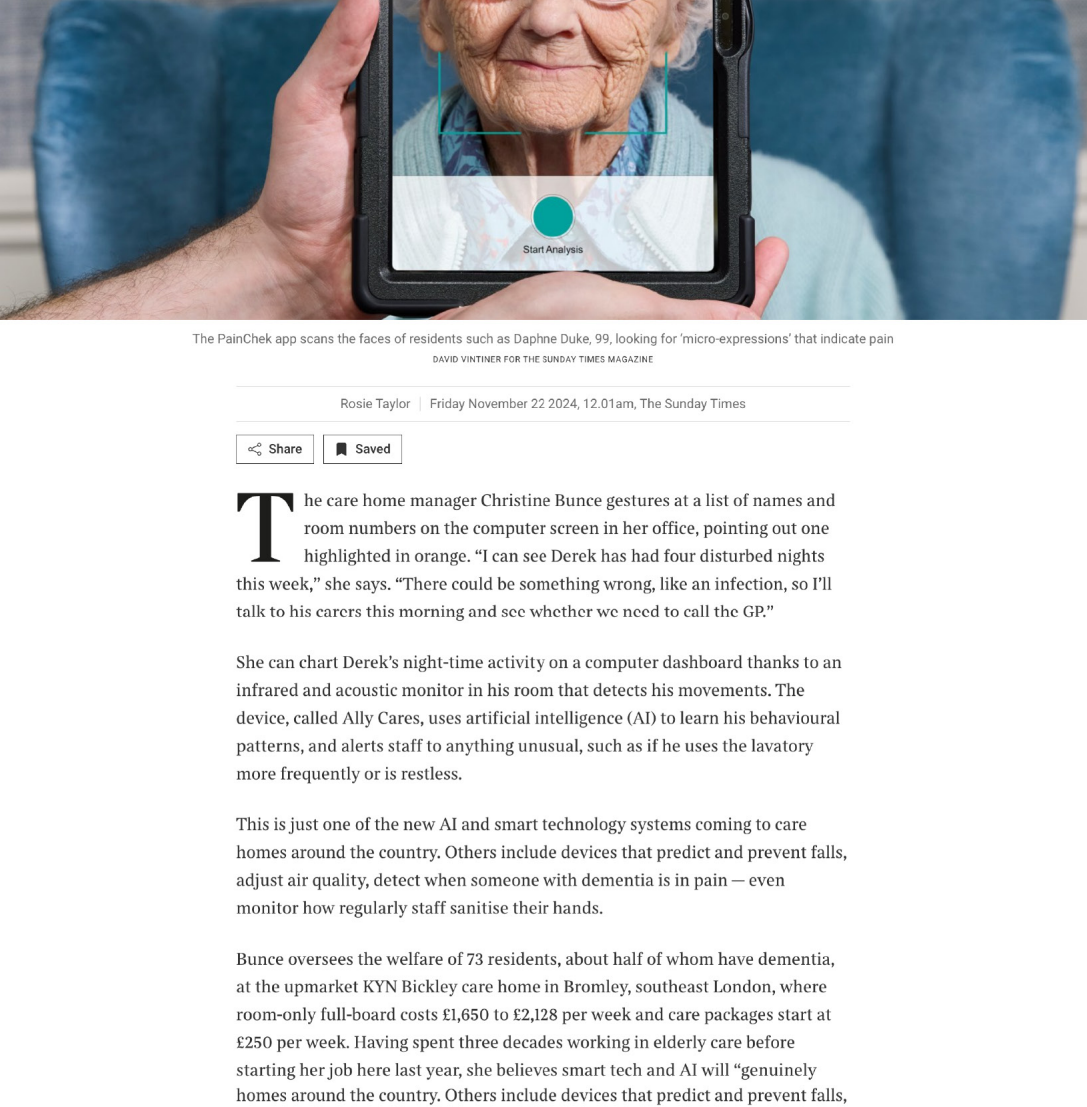


Inside the AI care home: the smart tech making old people safer

High-end care homes are now monitoring residents' facial expressions and night-time movements using artificial intelligence. Could smart tech save a falling system – or is it a dangerous shortcut to cutting staff numbers?



The PainChek app scans the faces of residents such as Daphne Duke, 99, looking for 'micro-expressions' that indicate pain

KEVIN WINTER FOR THE SUNDAY TIMES MAGAZINE

Rosie Taylor | Friday November 22 2024, 12.01am, The Sunday Times

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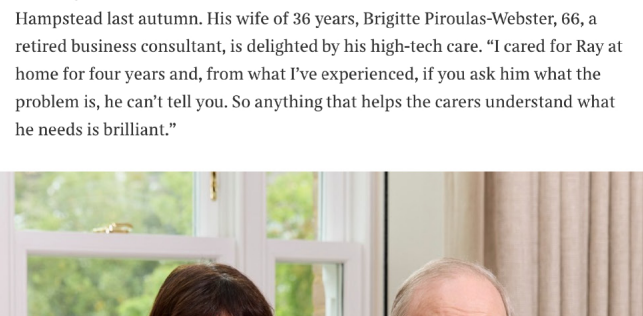
The care home manager Christine Bunce gestures at a list of names and room numbers on the computer screen in her office, pointing out one this week," she says. "There could be something wrong, like an infection, so I'll talk to his carers this morning and see whether we need to call the GP."

She can chart Derek's night-time activity on a computer dashboard thanks to an infrared and acoustic monitor in his room that detects his movements. The device, called Ally Cares, uses artificial intelligence (AI) to learn his behavioural patterns, and alerts staff to anything unusual, such as if he uses the lavatory more frequently or is restless.

This is just one of the new AI and smart technology systems coming to care homes around the country. Others include devices that predict and prevent falls, adjust air quality, detect when someone with dementia is in pain – even monitor how regularly staff sanitise their hands.

Bunce oversees the welfare of 73 residents, about half of whom have dementia, at the upmarket KYN Bickley care home in Bromley, southeast London, where room-only full-board costs £1,650 to £2,128 per week and care packages start at £250 per week. Having spent three decades working in elderly care before starting her job here last year, she believes smart tech and AI will "genuinely homes around the country. Others include devices that predict and prevent falls, adjust air quality, detect when someone with dementia is in pain – even monitor how regularly staff sanitise their hands.

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Christine Bunce, manager of the KYN care home in southeast London, where AI is used to monitor the health of elderly residents.

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Staff at KYN are also using an AI app called PainChek, developed from an idea by Professor Jeff Hughes at the School of Pharmacy at Curtin University in Western Australia. The app uses the camera on an ordinary smartphone or tablet to scan faces for tiny changes called micro-expressions to detect pain in non-verbal residents, including those living with advanced dementia. The company does not disclose the cost as it varies from home to home, but one Canadian evaluation of the technology said it was typically \$50 (Canadian dollars – about £28) per bed per year.

Multiple studies, including by the Picker Institute, a care research charity, have shown that up to four in five care home residents experience pain but are unable to communicate fully.

"People living with dementia might express pain through a distressed reaction or behaviour," says Emma Hewat, director of dementia care at KYN. "It's not 'just' their dementia – we have to understand triggers and causes of behaviour, including pain, which we can then manage."

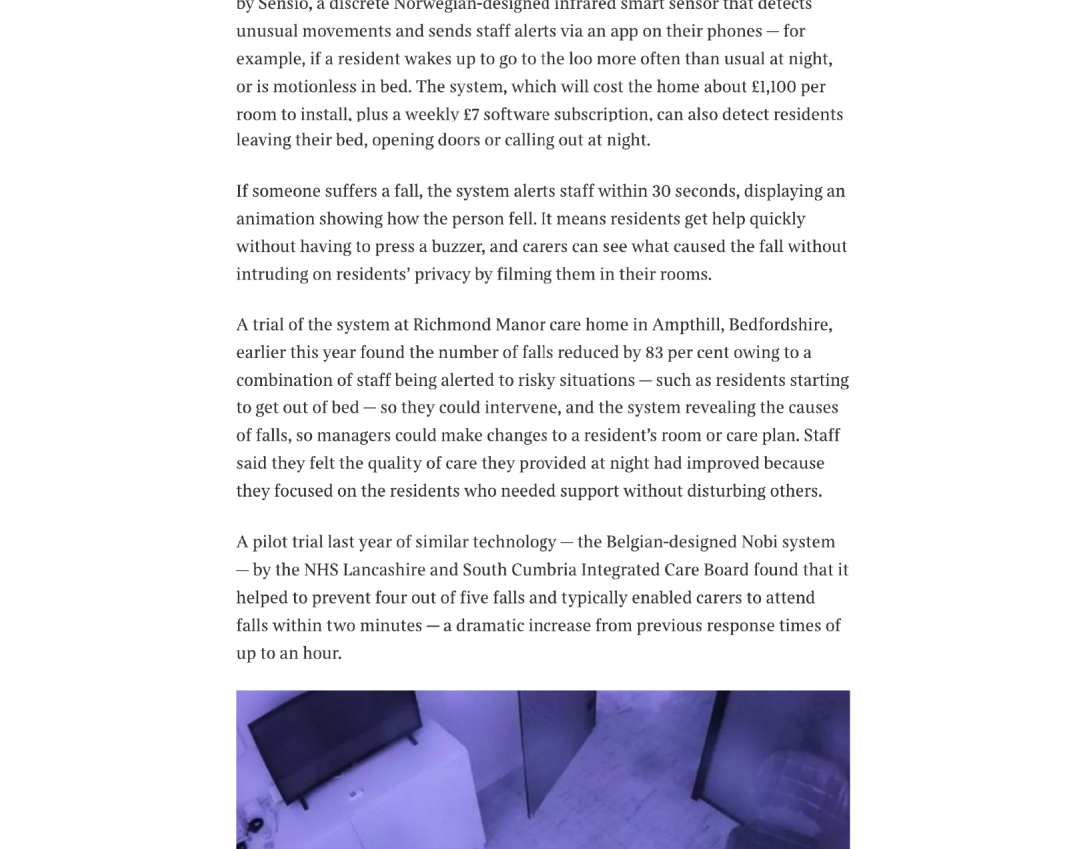
Traditionally, care staff have relied on a standardised printed checklist called the Abbey Pain Scale to assess pain levels. This asks the carer to mark the patient on a rising numeric scale across a series of observable signs, such as "vocalisation – eg whispering, groaning, crying" and "change in body language – eg fidgeting, rocking, guarding part of body, withdrawn". But this was heavily subjective and often used ineffectively as a "tick-box exercise", Hewat says. "I might look at you and decide you look like you're in pain, but someone else might assess you differently."

Staff also use PainChek at Loveday Abbey Road, a private members' club-style nursing home in London with joining fees of £2,000 and care packages from £3,000 per week. The general manager, Izabela Klaczekiewicz, says PainChek minimises the risk of subjectivity because it always assesses residents by the same standards, regardless of which staff member uses it.

One of the people under her care is the former easyJet CEO Ray Webster, 78, who was diagnosed with Alzheimer's in 2021 and moved into care from his home in Hampstead last autumn. His wife of 36 years, Brigitte Piroulas-Webster, 66, a retired business consultant, is delighted by his high-tech care. "I cared for Ray at home for four years and, from what I've experienced, if you ask him what the problem is, he can't tell you. So anything that helps the carers understand what he needs is brilliant."

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The former easyJet CEO Ray Webster lives at Loveday Abbey Road in London. His wife, Brigitte, says AI systems is reassuring

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A creaking system

Despite promises of reform over decades, Britain's adult social care system is on the brink of being overwhelmed by rising demand from a population that is growing older and sicker. The number of over-65s in the UK is expected to rise from 12 million to 20 million by 2041, with the fastest growth in the over-85s group. At the same time, average healthy life expectancy at age 60 is expected to rise from 19 to 21 years, meaning more people will live with chronic health problems. The number of people aged 65 and over with dementia is expected to rise from 1.2 million to 2.2 million by 2041. More people are needing health and care support for longer.

But the supply of care home places has not kept pace with demand, the Care Quality Commission (CQC) revealed in its latest State of Care report last month. Nearly half of all cases of bed-blocking – where patients are unable to be discharged from hospital – are now caused by waits for care beds or at-home support.

More than half of care homes are already struggling to recruit staff, according to a separate CQC report last autumn. Their ability to afford staffing costs will be hit by the rises in employer national insurance contributions and the minimum wage in the latest budget, according to Care England, which represents care home providers.

Understaffing is already affecting carers' "ability to provide safe and effective care", the CQC says. It also affects residents' quality of life, with many experiencing as little as two minutes of social interaction with staff per day.

Labour has already pledged to use AI to improve NHS services and, at a session at its latest party conference, speakers agreed technology must also form "part of the solution" in tackling the social care crisis.

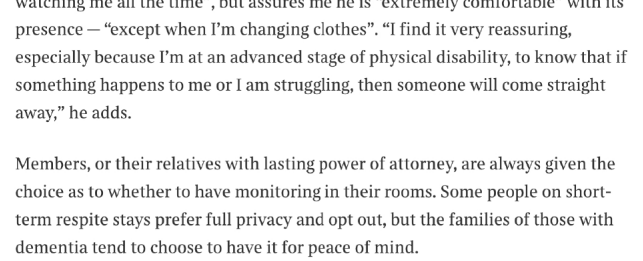
A breath of fresh air

The care home developer Peter Owen-George, 62, has spent 30 years building large care homes for private companies but became disillusioned. "There were very few I would be happy putting my mum into," he says. "These homes become huge monoliths. It is very difficult to give personalised care or understand individual needs when you have 70 residents to monitor."

Owen-George is launching a series of small, Scandinavian-inspired care homes in Cornwall, which will be heavily equipped with smart and AI tech. There is already a waiting list for the first home, Malmö St Kew, which will start construction in the New Year and is due to open next September. It will use AI and smart tech to strengthen infection control, with fees for each of its 24 bedrooms expected to cost between £1,860 and £2,300 per week.

Staff hand-sanitiser dispensers will use sensors to alert managers if they are not being used enough, while each room will have its own smart air conditioning (AC) system, bringing in fresh air from outside to limit the transfer of airborne viruses such as Covid-19. The AC units automatically detect air quality and adjust filtering levels accordingly. The home's heat-pump system will use AI to buy energy at the cheapest prices to maximise efficiency – meaning rooms are kept warm in winter and prevented from overheating in summer.

How AI can help



Graphic by The Times and Sunday Times

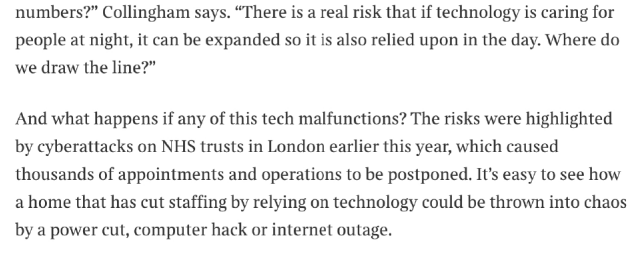
Catch a fall

Malmö is also one of the growing number of care homes using AI sensors to monitor residents in their rooms. Owen-George's preferred system is RoomMate by Unisno, a discrete Norwegian-designed infrared smart sensor that detects unusual movements and sends staff alerts via an app on their phones – for example, if a resident wakes up to go to the loo more often than usual at night, or is motionless in bed. The system, which will cost the home about £1,100 per room to install, plus a weekly £7 software subscription, can also detect residents leaving their beds, opening doors or calling out at night.

If someone suffers a fall, the system alerts staff within 30 seconds, displaying an animation showing how the person fell. It means residents get help quickly without having to press a buzzer, and carers can see what caused the fall without intruding on residents' privacy by filming them in their rooms.

A trial of the system at Richmond Manor care home in Amphilth, Bedfordshire, earlier this year found the number of falls reduced by 83 per cent owing to a combination of staff being alerted to risky situations – such as residents starting to get out of bed – so they could intervene, and the system revealing the causes of falls, so managers could make changes to a resident's room or care plan. Staff said they felt the quality of care they provided at night had improved because they focused on the residents who needed support without disturbing others.

A pilot trial last year of similar technology – the Belgian-designed Nobi system – by the NHS Lancashire and South Cumbria Integrated Care Board found that it helped to prevent four out of five falls and typically enabled carers to attend falls within two minutes – a dramatic increase from previous response times of up to an hour.



The Nobi system alerts staff to a fallen resident's body position using a stick figure

KYN Bickley's monitoring system, Ally Cares – a UK-developed product – also detects unusual movements and listens to sounds in residents' rooms, sending alerts to staff devices. It was founded and designed by Thomas Treddinnick, a former aerospace engineer turned start-up entrepreneur. Ally Cares does not disclose costs publicly, but care homes in Dorset are being offered government grants of up to £10,000 each to install the technology as part of an £8.2 million Digitising Social Care programme.

At KYN Bickley, I sit down with Daphne Duke, 99. She recently moved in from her home in Tonbridge, Kent. A grandmother and a retired secretary, she says she "hasn't noticed" any of the technology but says she feels safe here. "My favourite thing is not having to do much myself," she says. "I feel extremely well looked after."

Although KYN gets consent from residents and their families to monitor them, on a day-to-day basis most, like Daphne, forget the technology is there. With decor and plush soft furnishings by the interior designer Nina Campbell, the bedrooms feel more country-house hotel than space age. The only sign of activity from the small circular monitor above the bed is when it flashes green when staff activate it using a keypad reader by the door.

Daphne Duke in her room at KYN Bickley, a luxury care home in southeast London that uses the Ally Cares system

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Tom Kennefick-Clark, a household care lead at KYN, says the system has been particularly useful for residents such as James, 87, who has Parkinson's disease and falls frequently. "Previously, the first thing we would know about it was when we found him on the floor," he explains. "Now the team gets an alert when he's getting up, so whoever is nearest can rush to help steady him. He still has some falls but nowhere near as many – and it helps prevent serious injuries."

Ally claims it reduces bedroom falls by 63 per cent.

Kennefick-Clark still has memories of visiting his grandfather, who also had Parkinson's, in a care home and seeing him covered in bruises from falls. "This technology is so important. It's not going to completely eliminate falls but it gives us a much better chance of preventing them."

Sweet dreams

Another benefit of remote monitoring systems is they enable residents to sleep undisturbed. In traditional homes, carers must check on each resident every one to two hours – meaning they might be woken repeatedly yet problems can still be missed.

"If someone has only been checked every two hours, what's going on between those two hours?" Bunce says. "[With remote monitoring you don't] have to disturb anybody, which means people get restful nights, better sleep, better outcomes."

Shoab Ghaffar, 90, moved into Loveday Abbey Road earlier this year after his wife died and he spent time in hospital. As a retired engineer, the grandfather is fascinated by the technology in the home. Loveday uses smart acoustic monitors and video cameras in bedrooms, which send alerts to staff smartphones or tablets. It has an AI-driven lighting system that mirrors natural circadian rhythms and automatically turns on if members (as Loveday calls its residents) get up at night.

Shoab Ghaffar, 90, lives in Loveday Abbey Road care home, which uses smart acoustic monitors, video cameras and lighting

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Ghaffar jokingly refers to the monitor in his room as "Big Brother on the ceiling watching me all the time", but assures me he is "extremely comfortable" with its presence – "except when I'm changing clothes". "I find it very reassuring, especially because I'm at an advanced stage of physical disability, to know that if something happens to me or I am struggling, then someone will come straight away," he adds.

Members, or their relatives with lasting power of attorney, are always given the choice as to whether to have monitoring in their rooms. Some people on short-term respite stays prefer full privacy and opt out, but the families of those with dementia tend to choose to have it for peace of mind.

Ghaffar is particularly impressed that the lights automatically turn on when he moves to the bathroom. "These little touches are very useful, especially because I can't take my hands off the walker to turn on the switch," he explains.

Klaczekiewicz, the general manager, has really noticed the circadian lighting making a difference, compared with other homes she has worked in over a 20-year career. "It's common for people living with dementia to become agitated in the afternoon and evening, and this has been hugely beneficial in helping them to stay peaceful," she says.

"The most important thing is it doesn't feel like an institution, it's like a second home," says Ray Webster's wife, Brigitte. "The technology is very discreet, you're almost not conscious it's there, but it gives the staff time to focus on the care. I visit Ray almost every day but when I'm not there I'm relaxed, as I know that if anything happens they will pick it up straight away. It also reassures me that he is protected against any bad treatment, as the monitors also help ensure staff act appropriately."

Guinea pig grandparents

There are fears, however, that care homes are too quick to introduce technology without full consideration of the ethics. Henry Collingham, an innovation fellow at Northumbria University, is researching the impact of technology on people living with dementia. "A good way to test how ethical it is to use a technology in a care setting is to ask yourself: how would I feel about this being used in a school?" he argues. "If your child was on a school trip and there was a robot overseeing them at night, monitoring their movements and vital signs, instead of teachers going in regularly to check on them – would you be happy? What if a paediatrician relied on an app to check whether a toddler was in pain?"

"Time and again we see the way older people's lives are not valued as equal. We need to be really careful about deploying new technology on vulnerable populations and of viewing care homes as acceptable testing grounds."

He is sceptical about the ability of automated technology to interpret human responses. "You can monitor the way a face moves and a computer can attempt to allocate an emotion to that," he says. "But interpreting what drives people's behaviour is difficult even on a human-to-human level, let alone when it is done by a computer with no understanding of how every person is unique."

Cutting carers

Collingham is also concerned that more technology could result in fewer interactions between residents and carers.

"For me there are red flags around the way some of this technology is marketed to care home managers as a cost-saving measure, which almost always translates into cutting staff," he says. "Care work is already underpaid and undervalued – technology could devalue it further."

Ally, for example, estimates it frees up 30 per cent more time for carers. In an ideal world, all care homes would encourage staff to spend this extra time with residents. But in a profit-making system, where staff costs swallow up nearly 60 per cent of average care home income, it seems inevitable this will not always be the case.

At KYN Bickley, Bunce is adamant that high staffing levels will be maintained – averaging a 1:3 care assistant-to-resident ratio, compared with an industry average of 1:5 to 1:7. She says, however, that she knows of at least one UK care provider that used the technology purely as "a cost-saving exercise". "They cut their staff to the bare minimum [The home] was a ghost town with residents just sitting in their rooms."

There is no legal minimum staff-to-resident ratio for care homes – and there has been no update to factor in the rapid growth in monitoring technology. The CQC says "providers must deploy sufficient numbers of suitably qualified, competent, skilled and experienced staff to ... meet people's care and treatment needs". Its latest report revealed that carers describe being "overworked, exhausted and stressed". Some care home owners are bound to turn to technology to solve these problems.

"If AI increases efficiency, managers have a choice: do they allow their staff to spend more time with residents, or do they lower their costs and cut staff numbers?" Collingham says. "There is a real risk that if technology is caring for people at night, it can be expanded so it is also relied upon in the day. Where do we draw the line?"

And what happens if any of this tech malfunctions? The risks were highlighted by cyberattacks on NHS trusts in London earlier this year, which caused thousands of appointments and operations to be postponed. It's easy to see how a home that has cut staffing by relying on technology could be thrown into chaos by a power cut, computer hack or internet outage.

Then there is the question of a digital divide in care. Although various NHS trusts and local authorities nationwide have trialled different technologies, it is typically only higher-end private homes that can afford to roll them out on a grand scale. That includes luxury homes such as KYN Bickley, which now has a sister home, KYN Hurlingham, in Fulham, west London, where a room and basic care package costs from £3,350.

Collingham believes AI has its place and should be used to help alleviate the burden of bureaucracy on carers, who spend much of their time doing paperwork. "This is an unregulated field where companies can market technology to profit-making group owners with the promise that it can ultimately replace face-to-face care," he says.

"But when someone with dementia is distressed, there is simply no substitute for holding their hand."

Some names have been changed