



East Midlands Research into Ageing Network (EMRAN) Discussion Paper Series

ISSN [2059-3341]

Issue 41, June 2021

A Quality Improvement Collaborative focussed on safety in care homes in the East Midlands: Lessons learned and possible models for scale-up

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East Midlands Research into Ageing Network (EMRAN) is a research collaboration across the East Midlands to facilitate applied research into ageing and the care of older people. EMRAN was set up with support from National Institute of Health Research Applied Research Collaboration East Midlands (NIHR ARC-EM)

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EXECUTIVE SUMMARY

Care homes provide care for around 420,000 older people with disability and physical dependency in England. National initiatives are underway to improve healthcare delivery to the sector but do not address safety issues associated with adverse care events in care homes. These events include pressure ulceration, falls, dehydration, malnutrition and inadequate pain management.

The Landelijke Prevalentiemeting Zorgkwaliteit (LPZ) is an international benchmarking initiative that uses robust data collection approaches in care homes to identify targets for improvement across multiple European countries. In the East Midlands we used this as the basis of a Quality Improvement Collaborative which met three times a year, and used benchmarking data, alongside training in Quality Improvement (QI) and care competencies, to enable care homes to lead and develop their own improvement plans. We found evidence of improvements in pressure care, falls, nutrition, hydration and pain management. In addition, we developed a group of QI-enabled care homes, who began to take increased ownership of the collaborative. This provided the basis for development of educational interventions for care homes and also acted as a foundation to introduce new improvement initiatives to the sector in a way which aligned with existing priorities for care home organisations and staff.

Costs of such an approach are provided towards the end of this paper – the costs of running LPZ at a national level would be between £3.3m and £5.6m depending on the model avoided. There is evidence that LPZ is associated with a fall in incidence of pressure ulcers amongst homes which are recurrent participants, such that related savings to the NHS would be in the region of £207.56 per resident, equating to £87.2M across the 420,000 care home residents in England with respect to this condition alone. When other potential benefits are taken account including improvements in other conditions, improved staff training and wellbeing with reduced staff turnover, the return on investment is likely to be considerable.

The COVID-19 pandemic has exposed the need for more collaborative working between the NHS and care home providers. There is an increasingly recognised moral imperative to do more for people with frailty and disability living in care homes. The learning from the LPZ initiative in the East Midlands provides a basis for collaborative working around quality improvement, focussing on avoidable harms, to build resilience in the care home sector that could be scaled up nationally.

KEY POINTS

- The LPZ initiative in the East Midlands formed the basis of a Quality Improvement Collaborative, growing to include 62 care homes and 1941 residents between 2015 and 2019.
- Care home staff used a benchmarking audit to identify targets for change, and then implemented PDSA (Plan-Do-Study-Act) cycles using supplementary data to support measurement for change.

- The initiative developed QI capacity within the care home sector, formed the basis for educational interventions, and provided a scaffold upon which subsequent improvement initiatives could be built
- Case reports demonstrated impact on nutrition, pressure ulceration and falls in participating care homes.
- If such benefits were realised at scale, it is likely that the costs of implementing such a model nationally, outlined in this paper, would be offset by reduction of adverse safety events in care homes which are associated with costs to the NHS.
- Pressure ulcer rates dropped in participating care homes, which equates to significant savings for the NHS.
- If such benefits were realised at scale, it is likely that the costs of implementing such a model nationally, outlined in this paper, would be offset by reduction of adverse safety events in care homes which are associated with costs to the NHS

INTRODUCTION

Care homes are home to some 420,000 people across England. These people are either older people who live with frailty and disability, or people with learning disabilities and long term care needs. These groups are often considered separately, as each has slightly different requirements. This paper focusses on work undertaken to lead quality improvement in care homes which provide care for older people, although it's likely that many of the lessons learned could be applied across the entire care home sector.

The average age of older people living in care homes is 85 years, and this is a group affected by disability, physical frailty and cognitive impairment[1]. Many are in the last two years of life[2,3]. The care needs of residents are complex[4]. Because of their clinical vulnerability, care home residents are at high risk of preventable adverse events including pressure ulceration[5], falls[6], malnutrition[7] and dehydration[8].

Enhanced Health in Care Homes (EHCH)[9] was introduced by NHS England prior to the COVID-19 pandemic to deliver more co-ordinated healthcare to care home residents. Aspects of its roll-out accelerated during the pandemic[10]. EHCH envisages closer working between NHS and care home staff, with dedicated GP support and regular multidisciplinary team meetings taking advantage of NHS nursing and allied health professional expertise. Much day-to-day care will, however, continue to be delivered by care home staff and there is no provision in EHCH for quality improvement around preventable resident safety events occurring in care homes. It has been learnt that top-down, or in-reach, initiatives led by the NHS are an ineffective way to identify a focus for, and deliver, improvement in care homes, because they tend to insufficiently recognise and empower the expertise of care home staff about where issues lie, and how they can be improved[11,12].

The care home sector is a semi-regulated market, with lots of scope for individual provider organisations to impose different models of working[13]. Whilst this has the advantage of enabling consumer choice, it challenges attempts to work with or across care homes in a standardised way[14]. For example, a particular challenge which has come to the fore during the pandemic has been the different ways in which care homes collect, collate and share data, which has hampered systematic responses around healthcare working in collaboration with the NHS[15,16].

As we emerge from COVID-19, there is renewed interest across health and social care sectors in delivering high quality care in care homes. From the perspective of avoidable resident safety events, in order to achieve this we will need to support care home staff to lead quality assurance and improvements for themselves, and to establish a common language around safety that will enable us to understand and work with individual care homes to develop and support high standards[11,12]. This will help to build resilience in the sector against future large scale events, such as pandemics or other crises, which could reproduced the adverse conditions seen during the early part of the COVID pandemic.

This paper reports an initiative which ran in the East Midlands of England between 2015 and 2019 to establish a Quality Improvement Collaborative which grew to involve 62 care homes and 1941 residents. It used a standardised approach to data collection, collation and reporting to enable care homes to compare and learn from each other's practices using a shared vocabulary. The approach was based upon a European initiative which started in the Netherlands, called the Landelijke Prevalentiemeting Zorgkwaliteit[17–19]. In the Midlands we simply called it “the LPZ”.

The purpose of this paper is to describe how the LPZ evolved over 5 years, and the ways in which it enabled care homes to understand and improve their practice. We consider how the learning from this work might be used as part of national initiatives to minimise avoidable safety events in care homes after the pandemic. We present some practical proposals as a way of taking this work forward at scale, including indicative costs that could form the basis of business planning. The paper is aimed at policymakers, leaders, commissioners and managers who we believe are now looking for quality improvement solutions that have been shown to work in the care home space.

THE LPZ – ITS HISTORY IN THE UK

The LPZ in the UK was commissioned in 2014 as a programme of work by the East Midlands Academic Health Sciences Network Patient Safety Collaborative. This was part of an initiative to support safety in care homes[19] and the initial focus was on describing and quantifying avoidable safety risks for residents. Stakeholder engagement interviews highlighted particular concerns around pressure ulceration, falls, nutrition, hydration, polypharmacy and pain management[19]. In searching for an evidence-based way to quantify these harms across the East Midlands, we identified the Landelijke Prevalentiemeting Zorgkwaliteit (LPZ) as a way of doing so.

LPZ is a benchmarking approach, used in the Netherlands, Austria, Switzerland and Turkey, which uses counts of both avoidable harms and the measures in place to mitigate against these to focus providers on areas where improvement is needed[17,20]. In participating countries it runs once yearly, with providers working between times to improve practice around areas of concern identified in their metrics. The benchmarking takes the form of a once yearly audit, which includes a review of both resident care records, and an examination of the resident during routine care. The audit covers pressure injury, falls, hydration and nutrition, continence, pain and restraint. Data are entered using an online portal and care homes can then review their results within two weeks using a web-based dashboard, which presents their own results benchmarked against peer institutions in the host country. The work is co-ordinated by an international scientific committee led by a team of researchers at the University of Maastricht, with data processing conducted by a not-for-profit social enterprise, called Flycatcher, which was established by the University of Maastricht.

The initial focus of using LPZ in the UK was simply to quantify the extent of common care problems that might form the basis of avoidable harm to residents, to guide future initiatives by the Patient Safety Collaborative within the East Midland[19]. The first audit took place in November 2015, with

care homes receiving their data that month. For the first year, because we had no precedent of conducting the audit with care homes and were uncertain about uptake, we focussed on two modules – pressure ulceration and incontinence. We chose these because pressure ulceration had been identified as a particular area of avoidable harm by care home staff and because continence management and pressure care are inextricably linked[21,22]. Shortly afterwards, care homes asked the team for guidance on how to use the data they had collected to improve care. Working with the care home managers and staff, we identified training needs around both Quality Improvement skills and topic expertise. Taking account of these, an approach to using the LPZ evolved which combined training workshops with audit days, as summarised in Table 1. Care homes asked to repeat the audit the following year, and to include all modules, such were the insights they had gained into their practice through the first year of work.

Table 1 - the annual LPZ event cycle

Event	Month	Focus
LPZ audit training event	September	• Technical aspects of data entry • Practical learning from previous years' audits • An outline of Plan-Do-Study-Act cycles and how data will support these.
LPZ audit	November	• 2 week window during which homes undertake audit on as many residents as possible
LPZ feedback and improvement planning event (incorporating LPZ awards)	February following year	• Homes attend with their own data • Workshops with topic experts tissue viability, falls, continence and geriatric medicine to help develop improvement plans • Home leave with PDSA plans to focus on a topic of concern • Care homes that have made particular progress in the last year are recognised by receipt of an NHS award (trophy and certificate; coverage in local media)
LPZ special focus event	May/June following year	• Specific meeting focussing on a challenge raised by care homes that year – e.g. identifying and responding to deterioration, managing falls. Aligned to strategic focus of the Patient Safety Collaborative.

In further response to suggestions from care home staff, we produced accessible infographics summarising the results of each annual audit (Appendix 1 for example); and individual care home information packs, which were issued at the February feedback and improvement events to provide a tangible focus for discussions. We also instituted, from 2018 onwards, the “LPZ awards” which recognised individual care homes that were able to evidence having led an improvement programme with impact on resident outcomes in the previous year. These worked on the basis of self-nomination, with an independent judging panel working to determine which care home should receive an award in each category. After each passing year, we were encouraged by care home participants to continue the work and, encouraged by all that we were learning about how to work with the sector, we did so.

This evolving community of practice grew to take on many aspects of a Quality Improvement Collaborative (QIC), namely: (i) focus on a specified topic, (ii) support by clinical and quality improvement experts, (iii) participation by multiple professionals across organisations and (iv) use of an improvement model (setting targets, collecting data and testing changes)[23]. This was by evolution, rather than design, but it represented a significant advancement of the LPZ model in the East Midlands beyond what had been developed in other European countries, where it was used primarily as a benchmarking tool.

QICs are relatively data hungry and the requirements of ongoing improvement work were not able to be met by once annual audit. To this end, care homes developed their own measurement plans, driven by Plan-Do-Study-Act (PDSA) cycles, using either subcomponents of the LPZ benchmarking audit, or other outcome measures that met their needs, e.g. the use of a falls safety cross[24] as part of falls prevention work, or regular recording of food intake as part of attempts to improve nutrition.

QICs are dependent upon ground-rules to ensure that members approaching the work from different perspectives are able to unite around a common focus of interest[12]. For the LPZ in East Midlands, these were as follows:

- Data are collected for care homes, by care homes; they are not for regulation or performance management; they will not be shared with external agencies.
- Improvement plans come from the care homes, and are facilitated by external experts, the primary concern is that they should align with priorities of care home residents and staff, rather than external agencies.
- Collaborative meetings will follow the principles of appreciative enquiry, as outlined in the MyHomeLife Caring Conversations Framework[25], which states that participants should:
 - Be courageous
 - Connect emotionally
 - Be curious
 - Consider other perspectives
 - Collaborate

- Compromise
- Celebrate
- Everything should focus around the care home's data and experience, and be practically oriented to solve "real world" problems. Hospital-based examples, or teaching in the abstract, is to be avoided.

The last of these ground rules illustrates important learning from year 2 of LPZ, when we attempted to initiate a Quality Improvement workshop for care homes participating in the LPZ. This was led by an external training agency, used hospital exemplars for improvement, and was very poorly received by care home staff with several leaving halfway through the day. We did not repeat this approach again.

We saw increased uptake of LPZ year on year, as illustrated in Figure 1 and 2. This took place largely through word of mouth spreading through the care home sector, and through communication with NHS and social care staff supporting the care home sector who had become aware of the initiative through our workshop events. At no point did the Patient Safety Collaborative specifically recruit care homes into the LPZ network. In many ways this acted as a social movement – an approach which has previously been shown to work well when building collaborations with and within the care home sector[26]. Not all homes returned for more than one year, but 21 care homes did remain with the programme throughout its duration.

Figure 1 Care home participation in LPZ (2015-2019)

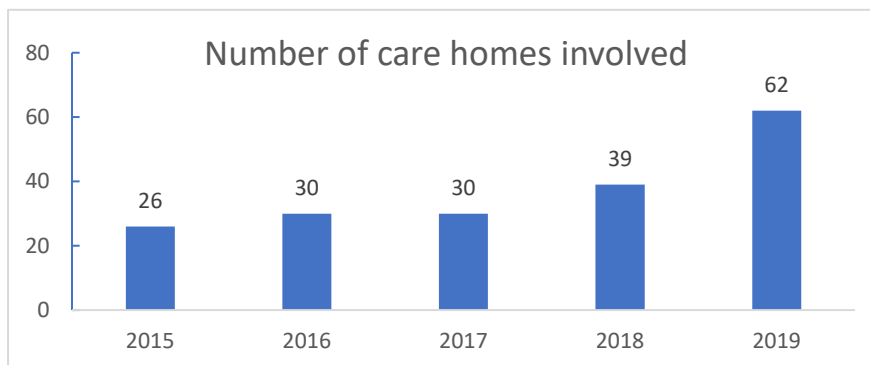
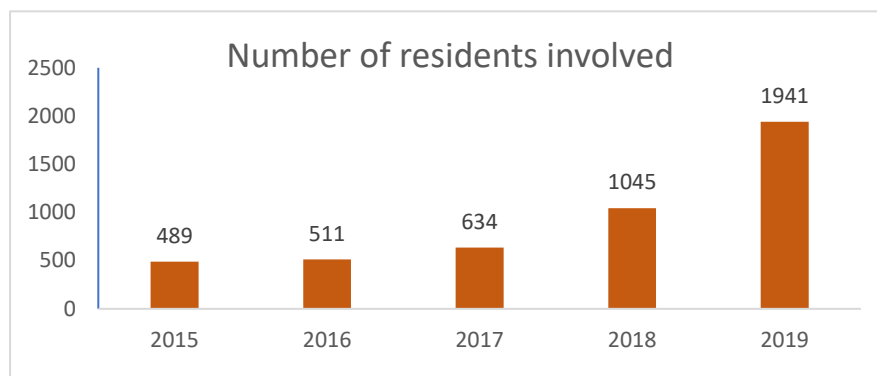


Figure 2 Number of residents audited within LPZ (2015-2019)



The work was funded in its entirety by the East Midlands Academic Health Sciences Network Patient Safety Collaborative. Care homes were not charged a fee for participation. The costs to the Patient Safety collaborative consisted of a per home analysis fee, paid to Flycatcher, staff time and the running costs for the workshop events. At the end of 2019 there was considerable appetite amongst participating homes to continue, as there had been throughout the initiative, but the intervening COVID-19 pandemic prohibited further audit, and changing national priorities for Patient Safety Collaboratives as of 2021 meant that it was no longer feasible to fund the annual audit or workshops at a regional level as part of this programme of work. Regular “virtual-LPZ” workshops, run once quarterly, sustained the community of practice through the pandemic, and the LPZ participant homes now form the core of future initiatives around patient safety in care homes in the East Midlands.

LPZ – EVIDENCE OF BENEFIT

Benefits around LPZ were identified around:

- Building a culture of improvement in care homes
- Developing a scaffold around which new collaborative initiatives could be built
- Enabling individual care homes to drive up standards.

Building a culture of improvement in care homes

There is a rich tradition in the nursing literature of participatory approaches to research and improvement within care homes. These include action research and appreciative inquiry based approaches to innovation and improvement. Structured approaches to quality improvement, of the sort that are now widely established among healthcare providers, are however new to care homes. At the beginning of this project many of the care homes were put-off by the idea of “quality improvement”. Several told us that the implicit message was that quality of care must be bad if it required improvement. In addition, the idea of using data to understand and change practice was anathema to most involved.

This uncertainty about improvement science and the role of data is not unique to care home staff but it reflects what has been reported in other care home improvement projects[11,12]. With time, though, care homes became much more comfortable with the process. From year 3 onwards, care home representatives led sessions at the February results meetings where they shared what they had learned from their benchmarking data, and how they had used this to identify priorities for change and develop PDSA cycles. As we closed the LPZ project in 2019, one of our managers conveyed this sentiment in email:

“The thing about LPZ was that it gave us our own evidence, and that it gave us control over what we were doing. Other improvement projects, where people come in and tell us what good looks like, they don’t give us that same control over how things are going to change in the home.”

LPZ acted as platform whereby a number of specific training materials were developed in conjunction with care homes. These were:

- React to Red: <https://www.reactto.co.uk/resources/react-to-red/>
- React to Moisture: <https://www.reactto.co.uk/resources/react-to-moisture/>
- React to Falls: <https://www.reactto.co.uk/resources/react-to-falls/>
- React to Dementia: <https://www.reactto.co.uk/resources/react-to-dementia/>

The first two of these resources, focussing on pressure ulcers and moisture lesions, were led by clinicians and the third, related to falls, was led by a team of clinical academics at the University of Nottingham. But with each development the level of input and control over content by care home staff increased to the point that React to Dementia was proposed, led and co-ordinated by care home managers, with clinical and academic experts providing technical input only. Empowered by this transition of power, care home managers, working with the LPZ team, suggested that we nominate the initiative for a National Patient Safety Award in 2019 for Education and Training. The LPZ initiative won on the basis of the inputs of care home managers, who attended judging meetings with members of the Patient Safety Collaborative team. Two care home managers stood side-by-side with the Patient Safety Collaborative team as they received the award.

Developing a scaffold around which new collaborative initiatives could be built

In 2018, the Patient Safety Collaborative were tasked with undertaking work around identification and management of deterioration in care homes. This is a challenging area, where novel programmes are overlaid on existing care home practices, which vary widely depending on available resource and, particularly, staff training. There is some contention as to what represents gold-standard practice[27]. Working to the principles of collaborative working with care homes already described above, the LPZ collaborative set out to establish a baseline of current practice and then use this as basis of future improvement work.

We attached an additional module, on deterioration, to the LPZ benchmarking audit for 2018, working with the LPZ co-ordinating team in Maastricht to develop an online questionnaire and feedback module. We used this with 15 volunteer care homes which were already taking part in the annual East Midlands Prevalence of Care Problems benchmarking audit[28]. Participants were asked four categorical response and six open answer questions covering recognition of deterioration, use of external agencies and communication protocols. We found wide variation in practice. 4/15 homes used the National Early Warning Score (NEWS). One home was piloting the second version of NEWS (NEWS-2) in addition to using NEWS. 2/15 homes used an in-house sepsis screening tool and one home used the Modified Early Warning Score (MEWS) to identify deterioration. 8/15 had no specific tool in place for identifying deterioration. 2/15 and 4/15 homes used the Situation-Background-Assessment-Recommendation (SBAR) and Concern-Action-Response-Examination-Shared Information (CARES) tools respectively when communicating with external agencies. The remainder of homes did not structure their communication using a tool. In free text comments, 5/15 care homes requested further training in identifying and communicating acute deterioration.

In 2019, we followed this process with a May special focus event on deterioration, where we used the findings as a basis of soliciting opinions and ideas from care homes about what could and should be done around identifying deterioration in care homes. Findings from this workshop have gone on to inform how the Patient Safety Collaborative in the East Midlands have approached deterioration since, including the successful roll-out of the RESTORE-2[29] and COVID oximetry at home[30] programmes in care homes across the region during the COVID-19 pandemic. We could not have progressed this work as effectively without the network and relationships already in place through LPZ.

Enabling individual care homes to drive up standards

We collected, over the five-year period, case studies from several care homes about how participation in LPZ had enabled them to improve care. Three exemplars, produced by the care homes and focussing on topics of nutrition, pressure ulceration and falls are outlined in appendix 2.

HOW MIGHT LESSONS FROM THE LPZ BE USED AS PART OF NATIONAL PROGRAMMES TO SUPPORT PATIENT SAFETY IN CARE HOMES?

The LPZ initiative in the East Midlands is, at the point of completion, the most sustained and widely subscribed care home improvement initiative focussing around healthcare safety issues in UK care homes. The only other initiative which has reported similar success is the PROSPER project in Essex, which has focussed primarily around day-to-day care in care homes and not on avoidable harm[31,32]. PROSPER has a number of methodological similarities to the LPZ in terms of its bottom-up approach, and enabling care home leadership through developing both technical and quality improvement competencies[11].

Evidence from multiple research studies[11,12,14,33,34] suggests that it is unlikely that NHS-mandated, funded and delivered improvement initiatives, such as EHCH, will do much to change the behaviour of care home staff. This is because, whilst incentives, targets and structures are a reliable way of changing the behaviour of NHS staff (albeit not always in predictable ways), care home organisations and staff are not directly commissioned and funded by the NHS and may have priorities or ambitions that do not fully align with the intention of healthcare commissioners.[34] Even social care commissioning has limited ability to modify care approaches across care homes, given that a majority of residents currently self-fund. Therefore if significant and sustainable changes are to be made to the NHS then discrete improvement initiatives focussing around quality of care in care homes will be required.

Care homes experience substantial variability and the experience from our own work reported here matches four “lessons learnt” across 6 improvement collaboratives run in care homes, five in the UK and 1 in the Netherlands, outlined in Box 1[11].

1. Data are not always readily available in the care home sector; thus, sufficient resources are needed to support collaborative teams with:
 - a. Collecting the data needed to test the impact of change. Data collection burden could be reduced by identifying ways that data collection might be incorporated into care home routine practice in an intuitive way (e.g., the Falls Safety Cross approach).
 - b. Processing and interpreting data. Ensure data are presented in an accessible way, particularly for those who have not previously used data to evaluate change.
2. Make a conscious effort to create an encouraging and safe environment where collaborative members feel valued, connections are built in and across collaborative teams, and any perceived hierarchies between care home and healthcare staff are minimised. The following techniques help: (i) use appreciative language, (ii) celebrate achievement, (iii) facilitate ice-breaker activities, (iv) set ground rules, (v) reimburse care home staff time, and (vi) carry out small gestures, e.g., high quality catering at collaborative shared learning events.
3. Recruit collaborative teams and QIC lead/facilitators who have established and longstanding relationships, as these relationships are particularly important in enabling faster progress with QI in care homes.
4. People living in care homes receive input from multiple professionals employed across a mix of organisations. For this reason, lines of responsibility may be unclear, and there may be differences in what is considered a priority. Regularly check project ideas are agreed by team members to be: (i) within their job role and responsibility and (ii) a local priority.

Box 1 - Lessons Learnt from Six Quality Improvement Collaboratives working in Care Homes, adapted from Devi et al[11]

Through LPZ we’ve learned to:

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- Use the data from annual benchmarking as the basis for measurement for change, and to use supplementary metrics where useful.
- Provide care homes with data in a way they can easily use. This comes in part through the pre-existing LPZ data and in part through infographics and information packs that they find easy to use.
- Build a safe environment where collaboration can take place, giving care homes ownership and leadership of the improvement agenda.

It's worth noting that, at the time of writing, there is no standardised approach to care home data across the UK that could enable care homes to collect and share data about avoidable harms to residents in the way that the LPZ enables[16,35,36]. There may be opportunities to change this, as part of national initiatives to develop minimum datasets for care homes in the wake of the COVID-19 pandemic, but the LPZ is unique at present in having an established and validated "off the peg" approach to collation and comparison of data between care homes. We have, hitherto, compensated for the lack of any measurement for change module within the LPZ by supporting care homes to develop their own metrics, some derived from the LPZ, to support PDSA cycles but there is potential to build measurement for change modules into future iterations of the tool.

We propose that a quality improvement infrastructure, with a measurement component, is required to compliment Enhanced Health in Care Homes across England. This will:

- Improve networking between NHS organisations and care homes.
- Enable reliable metrics on quality of care in care homes to be compiled and shared.
- Empower care homes to drive up quality for themselves.
- Improve patient care and patient safety.
- Drive down costs associated with avoidable patient safety events for both care homes and NHS providers.

Financial benefits are harder to quantify and remain, at best, speculative. Due to the frequency and size of measurements with the LPZ project in East Midlands, analyses have not been adequately powered to detect differences in care problems over time in such a way that cost-benefit could be reasonably established. It is, though, worth noting the following:

- Pressure ulceration currently costs the NHS £511M per year [37]
- Falls in current cost the NHS £2.3 billion per year [38]
- Care home admissions to hospital, for all causes, are estimated to currently cost the NHS between £1.5 and £3.4 billion per year[33,39]

Even minor shifts in the incidence of any of these could result in substantial organisational savings, which could offset the cost of establishing a robust approach to improvement in care homes. An important consideration alongside the moral imperative to deliver high quality and safe care.

An outline cost model for scaling up LPZ

There are a number of ways undertaking such a programme of work taking account of the lessons learnt in the East Midlands. But we propose here, how the LPZ could be used as the foundation for such an initiative.

Undertaking LPZ at scale and pace across multiple parts of England would require a change to the model deployed in the East Midlands to take account of resident and care home numbers, namely:

- Establishing a licensing agreement with the LPZ international steering group in Maastricht, so that data analysis could be supported by the NHS in-house, rather than buying analytical time from the Flycatcher institute in Maastricht.
- Dedicating sufficient NHS analyst time to support the LPZ in England.
- Using regional infrastructure, either through the Patient Safety Collaboratives, or NHSEI to replicate the LPZ QIC model delivered over the last five years in East Midlands.

Discussions with the LPZ team in Maastricht have indicated that they are receptive to the idea of licensing the LPZ technology, indeed licensing is the only option for scaling up across multiple parts of England since they have limited capacity to support rapid scale-up within their own team. They have not, though, been able to provide us with a cost of a license hitherto, and so this remains an uncertainty.

We have produced a detailed costing model taking account of all costs and overheads apart from the licensing fee, and produced two exemplars, one based around roll-out using the 15 Patient Safety Collaboratives (Table 3) and the other using the 7 NHSEI regions (Table 4). Salary costings are based upon NHS Agenda for Change and BMA consultant salary rates, correct at the time of going to press. A full Microsoft Excel costing model is available on request. All of these costs are based upon full national roll-out across England within 2 years. For each model we have proposed costs for a central co-ordinating unit to ensure consistency of approach around the country, and regional teams to work directly with care homes to establish improvement collaboratives on the ground. Costs to maintain academic oversight and links with the LPZ International Research Group in Maastricht are included as these are modest and we believe these components have been important in terms of the success of the LPZ to date. Costs are scalable if more modest ambitions in terms of roll-out were desired.

Table 2 - Costings for LPZ roll out across 15000 care homes over 2 years - using 15 Patient Safety Collaboratives (*WTE is Whole Time Equivalent)

Component	WTE*	Salary costs	Inc overheads
Estimate of central project team			
National Programme Manager (band 8b)	1	£106,336	£152,060
Travel costs		£12,000	£12,000
Clinical Lead - National consultant lead for LPZ (1 PA per week)		£41,237	£41,237
Academic supervision (built into clinical lead)		£0	£0
International travel costs		£2,000	£2,000
Care home representative		£3,328	£3,328.00
Lead Analyst (band 7)	1	£83,446	£119,328
Senior Information Analyst (band 6)	1	£67,558	£96,608
Training video development		£12,181	£17,418
Helpdesk (band 4)	1	£48,314	£69,089
Total central project team		£376,399	£513,068
Estimate for AHSN project team			
Regional lead (Improvement and Clinical) (band 8a)	1	£91,506	£130,854
Travel costs		£4,200	£4,200
Project Manager (band 7)	0.6	£50,068	£71,597
Admin support & local helpdesk (band 4)	1	£48,314	£69,089
Comms		£16,689	£23,866
PPI involvement in Steering Group		£5,180	£5,180
Regional workshop event (2/yr)		£33,600	£33,600
Cost per region		£249,557	£338,385
For all regions		£3,743,355	£5,075,775
Total project cost		£4,119,754	£5,588,843

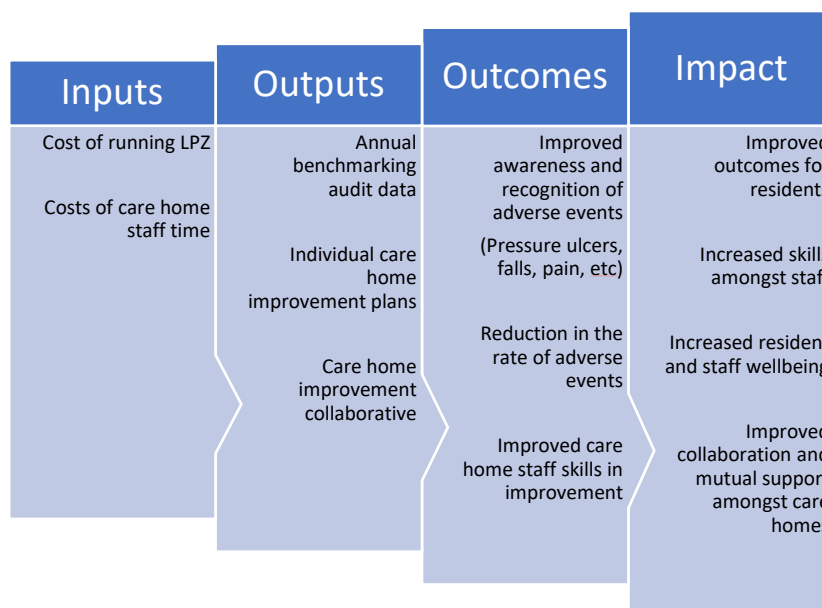
Table 3 - Costings for rolling LPZ out over 15000 care homes over 2 years - using 7 NHSEI regions

Component	WTE	Salary costs	Inc overheads
Estimate of central project team			
National Programme Manager (band 8b)	1	£106,336	£152,060
Travel costs		£12,000	£12,000
Clinical Lead - National consultant lead for LPZ (1 PA per week)		£41,237	£41,237
Academic supervision (built into clinical lead)		£0	£0
International travel costs		£2,000	£2,000
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Helpdesk (band 4)	1	£48,314	£69,089
Total central project team		£376,399	£513,068
Estimate for regional project team			
Regional lead (Improvement and Clinical) (band 8a)	1	£91,506	£130,854
Travel costs		£6,000	£6,000
Project Manager (band 7)	0.6	£83,446	£119,328
Admin support & local helpdesk (band 4)	1	£48,314	£69,089
Comms		£27,120	£38,782
PPI involvement in Steering Group		£5,180	£5,180
Regional workshop event (2/yr)		£33,600	£33,600
Cost per region		£295,166	£402,832
For all regions		£2,066,162	£2,819,824
Total project cost		£2,442,561	£3,332,892

Return on investment

A detailed Return on Investment calculation is beyond the scope of this work. However, exploratory analyses suggest that savings associated with implementing LPZ at scale and pace could be substantial. A theory of change, highlighting the mechanisms of likely impact is shown in Figure 3.

Figure 3 Theory of Change for LPZ UK



Based upon this theory of change, the most straightforward outcome to interpret is impact on pressure ulceration. This is because this is based on direct inspection as part of the LPZ audit. Falls prevalence, and pain prevalence, might be expected to rise as a consequence of improved recognition and documentation, or fall as a consequence of reduction in prevalence. Pressure ulceration is a source of considerable cost to the NHS, costing an estimated £51m per year[40].

Considering pressure ulceration, between 2016 and 2019 the percentage prevalence of residents with pressure ulcers in UK participant homes fell from 7.2 (5.1-9.8) to 3.1 (1.8-5.1) for homes who participated across all five years. The number of pressure ulcers in returning homes in 2015 and 2019 are outlined in table 5 with management costs and cost savings calculated using published data[41]. The number of residents with multiple ulcers was substantially higher in 2015, with associated costs. If these findings were replicated across the 420,000 residents across UK care homes the cost savings to the NHS would be in the region of £87.2m.

Table 4 - Cost savings related to pressure ulcers across returning care homes in LPZ UK

Pressure ulcer category	Numbers of pressure ulcers		Costs of managing pressure ulcers (£)		Cost per resident (£)		Cost saving per resident (£)
	2016	2019	2016	2019	2016 (n=606)	2019 (n=533)	
Overall	50	16	202832	67770	334.70	127.14	207.56
Category 1	17	7	18088	7448	29.85	13.97	15.88
Category 2	25	3	110050	13206	181.60	24.77	156.83
Category 3	3	5	21939	36565	36.20	68.60	-32.40
Category 4	5	1	52755	10551	87.05	19.79	67.26

Further impact might be recognised by considering principles of social return on investment. Not only would we expect cost benefits from improvements in other health conditions, such as falls and injuries, the other most obvious area in which LPZ might impact, based upon the driver diagram is in improved training of care home staff, and potential improved retention and reduced turnover in care home staff as a consequence. There is potential to establish much more extensive health and social care return on investment data as part of any future roll-out, which could include data on health and/or social care-related quality of life, where the programme might be expected to have impact.

CONCLUSIONS

Our recently concluded programme of work, implementing the LPZ as part of a quality improvement collaborative for care homes focussing on patient safety in the East Midlands has illustrated the potential of working collaboratively to empower care homes to lead change around safety. The examples provided illustrate how a similar initiative conducted at scale across England could result in substantial improvements in care around pressure ulceration, falls, hydration, nutrition and pain management. In addition, such an initiative would enable the care home sector to lead the patient safety agenda, so that issues addressed truly meet the need of provider organisations and the residents they care for. The learning from this project could be taken, adapted and used as the basis of new improvement initiatives. We present in this paper, though, an outline for taking what has been done in the East Midlands and scaling it up – harnessing all the benefits realised through our iterative development over the last half-decade. We believe this would potentially be the quickest and most effective way to take the learning accumulated hitherto and to deploy it nationwide. There are costs

associated with this, but cost savings are likely to be greater, particularly when broader social return on investment is taken into consideration.

CONFLICT OF INTEREST

The authors have no Conflicts of Interest to declare.

ACKNOWLEDGEMENT

Adam Gordon is part funded by the NIHR Applied Research Collaboration, East Midlands. The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care.

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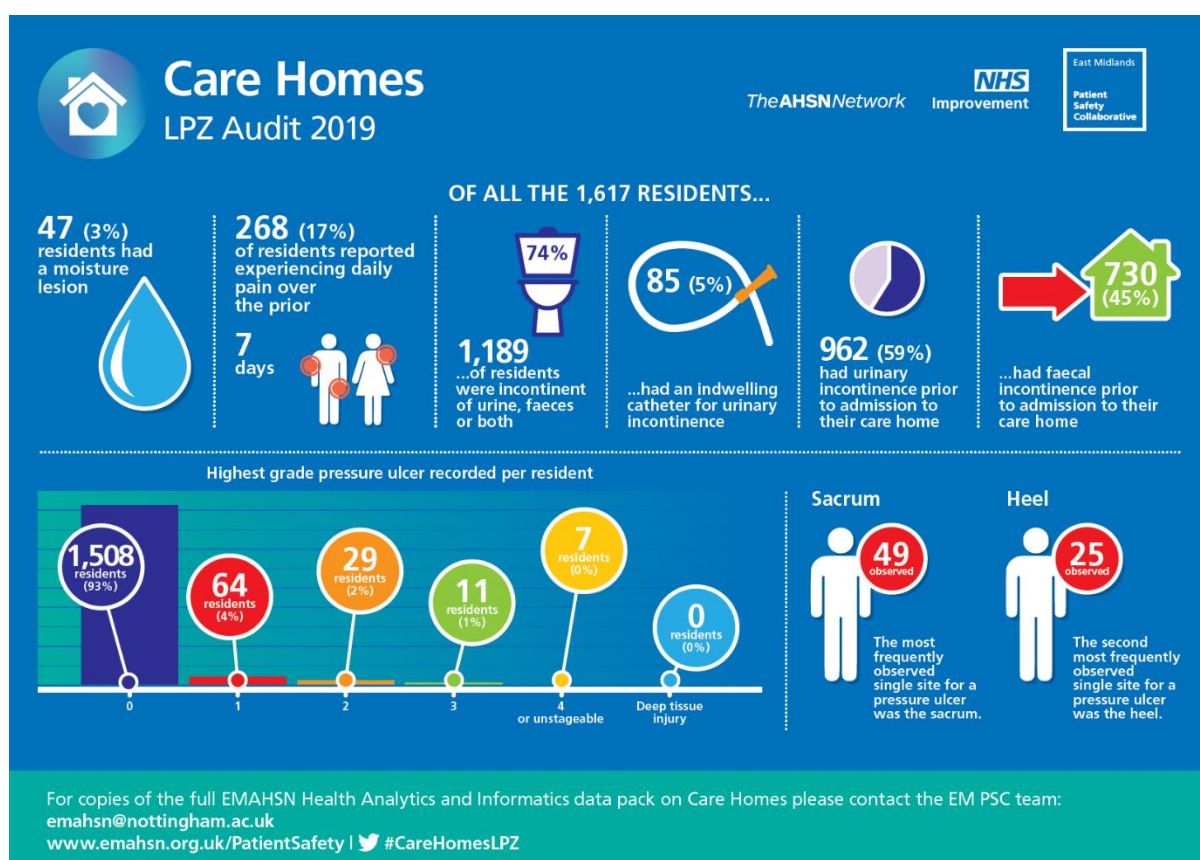
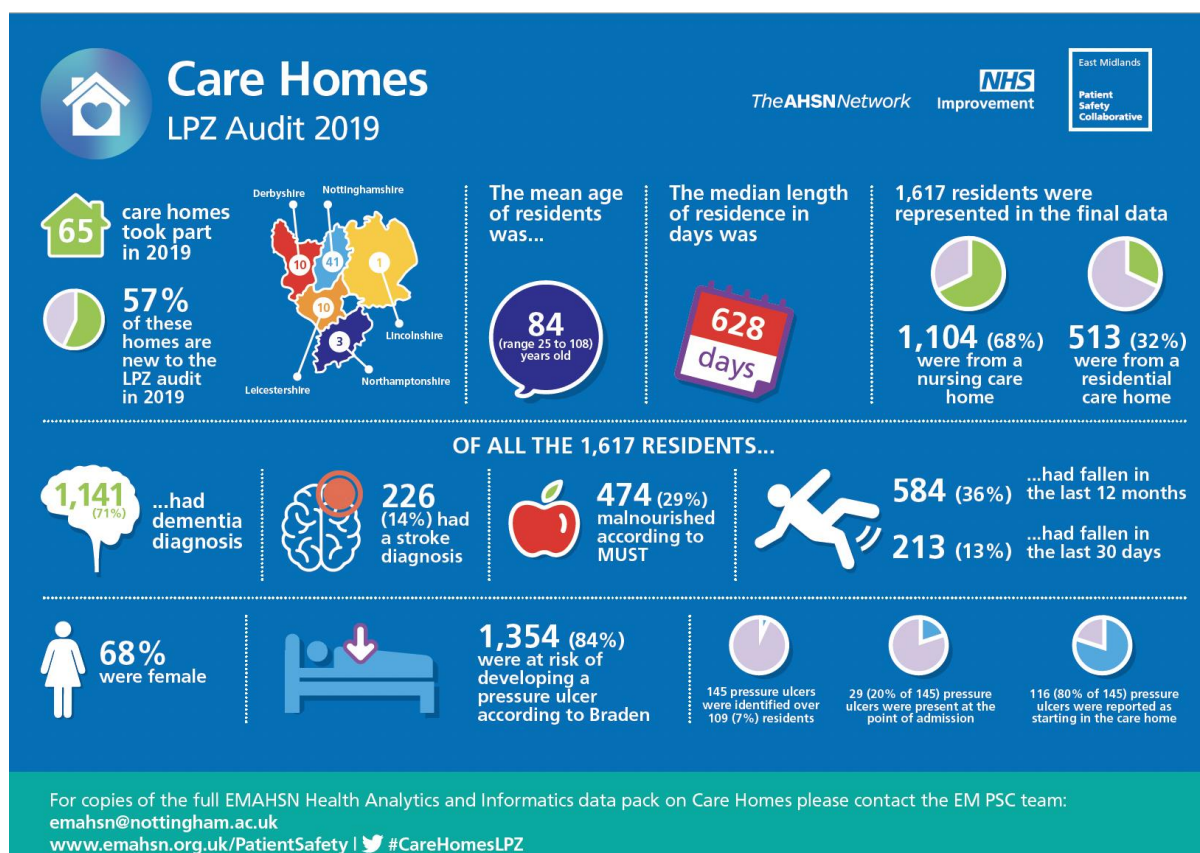
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APPENDIX 1 – LPZ Infographic



Alexandra Lodge Care Home – Nottinghamshire

LPZ achievements

Background:

Alexandra Lodge took part in the LPZ audit and since the initial pilot were really excited when they were offered the opportunity to be involved. Following their 2016 audit, results suggested the main area of concern was around falls, but they were aware that many other factors influenced falls and have made widespread changes to all aspects of practice using LPZ data from the audit areas.

What they did:

Pain management

LPZ encouraged the home to look at the use of analgesia in the home, as this may have been affecting the number of falls.

- All residents had their analgesia reviewed, and amended
- Good support from GP practice to achieve this

Continence

LPZ made the home more aware of continence issues and the impact on falls, pressure ulcers and other health problems.

- All staff more aware of the continence status of all residents
- Improved communication between carers and kitchen staff and diets amended if residents suffering with constipation
- More emphasis on mobility

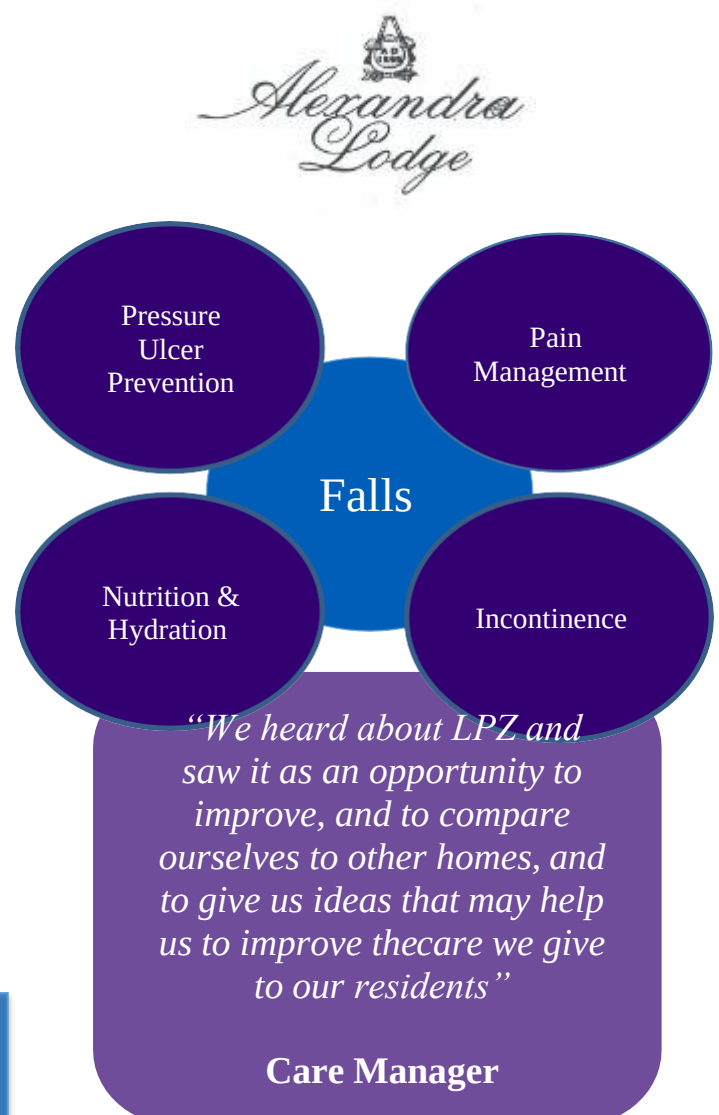
Pressure ulcer prevention

LPZ made the home more focused on pressure ulcer prevention.

- React to Red training resource readily available for staff to access, ensuring staff remain more vigilant
- Increased monitoring and body mapping of residents at risk
- More use of protective creams used

What the residents said:

- **93%** rated the meals as excellent or good
- **100%** can get drinks and snacks whenever they want them
- **100%** felt they were given adequate portions
- **86%** agreed they had a good variety of food



Falls

- The home had higher number of falls than other homes when comparing data. What they did?
- Shared the LPZ data with all staff in the home to raise awareness
- Collected information on the location and times of falls to identify themes. Noted that most falls occurred when the lounge was unsupervised. They brought in additional staff to increase supervision of this area from 7am-10pm
- Purchased bed/floor sensors/crash mats and electric profiling beds for every resident
- Collate data on the number of falls occurring, and share information with all staff
- Body map all residents following a fall and repeat if required
- Focus on all other factors that may cause falls such as nutrition & hydration, medications, skin integrity and continence.
- Increased activities to encourage mobility such as dancing to music and everyone encouraged to participate

What staff told us:

"LPZ has raised my awareness of common problems that our residents may face and highlighted things to look for as I have not come from a health care background"
Business Co-ordinator

"We are all carers and here to help. LPZ really opened my eyes to achieve improvements"
Cook

"LPZ has given us something for our staff- it motivates and boosts us"

"I make sure our residents have enough to drink as this is crucial to their wellbeing and is an important role. It enables me to interact with the residents which I enjoy doing. I also ensure that the staff, relatives & visitors to the home are offered drink. All the residents know when I am on duty, because their hands go up immediately. I am at Alexandra Lodge seven days a week and I enjoy every minute". **Tony – Volunteer (see photograph right)**

Nutrition and hydration

Through reviewing their data the home realised they could improve the nutritional status of residents which would prevent other problems such as falls and pressure ulcers. What they did?

- Ensured the Cook was invited to LPZ events and she reported feeling much more involved in the discussion's in the home around nutrition and hydration
- Introduced a range of different ways to increase fluid intake such as fruits and jellies/ice creams
- Commissioned an independent resident survey into the meal experience. Changes actioned as a result
- Volunteer (Tony) visits the home daily to ensure residents, visitors and staff are offered drinks and snacks



LPZ RESULTS

- ↓ Falls
- ↓ No pressure ulcers for 3-4 months
- ↓ Urinary Tract/Chest Infections
- ↓ Use of regular analgesia and more use of 'as required'. Staff report residents appear more alert and relaxed
- ↑ Resident satisfaction with meals. Greater choice of different fluid options, Volunteer appointed
- ↑ Improved staff morale and team cohesion. Carers, kitchen and domestic all staff working together
- ↑ Documentation

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Baily House - Care Home - Mansfield

Using LPZ to improve care

Background

When Baily House became involved in LPZ in 2015, they were a newly opened care home, with many staff new to the care role. This created challenges to ensure that care staff were aware of best practice around pressure ulcer prevention.

How has LPZ helped Baily House?

- We are more vigilant about skin damage as a result of the audit and ensure appropriate referrals to the community nursing service
- We are more conscious of the importance of good continence management and ensure appropriate referrals are made and the correct continence products are used
- We understand our data and areas that we need to improve in

"LPZ was brilliant for us as we received some training resources from the East Midlands Academic Health Science Network that really helped us, including the React to Red training package, designed specifically for care staff. 'I love React to Red! Anytime I need to just give the staff a boost on their training I can put the video on, the staff learn well this way and it's an invaluable tool'

Rachel Squire, Registered Manager

Contact

For more information contact
rachel@bailyhouse.co.uk



What the pressure ulcer data has shown us:

2015 LPZ results	4 pressure ulcers stage 2- 4
2016 LPZ results	2 pressure ulcers stage 1-2
2017 snapshot whilst awaiting audit	Zero

What the staff have said

"I didn't realise that my role had such an impact on the prevention of pressure damage in the home" **Sandra Ridd, Kitchen Manager**

"REACT TO RED is so interactive, I like that it shows us images so that we can know what to look for" **Rachel Kenned, Senior Care Assistant**

East Midlands

**Patient
Safety
Collaborative**

 **woodleighcare**
caring for the whole person.

Beechdale House Care Home, Nottingham

Using LPZ and the 'Safety Cross' to understand safety issues to monitor and reduce patient falls

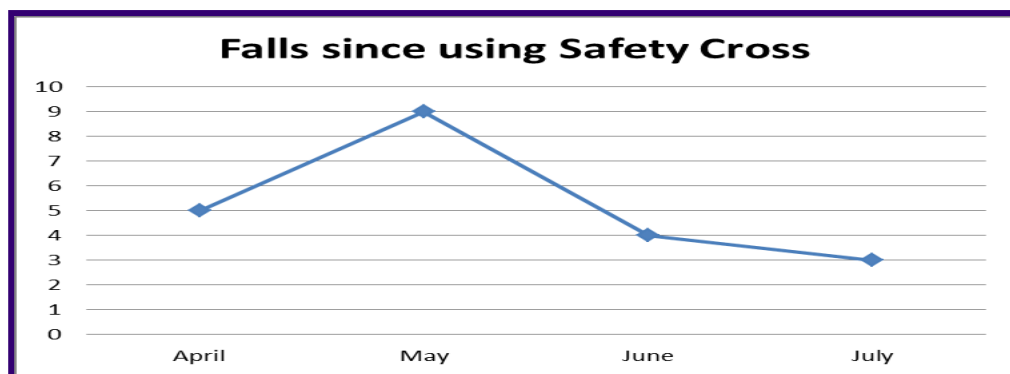
Background

Beechdale House Care Home, took part in the LPZ project for the first time in 2016. The home had been through a difficult time and needed something to help them to focus on the issues that were important to them as a home. LPZ was a great opportunity to learn new things.

Prior to the audit, Beechdale believed that the biggest problem was pressure ulcers. Training received at the East Midlands Academic Health Science Network's Patient Safety Collaborative (PSC) event and the care home's own audit data revealed that pressure ulcers weren't actually a concern. However, the number of falls were, and Beechdale was determined to address this to ensure they were providing the best possible care for residents.

What did Beechdale do?

Attended a workshop at the LPZ results event facilitated by the specialist falls team who introduced them to the Safety Cross (see below). The cross is used each time a resident falls, the relevant day of the month is coloured in for the fall and the cross is displayed in the staff area. Safety crosses can be used to visualise any issue and are incredibly simple to use while also being highly effective.



How has this helped?

- It has raised awareness for all staff, as the cross is displayed in the staff room and the results can be seen at a glance each month by all staff
- It has led us to increase our knowledge and vigilance around falls and any themes and trends such as where and when the falls occur
- Staff now have the confidence to pass on any concerns regarding falls, what may cause a fall and any hazards, so that we can take more proactive steps to prevent?

Feedback

"The LPZ gives us more knowledge about common care problems that our residents are at risk of and it is a great way of updating training for our staff, having knowledge in areas that we are unsure about. The events give you time to discuss with others what they do, and share experiences, and the meetings are relaxed and friendly. Each person with something to ask or say is listened to and supported"

Registered Manager