Using digital media to access information and good practice for paid carers of older people

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Using digital media to access information and good practice for paid carers of older people: A feasibility study

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Acknowledgements

1 Introduction

Designing an information system is not done in isolation, but rather in close coordination with the users and environment in which it is applied.... It involves understanding the nature of information, the current information systems and the information needs of the organisation (or community) being studied.... When policies are criticised as being too top down, part of the criticism also has to do with the failure of policy to recognise realities on the ground. (Berg, 1999, p 87)

1.1 Background

The provision of information services for paid care workers has lagged behind provision in comparable professions such as the health services, where a multitude of initiatives have been put in place (Smith, 1996; Ammenwerth et al, 2000; Thompson et al, 2002; Williams et al, 2003). The spread of digital media, particularly since the advent of the World Wide Web (www)in the mid-1990s, has resulted in health information being more widely available than ever before. UK government initiatives have been developed to harness digital media to deliver health-related information to the general public (Nicholas et al, 2004). This is not to mention the volume of commercially provided web-based information. There have also been many recent initiatives to improve timely and effective provision of information to clinical and other staff within the UK's National Health Service (NHS), notably the National Programme for IT in the NHS, which aims, over the next 10 years, to connect over 30,000 general practitioners (GPs) in England to almost 300 hospitals and give patients access to their personal health and care information (NHS, 2006). Recently a number of large-scale progammes for introducing innovative information technology (IT) solutions into local authority work have begun, such as the Project Nomad programme on mobile systems (www.projectnomad.org.uk) and the DigiTV programme for interactive TV (digitv.org.uk).

Social care may eventually benefit from such initiatives, but until now there has been little investment in digital services and tools for those in social care professions (Harrison et al, 2004). In particular there has been little in the way of extending information and communication services to care workers such as those employed in residential homes for older people. Indeed little is known about the day-to-day communication and information needs of care workers that would allow sensible, well-informed design decisions to be made about such provision. As Peace et al point out, 'information about the real character of residential care is still not easy to obtain: those living and working within its boundaries are not always able, or perhaps inclined, to describe or explain their experiences' (Peace et al, 1997, p 88).

1.2 About this study

This report describes a study commissioned by the Social Care Institute for Excellence (SCIE) and funded jointly by them with the National Knowledge Service. It was carried out by the University of Brighton to explore the feasibility and the appropriateness of digital technologies to support the work of paid carers in

residential care homes for older people[1]. The study used a combination of mutually informing methods – site visits, questionnaire and design workshops – to develop a picture of current work practices across the sector and to gauge the appropriateness of support mechanisms for information-seeking and communication using digital technologies.

1.3 An overview of residential care homes for older people

The UK has approximately 10,000 residential care homes for older people. They are run by a variety of bodies – local authorities, housing associations, non-profit-making institutions and private companies – and range from converted hotel buildings to purpose-built complexes. Each home tends to be home to between 20 and 80 residents. Care work is a predominantly female domain. It has traditionally been seen as unskilled and care assistants are encouraged to obtain on-the-job training to achieve a vocational qualification – typically an NVQ Level 2 in Health and Social Care – which is made up of modules on topics such as nutrition, communication and hygiene. There is no information communication technology (ICT) component. Care assistants are supervised by senior care workers or team leaders, who may also take on some of the responsibilities of managing the home, although these two functions may be separated. Care managers and senior care officers are expected to have a qualification equivalent to NVQ Level 4, such as the Registered Managers Award. The care home sector is distinct from the health service, with care home residents defined as people not in need of continuous medical care.

In the sections below we describe the methods used to understand something of the culture and practices of the setting and to involve the potential end users of any new system in its design and development. A literature review was used to define the parameters of the study, complemented by a range of data-gathering methods.

1.4 Report summary

The staff of residential care homes for older people have benefited very little from developments in IT, unlike their counterparts in the health services. There is little information available on which to base designs for any future technology to support the work of UK care staff. The project described in this report explored the feasibility and appropriateness of technologies to support communication and information seeking by care workers in homes for older people. Use of conventional desktop computers appears to be less popular in this sector than in others, for reasons that appear sound. Using a combination of workplace observations, a scenario-based questionnaire and participatory design workshops, the project encouraged care staff to 'leapfrog' the desktop computer, imagining non-computer-based systems that might be genuinely useful and acceptable. This resulted in a number of recommendations for areas where the introduction of digital media might be effective, namely communication, information sharing and work-based training.

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[1] The original brief stressed the feasibility aspect of the project, but given that appropriateness and usefulness are key to acceptance of technologies it was decided to put the resources of the project into these areas at this stage.

2 Literature review

In this section we discuss the current state of knowledge in six areas relevant to the potential application of media technologies within residential care:

- information needs and information-seeking behaviours in care and related fields
- selected ICTs that could assist carers
- assistive technology as an aid to carers in monitoring day-to-day care needs and dealing with critical incidents
- use of digital media in the training of paid carers
- cooperative work and its technological support
- user-centred design and acceptance issues.

Since little research has been carried out with a particular focus on the use of ICT in residential care, this review draws largely on sources from other related fields, such as developments in domiciliary care and medical informatics. Possible links between the technological developments applied in these other areas of care and the specific needs applicable to the residential care setting are thus suggested.

2.1 Information needs and information-seeking behaviours in residential care and related fields

As Barrett (2000) states, little has been written about the information needs and information-seeking behaviours of paid carers (p 148). An Age Concern research project (Tinker et al, 1993) reviews a number of studies that have focused on the information needs of older people. These, however, are all now somewhat dated and focus on older people living in their own homes. Little reference is made in these studies to the information needs of the carers (although the important point is made that the majority of informal carers are themselves older people) (Tinker et al, 1993, p 43). Barrett's research does consider the information needs of carers (alongside those of older people) but again only looks at those working in an informal capacity with older people living in their own home. The term 'information needs' in these studies tends to relate, as Barrett (2000, p 17) specifies, to the type of information that enables older people (and their carers) to access support to continue to live at home and retain their independence for as long as possible. Barrett concludes from her research findings that similar information needs were expressed by both older people and their carers, and that these particularly concentrated on whom to contact and how to access information in the areas of:

> ... services for elderly people; financial advice; health advice; practical help; house adaptations; and useful products. They also wanted information on their entitlements, particularly in terms of money and services. (Barrett, 2000, p 148)

In addition to the practical aspects of caring, a study of informal carers and professionals (nurses and social workers) working with people with dementia found that all respondents wanted information relating to the emotional side of caring, that is, coping with emotions and stress management (Turner and Street, 1999, p 175). The importance of this kind of psychological/supportive information was also emphasised in Smith (1996) in relation to doctors' information needs. Similarly,

the ACTION (Assisting Carers using Telematic Interventions to meet Older Persons' Needs) project found that in addition to better information on services, carers also wanted advice and psychological support as well as information on how to care more effectively. Such information was then incorporated into the ACTION telecare system developed with the aim of supporting the informal caring of older people living at home (Emery, 2001; Chambers and Connor, 2002, p 569).

Studies have found that accessible information for informal carers is lacking (Barrett, 2000) or that carers are simply not aware of all the services through which they could access information (Emery, 2001). There may also be similar problems with information gaps in formal care contexts. There is, however, a lack of knowledge about the problems paid carers may have with accessing relevant information and about the effectiveness of communication processes within residential care establishments. The use of performance process diagrams or workflow charts may be one useful way of helping to identify the specific information needs of management and care staff and how software systems might effectively be incorporated into existing structures (Moen, 2005). Scenario generation has also been seen as a useful mechanism for identifying processes and subsequent possible uses of new technologies (Rodriguez et al, 2005, pp 202-4).

The social care workforce has been under-researched in terms of information-seeking behaviours. Both older people and carers included in Barrett's research, however, expressed a strong preference for accessing information through other people (face-to-face) while the choice least frequently selected was the internet. In a more recent study, two thirds of the informal carers surveyed had never used or were infrequent users of the Internet (Read and Blackburn, 2005). A study by de Chazal et al (2004) found a similar tendency among social workers, in terms of a preference for obtaining information through face-to-face contact to using the Internet. It was, however, acknowledged that this finding was a reflection of poor general IT literacy. Most respondents never used the Internet and surprisingly, at the time of the study, none had Internet access in the workplace. Despite the abundance of alternative solutions to information seeking now available, it was noted that there had been little change in information-gathering processes used by social workers over the previous 30 years (de Chazal et al, 2004, p 30). Barrett also recognised that not using the Internet as a source of information could be attributed to a lack of access and opportunity among the respondent groups to learn to use the internet (Barrett, 2000, p 163). Interestingly, however, Emery (2001) found that carers and older people overcame these problems through the ACTION project due to the user-friendly nature of the system. The desire for face-to-face communication made the video-phone particularly popular among users (Emery, 2001, p 47).

IT literacy and other issues affecting the perceived acceptability of incorporating ICT in the workplace are discussed further in section 2.6.

2.2 Information and communication technologies

This section explores the opportunities and challenges that selected ICT present in relation to the information processing and communication needs of paid carers. We focus on three technologies: the Internet, mobile devices and digital television.

2.2.1   The Internet

The Internet, and in particular the WWW, offers great potential to support care staff in accessing useful information. A number of web sites provide lists of internet resources of potential use to carers, in the areas of health, housing, finance, support and policy. However these are mainly targeted at the unpaid carer, rather than the professional care worker.[2]

There have been significant developments in recent years in the field of medical/ health informatics that have begun to greatly affect the work of doctors, nurses and pharmacists around the globe. The abundance of health and medical information available on the WWW offers great potential to those working in this field. Concerns have been raised, however, about the problems it poses in terms of navigating the way through a mass of inaccurate or inappropriate material ever-present in the midst of the Internet 'jungle' (Williams et al, 2004b). Kiley, for example warns against 'biased information' and other 'quackery' on the web (Kiley, 1999, ch 7).

A number of guides are, however, available to assist health professionals to access quality health information on the internet (Anthony, 1996; Kiley, 1999; Tyrell, 1999; Chellen, 2000; Edwards, 2002; Kiley and Graham, 2002; McKenzie, 2002)[3] and there is evidence that physicians are now increasingly using Internet resources and even directing patients to appropriate websites (Williams et al, 2003, p 311). One suggestion to help physicians quickly access information at the point of need is for them to set up their own personal digital library (Balen et al, 2000, p 309). On a larger scale, this idea is being developed by the NHS, which has been establishing a National electronic Library for Health (launched in November 2004) to allow clinicians to access relevant up-to-date medical information, for example, regarding best practice (Turner, 2005).[4] A 'one-stop virtual library' for social workers has also been suggested (Watson, 1996, p 32) and SCIE has been developing Social Care Online (formerly the electronic Library for Social Care) since 2001, which brings together thousands of useful links and resources relating to social care.[5] Resources available online include, for example, information on good practice, training resources and links to specific help such as caring for people with certain medical conditions, on issues relating to caring for minority ethnic elders[6] and so on. However, resources are mainly aimed at social workers and students rather than carers, literacy demands tend to be high and navigation routes are not always clear.

Smith (1996) highlighted the importance of doctors developing evaluative skills to help navigate and make effective use of information available on the Internet. This is

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[2]   See Appendix 1 for details.

[3]   A number of other references relating to accessing health information on the Internet can be found at: http://library.wellcome.ac.uk/doc_WTL038919.html

[4]   See: www.nelh.nhs.uk/new_users.asp
      There is also a central NHS online location where a range of health informatics resources can be accessed at: www.nhsia.nhs.uk/informatics/pages/resource_informatics/

[5]   www.scie-socialcareonline.org.uk

[6]   For example in relation to minority ethnic elders, there is a list of references provided by the King's Fund at www.minorityhealth.gov.uk/pdfs/reading13.pdf

also relevant to others working in health and social care, including carers. If carers are to be encouraged to use the Internet as an aid to accessing appropriate information they will need adequate training to ensure that they are able to effectively do so (Williams et al, 2004b, p 10, also cite a number of references that emphasise the importance of users developing this capacity).[7]

Another obstacle to the use of the Internet by paid carers may be the lack of computing facilities available for paid carers in their work environment. There has been a lack of research into the availability of computing resources for care workers in residential care in the UK. Research in the US, however, has suggested that despite significant developments in healthcare settings, there had been little intervention to facilitate any equivalent advancement in residential care (Huber and Huggins, 2000).

Another facility offered by the Internet, as distinct from the WWW, is the discussion group or message board supporting asynchronous communication between users. Many discussion groups exist in the heath and social care fields, for professionals and service users, and there is some evidence that they may improve information sharing and morale (Forsgärde et al, 2000).

2.2.2   Mobile devices

Handheld devices such as Personal Digital Assistants (PDAs) and mobile phones have been used in healthcare for personal organisation and workload prioritisation (Balen et al, 2000; Al-Ubaydli, 2003). Their potential for improving communication between healthcare workers has also been noted (Coiera, 1995; Salter et al, 1998). Existing communication patterns among hospital workers have been found to be over-complex and inefficient (Coiera and Tombs, 1998). Ubiquitous technologies promoted as potentially improving communication in healthcare range from message pager (Crimslisk, 1998), to a number of more recently developed mobile and wireless technological systems that enable communication of information to medical staff at the bedside and to emergency services (Al-Ubaydli, 2003; Baugmart, 2005; Protti, 2005; Wilson, 2005). It has been argued that potential advantages of this technology include increasing the level of safety in patient care (Adis International, 2002), and saving time, since paper records do not need to be made and subsequently input into a computer (Abreu, 2001; McCall, 2002). It is also argued that further time could be saved and ease of use increased with the incorporation of recent improvements in speech recognition technology (Stefanelli, 2002).

Clearly there are ways in which developments in mobile and wireless technology evident in the healthcare sector could also be applicable to a residential care context. There has not, however, as yet, been a similar drive to encourage the use of mobile technology in residential care in the UK or indeed even to convert to computerised systems for recording data.[8] In the US, literature suggests that innovative healthcare

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[7]   Along these lines a training tutorial is available on the SCIE website at: www.vts.rdn.ac.uk/tutorial/health?sid=6615488&op=preview&manifestid=50&itemid=3476

[8]   Unlike in the NHS where it is now becoming standard procedure to keep patient records in an electronic format. See NHS (2000).

software, including wireless technology, is becoming a much more common feature in residential/nursing care (Jacob, 2003; Moen, 2005). Elsewhere, there have also been some notable projects looking at the appropriateness of the use of ubiquitous systems in home healthcare. For example, a study by Karsten et al (2002) looked at the use of mobile devices that enabled access to various information sources and opened up communication possibilities for home healthcare nurses working in Finland. Findings showed that these devices improved the quality of the nurses' work and (since there was less travelling to and from the office) allowed them to spend more time with patients. They thus identified several possible applications for mobile or handheld devices for home healthcare nurses (Karsten et al, 2002). Along similar lines, but in this example focusing on home carers, Ogawa et al designed a web-based support system for carers in Japan in order to improve scheduling and record-keeping efficiency. This project used WEB-WAP 'phone technology to enable carers to send their care reports to the main office server computer, which then automatically filed the data. Requests from clients could also be sent via the Internet to a head office computer, from which these would be routed automatically to a home helper's mobile 'phone (Ogawa et al, 2002, 2003). A similar project in the UK issued care workers with tablet computers in order to allow the integration of data recorded and accessed by health practitioners, social workers and home care agencies. The project, however, encountered numerous problems and was eventually abandoned (Cross, 2005). Another, which has been more successful, was trialled by Leeds City Council. In this case the technology consisted of digital pen and paper, which subsequently transmitted data via Bluetooth-enabled mobile 'phone. This technology was considered relatively easy to use and less intrusive than using PDAs or laptops in clients' homes (Jones, 2004).[9]

Further issues relating to potential uses of mobile technologies are included in section 2.5. PDAs are also discussed in relation to training in section 2.4.

2.2.3   Digital television

A study testing digital television as a means of giving older people access to health information found that, although the test group encountered a number of problems, with improvements, digital TV (DTV) could be a useful way of communicating with older people (Thompson et al, 2002). The ACTION project tested a computer-based system that was able to be viewed on the users' own television and navigated by the remote control handset, and users expressed preference for this method over a keyboard and mouse. It should be noted, however, that as users became more familiar and confident with using the system, many decided they would like to try using the mouse and keyboard rather than the remote control. The project was found to be a success, with older people and their carers finding the system to be user-friendly. The ACTION system was designed with the aim of improving the autonomy and independence of older people living in their own homes. However, some equipment was situated for testing in residential care settings, and there may be ways in which this kind of system could be helpful in supporting professional care

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[9]   A list of further references on mobile computing in medicine and homecare are available at: www.informatik.uni-trier.de/~ley/db/conf/mcm/mcm2002.html

work. Further research is required, however, to design an effective system that would be more appropriate to the residential care context (Emery, 2001; Magnusson et al, 2002; Magnusson and Hanson, 2003).

Using digital media as a form of communication between carer and resident raises acceptance and user-design issues, not only for carers, but also for the older people receiving care. This aspect will be discussed further in section 2.6.

2.3 Telecare

This section discusses literature on 'telecare', that is, assistive technology used to monitor the state and behaviour of residents in order to promote the safety and effectiveness of care.

Developments in digital assistive technologies have been emerging in recent years within the healthcare sector. For example, the European Mobihealth Consortium has tested a monitoring system where sensors attached to a person's body transmit vital data to a handheld device (PDA or mobile 'phone). Expected future developments include not only alerts but also automatic interventions (for example, releasing insulin through a pump) that will be triggered by electronically fed data (Protti, 2005). There have been similar innovations and a growing body of literature relating to the use of such technologies in the social care field. However, this has mostly focused on potential uses in the care of older people who are living in their own homes (Tang et al, 2000), particularly in relation to specific disabilities such as visual and hearing impairments.[10] Much of the focus on telecare has also been on its use in relation to helping those with dementia[11] through the use of systems tracking behaviour and monitoring cognitive decline through, for example, the use of sensor tags that can be attached to objects such as medicine bottles. Systems issuing automatic reminders that can be sent via 'phone, TV and so on, for example to take medication, have also been particularly marketed for those with dementia (Intel, 2004).

There has been a government drive towards the use of telecare systems for older people. Department of Health (DH) literature has expressed a commitment to 'telecare and preventative electronic technology' (DH, 2005b, p 46). However, the focus of this commitment has been to promote alternatives to institutional care, enabling people to stay in their own home rather than moving into a residential care home. The Audit Commission's report *Fully equipped* (Audit Commission, 2000), its update (Audit Commission, 2002), as well as their more recent report (Audit Commission, 2004), noted the importance of assistive technology in private homes as a way of promoting dignity and independence. The Department of the

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[10] For example, the text telephone (also known as a TDD and in the US generally called a TTY), which converts typed characters into tones that may be sent over the telephone line – see www.rnid.org.uk

[11] A reading list of sources relating to assistive technology and dementia can be found at: www.alzheimers.org.uk/Research/Library/reading_lists/Reading%20list_assistive%20technology.pdf

Environment, Transport and the Regions (DETR) and DH report *Quality and choice for older people's housing – A strategic framework* (2001) similarly stated the importance of enabling older people to remain in their own homes for as long as possible and thus endorsed assistive technologies such as telecare initiatives and smart homes. 'It recognised the benefits of community alarms services and the potential to graft passive alarms and movement sensors on to these services' (Curry et al, 2003, p 9). More recently, a DH report *Building telecare in England* states:

> Telecare is as much about the philosophy of dignity and independence as it is about equipment and services. Equipment is provided to support the individual in their home and tailored to meet their needs. It can be as simple as the basic community alarm service, able to respond in an emergency and provide regular contact by telephone. It can include detectors or monitors such as motion or falls and fire and gas that trigger a warning to a response centre. (DH, 2005b, p 9)

Although the importance of promoting independence for older people within residential care has also been stated in government literature, there is little coverage of the potential for incorporating telecare into a residential care setting. For example, as Curry et al (2003) noted, Standard 22 of the DH's national standards, which covers adaptations and equipment, 'states that call systems with an accessible alarm facility should be provided in every room, but does not deal with the use of new technologies for care and monitoring purposes' (Curry et al, 2003, p 21). Another research project that may signal some ways forward for the residential care sector, carried out by Kember et al (2002), looked at ways in which assistive technology may be useful in a semi-independent residential care home to manage the taking of medication (Kember et al, 2002).

In Scotland, there has also been a great deal of emphasis placed on promoting the independence and dignity of older people who choose to go into residential care. *The future for care homes in Scotland: A consultation paper* (Scottish Executive, 2001), envisages how this may be best achieved through a move towards flatlet-type accommodation within care homes, thus providing greater independent living space alongside the greater security and safety of residential care and opportunities for social interaction. Monitoring systems and other aspects of assistive technology are given some recognition in this report, although not in any great detail.

Although these and similar uses of digital technology do not directly aid in communication and information sharing among staff, they will need to be borne in mind, as assistive technologies will almost certainly be required to interact with any future digital support systems for staff.

2.4 Training

This section discusses the application of ICTs to training and education, particularly work-based training.

2.4.1   E-learning applications

Various applications are now available for e-learning in care-related NVQ programmes. Information about a number of online NVQ systems is available on the WWW (NVQ Web: Care & Health, 2005). NVQ Assist argues that there are a number of potential advantages of e-learning over paper-based systems. For example e-learning can offer potential for more flexible ways of learning that can be used in conjunction with in-house training programs, it can ease management of the NVQ portfolio and it can facilitate communication between learners, assessors and managers (NVQ Assist, 2005). It has also been argued that online learning opens up new opportunities for those who otherwise may not be able to access training due to the physical distance from the nearest centre offering relevant courses and that it can enable users to take advantage of a wide range of useful tools and resources available through the Internet[12], including potential networks or 'virtual communities' providing support for learners (DFES, 2003). At a time when government targets in training social care staff loom,[13] such training packages present new opportunities for the sector. One such virtual community available to NVQ Care students and assessors is the NVQweb Care and Heath support forum (http://nvqweb.com/php2/index.php).

However, according to a recent SCIE/Topss England (now Skills for Care) report entitled *Creating an e-learning strategy for social care in England* (Dunn, 2004), many e-learning initiatives have been of low quality and lacking in support for learners, leading to user dissatisfaction and low retention rates. The report also notes that there is a lack of structural support for ICT in the social care sector in comparison with the NHS, which has a national programme for IT, including, for example a commitment to support staff with European Computer Driving Licence (ECDL) training. In the social care sector, there is no ICT element currently included in the induction or the foundation standards for care workers. The Learning and Skills Council (LSC), which published a report on e-learning (LSC, 2002), is assessing how to improve workforce skills in a number of sectors including social care (Dunn, 2004, p 35). The NHSU (National Health Service University) draft strategic plan for 2003-08[14] expressed a commitment to supporting learning (including a virtual campus) in the social care sector, as well as within the NHS itself.[15] There are signs, therefore, that there is government commitment to the development of e-learning among care

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[12] Caring Together preview pack, for example (see www.regis.co.uk/acatalog/Caring_ Together_S_NVQ_Resources_Level_2.html, p 17) promotes using the Internet for accessing information relating to potential aspects of care work.

[13] Government targets set out in the national minimum Sstandards are for at least 50 per cent of carers in residential homes to have NVQ 2 Care or equivalent by 31st December 2005 and for all managers to have NVQ 4 or equivalent in both Management and Care or equivalent. See www.csci.org.uk/care_professionals/ service_providers/national_minimum_standards.aspx

[14] See www.nhsu.nhs.uk/about.html

[15] The NHSU was, however, dissolved in July 2005, but a new organisation, the NHS Institute for Innovation and Improvement, was designated to 'take forward strategic advice and direction concerning learning' (see www.nhsu.nhs.uk/docs/

workers as well as healthcare professionals. However, a number of concerns about this aim have been expressed.

One relevant concern is the issue of responsibility for the cost of training in what is now a largely privately run sector. Staff turnover in social care, especially in homes for older people is high, at least in the local authority homes investigated (Balloch, 2005). Additionally, research has shown that care home owners are reluctant to pay for training in homes where this is the case (Balloch et al, 2004, p 9; Balloch, 2005, p 19). The domination of the private sector, with small independent businesses specialising in different types of care, may also present challenges to building compatible e-learning networks across organisations (Eborall, 2005, p 1). Another challenge to the development of e-learning in the social care sector is the general issue of 'e-readiness', since disproportionately high levels of staff lack computer literacy and even basic skills (Dunn, 2004, p 32; McClimont and Grove, 2004, p 25). There are also issues around negative attitudes to IT training, which may be related to lack of incentives for workers (Bonk, 2002, p 115-116). It has been argued that there is a perceived association among workers and managers between e-learning and 'lonely, individualised and sterile learning experiences' (Dunn, 2004, p 21) and a sense that it fails to recognise the 'importance of the human element in all teaching and learning' (Dunn, 2004, p 26). It has, however, been argued that this should not be the case, since e-learning should enhance learning through teacher/learner communication, and opening up ICT supported learning networks (Dunn, 2004, p 21).

Developments in a range of digital media, which in some cases have been introduced in certain sections of the health/care field, may have potentially significant implications for e-learning in social care. Training can be delivered/supported, for example, through computer-based Internet access, email, CD-ROM/DVDs, streamed video, digital TV, mobile 'phones and handheld computers. A full discussion of how training can be facilitated through each of these media and devices is beyond the scope of this review. The next section, however, will briefly discuss ways in which mobile computing devices may facilitate training.

2.4.2   Handheld computing devices

The use of PDAs as a tool for medical professionals has been well documented. Less has been written, however, around the use of PDAs in medical or care training. Bertling et al (2003) discuss ways in which PDAs can be used in medical education and particularly emphasise their potential usefulness as a real-time teaching and data collection tool (Bertling et al, 2003, p 1). Similarly, Topps et al (2004) discuss how teacher/learner interaction may be improved through the use of PDAs, which were used in the project to log clinical encounters and provide feedback (to tutors/other students) for continuous assessment, to create learning portfolios, log diaries and also to access course materials such as schedules, email, calendars, course objectives and so on. A number of benefits of using PDAs were found, such as the potential to make care more efficient, effective and safer in allowing doctors or doctors in training to access multiple sources of information at patients' bedsides. The devices were seen as offering particular advantages for doctors in rural settings. However, the study also found that there were a number of challenges to effective use of PDAs for training purposes. Barriers to success included:

- a reluctance to adopt new technologies
- unfamiliarity and lack of knowledge about the potential of the device
- perceived lack of need, for example, little need for diary keeping
- perceived lack of time to familiarise with the PDA due to a heavy workload. Also it was felt that a lot of time was needed to set up the device in order to make it useful, for example, installing programs, entering data, etc
- difficult to carry around, especially as already had mobiles and bleepers
- lack of computer access
- perception of PDAs as not patient-friendly – patients were perhaps able to see information on computer screen but not on a PDA
- the potential for data sharing was not valued very highly. Respondents felt information they could share was not of significant value or that they were too overloaded by information.

Nevertheless, Topps et al concluded that incorporating PDAs into medical training was 'worth doing' so long as sufficient preparatory work is carried out to establish a 'support infrastructure'. The researchers also emphasised the importance of ensuring adequate training was available on using the devices and software to give students ample time to familiarise themselves with them before embarking on their medical training programme (Topps et al, 2004, p 22). A number of practical pointers for ensuring effective training for doctors in the use of handheld computers are given in Al-Ubaydli (2003, ch 18).

Some of these findings and ideas may be useful to consider in regard to the possible use of handheld devices for NVQ care training. Similarly, a handheld device may be useful for logging critical incidents and providing feedback and access to materials, although some of the same challenges may also apply. Acceptance issues may be a barrier, perhaps more so among the social care workforce than in healthcare, due to computer literacy and basic skills issues (as discussed above). Also a fairly large proportion of staff are older and perhaps more likely to be 'technophobic', and PDAs may be particularly unfamiliar. It is thus vital (as has been found in relation to the use of informatics in medical care) for the residential care workforce to be adequately trained in the use of ICT if these methods are to be promoted for training and use in the care setting (Balen et al, 2000).

2.5 Computer-supported cooperative work

This section identifies a number of research studies that have explored the use of digital media and devices to support collaborative work such as the work of care staff. It focuses on studies situated in healthcare environments, since these share many similarities with the residential care setting.

Hospitals and other healthcare domains have been popular testing beds for projects looking at computer-supported cooperative work (CSCW) design possibilities, since information tends to be dispersed across space and time within hospital settings that tend to be characterised by 'a high degree of collaborative work, mobility and information access from many devices or artefacts' (Rodriguez et al, 2003, p 133). The CSCW field has evolved from one that was centred around the use of the somewhat inflexible desktop computer, to one in which it has become much

more accepted that, as has been argued, 'mobility is critical to collaborative work' (Luff and Heath, 1998, p 305). Systems supporting cooperative work in healthcare organisations, which of course pre-date computer technology, have been shown to be very much organised around the mobility of workers and artefacts. Several studies have investigated the nature and purposes of non-electronic artefacts. A research study by Bardram and Bossen (2005), for example, identifies a range of paper and other objects used for communication and coordination of work activities within a hospital ward, including whiteboards, work schedules, examination sheets, patient records and post-it notes. The study shows how many of the artefacts provide similar information but serve different purposes. For example, the whiteboard differs from the work schedule in the basic sense that the latter can be carried around and contains a more detailed level of information. The purposes of the non-computerised artefacts identified in the hospital ward were categorised as including:

> ... producing overviews, viewing data differently, revealing status, planning of cooperation, continuous coordination, and passing on messages and notifications, as well as providing individual work spaces. (Bardram and Bossen, 2005, p 171)

The researchers found that the efficiency of the processes used to fulfil these functions could be increased through computerisation. One way in which this could be achieved was through the ability of information to be stored digitally in one place and then viewed elsewhere through different devices. Thus the re-writing of the same information on to the various artefacts could be avoided. The study also recognised the need for a ubiquitous system to provide different 'templates' through which information could be delivered in a similar way to that in which different 'views' are provided by the various manual artefacts (Bardram and Bossen, 2005, p 174).

Similarly Reddy et al (2001) demonstrate how computer systems in a hospital environment can enable multiple representations or 'views' of the same information, to a greater extent than could be achieved through paper records:

> ... by providing a range of interfaces tailored to the needs of either the different practitioners who may deal with the patient or the different activities that make up the patient's care. (Reddy et al, 2001, p 251)

Central to analyses of CSCW in healthcare environments has been the concept of a 'common information space' (CIS) through which it is explored how shared information is used to support and coordinate work practices (Reddy et al, 2001; Bossen, 2002). CIS can take different forms, ranging from those that are closely defined and where participants interact face to face such as in a control room or operating theatre, to those designed for actors who are loosely connected and may not be at all physically co-located, for example, over the web.

A concept of particular relevance to CSCW that has been found in healthcare environments is that of 'context-aware computing' (Dahl, 2005, p 2). Bardram and Bossen, for example, discuss the need for computerised artefacts to be 'context-aware', that is, to be made to easily "adapt to the changing working context" (2005, p 174). Dahl (2005), in his research study in a hospital environment, tests the

usefulness of a prototype system of 'context-mediated virtual notes' implemented on a PDA (p 6). The metaphor of a 'post-it note' was used on the system. Users would 'attach' a post-it note to a specific location to be viewed by people of a specific role. For example, it could be attached to a patient's bed to be read by a nurse. When a nurse approaches the bed of the relevant patient, the virtual note server would detect a virtual note in the area and the nurse would be notified of this through his/her PDA, through which s/he could then subsequently access the content of the note (Dahl, 2005, p 13).

One potentially beneficial effect of using such an asynchronous form of communication is the avoidance of interruptive effects which, research studies have found, often result from real-time communication. Dahl argues that these should be avoided where possible since 'interruptions can be viewed as a potential source for medical errors' (2005, p 4). Interruptions and delays may occur, for example, where there is only one copy of a manual artefact which needs to be accessed by several workers at the same time.

Interruptions may also be avoided by replacing synchronous forms of communication with asynchronous where possible. Bossen (2002) notes that in comparison with safety, critical CIS such as the control room of an airport 'the hospital ward rarely has the same need for the promptness of information' (of course excluding emergency situations) (2002, p 9). Fowkes et al (1997) note the redundancy of much synchronous communication in a study that looked at telephone communication in a nursing home and concluded that most calls were routine and did not require a return call. Hence, Dahl argues that asynchronous forms of communication such as voicemail, email and text messaging could, in many cases, be used as appropriate alternatives. The context-aware nature of Dahl's computerised system is designed to ensure that information is received by the intended recipient in due time (Dahl, 2005, pp 3-4).

Rodriguez et al (2003) have also tested a prototype 'context-aware messaging system' in a hospital setting. The system was context-aware in that it allowed the user to specify a particular set of circumstances for the message to be delivered. Messages could therefore be communicated not only over space but over time. For example, a message could be sent to a person of a certain role working on the next shift or more specifically to a particular member of staff when s/he enters a certain room. The researchers concluded that the system proved:

> … to be an efficient interface to support collaboration and opportunistic interaction. It provides an adequate balance between awareness, privacy and disturbance. (Rodriguez et al, 2003, p 146)

Some researchers have, however, noted the efficiency of low technology collaborative work processes evident in hospital settings. In particular, the use of the manual whiteboard or planning board have been highlighted as a vital means of communicating highly dynamic information at a rapid pace (Xiao et al, 2001). On the basis of Bardram's field study in Danish hospitals, he argues that the planning board in fact exceeded the usefulness of the computerised system, which:

... failed to support these important aspects of providing a highly visible, malleable, and shareable representation of the scheduled treatments. (Bardram, 1997, p 257)

However, there have been attempts to produce an electronic version of the whiteboard which successfully incorporate the collaborative functions of the manual version. A 'virtual whiteboard' was trialled by Mendonça and colleagues in a hospital setting with the information accessed through handheld computers. This was found to be an effective way of posting, routing and tracking non-emergency communications between nursing staff and physicians. It included a task-management database in which nursing staff were assigned to particular tasks and would be able to acknowledge completion. If the task was not acknowledged within a certain time frame then the sender would be automatically notified (Mendonça et al, 2004).[16] Another example of a system, which in this case retained the idea of the high visibility and interactivity of the planning board (that is, the 'e-whiteboard'), was designed by Berkowicz to 'display an integrated view of patient data, derived from an electronic scheduler, and room status information' (Berkowicz et al, 1999, p 1). A traditional whiteboard was replaced with a computer with a 50-inch plasma screen as well as a smaller version of the application that provided no editing facility. The researchers found the electronic device to have a number of advantages over the manual version. However, problems caused by network downtimes and software glitches were also noted (Berkowicz et al, 1999).

To sum up, this section has given several examples of innovative uses of CSCW in a healthcare context where computerised devices have been developed to replace manual artefacts in support of the collaboration and coordination of work activities. There are possible links to the residential care sector where similar manual artefacts for work coordination are evident, and the use of alternative forms of information communication may also be useful. It would, however, be critical for any implementation of such technology to be based on a comprehensive and detailed study of existing forms of cooperative work within care homes in order to identify specific ways in which computerisation could increase the efficiency and productivity of work processes. It is important that systems are designed to be adapted to users and not the other way round, as has been a criticism of computerisation in healthcare (Dahl, 2005, p 9).

Another important issue to consider in relation to possible developments in the use of mobile computing devices in residential care (as has also been raised in a healthcare context) is that of confidentiality and data protection (Abreu, 2001; Noble, 2003). One example of how this problem was tackled can be taken from a mobile computing project tested in a US hospital, in which a particular type of PDA (Compaq IPAQ) was used that allows users to access data through a wireless card. This ensures that no unauthorised person could access sensitive data without having access to the network (McCall, 2002). Bardram and Bossen also discuss confidentiality issues but decide on a system with a '... more relaxed privacy model

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[16] For further information on how mobile computing devices may support clinical staff see: www.pervasive.dk/projects/mobHealth/mobHealth_summary.htm

where some information may not be subject to user authentication' (Bardram and Bossen, 2005, p 175).

2.6 User-oriented design and implementation of ICT in the workplace

This section covers issues of acceptance and user-centred design for ICT systems.

A crucial challenge to implementing effective new forms of technology into any workplace is the issue of acceptability among the workforce in question. As studies on computerisation in healthcare have shown, the attitude of staff towards the technology is all important, in terms of whether or not incorporation of new systems or devices into the workplace will prove successful (Dansky et al, 1999, p 1). It is thus important to give careful consideration to the intended users. As Jones and Williams state:

> Again and again technology projects fall down not because the hardware is unstable, but because different systems' architectures have been poorly scoped and designed ... and the same mistakes – putting technology before people, not investing sufficiently in change management – continue to be made again and again. (Jones and Williams, 2005, p 9)

Although there has been little research looking specifically at the issue of user acceptance of telecommunications in health or social care, there have been many studies on attitudes towards computers, which raise many important and relevant issues. Such studies have shown, for example, that age tends to be positively correlated with computer anxiety and negatively correlated with computer experience (Dansky et al, 1999). Thus, as was highlighted in the ACTION project, as older people gain more experience using computers, they are likely to feel less anxious about doing so. Concerns that older people may not be able to easily adapt to telecare technology may therefore by overstated, as Emery notes:

> The ease with which older people adapted and used new technology was notable and dispelled the false assumption that older people and technology don't mix. (Emery, 2001 p 42)

However, a recent report on digital health information found that although older people were willing to use email as a form of communication with their doctor, they were less likely to make use of online systems (Williams et al, 2004b, p 39).

Among staff, age has been found to be significant in the use of digital media by those working in healthcare. Martin, for example, found that younger doctors were keener than their older counterparts on using information from the Internet, referring patients to Internet sources and on using PDAs (Martin, 2003). It has, however, been argued that the lack of use of computer systems developed to help doctors can be attributed to a lack of consideration of doctors' actual information needs (Smith, 1996, p 1062). This highlights the importance of ensuring that any IT systems developed for the residential care setting take sufficient account of the actual information needs of carers working in these establishments.

Interestingly, nurses have been found to hold significantly more negative attitudes about computers and to have greater levels of computer anxiety than doctors and clerical and administrative staff. However, a study carried out by Dansky et al (1999) also found that fears quickly dissipated as the nurses involved became aware of how user-friendly the system was that was being introduced to them. A study into the mobile support needs of home care nurses in Norway found that on average the test group had a 'positive technological attitude' (Sorensen et al, 2003, p 6).

The social care workforce has been under-researched, but it is likely that negative attitudes towards computers may be more acute among care workers than among nursing staff, since there is a particularly low level of basic skills and e-skills among the workforce (who include a significant number of people for whom English is not a first language) (Dunn, 2004, p 32). These barriers may be easier to overcome for the younger section of the care workforce who have been keener on training (Balloch et al, 2004, p 20). Nevertheless, for the effective design and incorporation of any ICT systems into the care workplace, it is important for research to look more specifically at the attitudes of paid care staff towards ICT and to address often-expressed fears (both within the health and social care sectors) of IT detracting from the human element in care, as Protti argues:

> Reticence toward clinical technology stems in part from a fear of further eroding dialogue and the human touch. (Protti, 2005, p 3)

It is also important to take due account of support issues relating to computer experience and computer anxiety as well as specific motivational variables such as 'enjoyment', 'self-efficacy' (defined as 'people's judgements of their capabilities to perform a given task' [Mun and Yujong, 2003, p 434]) and 'learning goal orientation' (as opposed to 'performance orientation') (Mun and Yujong, 2003, p 436). In order to increase commitment from workers, technology incorporated into social care work, as in other types of workplace, must be easily usable, flexible and useful and not merely overloading users with data (Balen et al, 2000; Noble, 2003). This must also be in direct response to identified information and communication needs rather than technology driven (Coiera, 1995; Stefanelli, 2002). Otherwise, as has been shown, new technologies can actually increase workloads, with staff maintaining a computer-based system alongside a parallel system that is paper-based. As has been argued, this can result from incorporating computerised systems into the workplace, which have not been adequately designed to fit work practices (Bardram, 1997, p 251).

One way of ensuring systems are designed to fit the needs of users is to involve intended users in the design and evaluation process. The complexities involved in user-centred design, however, should be noted. Simply asking carers to describe their information needs may be inadequate since some information needs will be unexpressed either because the user is unaware of them or because s/he for whatever reason does not want to express them (Devadason, 1996; Booth, 2000). Devadason thus recommends the use of a mixture of research methods, including 'direct methods' such as observation, surveys and interviews as well as 'indirect methods' including studying relevant documents such as the job description, work diaries, and so on. Scenario building with potential users has also been recognised

as 'a powerful mechanism to generate design ideas for new systems and to predict how people could act in a particular situation' (Rodriguez et al, 2005, p 202). Turner et al (2001), however, emphasise the point that there is not one voice but 'multiple voices' to consider in user-centred design. Thus they discuss the issue of unwanted compromises that may result from design workshops (Turner et al, 2001, p 1). Such ideas may be useful to reflect on when designing technology to be incorporated into residential care workplaces where workers are clearly not a homogeneous group, but, for example, include those of a wide range of ages, varying levels of experience and qualifications and different work goals and perspectives.

2.7 Summary

In the various areas discussed in this review, it is evident that technological advances to aid information and communication are being made in many aspects of health and social care, including the medical field and home care services. This review has suggested that the experience gained from many of these developments may also be beneficial within a residential care context. It has also highlighted concerns and potential barriers to incorporating ICT in the workplace and training programs, such as the disproportionately high level of support needs among the workforce in terms of e-skills and basic skills, which may also impact on attitudes towards digital media. It has shown that the social care workforce in the UK is under-researched in all of the areas discussed above, and that further research is thus required. In particular, research is needed to identify specific information and communication needs and work processes within residential care, so that the potential benefits of ICT could be appropriately applied to the sector, which otherwise, in the light of the current focus on promoting independent living, will be increasingly left in the shadows.

3 Methodology for gathering data

This project set out to obtain an understanding of the culture and work practices of paid workers in residential care settings for older people using three methods, all of which took to some extent a scenario-based approach. The methods used were site visits, a questionnaire study and design workshops.

3.1 Site visits

3.1.1 Method

The first stage of the study took the form of observations of the care staff in six UK care homes. The characteristics of the homes are described in the table below. To guard against regional bias we visited two homes each in London, Manchester and Sussex, although in fact little regional variation emerged. As far as possible within the resource constraints of the project, homes of different sizes, locations, ownership and architectural types were visited.

Home	Ownership	Location	Numbers	Building type
A	Private	South Coast – small town	80-90	Converted hotel
B	Local authority	South Coast – urban	20	Converted house
C	Voluntary organisation	Central London	27	Converted house
D	Local authority	London – residential area	35	Custom-built
E	Voluntary	Manchester – suburban	25	Custom-built
F	Ex-local authority, now voluntary organisation	Manchester – suburban	40	Custom-built

Typically six to eight hours were spent at each site, with researchers shadowing key staff members (receptionists, care managers, senior care workers, care assistants) as they went about their normal day's work. A pilot study had established that longer periods of observation would be disruptive and would be unlikely to yield proportionately richer information. Although it was not possible to spend a whole night shift in a home, a point was made of observing whenever possible the handover meetings at which workers on different shifts exchanged information. This gave access to a large number of staff and also revealed itself to be a key point of the working day for communication. We would expect night work to raise different issues from day work, and this is an area that would need to be investigated in any further study. The emphasis was on observing communication and information-

seeking behaviours and, via informal opportunistic interviews, eliciting attitudes both to currently used technologies and tools and to potential future uses of digital technologies. Although any observational study runs the risk of influencing behaviour, there was no sign that the activities and interactions witnessed were out of the ordinary.

The observations were collated and integrated using techniques from the contextual design systems development methodology (Beyer and Holtzblatt, 1997), in particular its five different work models: 'flow, representing the communication and coordination necessary to do the work; sequence, showing the detailed work steps necessary to achieve and intent; artifact, showing the physical things created to support the work, along with their structure, usage and intent; culture, representing constraints on the work caused by policy, culture or values; and physical, showing the physical structure of the work environment as it affects the work' (Beyer and Holtzblatt, p 86). The culture model has been particularly helpful here as it allows us a natural way of capturing the care workers' feelings about the type of work they are engaged in and about the place of technology in that work. The results from the six sites were then integrated at an interpretation workshop, to create a general model of care home work in the UK.

One result of this observation stage was that it gave the researchers enough insight into the workings of care homes to be able to create reasonably credible scenarios for use in two further strands of the study: the scenario-based questionnaire and the scenario design workshops (see below).

3.1.2   Key findings

Staff working in care homes have developed sophisticated and effective information and communication systems that rely on formal and informal face-to-face contact, augmented by paper documents and telephone use. All the homes had diaries and logbooks, each with a different and distinct purpose. This documentation is seen as key both to the functioning of the home and as a form of evidence for regulatory and inspection purposes.

A large number of files were maintained, the most essential being those related to resident care, which were permanent and 'official'. Only two of the homes used computerised systems for residents' care plans and in one of those there was a parallel paper-based system. The others all used paper-based systems. Ongoing information about residents tended to be noted down by senior carers while the carer was in the resident's room – or wherever an incident occurred – and then transferred to diary sheets, logbooks or files. (In several homes, senior workers carried around personal notebooks in which to make notes.) This meant that the same core information was written down several times in different places. A process of editing took place, where, for example, all information was transferred to an individual resident's file but only key information was transferred to a shared diary or logbook. Most staff seemed to accept the need for transferring information from one source to another and the inevitable duplication or omission, while a few questioned the efficiency of this. Several senior staff members commented about the amount of paperwork and how much of it was for regulation purposes rather than to improve

care directly, and one senior care officer spoke of how she would like computerised diary sheets, to save having to transfer information from one source to another.

Much work in the care home currently goes into recording snippets of information and either communicating them verbally or transferring them to one or more documents. There was little complaint about this as it was seen as good practice to record every detail of residents' lives and of the care workers' activities: 'if it isn't written down, it hasn't happened', as one manager put it. In other words, recording information is not generally seen as a problem to which an IT solution is sought.

It was noticeable that care assistants played little part in generating paper-based notes. This seems to be related to their limited role in decision making and also to confidentiality issues. It was clear that any abnormality or problem would be referred to a senior care worker or manager for resolution rather than being handled by the care assistant. The senior carer would then note the problem and make the decision. This division of labour seemed to work well in terms of information handling and was seen across all the homes visited. Care assistants were engaged in the day-to-day physical and social care needs of residents, such as dressing and bathing, while any functions that needed recording, whether one-off incidents such as falls, or routine procedures such as medication dispensing, were carried out by senior staff.

The need for ease of access to non-confidential information for all staff was a recurring theme – whether this was to files in a filing cabinet in an office or to a computer terminal. Figure 1 shows a list of files to be found in one office in one of the care homes visited. Staff used this to locate relevant information, for instance in response to a family member's 'phone enquiry. For instance, one manager gave the example of a family member who might 'phone wanting to know when her mother had last been to the hairdresser. It was important that any staff member should be able to access such information instantly.

All homes contain a plethora of different types of notice board and these are actively used throughout each shift. The types of information displayed on the boards included contact 'phone numbers, staff rotas, daily tasks, room allocations, residents' dietary information, medication details and so on. Notice boards in the residents' areas showed things like menus, daily activities and weather summaries.

Figure 1
List of files

Figure 2
Typical notice board in manager's office

Whiteboards were often used as a straightforward substitute for notice boards. In one home, however, a whiteboard was used very dynamically, in conjunction with post-it notes, to show changing information, for example, 'Mr S to go out for a walk this afternoon'. The whiteboard was constantly updated when tasks were completed or new situations arose and was the prime point of reference for staff as they managed their tasks during their shift.

Another set of documents arises from training and staff development activities. Many care assistants are undertaking work-based training for vocational qualifications. This involves gaining credit for competence in activities such as feeding, bathing, communicating with residents and so on. At the moment these activities are logged on paper 'witness statements' stating that a senior worker has seen them take place.

Information is transferred from shift to shift via 'handover meetings' when the person in charge of one shift reports to the incoming senior worker or to all the staff on the next shift. In the homes where we observed handover meetings, the communication was primarily done face to face and relatively informally. However, although informal, the process was thorough, with information about each resident in turn, even when there was nothing substantive to report. Written notes and diary logs were referred to and discussions about residents and their care tended to arise around the basic information exchange. These face-to-face meetings allowed subtle issues to be raised. For instance in one home, three separate care staff (two on night shift and one on day shift) had a fleeting impression that a particular resident was 'not quite herself'. Their impressions had been too vague for them to note them on the resident's file individually. However, when the resident was discussed at the

handover meeting the three staff could confirm their unease and make a note in the resident's file for special attention to be paid that day.

Information *during* a shift is typically relayed face to face and on the move:

'Do we know what time is Mr T being collected?'

'Around 11 o'clock.'

The overwhelming majority of communication and information seeking concerned individual residents. One manager made the point that this constant flow of interpersonal communication was valuable in terms of team building and also counted as informal training. At one home we witnessed a team meeting where general issues were discussed, but there was little in the way of general discussion or information seeking observed.

Communication with the world outside the home was overwhelmingly managed by telephone. Fax is used to a lesser extent and, in three of the homes visited, staff used email, although this was mainly restricted to the managers or senior workers, often in communication with other homes in their wider organisation. When not at work, managers tended to be on-call most of the time, preferring to be rung at home or on their mobiles to deal with a difficult decision than to be left out of the loop.

Digital technology of any sort was little used, although, as noted above, two homes used computerised systems for care plans. The homes typically had two or three personal computers, which were usually kept in separate, sometimes locked, rooms to which only senior staff had access. These computers tended to be older model computers of low specification. Word processing appeared to be the main use of the computers, for example, staff lists and other notices were generated from stored templates, which saved time and created a professional look. The slight exception was one of the local authority homes, where computers had been installed in the residential areas for use by care workers. The machines had not yet been connected but the staff we spoke to were enthusiastic about the prospect of training and being able to use them 'for looking things up'. However, the relative redundancy of computers was more typical, where keyboards were moved to one side to allow more space for note writing or computers sat unused in locked offices.

However, in one of the local authority homes, the manager used the council's intranet as the first port of call for information, citing dementia as an example of a recent information enquiry and a section called 'Being a manager', which she used regularly. In another local authority home, the receptionist also made use of the council's intranet and she circulated or printed off information that she thought would be of interest to other staff members. Elsewhere we observed little or no use of websites for seeking information. The key information sources were internal to the home, often self-generated in the form of notices or information sheets in files, or supplied from recognised sources such as medication information from the pharmaceutical companies.

Some variant of devices such as bleepers, buzzer alarms and baby intercoms, were used in most homes, but these tended to be simple alerting or monitoring devices. In most homes, when terms such as 'digital media' and 'technology' were mentioned, the tendency was to interpret this as a reference either to distance learning, typically for the NVQ Level 2 award in care, now demanded of 50 per cent of staff at each home, or more frequently to the desktop computers on which residents' long-term files might be held.

The view was frequently expressed that the sorts of people who chose to work in care were by nature unlikely to be enthusiastic about computer technology. They were people oriented and in addition had often had low achievement at school, or spoke English as a second language, which they saw as barriers to competent computer use.

However, natural antipathy and lack of confidence among care workers do not seem to be the primary reasons for the lack of technology in care settings. The drawbacks and inconveniences of the desktop computer in the care setting simply seem to outweigh any advantages it might have. Several senior staff we interviewed had clearly debated more extensive adoption of desktop computer technology and decided against it on the grounds of difficulties of physical access to machines, issues of confidentiality, speed and ease of access to information and the lack of visibility of this information when stored in a central machine.

4 Questionnaire

4.1 Design

A self-completion postal questionnaire was designed in order to test the wider applicability of the field study findings. Questions were designed primarily to obtain information regarding current practice in relation to information and communication processes within care homes and indirectly to give some further indication of the potential acceptability of supporting technologies. The questionnaire was designed for and addressed to the manager of the establishments included in the sample. Ideally we would also have been able to obtain direct responses from care staff themselves in order to have obtained a more accurate picture of staff attitudes towards and familiarity with various technologies. However, it was felt that this was beyond the scope of this study due to the limited timescale and resources available.

The questionnaire was piloted with several contacts who were currently or had been previously working as managers of care homes for older people. The questions (particularly those based on scenarios) were also informed by input received through the field studies. Before mailing out the questionnaires, final amendments were made according to feedback received and from discussion among the research team. Please see Appendix 2 for a copy of the questionnaire.

4.1.1 Sample selection

The study aimed to include a sample of care homes for older people that was representative of each of the regions of the UK, and also of type of provider. Using the Bettercaring database, a random stratified sample of 1,501 homes providing long-term care for older people (omitting any that were 'with nursing care') was taken: every seventh home from each region was selected. As this database did not include local authority homes, a further list was obtained from Bettercaring, from which 340 local authority homes were randomly selected (again every seventh home). The combined sample therefore totalled 1,841 care homes. Of these, 66 were found to be invalid, since the questionnaires were returned to sender (for various reasons, such as home closure). This therefore left a sample of 1,775.

4.1.2 Response rate

A total of 240 questionnaires were returned providing a response rate of 14 per cent. A further seven questionnaires were returned late and therefore not included in the quantitative analysis but some qualitative comments were extracted from these. The response rate was higher for private and voluntary homes (14.3 per cent) than for local authority homes (7.4 per cent). Local authority homes therefore made up 18 per cent of the original sample, but only 10 per cent of the returned sample.

4.2 Results

4.2.1 Background information

The results in this section relate to background information about the establishments that responded to the questionnaire.

Type of provider

A total of 173 questionnaires were received from privately run homes which as illustrated in Figure 3, constituted a large majority of the returned sample (72.1 per cent). Forty Two (18.5 per cent) were received from not-for-profit homes and 25 (10.4 per cent) from local authority homes.

Figure 3
Type of provider

Local authority	10%
Private	72%
Not-for-profit	18%
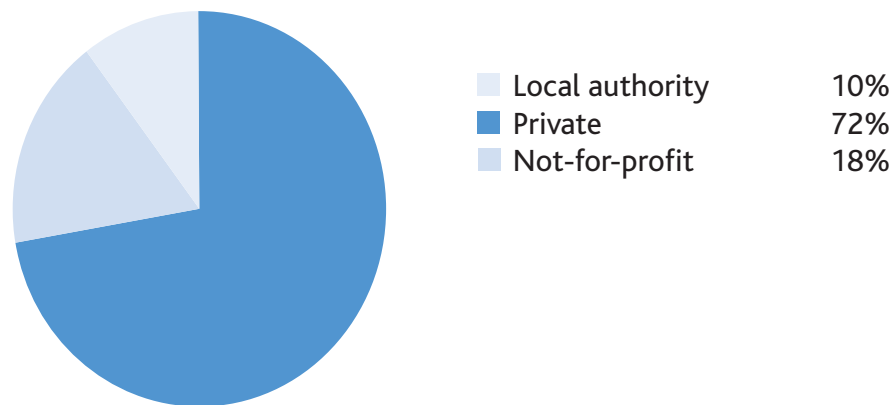
Numbers of residents and staff

The number of residents represented by the 240 care homes that completed the questionnaire was 5,647, which gives a mean of 24. The number of residents per home ranged from a minimum of five to a maximum of 137. Figure 4 show the relationship between ownership type and resident numbers, with private homes tending to be larger than others.

Figure 4
Ownership type: resident numbers
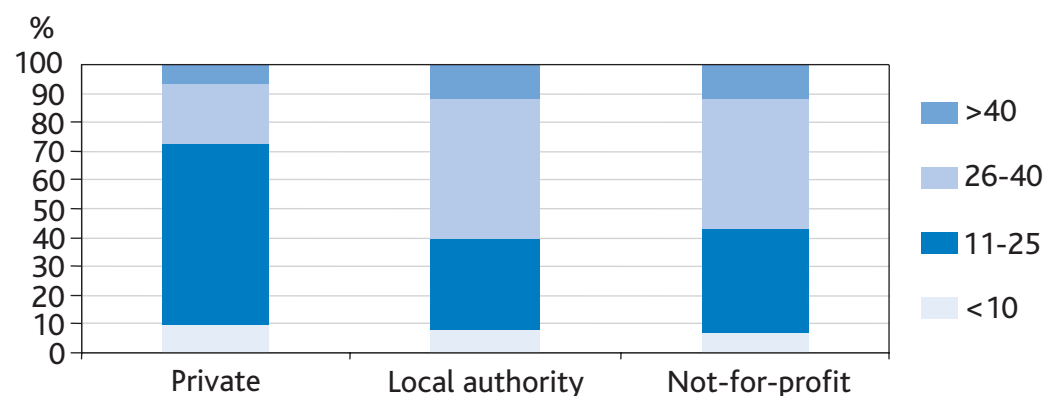
The total number of care staff was 4,457 (average 19), while there were 1,298 domestic and catering staff (average six), 324 administrative staff (average two) working in these establishments. In addition, there had been 182 agency staff (average one) working in these homes during the week prior to receiving the questionnaire.

A large majority of care workers were female (92 per cent) and most were aged between 25 and 49 (61 per cent). A slightly higher proportion of care workers were full-time (52 per cent) than were part-time. Thirty-eight per cent of all care workers had been working in the establishment for over five years, but around a third (33 per cent) had been working for less than two years, over half of which (19 per cent) for up to 12 months. Figure 5 illustrates the breakdown of the sample care workforce by gender and age groups and Figure 6 by type and length of employment.

Figure 5
The care workforce by age and gender

Male 24 and under	1%
Male 25-49	5%
Male 50 plus	2%
Female 24 and under	12%
Female 25-49	56%
Female 50 plus	24%
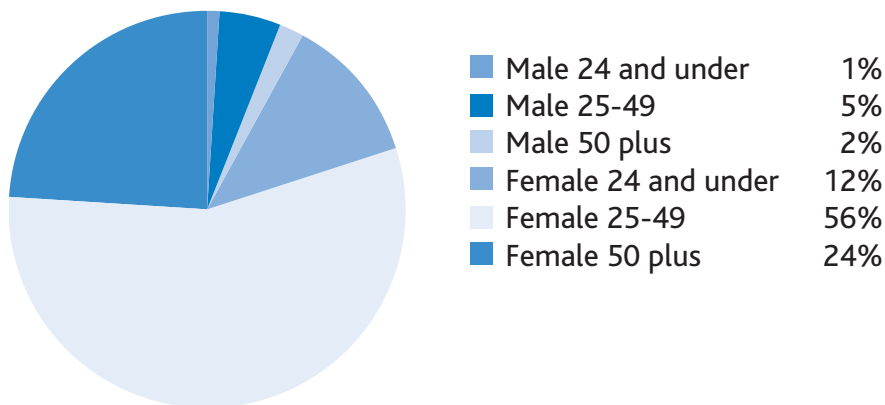
Figure 6
The care workforce by type and length of employment

FT <1 month	1%
FT 1-12 months	9%
FT 1-<2 years	7%
FT 2-<5 years	14%
FT 5 years +	20%
PT <1 month	1%
PT 1-12 months	8%
PT 1-<2 years	7%
PT 2-<5 years	15%
PT 5 years +	18%
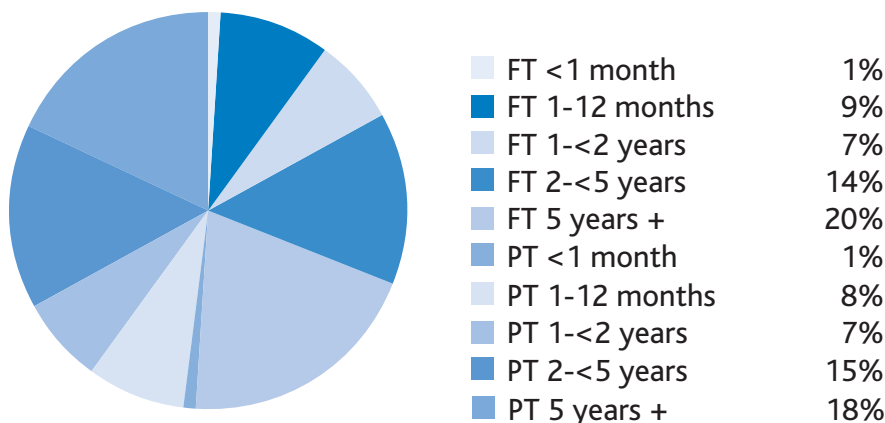
Staff qualifications and English language

The questionnaire found that 2,025 (45 per cent) care staff were stated to have NVQ 2, 3 or 4 Care (average nine per home) qualifications. In addition 757 (17 per cent) were stated to be currently working towards NVQ Level 2 Care (average 4). Figure 7 illustrates the proportion with, without or working towards the qualification.

The results showed that 403 care staff (9 per cent) did not have English as a first language (average two per home). [17]

Figure 7
Staff qualified, working towards or unqualified to NVQ Level 2, 3 or 4 Care

Qualified	45%
Working towards qualification	17%
Unqualified	38%
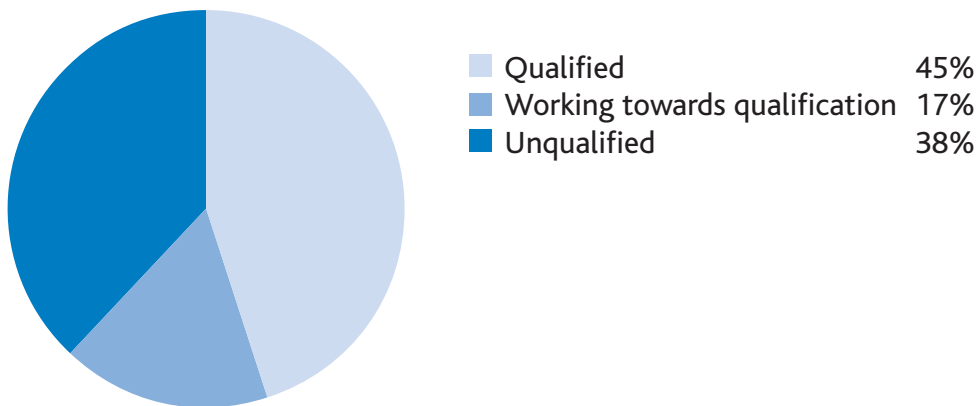
Use of ICT in the workplace

This section presents findings relating to the uses of technology within care homes.

Managers were asked whether their care staff had access to a range of technologies at work. The options given are shown in Figure 8. As the figure shows, apart from the telephone, the levels of access to the various technologies were low. Fifty per cent of managers, for example, stated that their care staff had access to a desktop computer, 11 per cent to a laptop and 17 per cent for both beepers and pagers. 'Other' responses included the call bell/intercom system and the fax machine.

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[17] The issue of the implications of a care workforce whose native language is not the same as those they care for is one that could not be followed up in this study but which is likely to be of great significance. A further issue is, of course, is the provision of care homes where those whose native or preferred language is not English will feel comfortable. A number of Polish-speaking homes have been established, for instance, in areas where there has been a need for this provision. Culture is a related issue. A participant in the design workshops raised the example of care workers from a culture where homosexuality was frowned on who might find it difficult to accept homosexual relationships between residents.

There were statistically significant differences in the proportion of homes in which care staff had access to desktop computers ($p=0.001$) when compared by type of provider. This was much more likely to have been the case in local authority homes (84 per cent) than voluntary (52 per cent) or private homes (45 per cent). There was also statistically significant differences between the proportion of homes in which care staff had access to pagers ($p=0.008$) and mobile phones ($p=0.023$). Again, staff were more likely to have access to these in local authority homes than those working in voluntary or private homes. In regard to the other devices, no significant differences between type of provider were found.

Establishments were divided into four categories based on the number of residents to test whether the size of the home made any significant difference to the level of use of the various technologies. Statistically significant results were only found in regard to beepers ($p<0.0005$) and mobile 'phones ($p=0.006$). In regard to beepers, the larger the home, the more likely staff were to have access to them. Staff only had access to beepers in 9 per cent of homes with less than 10 residents, while this was the case in 12 per cent of homes with 11 to 25 residents, 23 per cent with 25 to 40 residents and half of those with over 40 residents. Staff were, however, more likely to have access to mobile 'phones in smaller homes. This was the case in 82 per cent of homes with less than 10 residents, but only 39 per cent of the largest homes.

Figure 8
Technologies that staff have access to at work
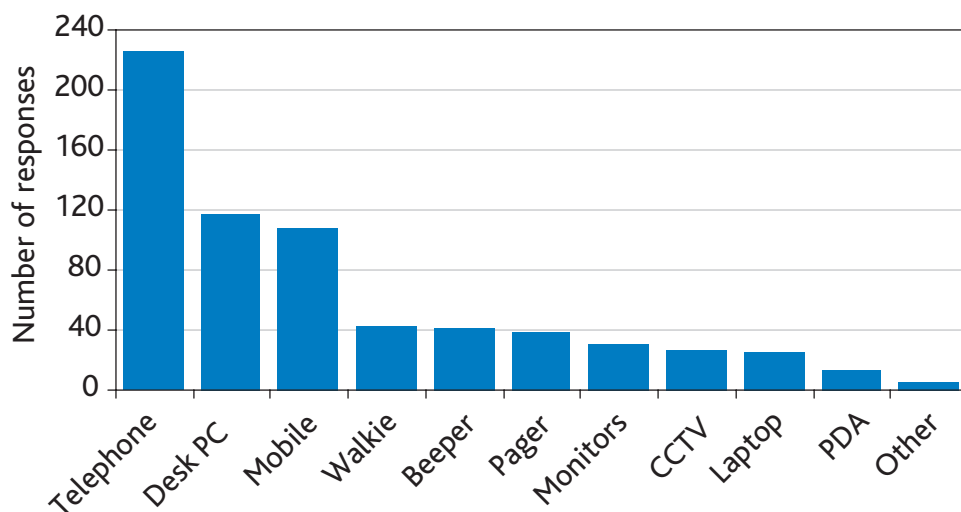
Managers were asked about their own and their staff's use of various forms of ICT in the workplace. As is illustrated in Figure 9, results showed that most managers stated care workers made no use of email, the Internet or the computer (for purposes such as word processing and to access patient records) in the workplace. As Figure 10 shows, the manager was much more likely to do so. Even so, however, the computer was mainly used for word processing, while most managers (51 per cent) never used computerised patient records. Around a third also never used the Internet for accessing training materials, and a similar proportion never used email to communicate with people outside the home. The large majority of managers (83 per cent) made no use of email to communicate with people inside the home.

There were statistically significant differences between type of provider in the proportion of managers who stated they used email to contact people both outside and inside the home. Eighty-eight per cent of managers in local authority homes used email for outside communication (either daily, weekly or monthly) in comparison with 66 per cent in private and voluntary homes ($p=0.025$), while 52 per cent of local authority home managers used email for communication with people inside the home, in comparison with 13 per cent of those managing private and voluntary homes ($p<0.0005$). Managers were also more likely to use a computer for accessing patient records and for word processing in local authority homes than in private or in voluntary homes. However, the difference was not statistically significant. Little difference was found between types of provider in the proportion using the Internet for general information or for training materials.

Similarly, there was a statistically significant difference ($p=0.006$) in the proportion of care staff in local authority homes using email to contact people outside the home (32 per cent) in comparison with private and voluntary homes (12 per cent), as there was ($p<0.0005$) between local authority homes (24 per cent) and other homes (4 per cent) in the proportion using email for communication inside the home. Staff in local authority homes were also more likely to use the computer and the Internet than those working in private or voluntary homes. The only statistically significant difference ($p=0.006$) found, however, was the use of computerised records. Thirty-two per cent of managers in local authority homes stated their care staff used the computer to access patient records, but only 12 per cent stated this was the case in private and voluntary homes.

No statistically significant differences were found in the use of these forms of ICT, when homes were compared by size.

Figure 9
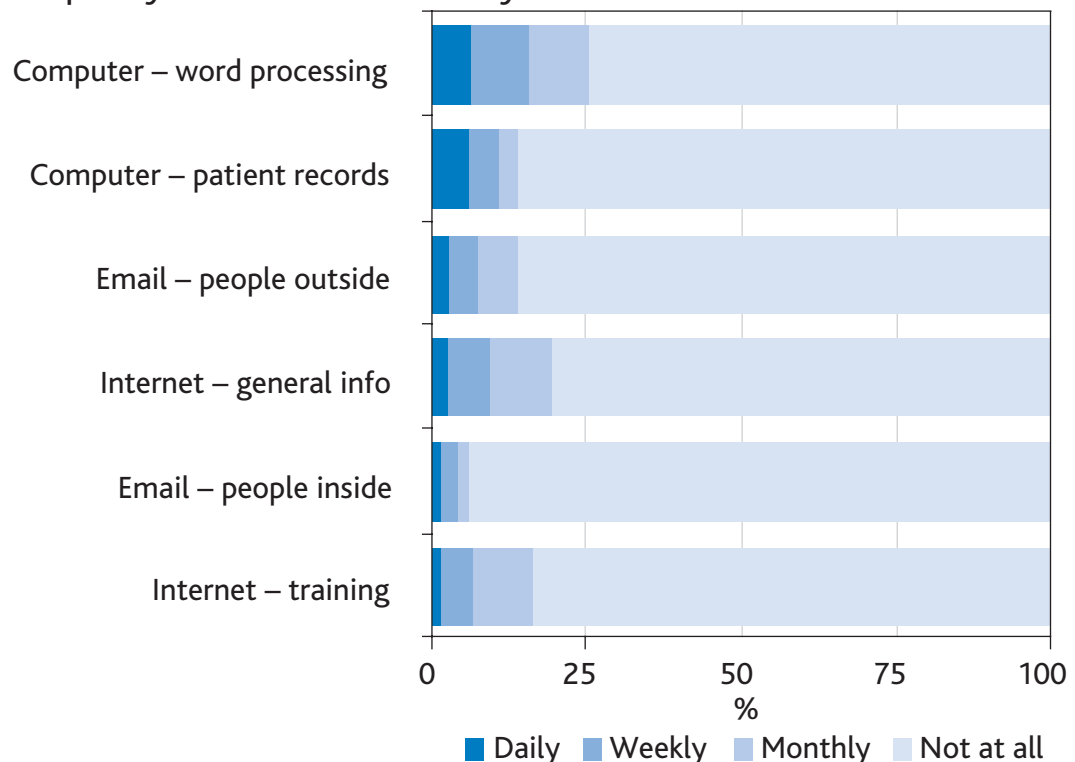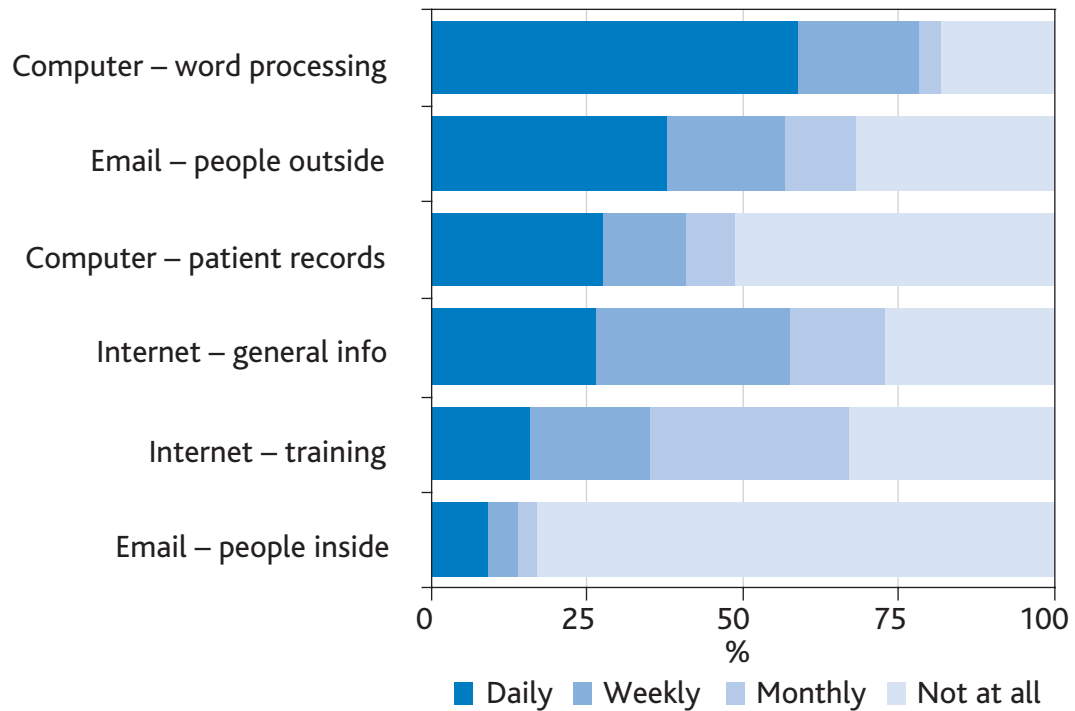Frequency of activities at work by care staff

Figure 10
Frequency of activities at work by manager

Question 12 asked about the use of assistive technologies such as medical alarms or sensors to alert staff to problems. A total of 150 respondents (63 per cent) stated that these were used in their home. Most of these expanded on this by describing a call system located with points located in various rooms such as residents' rooms, toilets, bathrooms and lounges, which were connected to a panel to alert staff to the location in which attention was required. In some cases managers described how the call system also alerted staff through the use of beepers or pagers.

A small number of respondents described other monitoring equipment such as baby monitors (for use with an ill resident), and movement sensors such as pressure mats or pads.

Familiarity with ICT

This section looks at the question relating to the perceived familiarity of staff with various forms of ICT at home and in the workplace.

Question 24 asked for the manager's perception of staff's familiarity with various technologies and their applications. As shown in Figure 11, managers felt that a large majority of their staff were very familiar with mobile 'phones, and that most were familiar with computers for use with word processing. They also mostly (61 per cent) considered their carers to be either familiar or very familiar with email. A significant proportion were not sure about their staff's familiarity with the Internet for the purposes included, but most (51 per cent) felt they were familiar or very familiar with shopping online.

In establishments where a larger proportion of the care workforce were over 50, there were statistically significant differences in the proportion of managers who stated their staff were familiar or very familiar with mobile 'phones for making calls ($p=0.001$) and for text messaging ($p<0.005$). Seventy-two per cent of managers of homes in which over half were aged over 50 were very familiar with mobile 'phones for making calls, in comparison with 94 per cent in homes with 21 to 50 per cent aged over 50, and 95 per cent where 20 per cent or less were over 50. Similarly, there was a lower proportion of staff very familiar with text messaging in homes in which most staff were aged over 50 (60 per cent), than where 21 to 50 per cent of care staff were aged over 50 (82 per cent), or where only up to one fifth were in the oldest age bracket (88 per cent). No statistically significant differences were found between the perceived familiarity with any of the other technologies and the age of the workforce.

Figure 11
Perceived familiarity of care staff with ICT
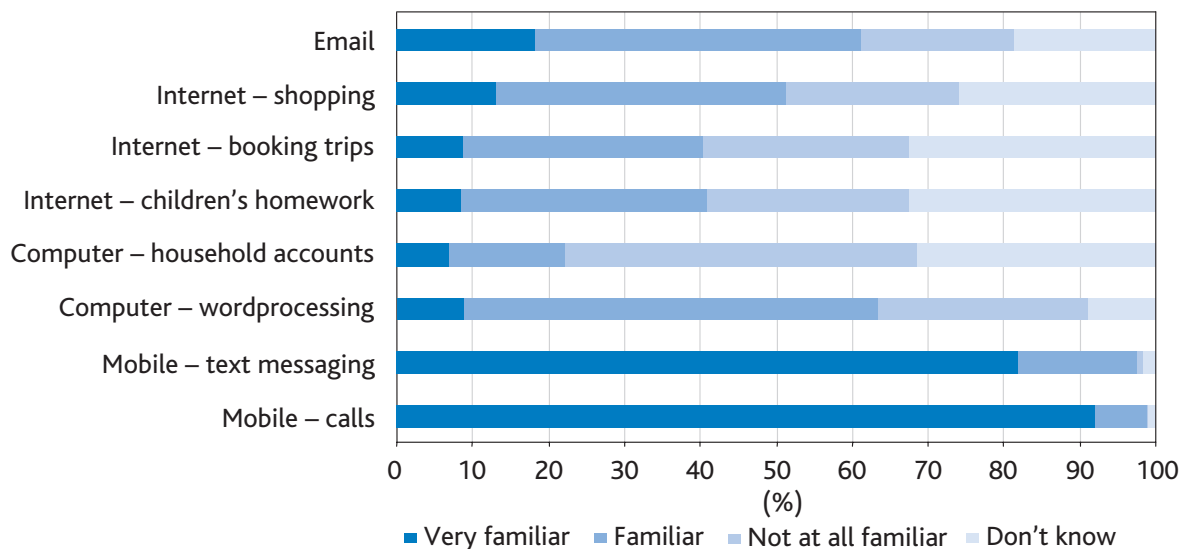
Training

This section presents findings relating to the questions around staff development in care work and the place of ICT in training (Questions 22, 23 and 27).

Question 22: Do you have an induction procedure?

Managers were asked to describe the induction procedure in place at their home. This question was answered differently by different respondents with some, for example, merely stating that they follow 'induction to Topss standards' or 'as recommended by Topss'. Others went into more detail in describing the methods of communication used. In most of these cases the principal format of induction materials was written, that is, an induction pack or sheets including printed documents relating to policies and procedures, employee rights and responsibilities and so on. Some also noted

the use of verbal and visual communication methods such as work shadowing and supervision and a few noted using training videos.

Question 23: An agency care worker has been taken on for a week. This is their first day, how will they know what their duties are?

When asked about methods used to communicate information to new agency workers, this most frequently consisted of verbal communication from a senior member of staff alongside work shadowing and supervision, with some stating agency workers would be constantly supervised if taken on for only one week. Many managers stated that written information would also be used, such as sheets explaining daily duties and induction materials.

Question 27: What training in (ICT) have you and your staff received?

As shown in Figure 12, a large majority of care workers (73 per cent) had not received any form of training in ICT (in using a computer for word-processing/recording patient details, the Internet or email), while managers were the most likely to have received formal training in these technologies (46 per cent). If homes were divided into local authority and 'other', staff working in local authority homes were more likely to have received some form of training at each of the three levels. This was only, however, statistically significant (p=0.012) for senior care workers, 84 per cent of whom had received training in local authority homes in comparison with 58 per cent of those working in other care homes included in the sample.

Figure 12
Training received in ICT (computer/internet/email)

Communication and information-seeking methods

The questionnaire included a number of questions based on scenarios which asked how specific incidents requiring the communication or retrieval of information might be dealt with. The scenarios were derived from the site visits. This section presents the findings relating to these questions.

Figure 13
Responses to Question 13: A resident has decided what to have for lunch. How does this information reach catering?
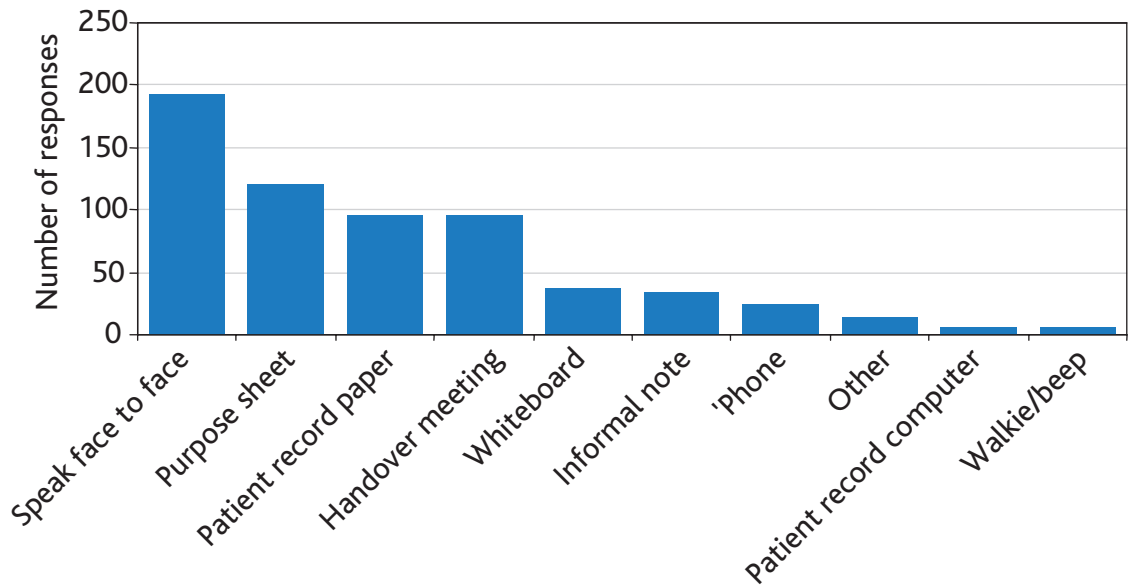

Figure 14
Responses to Question 14: It is 9am and a resident tells a carer they want to go for a walk in a wheelchair this afternoon. How does the carer communicate this?
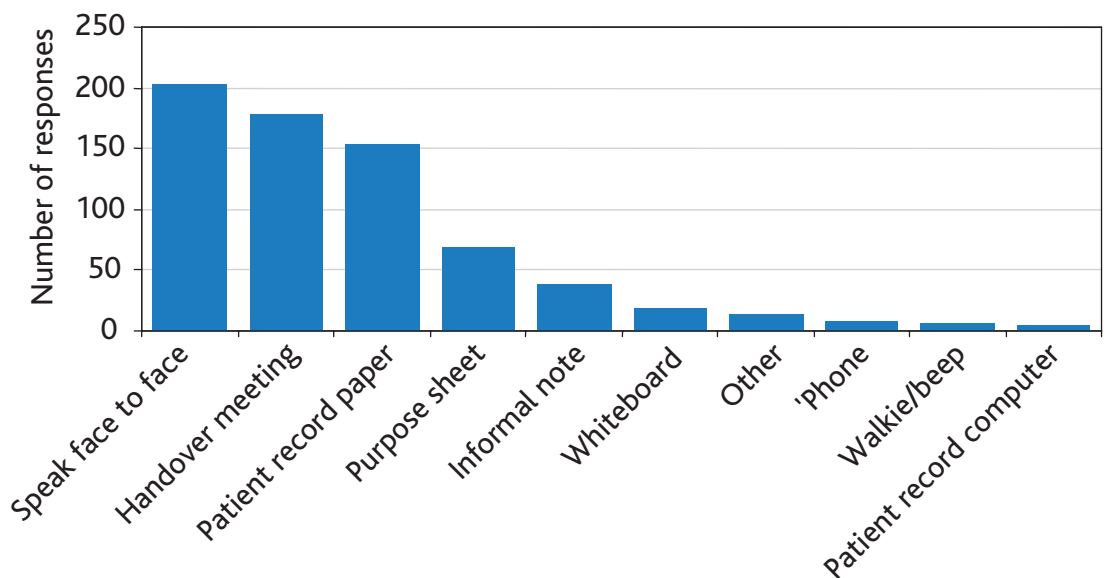
Figure 15
Responses to Question 15: A resident tells a carer they want to see the chiropodist, who visits one day a week. The care worker is not sure which day it will be this week. How will they find out?
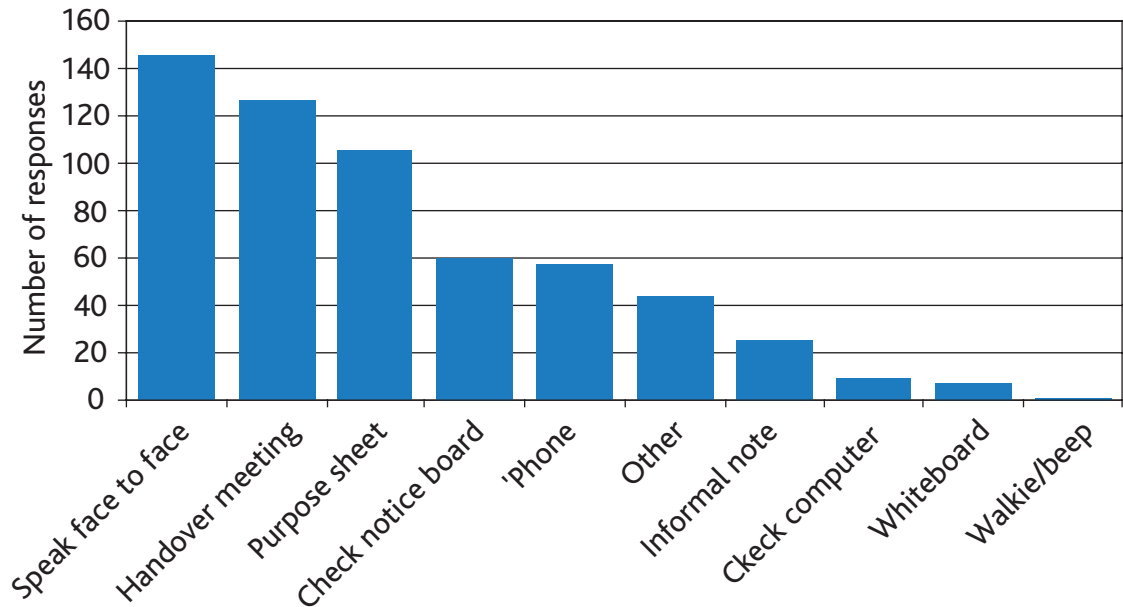
Figure 16
Responses to Question 16: A carer needs immediate help to clean a mess in a resident's room on floor three. How will they get help?
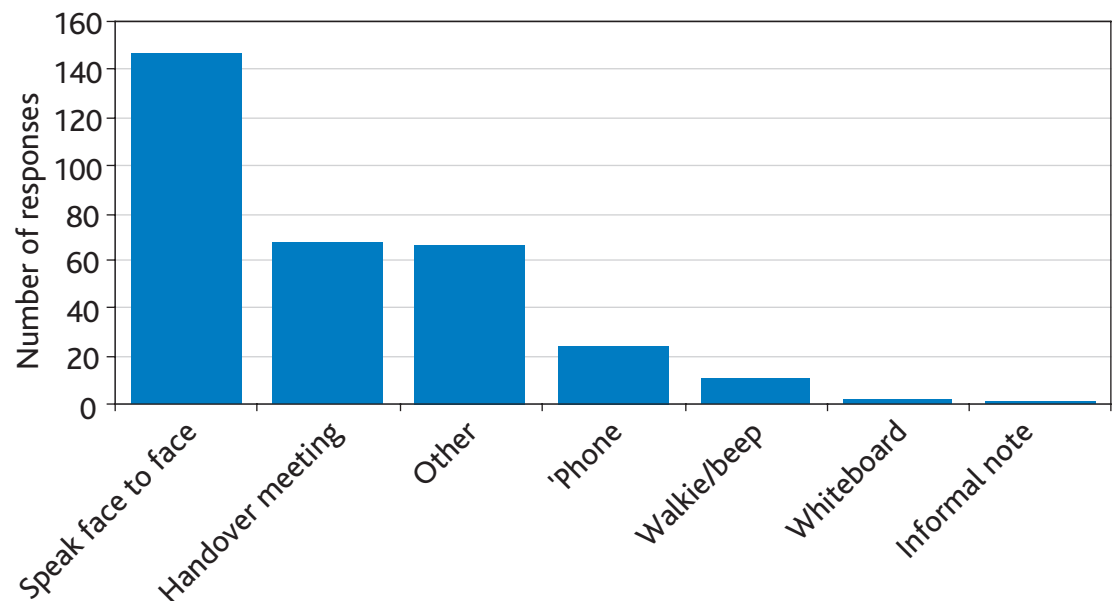
The responses to Questions 13 to 16 are quite similar.

Thus, in the majority of incidents requiring communication between staff working within the same shift, the predominant method identified was face-to-face communication. The majority selected this method for scenarios 13 to 16 (Figures 13 to 16). 'Other' forms of technology such as pagers and beepers tend to be used mainly to request urgent help as in the situation presented in scenario 16 (see Figure 16). It should be noted that most 'other' responses for this question were described in terms of a nurse call or call bell system.

Communication between shifts or between workers on- and off-site follows different patterns (Figures 17-19).

Figure 17
Responses to Question 17: A resident didn't take their sleeping pills last night. How do care staff on night shift inform care staff on day shift?
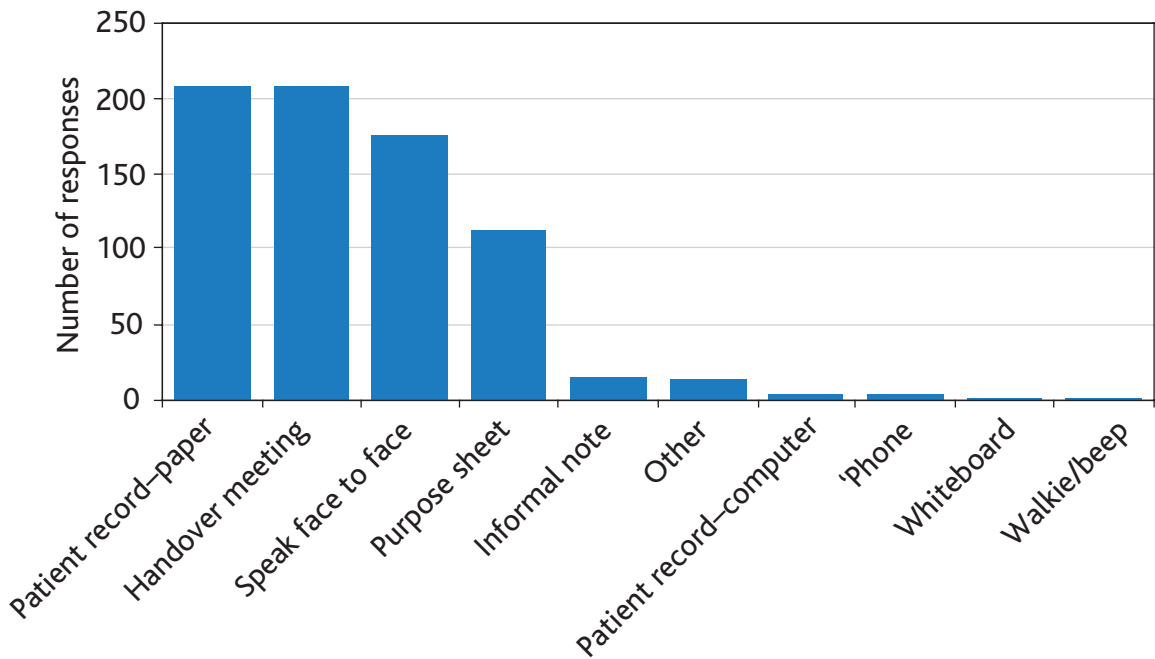
Figure 18
Responses to Question 18: A resident died last night. How do you make sure all care staff know about this?
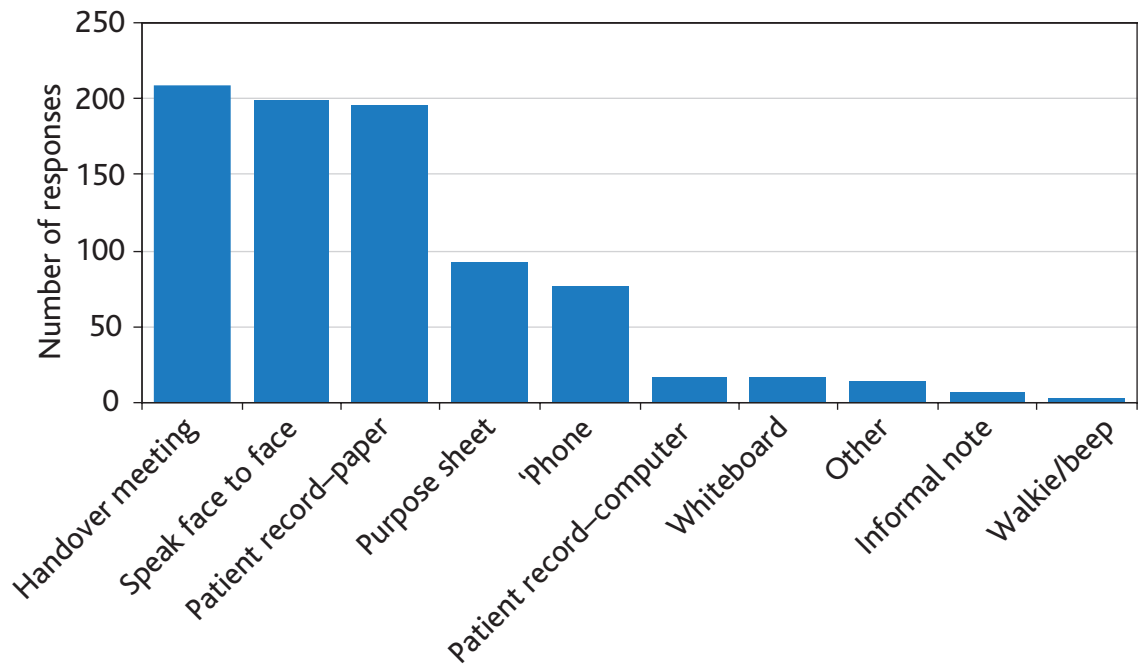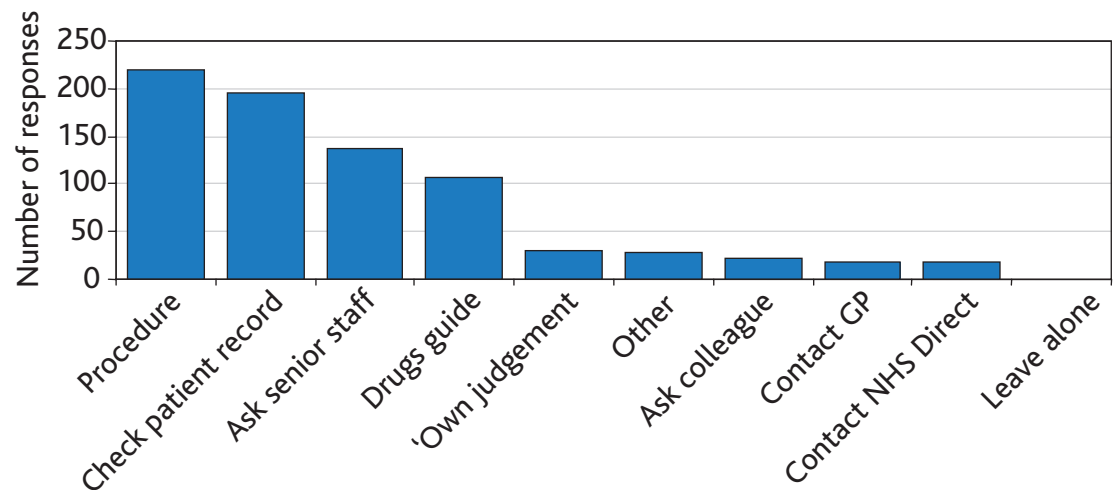

Figure 19
Reponses to Question 19: During the night a resident asks for a painkiller for a bad headache. How does this carer decide what to do?

Written information tended to be more important for the communication of information between shifts (Questions 17 and 18). Handover meetings that combine verbal and written methods were also identified as a vital means of communicating information between shifts, as illustrated in Figure 18. Figure 18 also shows the particular importance of patient records in medical incidents. As these responses suggest, computerised records are rarely used in comparison with patient records.
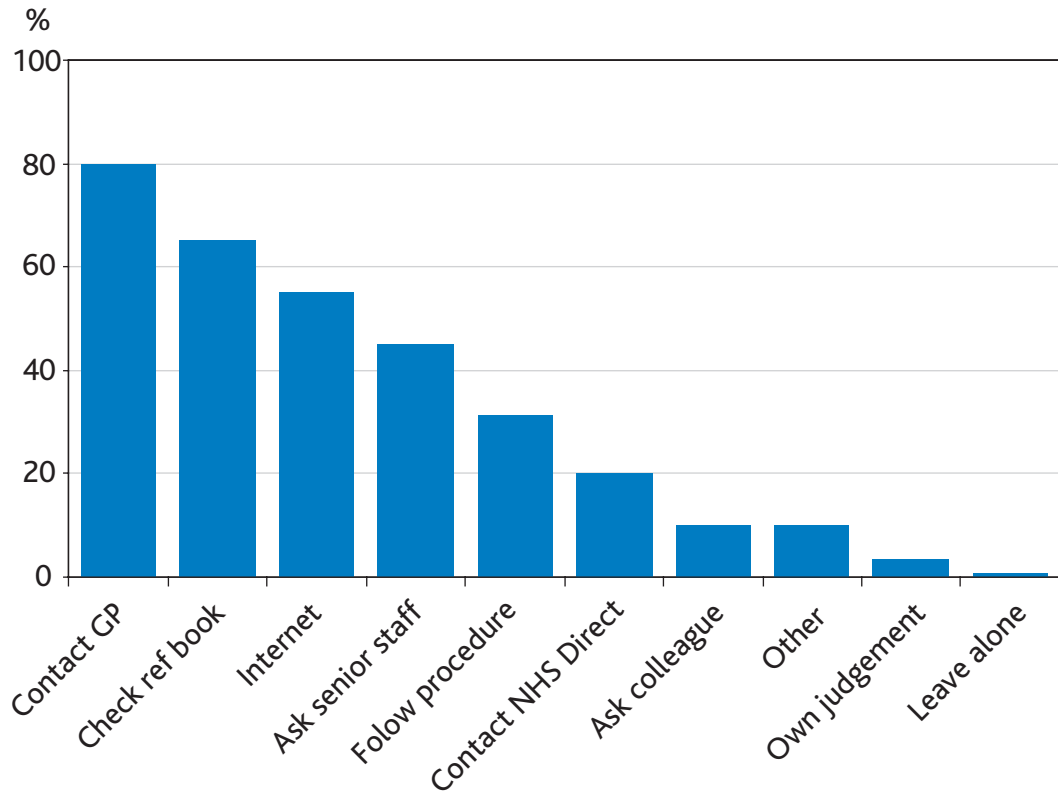
Figure 20

Responses to Question 20: It is 2am and a resident is confused and aggressive. You think they require a place in a psychiatric unit urgently as your staff are finding it difficult to manage. This has not happened to you before and there does not appear to be aprocudure. How do you find out what steps to follow?
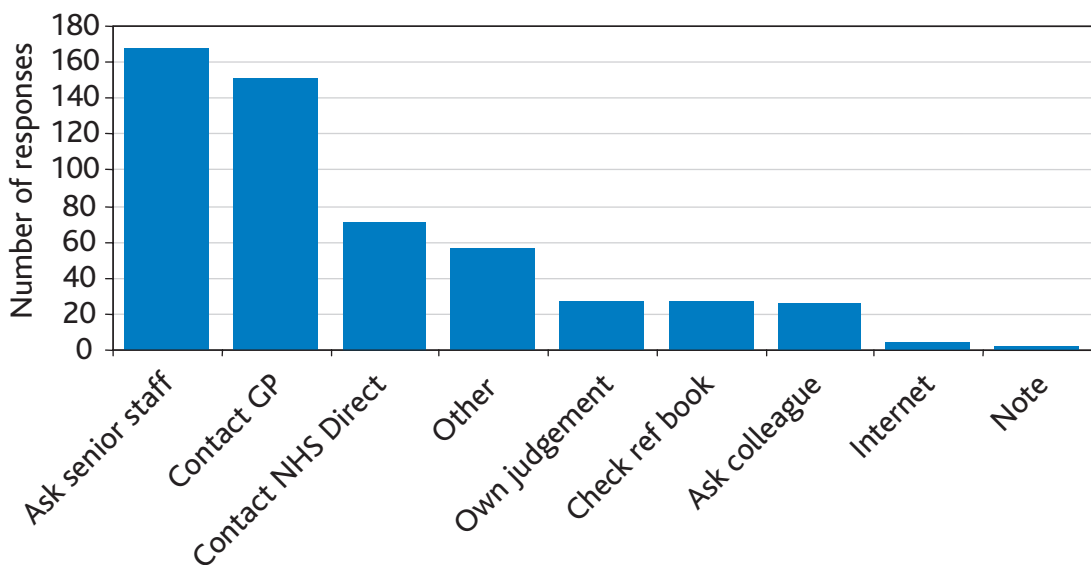
In the less typical incident involving information seeking put forward in Question 20, the majority of respondents stated that they would approach senior staff (72 per cent) and/or a GP (65 per cent) in regard to finding out what steps to follow. A significant proportion (31 per cent) also stated they would contact NHS Direct.

Figure 21
Responses to Question 21: A resident has returned from the GP having been diagnosed with a rare condition. How do you find out more about their condition?

As shown in Figure 21, contacting a GP was also chosen by a large majority (80 per cent) of managers with reference to finding out more about a resident's rare medical condition. Most managers also stated they would check in a reference book (65 per cent) and/or the Internet (55 per cent).

Suggestions and other comments

The final question gave a space for respondents to express any suggestions for ways in which technology could support their work. These are presented below.

A number of suggestions related to general areas that may be aided by technology. These included:

- legal guidance
- training
- information, relating to health and other activities
- communication.

Others suggestions were more specific to equipment or applications that may be useful. These included:

- computerisation of patient records, care plans, etc
- access to email, Internet, word processing for reports, forms, letters, etc
- handheld computer systems
- wage/finance systems, for example, 'Sage'
- electronic access to NHS data about residents (prevent repetitive work)
- need more and better computer equipment.

Some managers also used this space to express their attitudes towards or concerns around the uses of technologies in support of care work in residential care, although the majority did not comment.

Concerns were expressed, for example, around the lack of time for training and resources or lack of finance available in order to support the use of new technologies in care homes:

'Time and computers are needed. We only have three computers, which are in use all day.'

'I can see there are usages for technology within my care environment. However, it is the time factor for learning new methods that can cause the progress difficulty in this area.'

'Yes, but it involves financial expenditure for training and hardware and software.'

'Staff need training and regular use and contact with new technologies at home. Due to the culture of average care workers and their demographic background in this area, it is unlikely that this will work anytime soon.'

'Resident records could be held on computer. However, this would mean all care staff being trained, as the majority have never had access to a computer. Many care staff would not be willing to use a computer.'

Others were more positive about the potential for ICT in the workplace, for care staff to be trained and have access to new technologies:

'The newer and younger members of staff have more confidence and can learn and show more experienced staff – use staff to train staff.'

'Technology would support our work, for example, Using the Internet for reference, record keeping etc, but care staff need to have access to this, not only admin staff.'

'We are in the process of getting new computers and gaining access to the Internet. Training is to be given to all senior staff. It will help us gain vital information quickly.'

'Yes. Having individual computers recording IT points in every resident room and toilets/bathrooms – like a large handheld 'key pad' system to enable instant record updating of any and all incidents relevant to include in care plans – and to have this linked into a network computer system.'

A number of respondents raised doubts about the relevance and appropriateness of ICT in support of care work:

'Quite often IT can add to our workload, it is something that will have to be good, reliable and cheap if it was to be considered.'

'Care staff use document records on paper. It is easier for all to see at a glance and easily accessible. Care staff find it easier having written records.'

'No our job is mainly hands on.'

'It can get in the way of effective communication and double [the] workload.'

Such feelings were often particularly expressed by managers of small care homes:

'This home is too small to benefit from intensive use of computers in respect of care management. This would distract from the hands-on job and inter-staff communication would deteriorate due to lack of direct contact.'

'We do not use computers as the home is small and I feel that written and verbal communication is part of team building and we do not have access to the technology anyway.'

'No, as we are only a small home we do not use a computer in the home. The owner and myself [manager] have access to computers.'

Several of the comments in this section were in fact ambivalent, with managers recognising the potential of IT but also raising warnings about possible disadvantages.

4.3 Key findings

4.3.1 Use of ICT in the workplace

A large majority of managers stated that care staff made no use at all in the workplace, of email, the Internet or the computer for word processing or patient records. Managers were more likely than their care staff to use email, the Internet and computers at work. A high proportion of managers (82 per cent) used a computer at work for word processing but most (51 per cent) never used computerised patient records, around a third (32 per cent) did not use email to communicate with people outside the home and a large majority (83 per cent) made no use of email to communicate with people inside the home. These were in line with the observations made on the site visits.

Size of home was sometimes significant. Staff were more likely to use beepers in large care homes, and more likely to use mobile 'phones in smaller homes. No other significant differences were found in the use of technologies by size of home.

Local authority care homes appear to be more aware of ICT. Care staff in local authority homes were significantly more likely to have access to desktop computers,

pagers and mobile 'phones than those working in private or voluntary homes. Staff and managers in local authority homes were more likely to use email. Care staff in local authority homes were more likely to use computerised patient records.

4.3.2   Familiarity with technologies

The large majority of managers felt that their care staff were very familiar with mobile 'phones and most considered them familiar with computers for wordprocessing, email and using the Internet for shopping.

Significant differences were found between the age of the workforce and the use of mobile 'phones, but little difference was found in relation to the other technologies specified.

4.3.3   Training

ICT played little part in the training of new staff. Methods were largely written and verbal. A large majority of care staff had not received any training in ICT but most managers had done so (either informal or on the job). Care workers, senior care workers and managers working in local authority homes were more likely to have received training in ICT.

4.3.4   Communication and information-seeking methods

Answers to scenario questions suggest:

- Communication within shifts is largely face to face.
- Written information and handover meetings are important for communication between shifts.
- Managers tend to seek information direct from relevant persons (for example, GP). In one of the scenarios, however, most stated (55 per cent) they would seek information from the Internet.
- Pagers and beepers are often used to communicate an urgent need for assistance.

4.3.5   Attitudes to technology

A significant number of managers suggested ways in which technology could support care work, although some managers had concerns around related training and finance issues.

A number of managers raised doubts about the relevance and appropriateness of ICT in support of care work. Such concerns were particularly expressed by managers of smaller care homes.

5 Design workshops

5.1 Rationale and design

Once an understanding had been developed, from site visits and questionnaires, of the work rhythms of care homes and the attitudes of the people who work in them, a structure was prepared for design workshops with care home workers. The workshops had two objectives: firstly to encourage participants to engage in some future thinking themselves and secondly to give participants an opportunity to react to design ideas generated by the research team in response to the findings of the site visits. The rationale for the particular choice of activities, which were based on future scenarios involving ubiquitous technologies, was that newer technologies such as networks of palmtops or 'wearables' might be of more interest in the care home setting than the desktop computer, which seems to have been discounted due to issues of access, training, confidentiality and so on.

Two workshops were held, one in a college in Sussex and the other in a pub in South London. Each workshop had six participants, comprising both care assistants and senior carers, and lasted approximately two hours.

Two sets of materials were prepared for the workshops. The first consisted of a set of prototyping props designed to represent a range of artefacts and devices. Some of these were real (for example, keyboards and in-trays), while others were constructed for the purpose from cardboard and polystyrene. These were modular props which could be combined to represent mobile 'phones, palmtops, MP3 players, interactive TVs, interactive whiteboards, digital cameras, wearables, and so on. The range of devices was wide in order to underline the idea that desktop computers should not limit the participants' imagination (Iacucci et al, 2000; Maze and Bueno, 2002; Brandt and Messeter, 2004; Stromberg et al, 2004; Svanaes and Seland, 2004). Some of these props are shown in Figure 22.

Figure 22
Prototyping props

In addition, a set of scenarios was developed in response to the site visits and questionnaire results. These had suggested that digital technologies might be of use in three areas: communication, information seeking and training. A scenario was constructed for each purpose, as described below (Stage three).

5.1.1 Workshops

Each workshop had three stages

Stage one

In groups of two or three, participants were given short scenarios derived from the site visits and asked to prepare a short role play demonstrating how the situation would be handled currently in their workplaces. The full set of scenarios used can be found in Appendix 3. A typical scenario would be as follows:

Carer A is with Mrs S in her room on the third floor. Mrs S has fallen over in the shower and cannot get up. She is too heavy for carer A to lift. What would Carer A do and what information would be recorded?

Stage two

The groups were asked to imagine a future, say five years hence, when, as a result of huge government investment, their environment is saturated with as much digital technology as they care to imagine. Participants were asked to imagine how the scenario they had just acted out might be transformed, using the prototyping materials described above. They acted out this new situation and were then asked to consider a second scenario each. There was a general discussion of the groups' suggestions.

Stage three

In the third stage, the research team acted out the three scenarios we had developed and invited the participants to critique our own Future Visions. The rationale for this sequencing was that by this stage of the workshop be confident enough to react freely to our dramatisation. The scenarios used were as follows.

5.1.2 Communication scenario

At 9.30am on medication round, care assistant Anita is talking to Mr Turner who is feeling low after a recent operation. She suggests a walk along the seafront later in the day and Mr Turner is enthusiastic. Anita is going off shift soon and needs to let Mr Turner know who will be taking him out, in turn alerting the carer in question to this commitment. It is important to make a firm arrangement as Mr Turner is upset at change. She uses her communication device (Bluetooth enabled) to call up the day's staff arrangements and suggests that Barbara would be a good choice. Mr Turner agrees. Anita writes a message on the screen, which is sent to the staff electronic whiteboard and also to Barbara's own handheld device so that she will receive it (written, or if she prefers, spoken) when she comes in to work at 12.00pm.

The rest of the staff will see this on the whiteboard, which is in a central office. When the walk is over, Barbara can note how Mr Turner is feeling and send this to be noted on his own digital record.

5.1.3   Information-seeking scenario

Carol and Dee, senior care officer and home manager respectively, are discussing the possibility of an outing for residents. They are tired of the usual sites they tend to visit and want to find something new. However, they need to be sure it will have the necessary facilities and they both have experience of having been assured of good disabled facilities on the 'phone, only to be disappointed. As they are standing in front of the large interactive screen set up in the residents' lounge, they decide to consult the local carers' website (via touchscreen). This gives information on a range of subjects – training, new guidelines, events and also ideas for venues. They look up information on a local theatre that seems to be suitable. They look at the comments left by other local care workers who warn them about the distance from the nearest parking. They think better of it and try another venue. When they have chosen a venue and confirmed a date, they will leave the relevant web page on the screen so that residents can check it out themselves, using remote controls.

5.1.4   Training scenario

Phil is a care assistant currently working towards his NVQ Level 2 qualification. His senior care officer, Pat, asks him to talk to a resident, Mrs Jones, who is going to spend a few days with her daughter at the weekend and will need help to get prepared, both with packing and also to discuss the trip with her, as she is forgetful and may be alarmed if she fee it is sprung on her without warning. On the train into work, Phil had just checked his learning organiser (see Corlett et al, in press) to see what modules he still has left to study. Communication was one of these and he wonders whether this might be a good example to add to his online portfolio. Pat agrees. Later, when Phil meets Mrs Jones in her room, he calls Pat on his mobile device (on which the learning organiser is also stored). He has the loudspeaker function on so that it is obvious to Mrs Jones what is going on. Pat witnesses his talk with Mrs Jones, writes her evaluative comments on the screen of the learning organiser using a digital pen and they send off the record to Phil's centralised learning record. They leave a message about the visit, with a photo of Mrs Jones' daughter and her house, on the interactive TV screen in her room as a reminder.

5.2 Key findings

In general the participants entered cheerfully into the spirit of the workshops and had no trouble imagining how new technologies might support their work.

The systems they imagined in their own groups tended to be based on handheld devices that communicated with each other, with a local hub and with other, possibly distant, databases. For instance, participants imagined a system that could call up a resident's NHS record (from an off-site database) and their care plan (from a local hub). The suggested advantages of such systems would be that:

- there would be no need to leave a resident in distress in case of an emergency or even a non-urgent inquiry
- it would provide easy access to information
- capturing notes and transferring them to the local hub would be easy
- it may be possible to link the system with monitors and alarms.

However, in discussion it became clear that these devices would have to fulfil some stringent requirements:

- Ease of use was paramount. This included an easy way of inputting information. This might be by handwriting, or possibly speech.
- A means of transforming rough notes into polished documents was needed. The use of templates was explored. However, it was feared that simply using templates would cause subtle information to be lost.
- The transactions must be transparent to residents. It should be possible for residents to hear what is being said over any service.
- The device must be easy to hold or wear. Much care work is intimate and a device that was literally 'handheld' would intrude in carer-resident interactions. For example, one participant acted out a conversation with a resident that involved her kneeling on the floor at the resident's feet with her hand patting the resident's arm. This sort of comforting interaction is typical and must be supported.

When it came to participants' evaluation of the three pre-prepared scenarios, results were generally positive.

The communication scenario was accepted as quite natural and the idea of the interactive whiteboard was popular. It would prevent information being 'lost down cracks' and would also serve as a record. One issue was privacy: the whiteboard would need to be placed in a secure area so that only staff had access to information about residents' visits and so on.

The information scenario gave rise to a great deal of swapping of anecdotes about disastrous trips that had arisen out of lack of appropriate information about facilities. The idea of a portal listing venues, restaurants and so on for residents' outings was seen as very useful. It was accepted that much information could already be found on the web but the advantage of this site would be that it was focused and detailed, and also validated by comments from other local carers. The local element was quite popular. The participants could also appreciate the benefits of a portal that served as a community for people like themselves. The benefits of a community for carers were picked up by one manager who described a learning group she had set up among members of her staff studying for NVQ Level 2. This had resulted in a higher level of discussion than was generally the case (most daily communication being focused on individual service users) and several suggestions for changes in practice.

The 'learning assistant' was also easily understood and accepted as natural. It was felt that it might attract not only the younger carers (whom we had thought of as its natural users) but also older staff who might see this as less tedious than paper-based work involving numerous forms. The system was seen to have the advantage of allowing trainees and 'witnesses' such as the senior care officer, to record events

as they happened rather than after the fact, which caused delays. Writing up training incidents after the fact was perceived as extra work. In addition, it was suggested that the act of writing was perceived as a daunting task, particularly by people for whom English was a second language. It was suggested that such a system might also have a community building function, as isolated trainees could communicate with other local carers at the same stage of training. Several anecdotes were exchanged about trainees who had lost or damaged their paper-based portfolios and it was felt that the proposed system, by immediately sending back results to a central database, would be a safe repository for precious personal material.

Clearly, when carers are out of their usual surroundings and are encouraged to speculate via props, realistic scenarios, a friendly atmosphere and a definition of 'technology' that is not bound to the desktop computer, they are happy to envisage new technologies to support their work. They were particularly drawn to any technology that might also improve the quality of life of service users. Mobile and ubiquitous technologies were readily understood and pressed into imaginary service. On the other hand, no major pressing concerns were raised with current work practices that called out for a technological solution. These concepts, if realised, would be likely to bring about modest improvements in both information and communication processes in the residential homes, and also the quality of the working life of carers.

6 Conclusions and recommendations

6.1 Conclusions

The site visits revealed that residential care homes were run according to a set of well-established, paper-based working practices that tended not to make use of digital technology in any major way. The same practices and attitudes were witnessed in all the homes visited, giving a sense of a homogeneous care home culture, although each home differed slightly in terms of documents used, terminology, use of space, levels of formality and so on. Face-to-face interaction among staff is particularly prized as a way of communicating subtle information and in team building. Communication with the outside world, for example, hospitals, GPs, pharmacists and suppliers, is also verbal, via telephone, although local authority homes may also use email within their own wider care work community. Skilful use of paper-based information sources resolved the tension between the need to ensure confidentiality for residents and to facilitate quick and easy access to non-confidential information by all staff.

There is a relatively clear distinction between senior staff who take responsibility for decision making and tend to be the ones making use of computers, and care staff who engage in practical care work and tend to be uninterested in computer technology. Computers tend to be used for word processing, email and resident records. Few digital information sources are called on, but the telephone version of NHS Direct was valued. Some homes use a variety of assistive technologies, mainly monitors and alarms. ICT played little part in training for care workers as a delivery mechanism, and none as a topic for study.

These observations were reinforced by the findings of the questionnaire study, which found that although most care staff were thought to be familiar with digital technologies in their everyday lives, ICT played little part in their working lives. Managers were more likely than their care staff to use email, the Internet and computers at work, mostly (82 per cent) for word processing, but also for email (66 per cent) and computerised patient records. Local authority care homes appear to be more ICT aware.

However, when encouraged to think imaginatively, the care staff who took part in the design workshops generated a series of realistic ideas for effective mobile and ubiquitous digital support. A key requirement was that any new services or devices should be non-intrusive and appropriate. Carers were particularly drawn to any technology that might also improve the quality of life of service users. They readily generated scenarios involving wireless mobile and ubiquitous technologies, together with links to databases, and took easily to the idea of technologies such as interactive displays, speech input and handwriting input. The four most promising ideas concerned:

- communication and record keeping
- training support
- information sharing
- community building.

On the other hand, no major pressing concerns were raised with current work practices that called out for a technological solution.

6.2 Recommendations

From the site visits, questionnaire results and design workshops, we see four areas where care homes could leapfrog current technologies, avoiding the centralised deskbound computer by using a mixture of personal technologies and public displays.

- **Communication and record keeping.** A combination of handheld input and display devices, and a shared whiteboard to display and store notes might cut down on redundant information storage and trap any stray messages, in a way that might be easy to use and non-intrusive. This would also avoid the physical work of manually entering the information in centralised files.
- **Training support.** A service that prompted assistants about the credits they needed to have assessed and kept a record of achievement could usefully be provided on an unobtrusive handheld device. This might be similar to the student organiser being developed by Corlett et al (in press).
- **Information sharing.** A website designed specifically for carers in residential homes for the older people could be an effective way of sharing information, particularly if local sites could be created. Although managers do use the web, some of those we met commented on difficulties in navigation and quality of information. However, sites would need to be populated with practical information of immediate use to carers rather than simply policy documents or academic reports, which would be unlikely to be read.
- **Community building.** There is some evidence of demand for services that facilitate community building among care workers, and this could be a useful adjunct to an information sharing or a training website. Intranets seem to be used for this purpose in homes that are currently part of groups – at least in the voluntary and not-for-profit area.

We would therefore recommend that these services and technologies should be considered for development.

A number of points need to be borne in mind about the process for developing such systems and the constraints under which any development takes place.

Firstly, generalisation to other sectors is not warranted. This study has concentrated solely on homes for older people. It is very likely that homes and other facilities for other types of service users, such as people with learning or physical disabilities or children in care homes, would reveal quite different needs and attitudes.

As far as process is concerned, if digital technologies are to be implemented there is a need to carry out further careful and detailed preparatory work in care homes. The best way to do this would probably be by working with a small number of homes varying in size, layout and possibly in services provided, for example, long-term homes and homes providing respite and other short-term care. Care workers and managers in these homes could then act as partners in the development process, giving input at requirements negotiation, design and evaluation stages. It will be

necessary to develop services incrementally and to carefully pilot any new service or device in a small number of care homes before wider implementation. Familiarisation and training for staff of all grades will need to be a key part of this process.

Any new systems will need to deal with two sets of constraints in particular. The first of these is the existing ICT infrastructure in residential care homes for older people. Given the current situation, where many homes are not connected to the Internet, there may be a case for moving directly to a completely wireless solution. Secondly, any services introduced in care homes would need to be developed with an eye to integration with a range of other systems, from assistive technologies to residents' care records, and in the future possibly to NHS records, NVQ learning profiles and so on.

Whatever services, processes or technologies are taken up, it is important that any new system does not attempt to replace one-to-one spoken communication, but rather seeks to support and enhance it.

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Appendix 1: Sources of information for carers and managers

Training
   www.nvqweb.com
   www.nvqweb.com/php2/index.php
   www.scils.co.uk

Informal carers
   www.carers.gov.uk
   www.carersinformation.org.uk/
   www.carersuk.org
   www.carers.net (Scotland)
   www.carersinfo.net (Northern Ireland)

Magazines
   www.communitycare.co.uk (*Community Care* magazine plus other resources)
   www.healthcarebiweekly.com
   www.nursinghomesmagazine.com (US – interesting as a lot about technology)
   www.careinfo.org contains links to:
   Caring Times (management magazine for the long-term care sector)
   The Journal of Dementia Care (bi-monthly journal)

Other
   www.scie-socialcareonline.org.uk
   www.careinfo.org

Appendix 2: Questionnaire

University of Brighton

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Understanding the Information and Communication practices of care staff in Care Homes for the elderly

Please answer the following questions by placing a cross in the appropriate box(es), as illustrated, or filling in numbers or writing in the spaces provided. ☒

Your care home

Q1 Provider

Private ☐ Local Authority ☐ Not-for-profit (e.g. charity, housing association etc) ☐

Q2 Please state the current number of residents in your Care Home ☐

Q3 Please indicate the current number of staff in your Care Home

All staff	☐
Care staff (all staff who deliver personal care to people, excluding agency and relief staff)	☐
Domestic and catering staff	☐
Administration staff	☐
How many agency staff did you have working for you in the last week?	☐

Please complete the following tables, providing the appropriate number of CARE STAFF:

Q4 Care staff by age groups

Men		Women	
24 and under		24 and under	
25 to 49		25 to 49	
50 plus		50 plus	
TOTAL		TOTAL	

Q5 Care staff by length of employment

Full-time		Part-time	
Under 1 month		Under 1 month	
Between 1 to 12 months		Between 1 to 12 months	
1 year to less than 2		1 year to less than 2	
2 years to less than 5		2 years to less than 5	
5 years or more		5 years or more	
TOTAL		TOTAL	

Q6   How many care staff (including yourself) have NVQ2, NVQ3 or NVQ4?

Q7   How many care staff are currently studying for NVQ2?

Q8   How many of your care staff (including yourself) DO NOT speak English as their first language?

Q9   Is your Care Home...   Custom Built ☐   Converted ☐   A mixture ☐

Q10a Is your Care Home located in ONE building?   Yes ☐   No ☐
Q10b If you answered 'No' to Q10a, please indicate the number of buildings

Q10c How many floors does your tallest building have?

Q11 Which of the following do your care staff have access to at WORK? (please mark all that apply)

Telephone (office, public space, resident's room) ☐   Desktop computer ☐
Mobile phone ☐   Laptop computer ☐
PDA (Personal Digital Assistant) ☐   Monitors (e.g. baby monitors) ☐
Pager (displays message) ☐   CCTV ☐
Beeper (no message, just a beep) ☐   Other (please state in the box below) ☐
Walkie talkie ☐

Q12 Do you currently use equipment such as medical alarms or sensors which alert staff to problems?
Yes (please describe briefly below) ☐   No ☐

Scenarios

The following scenarios aim to find out how you communicate or find information on a day-to-day basis. For each scenario please mark ALL the methods which typically apply.

Q13 A resident has decided what to have for lunch. How does this information reach the catering staff?

Patient record (paper) ☐   Leave informal note (e.g. Post-it) ☐
Patient record (computer) ☐   Walkie talkie ☐
Purpose designed book/sheet ☐   Pager/Beeper ☐
Speak face-to-face ☐   Handover meeting ☐
Speak on phone ☐   Other (please specify below) ☐
Whiteboard ☐

Q14 It is 9am and a resident tells a carer they want to go for a walk in a wheelchair this afternoon. How does the carer communicate this? (please mark all that apply)

Patient record (paper) ☐   Leave informal note (e.g. Post-it) ☐
Patient record (computer) ☐   Walkie talkie ☐
Purpose designed book/sheet ☐   Pager/Beeper ☐
Speak face-to-face ☐   Handover meeting ☐
Speak on phone ☐   Other (please specify below) ☐
Whiteboard ☐

Q15 A resident tells a carer they want to see the chiropodist, who visits one day a week. The care worker is not sure which day it will be this week. How will they find out? (please mark all that apply)

Check a computer	☐	Leave informal note (e.g. Post-it)	☐
Check a noticeboard	☐	Walkie talkie	☐
Purpose designed book/sheet	☐	Pager/Beeper	☐
Speak face-to-face	☐	Handover meeting	☐
Speak on phone	☐	Other (please specify below)	☐
Whiteboard	☐		

Q16 A carer needs immediate help to clean a mess in a resident's room on floor three. How will they get help? (please mark all that apply)

Speak face-to-face	☐	Walkie talkie	☐
Speak on phone	☐	Pager/Beeper	☐
Whiteboard	☐	Other (please specify in box below)	☐
Leave informal note (e.g. Post-it)	☐		

Q17 A resident didn't take their sleeping pills last night. How do your care staff on night shift inform the care staff on day shift? (please mark all that apply)

Patient record (paper)	☐	Leave informal note (e.g. Post-it)	☐
Patient record (computer)	☐	Walkie talkie	☐
Purpose designed book/sheet	☐	Pager/Beeper	☐
Speak face-to-face	☐	Handover meeting	☐
Speak on phone	☐	Other (please specify below)	☐
Whiteboard	☐		

Q18 A resident died last night. How do you make sure all care staff know about this? (mark all that apply)

Patient record (paper)	☐	Leave informal note (e.g. Post-it)	☐
Patient record (computer)	☐	Walkie talkie	☐
Purpose designed book/sheet	☐	Pager/Beeper	☐
Speak face-to-face	☐	Handover meetings	☐
Speak on phone	☐	Other (please specify below)	☐
Whiteboard	☐		

Q19 During the night a resident asks for a painkiller for a bad headache. How does the carer decide what to do? (please mark all that apply)

Follow procedure	☐	Look in the drugs guide	☐
Ask senior staff directly	☐	Contact GP	☐
Ask a colleague directly	☐	Contact NHS direct	☐
Leave note for a colleague	☐	Check patient record	☐
Use own judgement	☐	Other (please specify below)	☐

Q20 It is 2am and a resident is confused and aggressive. You think they require a place in a psychiatric unit urgently as your staff are finding it difficult to manage. This has not happened to you before and there does not appear to be a procedure. How do you find out what steps to follow? (please mark all that apply)

Ask senior staff directly ☐   Check the internet ☐

Ask a colleague directly ☐   Contact GP ☐

Leave note for a colleague ☐   Contact NHS direct ☐

Use own judgement ☐   Other (please specify below) ☐

Check in a reference book ☐

☐

Q21 A resident has returned from the GP having been diagnosed with a rare condition. How do you find out more about their condition? (please mark all that apply)

Follow procedure ☐   Check in a reference book ☐

Ask senior staff directly ☐   Check the internet ☐

Ask a colleague directly ☐   Contact GP ☐

Leave note for a colleague ☐   Contact NHS direct ☐

Use own judgement ☐   Other (please specify below) ☐

☐

Staff Development

Q22 Do you have an induction procedure?   Yes (please describe briefly) ☐   No ☐

☐

Q23 An agency care worker has been taken on for a week. This is their first day, how will they know what their duties are?

☐

Q24 How familiar do you think your care staff are with the following, ie. in the home or at work?

	Very familiar	Familiar	Not at all familiar	Don't know
Using a mobile phone to make calls	☐	☐	☐	☐
Using a mobile phone to text	☐	☐	☐	☐
Using a computer to do word processing (e.g. letters)	☐	☐	☐	☐
Using a computer for household accounts	☐	☐	☐	☐
Using the internet to help with children's homework	☐	☐	☐	☐
Using the internet to book trips	☐	☐	☐	☐
Shopping online	☐	☐	☐	☐
Using email	☐	☐	☐	☐

Q25 How often do you do the following when you are at work?

	Daily	Weekly	Monthly	Not at all
Use a computer for patient records	☐	☐	☐	☐
Use a computer for word processing (e.g. typing notes)	☐	☐	☐	☐
Access the Internet for general information	☐	☐	☐	☐
Access the Internet for training materials	☐	☐	☐	☐
Use email to communicate with people outside the care home	☐	☐	☐	☐
Use email to communicate with people inside the care home	☐	☐	☐	☐

Q26 How often do you think your care staff do the following when they are at work?

	Daily	Weekly	Monthly	Not at all
Use a computer for patient records	☐	☐	☐	☐
Use a computer for word processing (e.g. typing notes)	☐	☐	☐	☐
Access the Internet for general information	☐	☐	☐	☐
Access the Internet for training materials	☐	☐	☐	☐
Use email to communicate with people outside the care home	☐	☐	☐	☐
Use email to communicate with people inside the care home	☐	☐	☐	☐

Q27 What training in the above technologies have you and your staff received?

	None	On the job	Formal training
You	☐	☐	☐
Other senior staff	☐	☐	☐
Care workers	☐	☐	☐

Q28 Do you have any suggestions about how technology might support your work?

Q29 Would you be willing to be contacted further as part of this research? Yes ☐ No ☐

Contact Name	
Name of Care Home	
Contact telephone number	

Please return this questionnaire in the envelope provided by Friday 5th January 2006. If you have any questions, please phone Audrey Marshall on 01273 642420.

THANK YOU FOR TAKING PART IN THIS SURVEY

Appendix 3: Scenarios used in workshops

Scenario 1
Carer A is with Mrs S in her room on the third floor. Mrs S has fallen over in the shower and can't get up. She is too heavy for carer A to lift. What would Carer A do and what information would be recorded?

Scenario 2
It's after midnight and Mrs W has asked for a pain killer for a bad headache. How would you decide what to give her? What information would be recorded or passed on?

Scenario 3
Mrs C is in her room before breakfast and complains of bad stomach pains. What would you do? Who is told?

What is recorded and where?
Scenario 4
Mr P, a new resident, is confused and aggressive. You think he needs to be in a psychiatric unit urgently as the staff are having trouble coping. You've never had to section anyone before. How would you find out what steps to follow? Who is told? What is recorded and where?

Scenario 5
Relatives of a potential resident have contacted you. She is a Jain, a religion you have no experience of. They are worried about whether you will be sensitive to her needs, especially in the area of food. How would you go about finding out? What is recorded and where?

Scenario 6
Care assistant Y is studying for her NVQ Level 2. Today she is bathing Mrs T. This is a unit she needs to cover. How would this be assessed or witnessed? What is recorded and where?

Using digital media to access information and good practice for paid carers of older people

This report describes a study commissioned by the Social Care Institute for Excellence (SCIE) and funded jointly by them with the National Knowledge Service. It was carried out by the University of Brighton to explore the feasibility and the appropriateness of digital technologies to support the work of paid carers in residential care homes for older people.

This publication is available in an alternative format upon request.