Impact of Robotics-Led Organisational Change on the Pharmacy Workforce: Preliminary Findings

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1 Introduction

The NHS continues to be one of the best respected health care providers internationally. This is in part attributable to the adoption of new innovations in science and technology which often act as a catalyst for change in the redesign of services (1). Technology advancements within the medicines supply chain have principally focused on the automation, through robotic technology, of high volume routine tasks involved in the supply of medicines to clinical areas (hospitals, wards, clinics) and the dispensing of medicines for individual patients. Goundrey-Smith (2) provides a useful summary of the current state of knowledge on this topic, with special attention to the situation in the UK. However, most of the literature has so far focused on relatively small-scale dispensing systems which have reported efficiencies in terms of: reduced time required to dispense medicines; more secure tracking and reduced losses; quicker response to ward-based emergencies; reduced dispensing errors; more efficient stock control and purchasing; and improved monitoring of the relationship between medicines dispensed and clinical outcomes (3-7). Such efficiency benefits have the potential to feed into both cost savings and better clinical outcomes.

Maximising efficiencies through automation is dependent on the effective introduction of technologies and, relatedly, the alignment of technical and social innovation to deliver new job roles and effective skills utilisation, management and Human Resource (HR) practice. While there is some evidence on the potential financial and clinical benefits of automation projects, less information is available on the implications of automation for people management, jobs and workforce development within healthcare settings. The potential for major change to take place successfully within a 'mutual gains' framework has been examined in healthcare settings elsewhere (8). Some research within UK public sector settings suggests that effective innovation strategies require staff at all appropriate levels to be consulted, to help shape, and to 'buy in' to the reform process (9). This aligns closely with wider debates on organisational change and change management, many of which propose extensive consultation with stakeholders in order to facilitate effective change (10, 11).

Glasgow Redesign Programme

Within NHS Scotland, NHS Greater Glasgow and Clyde (GG&C) is Scotland's largest Health Board serving approximately 25% of the population. In 2008 NHS GG&C approved a major pharmacy redesign programme with objectives including: (a) to redefine the core business around 'patients own medicine' medication management for hospital inpatients; (b) to redesign, consolidate and automate hospital pharmacy medicines distribution, in order to release staff to near-patient tasks as part of integrated clinical teams; and (c) to adopt new technology as an integral part of this redesign. The total capital investment programme was around £3.2 million.

Prior to the redesign the pharmacy service, with an annual expenditure on medicines of around £120million, was delivered on 14 main hospital sites, with a staff count of approximately 530 (including pharmacists, pharmacy technicians and various types of support staff). A key element in the implementation of the redesign programme was the construction of a new, centralised Pharmacy Distribution Centre (PDC) to replace 11 different in-hospital pharmacy stores. The PDC is now the single facility responsible for the procurement and automated distribution of medicines to replenish ward and site pharmacy stocks for all hospitals and community clinics in the Health Board

(approximately 4000 destinations). Within the PDC, eight robots are working in tandem as an integrated storage and distribution system, with an additional robot installed within a vault for safe and secure handling of narcotic agents. This constitutes the largest automation project for hospital pharmacy in the UK and, to the knowledge of the robotic system suppliers it is double the size of any other current installation worldwide. Aligned to this automation project was a major organisational change programme with significant implications for jobs, work and employees.

Redesign Programme Evaluation

In 2009, NHS GG&C Pharmacy Prescribing and Support Unit (PPSU) engaged the Institute of Pharmacy and Biomedical Sciences and the Department of Management Science from the University of Strathclyde in a project to develop a suitable metrics framework for the new pharmacy distribution system and to capture the early organisational learning (first 6 months) gained from the initial implementation phase of the PDC. This was completed in December 2010 (1, 12). This study identified a number of technical and social/human dimensions which aligned with the evidence on both theoretical and empirical grounds (13, 14) that the severity of implementation problems is likely to increase disproportionally with the scale and complexity of a healthcare technology installation. Given the scale of the NHS GG&C redesign project and its critical role in supporting the intended improvements in the quality of patient care as well as the quality of the pharmacy service and its overall cost effectiveness, a follow up study was undertaken.

In 2012, a research team from the University of Strathclyde's Institute of Pharmacy and Biomedical Sciences and Strathclyde Business School (Departments of Human Resource Management and of Management Science) undertook a further study, the key findings of which are the subject of this report.

2 Study Aims and Objectives

Aims
- To evaluate the issues faced by an NHS organisation in aligning a major technical innovation project with organisational and social innovation, particularly in relation to HR practices and employee experience.
- To assess the impact of the automation project on jobs, work and workforce development within pharmacy.
- To learn lessons for future technical, organisational and social innovation within the PPSU and NHS GG&C.

Key objectives:
- To evaluate the preparedness for organisational and technical change amongst stakeholders and site participants
- To categorise the nature of the change process
- To consider how effectively employees were engaged in the change process through information provision, consultation and involvement

- To analyse job change and new job roles amongst different occupational groups (support workers, technicians and pharmacists) in the context of:
  - Training
  - Pace and control of work
  - Career progression
  - Employee voice and relationships
  - Job satisfaction and employee morale
- To assess the extent of collaborative/cross boundary working resulting from the redesign programme
- To identify good practice, ongoing challenges and learning opportunities

3 Methods

Ethical Approval

The study is a service evaluation and therefore did not require University of Strathclyde ethical approval or NHS Research Ethics Committee approval. All participants read a standardised information sheet, were told that they could withdraw from the study, were assured that they would remain anonymous, and gave their informed written consent prior to taking part in the evaluation.

Methodological Approach

A multiple stakeholder approach was used to deliver a balanced understanding of the redesign programme and its implications. This was a qualitative study, and appropriate investigative tools were developed and piloted, including an interview schedule, timeline detailing landmark events to facilitate participant recall of their work-related events since 2008, information sheets and consent forms for participants.

Development of Research Tools

The University team developed and piloted the interview schedule. The two main topics covered the redesign process around perceptions and experiences of the nature and approach to the change, and the impact of the redesign programme on jobs and work experience. The interview questions were semi-structured enabling interviewers and interviewees to expand on areas deemed useful. The timeline of events was developed to accompany the interview schedule and included key milestones such as the opening of the PDC in 2010 and the introduction of a nightshift at the PDC to help prompt retrospective accounts.

Subjects and setting

Two groups of employees were identified for interviews: key stakeholders (management, partnership and trade union representatives) and pharmacy staff at hospital sites and the PDC. Interviews with the former focused on the redesign process and their role within that but stakeholders were also asked, where appropriate, for their view of what impact the programme had had on jobs and work practices. Interviews with the pharmacy staff group followed the full interview schedule and focused on their perceptions of the change process and of their jobs before and after the redesign.

The team identified and contacted nine key stakeholders, comprising seven female and two male

respondents who had been in their current post between 1 to 6 years. Data on age and time working for NHS were not collected for this group as members could be easily identified from this information.

Four hospital sites across NHS GG&C and the PDC were selected in which to conduct the pharmacy staff interviews. Interviews with staff (n=36) included six pharmacists, 16 pharmacy technicians and 14 support workers, ranging from Bands 2 to 8b (Agenda for Change).   The staff group comprised 25 females and 11 males. Participants were aged between 25 and 65 years (mean 41 years, standard deviation= 10.2) and had worked for the NHS for 4 to 40 years (median 11.5 years, inter-quartile range (IQR) = 12) although their time at their current site ranged from 1 month- 40 years (median 4 years, IQR = 8.25), some having moved job location due to the redesign. The ratio of full-time to part-time employees was 5:1.

Data Collection and analysis

One-to-one interviews were conducted face to face at the participants' place of work between July and October 2012. Interviews lasted between 45 minutes and 2 hours. Each interview was recorded in note form and by audio recorder. Recordings were transcribed verbatim and checked. All interviews were anonymous, confidential and voluntary.

Data was coded thematically by researchers, sorted using NVIVO 10, a software tool for qualitative analysis, and was checked for validity.   A thematic analysis was undertaken which is used extensively in both health care research (15) and organisational change research, specifically around the modernisation of the NHS (9, 16).   The data was analysed against relevant conceptual and empirical research.

4 Key Findings

In the following sections we report the preliminary findings arising from the interview analysis. These are presented under two main headings: the first giving a broad overview of the change process experienced (aligning technical, organisation and social innovation); and, the second focusing specifically on the impact on jobs, work and workforce development for three key staff groups (support workers, technicians and pharmacists).

4.1   The Process of Change

4.1.1 Preparing for change (pre 2010)

Early milestones

Change rarely emerges from a position of stasis and this programme was no exception. In response to Scottish Government policy developments NHS GG&C underwent considerable internal organisational restructuring resulting in the creation of the PPSU from three separate pharmacy operating structures in 2005/6.   The PPSU brought together earlier deliberations to move forward a major service redesign programme.   Not surprisingly, much of the discussions around the

fundamental nature of the pharmacy service took place at a strategic managerial level: by 2003/4, a well articulated vision of greater ward engagement of pharmacists and a technician led pharmacy service had been built; and by 2005, there was general agreement at the senior management levels of PPSU that delivering this vision could not be done without significant investment in automation. The consequence was that the internal coalition for change was expanded and formalised around the preparation of a business case for the redesign of pharmacy services within NHS GG&C. This would include the consolidation and automation of hospital pharmacy medicines distribution through adoption of robotic technology.

Stakeholder interviews reported that some early work was done in 2005 with staff focus groups, which aimed to involve staff in how the redesign would be shaped. Subsequent to this there was no reported systematic communication, from stakeholder or site participants, on the project from the time of the focus group activity to the point of securing the capital investment in 2008. Stakeholders acknowledged that although staff had been involved early on in the redesign, there were times where it appeared that staff had little influence over the course of events and that staff involvement had been overseen, forgotten or too distant in the past. Some members of the stakeholder group remarked at being surprised that there had to be such an effort to "sell" the redesign. However, it became clear also that some local management were unconvinced of the redesign and had therefore been unable to garner the support of staff on site:

> *…the quality of…you know, whether they're up for it and actually have the vision, if you like, has a big part to play in whether the staff that fall underneath that actually embrace it. And I think you've probably seen that as you've got around the sites that some are better at things than others* (Stakeholder)

In 2008 a series of visits or "road shows" to the various sites was undertaken to engage staff in project implementation. Some site participants reported having attended these road shows, others of not being able to attend due to their working hours, sick leave, annual leave or maternity leave, and therefore relied on co-workers for information. The consequence was that information dissemination was dependent on the views of attendees and some participants reflected that if this engagement had been ill-received and negative then this was what was communicated and perpetuated through site teams. The fact that a member of senior management delivered the road shows was also flagged as a concern by some participants: given unease over the redesign alongside attitudes towards management in the NHS, it was felt that a senior management presence did not encourage the appropriate environment for discussion and disseminating information:

> *I wasn't at the meeting that they had… I think I was on holiday at the time, and obviously I'm getting somebody else's view given to me…all these kind of negatives type of thing; and I never really ever had a positive, because I just wasn't there. (Technician, Site B)*

> *…they weren't used to senior managers necessarily going out and interacting with them either. So there was, and the culture within GG and C is quite distrustful of managers. So you're battling against a number of things to start with… (Stakeholder)*

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Vision

When asked what they were told (or perceived as) the reasons behind the redesign programme, the most common participant responses were money-saving and the centralisation of services:

> *I think it was to try and centralise services, because I can understand that having so many different sites in such a big Health Board, all doing different things is going to cause problems with regard to budget (Pharmacist, Site A)*

Few participant responses cited improvements in patient care, with few linking this and the PDC service at all. Some participants recalled being told that one of the aims of the redesign was to allow pharmacy staff more time at ward level and to improve the skill mix of the current workforce:

> *More time for pharmacists to spend with patients…we're going to have more time, all the services are going to be centralised, it's going to be easier working flow, generally a better solution to what we were doing (Pharmacist, Site B)*

Interestingly, many participants made no association between the MMyM (Making the Most of My Medicines) initiative, deliverable through pharmacy staff working at ward level with the robotic redesign, viewing these as being completely separate.

In contrast, stakeholders had a strong sense of connection between the introduction of MMyM and the PDC, the common goal being to provide better and safer patient care. It appeared that the core reason for centralising services, automating the supply of medicines and allowing the up-skilling and freeing of pharmacy staff to focus on patients had been missed by those at the frontline of service delivery. Stakeholders recognised the importance of maintaining the broader ethos of the redesign and not have it become about cost savings; it was important that staff did not perceive the redesign as *"all about money"*, notwithstanding the requirement that the programme delivered on financial targets:

> *I made a decision fairly early on that I was not going to let the payback be at the front of the redesign. I wanted the redesign to take, to be at the forefront of everybody's mind. I wanted everybody to think about what the service was that we were going to be delivering at the end of the day, and wanted them to focus on that. (Stakeholder)*

Some participants also reported that they had been informed about the success of other automation ventures (in England and Wales) and thus the Glasgow redesign was based on this. A small number of staff did indicate that they were provided with little or no reason as to why the redesign programme was occurring and that it was merely *"happening and that was it"* (Technician, Site B).

4.1.2 Delivering Change (2010 to 2012)

Project Management

From a project management point of view, the robotics redesign was a planned non-crisis change

which had evolved from initial work on the MMyM in 2002. Stakeholders acknowledged the challenge they faced on delivering the project, with the untested capability of the robotic technology at this scale and the bringing together on one site (PDC) of the distribution function previously delivered through 11 in-hospital pharmacy stores. When asked about capacity planning, stakeholders reported that due to the revolutionary nature of the project, some figures and estimations in terms of service delivery were arrived at through a combination of guess work and workforce analyses; by contrast, the dispensary redesign calculations were much more reliable due to the pre-existing nature of the work setting:

> *It's really difficult if…I mean, with the PDC, there was nothing to go on, it was a new thing, so capacity planning is typically done on the basis of experience of other sites or locations, or certain centres. So I can see that, that was very, very difficult. Whereas with dispensary, you had some better idea about what people are supposed to do (Stakeholder)*

The interviews identified amongst participants a lack of understanding of the scope and function of the PDC operation at the early implementation stages. Participants believed the PDC would supply most if not all items, but as sites went live participants found that this was not the case and some items required to be sourced from elsewhere, for example compliance aids. Participants also believed that the PDC would be reactive to emergency orders but reported instances of '*out of stock*' items at the PDC creating the need to spend time calling other dispensaries to locate medicines or, on occasions, to '*borrow*' the medicine from community pharmacy. This coupled with the major technological malfunctions in the robotic conveyor system in the first few months of the project put significant pressure on the reliability of the PDC supply chain, with consequent varied site responses to minimise any impact of lack of delivery of medicines for their patients. The resolution of the PDC technology issues and the move from local to more standardised approaches to responding to supply issues was a major focus in the first 12 months of going live. Additionally at this time delineation of different teams became an important issue as staff moved from old to new teams with new relationships and dependencies needing to be established and embedded, challenged further by the pressure of technology malfunctions and the introduction of the MMyM rollout. Participants expressed that this stage of the redesign was a particularly difficult and stressful experience:

> *The first Christmas the PDC was open, that was a disaster!... the winter period is always the busiest and then they were kind of changing the way we order things …We used to still order all these things ourselves, now they've all got to go through them so we kept getting no deliveries because the faxes weren't working…there was a lot of different issues, there was a lot of problems…It was really very stressful! (Technician, Site C)*

The decision to introduce a PDC nightshift in 2011 was seen as an important event by everyone. Beforehand, the robots would re-stock themselves with medicines from a conveyor overnight. However, when any jam occurred then the system stopped resulting in limiting access to stock for supply and frequent out of stock communications to sites. The night shift minimised this and ensured the robots were fully stocked for processing orders each day.

Human Resource Management

Most participants felt very informed about the job re-application process, which commenced in 2008 and concluded in 2009. Staff received letters regarding applying for posts throughout the redesign and were provided with job packs. Email communication was also used during the redeployment process but it was commented on that this did not suit everyone due to the infrequency with which emails could be checked in a working day. Most participants reported having received their first job choices through the process.

Participants described the lack of training pre-implementation and that the go-live point was when learning about the new system really began. However, changes in staff numbers and skill-mixes, as well as the initial high error rates and teething issues meant that any formalised training was reported as non-existent. Furthermore, participants stated that ongoing training was still informal and opportunistic as teams are working at full capacity with what to them still feels like inadequate staffing levels. With the concurrent rollout to wards of the MMyM initiative and the frequent rotation of staff participants commented that any long-term commitment to in-house training was not attainable.

It was also clear from the stakeholder and participant interviews that the project management team did not anticipate the full impact on staff of moving from a hospital site to the PDC. The change in job location and work pattern was poorly understood with variable perceptions on why this may be occurring. Some stakeholders cited the lack of patient contact and more industrial working environment as a rationale for staff dissatisfaction at the PDC; by contrast, one participant theorised that by relocating to the PDC this left staff better prepared for change as they were starting from scratch, whereas those remaining in sites would have to adjust their pre-existing working behaviours:

> *I suppose it has been a lot easier for us to accept change because we have been put up a*
> *brand new place, brand new everything, it is all change, whereas if you are on a ward*
> *and all of a sudden for the past ten years somebody has been telling you this is how you*
> *do it and then someone goes right actually you can't do that anymore you've got to fill in*
> *this. (Technician, Site E)*

4.1.3 Employee engagement

The general consensus from participants was that the change process was imposed in nature, top-down in approach, and lack of staff support was evident. Many felt that the presentations and consultations, where they were aware of these, were a "tick box" exercise and that the big decisions had already been made. Although some stakeholders agreed with this perspective at points during the redesign period, many disagreed and could identify a number of points during which staff were invited to engage with the evolving planning process from 2005 onwards: focus groups involving

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nominated staff members with cascaded feedback; sector chiefs engaging with staff; the business structure presented to staff and iterated over time based on feedback; the road shows; and the staff redeployment system. It is possible that although these events occurred, this was over a protracted time period and staff may have seen these events as disjointed and not part of a single planned system, consequently not seeing the continuing development of the redesign in which they were included and involved. Some participants reported a lack of understanding and empathy from change advocates and felt that they were expected to "*get on with it*" regardless of their concerns or levels of preparedness.

Most participants reported that they had been involved in the job re-application process which was well defined and conveyed, in general terms, a practical understanding of the new job roles. More concern was raised, however, about the level of detailed information available about new job profiles and actual responsibilities. Staff also reported that a lack of detailed insight into how the new organisational system would operate after the redesign generated additional stress for staff.

While individual employees may not have felt well informed about the redesign prior to implementation, staff representatives reported some involvement in early discussions around automation. More collective engagement emerged as the redesign progressed as part of formal NHS partnership arrangements. A background of constructive relations with staff representatives was reported. This was crucial to engaging constructively with staff redeployment and staff representatives reported that staff:

"… were given the chance to say, this is what I want to do … Overall I think the majority of people have ended up in posts that they have put down as their first preference … it's not 100% ultimate satisfaction … but considering the hundreds of staff that we have taken through this, there's a lot of them are quite happy now that they have gone through it. Maybe they might have been happier had they not have gone through it in the first place, but have come out of it unbroken and content.
(Stakeholder)

4.2 The impact on jobs, work and workforce development

In the following sections, we discuss the impact of the pharmacy redesign programme on the job roles, work experience and development of pharmacy staff. We focus separately on each of the key groups of workers within PPSU (pharmacy support workers, pharmacy technicians and, briefly, pharmacists) and examine the implications of the pharmacy redesign for collaborative working across occupational groups.

One of the aims of the pharmacy redesign was to free up clinical pharmacists to spend more of their time in clinical work and less of their time in the dispensary. This required an explicit commitment to reconfiguring the jobs of pharmacy technicians and support workers and to providing the appropriate training for the reconfigured jobs. To examine the impact of such reconfiguration, for each group of workers we examine the change in their: job roles; training; pace of work and level of control over tasks; career progression aspirations and opportunities; voice in the organisation and

relations with other staff; and job satisfaction.

4.2.1 Pharmacy Support Workers (Agenda for Change band 2 and 3)

Perceptions of job change and new job roles

The role of support worker has changed as a result of the redesign in a number of ways. Previously, the support worker role involved general tasks such as topping-up ward cupboards and dealing with ward stock issues, and for store workers, the movement of stock within the pharmacy. All tasks involved manually picking from a stock base in the pharmacy or ordering from suppliers for same or next day delivery.

The establishment of the PDC was aimed at removing the distribution function within hospital sites although some staff contest whether this function has been fully removed. While support workers still carry out some similar tasks, the redesign has introduced a more structured rotational nature to the job, covering satellite dispensaries and main dispensary in hospital sites. Some support staff can now cover different wards on different days while others are based in one particular area (such as dispensary, aseptic and controlled drugs) for a number of weeks. General tasks such as dealing with enquiries (by telephone or face to face) are undertaken. Support workers should now come into greater contact with patients and ward-based staff while rotating through wards.

Support workers who moved to the PDC are now engaged in work different from that undertaken in the hospital sites. The main task of Band 3 support workers is to arrange orders to go into the vans for the scheduled deliveries to sites, as well as handling any last-minute "priority" orders from any sites. Other Band 3 tasks include: assignment of staff to the over labelling area and collating and preparing orders for the robot. Band 2 tasks include: collection of items from the manual pick areas; receiving goods, checking these against orders and arranging the stock to be stored or processed (for example, allocating stock to the robot, fridge items, manual pick area or over labelling area). This is a similar stores role to pre-redesign Band 2 work.

Training

Support workers split fairly evenly between those who reported that they received insufficient training on redeployment and those who found the training at that time supportive and useful, particularly in relation to MMyM responsibilities, gaining SVQ qualifications and as a catalyst to continue with other training:

> *I've got such a good background of what I've done, I want to go and do more. It'll be*
> *good to learn more things because I've done the dispensing now. I'm not saying it's*
> *boring or anything but you want to learn more, so it would be quite nice to go out and do*
> *more stuff out there and learn more. I'm looking forward to it. (Support worker, Site D)*

Other support workers were more critical:

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> *I got dumped in that dispensary on my first day, having never worked in a general hospital, and got paired up with a student technician. And that was my training; on you go, you can work a computer. (Support worker, Site A)*

Options for training have, however, generated employee expectations, and many support workers complained that they had taken on additional responsibilities without commensurate reward or re-grading:

> *… they were explaining to me that they were going to train me up to do different things, and I said, 'Well does that mean I'm going to be moving up a band? Are you going to train me so I can move up a band?' And apparently there's not a band there. There's a Band 2 and then it skips to a Band 4. And there used to be a Band 3. And I was thinking, 'Well if I'm going to be doing prescriptions, putting prescriptions through here, doing dispensary work, then I would expect to get moved up to at least a Band 3 (Support worker, Site A)*

While many support workers reported role stretch without re-grading or reward, very few indicated no interest in training. Some reported not being able to access training that they wanted (in some cases not directly relevant to their current job) and this coupled with a lack of rotation and staff shortages limited their access to new skills:

> *… just now I've not been doing much of it because people are on holidays and we've got less staff and things. Hopefully when I come back from my holidays, maybe when staffing's a bit - when we've got more staff, we'll get more training (Support worker, Site D)*

The motivation for this training varied between training to support their current job and training in hope of progressing to a higher level job.

Pace and Control

While there was consensus that the pace of work had increased post redesign, support workers offered different assessments of this. Some suggested that while work processes were lean, with fewer staff, they preferred the faster pace and the work was manageable:

> *Respondent: I would probably say it was a slower pace before the redesign. My job was at a slower pace, because there was more of us to do the work. Whereas now there's less of us, so we're going at a faster pace to try and get things done, I would say. Whereas you could just go at your own pace before. Because there was always other people there to help you and everything. Interviewer: What do you prefer with regard to pace … before or? Respondent: Now. (Support worker, Site C)*

However, higher band support workers reported that with additional duties, their attention to paper work suffers:

> *We had more staff and more things got done. Now, we've got paperwork out there*

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piled up. We've got things that we can't get done. Before, it was more organised, we had more staff obviously. (Support worker, Site D)

All support workers reported little change to the extent of their control over their methods of work as they continue to work to Standard Operating Procedures (SOPs), but the ordering of work had changed, with the PDC deadlines now determining the priority of tasks. Whilst most reported these deadlines as achievable with a full complement of staff, the loss of flexibility to react to last minute requests was noted:

Although we had times for ordering things before … it's either got to be through for 12 o'clock or whatever the afternoon time is, 4 o'clock … whereas before we could always say to the clerical person 'We need this, I know it's out with the time' 'Right leave it with me and I'll see what I can do.' You know, so you are kinda stuck that way. (Support Worker, Site B)

The PDC deadlines aside, many support workers reported greater control over how to prioritise the remaining tasks relative to pre-redesign. This was particularly the case for those with MMyM responsibilities and was reported positively.

PDC support workers, however, reported the loss of capacity to plan for busy days:

… it used to be you could tell your busy days, but now it could be any day, it just depends when it comes in, that's when we've got to ask for help, because we know we'll not get it done. (Support Worker, Site E)

The reports of pace of work at the PDC were benchmarked by early difficult experiences of when the PDC first opened. All respondents commented on the chaotic organisation and frantic experience and pace in the first year (2010-2011) and that anything in comparison was seen as an improvement:

… It's different now from the beginning because at the beginning everybody was stressed, you know, people were crying, breaking down, going into the toilet, it was awful. But the pace is the same but we have that blip in the morning that we can catch up, you feel you can get stuff done, then the boxes out. That's the hectic bit I would say between 10am and 2pm, the boxes out and then we can go at our own pace because the stuff doesn't go out until the next day as long as we get it all done before 8 o'clock at night. (Support Worker, Site E)

Career Progression

Some support workers were not particularly interested in career progression, citing age, a lack of ambition or contentment with their current post as the reason. Others were interested in progressing to technician level, and key stakeholders reported that most student pharmacy technicians were drawn from support workers because of their existing job and organisational knowledge. However, some support workers reported that their aspirations were thwarted because they could not be assured of a job on completion of their training, as had been previous practice. This change to fixed term contracts for technician training combined with low staff turnover among

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technicians, introduced considerable uncertainty and insecurity to the decision to train to pursue career progression:

> *You can apply for the student technician's post... can't be guaranteed a job at the end of it. So why would I do that? I've got kids. I've got a mortgage..... I've got 14, 15 years in this job... I could probably do the job with my eyes shut, and I can't actually get qualified, although I'm doing the job already at a pittance. (Support worker, Site A)*

Employee Voice and Relationships

All support workers reported that there had been no change in the extent to which they could influence decisions relating to their work, commenting that their involvement in decision making had always been minimal:

> *In my position nobody says 'would you like to do this?' It's just a case of 'we're changing this and we're changing that' and you've just got to go with it. (Support Worker, Site D)*

Some of the support workers, however, spoke of their previous roles within pharmacy stores typically working on their own with occasional and informal contact with other pharmacy and non-pharmacy staff. Their transition, therefore, into dispensaries and satellite dispensaries had brought more involvement with other staff groups in a more formal context. Most support workers reported this change to being part of a team positively:

> *I was just in the store which was down the back ... I was more or less on my own all day. But here, if there is anything wrong, you need to know, the management will help you out, you just go in and ask them and they will...If they don't they'll find out for you and make it all okay. (Support Worker, Site E)*

Job Satisfaction and Employee Morale

For some support workers on hospital sites, although the work was more challenging due to the faster pace, higher volume of work and expectations to cover higher level work, most staff found the work more mentally challenging due to the new rotational nature of their work. Staff enjoyed this aspect, particularly being more ward-based with an improvement in knowledge of drugs and departments as well as skills reported:

> *More interesting and more challenging, more complex... Because we're here and we're doing a rotation, you're getting to see every aspect...it's stuff you don't get to see. So I would certainly say more interesting, more varied, definitely...It's obviously more difficult because it's different. (Support worker, Site A)*

In contrast, PDC support workers described how their role had become detached from pharmacy and felt more like warehouse work. The nature of the tasks and knowledge had changed as their familiarity with individual medicines was becoming less focused, being exposed to a larger variety of

medicines:

> *When I worked with the drugs in the [hospital] I was taking the drugs in, checking them in and it had to be right, you had to get the strength right, the quantity right. Now we're just making sure the orders are right…I am learning different things but just not as drug orientated…we are not on a one-to-one with the drugs it's just about the orders (Support worker, Site E)*

Employee morale, however, was reported more consistently with many support workers reporting low levels of morale as an issue at the time of interviewing. Although it was recognised that morale had improved slightly since the PDC opening, staff looked back upon their previous working lives as much more enjoyable. Some staff were still struggling to cope with the pressures of the current workload and the stress associated with the early days of the PDC still coloured their perception of the service to date, affecting morale levels considerably. Although job satisfaction levels were moderate to good, this appeared to be more related to the tasks undertaken than the conditions in which tasks are undertaken.

It was reported frequently that the level of staffing alongside the impact of having staff on long-term sick leave created a vicious circle of increased workload, increased stress and decreased morale. This has the potential to damage team cohesion, as some staff reported being left to get on with the work while others took time off due to feeling stressed and discouraged:

> *Well, I think the redesign hasn't helped. I think the reduction of staff has been left. I mean, the workload here, as far as for wards and stuff, hasn't gone down whatsoever. And the lack of staff is putting whoever's left under great pressure. I mean, I know here there's been quite an issue with long term sick, people just going off having had enough. And that has a knock on effect on workloads (Support worker, Site A)*

Some staff reported that during the first year of the PDC going live they were willing to stay behind after working hours and help get work finished, but after feeling as though their efforts were not appreciated, staff are now more reluctant to help out and perceive a disconnect with the service and with their team as a whole:

> *Well, when I was at the [hospital site], I wouldn't mind staying back a wee bit late to get a prescription finished,…I'm no longer willing to …you don't get a thank you for it, you know, they don't recognise the fact that you're invested in your job…I don't get anything back for it. (Support worker, Site A)*

4.2.2 Technicians (Agenda for change band 4, 5 and 6)

Perceptions of job change and new job roles

Essentially, few technicians perceived any change in the over-arching objective of their role insofar as the end user- the patient- remained their central concern. There was still a strong focus on providing the patient with the appropriate medicines in a safe and timely fashion:

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At the moment, I'd say we're much the same because we're still doing the same job in there with the same patients, so my job is the same. (Technician, Site B)

The previous role of most technicians was dispensary based and involved picking, preparing and supporting the dispensing of prescriptions, with work being checked by a pharmacist. Post-redesign, hospital based technicians are primarily focused on dispensing and checking prescriptions either within dispensaries or MMyM satellite dispensaries. In addition, all Band 5 technicians now have a responsibility for checking dispensing, requiring a Dispensing Checking Technician (DCT) qualification, and consequently their work need no longer be overseen by a pharmacist. However, both staff and stakeholders raised concerns that some Band 5 technicians are not spending the required time checking and are still engaged in dispensing or resolving difficulties in sourcing medicines unavailable from the PDC, drawing pharmacists back into the task of checking:

We're also looking at where pharmacy technicians are still dispensing because when they dispense they can't accuracy check their own dispensing, so you're paying them to accuracy check and then your systems don't allow them to do it because they can't check their own work. (Stakeholder)

At the PDC band 4 technicians rotate between the three 'side rooms' of the PDC; unlicensed medicines, vaccines and controlled drugs. Greater product awareness and concentration is required due to the rotational and wide ranging nature of the work. Band 5 technicians undertake supervisory duties checking that work on the main floor is operating smoothly, undertaking accuracy spot checks on filled boxes, dealing with any issues and attending to robot errors if management is unavailable.

Training

Technicians reported that prior to the pharmacy redesign much of their training was informal and experiential, supported by more senior technicians and pharmacists. This informal training, alongside rotation through the different functions within hospital pharmacies, was seen as important in developing and maintaining technicians' skills. Some technicians had taken advantage of more formalised training to improve their skills, qualifications and career prospects, notably by becoming DCTs. Whilst many technicians talked of the benefits of the informal approach to technician training, key stakeholders remarked that it was unpredictable with training responsibilities spread too thinly, taking too long to complete and poorly matched to succession planning for technicians.

The redesign programme required that new roles for technicians were met with additional and more formalised training opportunities, and technicians reported having undergone quite a wide array of training, both formal and informal, to enable them to meet their altered responsibilities. Technicians had, variously, undertaken: DCT qualifications; HNC qualifications; SVQ Assessor training; medicines management training; health and safety training and change management training. This training was generally positively assessed:

Well it means that I'm an SVQ Assessor, it means if I leave here I can take it with me! [Laugh] (Technician, Site C)

I really enjoyed DCT and the responsibility it brought. I always thought when I was younger and the pharmacists were under pressure and there was all these prescriptions and I used to always think I can do that, I could help them, but you couldn't because that wasn't the thing, and then the role changed. (Technician, Site D)

And the HNC, I feel, has helped personal improvement, on being able to speak to people appropriately… being able to stand up and give presentations, being able to go and sit in with senior management nurses… (Technician, Site A)

In contrast, training for technicians at the PDC was reported variably; some staff reported that their training was not planned or structured and that they were *"just dumped straight in"*; others noted that they had received useful training from the software and hardware manufacturer's support staff, when available:

When we were Band 4s we didn't do anything whatsoever to do with any of the ordering or things like that… and then we just got left with it… So you were ordering all these thousands of pounds from companies and we'd never done it before. So that's why we wanted training, but… oh no, just go for it, just press that button and away you go! That's what you got told. (Technician, Site C)

For those who received training this was reported as positive, either in terms of its impact on how they did their jobs, or in terms of the impact of training on their self-confidence, particularly in their relations with non-pharmacy specialists.   However, almost as many technicians reported the refusal of a request for training and reflected their belief that tight staffing levels were restricting both informal and formal training.   Technicians also raised concerns over the unanticipated impact of the redesign on opportunities for training through rotation.   It was reported that as all sites did not undertake the same range of activities following the redesign, site based technicians may miss out on opportunities to maintain their skills in some areas:

Everybody had a dispensary, everybody had a store, everybody had a sterile lab, everybody had experience on every aspect of pharmacy. The re-design has kind of made that into specific sites, so if you want to do sterile work, ….you have to make your way to that particular site, and on the training level, a band four technician on a training level, wouldn't always get that opportunity now. (Technician, Site B)

In addition, technicians reported undertaking their new professional obligations in relation to continuing professional development (CPD) largely in their own time due to pressures of work. Most viewed their CPD activities positively.   More disquiet regarding CPD requirements was expressed, however, by some technicians at the PDC, who felt that the nature of their work did not, and should not, require them to maintain skills that their job did not allow them to use:

You've got to be registered with the General Pharmaceutical Council and part of that to be a technician is to do this CPD, if you don't do it then that's you, you can't work as a technician… I mean I can understand it in certain areas, but not in an environment like this, in a warehouse where there is a certain limit to what you can continually personally develop yourself in… I don't really see the need for it…. If someone can come in and do their job effectively and competently … Why are they put under pressure to learn other

stuff? …I wouldn't say it should be something that should be inflicted on [staff]
(Technician, Site E)

Pace and Control

The experiences of dispensary-based technicians varied across sites according to how well the MMyM service was perceived to be working. In two sites where MMyM was reported as working well, the pace of work within the dispensary was said to have changed little. In contrast, the other two sites who reported on-going issues with MMyM had an increase in the pace of work dealing with more indents, queries and complaints regarding stock items ordered but not received from the PDC.   In all four sites the majority of technicians reported a loss of control over maintaining and communicating the supply of stock: where technicians had previously been able to access information about an item out of stock and consider alternative options, they were now faced with a *'waiting game'* to see what arrived from the PDC and then to resolve issues as a consequence of non-delivered items.   Some technicians argued that these tasks were previously the work of band 2 or 3s but were now typically carried out by a band 5 technician, taking them away from their work checking prescriptions. The resultant increase in the pace of work was reported to have increased the number of checking errors logged:

Before, you were checking and that was it … [you] didn't really have to worry about all
the other things. [You] didn't have lots of problems, because that all went to
distribution. But now it's coming to us and we're having to deal with that as well. So you
then have less time to spend checking prescriptions, so you are working at a faster pace.
(Technician, Site A)

The MMyM technicians were mostly positive about pace of work. Most reported that their pace was mainly determined by the number of discharges and that they organised their work with ward colleagues to avoid bottlenecks of prescriptions. Some technicians also reported paging their availability to support other satellite dispensaries.

The views of technicians at the PDC around pace of work was, again, affected by their experiences when the PDC first became operational but by comparison was felt to be improving:

… over the last sort of maybe year-ish out of the three it has finally settled down, the
robots are running reasonably happy, I think as far as I'm aware the big robots, most
stuff leaves every day….there has been staff leaving because they didn't like the place
essentially, but it has all settled down to an even keel now … I would say it has upped a
bit in here, it was never slow at [previous location of work] but I would say it is upped
here. (Technician, Site E)

The majority of technicians remarked on the lack of substitutability (staffing cover) given the fragmentation of jobs within and across sites and the impact that this had on holiday requests which now required considerable forward planning.

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Career Progression

The redesign programme contained both explicit and implicit implications for career progression. Key stakeholders framed this commitment within a narrative of improving both the jobs and the career prospects of technicians and support workers, and improving succession planning for the higher technician grades, resolving previous succession problems. Stakeholders identified a clear progressive career path for technicians, who now range from a Band 4 to a Band 8a, but also acknowledged that in practice accessing all points on this path may be challenging:

> *… So technicians start at band 4, band 4 up to 8a, and we've got a bulge at 5…*
> *(Stakeholder)*

Few of the technicians interviewed suggested that they were not interested in career progression, although some cited that they had not taken advantage of progression opportunities during the redesign because they were personally happy remaining in their current job and – notably – on their current site. Some technicians (as with support workers) felt that the lack of opportunities to train due to lack of staffing cover impacted negatively on potential for career development. While technicians acknowledged that they had career progression opportunities, many of them reported that in reality there were few opportunities to progress because turnover amongst technicians was so low. Interestingly, some technicians identified future phases of redesign as providing the only real possibilities of accessing higher graded posts where others suggested that technology was substituting for technicians: one cited the departure of a member of staff and offered the view that thereafter *"her yearly salary got used to service the robot!"*.

For technicians at the PDC, however, there were significant concerns over their progression opportunities, and these concerns were shared by key stakeholders. In particular, these concerns focused on whether PDC technicians had the same progression opportunities as technicians on hospital sites, and whether they were maintaining important skills (e.g. DTC skills) or amassing the right skills to move to band 5 or 6 posts elsewhere in the NHS:

> *One of the areas that we've identified is that we've got no good mechanisms in place*
> *currently for succession planning going forward because the old models, everybody*
> *would have been trained in all areas and rotated through all the areas, but now that*
> *we've got this new one service PDC in one area we've very little staff movement*
> *(Stakeholder)*

Employee Voice and Relationships

Most technicians reported an increase in the number of issues they raised with management compared with previously but were unsure of their voices being heard as responses were rarely received and/or fed back. In some sites, technicians reported a loss of mechanisms to raise concerns, with sector chiefs essentially viewed as part-time management given their multi-site remit. Technicians felt that they were now informed of change rather than consulted. In contrast, the higher graded technicians believed that they had better voice mechanisms and reported some success in being listened to.

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The dispensary and MMyM technicians experienced changes in relationships differently. Most had experienced a change in local management to which MMyM technicians were relatively indifferent given their distance in satellite dispensaries, while for some of the dispensary based technicians this had presented another change to their working dynamics. These differences followed through into relations with non-pharmacy staff. Most dispensary technicians reported that relations with non-pharmacy staff had become unnecessarily problematic because of the dispensary role as the 'go-between' for the PDC and wards:

> *… they'll phone up when you're snowed under with prescriptions and want you to deal with why they didn't get sodium chloride…..they want you to do it now, they want you to deal with it. And we can't always do that. And so you get anger from them because you're not dealing with them at that point … a lot of these problems, we felt should have gone to PDC … And if we give the number of PDC out to the wards and they phone them, we get hell to pay for giving the number out, because the ward ... it has to come through us, which is an additional job for us to then deal with it. (Technician, Site A)*

In contrast, MMyM technicians reported positive and developing relations with non-pharmacy staff as they worked alongside them at ward level. This relocation was reported to have made their job more interesting and challenging as well as more sociable. Some also commented that it brought them closer to the patient than before giving a real emphasis to the value of pharmacy work.

> *... I was always kept in the dispensary, I never got out for years, and when [My Medicines] was all happening I saw it as an opportunity for me to get out, and I said I want to be a part of this.(Technician, Site D)*

Job Satisfaction and Employee Morale

A moderate level of job satisfaction was reported by technicians overall although views were mixed, tending to reflect different areas of activity and for some they were clearly not satisfied in their current role. Many MMyM technicians reported feeling satisfied in their roles if their work for the day was completed and they had a clear work space:

> *When you're getting everything done and everything's going well and you've got enough staff and you've got enough time when you're talking to a patient to see if they've got their own meds and things like that. That's quite pleasing but, when you're running ragged and you can't do that and it's a quick in and out and all that, that's not so good.*
> *(Technician, Site B)*

However, days were variable and although there was a recognition that staff were satisfied in terms of task, the pressures of lean staffing issues and workload at times made their job less enjoyable. Additionally, there was limited room for manoeuvre when it came to working practices, which was particularly the case with technicians working within the hospital dispensaries. Time constraints meant that work had to be dealt with in a reactive way, with no opportunity to look ahead and plan

for a better service:

> *No, there's no job satisfaction, it's just going through the motions, so it is, at the moment. You can't plan to… You can't like implement anything new or you've got no foresight, you're just going ahead. Just what needs done today, let's get it done. You've got no forward planning in anything or we could maybe try this or we could… You can't try anything because you don't have time for anything to fail. (Technician, Site C)*

Technicians engaged in MMyM articulated how the potential for increased patient contact had enforced the idea that all staff members were working towards caring for individuals and supporting their families. However, it was recognised that at times it was difficult to maintain this frame of mind due to the pressures of working in the dispensary:

> *…when you're down here and you're in dispensary all the time you don't see the patients, you can become a wee bit withdrawn because you're forgetting that that's for somebody. That's somebody's family's waiting on them and they're getting discharged and you kind of, you take a step back and you just get caught up in, oh we don't have this drug….and it doesn't matter. Like you forget there's a patient at the end of it.*
> *(Technician, Site D)*

In terms of morale, there was some level of dissatisfaction in relation to what technicians expected their job roles to be and what actually transpired. One pharmacist identified that the expected versus actual levels of patient contact experienced by technicians was less than anticipated which contributed towards a negative mood:

> *From speaking to technicians, they would have quite liked to get involved in patient counselling and, you know, speaking to the patients a bit more about their medicines and kind of developing their role and increasing their knowledge and I think they are a bit bored, you know, there's only so long that you can work in dispensing. From speaking to the senior technicians that I work with they are a bit bored. (Pharmacist, Site B)*

There remains a feeling that technicians are carrying out tasks meant for those in higher grades in order to get the work done but are not receiving the appropriate training or being offered a reward (either monetary or in the form of job progression) for their efforts, creating a further demoralising effect:

> *Now, it's just kind of crisis management all the time...it's very, very difficult in here just now…it's just everything. It's the direction that everything's heading in…I think within pharmacy, certainly in Glasgow and very much in this department, people feel very undervalued…it would just be nice for someone to recognise the amount of work that you're doing. (Technician, Site A)*

4.2.3. Pharmacists

Prior to the redesign programme the pharmacists interviewed indicated their base as in the dispensary and that their role included screening and checking prescriptions and indents although

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they did spend limited time on wards. Following the redesign pharmacists spent more time on the wards interacting with patients and clinical staff regarding medicines use and communication with primary care practitioners including General Practitioners.

Pharmacists reported little change to their pace of work although most commented that there was less support available to cover holiday/sickness absences of other pharmacists and of pharmacy staff more generally. In these situations pharmacists were still being drawn into dispensary checking, dealing with supply issues and asked to cover other wards to undertake clinical checks on prescriptions. While very few reported having to work at a quicker pace, many of those interviewed did comment on the need to prioritise patients:

The main issue we found from the whole redesign is just having to do a lot more.
(Pharmacist, Site A)

The level of change in their methods or ordering of work differed according to whether the pharmacist had already been working at ward level or not. For the former, little change was reported whereas the latter reported positive outcomes in terms of more challenging, varied and interesting work alongside different professions. They also reported greater autonomy in prioritising their work schedule:

Interviewer: Do you enjoy relative autonomy at work that you can decide the order that
you're going to do things in and you can prioritise your own tasks? …Respondent: We
have a PPSU Prioritisation Plan. ..So we have that, but outside that we're fairly
autonomous (Pharmacist, Site C)

Pharmacists reported that they didn't receive much formalised training beyond basic grade positions but had on-going CPD requirements which they met either individually or as part of specialist networks. Some pharmacists reported engaging in management training, which they found challenging. Like the technicians, pharmacists suggested that there was very little time at work to engage in training. This mitigated against in-house training, while cost issues restricted access to external training.

For pharmacists, job progression issues were not prominent, although some band 7 pharmacists felt downgraded following Agenda for Change – "*doing the same job as Band 8 pharmacists but without the accompanying rewards*". Interestingly, some pharmacists indicated that they would prefer what in grading terms was a regression, to focus only on clinical work rather than management, but that the rewards of a position with managerial responsibilities kept them in post:

Interviewer: What are the sort of progression and promotion opportunities available to
you? Respondent: I'd say very slim, to be honest…I would go back to doing a purely
clinical role, if I could afford it…that would be so I just do purely clinical and ignore the
management stuff. I could quite easily go back to doing that. I loved doing that.
(Pharmacist, Site A)

Most of the pharmacists interviewed reported being able to influence local site decisions but not those at a more strategic organisational level, although few were clear if this was a result of the redesign:

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I remember having a meeting, people had come over to do discussion about what would happen when the PDC went live and we had a load of questions and none of them were answer …It was like the decisions had already been made, we weren't been asked our opinions, it had been made and this was what was happening. (Pharmacist, Site B)

The majority of the pharmacists did, however, voice concerns over a lack of feedback during the redesign with most citing a meeting at which they were asked to submit questions but subsequently received a list of all questions asked rather than answers to those they had raised. Additionally, pharmacists in the more senior roles reported little difference to relations with management over time whereas those in more junior roles reported confused and complex relations with multiple line managers currently:

You don't know who to go to, to get certain operational things sorted out…. I've got three line managers only one of them is based here, the rest are all over Glasgow, I only correspond with them by email, I've not actually met them….. so just very odd. I think people feel in certain situations there is no one you can go to, if you have an emergency on the day, ……. and so it's just really difficult to get someone to make that decision.
(Pharmacist, Site A)

While pharmacists now also have to report to technicians who have responsibility for the actual running of the service, this appears to cause them no difficulties.

4.2.4 Impact on collaborative/cross boundary working

One outcome from the redesign was the general increase in contact between pharmacy staff and other staff. Employees were asked about the impact of the redesign programme on opportunities for team-working, including collaboration across professional boundaries. As in other areas of work, participants reported a range of experiences of change, both positive and negative. For some support workers, the redesign had opened up new opportunities for collaborative working, marking a shift from (for example) relatively individualised ways of working within pharmacy stores to a greater sense of integrated team-working. In some cases, there was more of a sense of understanding how their role fitted within the broader pharmacy services infrastructure; and a belief that unhelpful professional boundaries and hierarchies had been challenged as a result of the redesign programme. The introduction of MMyM also meant that more patient interaction occurred as well as more interaction between pharmacy technicians and ward staff. Staff at hospital sites reported that they had some difficult and heated conversations during the initial stages of the redesign with other staff such as nurses. It was however noted that relations between different staff groups had improved, and that the redesign had provided an opportunity to liaise more with the wider hospital team.

Others, however, reported less collaborative working. Some individuals at the PDC reported feeling isolated when working in the controlled drugs, unlicensed medicines and vaccines areas as this meant they were working on their own or at most in pairs. However, due to the rotational nature of work, this experience was limited to a number of weeks rather than on a more long-term basis.

Concerns were also raised that the establishment of the PDC had sometimes had a negative impact on communication across professional groups. For one pharmacist, the loss of "*a specific point of contact*" on issues of pharmacy distribution since the establishment of the PDC had limited opportunities to build collaborative relationships of trust with other pharmacy staff.   Moreover, some support workers saw the redesign programme as introducing a higher level of functionalism and standardisation in job roles, so that the opportunity for collaborative team working was undermined. For one support worker, there was a tension between a recognition that the PDC model had produced efficiency improvements, but at the cost of morale and collaboration among staff:

> *I think the service has got slightly better. I don't think the PDC itself is necessarily the worst thing in the world, but I think the fallout of that is certainly not good… there is no morale; there is no teamwork; nobody works with each other any longer because 'it's not our jobs'. And that's been a direct result of that redesign, the PDC, the peeling off of staff, the lack of training… (Support Worker, Site A)*

More generally, we found high levels of commitment to collaborative working across all groups. A recurring theme was employees' shared commitment to delivering high quality pharmacy services, with many interviewees' emphasising the importance of a shared goal of ensuring that patients received appropriate care.

5 Discussion

This section provides some initial reflections from the University team focused on successes, ongoing challenges and concerns.

5.1 Successes from the redesign programme

When asked what parts of the redesign worked best, participants identified most frequently two key areas. The first was the rollout of the MMyM service which appeared to have been well received and was seen as a system which made sense and provided staff with the opportunity to perform interesting and varied work which had a direct patient focus. The second was the introduction of the night shift at the PDC in 2011, an emergent solution, which was important to everyone and produced a noticeable improvement in the performance of the PDC and service accuracy/completeness for sites.

Less frequently reported but also considered an important achievement by some participants was the subsequent dispensary robot automation, with fewer reports of major glitches or bugs in the technology. Some stakeholders reflected that the organisational learning from the PDC was their training "*on the job"* and helped to deliver the dispensary automation more rapidly and effectively. One Stakeholder tracked the change in perception of the dispensary robot at one site:

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The biggest critic of [the dispensary robot], who was the pharmacist, the lead pharmacist for the dispensary, said to the chief operating officer, you know, "I was the biggest critic of this before we started, I don't know how we could cope without this now".
(Stakeholder)

5.2 Ongoing challenges and concerns

Staff morale, teams and training

There were a number of social disruptions experienced during the redesign, principally exhibited as low levels of morale throughout the redesign programme. In 2010, morale was particularly low due to a number of factors, mainly the system not performing to expected levels, a natural staff adjustment period and a general lack of support for the redesign. Although many participants said that morale had most certainly improved, it was identified by both on site staff and stakeholders that morale has still not recovered to pre-redesign levels.

Some staff spoke about the impact of leaving or losing a team that they had worked with for a number of years, and how this impacted on their experience of the redesign. Social bonds were broken, and in a time when there was uncertainty around job roles and satisfaction, there was also a perceived lack of social and professional support. Those interviewed from a Partnership perspective supported the staff view that partnership efforts had not made staff feel more supported in parts of the redesign process. One project manager stated that they had not expected the level of loss and grief felt by staff during the redesign.

Some stakeholders reported that the new close-knit team at the PDC which evolved was the sole reason why the PDC succeeded throughout various points of difficulty. However, it does appear that there is a broken link between the PDC and the hospital sites. Staff who rotate on site interact with new teams and other healthcare staff on a regular basis, yet the geography of the PDC means that even when staff rotate they are still operating within the PDC itself. Staff at the PDC and the sites therefore had very differing experiences of what it is like to work in Pharmacy. One participant suggestion was to encourage broader rotations:

…So I've be keen to have a rotation which would actually help in terms of allowing people to understand what the PDC does as well. So actually what you would do is maybe have people at a certain level rotating from the local pharmacies into the PDC and then somebody from the PDC going out to the local pharmacies. We've not quite got there yet….it also means that people keep up their skills so that when opportunities arise out with the PDC you can move on. (Stakeholder)

Although participants reported positively on training they received, opportunities for training and time to undertake training were commonly reported as constrained due to workload and not well matched to succession planning. **Now that the redesign programme is embedded within practice, further attention to staff development will support better skills utilisation across the workforce**.

Staffing and skill mix

Staff concerns over intensive work pace comprise two different views. First that the overall number of staff is too low: some staff reported concerns over how the service could continue under such lean conditions; staff commented feeling under pressure as a result of the prevailing staff levels and felt that it was hard to provide a complete service particularly when sickness and absence levels were high. The second concern was around sites having the right skill mix for their individual needs.

On both issues, stakeholders have very different views from staff, expressing a view that the redesign had ensured the right people were in the right jobs, and that staff were now working at 100% effort for the entire duration of their shift:

> *I was able to say no, wait a minute, we've still got the same numbers of staff on site, the skill mix is just different. But they're still going back to, we don't have this person, we don't have that person, we don't have the staff that we used to have, we don't have the same numbers of staff… So there is definitely a perception there and I think they probably feel that they're pushed. (Stakeholder)*

Increased workload also remains a concern with some staff feeling that more and more responsibility is being placed upon them under the "other duties" section of their job description. This was also reported by some support workers in respect to considerable role stretch, indicating that short of final release, they reported carrying out similar tasks to technicians. In contrast, some technicians appear to be experiencing role contraction, continuing to engage in dispensing rather than checking with a consequent need for pharmacists to undertake checking roles. Both of these interconnected features concern staff at all levels. **This perceived increase in workload, role stretch and role contraction coupled with a "lean system" represent ongoing issues, which could impact on future redesign of the service.**

Distribution function on hospital sites

Although officially there is no distribution function at hospital sites some participants report that this is still occurring, to a larger or lesser degree, for a number of reasons: the PDC does not hold or is out of stock of the item(s) and thus site staff require to source the item(s) from other sites or suppliers; there are continuing issues with the handheld electronic machines used at ward level to order stock (designed to allow wards to order straight from the PDC) resulting in significantly more orders coming to the hospital site dispensaries rather than going directly through to the PDC; stock ordering behaviours at ward level are reported as not ideal - ward stock cupboards are often cluttered, unorganised with inaccurate stock level maintenance making it difficult to access stock and resulting in ward staff ordering for individual patient needs as a result; and errors in PDC orders (significantly less than in the early phase of implementation) have put pressure on sites to resolve issues in accessing medicines quickly. **Resolution of the technical issues and strategies to support improved ward stock control/ordering behaviour will be important to deliver improvement in this area.**

6 Conclusions and Recommendations

NHS GGG&C has embarked on a major pharmacy redesign program which aims to maximise the application of technology within the medicines supply chain and release staff to near-patient tasks as part of integrated clinical teams through the MMyM service. This report has focused on the progress made with the adoption of the robotic technology and the impact on the pharmacy workforce, approximately 2 years post implementation. Since the first evaluation undertaken in 2010 (first 6 months) significant progress has been made with the expansion of robotics beyond the PDC into dispensaries across NHS GG&C and continual improvement in the fitness for purpose of this technology, recognising though that some areas still require attention. The findings demonstrate the impact across the whole pharmacy workforce and the significant job changes particularly for pharmacy support workers and technicians. We hope this report provides the opportunity for stakeholders and staff to reflect back on the overall redesign programme, celebrate success and recognise areas requiring continued attention to improve the service provided to patients and support the well-being and development of the workforce. A list of recommendations follows which the research team consider may inform ongoing improvement plans for the service:

Organisational memory

1. To reflect as an organisation on how to sustain engagement and effective communication for future organisational change through the use of tools such as key milestone events, acknowledging challenges and limitations and celebrating success, and demonstrating a listening and feedback culture.

Teams and Training

2. To build on the local problem solving activity demonstrated to encourage staff empowerment and autonomy through local team development initiatives.
3. To consider the feasibility of a rotational programme across hospital sites (MMyM and pharmacy based) and PDC for pharmacy support workers and technicians which would improve awareness of pharmacy identity, communication, variety, skills development/maintenance, succession planning and progression.
4. To develop a process whereby pharmacy support workers could apply for technician training posts through secondment rather than a transfer to fixed term contracts.
5. To review the management training needs of lead technicians and explore access to training opportunities internally with NHS GG&C and externally through further/higher education institutions.

Staffing and skill mix

6. To review the level and consistency of role stretch (support workers) and contraction (pharmacy technicians/pharmacists) within and across Agenda for Change bandings to inform job description development.

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7. To extend current monitoring of staff levels, workload, errors/incidents demonstrated within the PDC to hospital sites to inform workforce capacity planning.

Technology development

8. To continue a focus on resolution of evolving technical issues, in particular the ward ordering technology, to support efficient ordering direct to the PDC and reduce workload on local hospital sites.
9. To consider a staged developmental procurement process, where feasible, in the adoption of new untested technology moving forward to aid staff adoption/engagement and minimise organisational risk.

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References

1. Bennie, M., van der Meer, R., Chalmers, D., Dunlop, E., Puangpee, P., Jindal, K., Lannigan, N., Griffith, E., Brady, M., Munday, A., Orlandi, A. (2010). NHS Greater Glasgow & Clude Acute Pharmacy Redesign programme.

2. Goundrey-Smith S. Information Technology in Pharmacy. London: Springer-Verlag 2013.

3. Coleman B. Hospital pharmacy staff attitudes towards automated dispensing before and after implementation. Hosp Pharm 2004; **11:248**-251.

4. Fitzpatrick R, Cooke P, Southall C et al. Evaluation of an automated dispensing system in a hospital pharmacy dispensary. Pharm J 2005; **274:763**-765.

5. Brinklow, N. 2006 A report assessing the impact of an automated dispensing system at King's College Hospital NHS Trust, London: King's College Hospital.

6. Fung, E. and Leung, B. 2009 Do automated dispensing machines improve patient safety? Canadian Journal of Hospital Pharmacy Vol 62, 516–519.

7. Colquhoun, A. 2010 Could automation improve efficiency and help pharmacies with cost saving?, The Pharmaceutical Journal Vol 285, 587-591.

8. Kochan, T.A., Eaton, A.E., McKersie, R., Adler, P. 2009 Healing together: The labor management partnership at Kaiser Permanente, Ithaca, NY: ILR Press.

9. Osborne, S. and Brown, L. 2011 Innovation, public policy and public services delivery in the UK. The word that would be king?. Public Administration Vol 89, 1335-1350.

10. Kanter R. M., Stein, B. A. and Jick, T. D. (1992) The Challenge of Organizational Change (New York: The Free Press).

11. Kotter J. P. (1996) Leading Change (Boston, MA: Harvard Business School Press).

12. Van der Meer R.B., Bennie M., Corcoran E. D., Lannigan N. Early-stage experiences of the large-scale implementation of pharmacy robotics in a hospital pharmacy service within a large UK Health Authority. European Journal of Hospital Pharmacy, *submitted*

13. Cresswell KM, Sheikh A. The NHS Care Record Service (NHS CRS): recommendations from the literature on successful implementation and adoption. Inform Prim Care 2009;**17**:153–164.

14. Greenhalgh T, Stones R. Theorising big IT programmes in healthcare: strong structuration theory meets actor-network theory. Soc Sci Med 2010;**70**:1285-1294.

15. Ritchie J, Spencer L. Qualitative data analysis for applied policy research. In: Bryman A, Burgess R, editors. Analysing Qualitative Data. London: Routledge; 1994: 173-94.

16. Williams, P. 2010 Special agents: the nature and role of boundary spanners, paper to the ESRC Research Seminar Series: 'Collaborative Futures', University of Birmingham, 10 February.