The Pharmaceutical Society of Ireland
Baseline Study of

# Hospital Pharmacy in Ireland

Final Report
December 2012

Crowe Horwath™

PSI
CUMANN CÓGAISEOIRÍ
NA hÉIREANN
The Pharmaceutical Society of Ireland
AN RIALTÓIR CÓGAISÍOCHTA
THE PHARMACY REGULATOR

# Contents

**Author's Note:** In line with the agreement reached with all of the hospitals in advance of the site visits, we are reporting all of our findings anonymously. The only exception to this is the description of the robotic dispensing system in use at the Mater Misericordiae University Hospital in Dublin, the only one of its type within the public hospital system in the State, which is well-known and has been visited by pharmacy staff and senior managers from across the Irish health system – anonymising this hospital when describing their robotic system would have been rather pointless, and in any event we have agreed with the MMUH that specific reference to their robotic system could be made within our report. The reader should also note that a smaller robotic system is in operation within the privately-owned Galway Clinic, following their decision to make an investment in robotic dispensing technology in 2009.

# Glossary

| Abbreviation | Full Description |
| --- | --- |
| ASHP | American Society of Hospital Pharmacists |
| BNF | British National Formulary |
| CCU | Coronary Care Unit |
| CE | Continuing Education |
| CPCE | Community Pharmacy Contractual Framework (England and Wales) |
| CPD | Continuing Professional Development |
| CPhA | Canadian Pharmacists Association |
| CPOE | Computerised Physician Order Entry |
| EAHP | European Association of Hospital Pharmacists |
| EHR | Electronic Health Record |
| FIP | Fédération Internationale Pharmaceutique (International Pharmaceutical Federation) |
| GPP | Good Pharmacy Practice |
| HDU | High-Dependency Unit |
| HIT | Health Information Technology |
| HPAI | Hospital Pharmacists Association of Ireland |
| HSE | Health Service Executive |
| ICCPE | Irish Centre for Continuing Pharmaceutical Education |
| ICU | Intensive Care Unit |
| IMB | Irish Medicines Board |
| NICE | National Institute for Health and Clinical Excellence (UK) |
| PhC | Pharmaceutical Care |
| PSI | Pharmaceutical Society of Ireland |
| RCSI | Royal College of Surgeons in Ireland |
| RPSGB | Royal Pharmaceutical Society of Great Britain |
| SHPA | Society of Hospital Pharmacists of Australia |
| TCD | Trinity College Dublin |
| UCC | University College Cork |
| UCD | University College Dublin |
| UCLan | University of Central Lancashire |
| UKCPA | United Kingdom Clinical Pharmacy Association |
| WHO | World Health Organisation |

# Executive Summary

## Introduction

The Pharmaceutical Society of Ireland (PSI) commissioned Horwath Bastow Charleton (now Crowe Horwath) in mid-2011 to conduct a study to provide an understanding of the nature and type of hospital pharmacy services currently being delivered in Ireland, and to review and report on the international profile of the standards of hospital pharmacy service and care delivery. Crowe Horwath was assisted in this project by senior academic pharmacists in the University of Central Lancashire (UCLan) in the UK.  This study followed a similar assignment conducted in 2010, when we completed a baseline study of community pharmacy in Ireland on behalf of the PSI.

## Approach

The study comprised three strands: a survey process, involving the issuing of two questionnaires: one to all hospital pharmacists, and one to the heads of pharmacy departments; a series of 16 site visits to a selected sample of hospitals around the country, comprising interviews with pharmacy and non-pharmacy staff; and an international literature review, examining hospital pharmacy provision and regulation in other EU countries, Australia, Canada, New Zealand and other countries as identified, seeking to identify and analyse the nature and scope of hospital pharmacy provision, best practice, policies and practice in relation to performance management, and how hospital pharmacy provision fits within the wider health and social care sector in each comparator country

## Key Survey and Stakeholder Findings

The following are the summarised findings from each of the areas examined in relation to the survey results and the site visit interview material, along with contextual and illustrative international review findings.

■ **Profile of Pharmacists:** The hospital pharmacy workforce represented in the sample shows much potential for further development. Many already have postgraduate qualifications, and a significant number have experience of another sector. There are many at senior pharmacist level, perhaps 'stuck' with regard to progression.

■ **Systems and Services:** Most Irish hospitals worked on a model of centralised distribution, although there was a significant amount of named patient dispensing in evidence. Most hospitals had a risk management policy in place, and medication safety initiatives. The majority of respondents agreed that hospital pharmacists took responsibility for medication-related outcomes, and that pharmacy had influence over prescribing. Whilst feeling that pharmacy performed well within its limited scope, there was a desire to do more.

■ **Technology:** Computers are used for a wide range of intra-pharmacy tasks in Irish hospitals, but levels of automation and communication between systems lag well behind other countries. Pharmacists are sceptical about the capability of their IT systems to cope with future demand, and believe that investment is needed.

■ **Inter-Professional Relationships:** Pharmacists felt generally that their relationships with other professionals in the hospital were good, but there were few links beyond the hospital with, for example, primary care doctors or even community pharmacists. Pharmacists were involved in multidisciplinary teaching & learning, audit and committees, but there were only ad hoc opportunities to join ward rounds. Pharmacists may need to be more visible in multidisciplinary ward-based activities to further develop relationships through common goals.

■ **Workforce:** The head of the pharmacy service has good managerial links to the chief officers within the hospital, and pharmacists perceive that they have influence over medicines policy, but not general policy, in the hospital. Half of them are engaged in work in a specific clinical area: a significant proportion of them have formal specialist qualifications, but many of them do not. Appraisal of pharmacy staff by managers is rare. There is a strong perception among pharmacists that the workforce is inadequate for the work required, but that there is an opportunity to capitalise on existing expertise through redeployment of staff. The recruitment embargo is having a significant negative impact on hospital pharmacy teams.

■ **Continuing Professional Development and Education:** Most pharmacists were doing CPD/CE, and a significant number were recording their activity. There were differing perceptions among pharmacists regarding whether they were doing enough CPD/CE ('enough' being from their own estimation). There was agreement that opportunities and choice of CPD/CE activities were very limited, especially for specialist areas of practice.

■ **Premises:** Hospital pharmacies in Ireland operate on limited opening hours, with ad hoc on-call arrangements for staff. Premises themselves are generally cramped and the services have grown out of the allocated space. This situation needs serious consideration if other opportunities in this report are to be realised.

## Key Strategic Issues

■ There is a perception that there is no national vision for pharmacy and how it could and should fit into the wider healthcare delivery system; specifically in the acute care setting, pharmacists wish to further develop evidence-based practice with hospital pharmacy an embedded part of integrated patient care services. This is something which the PSI could be seen to address by continuing to work closely with the HSE and Department of Health.

■ Clinical pharmacy practice appears under-developed and under-supported in the Irish acute hospital sector, and ways to address this should be explored by the health authorities, supported by the PSI.

■ In particular, medicines reconciliation has been identified as a key area in which hospital pharmacists could and should be playing a crucial role. It is important that this issue be addressed as a priority. The Patient Safety Commission specifically recommended formal medicines reconciliation in 2008; this has yet to materialise and it is important that this issue be addressed as a priority.

■ Access to hospital pharmacy services is restricted in most hospitals at present to weekday "office hours". A key issue is that clinical pharmacy services should be available in parallel with other medical services when this is required. Hospitals and hospital pharmacists need to address this issue and find solutions that allow for patients to access professional pharmacy input when they require it.

■ The recruitment embargo and budget cuts in the health services are creating significant challenges in relation to the financial and human resources for hospital pharmacies.

■ The development of current staff resources in terms of training, CPD/CE, and the consideration of new roles for existing staff (both pharmacist and non-pharmacist) is an important key to the expansion and development of professional hospital pharmacy services. Innovative solutions need to be considered by the profession and by hospital management to maintain and develop hospital pharmacy services.

■ Many pharmacies could develop clinical pharmacy services with existing pharmacist staff if the technician role were to be expanded to take on work the pharmacists currently carry out.

- The career structure, specialisation opportunities, and progression for pharmacists is a source of concern within the profession, and, in consideration of the above points, should be looked at in relation to the development of the profession as a whole.

- The PSI and the regulatory framework are perceived to focus on community pharmacy; hospital pharmacists' concerns in this regard are significant.

- The technology supporting hospital pharmacy activity is largely inadequate.

- Pharmacist involvement in multidisciplinary patient care teams is limited and this should be addressed.

- Hospital pharmacy premises are in many cases unfit for purpose and limit the potential for future development of services, with no space for additional staff resources, automation, storage, etc.

# 1

# Introduction

# 1  Introduction

## 1.1  Background

The Pharmaceutical Society of Ireland (PSI) commissioned Horwath Bastow Charleton (now Crowe Horwath) in mid-2011 to conduct a study to provide an understanding of the nature and type of hospital pharmacy services currently being delivered in Ireland, and to review and report on the international profile of the standards of hospital pharmacy service and care delivery. Crowe Horwath was assisted by senior academic pharmacists from the University of Central Lancashire (UCLan) in the UK.

This study followed a similar assignment conducted in 2010, when we completed a baseline study of community pharmacy in Ireland on behalf of the PSI. The report arising from that study was published in January 2011 and is available for download at:

http://www.thepsi.ie/Libraries/Publications

The first key element of the study was intended to focus on the provision of core and extended hospital pharmacy services in Ireland, providing baseline information for the PSI to enable it to understand the nature and scope of pharmacy provision nationally, to identify strengths and weaknesses in the sector, and to develop future policy to improve and implement change for hospital pharmacy provision in Ireland.

The second key element was designed to be an international review study, examining hospital pharmacy provision and regulation in other EU countries, Australia, Canada, New Zealand and other countries as identified, seeking to identify and analyse the nature and scope of hospital pharmacy provision, best practice, policies and practice in relation to performance management, and how hospital pharmacy provision fits within the wider health and social care sector in each comparator country.

## 1.2  Method of Approach

It was agreed with the Steering Group and PSI to carry out the data collection for the first element in two ways:

- Two census surveys: one of all hospital pharmacies in Ireland collecting structured data on pharmacy activity, staffing, infrastructure, etc, and a second of all hospital pharmacists in Ireland, gathering information such as qualifications, areas of specific expertise, and opinion on various aspects of pharmacy services;
- A series of site visits to a representative selection of hospitals (16 in total)  comprising interviews with pharmacy and other hospital staff along with a brief tour of pharmacy facilities.

The census surveys were designed to be administered mainly using a web-based version, with a paper-based version sent initially only to those who had no email address listed on the PSI register. Chief Pharmacists (on behalf of the hospital pharmacies) and hospital pharmacies were encouraged to complete the survey online if they had the capability to do so, but had the option to complete the paper version if not.

The site visits were conducted over a period of approximately six weeks from early June 2012. Hospitals were selected for visits so as to have as wide a representation of the differing sizes and types of hospital as possible, as well as a geographic spread.

The survey data were collated using SPSS, and the qualitative interview data by NVivo qualitative analysis software, with the overall information (facts, findings, analysis) compiled into this report for the consideration of the Steering Group.

The second element of the study, the international literature review, was run parallel to these data-gathering strands. Some of the initial review was carried out in advance of the development of the surveys and informed the content of the questionnaires. More in-depth review, and communication with other professional bodies, was conducted over the course of the assignment, and some of the issues and outcomes from the survey and interview process prompted some further exploration within the literature review.

## 1.3    Quantitative Survey

### 1.3.1    Background

Following an extensive preparatory period which involved significant engagement with the Steering Group, the quantitative survey commenced in April 2012 with an initial deadline of the 25th of May. Emails were issued to all hospital pharmacists inviting them to participate in the pharmacist survey using individual tokens (passwords) to access the online survey. Similarly, Superintendent Pharmacists were invited to complete the pharmacy survey using tokens.

Superintendent Pharmacists were invited both to complete the pharmacy survey as the head of the pharmacy department and the pharmacist survey in their capacity as hospital pharmacists. A small number of Superintendent Pharmacists had responsibility for more than one registered pharmacy (for example, where one larger hospital also provides services to "satellite" hospital sites, whose pharmacy services are registered separately), which entailed completing a number of pharmacy surveys along with a pharmacist survey.

Paper versions were issued to those who could not be contacted by email and those who requested hard copies. The paper versions of the surveys are attached as Appendix 1.

### 1.3.2    Response Rate

The total response rate for the pharmacy survey (46 surveys) was **61.3%.**

The total number of responses to the pharmacist survey was 218. There were approximately 575 pharmacists invited to participate, but this did include a considerable number who are on the PSI register with their area of interest as hospital pharmacy, but who are not currently working in hospital pharmacy in Ireland (e.g. some are retired, some doing occasional locum work, some working in other countries, etc); they therefore could be considered to be outside the survey population. It's hard to determine the hospital pharmacist numbers, but an estimate of 500 would be close to the mark, which sets the response rate at **43.6%.**

## 1.4 Site Visits

### 1.4.1 Overview

As outlined above, it was agreed with the Steering Group to undertake a series of site visits to a selected number of hospital pharmacies. This was intended to comprise the key qualitative strand of the study, although the surveys, the pharmacist survey in particular, do include several qualitative questions.

The hospitals were selected as a broadly representative group, to encompass the wide variety of types and sizes of hospitals in Ireland, as well as to include a spread in terms of geography and setting. Sixteen hospitals were selected following discussions with the Steering Group. The hospitals ranged in size, location, ownership (HSE, public voluntary, and private hospitals were all included), and specialty.

Some consideration was also given to including hospitals with specific aspects of hospital pharmacy practice that would be of interest to this study, such as the use of automation.

It had been envisaged to complete the site visits within the month of June 2012, but scheduling all 16 visits within this period proved difficult, and it was deemed preferable to extend the timeframe rather than reduce the visit numbers or to try to substitute other institutions. Consequently, the visit timetable ran into July. All visits were complete by the 3rd of August (including one which was initiated in late June, but due to unforeseen circumstances in the pharmacy on the day of our visit, had to be cut short and rescheduled for a later date).

All of the originally selected sixteen hospitals participated in the study and facilitated the visits. There were some who expressed reservations and sought clarification as to the nature of the study, having concerns that the request for a site visit indicated an inspection or an investigative process of some kind, in relation to PSI's regulatory role. Once the aims of the project and the objectives for the site visits were clarified, those who had had concerns were happy to participate.

We are grateful to the pharmacists, technicians and other staff who contributed to the consultation meetings, and to the hospital managers who assisted us in arranging the site visits.

### 1.4.2 Structure of Site Visits

Whilst each site visit was, naturally, dependent on the availability of key individuals – and the schedule for each visit varied accordingly – broadly speaking, we undertook the following interviews at most sites:

- Interview with the Chief Pharmacist (at all sites);
- Interview with pharmacy staff (both pharmacists and non-pharmacist staff), mostly in groups but on occasion individually;
- Interview with one or more nursing staff;
- Interview with one or more senior clinical staff members, i.e. consultants.

In many, but not all, hospitals we also had an interview with the hospital manager (General Manager, CEO, Hospital Manager, etc, or a senior member of the hospital management team).

In some sites, most interviews took place in, for example, one meeting room, with different staff members attending at various times for the discussions. In others, the Crowe Horwath team went to wards, doctors' offices, etc, to conduct the interviews with the relevant staff, and interviewed pharmacy staff in the pharmacy premises.

At some locations, it was not possible to conduct all interviews desired, sometimes because of a logistical difficulty in arranging times with key staff members, and in a small number of instances because there was no appetite to engage with the process by non-pharmacy staff. Overall, however, we found staff – both pharmacy and non-pharmacy staff – more than willing to contribute to the interview process.

### 1.4.3  Analysis

Extensive field notes were taken at each visit, and internal discussion of the emerging themes also took place among the members of the team following the site visit process. NVivo, a qualitative software package, was used to assist in the identification of the key issues and themes from the interview notes.

All information collected during the site visits is anonymised. All participants in the site visit interviews were assured of confidentiality. We report here collective key themes and aspects discussed during the interview process without any reference to individual staff members or hospitals.

## 1.5  International Literature Review

### 1.5.1  Overview

This included the exploration of both peer-reviewed and editorial/professional 'grey' literature as developments in international hospital pharmacy practice will be described in both types of papers.

### 1.5.2  Peer-Reviewed Literature

We used the Scopus bibliographic abstract and citation database ([www.scopus.com](http://www.scopus.com)) in November 2011 for the review. The search phrase used was kept deliberately broad as "hospital pharmacy practice". We did not restrict publication date or language at this point. This yielded a list of approximately 900 citations. The following exclusion criteria were then applied:

- Title indicated poor relevance to our framework of practice domains;
- Described practice within one specialist area e.g. oncology;
- Published before 1980 (although we reserved the right to make exceptions for novel and relevant subjects);
- About countries beyond those with a health system in principle broadly similar to Ireland (i.e. not Australia, Canada, New Zealand, South Africa, United Kingdom/Europe, USA);

■ Paper not available in English language;

■ A newer version of a particular repeated survey was available;

■ Focus on registered pharmacists (rather than students or trainees).

This filtering resulted in a list of 130 abstracts. The full list is included at Appendix 4: Further Reading as an annotated bibliography. Abstracts were then obtained for as many of the 130 abstracts as possible, and submitted to a further relevance test before reading the full paper.

### 1.5.3  Grey Literature

Grey literature refers to publications produced by government, academia, or business and industry, in print and/or electronic forms, which is not published in easily accessible journals or by commercial publishers, and may not appear in databases or through web searches. Examples include conference proceedings, abstracts of the research presented at conferences, unpublished theses, dissertations, government reports, technical reports, standards and specifications, translations, or other types of documentation.

Professional standards and documents were gathered by a number of methods:

■ Contacting professional organisations in countries of interest (Table 1.5.3);

■ Cited in peer-reviewed literature;

■ Google searches of the World Wide Web.

| Country | Number of Organisations Contacted | Organisations who contributed to the review |
|---|---|---|
| Multi-country | 2 | International Pharmacy Federation FIP<br>European Association of Hospital Pharmacists EAHP |
| Australia | 3 | The Society of Hospital Pharmacists of Australia SHPA |
| Canada | 3 | Canadian Pharmacists' Association CPA<br>Canadian Society of Hospital Pharmacists CSHP |
| New Zealand | 3 | New Zealand Hospital Pharmacists' Association NZHPA |
| UK | 3 | Royal Pharmaceutical Society RPS |
| USA | 4 | American Society of Health-System Pharmacists ASHP |

*Table 1.5.3 – Contacts with international professional organisations during the literature review*

A shortlist of peer-reviewed papers and professional documents from this review directly informed the writing of the survey instruments and interview schedules (asterisked in Appendix 4).

### 1.5.4  Framework Development

As with the baseline study of community pharmacy, we used a framework of "domains" or key themes and areas within which we could describe the findings of the international literature review and the data gathered by means of the surveys and site visits. The domains were the same as those used in the previous study and are as follows:

■ Systems and Services;

■ Information Technology;

- Inter-professional Relationships;

- Workforce;

- Continuing Professional Development and Continuing Education;

- Premises;

- Overall Themes from Survey and Site Visits.

## 1.6   Notes in Respect of International Literature Review Findings Presented

- Throughout the report, we have presented some illustrative examples and vignettes of international practice and findings from the literature review. **We stress that these are not intended to be read as benchmarks for Irish hospital pharmacy practice, nor to be directly compared and contrasted with findings from Irish hospital pharmacies.** We consider that this material should be considered as an interesting adjunct to the findings of the questionnaire and the site visit interviews. We present these findings to contextualise the Irish material, to illustrate some practice and thinking elsewhere, and to contribute to the wider debate on ways to move forward in the Irish hospital pharmacy sphere.

- The findings of the 2010 EAHP survey were just beginning to be released as this report was being finalised. Where we had data from the 2010 survey, we have presented it alongside that from 2005. We suggest that anyone with interest in the further findings should look for the series of articles due to be published in the European Journal of Hospital Pharmacy over the coming months.

## 1.7   Structure of the Remainder of This Report

The report is structured along the key themes or domains identified during the project as the main areas of interest both from the perspective of the PSI and the Steering Group and from the international research findings.

Firstly, we look at some of the overarching themes within hospital pharmacy practice internationally, as context for the findings of both the Irish and international research. We then introduce the survey findings by looking at the key statistics relating to the profile of the pharmacists who responded to the questionnaire. Following this, we examine the seven domains as follows:

- Systems and Services;

- Information Technology;

- Inter-professional Relationships;

- Workforce;

- Continuing Professional Development and Continuing Education;

- Premises;

- Overall Themes from Survey and Site Visits.

The last category arose during the course of our research, as with the former study into community pharmacy, and represents the views in relation to overarching themes expressed

in the opinion questions in the survey and during the course of the site visits. A key element relates to the organisations impacting on pharmacy practice in Ireland: the PSI, the HPAI, the HSE, the hospital management in non-HSE hospitals, the Department of Health and Children, and so on.

Within each domain, we have presented the findings from the quantitative questionnaires and the site visits, and any relevant illustrative material from international research.

These findings then lead us to our Conclusions and Recommendations to the PSI in respect of the research.

## 1.8   Notes in Respect of Survey Percentage Figures

- Percentages expressed in the survey findings and charts are percentages of those who answered the specific question, not necessarily of the total number of respondents. That is, if 40 out of 46 respondents answered a particular question, and 20 chose a specific answer, this would be expressed as a 50% response for that option.

- It can be seen in many of the reported figures in tables and charts that the percentages add up to more than 100%, which can appear to be an error. This is due to the fact that in these questions, respondents were able to tick more than one box (for example, when listing the specialties in the hospital). The figures reported in these cases are individual percentages of the total responses to that particular category.

# A Global Context for Hospital Pharmacy Practice

# 2 A Global Context for Hospital Pharmacy Practice

Many organisations and groups internationally have sought an overarching framework to describe their vision for hospital pharmacy practice, and there is much cohesion across the global hospital pharmacy movement about their vision, with different nations moving at different speeds towards these goals.

In 2011, FIP and WHO published guidelines on Good Pharmacy Practice (GPP) for all sectors of the profession (extracts in Box 1.5.1a). The underlying philosophy was that "The mission of pharmacy practice is to contribute to health improvement and to help patients with health problems to make the best use of their medicines". There were "six components to this mission:

- ■ being readily available to patients with or without an appointment;

- ■ identifying and managing or triaging health-related problems;

- ■ health promotion;

- ■ assuring effectiveness of medicines;

- ■ preventing harm from medicines;

- ■ making responsible use of limited health-care resources"[1].

> **Box 1.5.1a: Extracts from Joint FIP/WHO guidelines on good pharmacy practice (GPP): standards for quality of pharmacy services (FIP/WHO 2011)**
>
> Requirements of good pharmacy practice
>
> - ■ GPP requires that a pharmacist's first concern in all settings is the welfare of patients.
>
> - ■ GPP requires that the core of the pharmacy activity is to help patients make the best use of medicines. Fundamental functions include the supply of medication and other health-care products of assured quality, the provision of appropriate information and advice to the patient, administration of medication, when required, and the monitoring of the effects of medication use.
>
> - ■ GPP requires that an integral part of the pharmacist's contribution is the promotion of rational and economic prescribing, as well as dispensing.
>
> - ■ GPP requires that the objective of each element of pharmacy service is relevant to the patient, is clearly defined and is effectively communicated to all those involved. Multidisciplinary collaboration among health-care professionals is the key factor for successfully improving patient safety. (p7)
>
> At the national or appropriate (e.g. state or provincial) level, it is necessary to establish:
>
> - ■ A legal framework that:
>   - • defines who can practice pharmacy;
>   - • defines the scope of pharmacy practice;
>   - • ensures the integrity of the supply chain and the quality of medicines.
>
> - ■ A workforce framework that:
>   - • ensures the competence of pharmacy staff through continuing professional development (CPD or continuing education (CE)) programmes;
>   - • defines the personnel resources needed to provide GPP.

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[1]    FIP/WHO 2011, p6

> ■ An economic framework that:
>   - provides sufficient resources and incentives that are effectively used to ensure the activities undertaken in GPP. (p8-9)
>
> **Conclusions**
>
> There are four main roles where pharmacists' involvement or supervision is expected by society and the individuals they serve:
>
> 1. Prepare, obtain, store, secure, distribute, administer, dispense and dispose of medical products.
>
> 2. Provide effective medication therapy management.
>
> 3. Maintain and improve professional performance.
>
> 4. Contribute to improve effectiveness of the health-care system and public health.
>
> These roles may vary for each individual pharmacist depending on their practice responsibilities. Specific standards of GPP can be developed only within a national pharmacy professional organization framework. (p16)

The guidance also recognised that "Just as pharmacy practice will vary among nations, it will also vary among practice locations. Therefore, standards should recognize the uniqueness of different pharmacy practice settings (e.g. community and hospital pharmacy)"[2].

The FIP "Basel Statements" about the future of hospital pharmacy - agreed by 348 hospital pharmacists, representing 98 nations, in Basel in 2008 – comprise 14 overarching consensus statements (Box 1.5.1b) and then 61 further statements grouped under the following themes: Procurement; Influences on Prescribing; Preparation and Delivery; Administration; Monitoring of Medication Practice, and Human Resources and Training. The thrust of the vision is that pharmacists take responsibility for - and exert influence upon - all medicines-related activities in the hospital, using their skills for the benefit of the patient. They pre-date the FIP/WHO GPP standards, but are consistent with that vision.

> **Box 1.5.1b: Final Basel Statements on the Future of Hospital Pharmacy (FIP, 2008) – Overarching consensus statements**
>
> 1. The overarching goal of hospital pharmacists is to optimize patient outcomes through the judicious, safe, efficacious, appropriate, and cost effective use of medicines.
>
> 2. At a global level, 'Good Hospital Pharmacy Practice' guidelines based on evidence should be developed. These guidelines should assist national efforts to define standards across the levels, coverage, and scope of hospital pharmacy services and should include corresponding human resource and training requirements.
>
> 3. The "five rights" (the right patient, right medicine, right dose, right route, and right time) should be fulfilled in all medicines-related activities in the hospital.
>
> 4. Health authorities and hospital administrators should engage hospital pharmacists in all steps in the hospital medicines-use process.
>
> 5. Health authorities should ensure that each hospital pharmacy is supervised by pharmacists who have completed specialized training in hospital pharmacy.
>
> 6. The Chief Pharmacist/Director of Pharmacy should be the senior professional responsible for coordinating the judicious, safe, efficacious, appropriate, and cost effective use of medicines in the hospital.
>
> 7. Hospital pharmacists' authority over the medicine-use process should include authority over the selection and use of medicine-related devices such as administration devices, giving sets, infusion

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[2]    FIP/WHO 2011, p9

pumps and computer-controlled dispensing cabinets.

8. Hospital pharmacists should take responsibility for all medicines logistics in hospitals.

9. Hospital pharmacists should serve as a resource regarding all aspects of medicines use and be accessible as a point of contact for health care providers.

10. All prescriptions should be reviewed, interpreted, and validated by a hospital pharmacist prior to the medicine being dispensed and administered.

11. Hospital pharmacists should monitor patients taking medicines (daily or whenever medicines are changed) to assure patient safety, appropriate medicine use, and optimal outcomes. When resource limitations do not permit pharmacist monitoring of all patients taking medicines, patient-selection criteria should be established to guide pharmacist monitoring.

12. Hospital pharmacists should be allowed to access the full patient record.

13. Hospital pharmacists should ensure that patients are educated on the appropriate use of their medicines.

14. Hospital pharmacists should provide orientation and education to nurses, physicians, and other hospital staff regarding best practices for medicines use.

The core principles of the Basel statements have influenced national hospital pharmacy standards, including the recent Royal Pharmaceutical Society standards for hospital pharmacy services in Great Britain, published in July 2012 (Box 1.5.1c). The foreword to these standards states that "In partnership with patients and with multidisciplinary collaboration, a quality pharmacy service strives to optimise patient outcomes through the judicious, safe, clinically effective, appropriate and cost effective use of medicines". These elements of multidisciplinary working, partnership with patients, and cost-effectiveness of therapy are echoed across the international hospital pharmacy literature.

| Box 1.5.1c – Ten Standards for Hospital Pharmacy Services (RPS, 2012) | | |
|---|---|---|
| **Domain 1**<br>**Patient Experience** | **Domain 2**<br>**Safe and Effective Use of Medicines** | **Domain 3**<br>**Delivering the Service** |
| ◼ Standard 1: Patient-centred<br>◼ Standard 2: Episode of care<br>◼ Standard 3: Integrated transfer of care | ◼ Standard 4: Effective use of medicines<br>◼ Standard 5: Medicines expertise<br>◼ Standard 6: Safe use of medicines<br>◼ Standard 7: Supply of medicines | ◼ Standard 8: Leadership<br>◼ Standard 9: Governance and financial management<br>◼ Standard 10: Workforce |

## 2.1 Key Quote

The "transformation of pharmacy practice will not march in a straight line toward some ultimate perfection. Rather, it is likely to follow a haphazard course, leading to a variety of practice models that have core traits in common with the early concept of clinical pharmacy. The pace of change may fluctuate between exhilarating advances and disappointing setbacks, depending on the forces in the environment and the quality of the profession's leadership". (Zellmer WA. Pharmacy's future: Transformation, diffusion, and imagination. *Am J Health Syst Pharm* 2010; 67: 1199-204.)

**3**

# Pharmacist Profiles

# 3  Pharmacist Profiles

## 3.1  Profile of Respondents to Pharmacist Survey

### 3.1.1  Overview

This section examines some of the key elements in the "About You" section of the pharmacist survey, which sought to elicit demographic and other information to give a profile of those pharmacists working in hospital pharmacy practice in Ireland.

### 3.1.2  Grade

We asked participants to indicate their employment grade. Most respondents, as illustrated below, were senior pharmacists, with Chiefs 2 and 1 the next biggest group, followed by basic grade pharmacists.
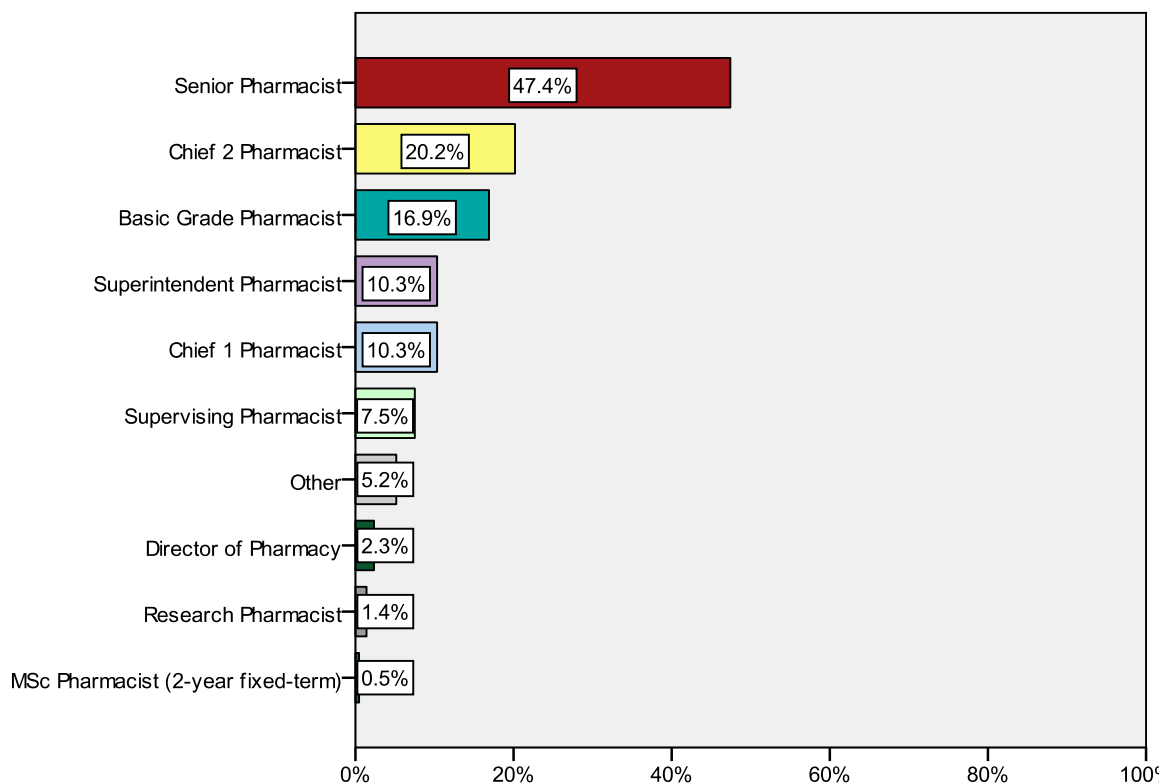


The issues around the current grades and a perceived lack of options within the career structure for hospital pharmacists is discussed in the qualitative findings of the Workforce domain.

### *3.1.3   Length of Time Working in Pharmacy*

Respondents were asked how long they had worked in their current location, with the majority indicating they had been in their current hospital for more than five years. This obviously reflects the profile of the respondents, most of whom were at senior pharmacist grade or above.

**How long have you worked in this hospital pharmacy?**
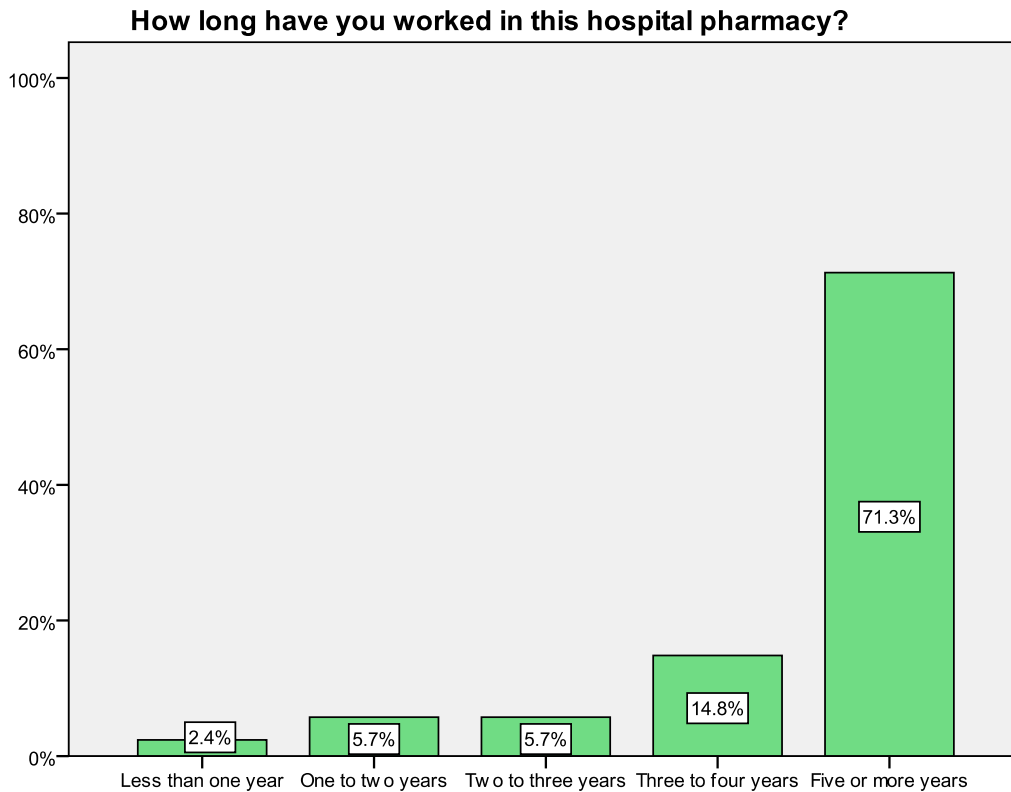


### *3.1.4   Time in Current Position*

We also asked how long they had held their current position; most (58.7%) had done so for five or more years. There were some discussions within the site visits as to the impact of the recruitment moratorium on workforce mobility. Pharmacists have few if any alternative positions in other hospitals because of the ban on recruitment in the health services and turnover is therefore reduced and pharmacists are staying in one location longer. Combined with the limited opportunities for progression beyond the senior pharmacist grade, it can be seen why the majority of respondents have held their current position, in their current location, for a considerable period of time.

### *3.1.5   Other Pharmacy Activity*

21.1% of those who responded indicated that they do some pharmacy work outside that relating to their current position in the hospital pharmacy. The most common work mentioned in this regard is locum work in community pharmacy and lecturing or presenting for CPD courses such as those by ICCPE or to postgraduate pharmacy students.

### 3.1.6 How Long Qualified

The average number of years since qualification of the respondents is 14.65. The histogram below illustrates the distribution.
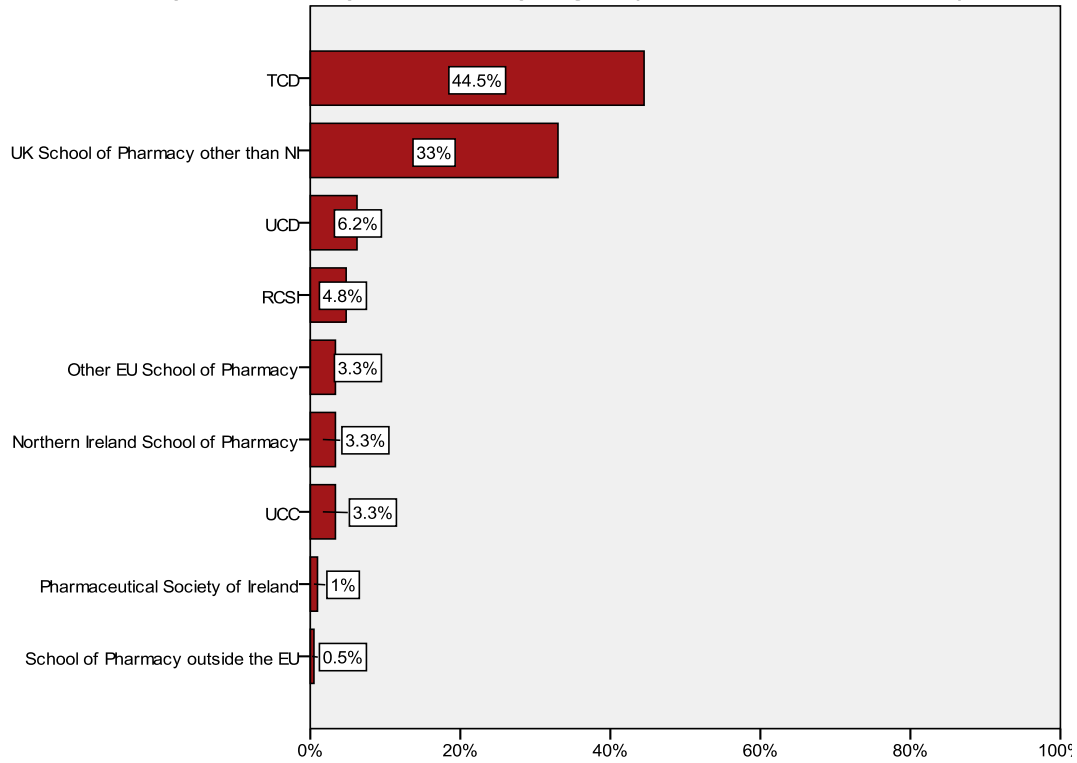


Years since qualification
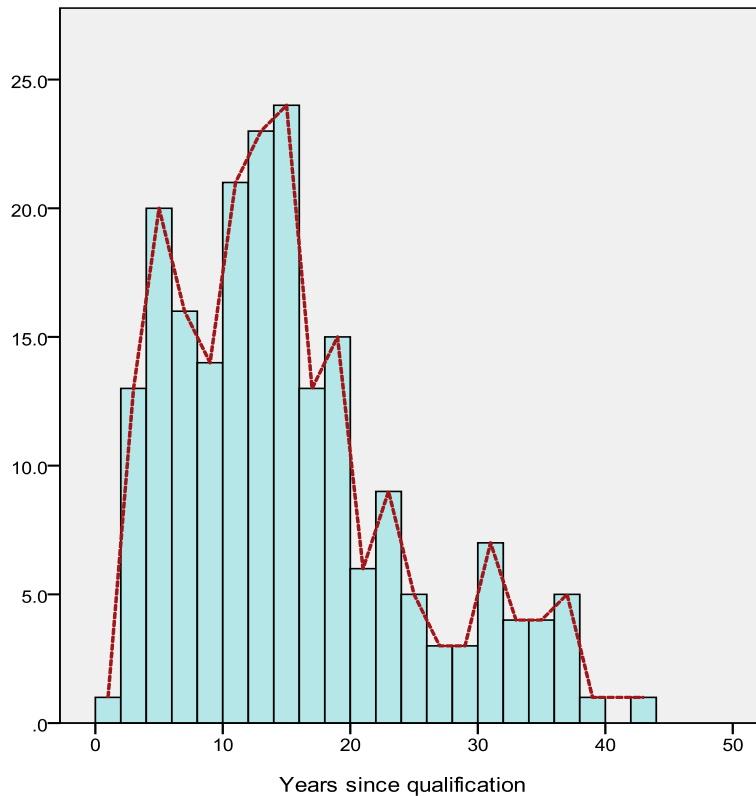
It can be seen that the bulk of respondents have been qualified for between 10 and 15 years, with a good many also between 6 and 10 years. There is quite a fall-off from 20 years' qualified on.
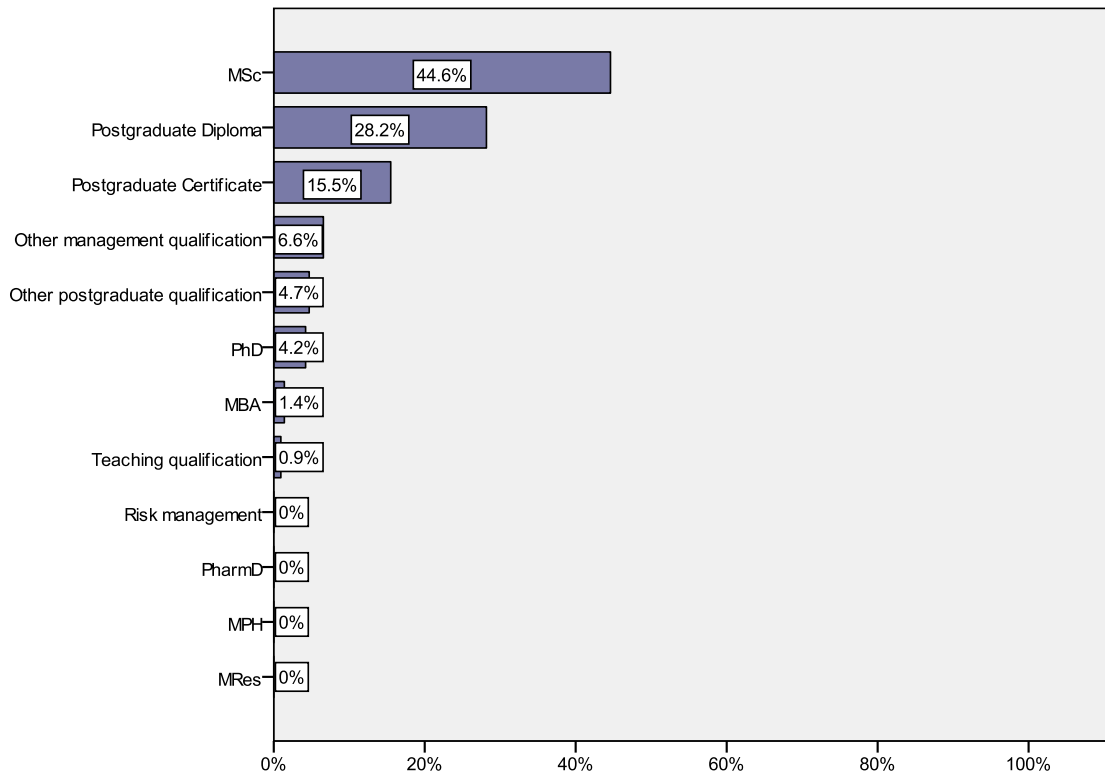
### 3.1.7 Where Pharmacy Degree was Completed

The survey asked participants to indicate at which institution they had completed their primary pharmacy degree. The biggest group had done so at Trinity College Dublin, as illustrated below. Other Irish institutions constituted a smaller percentage (14.3% in total between UCD, UCC, and RCSI). Most striking was the percentage of those in hospital pharmacy who had completed their primary degree outside Ireland: 39.7%. This contrasts with community pharmacy, where only 15% of respondents had achieved their primary degree outside Ireland.

**Where did you complete your pharmacy degree (or equivalent qualification)?**

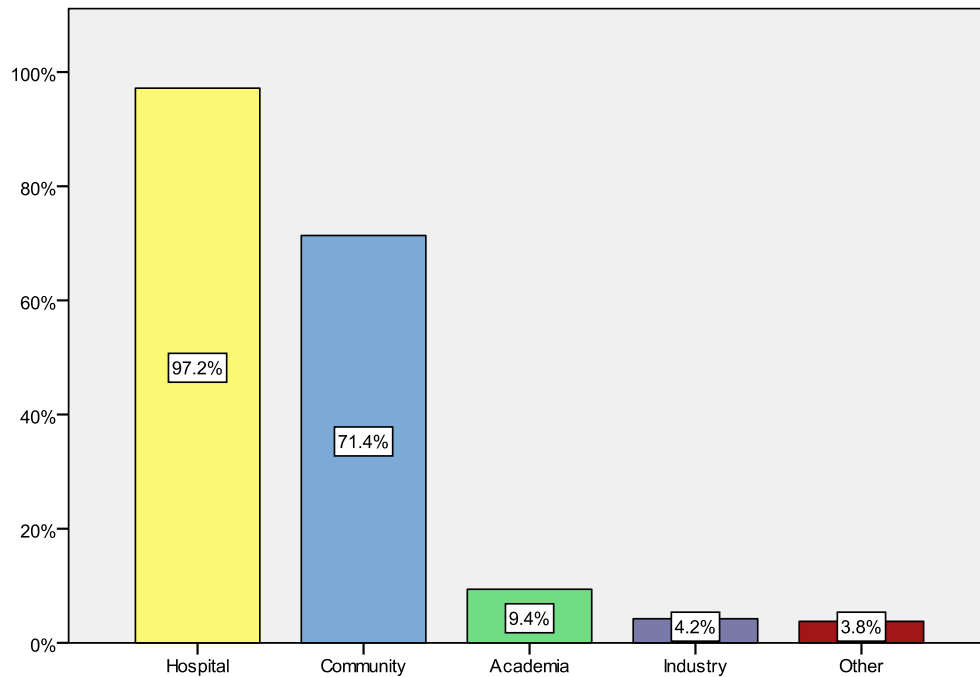| Institution | % |
|---|---|
| TCD | 44.5% |
| UK School of Pharmacy other than NI | 33% |
| UCD | 6.2% |
| RCSI | 4.8% |
| Other EU School of Pharmacy | 3.3% |
| Northern Ireland School of Pharmacy | 3.3% |
| UCC | 3.3% |
| Pharmaceutical Society of Ireland | 1% |
| School of Pharmacy outside the EU | 0.5% |

### 3.1.8  Postgraduate Qualifications

More than three-quarters (76.6%) of hospital pharmacists responding to the survey indicated that they held postgraduate qualifications. The following graph indicates the breakdown:

| Qualification | % |
|---|---|
| MSc | 44.6% |
| Postgraduate Diploma | 28.2% |
| Postgraduate Certificate | 15.5% |
| Other management qualification | 6.6% |
| Other postgraduate qualification | 4.7% |
| PhD | 4.2% |
| MBA | 1.4% |
| Teaching qualification | 0.9% |
| Risk management | 0% |
| PharmD | 0% |
| MPH | 0% |
| MRes | 0% |

### *3.1.9   Areas Worked in Since Qualifying*



As can be seen from the graph above, a high percentage (71.4%) of hospital pharmacists have also worked in community pharmacy, with a much smaller group having worked in academia (9.4%) or industry (4.2%).

### *3.1.10  Gender*

84% of respondents were female, a significant contrast to the community pharmacy study, which indicated a more balanced gender profile (52.6% female). This issue is examined further in the findings of the pharmacy survey in the Workforce domain.

### *3.1.11  Age Group*

Lastly, respondents were asked what age group they fell into. The under-35 age group had the most respondents, followed very closely by the 35-44 group; between them they account for more than 80% of the pharmacists who answered the question. The breakdown is illustrated in the following pie chart:

**Age Group**

Legend:
- Under 35
- 35-44
- 45-54
- 55-64

Pie chart segments:
- 7.18%
- 11.96%
- 41.15%
- 39.71%
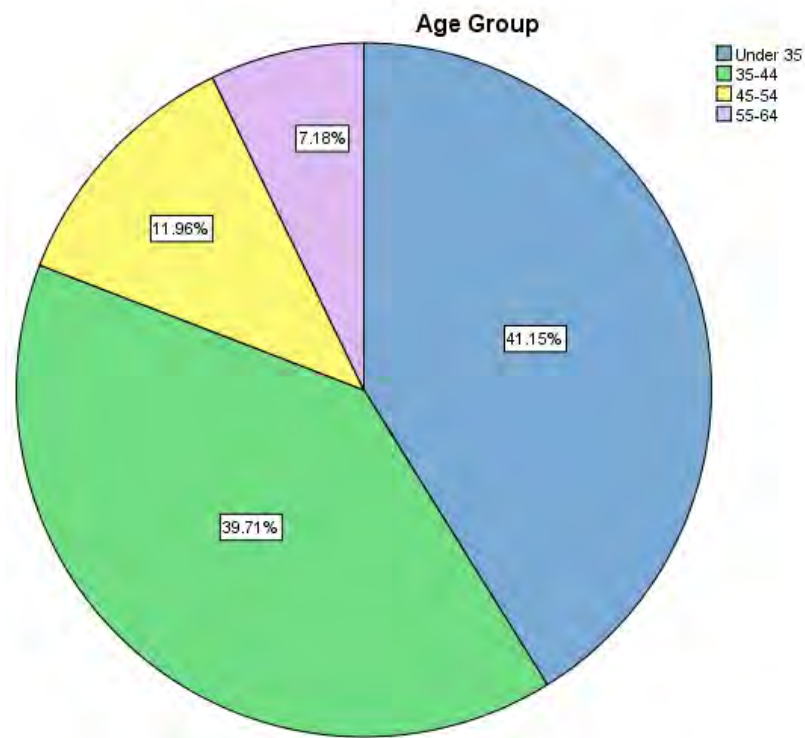
The age group demographic plays a role, according to many of those interviewed, in the high levels of maternity leave that many hospital pharmacy departments experience. Along with the mostly female workforce, the main age groups constitute the key ages for women having families, and the combination means that hospital pharmacies regularly have maternity leave among their staff numbers. Ordinarily, maternity leave would be covered by temporary locum or agency staff, but the recruitment embargo, which means that in many cases these women cannot be replaced for the duration of the leave, is now impacting on the ability to deliver services.

### 3.1.12 Age Group by Grade

The following graph illustrates the age breakdown in the various grades. As can be seen from this chart, the age profile for the managerial grades is significantly higher than that for lower grades.
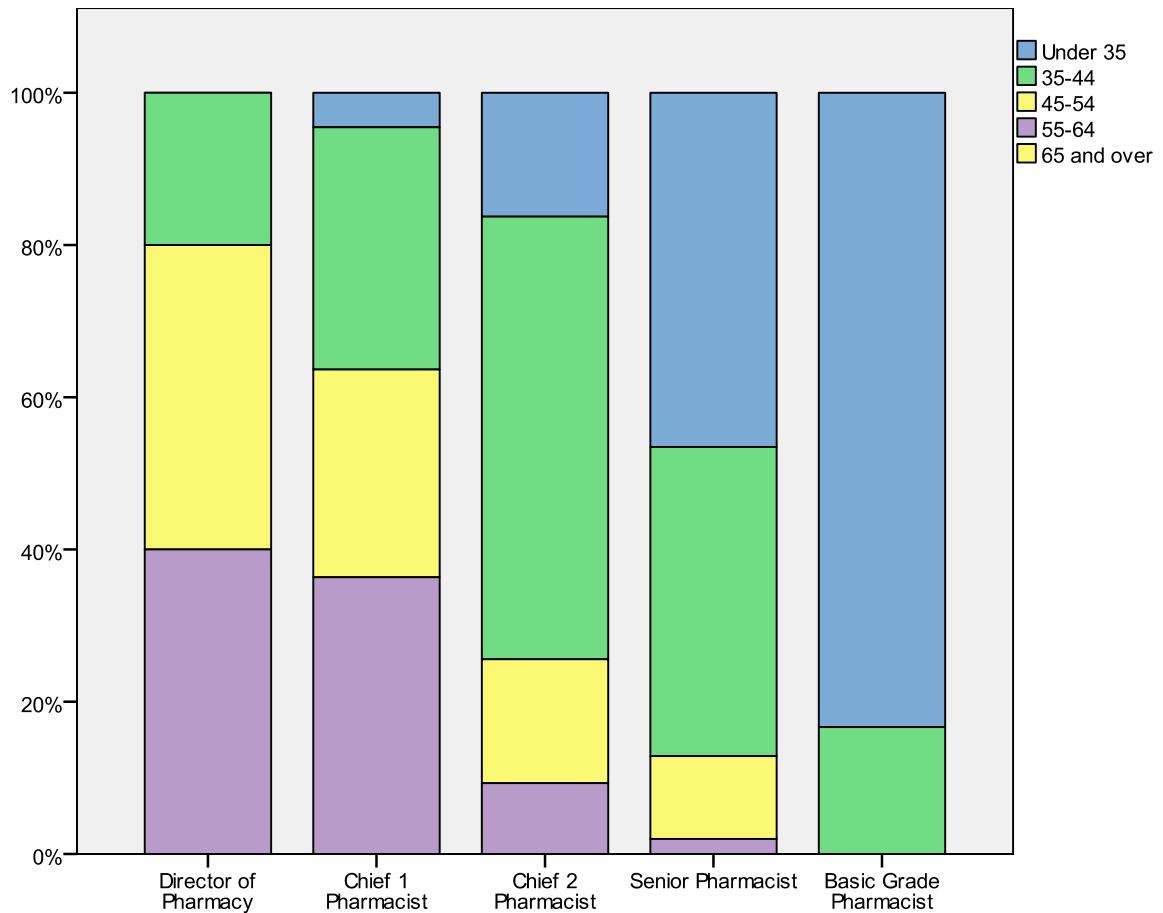
Although this is not a surprising finding, given the need for significant experience to gain seniority, it does point up the necessity for succession planning within hospital pharmacies to ensure that those currently at senior pharmacist grade have sufficient training and experience to be capable of taking up Chief and Director positions in future.

## 3.2   Main Messages

The hospital pharmacy workforce represented in the sample shows much potential for further development. Many already have postgraduate qualifications, and a significant number have experience of another sector. There are many at senior pharmacist level, perhaps 'stuck' with regard to progression.

# 4

# Systems and Services

# 4 Systems and Services

## 4.1 Pharmacy Survey Findings

### 4.1.1 Demand

An average of just under 2,500 items are dispensed by hospital pharmacies each week, ranging up to 14,600 for one respondent. The vast majority of the items (average 2,040) are for inpatients, with very few outpatient items routinely dispensed. Many pharmacies do supply medicines for long-term residential care patients and to other sites, but they account for low levels of activity in most hospitals.
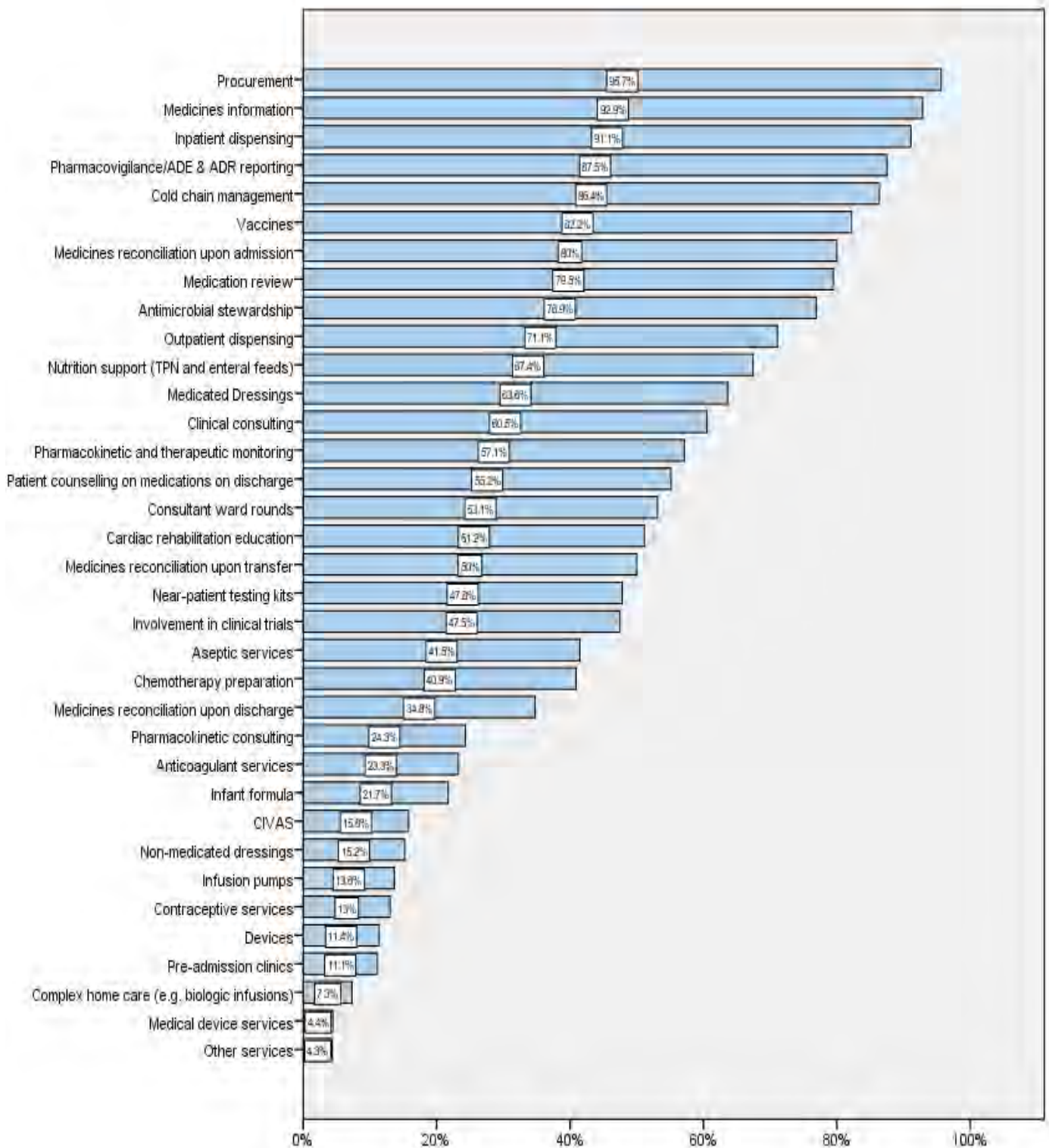
### 4.1.2 Model of Distribution

Most hospital pharmacies (87%) have a centralised distribution service. Whilst 39.8% of respondents indicated that they dispensed medication to individual patients, the site visit interviews indicate that where there is named-patient or individual dispensing, this is often to only a small number of patients for specified medicines, for example, rather than the main mechanism for the distribution of medicines to wards and patients in the hospital.

> Pedersen et al 2009 (US), in the ASHP Dispensing and Administration survey of 2008, found that most hospitals had a centralised medication distribution system, but there was evidence of growth in decentralised models since their last survey in 2005. The percentage of unit dose medicines dispensed had increased, as had the use of 2-pharmacist checks for high-risk drugs and high-risk patient groups.
>
> The Hospital Pharmacy in Canada 2009/10 report found that many hospitals use more than one practice model. The percentage of respondents that use each pharmacy practice model, either for all beds or for a portion of all beds in their facility, varied from 74% (113/152) for an integrated drug distribution/clinical practice model, 38% (57/152) for a drug distribution centred model, 30% (46/152) for a clinical practice centred model and 11% (17/152) for a separate clinical and drug distribution practice model. The percentage of inpatient beds covered by the drug distribution model is higher in smaller hospitals (31% in 50-200 beds vs. 18% in 201-500 beds vs. 12% in > 500 beds), and in non-teaching hospitals (24% in non-teaching vs. 9% in teaching).

### 4.1.3 Services Provided

The detailed chart overleaf outlines the various services within hospital pharmacies and the percentage of pharmacies supplying these. As might be expected, the "core" supply and information services are effectively universal, with other elements like procurement and adverse drug event reporting also undertaken by nearly all pharmacies.

Procurement — 95.7%
Medicines information — 92.9%
Inpatient dispensing — 91.1%
Pharmacovigilance/ADE & ADR reporting — 87.5%
Cold chain management — 85.4%
Vaccines — 82.2%
Medicines reconciliation upon admission — 80%
Medication review — 79.9%
Antimicrobial stewardship — 76.9%
Outpatient dispensing — 71.1%
Nutrition support (TPN and enteral feeds) — 67.4%
Medicated Dressings — 63.6%
Clinical consulting — 60.8%
Pharmacokinetic and therapeutic monitoring — 57.1%
Patient counselling on medications on discharge — 55.2%
Consultant ward rounds — 53.1%
Cardiac rehabilitation education — 51.2%
Medicines reconciliation upon transfer — 50%
Near-patient testing kits — 47.8%
Involvement in clinical trials — 47.5%
Aseptic services — 41.9%
Chemotherapy preparation — 40.9%
Medicines reconciliation upon discharge — 34.8%
Pharmacokinetic consulting — 24.3%
Anticoagulant services — 23.3%
Infant formula — 21.7%
CIVAS — 15.8%
Non-medicated dressings — 15.2%
Infusion pumps — 13.8%
Contraceptive services — 13%
Devices — 11.4%
Pre-admission clinics — 11.1%
Complex home care (e.g. biologic infusions) — 7.3%
Medical device services — 4.4%
Other services — 4.3%

LeBlanc & Dasta 2005 (Global) surveyed hospital pharmacists outside the US and found that the three most common specialities were intensive care, general medicine, and cardiology. There was low involvement in pharmacokinetic consultations (28%), although there was regional variation as it was done widely in Europe (particularly in UK and The Netherlands). There was wide variability in supervision, and medication preparation.

In Canada (HPIC report, 2009/10), pharmacists spent approximately 47% of their time performing clinical activities in 2009/10, compared to 45% in 2007/08, while spending correspondingly less time in drug distribution. When the historical trend is examined since 1997/98, the time spent on clinical activities has slowly but steadily increased from 33% to 47%.

80% of the respondents to the survey indicate that they undertake medicines reconciliation on admission, 50% on transfer of care, and 35% on discharge. Our experience with the site visits would suggest that this does not indicate routine medicines reconcilation for every patient at these stages, but rather for a subset of patients (e.g. for a particular unit), or on an ad hoc basis for particular patients. In any case, the pharmacy service opening times mean that many patients are admitted outside the times of the availability of the pharmacy service, and therefore do not have medicines reconciliation on admission (e.g. on weekends).

60.5% indicate that they undertake clinical consulting; again, our discussions during the site visits suggests that this does not necessarily indicate a routine clinical pharmacy service to every patient, but rather to selected wards or units, or to specific patients under particular circumstances.

The EAHP 2005 survey found that:

- "Clinical pharmacy services increased significantly in all countries during the last five years. In 85% of the hospitals, participating in the 2005 survey, the pharmacists perform centralised clinical services, i.e. pharmacists occasionally visit patients in the ward. In Germany and Spain the average number of visits to the hospital wards increased the most by 19% and 13%, respectively.

- In 12% of hospitals only, a pharmacist visits patients on a daily basis: in Ireland in 45% of hospitals, in Belgium in 38%, in Greece in 20% and in Spain and the Netherlands in16%. Decentralised clinical service means that a pharmacist spends at least half of his working hours on a hospital ward. This is mostly done in Poland and Norway, where 40 to 50% of hospitals operate such system of clinical pharmacy.

- In the majority of European hospitals which participated in the survey there was an established centralised clinical service and the pharmacists did not visit the wards on a daily basis. This has been reported from all participating hospitals in Denmark, Estonia, France, Greece, Hungary, Lithuania, Luxembourg, Slovakia and Switzerland.

- A hospital pharmacist visits hospital wards at least once daily in as few as 13% of hospitals. The percent of these hospitals has been slightly reduced, compared to the survey 2000. The majority of such hospitals are in Ireland - 45% , Belgium 38% and in Greece 20%.

- Decentralised clinical services are provided in more hospitals than five years ago. The most numerous hospitals with the established system are hospitals in Poland - 50% of participating hospitals, in Norway 40% of hospitals, in the Czech Republic 27% and in Croatia 25% of hospitals."

### 4.1.4  Discharge Medication

We asked respondents whether the hospital pharmacy dispensed discharge medication to patients leaving the hospital. This was by no means routine, with only 28% of respondents dispensing medication to inpatients on discharge, 24% to day-case patients, 26% to outpatients, 11% to long-stay hospital patients, and the same percentage to patients in residential care homes. 33% do not dispense any discharge medication.

In the site visit discussions, it appears that regular discharge dispensing is not a feature of most hospital pharmacy practice: the survey may reflect ad hoc occasional dispensing rather than suggesting that the 28% of hospital pharmacies dispense discharge medication routinely.

> Craig (2001) describes 'new' pharmacy services, and differences from 'old' style, in the planning of a new pharmacy department. This included what at the time was a pioneering system of what is now known as dispensing for discharge, or one-stop dispensing:
>
> "For the past three years at the Cumberland Infirmary, pharmacy staff have pioneered a system of individual patient dispensing (IPD)/use of patients' own medicines/ self-medication with a view to introducing this system to all wards in the new hospital. To that end, all wards in the new hospital have patient medication lockers sited next to the beds. The principle behind this system is that pharmacists and technicians work on wards to ensure that patients on admission have sufficient medicines, both for their stay in hospital and after discharge."

### 4.1.5 Outpatient Clinics

Pharmacy involvement in outpatient clinics is very limited. Nearly 85% reported that there were no pharmacist-led outpatient clinics in their hospitals.
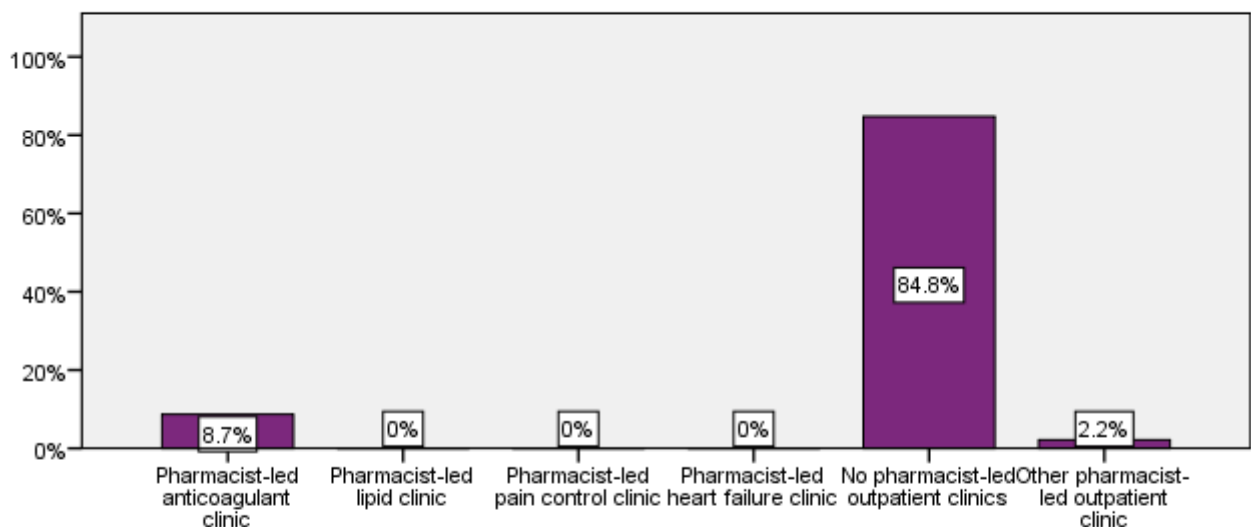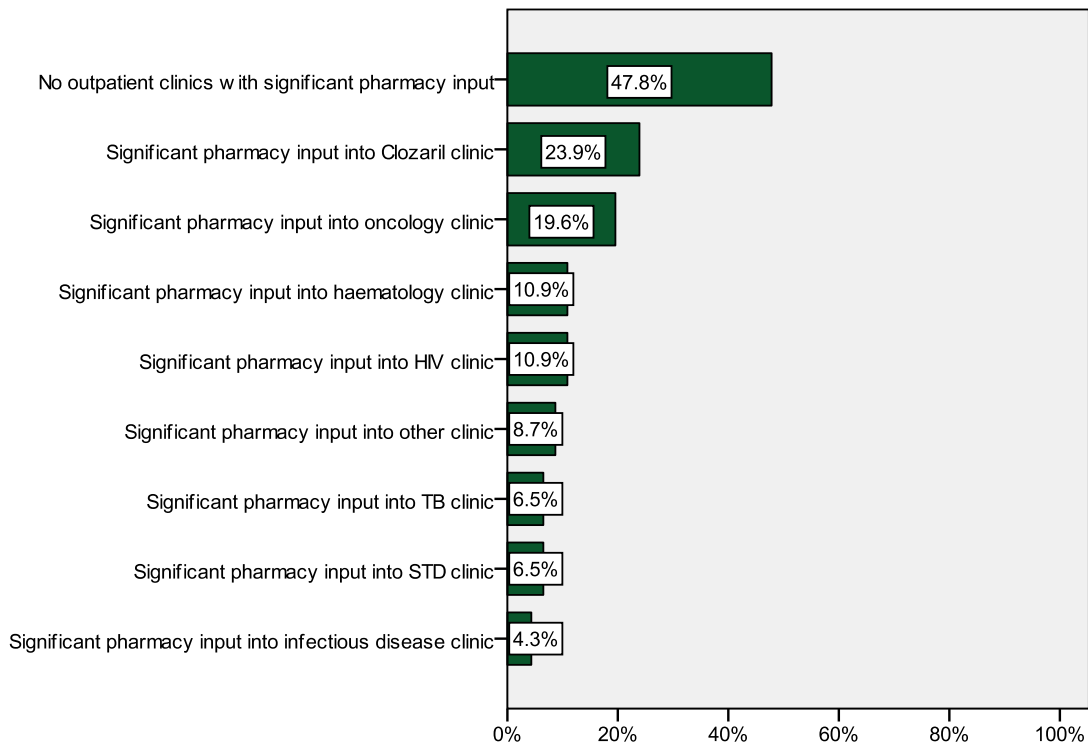


Just under half stated that there were no outpatient clinics with significant pharmacy input. Clozaril[3] outpatient clinics have significant pharmacy input in 23.8% of responses, with oncology outpatient clinics also having significant pharmacy input in nearly 20% of cases.
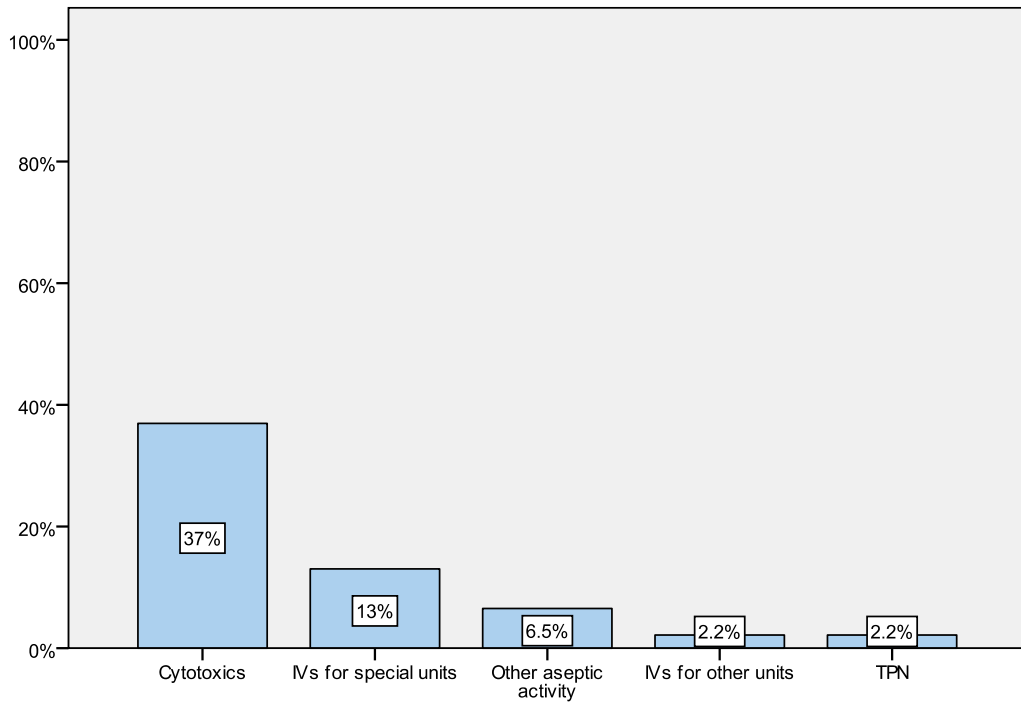
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[3]    Clozaril (clozapine) is a psychiatric antipsychotic medication that can only be dispensed by hospital pharmacies even though it is used in a community mental health setting.

| Category | Percentage |
|----------|-----------|
| No outpatient clinics with significant pharmacy input | 47.8% |
| Significant pharmacy input into Clozaril clinic | 23.9% |
| Significant pharmacy input into oncology clinic | 19.6% |
| Significant pharmacy input into haematology clinic | 10.9% |
| Significant pharmacy input into HIV clinic | 10.9% |
| Significant pharmacy input into other clinic | 8.7% |
| Significant pharmacy input into TB clinic | 6.5% |
| Significant pharmacy input into STD clinic | 6.5% |
| Significant pharmacy input into infectious disease clinic | 4.3% |

## 4.1.6   Aseptic Services

40.9% of respondents indicated that aseptic manufacturing took place within the pharmacy. The breakdown of the products made in this way is as follows:



| Product | Percentage |
|---------|-----------|
| Cytotoxics | 37% |
| IVs for special units | 13% |
| Other aseptic activity | 6.5% |
| IVs for other units | 2.2% |
| TPN | 2.2% |

The lack of space in many hospital pharmacies for aseptic compounding was discussed in the site visits. The additional expense of buying in costly chemotherapy and other medicines because they cannot be made up on site was a source of contention for some pharmacists.

### 4.1.7   Risk Management

We asked if there was a risk management system in place, and/or a policy on safe medication practice. (Whilst a quarter stated they did not have the latter, it may be that it goes by a different name in the particular hospital.)
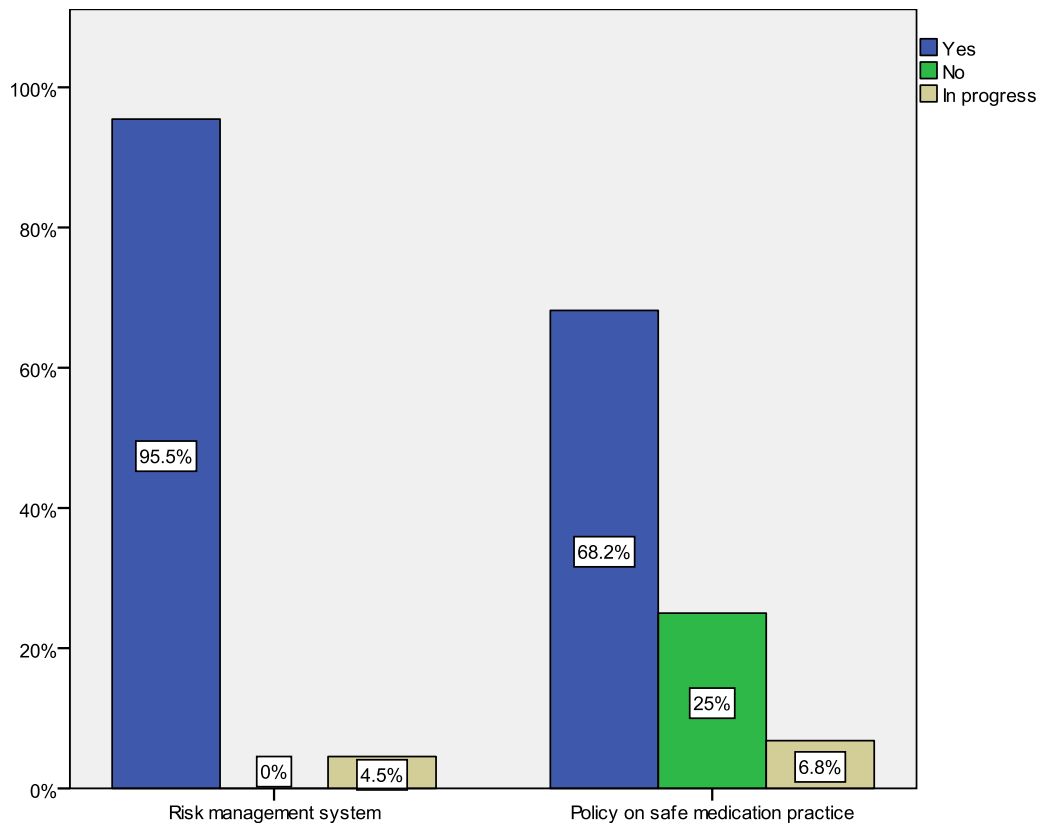


Participants were then asked about risk management activities:
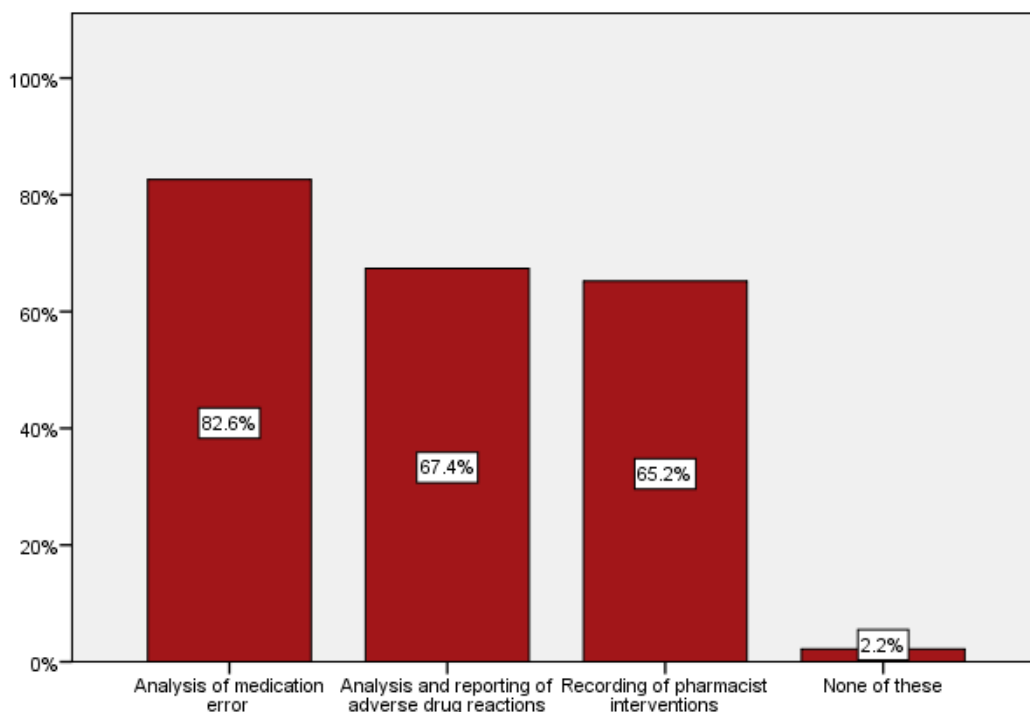
As can be seen, most hospitals have risk management policies in place, with pharmacy involvement in terms of analysis and reporting of adverse medication incidents.

### 4.1.8 Formulary

36.4% of respondents had a formulary in place, with 6.8% indicating that one was in development. Of those with a formulary, 21% indicated it was updated every year, a further 21% every two years, 29% more than two years, and another 29% stated that it was updated in another way – for the most part, these indicated that the updates were on a rolling basis, arising from particular requests by doctors, as new drugs were introduced to the market, and/or when existing drugs were updated in terms of licensing and use.

## 4.2 Pharmacist Survey Findings

### 4.2.1 Perceptions regarding Services

In the pharmacist survey, we asked pharmacists what they thought of the role and responsibility of the hospital pharmacist in relation to patient outcomes and prescribing practice in their hospitals.
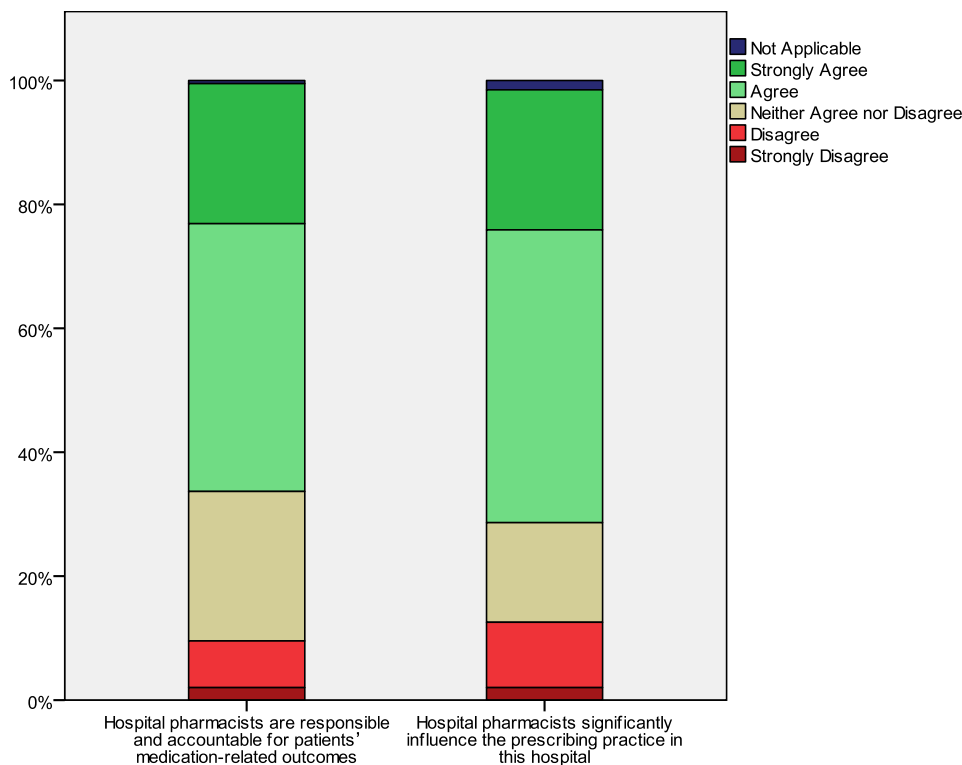


As can be seen, most pharmacists agree that hospital pharmacists should be considered responsible and accountable for patients' medication-relation outcomes, and also that hospital pharmacists significantly influence the prescribing practice in their hospitals.

The latter point was discussed also in the site visit interviews, both with pharmacy and non-pharmacy staff. Where a clinical pharmacy service and/or an antimicrobial pharmacist was in place, there was more confidence that prescribing practice was influenced by the pharmacy

service. Where there was a service that was almost entirely supply-based, interviewees generally concluded that there was little influence, with the exception in some cases of the use of generics and/or lower-cost equivalent medicines in place of those originally prescribed.

In Doloresco & Vermeulen's 2009 global survey of hospital practice, the most frequently reported practice models were pharmacists who either managed product supply only (41%) or managed all aspects of the medication use process (38%).They found that pharmacists played a significant role in influencing prescribing. Over three-quarters (77%) reported pharmacists, as part of a committee or the individual, responsible for formulary development.

## 4.3 Site Visit Findings

### 4.3.1 Clinical Pharmacy Services

For the most part, pharmacists working within Irish hospitals would prefer to have a broad-ranging role within the clinical team, involved in direct patient care and decision-making. Whilst this happens in some hospitals, or within some wards/clinical departments, it is not universal, the prevailing reason being that resources are not sufficient to permit pharmacists to have ward-based roles, given the staffing needs within the central dispensary.

In their practice standards of 2005, the Society of Hospital Pharmacists of Australia (SHPA) defined clinical pharmacy practice as "The practice of pharmacy as part of a multidisciplinary healthcare team directed at achieving the quality use of medicines (QUM). They thought it might include:

- Participation in the management of individual patients;
- Application of the best available evidence in daily clinical practice;
- Contribution of clinical knowledge and skills to the healthcare team;
- Identification and reduction in risks associated with medicines use;
- Involvement in the education of patients, carers and other health professionals; and
- Involvement in research.

In a small number of hospitals which we visited, the services provided by the pharmacy were almost entirely restricted to dispensing, and it was apparent from our discussions with pharmacy staff – and from the unwillingness of other clinicians within the hospital to meet us during the site visits – that the pharmacy was regarded as a relatively unimportant ancillary service which was not really part of mainstream patient care.

In general terms, pharmacists at all levels within hospitals would like to do more and expand services, particularly clinical pharmacy. A significant number of the pharmacists whom we met had previously worked outside Ireland (particularly in the UK, and some in the US), and it was frequently expressed by them that they would ideally like to play a more significant and central role in patient care, including such activities as:

- medicines reconciliations on admission and discharge (and any other care-transfer points) for all patients;
- supplemental and independent prescribing (as in the UK), with recognition that there is no current structured basis or educational method to facilitate this in Ireland;
- medicines management for the whole hospital;

■ greater multidisciplinary interaction with other members of the clinical team, particularly with consultants (a significant number of pharmacists indicated that they tend to have better interaction with non-consultant hospital doctors, and that consultants may be less inclined to seek an opinion from the pharmacist).

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Bush et al 2010 (US) described the development of an academic medical centre model, with a specification for minimum pharmacy services. System-relevant features include:

■ Patient care services for all patients

■ Perform medication histories for inpatients, for patients admitted for >24 hours, in procedural areas

■ Reconcile medications upon admission for inpatients, in procedural areas

■ Review all non-emergent orders prior to the first dose administered

■ Participate in patient care rounds

■ Educate patients about new medications

■ Patient care services for specific patients based on need e.g. anticoagulation management

■ Medication preparation and delivery

■ Pharmacy oversight of the process of reconciling controlled-substance waste

■ Integration of distribution and clinical services

■ Medication safety – pharmacists having the lead role

■ Medication use policy – Continuously improve and redesign

■ Information systems and technology – to enhance patient safety

■ Quality outcomes and performance improvement

■ Education and research – participation in teaching of pharmacists and other professions

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### 4.3.2 Impacts on Service

The ability of hospital pharmacies to deliver services was reported as being severely impacted by **resource issues**, including disproportionately high numbers of pharmacists on maternity leave, the present recruitment embargo, and other resource and financial constraints. The ban on recruitment will be discussed further in the Workforce domain, but its impact on services is a source of considerable concern for pharmacists. The ability to maintain existing services is under threat, and there is little scope to develop further services with budgetary and staff cuts. Current staff are under significant pressure to maintain services with fewer numbers, and this reduces ancillary activities such as research.

Although almost all the interviewees agreed that clinical pharmacy should be an integral part of patient care, it was noted that the key or core function remained that of supplying the right medicines to the right patients at the right time. In the current environment of reducing personnel and budgets, many hospital pharmacies have reduced or even cut out their clinical services because the resources were needed to maintain a safe and effective supply function. This is far from ideal, as far as managers and staff are concerned, but most feel that they are left with little choice.

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Knoer et al, as recently as 2010 (US), said that "Hospital and health-system pharmacists need to engage now in the development of a future practice model that is responsive to health care reform and the health system of the future."

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"A department cannot focus on high-level clinical services or changes to the practice model until it is safely, accurately, and efficiently dispensing medications to patients.

The premises – as will be considered further in the Premises domain – can restrict the development of services if they are, as are many across Ireland, relatively small and have little scope for expansion.

Many would like to see specialist clinical pharmacy areas recognised and accredited, and believe that such a move would assist in developing hospital pharmacy services further.

Al-Shaqha & Zairi 2001 (UK) described three stages of pharmacy history – compounding & dispensing, clinical pharmacy and pharmaceutical care (PhC). Pharmaceutical care was defined as "A system of drug use in which pharmacists share with other health care professionals the responsibility for optimising the outcomes of patients' drug therapy" (Hepler 1990). It has three steps: assessment, the care plan, and the follow-up evaluation.

They described different types of barriers to implementing PhC:

| System-related | ■ Fragmentation of system<br>■ Lack of access to patient information<br>■ Admission and discharge planning |
| --- | --- |
| Pharmacist-related | ■ Lack of time<br>■ Focus on drug distribution – traditional role<br>■ Unaccustomed to documenting care |
| Management/Department-related | ■ Failure to hold pharmacists accountable<br>■ Job descriptions reflect traditional role<br>■ Lack of time to plan<br>■ Focus on financial success<br>■ Lack of mechanism to measure PC impact<br>■ Poor organisational chart |
| Professional/Administrative barriers | ■ Lack of demand for PhC<br>■ Lack of evidence base<br>■ Patients do not recognise value<br>■ No promotion of PhC to patients and colleagues<br>■ Resistance of others<br>■ Lack of awareness by administrators of pharmacist's potential |

## 4.4   Main Messages

Most Irish hospitals worked on a model of centralised distribution, although there was a significant amount of named patient dispensing in evidence. Most hospitals had a risk management policy in place, and medication safety initiatives. The majority of respondents agreed that hospital pharmacists took responsibility for medication-related outcomes, and that pharmacy had influence over prescribing. Whilst feeling that pharmacy performed well within its limited scope, there was a desire to do more.

# 5

# Information Technology

# 5   Information Technology

## 5.1   Pharmacy Survey Findings

### 5.1.1   Activities Carried out on Computers

Respondents were asked to indicate what activities they used computers to assist with. As can be seen in the chart below, most pharmacies use computers for stock control and distribution, with lab results and patient medication records also featuring strongly. Very few use it to get prescriptions from wards, something that many of those interviewed in the site visits aspired to in the future.
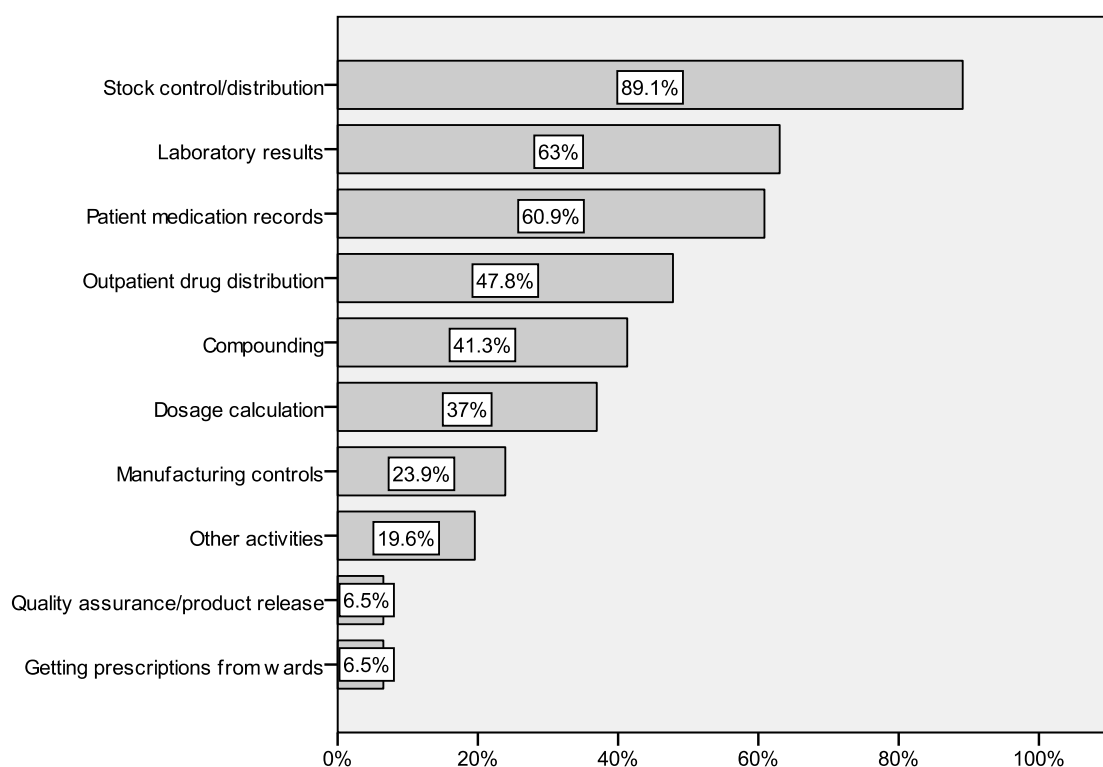


According to the EAHP 2005 survey: "As expected, an increase in the use of pharmacy computing system in hospital pharmacies has been observed in all aspects of pharmacy activities, particularly in obtaining the prescriptions from the wards, which increased by 18% , compounding by 11%, and drug information by 6%.

The use of pharmacy computing systems in collecting prescriptions from the wards was increased by more than 30% in Belgium, Denmark and Germany. The percent of hospitals with established computer controlled collection of the prescriptions from the wards exceeds 60% in Austria, Belgium, Denmark, Finland, Italy, Luxembourg and the Netherlands. In Denmark, Luxembourg and Norway all the surveyed pharmacies use computer system for drug information. Countries, where the use of computing systems in drug information is very modest are Croatia, Lithuania, Estonia and Poland.

Computerization used for compounding was increased in all countries except in Belgium. In Hungary, Denmark, Finland and in the Netherlands it was increased by more than 20%. On the average 98% of the hospital pharmacies participating in the 2005 survey, use computer system. The average of 34% of hospitals have a standalone system which interfaces with other departments and/or with the mainframe system in the hospital."

### 5.1.2   Computer Systems

Cliniscript is the dominant system in hospital pharmacy (almost 74% of pharmacies surveyed used the system, and our site visit interviews confirm its place as the main system in use across most hospital pharmacies), along with its counterpart Clinichemo for aseptic services.
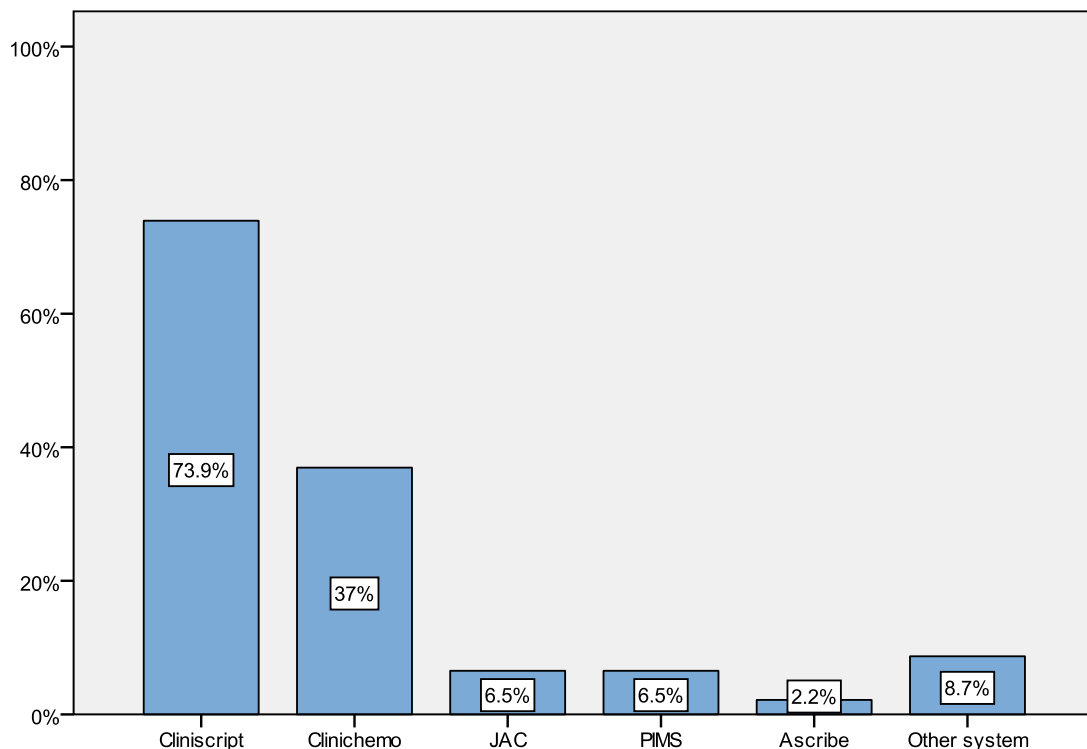


In Canada (HPIC report, 2009/10), almost all respondents (99%, 158/160) across all sectors and all sizes of hospitals reported that they have a pharmacy information system (PIS). (Table F-1) Eighty percent (125/156) reported that the pharmacy information system includes clinical decision support functionality, vs. 91% (150/164) of respondents in the 2007/08 report, 83% (118/142) in the 2005/06 report and 40% (58/144) in the 2003/04 report. Caution should be exercised in trying to compare these responses since "clinical decision support systems" were defined differently in the earlier surveys.

The reported availability of a pharmacy information system with clinical decision support functionality was similar across most provinces and hospitals, with the exception of the Prairie region, and small hospitals with 50-200 beds, where the availability of such systems was lower. The majority of respondents, 89%, reported that pharmacy staff had the ability to access patient care information at the patient care unit level, via either a portable computer or a fixed desktop computer.

### 5.1.3 Electronic Prescribing

21.4% of respondents indicated a capability to introduce electronic prescribing. As mentioned above, many we spoke to during the site visits expressed a desire to see electronic prescribing introduced, although it was recognised that many changes would be required in terms of IT and practice within the pharmacy and the wards in order to effect this.

The US ASHP survey of prescribing and transcribing in 2010 (Pedersen et al 2011) found that "prescribers can transmit prescriptions electronically (e-prescribe) to pharmacies outside their health system in 35.4% of hospitals. Larger hospitals are more likely than smaller hospitals to have e-prescribing functionality ($p < 0.05$). For example, 34.4% of hospitals with fewer than 50 staffed beds have the ability to e-prescribe from their outpatient clinics to pharmacies outside the system, compared with 28.7% of hospitals with 50–99 beds, 26.4% of hospitals with 100–199 beds, 42.9% of hospitals with 200–299 beds, 37.5% of hospitals with 300–399 beds, 56.5% of hospitals with 400–599 beds, and 67.3% of hospitals with 600 or more staffed beds."

### 5.1.4 Automation

9.5% of respondents had some form of automation in place in the hospital pharmacy. Only a further 10.5% have plans to introduce automation. During the site visits, many indicated that the premises size restricted the capability for introducing automation.

### 5.1.5 Barcoding

We asked participants whether the hospital pharmacy department used EAN barcodes in stock management or dispensing. 28.6% stated that this was in place, with a further 4.8% indicating that it was in progress, with the remaining 66.7% indicating that they did not use these barcodes.

Many hospital pharmacies worldwide are implementing different technological strategies to assist in their operations and underpin patient care and safety (e.g. Doloresco & Vermeulen 2009, Knoer et al 2010 US and Bush et al 2010 US). Pharmacists are not IT-phobic, and technicians are likely to be closely working with distribution systems; There is a lack of health IT professionals to help hospitals to develop. Perhaps as a consequence, many developments are reactive, and not thought through strategically. The introduction of IT systems can result in different errors occurring and safety concerns. The different technologies used include those included in the table below:

| Technology | Pederson et al 2009/2010 US | Siska & Tribble 2011 (US) | Hospital Pharmacy in Canada 2009/10 | EAHP 2005 |
|---|---|---|---|---|
| Automated dispensing cabinets | 10.0% | - | 53% | Up to 25% |
| Robots | 83.0% | 83% | - | - |
| Barcoding (product management) | 27.9% | 20% | 49% | 28% |
| CPOE | 15.4% | 15% | 8% | - |
| Smart pumps | 56.2% | 20% | 68% | - |
| Complete EHR | 8.8% | 5-60% | - | - |

| | | | | | |
|---|---|---|---|---|---|
| | e-prescribing outside hospital | 35.4% | - | - | - | |

### 5.1.6   Resources Accessed by Pharmacy Staff

We asked participants what online medicines and pharmacy resources were accessed by pharmacy staff. The resource most commonly accessed was medicines.ie, the Irish Medicines Board (IMB)'s medicines information website. NICE, the British National Formulary (BNF) and the HPAI websites were also indicated as accessed frequently by high numbers of respondents.
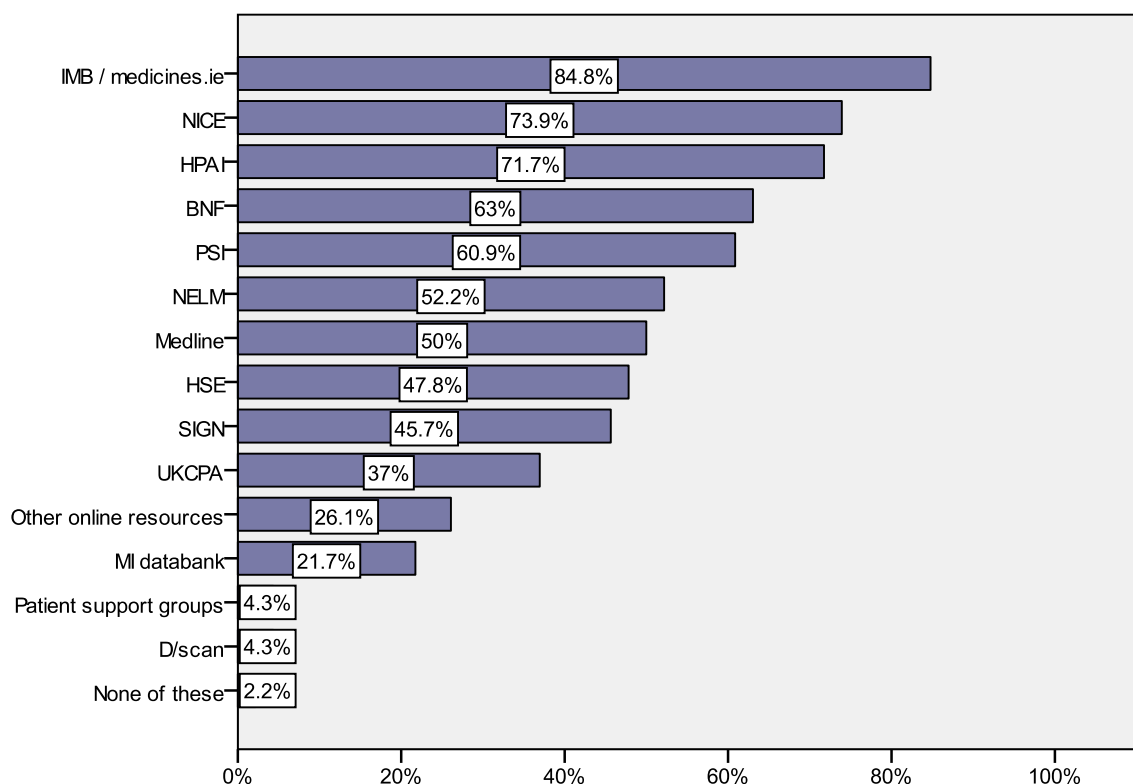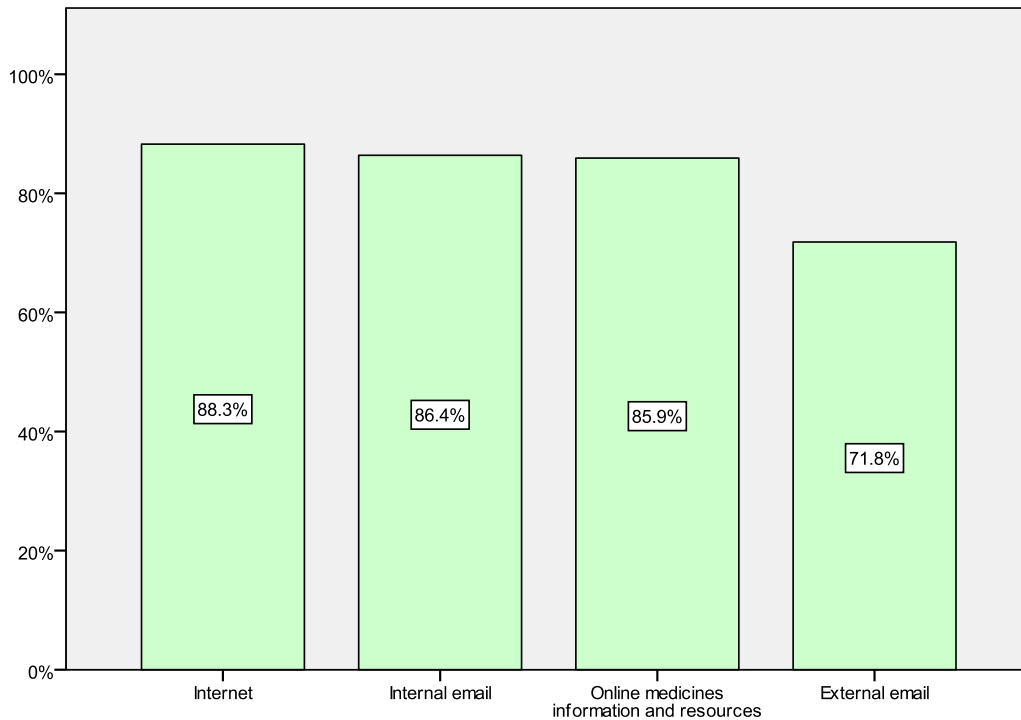


### 5.1.7   Email and Website

40.5% of respondents stated that there was a specific pharmacy email address, and 47.6% indicated that the pharmacy department had a dedicated separate section on the hospital's website.

## 5.2 Pharmacist Survey Findings

### 5.2.1 Access to IT Resources

We asked respondents what resources they had access to over the course of their working day.



As can be seen from the graph above, the majority of respondents have access to email, internet, and online medicines resources during the course of their working day. Over the course of the site visits, some pharmacy staff interviewees mentioned that their online access was restricted to approved sites, and sometimes this prevented them from accessing the correct information required, especially in research roles.

In Doloresco & Vermeulen's 2009 global survey of hospital practice, they found that "access to computers and electronic information (including drug information on the internet, etc.) necessary to provide care to hospitalized patients was also reported to be variable around the globe".

### 5.2.2 Perception about Technology

Pharmacists were asked whether they agreed with the statement that the technology in the pharmacy was adequate to support the provision of high-quality pharmacy services. Opinion was clearly divided on this, as the chart below illustrates: 14.1% strongly agreed, with 15.6% strongly disagreeing, and again a near-even 27.6% agreeing versus 29.2% disagreeing.

**The technology in this pharmacy is adequate to support the provision of high quality pharmacy services**
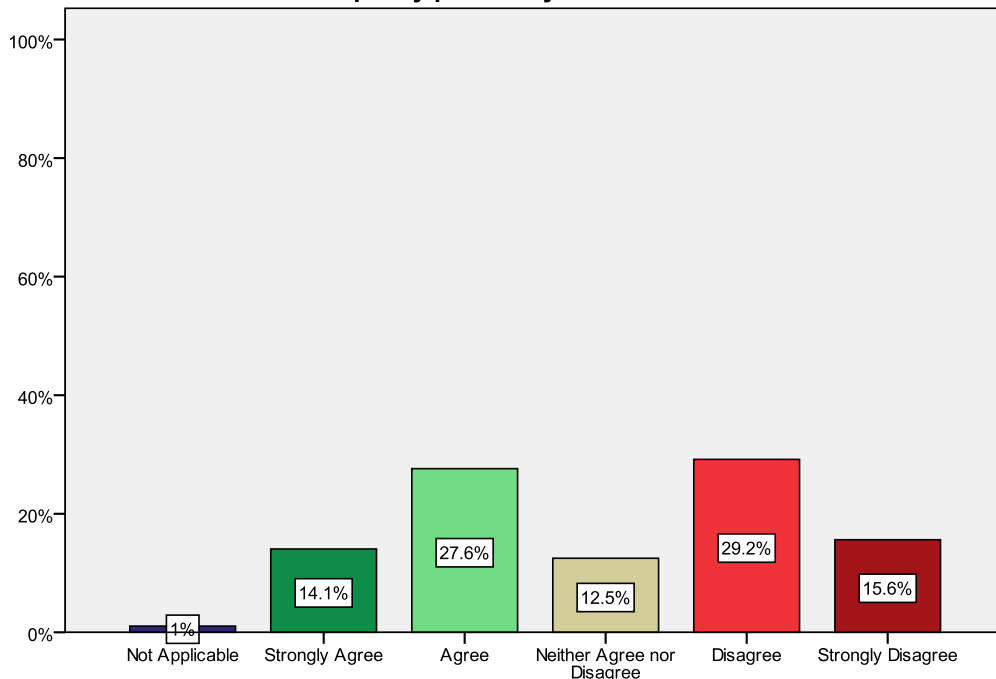


## 5.3    Site Visit Findings

### 5.3.1   Overview

Over the course of the site visits, we discussed the information technology resources within the hospital pharmacy and asked pharmacy staff opinion on how well they support the work within the pharmacy department. Overall, we found that technology is not utilised significantly for the support of pharmacy services to a large extent, other than the use of computers for dispensing.

Whilst the pharmacy staff interviewees discussed the shortcomings of the technology at their disposal, most rated the technology in their hospital pharmacy as average in relation to that in hospital pharmacies in Ireland generally; there is a perception that, with few exceptions, the technology in hospital pharmacy in this country is not as developed as it could be to support pharmacy services.

Balen &Jewesson 2004 (Canada) undertook a computer skills and needs assessment survey with hospital pharmacists. Most pharmacists believed they needed to upgrade their computer skills. Medical database and internet searching were skills identified as most in need of improvement for greater practice effectiveness. Most were generally computer-literate and not anxious about using them. Few were familiar with handheld computers.

### 5.3.2   Automation

Only one public hospital in the country – the Mater Misericordiae University Hospital in Dublin – uses robotic dispensing, having invested a very significant sum in the technology and associated capital works in recent years.

A smaller robotic system is in operation within the privately-owned Galway Clinic, following their decision to make an investment in robotic dispensing technology in 2009.

Across other hospitals within Ireland, considerable interest has been expressed in the acquisition and implementation of robotic dispensing systems, and the Mater Hospital in particular  has hosted quite a number of visits from pharmacists and managers working within other hospitals who have been keen to understand the nature of the technology, its cost, and the benefits which it brings. Other than the Mater and the Galway Clinic, no other hospitals have invested in robotic dispensing systems, although a very small number of others use automated drug cabinets.

### 5.3.3   Fragmentation of IT Systems

For the most part, hospital pharmacies are not well served by information technology, and hospital IT systems used for administration, financial management/resource control, and management of patient care do not integrate with each other nor with pharmacy systems.

Information is often captured and held in a fragmented manner across different systems, necessitating extra work to collect pieces of data and duplication of effort in entering them into other systems.

In a not insignificant number of cases, it was argued by pharmacy staff that the systems in place militate against the comprehensive and accurate reporting of pharmacy activity and costs. We heard many references to having to compile reports for hospital management and for internal departmental needs from information gathered from a number of sources. Frequently, one system provides a certain set of reports or data sets, which do not exactly fit the reporting and management requirements, necessitating additional work to supplement the information from elsewhere, or to have a separate, somewhat duplicated recording system (e.g. using Excel) to ensure the required information is available when needed.

### 5.3.4   Use of Paper Records

A considerable amount of patient care detail is recorded on paper, on patient charts and drug Kardexes. Many pharmacists – and ward staff – indicated that they would like to see an increase in electronic recording, up to and including electronic prescribing. Several suggested that recording pharmacist clinical interventions on handheld devices would be beneficial, although it was noted by some that this would need to be managed to ensure that it did not become so time-consuming as to take from the resources for clinical pharmacy to as many patients as possible

Dasgupta et al 2009 (US) explored pharmacists' use of PDAs and found that pharmacists were using PDAs as personal organisers, for obtaining Drug Information, and as medical calculators. More likely to be used as administrative, rather than patient care, tools. Hospital pharmacists were twice as likely as community pharmacists to own one. Being able to transport it with them round the hospital was advantageous. Some PDAs in hospital had

### 5.3.5   Cliniscript

Many people mentioned significant issues with Cliniscript, especially its DOS base (owing to a decision not to upgrade to the Windows version by the HSE) and the lack of support from its suppliers. It was stated on more than one occasion that the cost of technical support was high considering the difficulties in accessing technical support for the DOS version and the occasional delays in dealing with technical problems, which created difficulties for ensuring medicines could be dispensed when needed.

### 5.3.6   Access to Computers

From the site visits which we made, it was frequently reported that there are not enough computers for the staff in pharmacy departments, and we also observed in a significant number of publicly funded hospitals that workstations (i.e. desktop computers and laptops) and associated devices such as printers were often quite old and from a previous generation in technology, suggesting a lack of investment in recent years.

One interviewee mentioned composing presentations and documents on their home computer because the one they used in the pharmacy was so slow and incapable of handling anything but the dispensing function.

> Doloresco & Vermeulen's 2009 global survey of hospital practice found that 43% of respondents from low- and medium-HDI countries reported that fewer than 40% of their hospital pharmacies had access to at least one computer in their pharmacy, and 62% reported that fewer than 40% of hospitals had access internet.
>
> In high-HDI countries, 61% of respondents reported that virtually all hospitals in their countries had at least one computer in every pharmacy, and 21 (46%) of 46 re- ported that virtually all had internet access.

### 5.3.7   Access to Online Resources

It was also reported that some hospitals may restrict access to the internet (i.e. allow access only to particular websites pre-approved by management and/or IT), with the result that pharmacy staff cannot access necessary information or conduct research. This was mentioned by a number of pharmacy staff working in or needing information in relation to highly specialist areas (e.g. neonatal): the key information may not be available in the "normal" everyday resources, and the inability to go beyond these in many hospitals inhibits their ability to obtain the correct information in a timely manner.

### 5.3.8   Potential for IT to Support Pharmacy

Technology was seen by many pharmacists as having the capacity to decrease their workload and allow for the development of more clinical pharmacy services. In particular, a number of pharmacists who had worked in the UK had extensive experience of robotic dispensing systems, and expressed the view that investment in that technology would free them up to undertake a more clinical role within the hospital.

Without significant changes and improvements in technology, the prospect for well-developed clinical pharmacy services was seen as being limited. Developments such as electronic

prescribing, pharmacist intervention recording (with handheld devices), and automation were seen as ways in which clinical pharmacy could be supported by technology.

Siska & Tribble 2011 (US) described heath IT challenges in hospital practice. "The use of technology and automation to support pharmacy practice dates back to the 1970s and has frequently been implicated as both the problem and solution for optimising the role of the pharmacist in providing direct patient care."

Core health information technology HIT systems supporting medication management, and their penetration into US hospitals in 2011, are:

| | |
|---|---|
| CPOE and clinical decision-support systems | 15% |
| Medication reconciliation systems | 10% |
| Pharmacy systems | Approx 100%, but only 50% of those can interface with EHR |
| Medication distribution and storage | 83% |
| Repackaging automation | 92% |
| Medication administration systems<br><br>■ electronic medication administration records<br><br>■ bar-code-assisted medication administration technology<br><br>■ smart pumps | 20% (all 3 elements) |
| EHR | 5-60%, depending on EHR definition.<br>Only 2% have a system meeting the federal government's 'meaningful use' criteria.<br>More likely in larger hospitals, urban hospitals, and teaching hospitals. |

Significant challenges to HIT adoption were:

| | |
|---|---|
| **Financial** | 2005 study estimated cost of CPOE at $63,000 per bed.<br>Cost includes hardware, software, maintenance and support, training, worker adaptation (temp loss of productivity). |
| **Workforce** | Few HIT professionals. Insufficient training in the field.<br>Multidisc clinical informatics workforce needed. |
| **Strategic** | Lack of an overall vision for what the new medication-use process might look like. Considered independent departments rather than "a tightly connected process for health care delivery."<br>Leads to fragmented technology solutions.<br>Often implemented as reactive to a critical incident, without thoughts of the future implications. |
| **Cultural** | "Implementation of an integrated medication management system is a major cultural event."<br>Professionals tend to work in silos, with IT to match.<br>"It requires committed leaders, an environment for innovation...and a willingness to forego perfection in pursuing modest incremental improvements."<br>Introducing HIT into clinical workflows is difficult and disruptive. |

| **Structural** | Health information exchange (anytime-anywhere access) is essential. Common standards must be set to ensure system interoperability. |
|---|---|
| **Technical** | Designed primarily to automate recurring tasks or to mimic paper-based interactions. Offer little support for cognitive tasks. Existing HIT rarely takes advantage of human-computer interaction principles. Can introduce new sources of errors and different safety concerns. |
| **Privacy and security issues** | Conflicting state and federal policies. Difficult to gain access to information across the continuum of care. |

They asserted that "In the ideal future, the medication distribution system is overseen by a pharmacist but is exclusively operated by advanced technical practitioners who are appropriately trained and credentialed. The medication selection and distribution process is governed by in-process quality assurance steps; standardised practices minimise the opportunity for errors in product selection, preparation and distribution."

## 5.4  Main Messages

Computers are used for a wide range of intra-pharmacy tasks in Irish hospitals, but levels of automation and communication between systems lag well behind other countries.

Pharmacists are sceptical about the capability of their IT systems to cope with future demand, and believe that investment is needed.

# 6

# Inter-Professional Relationships

# 6 Inter-Professional Relationships

## 6.1 Pharmacy Survey Findings

### 6.1.1 Relationships with Other Healthcare Professionals and Groups

Participants were asked to rate the relationship between the pharmacists in the hospital and each of the following groups. In only a small number of cases is the relationship considered poor – some rate it poor with hospital managers and primary care doctors – and most relationships are considered positive.
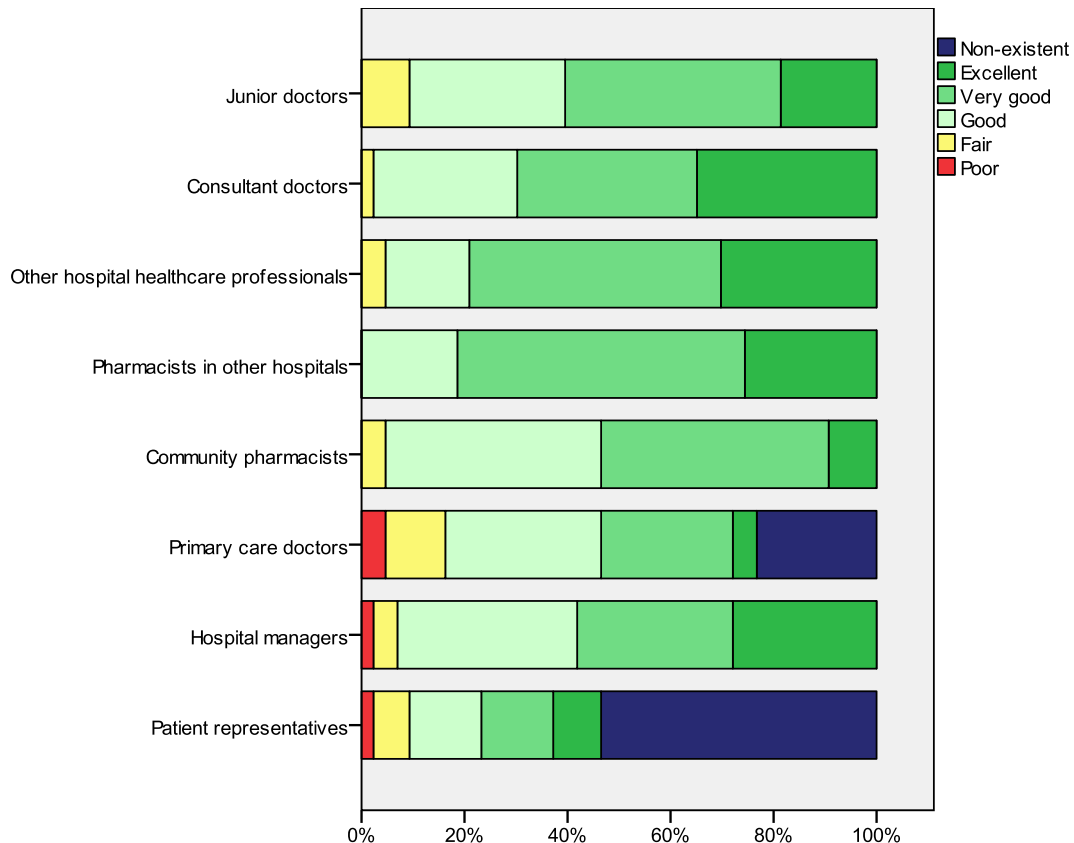


### 6.1.2 Multidisciplinary Ward Rounds

We asked respondents how often pharmacists participated in multidisciplinary ward rounds. As can be seen from the chart below, this is not a routine activity, with fewer than 10% indicating that this always took place.

**Multidisciplinary ward rounds**
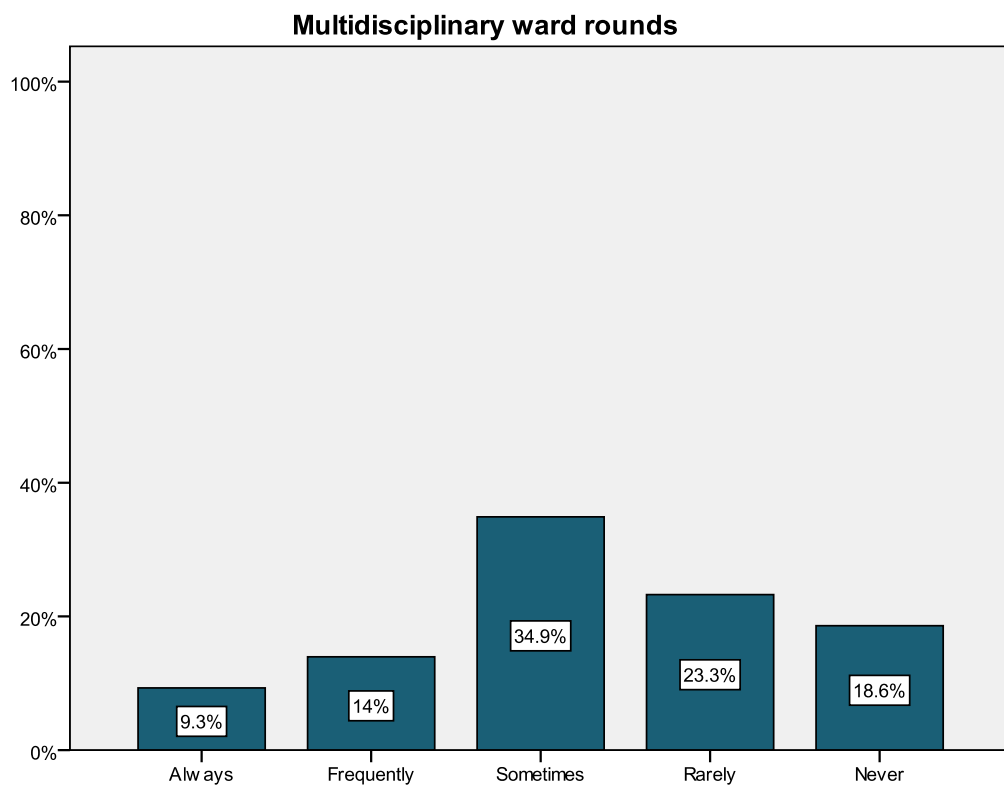
Five levels of collaborative pharmacy practice[4] have been identified in the reference paper supporting the **FIP** Statement on Collaborative Pharmacy Practice 2010 (FIP, 2009):

- Level 1 - Minimal contact between pharmacists and other healthcare professionals;
- Level 2 – System wide "pharmacy only" or "pharmacist only" authority to supply medicines;
- Level 3 - Reactive advice to other healthcare professionals;
- Level 4 - Prospective advice and/or referral by another healthcare professional;
- Level 5 - Collaborative Pharmacy Practice (CPP) - Authority to initiate or modify medicine therapy.

The statement includes a recommendation that "Each country take steps to prepare their pharmacists and healthcare systems for collaborative pharmacy practice with the intention to move through the various defined levels, culminating, where possible, in advanced collaborative pharmacy practice".

In order for this to take place, FIP recognised that critical elements of the strategy would include:

- Appropriate access to patient records
- Agreed communication between pharmacists and other healthcare professionals
- Evidence-based research
- Pharmacist competence
- Quality assurance
- Regulatory support
- A sustainable business model.

### 6.1.3   *Participation in Other Multidisciplinary Activities*

Respondents were asked what other activities were undertaken in collaboration with other healthcare professionals. The graph below illustrates these key inter-professional activities – mostly audit and committee work, along with teaching, learning, and membership of specialist teams.

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[4]    Defined by FIP in the Statement as "The advanced clinical practice where pharmacists collaborate with other healthcare professionals in order to care for patients, carers and public".
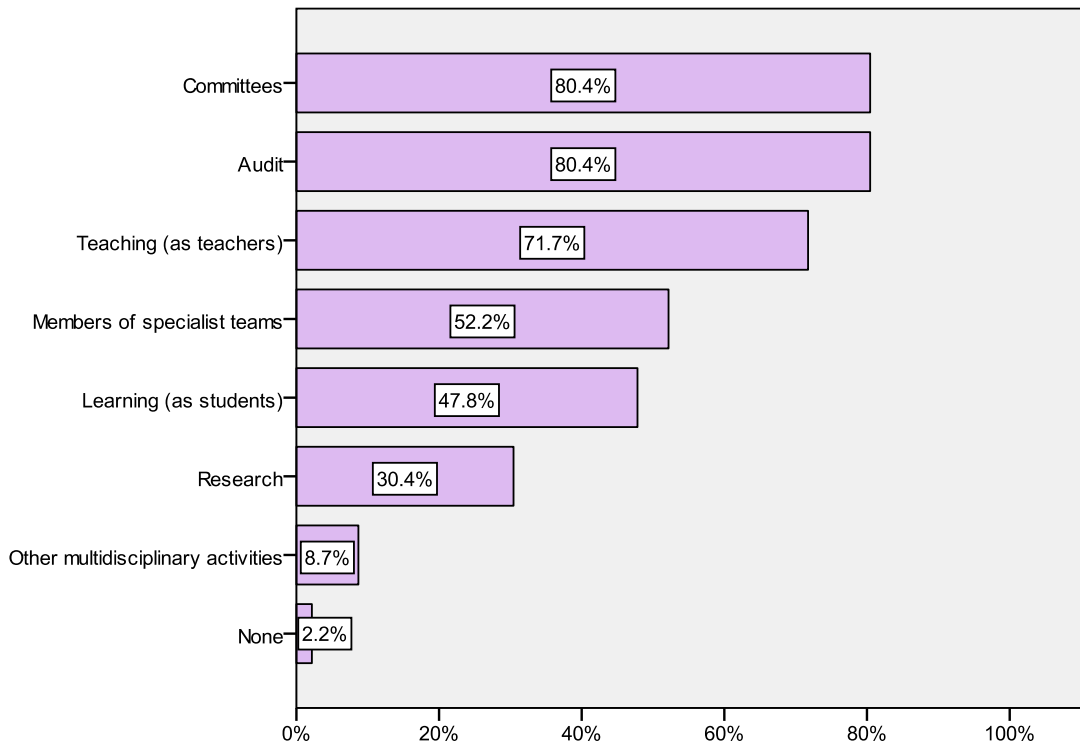
Bush et al 2010 (US) described the development of an academic medical centre model, with a specification for minimum pharmacy services. They emphasised the role of pharmacists in the teaching of other professions.

Pedersen et al 2010 (US), in the ASHP Monitoring and Patient Education survey 2009, found that most hospitals assigned oversight for patient education about medication to nursing staff (89%) but many hospitals (68.9%) reported that pharmacists supplied education to 1-25% of patients. ADE reporting came most often from nursing staff.

### 6.1.4   Membership of Other Teams and Committees

As can be seen above, membership of committees constitutes a strong element of the inter-professional activities of hospital pharmacists. Below is a chart showing the most common committees participated in by the hospital pharmacy department. Not surprisingly, the committee with the highest representation rate is the Drugs and Therapeutics committee.
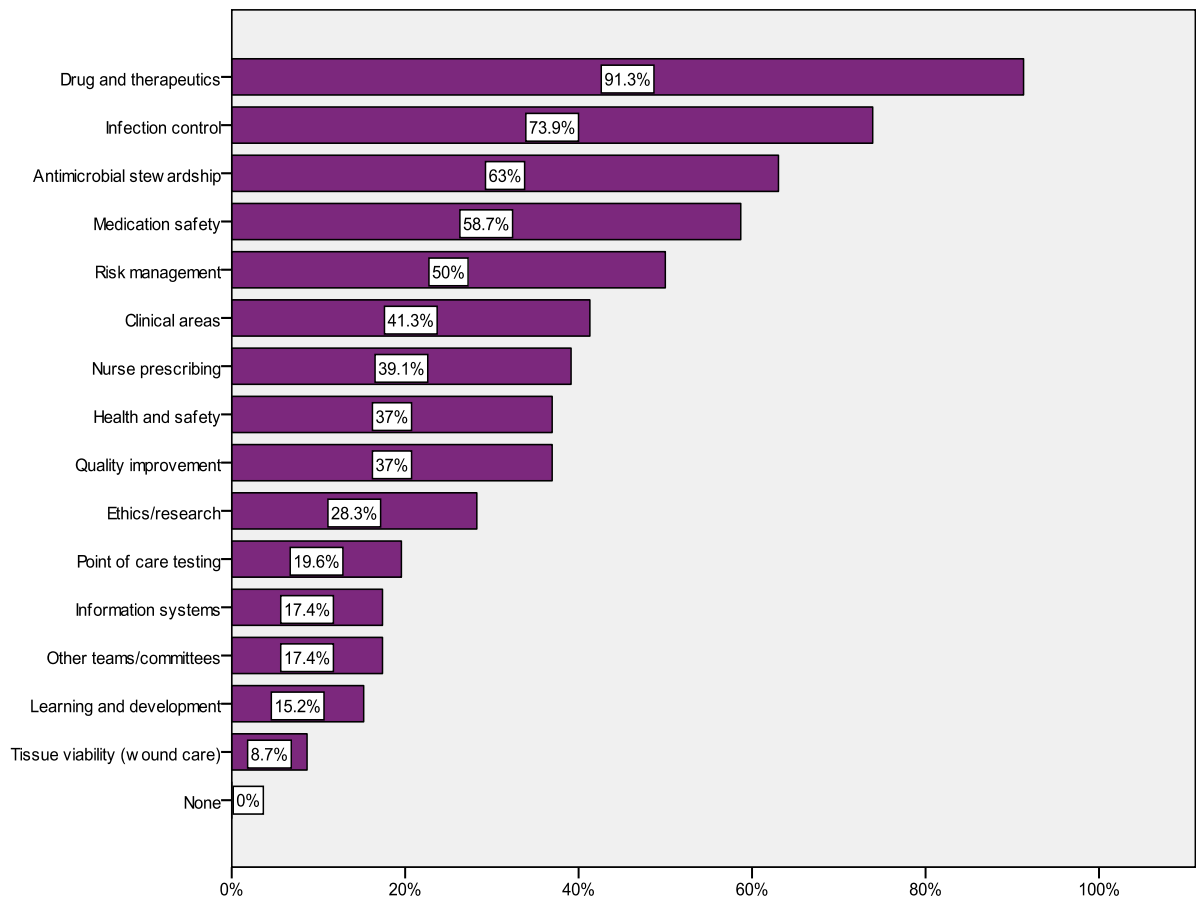
Only 30%, approximately, of these committees and/or teams have the pharmacy representative as the chairperson.

## 6.1.5  *Link to Other Pharmacies*

### Community

Only 5% of respondents have a link at admission to community pharmacy for medicines reconciliation for every patient. 72.5% have this for some patients, but this appears to be ad hoc in most instances, as previously discussed in the Services domain in relation to medicines reconciliation at admission.

### Hospital

As can be seen from the chart below, there are few formal routine links with other hospital pharmacies; this is largely ad hoc in relation to specific patient transfers or in some cases where there are a number of hospitals in a network and patients attend different sites for different services.

## Links with other hospital pharmacies
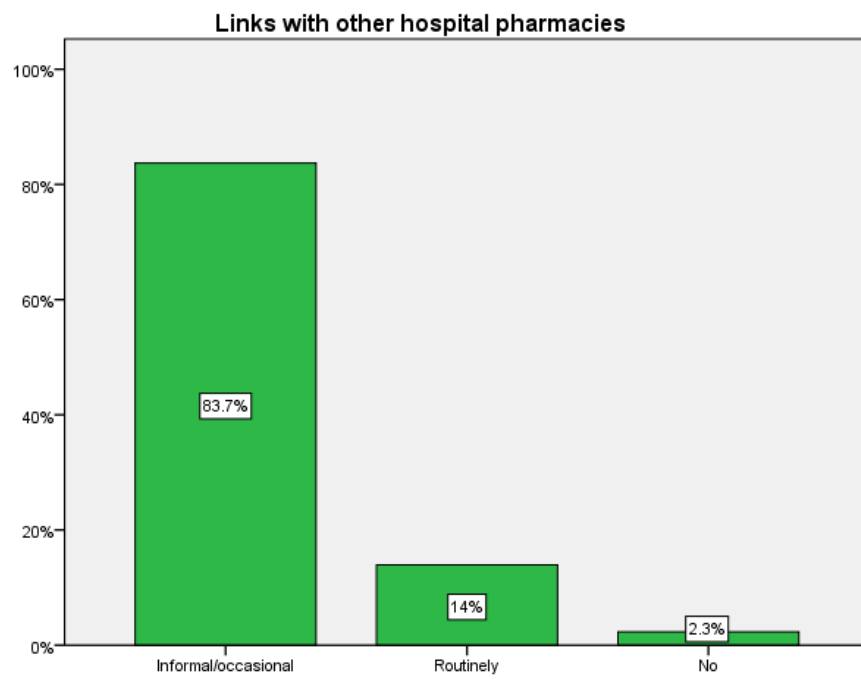
## 6.2   Pharmacist Survey Findings

### 6.2.1   Relationships with Other Groups

As with the pharmacy survey, we asked pharmacists to rate the relationships with other healthcare professionals from their personal experience. Again, most rate the relationships as good, very good, or excellent, with groups like patient representatives not featuring as particularly relevant.
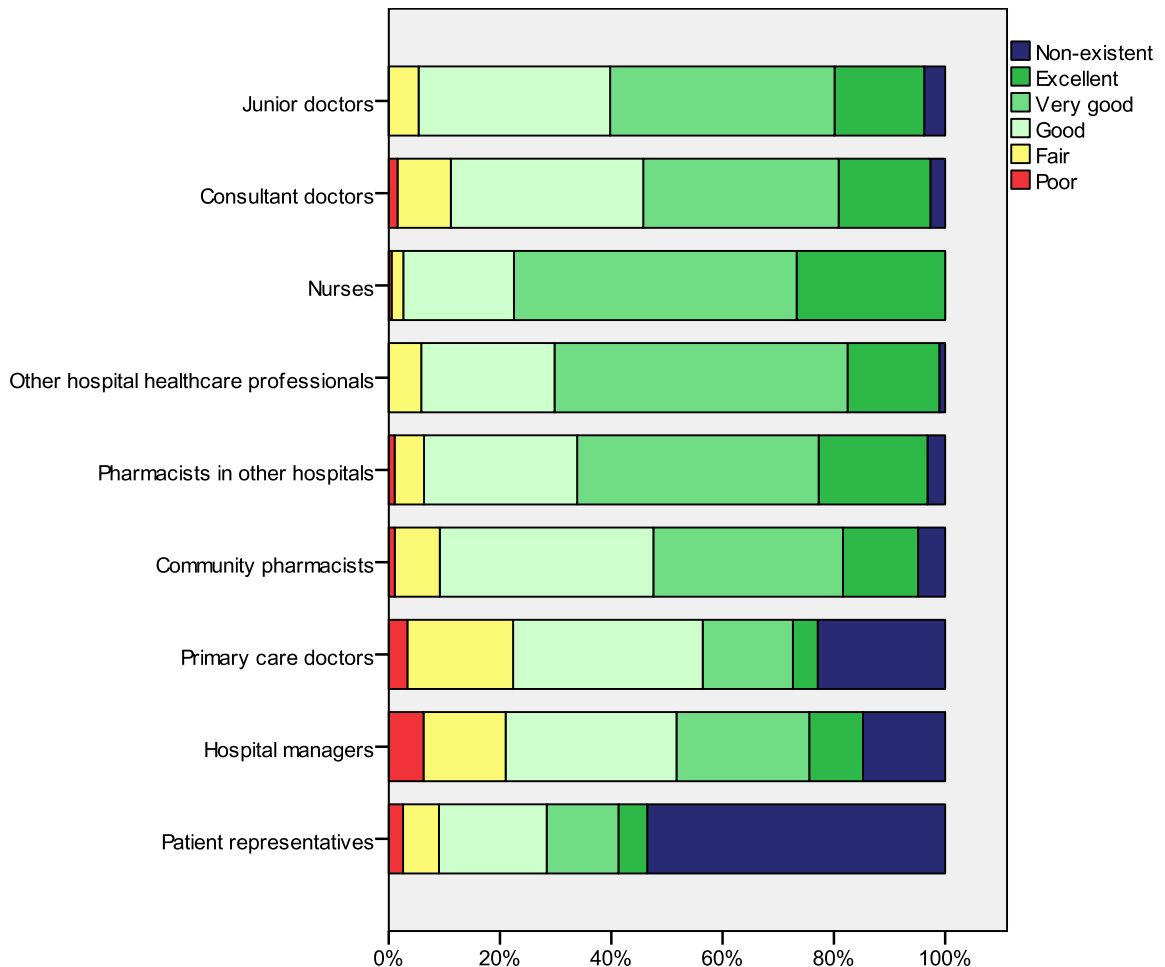


Al-Shaqha & Zairi 2001 (UK) felt that "The pharmacist's inter-professional relationships are limited because of the physical location of practice: physicians and nurses are in the patient-care areas and the pharmacists are in the central hospital pharmacy."

### 6.2.2   Perceptions about Inter-Professional Working

Pharmacists were asked to consider to what extent they agreed with the following statements (responses illustrated in the graph below):

■      The pharmacy team has satisfactory influence over the policymakers and managers within the hospital (somewhat split but on balance more a negative outlook on this);

■      More joint professional working would raise the profile of the hospital pharmacy team (most agreed or strongly agreed with this statement).
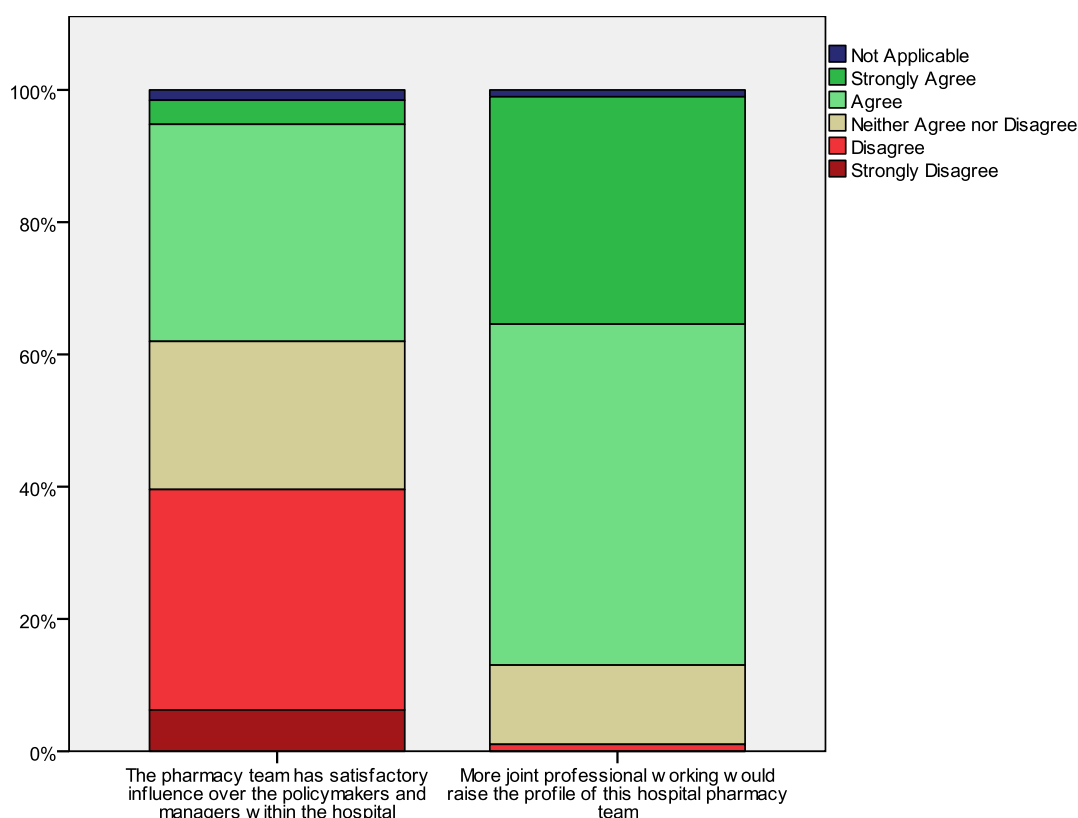
## 6.3 Site Visit Findings

### 6.3.1 Relationships within the Hospital

Relationships with other hospital staff were reported as being very good overall from our interviews with pharmacy staff. Most believed that their service was well-received and appreciated. The development and provision of clinical services was seen as helping to improve relationships between pharmacy staff and other clinical staff. In hospitals with limited or no clinical pharmacy services, the relationship is less well-developed because of the lack of face-to-face contact on wards.

### 6.3.2 Perceptions of Non-Pharmacy Staff

Pharmacists are perceived to be a valuable resource by medical and nursing staff where there is a clinical service. Whilst most appreciated the supply service as well, for many it does not register strongly (drugs are ordered and then arrive at the ward). The exception is where there is a ward top-up and/or supply management service by the pharmacy department (usually a technician. Nursing staff and managers rate this service highly in terms of saving them time and resources.

There is a strong perception that pharmacy staff are willing to help (whether ward- or pharmacy-based). Any non-pharmacy staff member who was asked about seeking information from pharmacists had praise for the manner in which queries were dealt with and the way in which the staff were approachable and willing to resolve issues.

### 6.3.3  Medical Staff

In several hospitals, junior medical staff appear to be open to pharmacy input as a resource to help with their prescribing; for some, this stems from working elsewhere (in Ireland or abroad) with clinical pharmacy services embedded in patient care.

Some older doctors, pharmacists felt, did not appreciate advice from pharmacists: they perceive it as criticism or as usurping their role as prescriber. However, many consultants valued the input highly, and this also trickled down to their medical team in terms of respect for pharmacists and willingness to involve them in patient care decisions.

> LeBlanc et al 2007 (Int) found that more than 70% of their international respondents indicated having a good to excellent relationship with nurses and physicians.
>
> Nesbit et al 2001 (US) strategically positioned their 'clinical services pharmacists' (see CPD section) to maximise inter-professional benefit.
>
> Van dem Bemt 2011 (Netherlands) described a 29-activity framework for pharmaceutical care, which was linked closely to an existing 6-step treatment plan for physicians.

### 6.3.4  Factors in Inter-Professional Relationships

It was expressed by many pharmacists that the full value of the role which they could play in patient care is not appreciated. Mutual respect for the different roles and skills of each clinical professional is key to good relationships.
Communication was seen as being critical, as is the means of communication (i.e. face-to-face is better than the "green pen" on charts alone). This was especially true in hospitals with a limited or non-existent clinical and/or top-up service. Where the pharmacy staff are effectively confined to the pharmacy, it creates difficulties in building relationships with other healthcare professionals within the hospital.

> Holland & Nimmo 1999 (AUS/US) asserted that resistance of other professionals to the changing model of pharmacy practice threatens it, and that strong leadership would be crucial. Similarly, in Knoer et al's 2010 (US) description of the implementation of their new model of practice, inter-professional lessons they had learned were:
>
> ■ Anticipate politics;
>
> ■ Communicate with key leaders (hospital administration and nursing staff key to this);
>
> ■ Communicate with key physicians.

## 6.4  Main Messages

> Pharmacists felt generally that their relationships with other professionals in the hospital were good, but there were few links beyond the hospital with, for example, primary care doctors or even community pharmacists. Pharmacists were involved in multidisciplinary teaching & learning, audit and committees, but there were only ad hoc opportunities to join ward rounds. Pharmacists may need to be more visible in multidisciplinary ward-based activities to further develop relationships through common goals.

**7**

# Workforce

# 7   Workforce

## 7.1   Pharmacy Survey Findings

### 7.1.1   Numbers and Grades of Staff

> **Note: these figures relate to those reported in the survey; they are not independently verified and may not be wholly accurate (for example, some may have included staff on leave such as carer's leave and some may have excluded such staff). They should be considered as indicative only.**

**Senior Pharmacist Grade**

There were on average 4.16 senior pharmacists (not including those at Chief 1 or Chief 2 grades) in the hospital pharmacies surveyed. This is the figure for the numbers employed: the whole-time equivalent is an average of 3.68 senior pharmacists, ranging from no senior pharmacists in the department to 18 at this grade (17.5 whole-time equivalent). Approximately 94% of these are on permanent contracts. The working week ranges from 33 to 40 hours for a full-time employee across the pharmacy staff grades in the various hospitals.

**Basic Pharmacist Grade**

The numbers of basic-grade pharmacists are significantly lower than those at senior grade. The average was 1.42 (whole-time equivalent 1.36) basic-grade pharmacists in the pharmacies surveyed, ranging from none to a maximum of 8 basic-grade pharmacists across the hospital pharmacies who responded. The number of these on temporary contracts was higher than those at senior grade, with 28.4% on temporary contract.

**Senior Pharmacy Technician Grade**

The average number of senior pharmacy technicians is 2.55 (2.25 whole-time equivalent), ranging from none to a maximum of 11 senior technicians per hospital pharmacy department. Most (93.5%) were on permanent contracts.

**Basic Pharmacy Technician Grade**

There were on average 3.66 (3.34 whole-time equivalent) basic-grade pharmacy technicians in the hospital pharmacy departments who responded. The numbers ranged from no technicians at this grade to a maximum of 17. Around 8% were on temporary contracts.

> In Canada (HPIC Report, 2009/10), the average number of pharmacist positions reported represented 40% of total pharmacy staffing. Management positions represented 4% of total pharmacy staffing, similar to the previous report (5%), when looking at all management positions combined. Technician/Assistant positions represented 51% (49% in 2007/08) of total pharmacy staffing. Support personnel represented 3.4% (3.8% in 2007/08) of total pharmacy staffing.
>
> The EAHP 2010 survey (Frontini et al, 2012) reported that pharmacists (27%) and qualified technicians (32%) made up 60% of the total staff. The number of pharmacists/100 beds varied from 0.24 (Bosnia and Herzegovina) to 4.35 (UK). Only a few countries did not

experience shortages of pharmacists and technicians. European hospital pharmacy staffing (pharmacists and pharmacy technicians) remains, on average, low compared with the USA and has not grown significantly since 1995. Therefore, it can be problematic to make direct comparisons between hospital pharmacy services in the USA and Europe.

On average, in the 2010 survey, a hospital pharmacy in Europe is providing services to a hospital with 606 beds with an average number of 4.7 pharmacists (0.9 per 100 beds) and 5.5 qualified pharmacy technicians (1.0 per 100 beds). A hospital pharmacy in the US has, on average, 19-fold the pharmacists in Europe and 15-fold the qualified pharmacy technicians.

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EAHP 2010 survey reported that the number of pharmacists/100 beds ranged from 0.24 in Bosnia & Herzegovina to 4.35 in the UK.

The EAHP 2005 survey found that: "The most numerous staff in hospital pharmacies is in Denmark – 10.3 pharmacists on the average, and in Norway 9.1 where the increase of FTE in hospital pharmacies was the greatest. Luxembourg and Slovakia, on the contrary have the smallest number of pharmacy staff – on the average 2.3 and 2.2 pharmacists, respectively. The average number of FTE for pharmacists in the European hospitals is 4.7."

The Society of Hospital Pharmacists of Australia (SHPA) published advice on staffing levels for clinical pharmacy services in May 2011 (Table 6.4). These suggestions were based upon the following service features:

■ Provision of a comprehensive clinical pharmacy service

■ A bed occupancy rate of 95%;

■ An average length of stay of 6 days;

■ Minimal dispensing or medicine distribution activities performed by the clinical pharmacist;

■ A component of clinical supervision e.g. undergraduate and postgraduate pharmacy students;

■ A five-day-a-week service with an eight-hour working day (allowance was made for attending ward/clinical unit rounds, pharmacy staff meetings, liaison with other pharmacy staff re: prescriptions etc.)

**Table 7.1.1: Clinical pharmacist staffing levels for clinical pharmacy services for a five-day period (SHPA, 2011)**

| Category | Service-related group /bed type | Beds to one FTE pharmacist for clinical pharmacy services |
|---|---|---|
| 1 Critical care units | All critical care units, extensive burns, tracheostomy and ECMO | 10 |
| 2 Specialist units, high dependence on medicines | Haematology, Immunology and infections, medical oncology*, renal medicine, transplantation, qualified neonates | 15 |
| 3 Medical bed type | General medical units and cardiology, interventional cardiology, dermatology, endocrinology, gastroenterology, neurology, respiratory medicine, rheumatology, pain management, definitive paediatric | 20 |

| | | |
|---|---|---|
| | medicine**, acute psychiatry, palliative care, acute definitive geriatrics | |
| 4 Surgical bed type | General surgical units and breast surgery, cardiothoracic surgery, colorectal surgery, upper GIT surgery, head and neck surgery, neurosurgery, orthopaedics, plastic and reconstructive surgery, urology, vascular surgery | 25 |
| 5 Minimal change to medicines anticipated | Ear nose and throat, gynaecology, obstetrics, unqualified neonates, perinatology | 30 |
| 6 Day surgery | Day surgery beds, diagnostic GI endoscopy, renal dialysis, dentistry, ophthalmology | 110 patients per week |
| 7 Longer stay admissions | Rehabilitation, drug and alcohol, non-acute geriatric | 30 |

*\*Additional recommendations have been previously made (SHPA Oncology, 2002)*
*\*\* for paediatric specialities refer to bed type e.g. paediatric orthopaedics use orthopaedics*

### 7.1.2 Unfilled Posts

We asked respondents to indicate if they had unfilled posts in the pharmacy department. 41% of those who responded said there were unfilled posts in the department.

There were an average of 1.9 unfilled pharmacist posts, ranging from 0.5 of a post to 5 posts unfilled; there were 1.45 unfilled non-pharmacist posts, from 0.4 of a post to 3.75 posts unfilled.

Only 11% were planning to fill the posts and had leave to do so. More than half of respondents (55.6%) indicated that there were no plans to fill the posts or that the recruitment embargo prevented such plans from being progressed.

Pedersen et al 2009 (US), in the ASHP Dispensing and Administration survey of 2008, found a vacancy rate of 5.9% for pharmacists and 4.7% for technicians; and a turnover rate of 8.6% for pharmacists and 13.8% for technicians. Only 6.8% had a pharmacist working in the Emergency Department. There was increasing recognition that pharmacy input is needed there.

In Canada (HPIC report, 2009/10), fifty-eight percent (93/159) of respondents reported having pharmacist position vacancies on March 31, 2010, which is about the same as in 2007/08 when 60% (98/163) reported having pharmacist vacancies. The average reported vacancy rate for pharmacists in 2009/10 was 8.2%, which was lower than the vacancy rate reported in the 2007/08 report (10.4%). In the 2005/06 report the vacancy rate was 13.3%.

Overall, respondents reported a total of 235 pharmacist position vacancies nationally. This is down from 292 pharmacist position vacancies in 2007/08 and 270 vacancies in 2005/06. As noted in past reports, this number underestimates the total national number of vacancies as not all hospitals participated in the survey. The average number of pharmacist vacancies per respondent is down from 1.8 (292/163) in 2007/08 to 1.5 (235/159) in 2009/10.
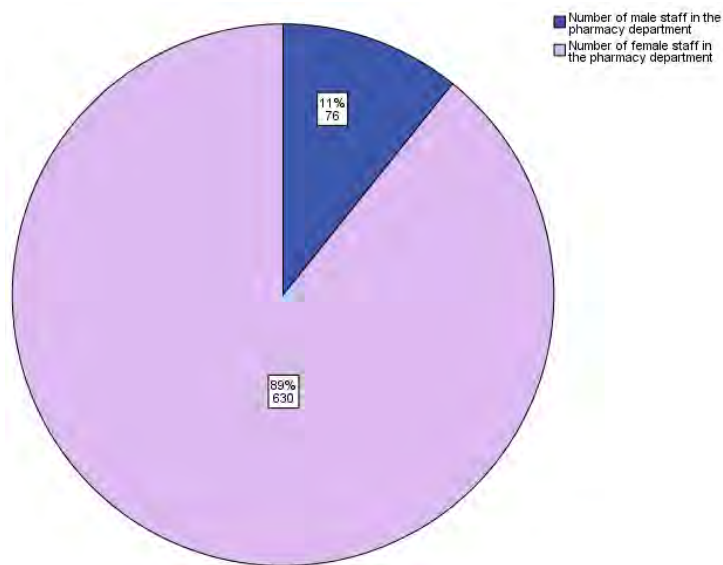
### 7.1.3   Ratio of Pharmacists to Consultants

This varied widely (and we may be able to provide more accurate figures at a later stage for this statistic): from 1:2 to 1:28.

### 7.1.4   Gender Profile of Workforce

As with the earlier demographic finding from the pharmacist survey, there is a significantly higher representation of women in hospital pharmacy:



This has implications for workforce planning, such as maternity leave, especially in the era of the recruitment embargo. As mentioned earlier, the age and gender profile of hospital pharmacy staff make for high levels of maternity leave, which are not being covered because of the recruitment embargo. This is a matter of concern to chief pharmacists and other pharmacy staff.

As a contrast, the community pharmacy gender profile is as follows:
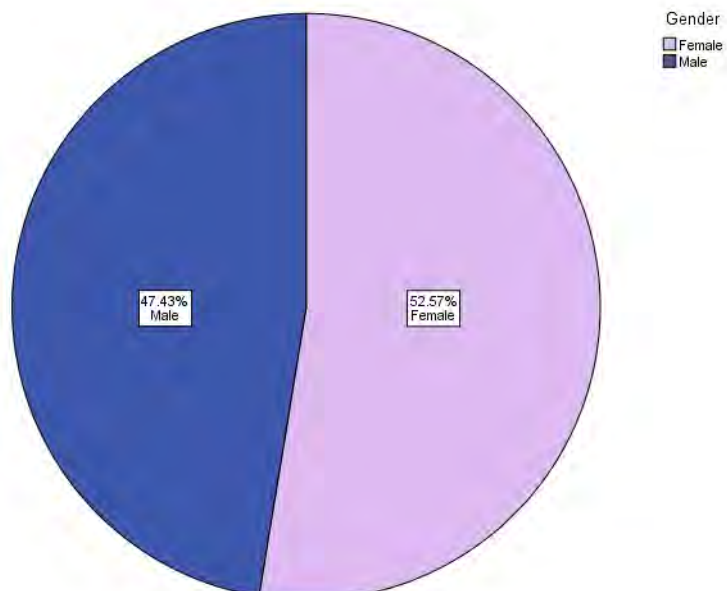
Harrison *et al.* (2011) described the changing context of NZ pharmacy practice, and the move towards a more patient-focused service. The article explored New Zealand pharmacists' alignment with their professional body's vision for the future (The Pharmaceutical Society of New Zealand (PSNZ) commissioned the development of a vision for pharmacy. This vision, Focus on the Future: The Ten Year Vision for Pharmacists in New Zealand (2004-2014).

There were 132 hospital pharmacists out of 980 respondents. Although a small number, demographic information is included here to add to the picture of international pharmacy practice:

Sex: 19.7% male (cf. 41% community); 87.3 female (cf. 57.3%community - 1.7 missing data)

In Doloresco & Vermeulen's 2009 global survey of hospital practice, they found that 64% of responding countries reported that >60% of pharmacists were women or gender mix was about equal. Fewer (38%) reported that a majority of hospital managers were female. They also found that over half of responding countries had a shortage of pharmacists. Gouveia and Shane had indeed warned of a looming shortage of pharmacy managers and leaders in 1999.

## 7.1.5   Age Profile of Workforce

The chart below echoes the age profile of the pharmacist survey: the workforce is predominantly in the under-35 and 35-44 age group.
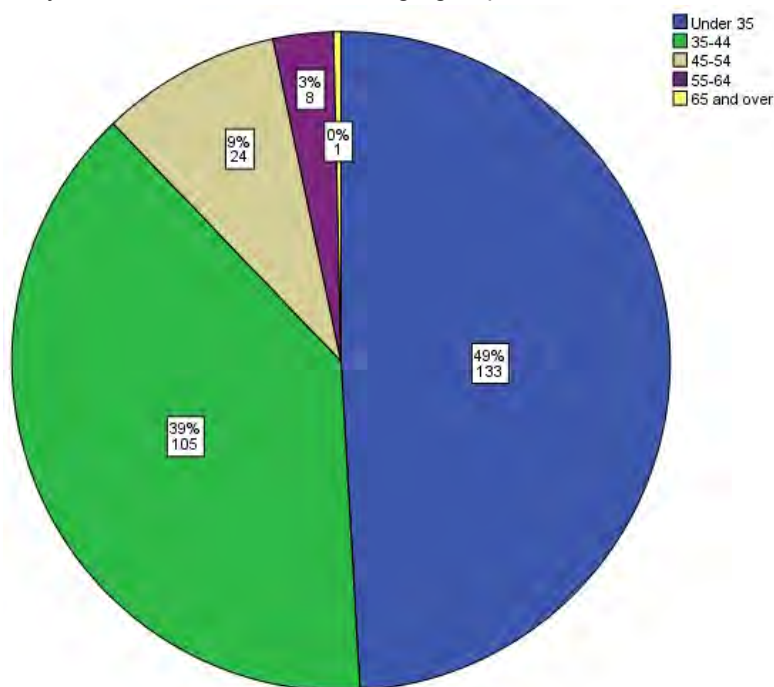


## 7.1.6   Hospital Pharmacy Qualifications

72.7% of the staff in hospital pharmacies have hospital pharmacy qualifications, according to the responses to the pharmacy survey, a broadly similar response to that in the profile of the pharmacist survey.

### 7.1.7 Reporting

The head of pharmacy most commonly reports to the hospital manager or CEO; some mention reporting to the clinical services manager or operational manager.

### 7.1.8 Other Departments

Only one respondent mentions leading another hospital department apart from pharmacy, and that is the stores department.

### 7.1.9 Perceptions about Workforce

We asked respondents how much they agreed or disagreed with the following statements:

■ We have a satisfactory level of influence over the medicines policy within the hospital (with which respondents largely agreed);

■ We have a satisfactory level of influence over general policy within the hospital (about which people were less certain, with a large number of "neither" answers and largely negative response).

These responses are illustrated in the graph below.
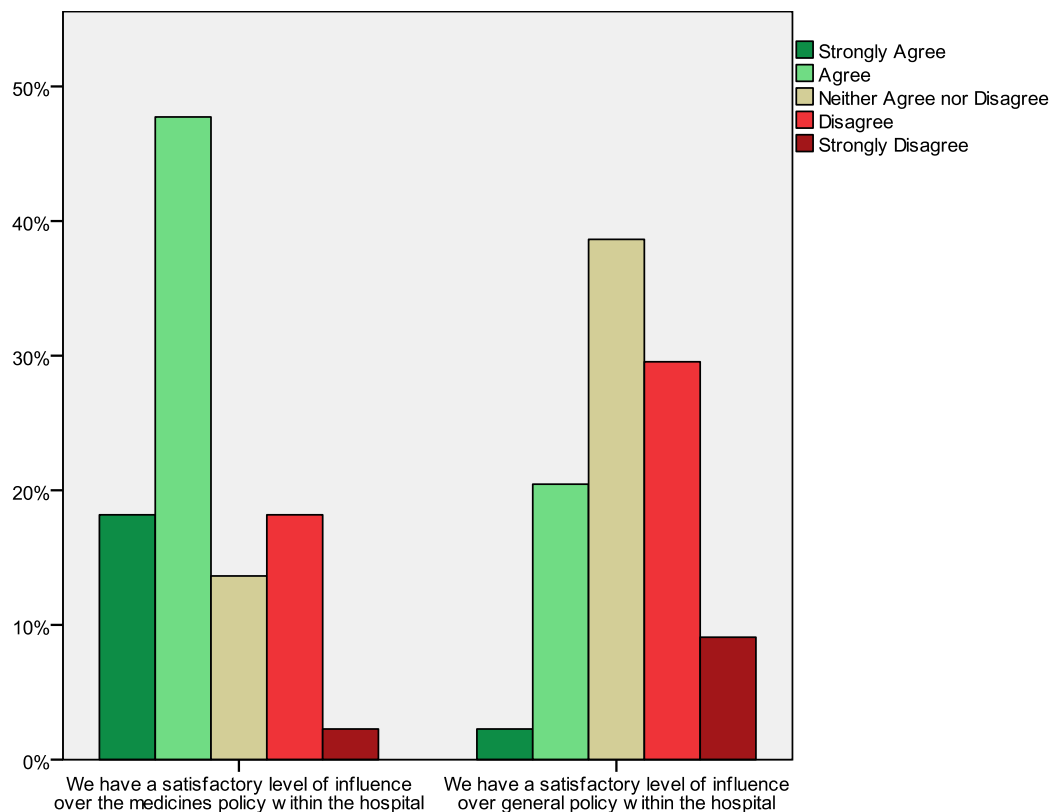
### *7.1.10 Time-spend on Clinical Activities*

We asked respondents how much time pharmacists and other pharmacy staff spent on clinical activities, the responses to which are illustrated below:
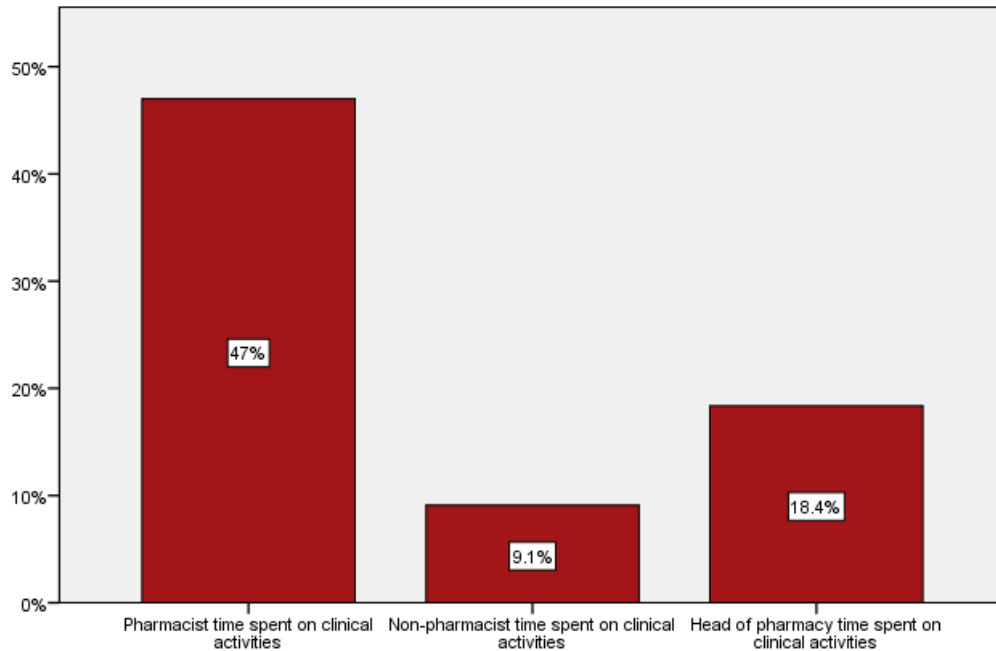


Harrison *et al.* (2011) in New Zealand found the following: % of time spent on clinical activities: 62.1 % reported spending over 60% of time on clinical activities (cf. 47.4% community); 15.2% between 41 and 60% of time (cf. 14.7% community), and 22.7 spent less than 40% of their time on clinical activities (cf. 36.9% community).
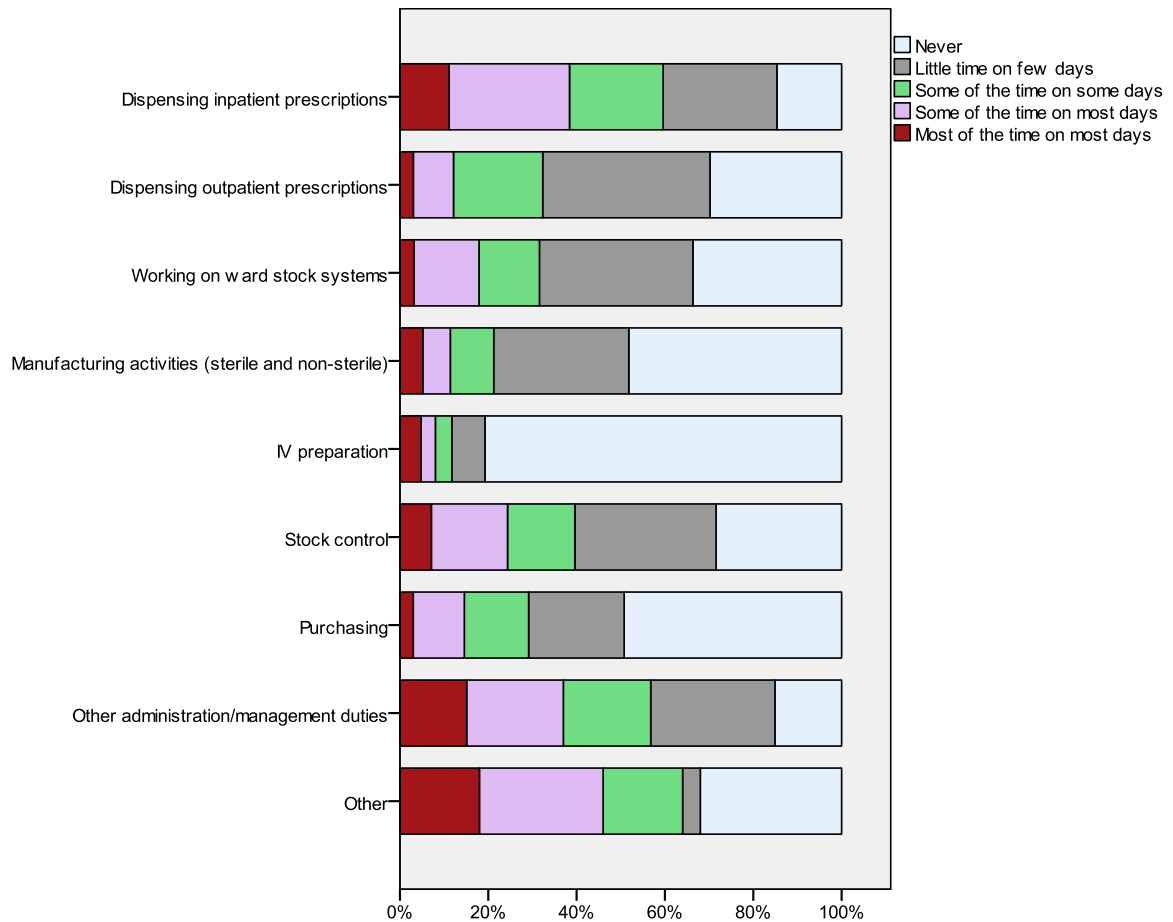
In Canada (HPIC Report, 2009/10), respondents reported that pharmacists spent approximately 47% of their time performing clinical activities in 2009/10, compared to 45% in 2007/08, while spending correspondingly less time in drug distribution. When the historical trend is examined since 1997/98, the time spent on clinical activities has slowly but steadily increased from 33% to 47%.

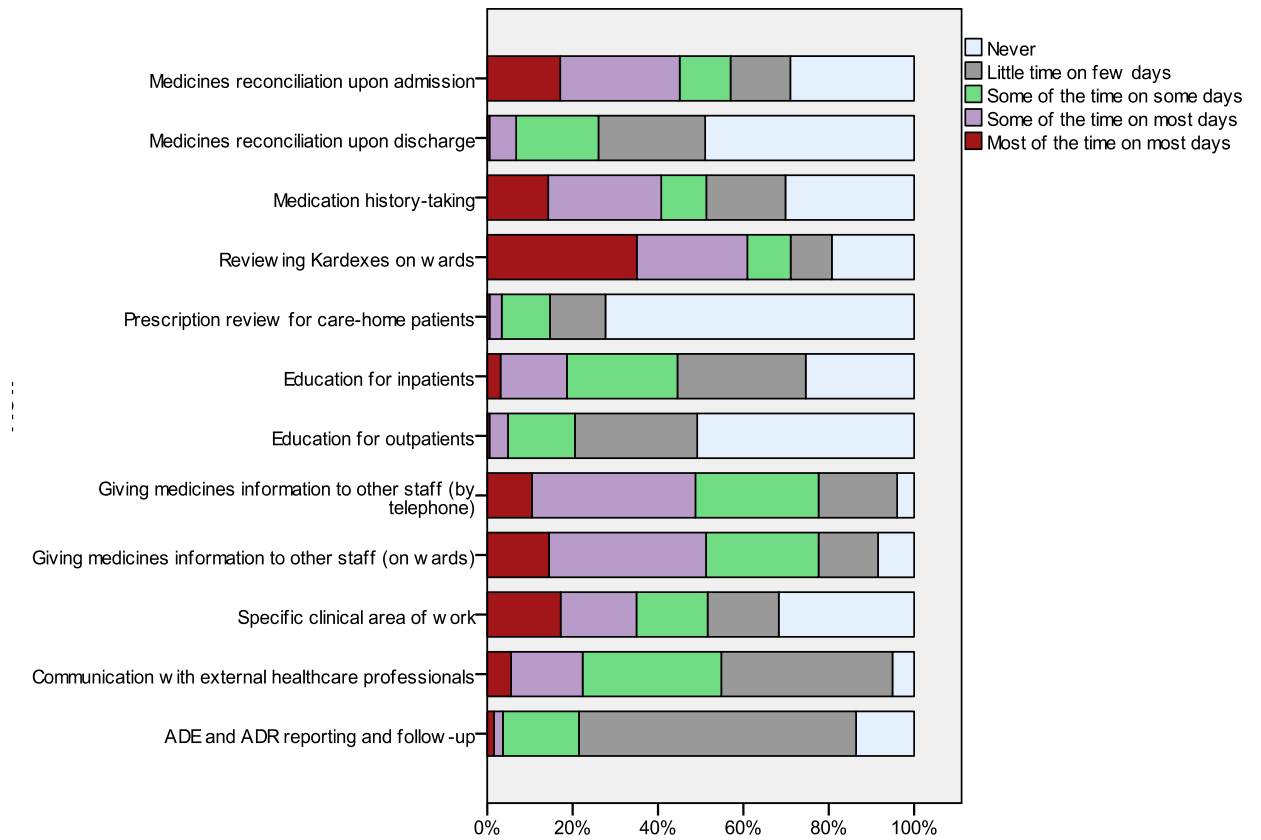## 7.2   Pharmacist Survey Findings

### 7.2.1   *Time-spend on Pharmacy Activities*

Respondents were asked to consider their typical week and to estimate how much time they spent on a range of pharmacy activities. The following four graphs indicate their answers:
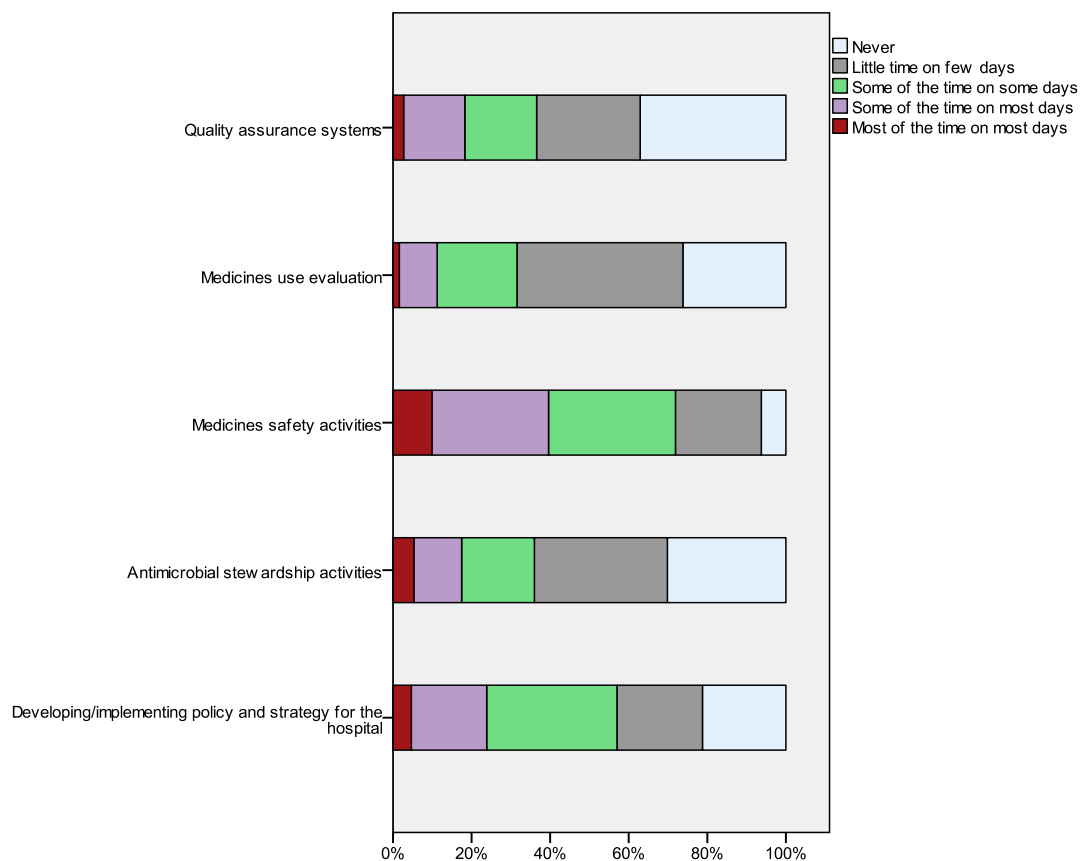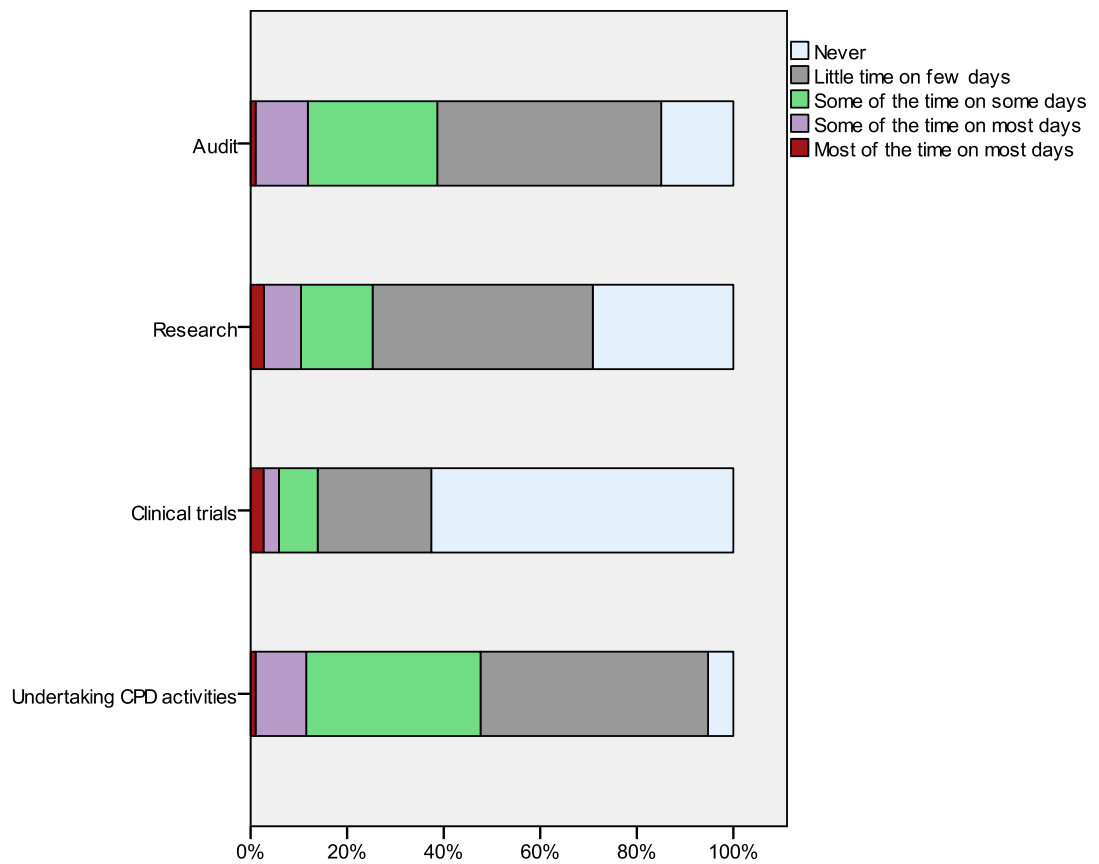
**Distribution Activities**

## Clinical Activities



Legend:
- Never
- Little time on few days
- Some of the time on some days
- Some of the time on most days
- Most of the time on most days

Categories (top to bottom):
- Medicines reconciliation upon admission
- Medicines reconciliation upon discharge
- Medication history-taking
- Reviewing Kardexes on wards
- Prescription review for care-home patients
- Education for inpatients
- Education for outpatients
- Giving medicines information to other staff (by telephone)
- Giving medicines information to other staff (on wards)
- Specific clinical area of work
- Communication with external healthcare professionals
- ADE and ADR reporting and follow-up

## Strategic Activities



Legend:
- Never
- Little time on few days
- Some of the time on some days
- Some of the time on most days
- Most of the time on most days

Categories (top to bottom):
- Quality assurance systems
- Medicines use evaluation
- Medicines safety activities
- Antimicrobial stewardship activities
- Developing/implementing policy and strategy for the hospital

**Research and Development Activities**

### 7.2.2 Area of Specific Clinical Expertise

We asked pharmacists to identify whether they were engaged in an area of specific clinical expertise[5], either currently or previously. 71% were either currently or previously working in such an area.

**Engaged primarily in a specific area of clinical expertise**
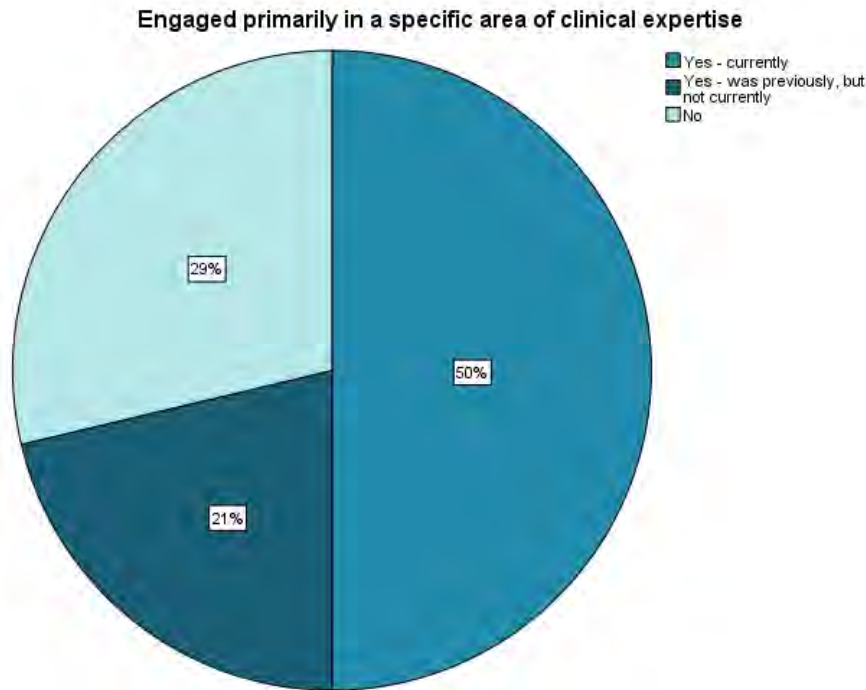


We also asked if they had formal qualifications or had engaged in further study in areas of specific clinical expertise. The chart below summarises the responses:



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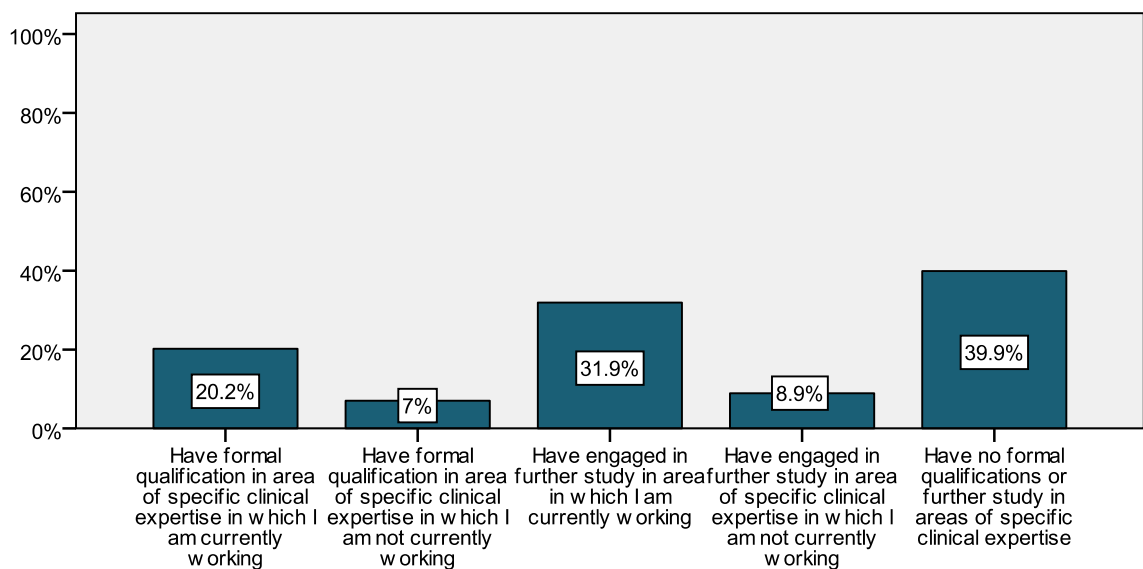
[5]    In the absence of formally recognised "specialist pharmacist" titles, we used the term "area of specific clinical expertise" in the survey for what is informally known as a specialist pharmacist role.

As can be seen in the discussion in the Site Visit section below, there is a general call among pharmacists for formal definition, recognition, and accreditation of "specialist pharmacists", which would be clearly delineated in terms of competencies, skills, qualifications, and role.

## 7.2.3 Appraisal

82.5% of respondents said they had no formal appraisal; of those that had such appraisals, 57% were asked about CPD as part of this appraisal.

## 7.2.4 Perceptions about Workforce

We asked pharmacists to what extent they agreed with the following statements.

- We have enough pharmacists to comfortably provide our services from this hospital pharmacy department (most strongly disagreed or disagreed with this);

- We have enough non-pharmacist staff to comfortably provide our services from this hospital pharmacy (similarly, pharmacists disagreed and strongly disagreed with this statement);

- We would like to delegate more tasks to other staff (most agreed with this);

- We could benefit from more specific clinical areas of pharmacist expertise in the pharmacy (this elicited strong agreement);

- We could benefit from more use of the specific expertise already present in the pharmacy (again, most agreed or strongly agreed with this);

- There is an opportunity to significantly advance patient health and wellbeing in hospitals by changing how pharmacists, pharmacy technicians and technology resources are deployed (this was very strongly agreed with by most).
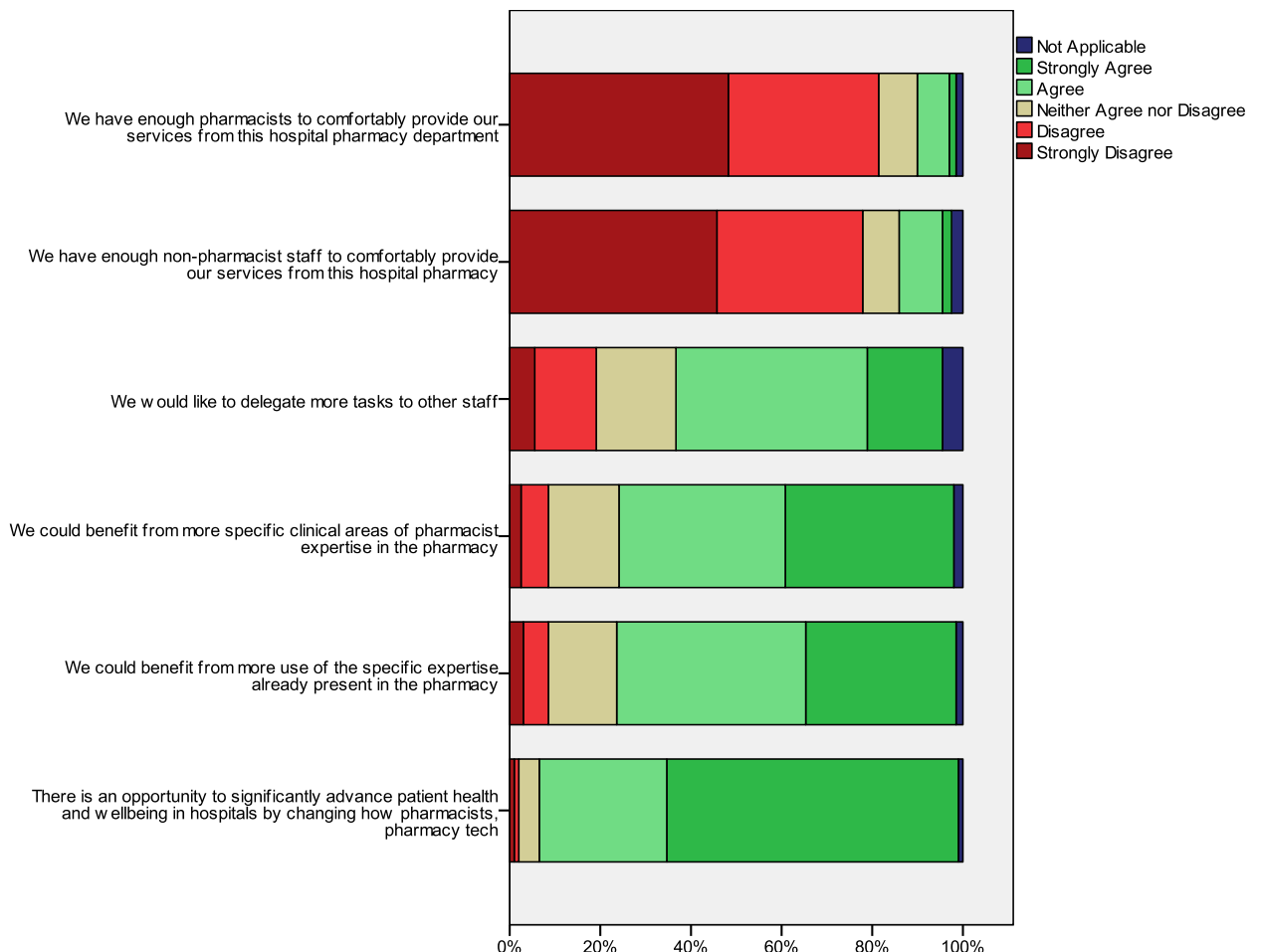
## 7.3 Site Visit Findings

### 7.3.1 *Health Service Recruitment Moratorium*

The recruitment embargo is the single biggest issue in relation to workforce for hospital pharmacies. Not one site visit interview failed to bring up the ban on recruitment as a key, if not the only, issue affecting the planning and delivery of hospital pharmacy services and patient care.

Linked to the recruitment embargo, the current demographic of mostly female, 25-40 age group within the hospital pharmacy workforce makes for a high rate of maternity leave, which creates difficulties when cover cannot be put in place.

Chief pharmacists report spending significant time on trying to manage the workforce and the services with decreasing numbers, reduced resources, and a perceived lack of support from hospital managers. Many describe the current environment as entailing a constant fight to maintain current staff numbers and continue to deliver services.

### 7.3.2 *Pharmacy Technicians*

Many pharmacists reported that their current work role tends to be very heavily geared towards routine activity related to dispensing (e.g. writing out labels, making up packs for delivery to the wards, doing physical checking of inventories, etc) and/or procurement, which could be done either by use of robotic systems or by delegation of such routine activities to pharmacy technicians or administrative/support staff.

Technicians themselves also expressed a wish to take on more duties, such as ward top-ups and supply management. It was felt that issues such as over-stocked drug cupboards on wards and medicines going out of date would be minimised with a pharmacy-driven ward supply service, undertaken by technicians.

It was felt by many people working within pharmacies – both technicians and pharmacists – that the position of Pharmacy Technician should be a registered and accredited title. This was expressed from a number of points of view:

■   That pharmacy technician qualifications would be consistent and to a certain standard;

■   That pharmacies could have confidence in the title of technician and the role and duties could be more clearly and consistently defined across hospitals;

■   That more opportunities would be available for further development, CPD, and higher qualifications for technicians;

■   That the technician role could be developed further, potentially, for example, to manage dispensing in order to free up pharmacists for clinical work.

Skill mix within the pharmacy team was a rich vein of discussion. Van dem Bemt 2011 (Netherlands) described a 29-activity framework for pharmaceutical care. There was recognition therein that any member of hospital staff could do each activity, as long as a pharmacist retained responsibility for quality. Myers (2011) describes the US context, in which there is a diversity of accreditation, training, education and roles in relation to pharmacy technicians. Myers argues for standardisation of technician training and certification, in order

to improve patient safety and free up pharmacists to focus on patient care. The ASHP Pharmacy Practice Model Summit 2011 (US) proposed a number of statements grouped under different headings. Workforce-relevant ones included:

- Advancing the use of pharmacy technicians
  - e.g. ASHP should define a scope of practice, including core competencies, for hospital and health-system pharmacy technicians

An example of innovation in skill mix was described by Knoer *et al.* 2010 (US) developed a practice model "To make sure pharmacy work is being done by the right people in a way that optimises patient care." "Technicians became the 'face of pharmacy' for nursing with respect to drug distribution." "All staff members would work 'at the top of their license'. Pharmacists' tasks were ones requiring clinical judgement and cognitive assessment." They used a model of team leader and clinical specialist. Teams of 5-8 pharmacists were created. Techs were assigned to teams according to personal interest. Technicians now had direct responsibility to the team for medication distribution. Workforce-related lessons learned were:

- Evaluate clinical skills vs. leadership skills
- Optimise the use of technicians and automation
- Be a role model

### 7.3.3   Other Support Staff

It was suggested that there could be a greater role for pharmacy aides, who could do much of the work that technicians currently do, which would allow for technicians to upskill and free up pharmacists for more clinical work.  (A pharmacy aide would generally be a support person undertaking routine activity, such as typing prescription labels, stocking the shelves, answering the telephone, taking inventories, compiling routine report, etc.) Alternatively, it was felt by many staff that there should be more administrative support for pharmacy departments.

Many chief pharmacists and pharmacists expressed frustration at the extent of the work they have to do that does not require a pharmacist qualification. Most would prefer to maximise the utilisation of the pharmacy skills and qualifications by doing clinical pharmacy work. This requires the delegation of the other work to non-pharmacist staff.

Technicians, also, mention that their role could contribute more than at present, but that this would require some of the more administrative tasks to be delegated to pharmacy aides or administration staff.

In the difficult economic times, some did suggest that instead of focusing on the need for more pharmacist-qualified staff, consideration could be given to recruiting other staff at lower grades to undertake the work that would then allow a greater proportion of pharmacist time to be devoted to clinical services.

The Society of Hospital Pharmacists of Australia (SHPA) (2011) recognised that adequate support staff must be in place to perform non-clinical functions, and that pharmacy technicians could support the clinical activities of pharmacists. Indeed, in their clinical practice standards (2005), the SHPA included a table that detailed the clinical supporting activities of technicians. For example, in the context of taking an accurate medication history, the SHPA identified that technicians could detect new patient admissions, communicate medicines supply information with other health professionals, and assist in managing the storage and retrieval of the patient's own medicines.

### 7.3.4  *Specialist Pharmacist Roles/Titles*

It was also stated that specialist pharmacist roles with registration and accreditation should be developed. This was a near-universal viewpoint, with pharmacists and chief pharmacists in agreement that the career structure needs overhauling and that specialist titles should be recognised and accredited.

> Several authors from the US reflected specifically upon leadership issues in hospital pharmacy. Zilz et al. (2004) reflected that synergy was needed between leadership and high-performance practice. "This requires leaders committed to a clear vision for excellent practice. These pharmacy leaders must continuously enhance their team's commitment to that vision, using recognised benchmarks of best practice to extend pharmacy's influence across the continuum of care." They identified the components of leadership being core self; vision; relationships; learning, and mentoring.
>
> Vermeulen et al. 2007 (US) cited the importance of the leader being strong, and well connected beyond pharmacy, in the health system.
>
> Pollard & Clark (2009) explored leadership pathways among hospital pharmacists. They found that leaders were choosing among 4 administrative degrees – MBA, Master of Health Administration, Master of Public Administration and MPH. Medication-use policy, human resource management, and interpersonal skills were the most valued skill-set to a health-system pharmacy leader. Leaders would have liked more training or experience with finance/budget management (52%), human resource management (52%), and quality improvement (41%) before accepting their first pharmacy leadership position. (n=205). On the job experience was the most common leadership pathway of current leaders.

Many commented that in the absence of specific recognition for specialist pharmacy roles, defining such work and the qualifications and experience that would be required is difficult. This can lead to inconsistency. There is also the issue that many raised, whereby some pharmacists have postgraduate qualifications in specific areas of clinical expertise, and perhaps more than ten years' experience of working in such areas, but be on the same grade as someone with a primary degree and three years' general dispensing experience and have no right to use a title that would distinguish what they do.

The issue of appropriate specialised CPD and CE opportunities for those working in areas of clinical expertise is also related: many felt that the opportunities for further learning in specific areas of clinical pharmacy expertise were limited in Ireland, and that the lack of recognition of the role of specialist pharmacist was a factor in this.

Gouveia and Shane 1997 (US) described how pharmacists in the New England Medical Center conducted patient outcomes assessments in adult neurology, psychiatry, and dialysis clinics. Their role included clinic management, development of critical pathways of care, evaluation of medication use, outcomes assessment, and co-ordination of clinical trials.

Holland & Nimmo 1999 (AUS/US) felt that a shift to pharmaceutical care emphasised the increasing professionalisation of the pharmacist. For pharmacists embracing the Clinical Pharmacy model, they felt the shift to Pharmaceutical Care was largely one of attitude. Woods et al 2011 (US) described three models of pharmacy practice in the US (see systems section): *Drug distribution-centered model DDC; Clinical-specialist-centered model CSC, and Patient-centered integrated practice model PCIP* (considered most common in the US). In PCIP, the individual pharmacist's own preferences and interests may need to be subordinate to the needs of patients and the wider department.

## 7.4   Main Messages

The head of the pharmacy service has good managerial links to the chief officers within the hospital, and pharmacists perceive that they have influence over medicines policy, but not general policy, in the hospital. Half of them are engaged in work in a specific clinical area: a significant proportion of them have formal specialist qualifications, but many of them do not. Appraisal of pharmacy staff by managers is rare. There is a strong perception among pharmacists that the workforce is inadequate for the work required, but that there is an opportunity to capitalise on existing expertise through redeployment of staff. The recruitment embargo is having a significant negative impact on hospital pharmacy teams.

# 8

# Continuing Professional Development (CPD) and Continuing Education (CE)
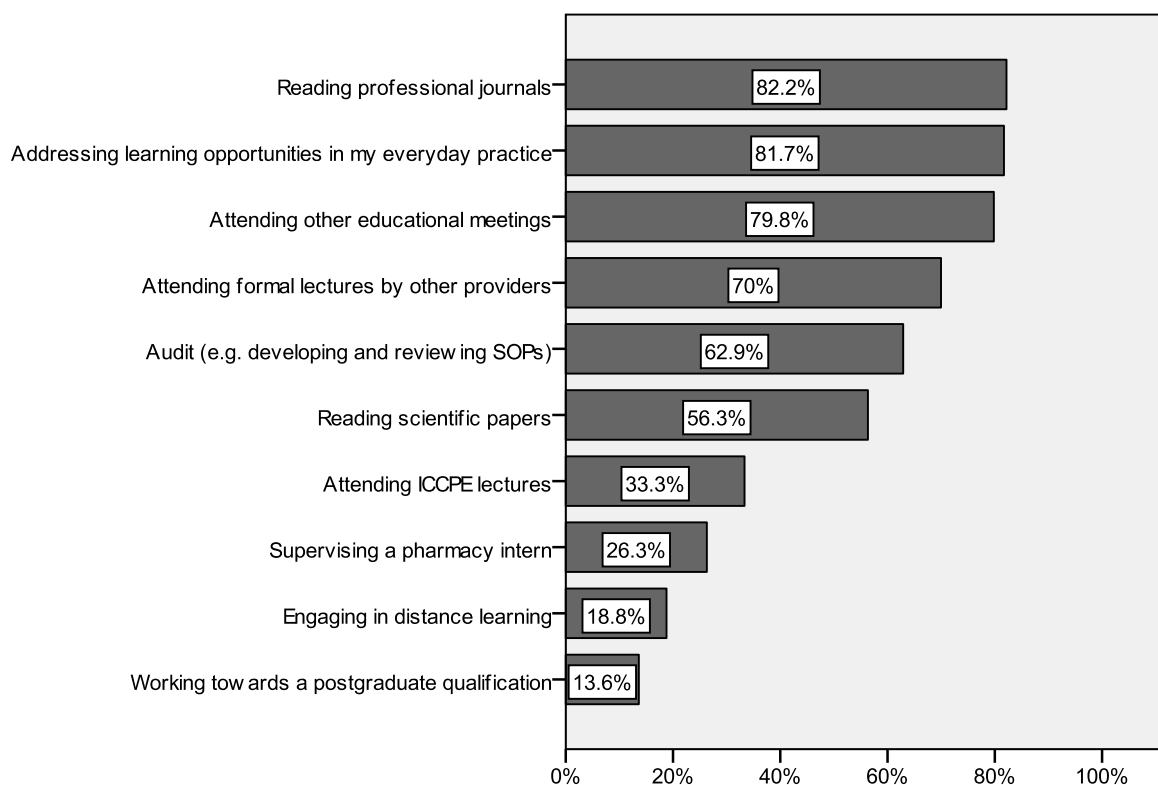
# 8 Continuing Professional Development (CPD) and Continuing Education (CE)

## 8.1 Survey Findings

Most of the findings presented here relate to the pharmacist survey; similar questions – with similar responses – were asked in the pharmacy survey. Where there are additional data from the pharmacy survey included, this is flagged as such.

### 8.1.1 Types of CPD/CE Activities Undertaken

We asked pharmacists what types of CPD (incorporating CE) activities they undertook. Most read professional journals, addressed learning opportunities in everyday practice, attended lectures, and undertook audit activities.

| Activity | % |
|---|---|
| Reading professional journals | 82.2% |
| Addressing learning opportunities in my everyday practice | 81.7% |
| Attending other educational meetings | 79.8% |
| Attending formal lectures by other providers | 70% |
| Audit (e.g. developing and reviewing SOPs) | 62.9% |
| Reading scientific papers | 56.3% |
| Attending ICCPE lectures | 33.3% |
| Supervising a pharmacy intern | 26.3% |
| Engaging in distance learning | 18.8% |
| Working towards a postgraduate qualification | 13.6% |

> Gouveia and Shane 1997 (US) reflected on the history of the term 'clinical pharmacy' and 'pharmaceutical care', and how its implementation coincided with a change in US pharmacy education to the PharmD qualification. In 1999 they called for a balance of management training in residency as well as clinical skills to meet future hospital pharmacy practice needs.

### 8.1.2   Recording CPD/CE Activity

46% of pharmacists record their CPD/CE activities. How they do so is illustrated in the following chart:
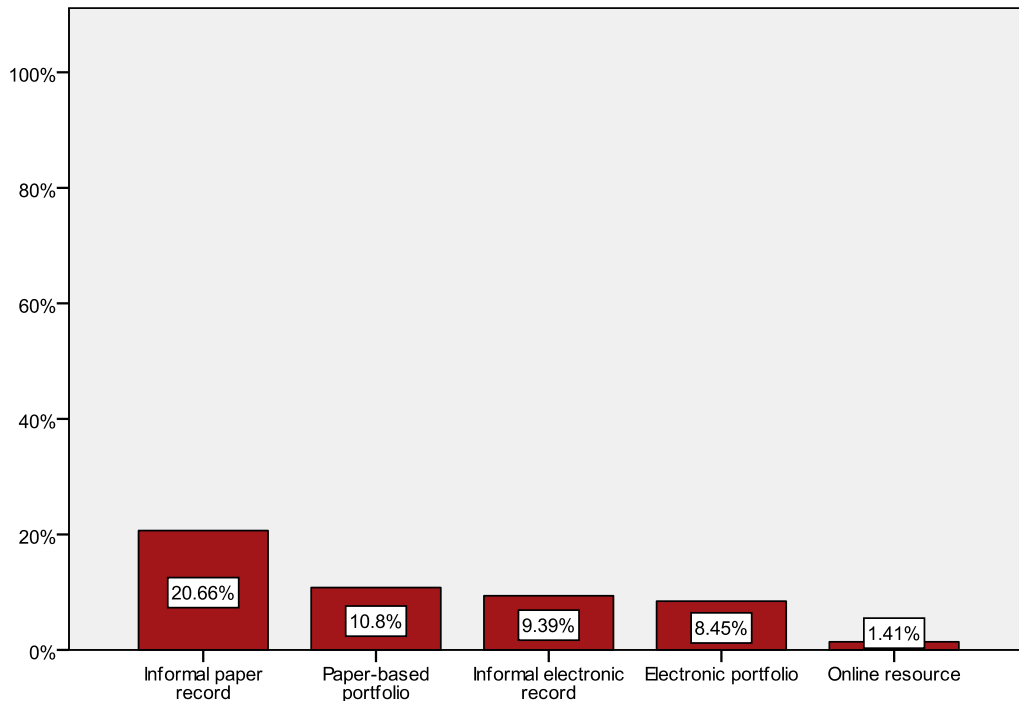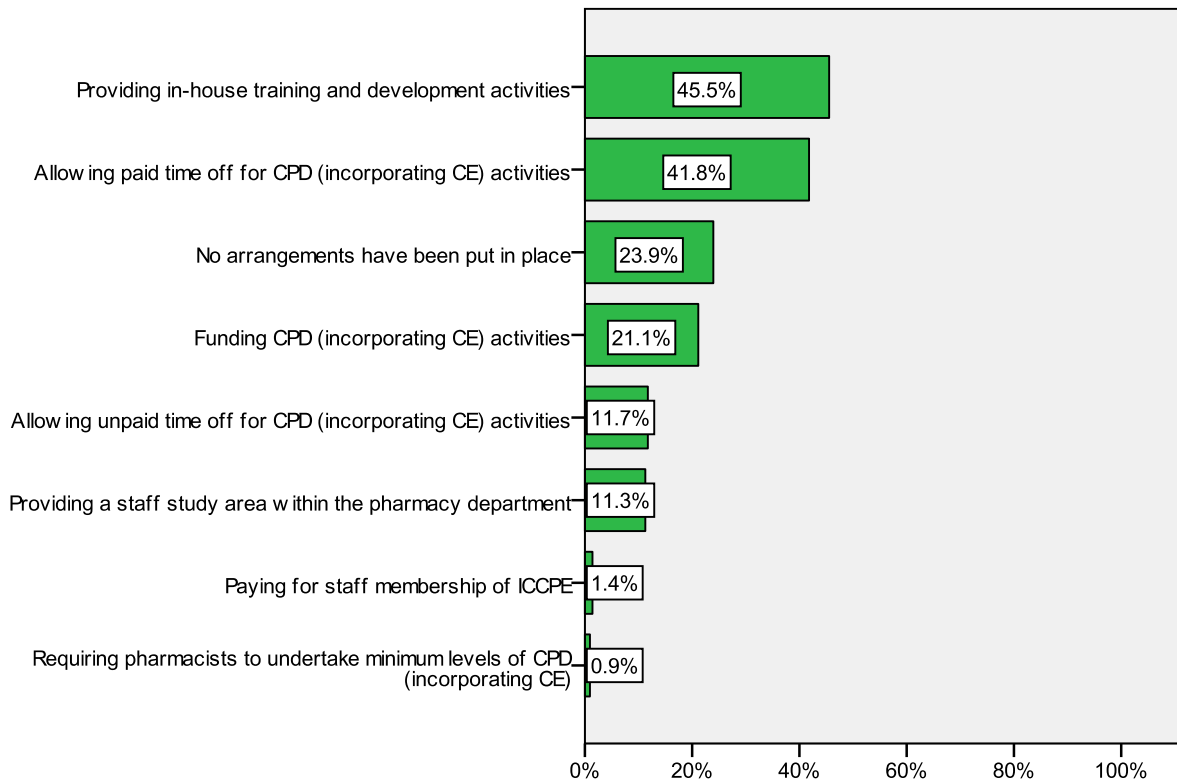


### 8.1.3   Purpose of CPD

Respondents were asked the main purpose of their undertaking CPD (incorporating CE). As can be seen in the chart below, for most it is a case of personal professional development, with many also undertaking it to deliver specific pharmacy services.



65
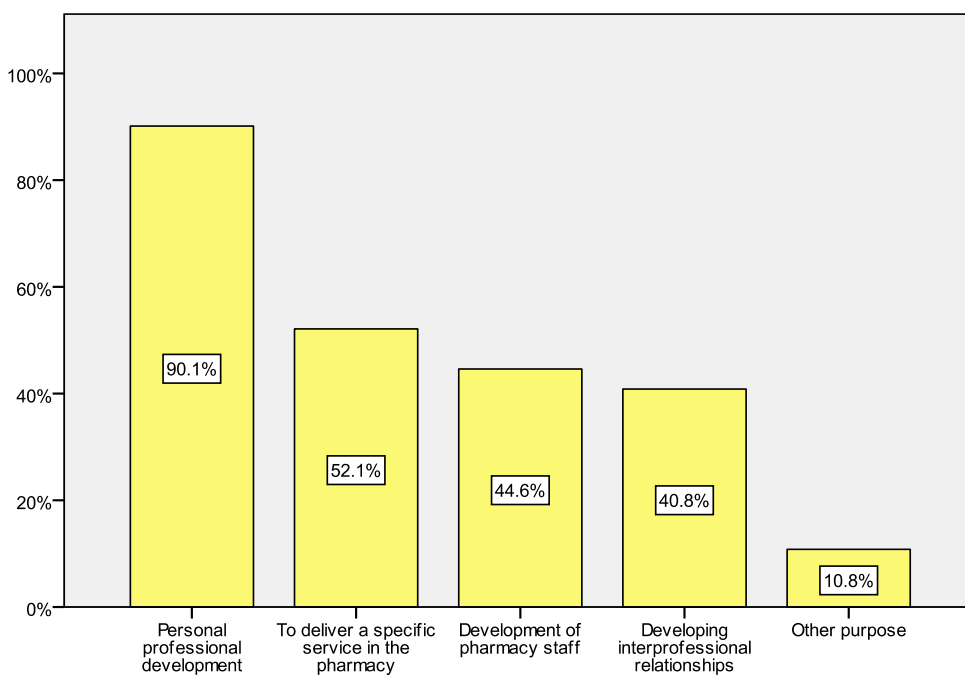
### 8.1.4   Arrangements for CPD/CE

We asked respondents what arrangements had been put in place to facilitate their CPD and CE activities. The responses are illustrated below. As can be seen, many pharmacies allow paid time off and in-house training. It's less common for the pharmacy/hospital to fund CPD/CE activities (only 21%). In nearly a quarter (24%) of cases, respondents indicated that no arrangements were put in place by their employer to facilitate their CPD/CE activities.

| Arrangement | Percentage |
| --- | --- |
| Providing in-house training and development activities | 45.5% |
| Allowing paid time off for CPD (incorporating CE) activities | 41.8% |
| No arrangements have been put in place | 23.9% |
| Funding CPD (incorporating CE) activities | 21.1% |
| Allowing unpaid time off for CPD (incorporating CE) activities | 11.7% |
| Providing a staff study area within the pharmacy department | 11.3% |
| Paying for staff membership of ICCPE | 1.4% |
| Requiring pharmacists to undertake minimum levels of CPD (incorporating CE) | 0.9% |

Nesbit et al 2001 (US) developed 3 FTE pharmacists to be 'clinical services pharmacists' CSPs serving 200 patients per day (haematology-oncology, medical-surgical intensive care, and general medicine). Candidates were selected on the basis of motivation, knowledge base, interpersonal skills and oral communication skills. They received a minimum of 80 hours formalised education and training from clinical specialists, and up to two weeks of one-to-one training from mentor for that practice area. They undertook case-based program and examinations. Their training on documentation continued until two raters agreed on CSP category assignment of interventions for more than 85%.

The cost of the program for 12 months was $187,852. Cost savings and cost avoidance for the same period from their actions was $580,511. The CSP model yielded a net benefit every month. The authors concluded that the program had potential to minimise risk, decrease cost and improve outcomes.

### 8.1.5   Courses Attended

Respondents were asked whether they attended courses by the following organisations. As the chart below illustrates, courses run by the HPAI were most popular (71%). Courses run by the ICCPE had been attended by 45% of the respondents.
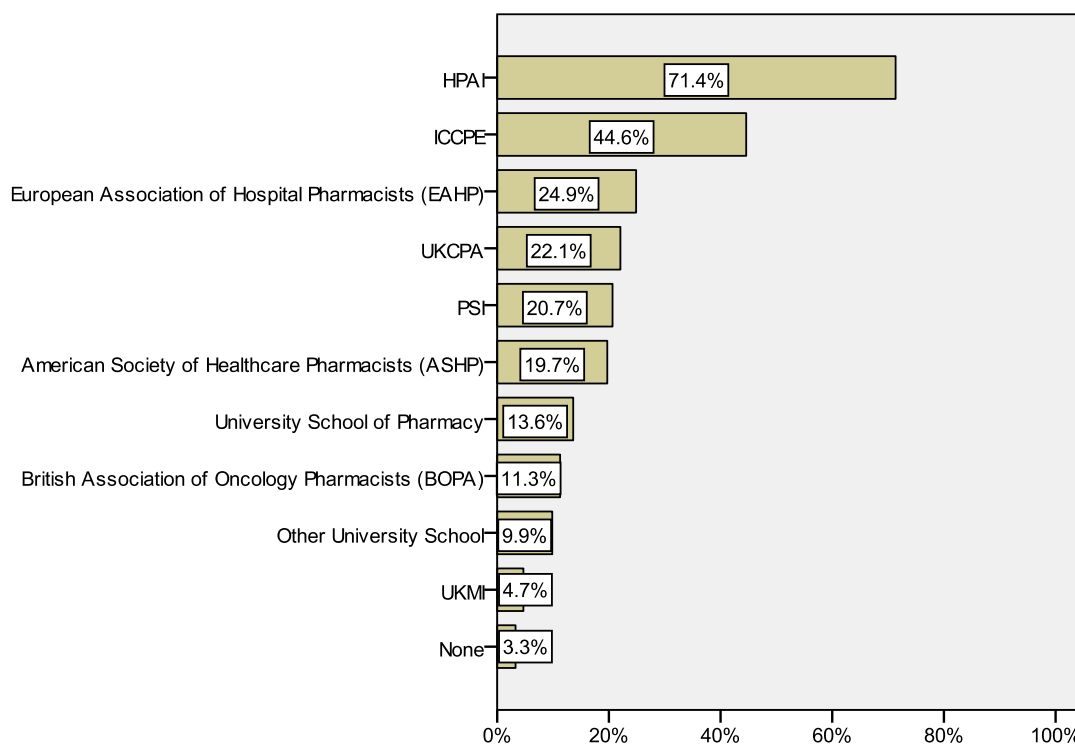


### 8.1.6   Hospital Funding Attendance

Participants were asked whether the hospital funded their attendance at such courses. 56% said the hospital did fund attendance, with 44% saying that this did not take place.

Where the hospital had funded attendance, 46.5% said this had included the course fee, 34% the travel costs, 26% the accommodation, and only 7% subsistence.

### 8.1.7   Satisfaction with level of CPD/CE

Participants were asked whether they undertook as much CPD (incorporating CE) as they would like to or as they considered appropriate. 44% felt they did not undertake as much as they would like, with 39% considering that they did do as much as they would like, and 17% unsure.

**Do you undertake as much CPD (incorporating CE) as you would like or consider appropriate?**

■ Yes
☐ No
☐ Not sure

16.9%

39.0%

44.1%
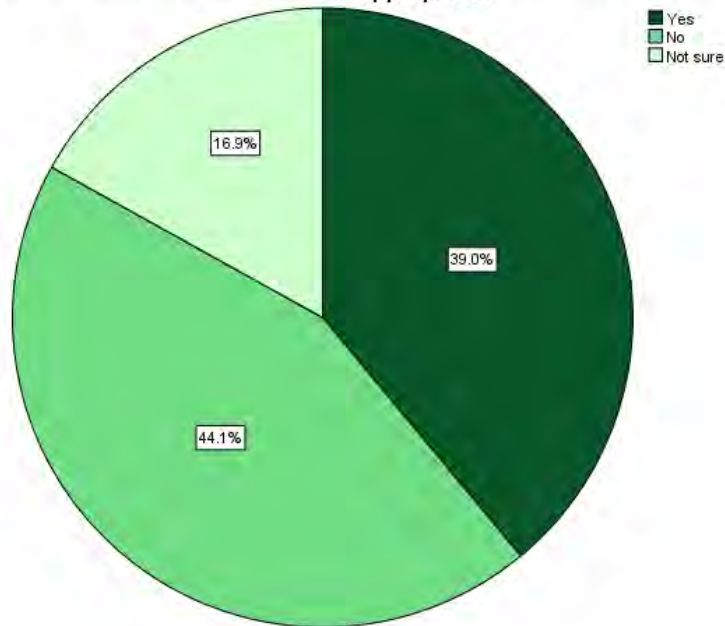
### 8.1.8  CPD Enablers and Barriers

We asked the respondents to tell us what would facilitate them to take on more CPD (incorporating CE), and also to tell us what hindered them from doing as much CPD/CE as they would wish to undertake.

**Enablers**

| | |
|---|---|
| Availability of an enhanced range of topics that meet practice needs | 35.7% |
| More access to online or technology-based learning methods for CPD (incorporating CE) | 34.7% |
| Greater frequency and more convenient range of times for CPD (incorporating CE) activities | 34.7% |
| More opportunities to engage in interprofessional learning with other healthcare professionals | 29.1% |
| Availability of CPD (incorporating CE) activities closer to pharmacy location | 29.1% |
| Understanding what workplace activities can constitute appropriate CPD (incorporating CE) | 21.6% |
| Different staffing rosters in the pharmacy to free up time | 17.8% |
| Greater availability of locum cover | 12.2% |
| Other | 8% |

0%   20%   40%   60%   80%   100%

As can be seen above, pharmacists would like to see more availability of CPD/CE, in terms of frequency, proximity, and timing, more access to online learning opportunities, enhanced range of topics, and more opportunities to engage in inter-professional CPD/CE activities.

**Barriers**
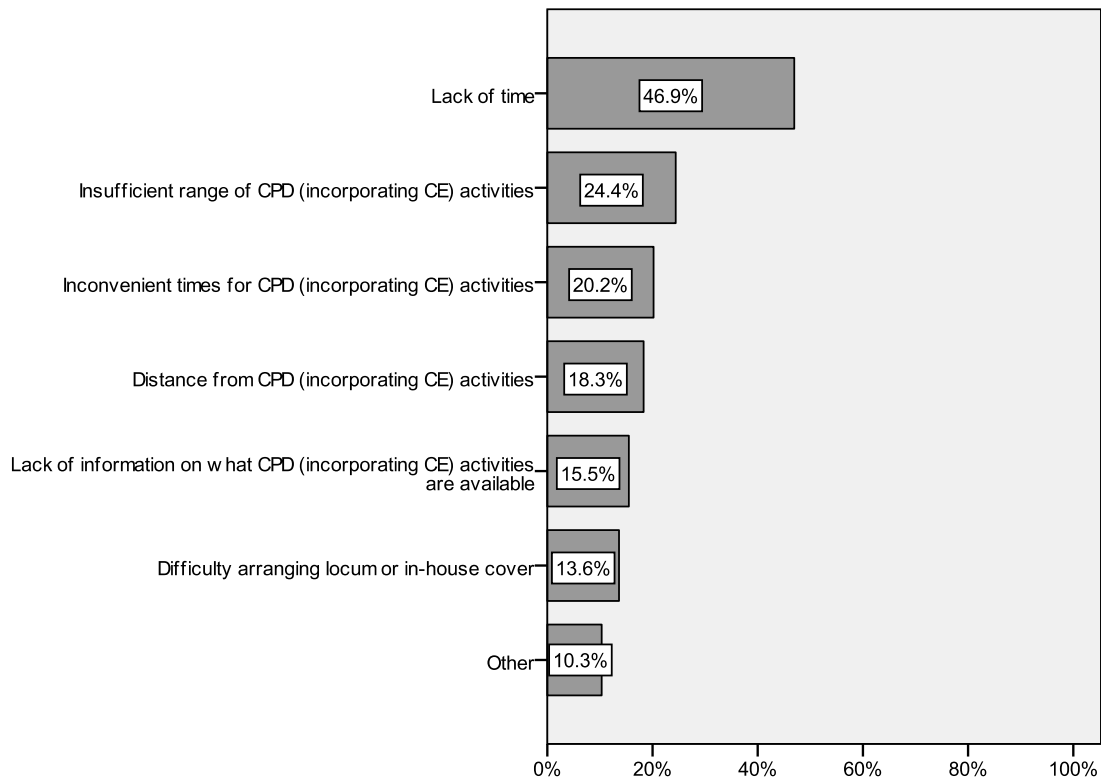


The main barrier identified is lack of time. It can be seen that the enablers identified focus on ways to address this, such as online learning, greater range of times to access CPD/CE activities, and such activities closer to pharmacists' locations.

## 8.1.9   *Inter-professional CPD/CE Activities*

57% of respondents indicated that they had engaged in inter-professional CPD activities. These included participation in Grand Rounds in hospitals, journal clubs, teaching new staff members – both nurses and junior doctors – attending lectures, and participating in multidisciplinary team meetings.

We also asked whether pharmacists were involved in the training of any of the following groups (illustrated in the chart below). As can be seen, pharmacists are relatively active in training of other staff groups, as well as student pharmacists.

Pharmacy interns — 47.9%
Post-qualification nurses — 34.3%
Junior medical staff — 33.3%
Undergraduate pharmacists — 33.3%
Postgraduate pharmacists — 29.6%
Student pharmacy technicians — 28.2%
Undergraduate medical students — 13.6%
Not involved in any training — 13.6%
Undergraduate nursing students — 11.3%
Nurse prescribing students — 10.3%
Consultant medical staff — 9.4%
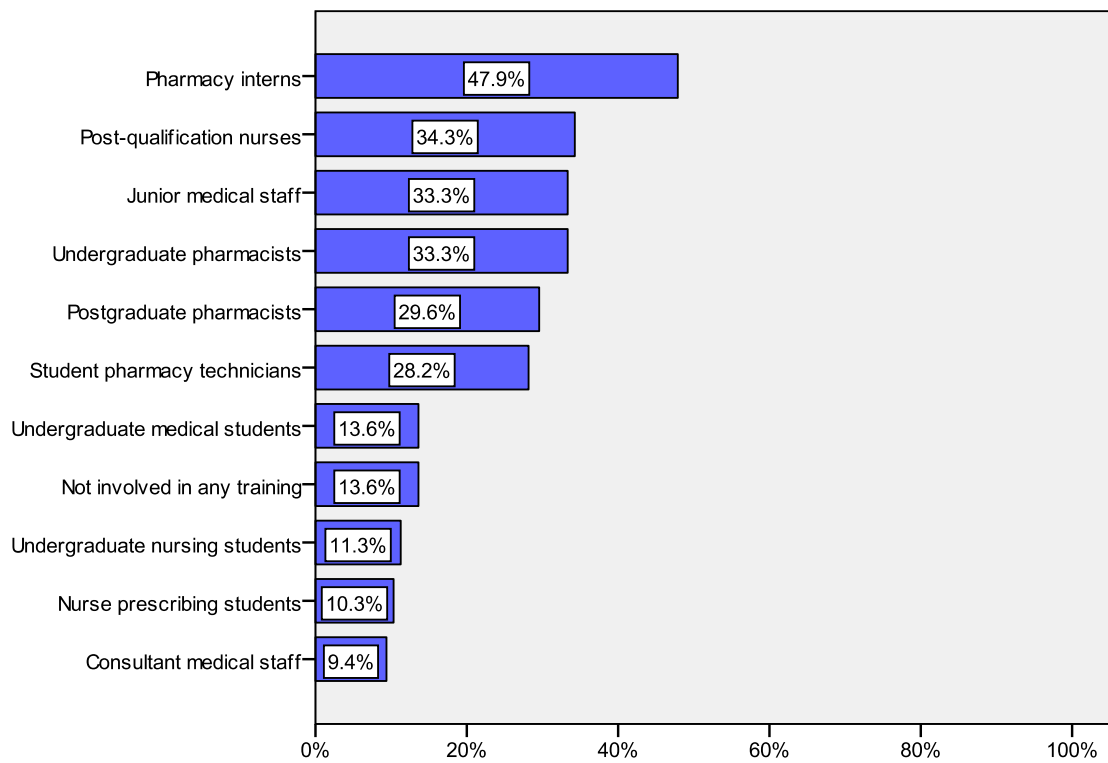
### 8.1.10 Audiences for Presentations (Pharmacy Survey)

We asked participants what audiences pharmacy staff had made presentations to in relation to aspects of practice. The responses are illustrated below:



Hospital medical staff — 78.3%
Hospital pharmacy staff — 76.1%
Hospital nursing staff — 65.2%
Hospital administrative staff — 45.7%
National pharmacy audience — 43.5%
National multi-disciplinary audience — 34.8%
International pharmacy audience — 26.1%
None — 10.9%
International multi-disciplinary audience — 8.7%
Other audiences — 4.3%
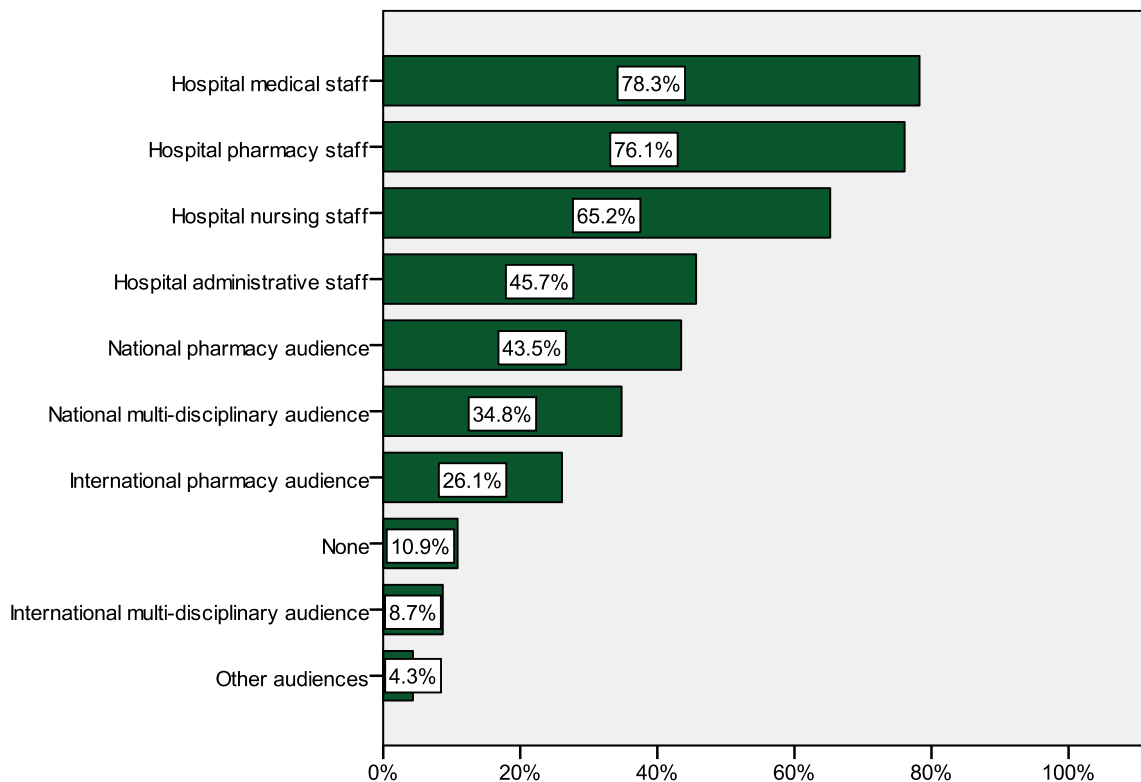
### 8.1.11 Affiliated Organisations for Training (Pharmacy Survey)

Respondents were asked what organisations the hospital pharmacy department was affiliated with for the purposes of training. The graph below outlines the responses, with the highest number of responses indicating affiliation with a university medical school.
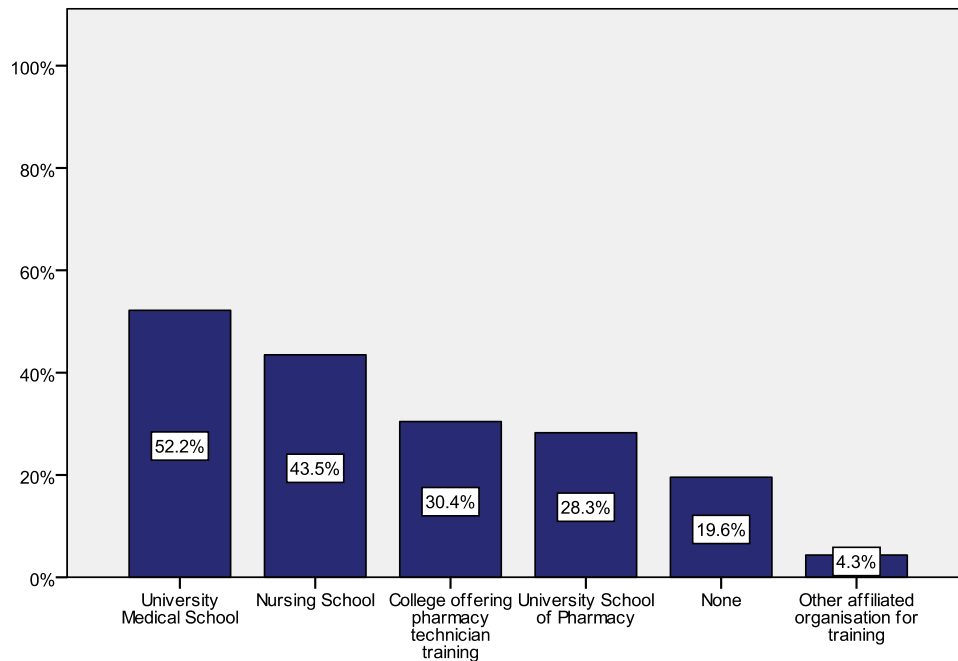


### 8.1.12 Training to Other Groups

We asked the respondents what groups pharmacy staff were involved in providing training to. The responses are illustrated in the following chart:
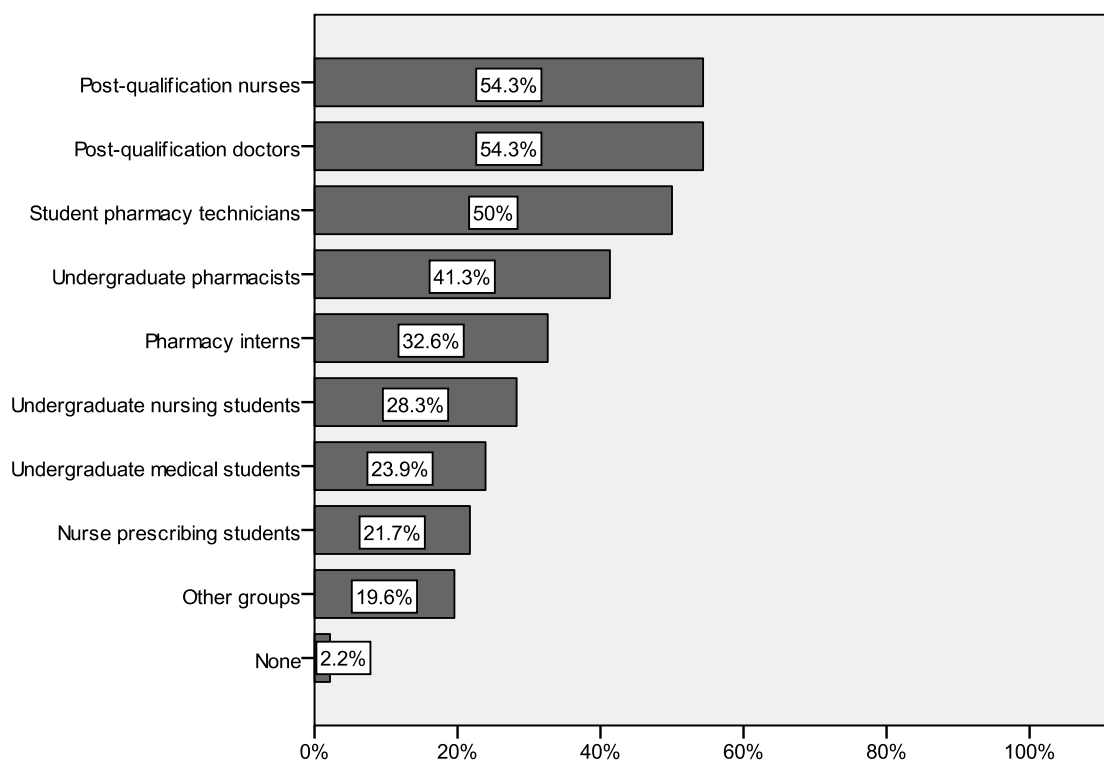
### 8.1.13 Audit and Practice Research

Participants were asked whether they had undertaken clinical audits, practice research projects, or clinical trials within the past year. Audit was the most common activity, with just over 50% of respondents indicating they had undertaken clinical audits within the last year.
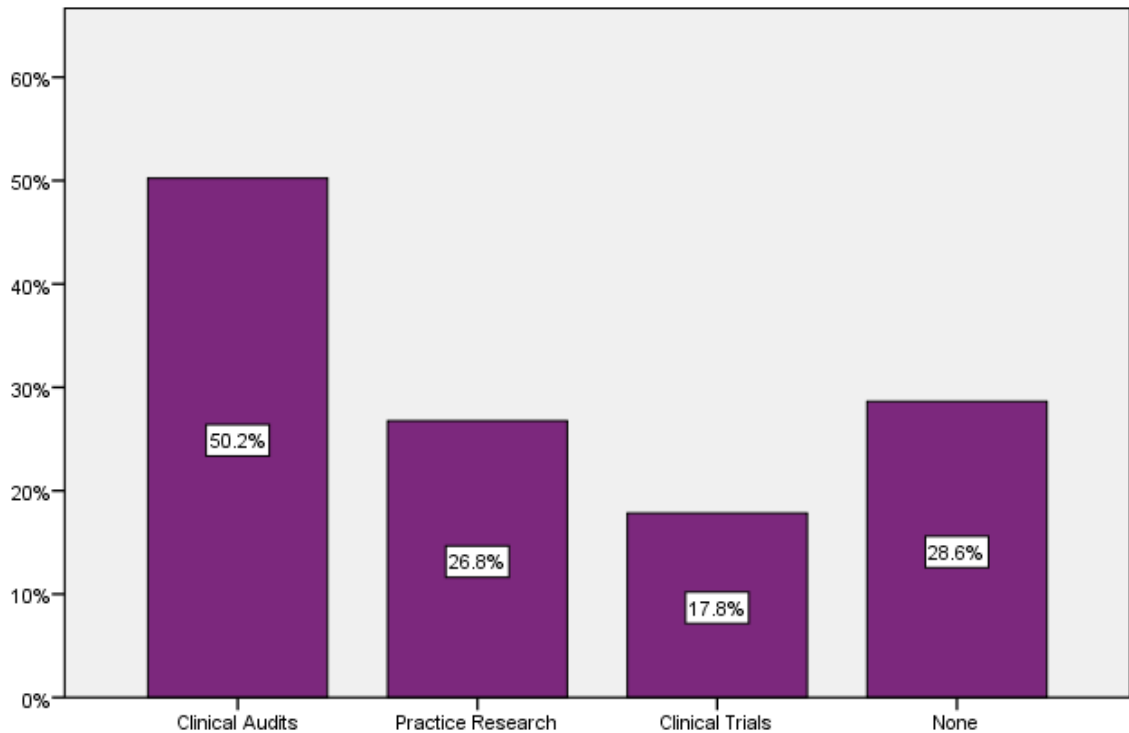


Pharmacists' involvement in research was mentioned in a few articles. The EAHP 2005 survey found that pharmacists from half of the responding hospital pharmacies were involved in research with inpatients, and from one-quarter of responding hospital pharmacies with outpatients. The highest percentage of pharmacist involvement with inpatient research was in Dutch (96%) and Danish pharmacies (80%), and with outpatients in Dutch (70%) and Spanish pharmacies (67%). LeBlanc & Dasta 2005 found that 37.8% of their global hospital respondents had pharmacists involved in research.

### 8.1.14 Perceptions about CPD/CE

Pharmacists were asked their opinion on the following statements:

- There is a good choice of CE courses available nationally for hospital pharmacists (considerable disagreement with this);
- There are many externally funded CPD opportunities for staff (again, mostly this was disagreed with);
- There are many in-house CPD opportunities for staff (many agreed, but on balance still a negative response);
- There is a need for pharmacists to develop more focused expertise in specific clinical areas in this hospital (agreement with this);

■ Staff here have many opportunities to develop high levels of expertise in specific clinical areas of hospital pharmacy practice (split opinion);

■ Staff here have many opportunities to develop high levels of expertise in general hospital pharmacy practice (split again, but a good deal of agreement);

■ We have the right mix of skills and qualifications among our staff to provide our current services (most agreed with this).
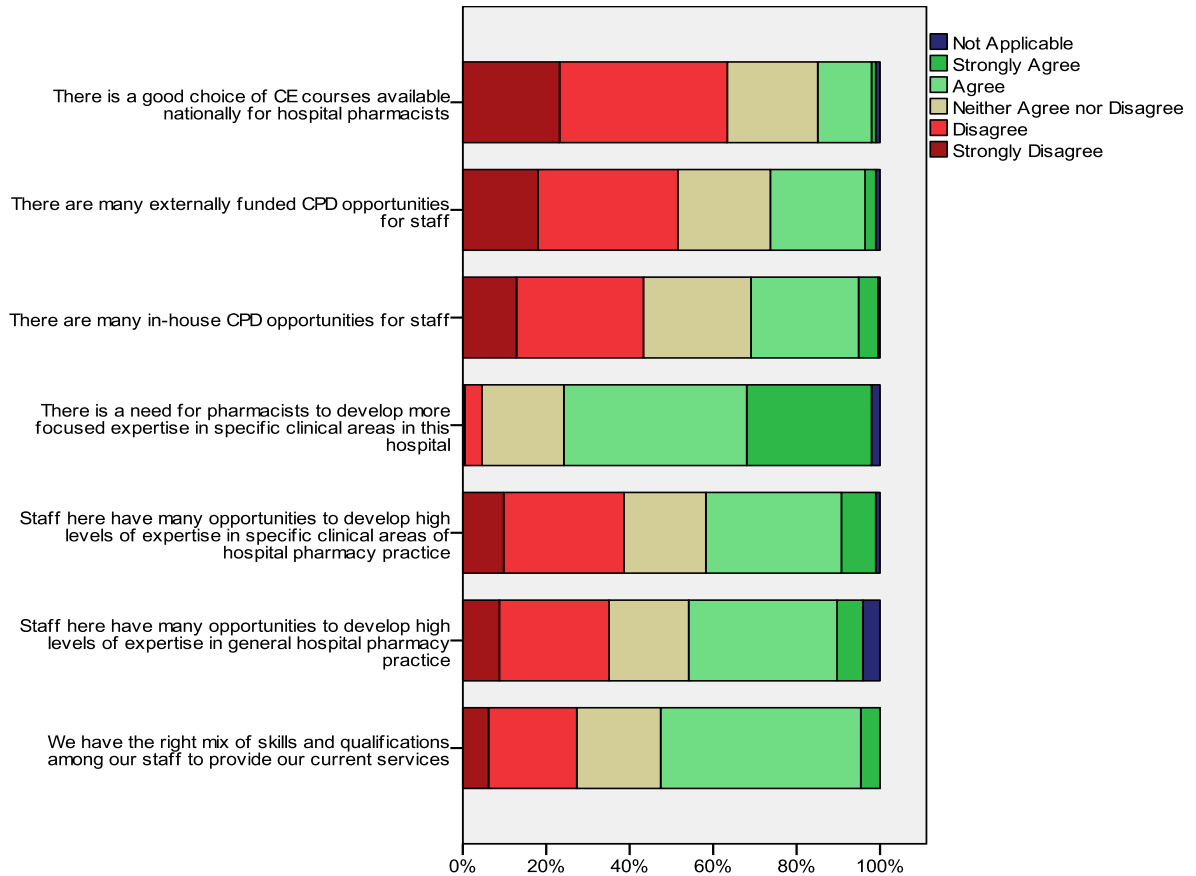
## 8.2    Site Visit Findings

### 8.2.1    *Variations across Hospitals*

There was a clear difference in the level of further education and CPD undertaken in hospitals with different cultures and attitudes to further learning. In some hospitals, it appeared that pharmacy staff did not perceive significant value in pursuing, for example, postgraduate qualifications, because they would have to fund the course themselves and felt there would be no opportunity for advancement once the qualification was obtained. In other departments, in contrast, it was clearly ingrained in the culture that all pharmacists would be expected to obtain a postgraduate qualification and that further learning and study are considered an integral part of the job.

### 8.2.2    *Lack of Hospital Pharmacy CPD*

It was widely stated that there are not enough opportunities for hospital-specific CPD and in particular for areas of specific clinical expertise. Although the ICCPE runs lectures, these were noted by a significant number of hospital pharmacists as geared towards pharmacists working within the community sector (as is the remit of ICCPE); therefore much of the content is less relevant to those working in the hospital pharmacy sector.

The HPAI provides some opportunities for CPD (e.g., through its conference, annual study day, special interest groups, etc) but a number of pharmacists reported that they were unable to avail of these opportunities as they are not members of the IMPACT trade union (membership of which is a precondition before hospital pharmacist can apply for membership of the HPAI), which was felt to be an unnecessary impediment.

The lack of learning opportunities is most acute in particular specialties and sub-specialties. There are many hospitals in Ireland that are the single site for particular specialties, or are one of only two or three such centres, and this makes the number of pharmacists working in these areas small and consequently ill-served by learning opportunities for CPD to maintain their knowledge and skills.

Nimmo & Holland 1999 (US) described professional competencies required by 5 practice models – drug information, self care, clinical pharmacy, pharmaceutical care, distribution.

"Professional competence in any of the practice models is defined as the sum of skills, professional socialisation, and judgement rooted in experience pertinent to the model."

"Professional competence equation" – is the sum of these parts:

| Skills | Professional socialisation | Judgement |
|---|---|---|
| Psychomotor<br>Problem solving | Attitudes<br>Values | Practice with feedback<br>Reflection on practice |

### 8.2.3 Lack of CPD Opportunities for Technicians

There appear to be minimal, if any, opportunities for CPD for pharmacy technicians. The absence of a recognised and accredited pharmacy technician title is a factor in the lack of formal CPD and CE activities for technicians to undertake. Most technicians would welcome more opportunities to pursue CPD, as part of the overall desire to upskill and develop the technician role to support pharmacy activity.

Many of the technicians we spoke to, especially those working in hospitals with a strong continuing learning culture, had undertaken CPD courses in the UK, in most cases having had to travel to do so. Some hospitals allowed technicians with specific training to undertake more advanced work, with hospital-specific procedures approved in advance. However, such technicians could not take such accreditation to another institution, as it would not be recognised.

### 8.2.4 Compulsory CPD

It was felt by stakeholders within hospital pharmacies that there should be minimum levels of CPD set down as a condition of professional registration. Pharmacists would welcome more CPD opportunities, along with clear guidance on how to record and score learning opportunities in everyday practice, along with other CPD and CE activities.

> The UKCPA (UK) has described the Advanced Consultant Level Framework ACLF (6 clusters of competencies) and General Level Framework GLF (4 clusters of competencies). These frameworks can be used by pharmacists in all sectors. Each cluster has three levels of advancement – foundation, excellence and mastery.

### 8.2.5 Online Learning

More online learning opportunities would be welcomed; hospital pharmacists commented on the difficulty in accessing CPD and CE learning opportunities, especially as most are in the evenings, outside working hours, and therefore impact on family and other commitments. CPD and CE activities that could be accessed online would provide opportunities for learning at times that suit the pharmacist. This might also allow for access to more specialised modules for those in highly specialised clinical areas, as discussed above.

## 8.3 Main Messages

> Most pharmacists were doing CPD/CE, and a significant number were recording their activity. There were differing perceptions among pharmacists regarding whether they were doing enough CPD/CE ('enough' being from their own estimation). There was agreement that opportunities and choice of CPD/CE activities were very limited, especially for specialist areas of practice.
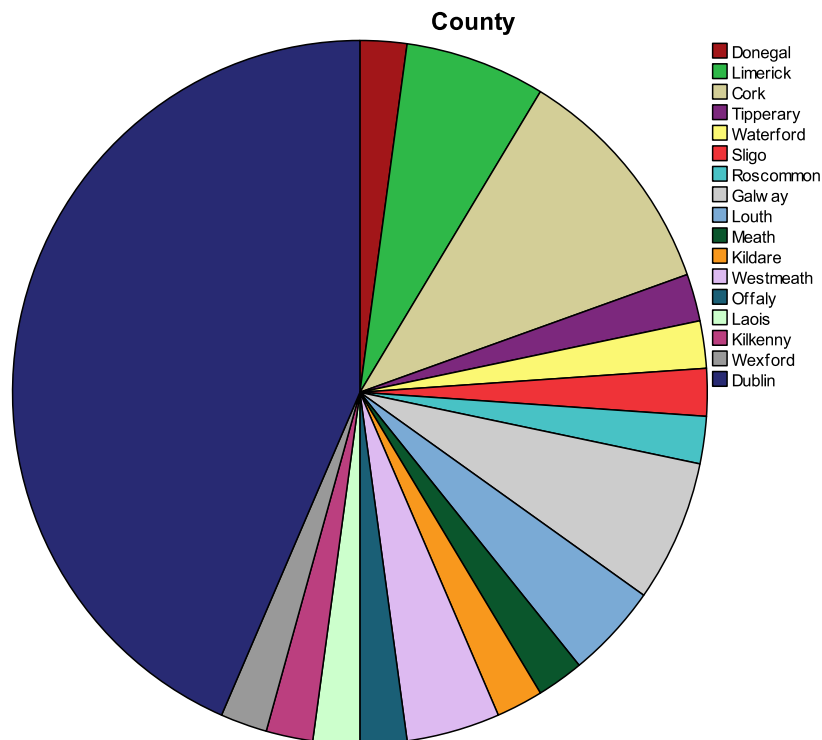
# 9

# Premises/Setting

# 9 Premises/Setting

## 9.1 Pharmacy Survey Findings

### 9.1.1 County

The majority of respondents to the pharmacy survey, obviously, were from Dublin, reflecting the greater number of hospitals in that city.
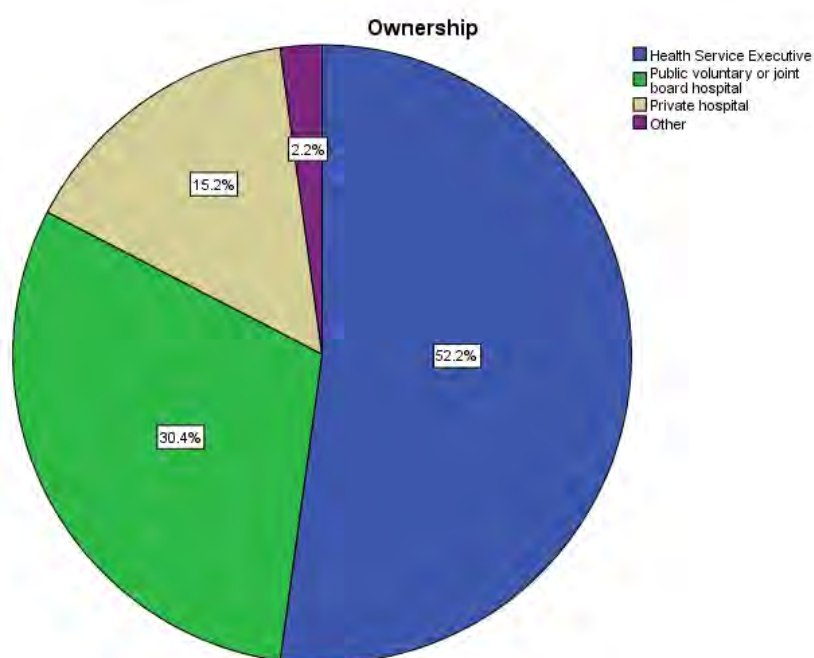


### 9.1.2 Location

Most responses indicated that the hospital was in a city (65.5%) or large town (17.4%). Again, the dominance of city and large-town locations reflects the tendency to locate acute hospitals in such urban centres.

### 9.1.3 Ownership

We asked about the ownership of the hospital: whether it was a HSE-owned, public voluntary, or private hospital. Just over half, as the chart below indicates, were HSE hospitals, with a further 30% public voluntary hospitals and 15% private.

Ownership



52.2% Health Service Executive
30.4% Public voluntary or joint board hospital
15.2% Private hospital
2.2% Other

### 9.1.4 Bed Numbers

Respondents were asked about the number of beds in the hospital. The table below outlines the average, minimum, maximum, and total bed numbers in the responses.

| | Average | Minimum | Maximum | Total |
|---|---|---|---|---|
| **Total Inpatient Beds** | 264.8 | 30.0 | 875.0 | 11386.0 |
| **Day-case Beds** | 30.1 | 2.0 | 100.0 | 993.0 |
| **CCU / ICU Beds** | 14.3 | 2.0 | 60.0 | 342.0 |
| **HDU Beds** | 7.3 | 2.0 | 25.0 | 110.0 |
| **Neonatal ICU Beds** | 19.2 | 2.0 | 50.0 | 250.0 |
| **Long-term Residential Beds On-Site** | 112.2 | 20.0 | 463.0 | 1010.0 |
| **Off-site Beds Served by Hospital Pharmacy** | 174.8 | 15.0 | 600.0 | 3147.0 |
| **Other Beds** | 45.7 | 3.0 | 110.0 | 137.0 |

In the European Association of Hospital Pharmacists (EAHP) 2010 survey (Frontini et al., 2012), 1283 hospitals responded from 30 countries (including Ireland). Key findings regarding the pharmacy environment/premises were that the average number of beds in complete hospitalisation served by the pharmacy in 2010 was 606, which represented a slight decrease from 2005. the average number of beds served by one pharmacy had not changed since 2005, but there was a decrease in complete and an increase in partial hospitalisation. Hospital pharmacies which served the largest number of beds were in Denmark (2974), Germany (1566), the UK (1310), Luxembourg (1249), Austria (1203) and the Czech Republic (1115).

### 9.1.5 Plans to Move or Develop the Pharmacy Service

91% of respondents indicated there was no plan to move or develop the pharmacy premises.

### 9.1.6 Opening Hours

We asked participants how many hours the pharmacy department was open on weekdays and weekends. The average was 7.25 hours on weekdays, with the most common response being 7 hours per weekday. The table below indicates the responses for the different days.

|  | Average* | Mode* | Minimum | Maximum |
|---|---|---|---|---|
| No. of hours open on weekdays | 7.25 | 7.00 | 0.00 | 10.00 |
| No. of hours open on Saturdays | 0.41 | 0.00 | 0.00 | 6.50 |
| No. of hours open on Sundays | 0.09 | 0.00 | 0.00 | 2.00 |
| No. of hours open on public holidays | 0.16 | 0.00 | 0.00 | 3.00 |

*\*Average refers to the mean average, that is, the sum of the responses divided by the number of responses; mode refers to the most common answer to the question posed.*

The EAHP 2005 survey noted that, on average, hospital pharmacies were open 12 hours a day from Monday to Friday, which was on average 3 hours (33%) more than in the year 2000. On Saturdays, hospital pharmacies on average were open for 4 hours, which was 1 hour more than in the year 2000; and on Sundays they were open for 3 hours, which was 1 hour more than in the year 2000, resulting in an increase of 33% and 50%, respectively.

In Canada (HPIC Report, 2009/10), ninety-eight percent (155/158) of all respondents reported that the pharmacy was closed for a period of hours each day. This was essentially unchanged from 2007/08. One respondent in British Columbia, one in the Prairies, and one in Ontario reported that the pharmacy was open 24 hours a day.

### 9.1.7 Out-of-Hours Arrangements

Respondents were asked about services available outside the formal opening hours. Nearly half indicated that there were no out-of-hours services, with 17.4% indicating an on-call system was in place. Many (43.5%) said there were other out-of-hours arrangements.
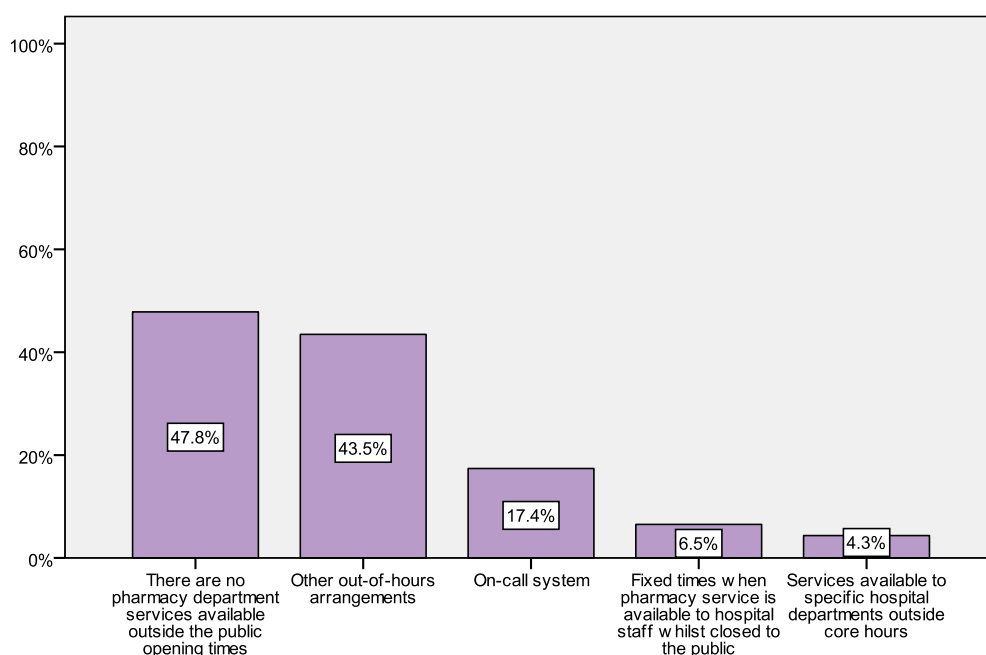
On-call systems in place, for those who indicated there were some, are either formal (57.1%) or informal (42.9%; this refers to a system where staff call pharmacists on mobiles with queries but not on a formal rota basis).

The EAHP 2005 survey also reported that, on average, less than 40% of the European hospital pharmacies provided a 24-hour on call service. This means nearly 10% less hospitals than shown by the 2000 survey. In Denmark and in the Netherlands hospital pharmacists are available around the clock in all hospitals participating in the survey, in Greece the 24-hour on call hospital pharmacy service was reduced by 14 %. The 2005 survey demonstrated that that the 24-hour on call service of a pharmacist is provided by 8-15% more hospitals in Austria, Germany, Hungary and Switzerland compared to the previous survey.

## 9.2   Site Visit Findings

### 9.2.1   *Premises – Space*

Premises are generally small, cramped, overcrowded, and appear to be unfit for any further development of pharmacy services. In many sites, there is insufficient space for existing services to operate without difficulty. For example, little or no space for staff belongings, storage space issues, lack of suitable space for extemporaneous compounding, restricted (or non-existent) aseptic units, inadequate workspace for the staff, and so on.

Most pharmacy staff expressed deep dissatisfaction with the premises they work in. Many were concerned about its impact on existing services and felt strongly that further service development was inhibited by the size and layout of existing premises.

### 9.2.2   Consultation Areas

Few of the sites we visited had installed consultation areas in line with the 2008 regulations. There were several reasons for this:

■ No space to install a consultation area: as discussed above, most pharmacy departments have inadequate space for current services, and there is no physical space to install a consultation room and/or to do so would entail sacrificing some other, more crucial, working areas.

■ Inability to install one according to the regulations: related to the first point, in many pharmacy departments, there is either no public/staff "shop" or counter, off which a consultation area could be installed, or there is no way to install one where there is such a public/staff interface.

■ No requirement to counsel patients in the hospital pharmacy: most of the sites we visited have no patient contact in the pharmacy department whatsoever. Patient counselling takes place on wards and in clinics, not at the pharmacy premises. Therefore, a consultation area would never be used and is perceived as a waste of money.

■ Lack of funding to install a consultation area: as discussed in a number of contexts, pharmacy department budgets, along with those of all involved in the health services, are under severe pressure. There is no extra money available to put consultation rooms in place, and no appetite to divert funding from frontline service provision to do so.

■ Lack of authority to commission a consultation area: in common with a number of issues of concern to Superintendent Pharmacists, the obligations placed on them under the provisions of the Pharmacy Act cannot in some cases be fulfilled, because they are employees and do not have a mandate to authorise, for example, capital expenditure and physical changes to the hospital premises.

### 9.2.3   Workstations

It would also appear from our site visits that there are insufficient numbers of work stations and desk spaces for staff in many hospitals. Many pharmacists and technicians are sharing computers and/or workspaces, having to take turns, "hot-desk", defer computer research until dispensing work is complete, etc. Frequently, there is little space or computer access for staff to engage in research for medicines information and other research and study related activities.

### 9.2.4   Aseptic Units

Many hospitals do not have space or adequate infrastructure for aseptic units, necessitating the buying-in of expensive drugs. Pharmacy staff indicated that their preference, both from a professional and cost-effectiveness point of view, would be to produce chemotherapy and other such medicines with aseptic units on site. However, in many sites, there is no room for expansion of the pharmacy premises, so this is not feasible.

### 9.2.5   Workflow

Arising from our discussions with hospital pharmacy staff, it was generally felt that workflow could be improved in many pharmacies. Some suggested that even within the small premises in which the pharmacy department was located, the space utilisation could be improved and

the workflow changed to increase efficiency and improve the processes within the department.

An example of innovative thinking to improve efficiency in the face of budgetary restrictions is the initiative in one hospital in a large urban centre to "cohort" patients for chemotherapy and infusion treatments. That is, the pharmacy department worked with the clinics to ensure that patients receiving the same drug all attended on the same day, rather than each day seeing a mix of patients and treatments, and the drug was made up for all those requiring it in the aseptic unit on the day, once the patients had been admitted to the day unit and cleared for treatment. This ensured no waste (no costly drugs were made up for patients who then failed to attend) and considerable efficiency savings.

### 9.2.6   Automation

The generally small premises hamper the development of technology-based initiatives such as robotic dispensing. To have such technology requires extra space and most premises we visited simply had no additional space available. In many cases, there was no potential to expand the pharmacy premises, so such technological developments cannot be progressed.

### 9.2.7   Out-of-Hours Services

There are almost no formal out-of-hours services; many have an informal system where the Chief Pharmacist can be contacted out of hours for urgent queries. Most hospitals have a system whereby the director of nursing or similar senior member of staff holds the key to the pharmacy and non-controlled drugs can be accessed in this way out of hours. The conflict between this and the provisions of the Pharmacy Act is of considerable concern to Superintendent Pharmacists.

> Resident on-call services were organised in less than 6% of the European hospitals on average. This average had not changed since 2000. Only 13 out of 22 countries reported that some of their hospitals provided such a service.
>
> In Doloresco & Vermeulen's 2009 global survey of hospital practice, they similarly found that access to pharmacists 24/7 was not common, with only 35% of countries requiring this.

There was some discussion from chief pharmacists as to the difficulty in trying to "sell" the pharmacy service, in particular clinical pharmacy services, as an integral part of patient care, whilst also maintaining a 9-to-5, Monday-to-Friday service. If other medical professionals and hospital management are to be convinced to recognise the important role the pharmacy service can and should play in patient care, it behoves the pharmacy department to provide this service at times more in line with other clinical services in the hospital.

## 9.3   Main Messages

> Hospital pharmacies in Ireland operate on limited opening hours, with ad hoc on-call arrangements for staff. Premises themselves are generally cramped and the services have grown out of the allocated space. This situation needs serious consideration if other opportunities in this report are to be realised.

# 10

# Overall Themes from Survey and Site Visits

# 10 Overall Themes from Survey and Site Visits

A number of consistent themes arose within both the survey responses and the consultation meetings conducted as part of the hospital pharmacy site visits. In no specific order of priority, these may be summarised as follows:

- For the most part, hospital pharmacists want hospital pharmacy to play the full role within patient care within the hospital that evidence supports, assisting medical and nursing staff to reach informed decisions on the provision of medications. Whilst this goal is currently being met in some hospitals, the practice of clinical pharmacy remains aspirational elsewhere.

- Where hospital pharmacists play only a limited role in direct patient care, this is often the result of resources being stretched (i.e. the dispensary must take top priority) or of reluctance on the part of some consultant physicians to seek the advice of the pharmacist.

- Notwithstanding the above, in the vast majority of cases which were reported to us through the survey and the site visits, hospital pharmacy staff enjoy an excellent working relationship with their medical and nursing colleagues, with good professional interaction and mutual respect and understanding.

- Staff resources are almost certainly the predominant concern of senior pharmacy staff and of hospital management generally, particularly with regard to the present recruitment embargo meaning that staff absent on maternity leave or sick leave cannot be replaced on a temporary basis in most locations.

- The organisation of work for hospital pharmacists would also appear to be dysfunctional in many places, partly as a result of staff absences and partly due to robotic dispensing technology not having been introduced widely across the country. Many pharmacists who had worked in hospital pharmacies in the UK or US reported to us that they were performing very routine and administrative functions which could be handled more appropriately and more efficiently by robotic technology or junior support staff if either were available, at significantly less running cost.

- The working dynamic in the majority of hospital pharmacies which we visited appeared to be very good, with pharmacists and technicians very much focused on playing their part within the hospital, and working together collaboratively to maximise the quality of the contribution of the pharmacy department, often within a very challenging resource scenario.

- Many senior pharmacists shared with us their concerns over the appropriateness of the regulatory framework within which they operate, and it was a common concern that the legal framework appears geared towards community pharmacy rather than hospital pharmacy, particularly with regard to record keeping for unlicensed drugs, out-of-hours access to medicines, consultation areas, and other features, which they felt made little sense and were difficult, if not impossible, to implement within the context of a busy hospital pharmacy.

- This issue relates to the conflict Superintendent Pharmacists believe exists between their obligations as laid down by the Pharmacy Act and their ability to implement such requirements when they are an employee of a hospital or the HSE and consequently

do not have the authority to make final decisions concerning budget, staff numbers, CPD, premises, capital expenditure, etc.

■   Premises were generally found to be quite cramped, with limited capacity for storage of pharmacy products in many hospital pharmacies, and working conditions for pharmacists and technicians which were frequently reported as being substandard.

■   The use of information technology within hospital pharmacies is often relatively limited, with a lack of integration between hospital information systems and pharmacy systems, with the result that there is duplication of data and significant problems with regard to the sharing of patient information across the hospital.

■   We found that there was a somewhat mixed picture with regard to attitudes towards CPD within hospital pharmacies. In some of the larger hospitals, many pharmacists already have postgraduate qualifications and are actively involved in further study and research, with significant opportunities afforded in respect of CPD for both pharmacists and technicians. In other hospitals (not necessarily the smaller ones), limited CPD appears to be pursued, with some pharmacists commenting that CPD within the profession is more geared towards community pharmacists rather than their hospital counterparts.

# 11

# Conclusions and Recommendations

# 11 Conclusions and Recommendations

This Baseline Study of Hospital Pharmacy Practice in Ireland has sought to provide an understanding of the nature and type of hospital pharmacy services currently being delivered in Ireland, and to set that in context with relevant aspects of hospital pharmacy in other countries.

We have produced a comprehensive set of findings across a series of domains, each of which has been detailed in the preceding sections of this report.

Some of the key strategic issues to emerge from this research have included the following:

- One factor, among others, in common with the findings of the earlier baseline study for community pharmacy is the strong perception that there is no national vision for pharmacy and how it could and should fit into the wider healthcare delivery system; specifically in the acute care setting, pharmacists wish to further develop evidence-based practice with hospital pharmacy an embedded part of integrated patient care services. This is something which the PSI could be seen to address by continuing to work closely with the HSE and Department of Health.

- In this context, clinical pharmacy practice appears under-developed and under-supported in the Irish acute hospital sector, and ways to address this should be explored by the health authorities, supported by the PSI. Consideration must also be given within the hospital pharmacy profession as to how best to utilise, build on, and redeploy staff resources to develop clinical pharmacy practice.

- In particular, medicines reconciliation has been identified as a key area in which hospital pharmacists could and should be playing a crucial role. The ideal is for all patients to have medicines reconciliation on admission and transfer of care, regardless of the day or time. The Patient Safety Commission specifically recommended formal medicines reconciliation in 2008; this has yet to materialise and it is important that this issue be addressed as a priority.

- Access to hospital pharmacy services is restricted in most hospitals at present to weekday "office hours"; this is at odds with the aspiration, supported by the evidence, to have hospital pharmacy practice as an integral element of high-quality patient care. Irish hospital pharmacy services are available for far less than the average time identified in the EAHP research. A key issue is that clinical pharmacy services should be available in parallel with other medical services when and where this is required. Hospitals and hospital pharmacists need to address this issue and find solutions that allow for patients to access professional pharmacy input when they require it.

- The recruitment embargo and budget cuts in the health services are creating significant challenges in relation to the financial and human resources for hospital pharmacies. The future development of clinical pharmacy services and the progression of hospital pharmacy will need to take into account the resource constraints and consider how these can be addressed.

- The development of current staff resources in terms of training, CPD/CE, and the consideration of new roles for existing staff (both pharmacist and non-pharmacist) is an important key to the expansion and development of professional hospital pharmacy

services. Within the current serious constraints in the health service budgets and staffing resources, innovative solutions need to be considered by the profession and by hospital management to maintain and develop hospital pharmacy services.

■ In this regard, the development of the technician role is not to be overlooked; many pharmacies could develop clinical pharmacy services with existing pharmacist staff if the technician role were to be expanded to take on work the pharmacists currently carry out. In addition, other support roles, such as administrative staff, should be considered as a way to allow all pharmacy staff to operate at the highest level for their qualification and skills.

■ The career structure, specialisation opportunities, and progression for pharmacists is a source of concern within the profession, and, in consideration of the above points, should be looked at in relation to the development of the profession as a whole. We are aware that this is already being addressed and that developments are ongoing. We welcome this and urge those involved to progress this rapidly.

■ The PSI and the regulatory framework are perceived to focus on community pharmacy; hospital pharmacists' concerns in this regard are significant. The PSI needs to consider how this perception can be changed so that all the relevant parties can work together for the future benefit of the profession and ultimately for patient care and safety.

■ The technology supporting hospital pharmacy activity is largely inadequate. Integrated IT systems supporting electronic prescribing and electronic patient records will be required for the future development of pharmacy practice along the lines of that in other countries.

■ Pharmacists have good relationships with their medical and nursing colleagues, and their services are well-perceived and valued by these staff. However, pharmacist involvement in multidisciplinary patient care teams is limited and this should be addressed.

■ Hospital pharmacy premises are in many cases unfit for purpose and limit the potential for future development of services, with no space for additional staff resources, automation, storage, etc. Adequate physical facilities are a basic requirement for the delivery of professional healthcare services such as hospital pharmacy.

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**The above summary of conclusions provides a brief synopsis of the issues which have been articulated and considered in the preceding sections of this report. We trust that this Baseline Study report will provide a good factual assessment of the present position with regard to hospital pharmacy in Ireland, and that our articulation of the issues affecting hospital pharmacists in 2012 will help contribute to the ongoing debate regarding the future of this vital service.**

# Appendix 1

# Surveys

# Pharmacy Survey Questionnaire

## PREMISES

1.  In what county is the hospital located?

    | | | | |
    |---|---|---|---|
    | ❑ | Donegal | ❑ | Longford |
    | ❑ | Cavan | ❑ | Kildare |
    | ❑ | Monaghan | ❑ | Wicklow |
    | ❑ | Leitrim | ❑ | Wexford |
    | ❑ | Sligo | ❑ | Offaly |
    | ❑ | Mayo | ❑ | Laois |
    | ❑ | Roscommon | ❑ | Carlow |
    | ❑ | Galway | ❑ | Kilkenny |
    | ❑ | Clare | | |
    | ❑ | Limerick | | |
    | ❑ | Tipperary | | |
    | ❑ | Cork | | |
    | ❑ | Kerry | | |
    | ❑ | Waterford | | |
    | ❑ | Louth | | |
    | ❑ | Meath | | |
    | ❑ | Dublin | | |
    | ❑ | Westmeath | | |

2.  Location of hospital
    - ❑ City (pop. greater than 30,000)
    - ❑ Large towns (pop. 20,000 to 30,000)
    - ❑ Mid-sized towns (pop. 5,000 to 20,000)
    - ❑ Small towns (pop. 1,500 to 5,000)
    - ❑ Villages (pop. less than 1,500)

3.  How would you describe the ownership of this hospital?
    - ❑ Health Service Executive
    - ❑ Public voluntary or joint board hospital
    - ❑ Private hospital
    - ❑ Other: _____

4.  What specialties, if any, does the hospital have? Please choose **all** that apply:

    ❑   Cardiology
    ❑   Paediatrics
    ❑   Critical care and/or intensive care unit
    ❑   Burns unit
    ❑   Endocrinology
    ❑   Infectious diseases
    ❑   Emergency medicine
    ❑   Gastro-intestinal / liver / nutrition
    ❑   General / internal medicine
    ❑   Care of older people
    ❑   Haematology
    ❑   Oncology
    ❑   Immunology
    ❑   Transplants
    ❑   Nephrology
    ❑   Neurology
    ❑   Psychiatry
    ❑   Respiratory medicine
    ❑   Surgery
    ❑   Obstetrics / gynaecology / women's health
    ❑   Orthopaedics
    ❑   Ophthalmology
    ❑   Neonatal ICU
    ❑   Fertility treatment / IVF
    ❑   Other: _____

5.  How many beds are served by your hospital?

    Please give the numbers of beds in the following categories. Note that these do not need to add up to the total; we wish to get a sense of the scale of the beds in various categories across different hospitals. This means counting, for example, ICU/CCU beds in the total inpatient beds (if there are such) and then giving the details of their numbers separately in the relevant box.

    ❑   Total inpatient beds
    ❑   Day-case beds
    ❑   CCU / ICU beds
    ❑   HDU beds
    ❑   Neonatal ICU cots
    ❑   Long-term residential beds on-site (e.g. care of elderly patients)
    ❑   Off-site beds served by this hospital pharmacy
    ❑   Other: _____

6.    Please give details of the following, if known:

   ❑    Budget for the hospital pharmacy [EXCLUDING the medicines budget]

   ❑    Medicines budget

   ❑    Total overall hospital budget

7.    How many dispensing locations are there in the hospital?

|  |
|--|
|  |

7a.    Please describe the dispensing location(s) in terms of their physical location within the hospital, size, facilities, etc.

|  |
|--|
|  |

8.    Are there any confirmed and funded plans to move or develop the pharmacy service at your hospital?

   ❑    Yes

   ❑    No

8a.    If Yes, please describe the plan(s).

|  |
|--|
|  |

9.    How many hours per day is the pharmacy service open to patients? [Enter 0 if the pharmacy is not open to patients on the relevant day(s).]

If your hospital has more than one dispensing location, please indicate the hours of opening from the earliest time that any dispensing location opens to the latest time that any dispensing location closes, e.g. if one location is open from 9:30am to 3:30pm and another from 12:30pm to 4:30pm, the pharmacy service is available for 7 hours per day.

| Weekdays |  |
|----------|--|
| Saturdays |  |
| Sundays |  |

Public Holidays

10. Are there any arrangements for the pharmacy department to provide services outside the opening hours listed above? Please choose **all** that apply:

- ❑ Fixed times when pharmacy service is available to hospital staff whilst closed to the public (e.g. weekend morning)
- ❑ On-call system
- ❑ Services available to specific hospital departments outside core hours
- ❑ There are no pharmacy department services available outside the public opening times
- ❑ Other: _____

10a. If the pharmacy service is open at fixed times for staff to access on behalf of patients whilst closed to public access, please give details of when the service is available over and above core hours in this way.

10b. If the pharmacy operates an on-call system, please indicate how this operates.

- ❑ 24-hour formal, i.e. with pharmacists on rotation
- ❑ 24-hour informal, with staff calling pharmacists on mobile phones
- ❑ Formal rotation but not 24-hour
- ❑ Informal but not 24-hour
- ❑ Other

10c. If the pharmacy department provides cover for specific hospital specialties or departments outside core hours, please give details below.

## WORKFORCE

11. Please indicate the number of staff working in the hospital pharmacy department at each of the following grades, along with the hours that represent a full-time week for that grade, their contracted weekly hours (total for all staff at that grade), and whether they are on permanent or temporary contracts.

    For example, you might have three pharmacy technicians, where a full-time week might be 37.5 hours.

    If two work full-time and one works 25 hours per week, then their total hours per week is 100 (2 x 37.5 = 75; 75 + 25 = 100).

    You will therefore enter 37.5 in the "Full-time hours" box and "100" in the "Total weekly hours" box.

    Please note that where one person has more than one role, you should complete their hours in the first boxes only and note that they also hold other roles in the relevant boxes

    For example, if the Superintendent Pharmacist is also the Chief 1 Pharmacist, you would enter "=Chief 1" or similar in the Superintendent field to indicate that the Superintendent Pharmacist's details have already been entered in the Chief 1 Pharmacist row.

| Grade | No. of staff at this grade | Full-time hours per week at this grade | Total weekly hours for all staff at this grade | No. on permanent contracts | No. on temporary contracts |
|---|---|---|---|---|---|
| Director of Pharmacy | | | | | |
| Chief 1 Pharmacist | | | | | |
| Chief 2 Pharmacist | | | | | |
| Senior Pharmacist | | | | | |
| Superintendent Pharmacist | | | | | |
| Supervising Pharmacist | | | | | |
| Research Pharmacists | | | | | |
| MSc Pharmacists (2-year fixed term) | | | | | |
| Basic Grade Pharmacists | | | | | |
| Registered pharmaceutical assistants | | | | | |
| Pharmacy interns | | | | | |
| Pharmacy students | | | | | |
| Pharmacy technicians - basic grade | | | | | |
| Pharmacy technicians - senior | | | | | |

| Grade | No. of staff at this grade | Full-time hours per week at this grade | Total weekly hours for all staff at this grade | No. on permanent contracts | No. on temporary contracts |
|---|---|---|---|---|---|
| Non-qualified technical pharmacy staff (including student/trainee technicians) | | | | | |
| Agency or locum pharmacists | | | | | |
| Agency or locum staff of other grades | | | | | |

12.  Are there unfilled posts within the hospital pharmacy department, for either pharmacists or non-pharmacist staff?

❑   Yes

❑   No

12a. If Yes, how many unfilled posts do you have for pharmacists and/or non-pharmacist staff in the hospital pharmacy department?

Unfilled pharmacist posts

|  |
|---|
|  |

Unfilled posts for non-pharmacist grades

|  |
|---|
|  |

12b. How long have these posts been unfilled?

| | |
|---|---|
| Number of posts unfilled for less than 6 months | |
| Number of posts unfilled from 6 to 12 months | |
| Number of posts unfilled from 12 months to 2 years | |
| Number of posts unfilled for more than 2 years | |

12c. Are you planning to (or have been given leave to) recruit for these posts?

❑   Planning to recruit for some or all posts and have leave to fill them

❑   Planning to recruit for some or all posts but recruitment embargo prevents filling them

❑   No plans to fill the posts at present

❑   Don't know

❑   Other: _____

12d. What impact, if any, do the unfilled posts have on the ability of the hospital pharmacy department to provide services?

13. Are there pharmacists working in the hospital who are not part of the hospital pharmacy department (i.e. not under the remit of the Chief Pharmacist, such as pharmacists in a research setting)?

   ❑   Yes
   ❑   No

13a. If Yes, please give details.

14. What is the ratio of pharmacists in the pharmacy department to the consultants in the hospital, if known?

15. What kind of work team model do you have in the hospital pharmacy department?

   ❑   Ward-based pharmacists
   ❑   Team-based pharmacists
   ❑   Mixed ward- and team-based model
   ❑   Other: _____

16. How many staff in the hospital pharmacy department are engaged primarily in a specific area of clinical expertise (e.g. antimicrobial, palliative care)?

| Clinical area | Number of pharmacists engaged in this area | Number of non-pharmacist grade staff engaged in this area |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
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| | | |
| | | |

17. List which of the areas of pharmacy expertise you noted in Q16 above, if any, is utilised by other departments in the hospital, i.e. where the skills and experience of the pharmacists in specific clinical areas of expertise is utilised in the relevant hospital departments or specialties.

18. Please indicate the gender profile of the staff in the hospital pharmacy department (all staff: pharmacists and non-pharmacist staff).

Number of male staff

Number of female staff

19. Please give the age profile of the staff in the hospital pharmacy department (all staff: pharmacists and non-pharmacist staff).

| | Under 35 | 35-44 | 45-54 | 55-64 | 65 and over |
|---|---|---|---|---|---|
| Number of staff in each of the following age bands | | | | | |

20. How many staff have the following qualifications? Please note that if staff members have more than one of these qualifications, they should be counted in each category.

| | **Number of pharmacists** | **Number of non-pharmacist staff** |
|---|---|---|
| Postgraduate certificate | | |
| Postgraduate diploma | | |
| MSc | | |
| MRes | | |
| MBA | | |
| MPH | | |
| PhD | | |
| PharmD | | |
| Teaching qualification | | |
| Risk management | | |
| Other management qualification | | |
| Vocational qualifications | | |

21. Do any staff have specific hospital pharmacy qualifications?

- ❑ Yes
- ❑ No

21a. If Yes, please give details

22. To whom in the hospital does the head of the pharmacy department report?

> (blank box)

23. Does the head of the pharmacy department lead any other hospital departments?
- ❑ Yes
- ❑ No

23a. If Yes, which department(s)?
- ❑ Sterilisation
- ❑ Infection control
- ❑ Medical analysis laboratory
- ❑ Medical devices
- ❑ Waste management
- ❑ Other: _____

24. Is the head of the pharmacy department accountable for the hospital's drug budget?
- ❑ Yes
- ❑ No

25. Do pharmacy technicians have any management role within the pharmacy?
- ❑ Yes
- ❑ No

25a. If Yes, please give details.

> (blank box)

26. For each of the following statements, please indicate the extent to which you agree with the perception.

| | Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|---|
| We have a satisfactory level of influence over the medicines policy within the hospital | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| We have a satisfactory level of influence over general policy within the hospital | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |

27. What percentage of time do pharmacists and other staff spend on the following?

| | Pharmacists | Non-pharmacist staff | Head of Pharmacy |
|---|---|---|---|
| Undertaking clinical activities (i.e. giving advice to patients and staff) outside the dispensary? | | | |

28. Have you conducted formal staff appraisals in the past year?

❑ Yes

❑ No

28a. If Yes, did you ask about CPD/CE during the appraisal?

❑ Yes

❑ No

## SYSTEMS AND SERVICES

29. How many items do you dispense on average each week? Please give the total, along with figures for each of the listed categories (note that these are not intended to add up to the total amount).

| | |
|---|---|
| Inpatient items | |
| Outpatient items | |
| Long-term residential care items | |
| Items dispensed to other sites | |

30. Does the pharmacy department provide unit/monitored dose dispensing or named-patient dispensing services?

❑ Provide unit/monitored dose dispensing services

❑ Provide named-patient dispensing services

❑ Neither

30a. If you provide such services, please indicate how many doses in a typical week are dispensed in this way.

| | |
|---|---|
| Unit/monitored dose items | |
| Named-patient items | |

31. How is your drug distribution service organised?

❑ Centralised service: all distribution from the central pharmacy

❑ Decentralised service: drug distribution is undertaken by satellite pharmacies on wards, that are in turn supplied by the central pharmacy

❑ Patient-oriented service: medicines are supplied to individual named patients

❑ Other: _____

32. What services does the hospital pharmacy provide?

| | Currently provide internally | Plan to provide internally | Would like to provide internally | Provided to external sites/customers |
|---|---|---|---|---|
| Inpatient dispensing | ❑ | ❑ | ❑ | ❑ |
| Outpatient dispensing | ❑ | ❑ | ❑ | ❑ |
| Medicines information | ❑ | ❑ | ❑ | ❑ |
| Antimicrobial stewardship | ❑ | ❑ | ❑ | ❑ |
| CIVAS | ❑ | ❑ | ❑ | ❑ |

| | Currently provide internally | Plan to provide internally | Would like to provide internally | Provided to external sites/customers |
|---|:---:|:---:|:---:|:---:|
| Devices | ❑ | ❑ | ❑ | ❑ |
| Medicated Dressings | ❑ | ❑ | ❑ | ❑ |
| Non-medicated dressings | ❑ | ❑ | ❑ | ❑ |
| Infusion pumps | ❑ | ❑ | ❑ | ❑ |
| Contraceptive services | ❑ | ❑ | ❑ | ❑ |
| Vaccines | ❑ | ❑ | ❑ | ❑ |
| Cold chain management | ❑ | ❑ | ❑ | ❑ |
| Infant formula | ❑ | ❑ | ❑ | ❑ |
| Near-patient testing kits | ❑ | ❑ | ❑ | ❑ |
| Anticoagulant services | ❑ | ❑ | ❑ | ❑ |
| Medication review | ❑ | ❑ | ❑ | ❑ |
| Medical device services | ❑ | ❑ | ❑ | ❑ |
| Procurement | ❑ | ❑ | ❑ | ❑ |
| Chemotherapy preparation | ❑ | ❑ | ❑ | ❑ |
| Pharmacovigilance/ADE & ADR reporting | ❑ | ❑ | ❑ | ❑ |
| Pharmacokinetic and therapeutic monitoring | ❑ | ❑ | ❑ | ❑ |
| Complex home care (e.g. biologic infusions) | ❑ | ❑ | ❑ | ❑ |
| Medicines reconciliation upon admission | ❑ | ❑ | ❑ | ❑ |
| Medicines reconciliation upon transfer | ❑ | ❑ | ❑ | ❑ |
| Medicines reconciliation upon discharge | ❑ | ❑ | ❑ | ❑ |
| Aseptic services | ❑ | ❑ | ❑ | ❑ |
| Pharmacokinetic consulting | ❑ | ❑ | ❑ | ❑ |
| Clinical consulting | ❑ | ❑ | ❑ | ❑ |
| Nutrition support (TPN and enteral feeds) | ❑ | ❑ | ❑ | ❑ |
| Involvement in clinical trials | ❑ | ❑ | ❑ | ❑ |
| Cardiac rehabilitation education | ❑ | ❑ | ❑ | ❑ |

| | Currently provide internally | Plan to provide internally | Would like to provide internally | Provided to external sites/customers |
|---|---|---|---|---|
| Pre-admission clinics | ❑ | ❑ | ❑ | ❑ |
| Patient counselling on medications on discharge | ❑ | ❑ | ❑ | ❑ |
| Consultant ward rounds | ❑ | ❑ | ❑ | ❑ |
| Other (please give details below) | ❑ | ❑ | ❑ | ❑ |

32a. If you provide "other services", please give details.

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32b. If you provide pharmacokinetic consulting, for what types of medicines do you do so?

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32c. If you provide services to external sites, please give details of these sites.

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33. Does the pharmacy department routinely dispense discharge medication for any of the following groups?

- ❑ Inpatients
- ❑ Day case patients
- ❑ Outpatients
- ❑ Long -term care patients in the hospital
- ❑ Patients in residential homes
- ❑ Staff
- ❑ Do not dispense discharge medication
- ❑ Other: _____

33a. If you dispense discharge medication, how many days' supply do you provide?

| | |
|---|---|
| Day case patients | |
| Outpatients | |
| Long-term care patients in the hospital | |
| Patients in residential homes | |
| Other | |

34. How are your clinical pharmacy services organised?

- ❑ Centralised: pharmacists visit patient care areas at least once daily
- ❑ Centralised: pharmacists visit patient care areas regularly, but not every day
- ❑ Decentralised: pharmacists spend at least 50% of their time in patient care areas
- ❑ None of these
- ❑ Other: _____

35. Are there any pharmacist-led outpatient clinics in your hospital?

- ❑ Anticoagulant
- ❑ Lipid
- ❑ Pain control
- ❑ Heart failure
- ❑ None
- ❑ Other: _____

36. Are there any other outpatient clinics with significant pharmacy input in your hospital?
   - ❑ HIV
   - ❑ STD
   - ❑ TB
   - ❑ Infectious disease
   - ❑ Clozaril
   - ❑ Haematology
   - ❑ Oncology
   - ❑ None
   - ❑ Other: _____

37. Does aseptic manufacturing occur at pharmacy level?
   - ❑ Yes
   - ❑ No

37a. If Yes, please indicate the types of products involved.
   - ❑ Cytotoxics
   - ❑ TPN
   - ❑ IVs for special units
   - ❑ IVs for other units
   - ❑ Other: _____

38. What standards do you operate to in relation to compounding/IV preparation, if relevant?

39. What provision is in place for batch recalls, etc, if applicable?

40. Do you have a manufacturing licence from the IMB?
   - ❑ Yes
   - ❑ No

40a. If Yes, please give details.

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41. Does the pharmacy have a wholesaling licence?
    - ❑ Yes
    - ❑ No

41a. If Yes, please give details of the products this covers.

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42. Is there a risk management system implemented in your hospital?
    - ❑ Yes
    - ❑ No

43. Does your hospital have a policy on safe medication practice?
    - ❑ Yes
    - ❑ No
    - ❑ In progress

44. Do the following occur in the hospital pharmacy department?
    - ❑ Analysis of medication error
    - ❑ Analysis and reporting of adverse drug reactions
    - ❑ Recording of pharmacist interventions
    - ❑ None of these

45. Please give details of any other risk management activities or initiatives undertaken by the hospital pharmacy department in last year.

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46. Is there a formulary in place in your hospital?

    ❑    Yes

    ❑    No

    ❑    In progress

46a. If Yes, how often is the formulary updated?

    ❑    Every year

    ❑    Every two years

    ❑    More than every two years

    ❑    Other: _____

46b. Does the pharmacy department team lead formulary development?

    ❑    Yes

    ❑    No

46c. Is the pharmacy department team responsible for monitoring formulary compliance?

    ❑    Yes

    ❑    No

47. What documented standards and policies are in place in the hospital pharmacy department?

    ❑    Dispensing

    ❑    Clinical trials

    ❑    Aseptic compounding

    ❑    None

    ❑    Other: _____

48. Are external standards or policies used in the pharmacy quality assurance procedures?

    ❑    Yes

    ❑    No

48a. If Yes, please give details.

49. Do the hospital processes have external quality certification?

    ❑    Yes

    ❑    No

    ❑    In progress

49a. If Yes or In progress, please give details.

## CPD

CPD is defined as a systematic, ongoing, cyclical process of self-directed learning and continuous quality improvement which allows pharmacists to learn and develop to meet their own personal and professional needs, the needs of the health service and the needs of patients. CE is defined as structured formal learning experiences and activities that pharmacists undertake following registration to improve knowledge, skills and competencies. Quality assured CE is a component of the learning experiences required in a CPD system.

50. What opportunities are there in the hospital for CPD/CE for pharmacists and other staff?

| | Pharmacists | Non-pharmacist staff |
|---|---|---|
| In-house pharmacy seminars and courses (including journal clubs, Grand Rounds, and industry-supported sessions with medical reps) | ❑ | ❑ |
| In-house multi-disciplinary seminars and courses | ❑ | ❑ |
| Other (please give details below) | ❑ | ❑ |

50a. If you indicated that there are "other" opportunities for CPD (incorporating CE) in the hospital for pharmacists and/or other staff, please give details below.

51. What arrangements have been put in place to ensure all pharmacists employed maintain appropriate experience in the practice of pharmacy and undertake CPD (incorporating CE)?
   - ❑ Allowing paid time off for CPD (incorporating CE) activities
   - ❑ Allowing unpaid time off for CPD (incorporating CE) activities
   - ❑ Paying for staff membership of HPAI
   - ❑ Paying for staff membership of ICCPE
   - ❑ Funding CPD (incorporating CE activities)
   - ❑ Requiring pharmacists to undertake minimum levels of CPD (incorporating CE)
   - ❑ Providing in-house training and development activities
   - ❑ Providing a staff study area within the pharmacy
   - ❑ No arrangements have been put in place
   - ❑ Other - please specify: _____

51a  If you have minimum CPD (incorporating CE) requirements for your pharmacists, please give details of these requirements below:

52.  For what purposes have your staff undertaken CPD (incorporating CE)? Please choose **all** that apply:

- ❑  Personal professional development
- ❑  To deliver a specific service in the pharmacy
- ❑  Development of pharmacy staff
- ❑  Developing inter-professional relationships
- ❑  Other - please specify: _____

53.  What would help your staff to engage in more CPD (incorporating CE)?

- ❑  Availability of CPD (incorporating CE) activities closer to pharmacy location
- ❑  Greater frequency and more convenient range of times for CPD (incorporating CE) activities
- ❑  Availability of an enhanced range of topics that meet practice needs
- ❑  More access to online or technology-based learning methods for CPD (incorporating CE)
- ❑  Greater availability of locum cover
- ❑  Different staffing rosters in the pharmacy to free up time
- ❑  Understanding what workplace activities can constitute appropriate CPD (incorporating CE)
- ❑  More opportunities to engage in inter-professional learning with other healthcare professionals
- ❑  Other - please specify: _____

54.  What stops your staff from engaging in as much CPD (incorporating CE) as you would like them to?

- ❑  Lack of time
- ❑  Difficulty arranging locum or in-house cover
- ❑  Distance from CPD (incorporating CE) activities
- ❑  Inconvenient times for CPD (incorporating CE) activities
- ❑  Insufficient range of CPD (incorporating CE) activities
- ❑  Lack of information on what CPD (incorporating CE) activities are available
- ❑  Other - please specify: _____

55. Is there an education budget for the hospital pharmacy department staff?

    ❑    Yes

    ❑    No

55a. If Yes, does this include conference attendance?

    ❑    Yes

    ❑    No

56. Do your staff engage in inter-professional CPD or CE activities?

    ❑    Yes

    ❑    No

56a. If Yes, please give details.

Audit is an exploration of the extent to which a service meets an established standard, and research is an exploration of broader questions where no published standards or guidelines exist.

57. Please give details of the number and subject of any clinical audits, practice research projects, or clinical trials undertaken by your staff in the past year.

|  | **Number** | **Subject** |
|---|---|---|
| Clinical audits |  |  |
| Practice research |  |  |
| Clinical trials |  |  |

58. To which audiences have pharmacy department staff presented their results for audit or research?

   ❑ Hospital pharmacy staff

   ❑ Hospital medical staff

   ❑ Hospital nursing staff

   ❑ Hospital administrative staff

   ❑ National pharmacy audience

   ❑ National multi-disciplinary audience

   ❑ International pharmacy audience

   ❑ International multi-disciplinary audience

   ❑ None

   ❑ Other: _____

59. Is your hospital affiliated to any of the following teaching programmes? (That is, is it a routine training site for students, residents, interns, or other trainees?)

   ❑ University School of Pharmacy

   ❑ Nursing School

   ❑ University Medical School

   ❑ College offering pharmacy technician training

   ❑ None

   ❑ Other: _____

60. Are pharmacy department staff involved in training any of these groups?

   ❑ Undergraduate pharmacists         ❑ Post-qualification nurses

   ❑ Pharmacy interns                  ❑ Post-qualification doctors

   ❑ Student pharmacy technicians      ❑ Postgraduate pharmacists

   ❑ Undergraduate medical students    ❑ None of these

   ❑ Undergraduate nursing students    ❑ Other: _____

   ❑ Nurse prescribing students

61. Is there a formal process to identify staff requirements for CPD/CE or to engage in CPD/CE planning (e.g. as part of a formal appraisal)?

   ❑ Yes

   ❑ No

61a. If Yes, please give details.

62. Please add any comment you have about CPD and CE opportunities, including whether and how you think they could be improved.

## INTERPROFESSIONAL LINKS

63. How would you describe the relationship between the pharmacists in your hospital and each of the following groups?

|  | Excellent | Very good | Good | Fair | Poor | Non-existent |
|---|---|---|---|---|---|---|
| Junior doctors | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Consultant doctors | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Other hospital healthcare professionals | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Pharmacists in other hospitals | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Community pharmacists | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Primary care doctors | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Hospital managers | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Patient representatives | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |

64. How often do pharmacists take part in multidisciplinary ward rounds?

| **Always** | **Frequently** | **Sometimes** | **Rarely** | **Never** |
|---|---|---|---|---|
| ❑ | ❑ | ❑ | ❑ | ❑ |

65. In which kinds of multidisciplinary activities are pharmacists involved?
   - ❑ Research
   - ❑ Audit
   - ❑ Committees
   - ❑ Teaching (as teachers)
   - ❑ Learning (as students)
   - ❑ Members of specialist teams (e.g. nutrition)
   - ❑ None
   - ❑ Other: _____

66. Which, if any, of these multidisciplinary teams or committees include(s) a pharmacist or other staff member from the pharmacy department? Please choose **all** that apply:
   - ❑ Antimicrobial stewardship
   - ❑ Drug and therapeutics
   - ❑ Ethics/research
   - ❑ Infection control

- ❑ Quality improvement
- ❑ Health and safety
- ❑ Information systems
- ❑ Learning and development
- ❑ Medication safety
- ❑ Risk management
- ❑ Clinical areas, e.g. CPR, nutrition/TPN, pain control
- ❑ Tissue viability (wound care)
- ❑ Nurse prescribing
- ❑ Point of care testing
- ❑ None
- ❑ Other: _____

66a. Of which, if any, of these teams or committees, is the pharmacy department representative the chair? Please choose **all** that apply:

- ❑ Antimicrobial stewardship
- ❑ Drug and therapeutics
- ❑ Ethics/research
- ❑ Infection control
- ❑ Quality improvement
- ❑ Health and safety
- ❑ Information systems
- ❑ Learning and development
- ❑ Medication safety
- ❑ Risk management
- ❑ Clinical areas, e.g. CPR, nutrition/TPN, pain control
- ❑ Tissue viability (wound care)
- ❑ Nurse prescribing
- ❑ Point of care testing
- ❑ None
- ❑ Other: _____

67. What links, if any, are there between the hospital pharmacy and the primary care services for patients following discharge? Please choose **all** that apply:

- ❑ Planned discharge services
- ❑ Nominated community pharmacy
- ❑ Community liaison workers
- ❑ None
- ❑ Other: _____

68. Is there a link at admission, i.e. does the pharmacy contact the community pharmacy for medicines reconciliation?

    ❑    Yes, for every patient

    ❑    Yes, for some patients

    ❑    No

    ❑    Other: _____

69. Does the pharmacy have links with other hospital pharmacies for patient care?

    ❑    Yes, informal/occasional

    ❑    Yes, routinely/formally

    ❑    No

## TECHNOLOGY

70. Are pharmacy staff provided with access to the internet?

    ❏ No

    ❏ Yes, some of the time

    ❏ Yes, on demand

    ❏ Yes all of the time

    ❏ Yes, with restrictions (e.g. certain sites barred)

71. What activities are computer systems used for? Please choose **all** that apply:

    ❏ Getting prescriptions from wards

    ❏ Stock control/distribution

    ❏ Patient medication records

    ❏ Outpatient drug distribution

    ❏ Dosage calculation

    ❏ Manufacturing controls

    ❏ Compounding

    ❏ Quality assurance/product release

    ❏ Laboratory results

    ❏ Other: _____

72. What computer system(s) is/are used in the hospital pharmacy department?

| System | Used? | Version number |
|---|---|---|
| Cliniscript (CScript) | ❏ | |
| Clinichemo (CChemo) | ❏ | |
| JAC | ❏ | |
| PIMS | ❏ | |
| Ascribe | ❏ | |
| Other: _____ | ❏ | |

73. Does/do the hospital pharmacy system(s) link with other in-hospital systems?

    ❏ Yes

    ❏ No

    ❏ In development

73a. If Yes, please give details of these systems and links.

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74.  How many terminals are available to staff in the hospital pharmacy department?

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75.  Does the hospital have any technical capability to introduce electronic prescribing?
    ❑    Yes
    ❑    No

75a. If Yes, please give details.

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76.  Has the hospital pharmacy department engaged in any projects to develop electronic prescribing?
    ❑    Yes
    ❑    No

76a. If Yes, how would such records be maintained?

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76b. If Yes, what security measures would be included in an electronic prescribing system?

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77. Which of the following resources can pharmacy department staff access through the computer system? Please choose **all** that apply:
    - ❑ Online medicines information resources
    - ❑ Patient hospital notes
    - ❑ Laboratory results
    - ❑ Previous dispensing data
    - ❑ Stock control information
    - ❑ Online CE courses
    - ❑ CPD recording database
    - ❑ Hospital management data, e.g. budget
    - ❑ Messaging with other health professionals in the hospital
    - ❑ Messaging with other health professionals outside the hospital
    - ❑ Formulary information
    - ❑ Decision support resources
    - ❑ None of the above
    - ❑ Other:

78. Is there any automation in the dispensary?
    - ❑ Yes
    - ❑ No

78a. If No, are there plans to introduce this?
    - ❑ Yes
    - ❑ No

79. Do you use EAN-barcodes in stock management and/or product dispensing?
    - ❑ Yes
    - ❑ No
    - ❑ In progress

80. Do you use any of the following? Please choose **all** that apply:
    - ❑ Computer dispensing machines (e.g. ATC machine) to pick doses for individuals
    - ❑ Computer picking systems to pick drugs for stock (e.g. ROWA machine)
    - ❑ Robotic picking systems to pick individual patient supplies (e.g. APS Robot)
    - ❑ Integrated computer systems for ordering, picking, and ward storage (e.g. Pyxis)
    - ❑ None of these

81. What online resources are commonly accessed for information? Please choose all that apply:
    - ❑ BNF
    - ❑ MI databank
    - ❑ D/scan

- ❑ PSI
- ❑ IMB (medicines.ie)
- ❑ HSE
- ❑ Patient support groups
- ❑ Medline
- ❑ HPAI
- ❑ NELM
- ❑ UKCPA
- ❑ NICE
- ❑ SIGN
- ❑ None of these
- ❑ Other:

82. Do the pharmacy department staff receive drug alerts from the IMB and/or other sources?

- ❑ Yes
- ❑ No

82a. If Yes, please give details.

```
                                                                            
                                                                            
                                                                            
                                                                            
                                                                            
```

83. Do pharmacy department staff have access to regulatory updates and information from the PSI and/or other sources?

- ❑ Yes
- ❑ No

83a. If Yes, please give details.

```
                                                                            
                                                                            
                                                                            
                                                                            
                                                                            
```

84. Does the pharmacy have a dedicated pharmacy email address for a professional pharmacy business which all pharmacists can access if necessary?

- ❑ Yes
- ❑ No

84a. Do patients ever email the pharmacy at this email address?

- ❑ Yes
- ❑ No

85. Is there a dedicated pharmacy section on the hospital website?

- ❑ Yes
- ❑ No

86. Does the pharmacy department use or interact with any electronic devices for recording clinical interventions, etc?

- ❑ Yes
- ❑ No
- ❑ In progress

86a. If Yes or in progress, please give details.

87. What, if any, technological developments are planned in coming months?

88. What kind of impact will any technology advances have on the service provided?

## FINAL

89. Are there areas to which you feel hospital pharmacy could have a greater contribution in the future, for example, additional services the pharmacy doesn't currently provide they would like to provide and/ or areas that pharmacists aren't currently involved in where they believe greater pharmacist input would be beneficial for patients?

90. How do you view hospital pharmacy practice in Ireland and how would you like to see pharmacy practice develop in the future?

Thank you for your time and effort in completing this questionnaire.
Your contribution is much appreciated.

# Pharmacist Survey Questionnaire

## ABOUT YOU

1.  What is/are your designated role(s)? If you hold more than one of the following titles, tick all that apply to you.

    ❑   Director of Pharmacy

    ❑   Chief 1 Pharmacist

    ❑   Chief 2 Pharmacist

    ❑   Senior Pharmacist

    ❑   Superintendent Pharmacist

    ❑   Supervising Pharmacist

    ❑   Research Pharmacist

    ❑   MSc Pharmacist (2-year fixed-term)

    ❑   Basic Grade Pharmacist

    ❑   Other: _____

2.  How long have you worked in this hospital pharmacy?

    ❑   Less than one year

    ❑   One to two years

    ❑   Two to three years

    ❑   Three to four years

    ❑   Five or more years

3.  How long have you held your current position?

    ❑   Less than one year

    ❑   One to two years

    ❑   Two to three years

    ❑   Three to four years

    ❑   Five or more years

4.  Do you carry out any pharmacy-related activity other than that which relates to this hospital pharmacy? (For example, part-time or agency/locum work in another pharmacy.)

    ❑   Yes

    ❑   No

4a. If Yes, please give details:

5.      Which year did you first register as a pharmacist?

---

6.   Where did you complete your pharmacy degree (or equivalent qualification)?
- ❑   UCC
- ❑   RCSI
- ❑   TCD
- ❑   UCD
- ❑   Northern Ireland School of Pharmacy
- ❑   Other UK School of Pharmacy
- ❑   Other EU School of Pharmacy
- ❑   School of Pharmacy outside the EU
- ❑   Pharmaceutical Society of Ireland
- ❑   Other: _____

7.   Do you hold any postgraduate qualifications?
- ❑   Yes
- ❑   No

7a.  If Yes, which of the following postgraduate qualifications do you hold?

- ❑   Postgraduate Certificate
- ❑   Postgraduate Diploma
- ❑   MSc
- ❑   MRes
- ❑   MBA
- ❑   MPH
- ❑   PhD
- ❑   PharmD
- ❑   Teaching qualification
- ❑   Risk management
- ❑   Other management qualification
- ❑   Other: _____

8.   What areas of pharmacy have you practised in since qualifying?
- ❑   Community
- ❑   Hospital
- ❑   Industry
- ❑   Academia/Research
- ❑   Other - please specify: _____

9.   Are you:
- ❑   Female
- ❑   Male

10.  Which age group are you in?

    ❑    Under 35

    ❑    35-44

    ❑    45-54

    ❑    55-64

    ❑    65 and over

## PREMISES

11. In what county is the hospital located?
    - ❑ Donegal
    - ❑ Cavan
    - ❑ Monaghan
    - ❑ Leitrim
    - ❑ Sligo
    - ❑ Mayo
    - ❑ Roscommon
    - ❑ Galway
    - ❑ Clare
    - ❑ Limerick
    - ❑ Tipperary
    - ❑ Cork
    - ❑ Kerry
    - ❑ Waterford
    - ❑ Louth
    - ❑ Meath
    - ❑ Dublin
    - ❑ Westmeath
    - ❑ Longford
    - ❑ Kildare
    - ❑ Wicklow
    - ❑ Wexford
    - ❑ Offaly
    - ❑ Laois
    - ❑ Carlow
    - ❑ Kilkenny

12. How would you describe the ownership of this hospital?
    - ❑ Health Service Executive hospital
    - ❑ Public voluntary or joint board hospital
    - ❑ Private hospital
    - ❑ Other: _____

13. What specialties, if any, does the hospital have? Please choose **all** that apply:

- ❑ Cardiology
- ❑ Paediatrics
- ❑ Critical care and/or intensive care unit
- ❑ Burns unit
- ❑ Endocrinology
- ❑ Infectious diseases
- ❑ Emergency medicine
- ❑ Gastro-intestinal / liver / nutrition
- ❑ General / internal medicine
- ❑ Care of older people
- ❑ Haematology
- ❑ Oncology
- ❑ Immunology
- ❑ Transplants
- ❑ Nephrology
- ❑ Neurology
- ❑ Psychiatry
- ❑ Respiratory medicine
- ❑ Surgery
- ❑ Obstetrics / gynaecology / women's health
- ❑ Orthopaedics
- ❑ Ophthalmology
- ❑ Neonatal ICU
- ❑ Fertility treatment / IVF
- ❑ Other: _____

## WORKFORCE

14. Please indicate whether your contract is full- or part-time and whether it is temporary or permanent (tick all categories that apply to you):

❏ Full-time

❏ Part-time

❏ Permanent

❏ Temporary

❏ Agency/Locum

14a. If you are part-time, what percentage of a full-time contract do your hours represent?

15. What time do you spend (thinking about a typical week or month) on each of the following activities?

| | Most of the time on most days | Some of the time on most days | Some of the time on some days | Little time on few days | Never |
|---|---|---|---|---|---|
| Dispensing inpatient prescriptions | ❏ | ❏ | ❏ | ❏ | ❏ |
| Dispensing outpatient prescriptions | ❏ | ❏ | ❏ | ❏ | ❏ |
| Medicines reconciliation upon admission | ❏ | ❏ | ❏ | ❏ | ❏ |
| Medicines reconciliation upon discharge | ❏ | ❏ | ❏ | ❏ | ❏ |
| Medication history-taking | ❏ | ❏ | ❏ | ❏ | ❏ |
| Reviewing Kardexes on wards | ❏ | ❏ | ❏ | ❏ | ❏ |
| Prescription review for care-home patients | ❏ | ❏ | ❏ | ❏ | ❏ |
| Education for inpatients | ❏ | ❏ | ❏ | ❏ | ❏ |
| Education for outpatients | ❏ | ❏ | ❏ | ❏ | ❏ |
| Working on ward stock systems | ❏ | ❏ | ❏ | ❏ | ❏ |
| Giving medicines information to other staff (by telephone) | ❏ | ❏ | ❏ | ❏ | ❏ |
| Giving medicines information to other staff (on wards) | ❏ | ❏ | ❏ | ❏ | ❏ |
| Manufacturing activities (sterile and non-sterile) | ❏ | ❏ | ❏ | ❏ | ❏ |
| IV preparation | ❏ | ❏ | ❏ | ❏ | ❏ |

| | Most of the time on most days | Some of the time on most days | Some of the time on some days | Little time on few days | Never |
|---|---|---|---|---|---|
| Stock control | ❏ | ❏ | ❏ | ❏ | ❏ |
| Purchasing | ❏ | ❏ | ❏ | ❏ | ❏ |
| Quality assurance systems | ❏ | ❏ | ❏ | ❏ | ❏ |
| Audit | ❏ | ❏ | ❏ | ❏ | ❏ |
| Research | ❏ | ❏ | ❏ | ❏ | ❏ |
| Medicines use evaluation | ❏ | ❏ | ❏ | ❏ | ❏ |
| Medicines safety activities | ❏ | ❏ | ❏ | ❏ | ❏ |
| Antimicrobial stewardship activities | ❏ | ❏ | ❏ | ❏ | ❏ |
| Specific clinical area of work, e.g. cardiac rehab | ❏ | ❏ | ❏ | ❏ | ❏ |
| Developing/implementing policy and strategy for the hospital (e.g. committee work) | ❏ | ❏ | ❏ | ❏ | ❏ |
| Clinical trials | ❏ | ❏ | ❏ | ❏ | ❏ |
| Undertaking CPD activities | ❏ | ❏ | ❏ | ❏ | ❏ |
| Communication with external healthcare professionals | ❏ | ❏ | ❏ | ❏ | ❏ |
| ADE and ADR reporting and follow-up | ❏ | ❏ | ❏ | ❏ | ❏ |
| Other administration/management duties | ❏ | ❏ | ❏ | ❏ | ❏ |
| Other (please give details below) | ❏ | ❏ | ❏ | ❏ | ❏ |

15a. Please give details of the "other" activities on which you spend time if you indicated this above.

16. Are you or have you been engaged primarily in a specific area of clinical expertise (e.g. palliative care, antimicrobial, etc)?

- ❑ Yes - currently
- ❑ Yes - was previously, but not currently
- ❑ No

16a. If Yes (previous or current), please give details.

<br><br><br><br><br><br><br>

17. Do you have formal qualifications, or have you engaged in further study, in any areas of specific clinical expertise?

Please choose **all** that apply:

- ❑ Have formal qualification in area in which I am currently working
- ❑ Have formal qualification in area of specific clinical expertise in which I am not currently working
- ❑ Have engaged in further study in area in which I am currently working
- ❑ Have engaged in further study in area of specific clinical expertise in which I am not currently working
- ❑ Have no formal qualifications or further study in areas of specific clinical expertise

17a. If you ticked "formal qualifications" in a specific area (or areas) of clinical expertise, please give details.

<br><br><br><br>

17b. If you ticked "engaged in further study" in a specific area (or areas) of clinical expertise, please give details.

<br><br><br><br>

18. Have you had a formal appraisal by a line manager in the past year?

    ❑   Yes

    ❑   No

18a. If Yes, did they ask you about CPD or CE as part of your appraisal?

    ❑   Yes

    ❑   No

19. For each of the following statements, please indicate the extent to which you agree or disagree with the perception.

    Please choose the appropriate response for each item:

| | Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|---|
| We have enough pharmacists to comfortably provide our services from this hospital pharmacy department | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| We have enough non-pharmacist staff to comfortably provide our services from this hospital pharmacy | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| We would like to delegate more tasks to other staff | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| We could benefit from more specific clinical areas of pharmacist expertise in the pharmacy | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| We could benefit from more use of the specific expertise already present in the pharmacy | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| There is an opportunity to significantly advance patient health and wellbeing in hospitals by changing how pharmacists, pharmacy technicians and technology resources are deployed | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |

## SYSTEMS AND SERVICES

20. For each of the following statements, please indicate to what extent you agree with the perception.

    Please choose the appropriate response for each item:

|  | Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|---|
| Hospital pharmacists are responsible and accountable for patients' medication-related outcomes | ❏ | ❏ | ❏ | ❏ | ❏ | ❏ |
| Hospital pharmacists significantly influence the prescribing practice in this hospital | ❏ | ❏ | ❏ | ❏ | ❏ | ❏ |

## CPD

CPD is defined as a systematic, ongoing, cyclical process of self-directed learning and continuous quality improvement which allows pharmacists to learn and develop to meet their own personal and professional needs, the needs of the health service and the needs of patients. CE is defined as structured formal learning experiences and activities that pharmacists undertake following registration to improve knowledge, skills and competencies. Quality assured CE is a component of the learning experiences required in a CPD system.

21.  What type(s) of CPD (incorporating CE) activity have you engaged in over the last year?

Please choose **all** that apply:
- ❑ Addressing learning opportunities in my everyday practice
- ❑ Attending ICCPE lectures
- ❑ Attending formal lectures by other providers
- ❑ Attending other educational meetings
- ❑ Reading professional journals
- ❑ Reading scientific papers
- ❑ Engaging in distance learning
- ❑ I am working towards a postgraduate qualification
- ❑ Supervising a pharmacy intern
- ❑ Audit (e.g. developing and reviewing SOPs)
- ❑ None
- ❑ Other - please specify:

21a. If you are undertaking a postgraduate qualification, please give details:

Qualification type _____

Institution: _____

22.  Do you record your CPD (incorporating CE) activity (formally or informally)?
- ❑ Yes
- ❑ No

22a. If Yes, how do you record this activity?
- ❑ Informal paper record
- ❑ Paper-based portfolio
- ❑ Informal electronic record
- ❑ Electronic portfolio
- ❑ Online resource
- ❑ Other:

23. For what purposes have you undertaken CPD (incorporating CE)?

    Please choose **all** that apply:
    - ❑ Personal professional development
    - ❑ To deliver a specific service in the pharmacy
    - ❑ Development of pharmacy staff
    - ❑ Developing inter-professional relationships
    - ❑ Other - please specify:

24. What arrangements have been put in place by your employer so that you can maintain appropriate experience in the practice of pharmacy and undertake CPD (incorporating CE)?

    Please choose **all** that apply:
    - ❑ Allowing paid time off for CPD (incorporating CE) activities
    - ❑ Allowing unpaid time off for CPD (incorporating CE) activities
    - ❑ Paying for staff membership of ICCPE
    - ❑ Funding CPD (incorporating CE) activities
    - ❑ Requiring pharmacists to undertake minimum levels of CPD (incorporating CE)
    - ❑ Providing in-house training and development activities
    - ❑ Providing a staff study area within the pharmacy department
    - ❑ No arrangements have been put in place
    - ❑ Other - please specify:

24a. If your employer has minimum CPD (incorporating CE) requirements for pharmacists, please give details of these requirements below:

25. Do you ever attend courses organised by the following organisations?

    Please choose **all** that apply:

    - ❑ University School of Pharmacy
    - ❑ Other University School
    - ❑ ICCPE
    - ❑ HPAI
    - ❑ Pharmaceutical Society of Ireland
    - ❑ American Society of Healthcare Pharmacists (ASHP)
    - ❑ European Association of Hospital Pharmacists (EAHP)
    - ❑ British Association of Oncology Pharmacists (BOPA)
    - ❑ UKCPA
    - ❑ UKMI
    - ❑ None
    - ❑ Other: _____

26.  Has the hospital ever funded your attendance at courses?
   - ❑   Yes
   - ❑   No

26a. If Yes, what did it support? Please choose **all** that apply:
   - ❑   Course fee
   - ❑   Travel
   - ❑   Accommodation
   - ❑   Subsistence
   - ❑   Other: _____

27.  Do you undertake as much CPD (incorporating CE) as you would like or consider appropriate?
   - ❑   Yes
   - ❑   No
   - ❑   Not sure

27a. If No or Not sure, what would help you to engage in more CPD (incorporating CE)? Please choose **all** that apply:
   - ❑   Availability of CPD (incorporating CE) activities closer to pharmacy location
   - ❑   Greater frequency and more convenient range of times for CPD (incorporating CE) activities
   - ❑   Availability of an enhanced range of topics that meet practice needs
   - ❑   More access to online or technology-based learning methods for CPD (incorporating CE)
   - ❑   Greater availability of locum cover
   - ❑   Different staffing rosters in the pharmacy to free up time
   - ❑   Understanding what workplace activities can constitute appropriate CPD (incorporating CE)
   - ❑   More opportunities to engage in inter-professional learning with other healthcare professionals
   - ❑   Other - please specify: _____

27b. If No or Not sure, what stops you from engaging in as much CPD (incorporating CE) as you would like to? Please choose **all** that apply:
   - ❑   Lack of time
   - ❑   Difficulty arranging locum or in-house cover
   - ❑   Distance from CPD (incorporating CE) activities
   - ❑   Inconvenient times for CPD (incorporating CE) activities
   - ❑   Insufficient range of CPD (incorporating CE) activities
   - ❑   Lack of information on what CPD (incorporating CE) activities are available
   - ❑   Other - please specify: _____

28. Do you engage in inter-professional CPD/CE activities?

   ❑ Yes

   ❑ No

28a. If Yes, please give details:

```
┌─────────────────────────────────────────────────────────────┐
│                                                             │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
└─────────────────────────────────────────────────────────────┘
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Note: Audit is an exploration of the extent to which a service meets an established standard, and research is an exploration of broader questions where no published standards or guidance exist.

29. In the past year, have you undertaken or participated in any of the following? Please choose **all** that apply:

   ❑ Clinical audits

   ❑ Practice research

   ❑ Clinical trials

   ❑ None of the above

29a. Please give details of the number of such audits, research activities, or trials.

| | **Number** | **Subject** |
|---|---|---|
| Clinical audits | | |
| Practice research | | |
| Clinical trials | | |

30. Are you involved in the training of any of these groups? Please choose **all** that apply:

   ❑ Undergraduate pharmacists

   ❑ Pharmacy interns

   ❑ Student pharmacy technicians

   ❑ Undergraduate medical students

   ❑ Undergraduate nursing students

   ❑ Nurse prescribing students

   ❑ Post-qualification nurses

   ❑ Consultant medical staff

   ❑ Junior medical staff

   ❑ Postgraduate pharmacists

   ❑ I am not involved in any training

   ❑ Other: _____

31. Is there a formal process to identify your individual requirements for CPD/CE or to engage in CPD/CE planning (e.g. as part of an appraisal or otherwise)?

   ❑ Yes

   ❑ No

31a. If Yes, please give details.

<br><br><br><br><br>

32. For each of the following statements, please indicate the extent to which you agree with the perception.

   Please choose the appropriate response for each item:

| | Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|---|
| We have the right mix of skills and qualifications among our staff to provide our current services | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Staff here have many opportunities to develop high levels of expertise in general hospital pharmacy practice | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Staff here have many opportunities to develop high levels of expertise in specific clinical areas of hospital pharmacy practice | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| There is a need for pharmacists to develop more focused expertise in specific clinical areas in this hospital | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| There are many in-house CPD opportunities for staff | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| There are many externally funded CPD opportunities for staff | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| There is a good choice of CE courses available nationally for hospital pharmacists | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |

33. If you have any comment about the current provision of CPD (incorporating CE) for hospital pharmacists, and/or any suggestions as to whether and how such provision could or should be improved, please give details.

## INTERPROFESSIONAL LINKS

34. How would you describe the relationship between you and each of the following groups of professionals?

| | Excellent | Very good | Good | Fair | Poor | Non-existent |
|---|---|---|---|---|---|---|
| Junior doctors | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Consultant doctors | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Nurses | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Other hospital healthcare professionals | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Pharmacists in other hospitals | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Community pharmacists | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Primary care doctors | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Hospital managers | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| Patient representatives | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |

35. For each of the following statements, please indicate to what extent you agree with the perception.

| | Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|---|
| The pharmacy team has satisfactory influence over the policymakers and managers within the hospital | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| More joint professional working would raise the profile of this hospital pharmacy team | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |

36. If you have any further comments in relation to inter-professional relationships in respect of hospital pharmacy, please give details.

## TECHNOLOGY

37. Do you have access to the following during the course of your working day?

   ❑   Internal email

   ❑   External email

   ❑   Internet

   ❑   Online medicines information and resources

   ❑   None of the above

38. How important are the following in supporting you in fulfilling your role and in relation to maintaining an appropriate standard of service?

| | Very Important | Important | Neither Important nor Unimportant | Not Important | Not at All Important |
|---|---|---|---|---|---|
| Internal email | ❑ | ❑ | ❑ | ❑ | ❑ |
| External email | ❑ | ❑ | ❑ | ❑ | ❑ |
| Internet | ❑ | ❑ | ❑ | ❑ | ❑ |
| Online medicines information and resources | ❑ | ❑ | ❑ | ❑ | ❑ |

39. Please indicate to what extent you agree with the following perception.

| | Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|---|
| The technology in this pharmacy is adequate to support the provision of high quality pharmacy services | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |

39a. If you wish to expand on your answers, please do so here.

## FINAL

40. Are there areas in which you feel hospital pharmacy could have a greater contribution to in the future? For example, additional services the pharmacy doesn't currently provide which you would like to see provided, and/or areas in which pharmacists are not currently involved where you believe greater pharmacist input would be beneficial for patients.

41. How do you view hospital pharmacy practice in Ireland currently and how would you like to see hospital pharmacy practice develop in the future?

Thank you for your time and effort in completing this questionnaire.
Your contribution is much appreciated.

Please return the survey by post before **Friday, 25 May 2012**, to:

**Vanya Sargent**
**Horwath Bastow Charleton**
**Marine House**
**Clanwilliam Court**
**Dublin 2**

# Appendix ❷

# Interview Schedules

**Interview Questions – Supervising Pharmacist**

**Opening**

Has the work that you do changed in the last [5 years]? If so, how?
*How would you like it to change in the future?*

**Services**

How would you describe the model of pharmacy practice within your hospital?
*What, if anything, would you change about the tasks you do during a typical day?*

How do you feel about the services that you currently provide in your pharmacy?
*Which services work well? Which work less well?*
*Do you feel that the pharmacy service meets the needs of the patients and staff ?*

Are there services that you would you like to offer in the future?
*What are your main reasons for considering these services?*

What do you see as the future trends in hospital pharmacy services?
*What types of services should pharmacy as a profession concentrate on in the future?*

**Premises**

How satisfied are you with the premises you work in?

Do you plan, or would you like, to make changes to the premises in the future?
*Will future services need changes to premises?*
*What kind of changes do you think will be needed?*

**Education / CPD**

What do you find helpful when planning and undertaking CE/CPD?

What do you find are the main barriers to undertaking CE/CPD?

Do you feel your staff are equipped for current and future practice with the CPD activities available to you? (NB: Please consider both pharmacists and other pharmacy staff)
*Are there any implications for CPD/education from the future service trends you mention above?*
*Have you any plans to study for additional or higher qualifications?*
*If so do you feel that the support and funding would be made available?*

Do you consider yourself as having a clinical special interest?
*What is it? How do you keep yourself up-to-date in this area?*

**Technology**

How do you feel about the IT resources within your hospital pharmacy?
*Do you feel that you are leading edge, average, or falling behind with current hospital pharmacy IT trends?*

Do you see the need for any changes in the IT capability of your pharmacy in order to support the services that you provide / would like to provide?

What links would you like to see with data that other professionals hold about your patients?

What information would you like to share within the hospital, or beyond, about your patients?

**Inter-professional Issues**

How would you describe your professional relationship with doctors, nurses, administrators and other hospital staff?
*What factors make for a successful professional relationship?*
*What barriers prevent a successful professional relationship?*
*How can pharmacists support this?*
*How can pharmacists be supported by PSI and others to do this?*

Do you have the influence that you want, and need, within the hospital (over budgets, staffing, medicines use etc.) ?
*If Not, what are the barriers to gaining that influence?*

**Workforce**

How satisfied are you with the workforce arrangements in the hospital pharmacy?
*e.g. on a range from1 to 10*

What would you change about the workforce in your pharmacy, if you could?

Does the current workforce in your hospital pharmacy reflect what is needed to allow for the development of professional services?
*How many / what kind of activities are delegated to other staff by the pharmacists?*
*Could more activities be delegated to other staff?*
*What are the barriers to pharmacists delegating appropriate activities to other staff?*
*Is there the right skill mix?*

**Closing**

Is there anything else that you would like to say about hospital pharmacy services in Ireland?

**Focus Group Questions – Other Pharmacy Staff**

**Services**

How would you describe your work within your hospital?
*What, if anything, would you change about the tasks you do during a typical day?*

How do you feel about the services that you currently provide in your pharmacy?
*Which services work well? Which work less well?*

What do you see as the future trends in hospital pharmacy services?
*What would you like your role to be in those services?*

**Premises**

How satisfied are you with the premises you work in?

Are there any plans to make changes to the premises in the future?

Will future services need changes to premises?
*What kind of changes do you think will be needed?*

**Education / CPD**

Do you get the chance to do activities that keep you up-to-date with your job?
*If Yes, What are those activities, and how do you make time to do them?*
*Do you feel that you need any additional training?*

**Technology**

How do you feel about the IT resources within your hospital pharmacy?
*Do you feel that you are leading edge, average, or falling behind with current hospital pharmacy IT trends?*

Do you see the need for any changes in the IT capability of your pharmacy in order to support the services that you provide / would like to provide?

**Inter-professional Issues**

How would you describe your professional relationship with:

- Pharmacists
- Doctors
- Nurses
- Other hospital staff?

*What factors make for a successful professional relationship?*
*What barriers prevent a successful professional relationship?*

**Workforce**

How satisfied are you with the workforce arrangements in the hospital pharmacy?
*e.g. on a range from1 to 10*

How many / what kind of activities are delegated to you by the pharmacists?
*Could more activities be delegated to you?*
*What are the barriers to delegation?*

**Closing**

Is there anything else that you would like to say about hospital pharmacy services in Ireland?

**Focus Group Questions – Other Hospital Staff (could be a ward team – nurses, junior doctors, assistants)**

Tell us about the last time that you needed information from a pharmacist (collect a few examples, not necessarily one from everyone):
*What was the issue?*
*Was it in-hours or a problem out-of-hours?*
*Did you get benefit from discussing it with the pharmacist?*

**Services**

Does the pharmacy team provide all the support that you need for your work with patients?
*If No, how could the support be improved?*
*Do you feel the presence of a pharmacist on the ward is beneficial to the service?*
*Would you like to see more pharmacist time on the ward and, if so , for what purpose?*

Can you get the advice you need from pharmacists as quickly as you need it?
*If No, tell us about a time when you had an unacceptable delay*

Are there any further services that pharmacy could provide that would be useful to you?

Do you know any pharmacists who have specialist clinical interests that help your team?
*If No, would a specialist pharmacist be a good addition to your team?*

Do you think that pharmacists influence the prescribing patterns in the hospital?
*If Yes, tell us how they do that*

**Education / CPD**

Do you do any joint education / CPD activities with pharmacists?
*If Yes, What are those activities?*
*If No, do you think such activities would be useful?*

Do pharmacists take part in the teaching of students on the wards? (other than pharmacy students!)
*If No, do you think such activities would be useful?*

**Inter-professional Issues**

Is the pharmacy team 'visible' on the wards?
*To you?*
*To your patients?*
*Pharmacists, and/or other pharmacy staff?*

How would you describe the contact you have on the wards with

- Pharmacists
- Other pharmacy staff

*How would you describe the difference between what the pharmacists do, and what other pharmacy staff do, on the wards?*

How would you describe your professional relationship with:

- Pharmacists
- Other pharmacy staff

*What factors make for a successful professional relationship?*
*What barriers prevent a successful professional relationship?*

**Closing**

Is there anything else that you would like to say about hospital pharmacy services in Ireland?

**Questions for Senior Clinical Staff**

How would you describe the changes, if any, that you have seen in your practice in this hospital over the past 5 years?

What do you see as being the big challenges for your work in this hospital over the next 5 years?

How would you describe your engagement with pharmacy staff in this hospital?

Do you believe that pharmacy staff have significant influence on prescribing patterns in this hospital?

Do you believe that pharmacy staff have significant influence on other aspects of the hospital's work? (e.g. antibiotic stewardship, adoption of technology, risk management)

What developments would you like to see in hospital pharmacy practice, to benefit your team?

Is there anything else you would like to say about any of these issues?

# Appendix **3**

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# Appendix 4

# Annotated Bibliography
## (Further Reading)

## Further Reading – Annotated Bibliography of the International Literature Review

Papers are coded - on the basis of reading the abstract - into the domains

- (S) Systems and Services
- (P) Premises
- (T) Technology
- (W) Workforce.
- (C) CPD and continuing education
- (I) Interprofessional relationships
- (G) General

Those papers prefaced with (Q) contained ideas for survey and interview questions, and (V) provided interesting practice vignette material.

Papers with an asterix are those that will inform the question-drafting exercise.

Some paper citations are supplemented with text to describe interesting aspects of the article.

------------------------------------------------------------------

(T) (I) ASHP guidelines on pharmacy planning for implementation of computerized provider-order-entry systems in hospitals and health systems. 2011. *American Journal of Health-System Pharmacy,* **68**(6), pp. 537.

This is a very comprehensive (23 pages) account of the processes involved in planning and designing CPOE systems, from developing the team, through the design process to education and training. The article includes detail of design considerations and functionality. The stated purpose of the guidelines is to "provide guidance to pharmacists in hospitals and health systems on planning for, implementing, and enhancing safe computerized provider order- entry (CPOE) systems."
"These guidelines are intended to help pharmacy directors, managers, informaticists, and project managers successfully engage in this type of CPOE system implementation"

(G) Executive summary. 2011. *American Journal of Health-System Pharmacy,* **68**(12), pp. 1079-1085.

*(Q) (G) The consensus of the Pharmacy Practice Model Summit. 2011. *American Journal of Health-System Pharmacy,* **68**(12), pp. 1148-1152.

Consensus statements are grouped under following headings:
- Imperatives for new pharmacy practice models
  - E.g. All patients should have a right to the care of a pharmacist.
- Optimal pharmacy practice models
  - E.g. hospital and health-system pharmacists must be responsible and accountable for patients' medication-related outcomes
- Advancing the application of information technology in the medication-use process

- • E.g. no hospital should be exempted from compliance with technology-related medication-use safety standards
- ■ Advancing the use of pharmacy technicians
    - • E.g. ASHP should define a scope of practice, including core competencies, for hospital and health-system pharmacy technicians
- ■ Successful implementation of new pharmacy practice models

(G) ASHP statement on standards-based pharmacy practice in hospitals and health systems. 2009. *American Journal of Health-System Pharmacy,* **66**(4), pp. 409-410.

(T) (S) ASHP guidelines on the safe use of automated medication storage and distribution devices. 2010. *American Journal of Health-System Pharmacy,* **67**(6), pp. 483-490.

These guidelines define "automated dispensing devices" as primarily computer-controlled decentralized medication-dispensing cabinets, although they note that "since many of the concepts discussed here may be applicable to related technologies. The guidelines are intended to serve four purposes: "to (1) propose goals and objectives for the safe use of automated dispensing devices in the medication use process, (2) provide guidance on the safe use of automated dispensing devices to pharmacists and others involved in the medication-use process, (3) advise vendors of automated dispensing devices about the safety needs of health care professionals who use their systems, and (4) recommend standardization for Health Level 7 (HL7) interfaces between pharmacy information systems and automated dispensing devices."

(G) ABRAMOWITZ, P.W., 2009. The evolution and metamorphosis of the pharmacy practice model. *American Journal of Health-System Pharmacy,* **66**(16), pp. 1437-1446.

(G) ALDERMAN, C.P., 1997. Guidelines for hospital pharmacy practice. *Journal of quality in clinical practice,* **17**(1), pp. 33-35.

(W) ALLINSON, Y.M., DOLPHIN, R.G., LARMOUR, I. and SPALDING, G.J., 1985. The application of peer review to clinical pharmacy. *Australian Journal of Hospital Pharmacy,* **15**(1), pp. No. 4-7.

AL-SHAQHA, W.M.S. and ZAIRI, M., 2001. Pharmaceutical care management: A modern approach to providing seamless and integrated health care. *International journal of health care quality assurance,* **14**(7), pp. 282-301.

Three stages of pharmacy history – compounding & dispensing, clinical pharmacy and pharmaceutical care (PhC).
Pharmaceutical care – A system of drug use in which pharmacists share with other health care professionals the responsibility for optimising the outcomes of patients' drug therapy (Hepler 1990).
Has three steps assessment, the care plan, and the follow-up evaluation.
Barriers to implementing PhC:

| System-related | Fragmentation of system |
| | Lack of access to patient information |
| | Admission and discharge planning |
| Pharmacist-related | Lack of time |
| | Focus on drug distribution – traditional role |

| | Unaccustomed to documenting care |
|---|---|
| Management/Department-related | Failure to hold pharmacists accountable |
| | Job descriptions reflect traditional role |
| | Lack of time to plan |
| | Focus on financial success |
| | Lack of mechanism to measure PC impact |
| | Poor organisational chart |
| Professional/Administrative barriers | Lack of demand for PC |
| | Lack of evidence base |
| | Patients do not recognise value |
| | No promotion of PC to patients and colleagues |
| | Resistance of others |
| | Lack of awareness by administrators of pharmacist's potential |

"Pharmacists must acknowledge that drug products are one component of the drug use process, and to understand that drug-related disease and treatment failure are hazards of the process. That means, however, that pharmacists will have to accept some responsibility for the undesired consequences of the drugs that they dispense."

"The pharmacist's inter-professional relationships are limited because of the physical location of practice: physicians and nurses are in the patient-care areas and the pharmacists are in the central hospital pharmacy."

Primary, secondary and tertiary pharmaceutical care – equates to settings

PhC pharmacists must maintain clinical competence.

*(Q) (S) BABCOCK, K., 1987. Survey of small hospitals. *Canadian Journal of Hospital Pharmacy,* **40**(2), pp. 63-66.

*(Q) (T) BALEN, R.M. and JEWESSON, P.J., 2004. Pharmacist computer skills and needs assessment survey. *Journal of Medical Internet Research,* **6**(1), pp. 126-135.

Computer skills and needs assessment survey

Most pharmacists believed they needed to upgrade their computer skills.

Medical database and internet searching were skills identified as most in need of improvement for greater practice effectiveness.

Most were generally computer-literate and not anxious about using them.

Few were familiar with handheld computers.

(V) (S) BARNHART, M.R., 1997. How we justified the need for 24-hour pharmacy services in a 110-bed hospital. *Hospital pharmacy,* **32**(7), pp. 1021-1025.

(V) (T) BATES, D.W., 2007. Preventing medication errors: A summary. *American Journal of Health-System Pharmacy,* **64**(14 SUPPL.), pp. S3-S9.

(V) (I) BELL, D.A. and ABDULLAH, R.A., 1998. Rapid discharge summaries: Meeting modern guidelines with a computerized system. *Journal of the Royal College of Surgeons of Edinburgh,* **43**(3), pp. 213.

(S) BERNKNOPF, A.C., KARPINSKI, J.P., MCKEEVER, A.L., PEAK, A.S., SMITH, K.M., SMITH, W.D., TIMPE, E.M. and WARD, K.E., 2009. Drug information: From education to practice. *Pharmacotherapy,* **29**(3), pp. 331-346.

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(V) (T) BOBB, A.M., BOEHNE, J., ETHRIDGE, W.L., HARDY, J.C., HERRING, R., JACOBS, R.S., JONES, M.A., LYNCH, T.W., MACKOWIAK, L.R., MANNINO, T.J., PRZYBYLA, J.J., REICHERT, B.J., RUNNEBAUM, R.M., SMESTAD, N.R., TROIANO, D.L., TYNDALL, L.L. and WRIGHT, L., 2011. ASHP guidelines on pharmacy planning for implementation of computerized provider-order-entry systems in hospitals and health systems. *American Journal of Health-System Pharmacy,* **68**(6), pp. e9-e31.

(V) (E) BOURDON, O., EKELAND, C. and BRION, F., 2008. Pharmacy education in France. *American Journal of Pharmaceutical Education,* **72**(6),.

(G) BRELAND, B.D., 2007. Believing what we know: Pharmacy provides value. *American Journal of Health-System Pharmacy,* **64**(12), pp. 1284-1291.

Giving the 22[nd] annual Webb lecture, **Breland (2007)** wrote of an advanced pharmacy practice model, and the importance of leadership and management in supporting pharmacists to do their jobs. He introduced the concept of the 'pharmacy family', and the role of the pharmacy Director in developing this: "The pharmacy department needs to be united as a pharmacy family to achieve its greatest potential". He described the change from a product-focused model to a patient-oriented one, but stated that, with the success of a patient-focussed service, "the reality hits that a demand for services has been created that exceeds the ability of the pharmacy department to meet."

"Management excellence is never forgetting the basics—never forgetting the importance of providing quality core pharmacy services. Failure to maintain quality core pharmacy services may result in the loss of resources needed to provide advanced clinical pharmacy services. The pharmacy family must recognize the importance of supporting all elements of the pharmacy program."

He termed this advanced model the "pharmaceutical-care-oriented practice model".

He asserted that pharmacy managers must work for the benefit of the department: "As pharmacy managers, we should look at ourselves as servant leaders supplying our staff with the resources and opportunities needed to meet the individual pharmaceutical care needs of our patients."

(V) (E) BROWN, B.L. and WILLIAMSON, S.E., 1993. A system for documentation of pharmacist interventions with incorporation into performance and quality improvement plans. *Hospital pharmacy,* **28**(11), pp. 1083-1084+1086.

*(Q) (G) BUSH, P.W., ASHBY, D.M., GUHAROY, R., KNOER, S., ROUGH, S., STEVENSON, J.G. and WIEST, M., 2010. Pharmacy practice model for academic medical centers. *American Journal of Health-System Pharmacy,* **67**(21), pp. 1856-1861.

Academic medical centre model, detailing minimum pharmacy services

- Patient care services for all patients
  - Perform medication histories for inpatients, for patients admitted for >24 hours, in procedural areas
  - Reconcile medications upon admission for inpatients, in procedural areas
  - Review all non-emergent orders prior to the first dose administered
  - Participate in patient care rounds
  - Educate patients about new medications
- Patient care services for specific patients based on need e.g. anticoagulation management
- Medication preparation and delivery
  - Pharmacy oversight of the process of reconciling controlled-substance waste
  - Integration of distribution and clinical services
- Medication safety – pharmacists having the lead role
- Medication use policy – Continuously improve and redesign
- Information systems and technology – to enhance patient safety
- Quality outcomes and performance improvement
- Education and research – participation in teaching of pharmacists and other professions (EdT)

(V) (E) (T) BUSSIÈRES, J.-., THERRIEN, R., LEBEL, D. and DUMONT, M., 2004. Use of a Web-assisted approach to the teaching of a hospital pharmacy management course. *Canadian Journal of Hospital Pharmacy,* **57**(2), pp. 98-106.

(T) CALABRETTO, J.-., WARREN, J. and BIRD, L., 2005. Pharmacy decision support: Where is it? A systematic literature review. *International Journal of Pharmacy Practice,* **13**(3), pp. 157-163.

(V) (T) CASEY, M.M., SORENSEN, T.D., ELIAS, W., KNUDSON, A. and GREGG, W., 2010. Current practices and state regulations regarding telepharmacy in rural hospitals. *American Journal of Health-System Pharmacy,* **67**(13), pp. 1085-1092.

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(G) CHILD, D., CANTRILL, J. and COOKE, J., 2004. The effectiveness of hospital pharmacy in the UK: Methodology for finding the evidence. *Pharmacy World and Science,* **26**(1), pp. 44-51.

(E) CLARK, J.S., 2007. Developing the future of pharmacy through health-system pharmacy internship programs. *American Journal of Health-System Pharmacy,* **64**(9), pp. 952-954.

(P) CRAIG, R.C.A., 2001. Pharmacy practice in the first PFI hospital. *Hospital Pharmacist,* **8**(3), pp. 82-84.

This paper describes 'new' pharmacy services, and differences from 'old' style, in the planning of a new pharmacy department. This included what at the time was a pioneering system of what is now known as dispensing for discharge, or one-stop dispensing:

"For the past three years at the Cumberland Infirmary, pharmacy staff have pioneered a system of individual patient dispensing (IPD)/use of patients' own medicines/ self-medication with a view to introducing this system to all wards in the new hospital. To that end, all wards in the new hospital have patient medication lockers sited next to the beds. The principle behind this system is that pharmacists and technicians work on wards to ensure that patients on admission have sufficient medicines, both for their stay in hospital and after discharge."

(V) (S) DAPAR, M.L.P., MC CAIG, D.J., CUNNINGHAM, I.T.S., DIACK, L. and STEWART, D.C., 2010. Facilitators and barriers to pharmacist prescribing: Exploring the association of pharmacy practice setting. *International Journal of Pharmacy Practice,* **18**(SUPPL. 1), pp. 38-39.

(V) (T) DASGUPTA, A., SANSGIRY, S.S., SHERER, J.T., WALLACE, D. and SIKRI, S., 2010. Pharmacists' utilization and interest in usage of personal digital assistants in their professional responsibilities. *Health Information and Libraries Journal,* **27**(1), pp. 37-45.

Pharmacists using PDAs as personal organisers, for obtaining DI, and as medical calculators. More likely to be used as administrative, rather than patient care, tools. Hospital pharmacists were twice as likely as community pharmacists to own one. Being able to transport it with them round the hospital was advantageous. Some PDAs in hospital had integrated software with the hospital system and pharmacists could document activities. Not used for recording patient history, emailing with patients or filing claims.

*(Q) (G) DOLORESCO, F. and VERMEULEN, L.C., 2009. Global survey of hospital pharmacy practice. *American Journal of Health-System Pharmacy,* **66**(5 SUPPL. 3), pp. S13-S19.

85 countries responded, reflecting 83% of the world's population.

The most frequently reported practice models were pharmacists who either managed product supply only (41%) or managed all aspects of the medication use process (38%).

Pharmacists play a significant role in influencing prescribing. 77% reported pharmacists as part of a committee or the individual responsible for formulary development.

Access to pharmacists 24/7 was not common, with only 35% of countries requiring this.

 64% reported that >60% of pharmacists were women or gender mix was about equal. Fewer (38%) reported that a majority of hospital managers were female.

Over half of respondents had a shortage of pharmacists.

(G) DRISCOLL, D.F., 1997. Is hospital pharmacy practice at a crossroad? *Nutrition,* **13**(6), pp. 585-586.

Driscoll presents a cautionary note to the turn to patient focus, with a call to hold on to the core pharmacy skills and knowledge, especially in relation to pharmaceutics/aseptic and parenteral

nutrition. "In some practice environments, the "folly" of clinical pharmacy has been to make pharmacists available in the patient-care setting at the expense of drug distribution.""

(E) DUBIED, A., 2010. Management skills in hospital pharmacy practice and training. *EJHP Practice,* **16**(4), pp. 56.

(E) DUGGAN, C., ENGOVÁ, D., FRANKLIN, B.D. and WONG, I., 2004. Bridging the gap between academia and practice. *Hospital Pharmacist,* **11**(4), pp. 155-157.

***European Association of Hospital Pharmacists EAHP. Survey of European Hospital Pharmacy Practice. EAHP, The Hague: 2005.***
Available at http://www.eahp.eu/publications/survey/2005-survey

In the **European Association of Hospital Pharmacists (EAHP) 2005** survey[6], 825 hospitals responded from 22 (out of 26) EAHP members (including Ireland). Key findings regarding the pharmacy environment/premises were that "The average number of beds in complete hospitalisation served by the pharmacy in 2005 is 680, which is 13% more than in the year 2000." Hospital pharmacies which served more than 1000 beds were in Austria (1085), Denmark (1107), Germany (1115), and the Netherlands (1142). "In the year 2005 a hospital pharmacy on the average supplied 680 beds in complete hospitalisation, and 90 beds in partial hospitalisation."

The EAHP survey noted that, on average, hospital pharmacies were open 12 hours a day from Monday to Friday, which was on average 3 hours (33%) more than in the year 2000. On Saturdays, hospital pharmacies on average were open for 4 hours, which was 1 hour more than in the year 2000; and on Sundays they were open for 3 hours, which was 1 hour more than in the year 2000, resulting in an increase of 33% and 50%, respectively.

The EAHP 2005 survey also reported that, on average, less than 40% of the European hospital pharmacies provided a 24-hour on call service. This means nearly 10% less hospitals than shown by the 2000 survey. In Denmark and in the Netherlands hospital pharmacists are available around the clock in all hospitals participating in the survey, in Greece the 24-hour on call hospital pharmacy service was reduced by 14 %. The 2005 survey demonstrated that that the 24-hour on call service of a pharmacist is provided by 8-15% more hospitals in Austria, Germany, Hungary and Switzerland compared to the previous survey.

Resident on-call services were organised in less than 6% of the European hospitals on average. This average had not changed since 2000. Only 13 out of 22 countries reported that some of their hospitals provided such a service.

"The most numerous staff in hospital pharmacies is in Denmark - 10.3 pharmacists on the average, and in Norway 9.1 where the increase of FTE in hospital pharmacies was the greatest. Luxembourg and Slovakia, on the contrary have the smallest number of pharmacy staff - on the average 2.3 and 2.2 pharmacists, respectively. The average number of FTE for pharmacists in the European hospitals is 4.7."

"The hospital pharmacy directors are responsible for other hospital departments in 37% of the European hospitals, which is 2% less than in the year 2000." Other departments which pharmacy directors are responsible for include: management of medical devices; sterilisation (aseptics??); infection control; medical analysis lab, and waste management.

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[6] The results of the 2010 survey were as yet unavailable, but will be published in instalments in the European Journal of Hospital Pharmacy (Practice Edition) from late summer 2012 (personal communication, Dr Roberto Frontini, President – EAHP – 4 July 2012).

Pharmacists from half of the responding hospital pharmacies were involved in research with inpatients, and from one-quarter of responding hospital pharmacies with outpatients. The highest percentage of pharmacist involvement with inpatient research was in Dutch (96%) and Danish pharmacies (80%), and with outpatients in Dutch (70%) and Spanish pharmacies (67%).

"Clinical pharmacy services increased significantly in all countries during the last five years. In 85% of the hospitals, participating in the 2005 survey, the pharmacists perform centralised clinical services, i.e. pharmacists occasionally visit patients in the ward. In Germany and Spain the average number of visits to the hospital wards increased the most by 19% and 13%, respectively.

In 12% of hospitals only, a pharmacist visits patients on a daily basis: in Ireland in 45% of hospitals, in Belgium in 38%, in Greece in 20% and in Spain and the Netherlands in16%. Decentralised clinical service means that a pharmacist spends at least half of his working hours on a hospital ward. This is mostly done in Poland and Norway, where 40 to 50% of hospitals operate such system of clinical pharmacy.

In the majority of European hospitals which participated in the survey there was an established centralised clinical service and the pharmacists did not visit the wards on a daily basis. This has been reported from all participating hospitals in Denmark, Estonia, France, Greece, Hungary, Lithuania, Luxembourg, Slovakia and Switzerland.

A hospital pharmacist visits hospital wards at least once daily in as few as 13% of hospitals. The percent of these hospitals has been slightly reduced, compared to the survey 2000. The majority of such hospitals are in Ireland - 45% , Belgium 38% and in Greece 20%.

Decentralised clinical services are provided in more hospitals than five years ago. The most numerous hospitals with the established system are hospitals in Poland - 50% of participating hospitals, in Norway 40% of hospitals, in the Czech Republic 27% and in Croatia 25% of hospitals

"In the majority of the European hospitals bar codes are not used in everyday practice. They are used in stock management of the medicinal products in 28% of hospital pharmacies, mostly in the Czech Republic - 89%, Luxembourg - 75%, Norway - 63%, in the Netherlands - 62%, Italy - 58%, while in Croatia, Slovakia and Greece the bar codes are not used at all. Bar codes are used in stock management of medical devices in less than 16% of hospital pharmacies, mostly in Norway 50%, the Czech Republic 37% and in the Netherlands 32%. Belgium, Croatia, Poland and Greece do not use bar codes in this field. 13% of hospital pharmacies use bar codes for labelling the in-house produced drugs, mostly in the Czech Republic 57% and in the Netherlands 42%.

20% of hospital pharmacies use bar codes when manually picking medicinal products for distribution to hospital wards: Luxembourg 75%, France 50%, Italy 47% and the Netherlands 46%. In Croatia, Greece, Estonia, Lithuania, Norway and Slovenia no such procedure is performed.

16% of hospitals use or plan to use bars codes at the bedside to capture the information about the medicinal product given to the patient. In the Netherlands and in Luxembourg such method is more widely used - on the average in more than 50% of hospitals.

97% of hospitals distribute drugs with manual picking. Nonetheless the automation of drug distribution in hospitals increased. In the Netherlands (by 16%) and in Norway (by 13%) the use of ATC machines increased the most, while in Belgium (by 17%) and in Hungary (by 43%) the use of

Rowa machines increased. In Spain, Norway and Belgium the use of the integrated computer system – Pyxis significantly increased, by 23%, 25% and 10%, respectively."

"As expected, an increase in the use of pharmacy computing system in hospital pharmacies has been observed in all aspects of pharmacy activities, particularly in obtaining the prescriptions from the wards, which increased by 18% , compounding by 11% and drug information by 6%.

The use of pharmacy computing systems in collecting prescriptions from the wards was increased by more than 30% in Belgium, Denmark and Germany. The percent of hospitals with established computer controlled collection of the prescriptions from the wards exceeds 60% in Austria, Belgium, Denmark, Finland, Italy, Luxembourg and the Netherlands. In Denmark, Luxembourg and Norway all the surveyed pharmacies use computer system for drug information. Countries, where the use of computing systems in drug information is very modest are Croatia, Lithuania, Estonia and Poland. Computerization used for compounding was increased in all countries except in Belgium. In Hungary, Denmark, Finland and in the Netherlands it was increased by more than 20%. On the average 98% of the hospital pharmacies participating in the 2005 survey, use computer system. The average of 34% of hospitals have a stand alone system which interfaces with other departments and/or with the mainframe system in the hospital."

"92% of computer systems in hospital pharmacies are linked to the internet."

(W) FRONTINI, R., MIHARIJA-GALA, T., and SYKORA, J., 2012. EAHP Survey 2010 on hospital pharmacy in Europe: Part 1. General frame and staffing. Eur J Hosp Pharm, 19: 4 385-387.

Abstract: In 2010, the European Association of Hospital Pharmacists (EAHP) conducted its fourth survey on hospital pharmacy practice in Europe. 4748 heads of pharmacy were contacted in all member states through a network of national coordinators. 1283 hospital pharmacies from 30 countries answered the questionnaire with an overall response rate of 27.0%. The average number of beds served by one pharmacy had not changed since 2005 but there was a decrease in complete and an increase in partial hospitalisation. Pharmacists (27%) and qualified technicians (32%) make up 60% of the total staff. The number of pharmacists/100 beds varies from 0.24 (Bosnia and Herzegovina) to 4.35 (UK). Only a few countries did not experience shortages of pharmacists and technicians. European hospital pharmacy staffing (pharmacists and pharmacy technicians) remains, on average, low compared with the USA and has not grown significantly since 1995. Therefore, it can be problematic to make direct comparisons between hospital pharmacy services in the USA and Europe.

(W) GAITHER, C.A., MASON, N.A., DIOKNO, D.A. and HOFFMAN, E.J., 1994. Benefits and work-schedule options in hospital pharmacy practice. *American Journal of Hospital Pharmacy,* **51**(6), pp. 782-789.

GODWIN, H.N., 2004. Closing the pharmacy practice gap. *American Journal of Health-System Pharmacy,* **61**(6), pp. 623-625.

**Godwin'**s commentary article **(2004)** reviewed the developments in the American Society of Health-System Pharmacists (ASHP) towards the vision of health care pharmacists as "the primary individuals responsible for medication use and drug distribution." This included the introduction of the Best Practice Toolkit. He reviewed what still needed to be done, and introduced the call for CPO' – " I urge the profession to strive for the goal of having a chief pharmacy officer in every health system who will work in conjunction with the other chief officers in such institutions."

(G) GOLDBERG, L., CLARK, C. and PIKE, H., 2008. Sharing recent advances in hospital pharmacy practice. *Hospital Pharmacist,* **15**(1), pp. 25-27.

(W) GOUVEIA, W.A., 1990. Turbulence and tranquility in the new decade: Pharmacy leader-managers in patient care. *American Journal of Hospital Pharmacy,* **47**(2), pp. 311-319.

GOUVEIA, W.A. and BUNGAY, K.M., 1994. Incorporating pharmacoeconomic principles into hospital pharmacy practice. *Topics in hospital pharmacy management / Aspen Systems Corporation,* **13**(4), pp. 31-37.

GOUVEIA, W.A. and SHANE, R., 1999. Pharmacy practice management in the next century. *American Journal of Health-System Pharmacy,* **56**(24), pp. 2533.

Called for a balance of management training in residency as well as clinical skills. Predicted a looming shortage of pharmacy managers and leaders.

(S) GOUVEIA, W.A. and SHANE, R., 1997. The three dimensions of managed care pharmacy practice. *The American Journal of Managed Care,* **3**(2), pp. 231-239.

The three elements are:

- Pharmacy practice across the continuum of care;

- The major elements of pharmacy practice;

- The evolution of pharmacy during the 5 stages of the development of managed care.

(Figure including prevention, primary care, acute care and post-acute care)

Interesting table about pharmacists' responsibilities in health systems on p234 (adapted from Zilz).

History of term clinical pharmacy and pharmaceutical care on p234-5. Coincided with change in education to PharmD.

Pharmacists in the New England Medical Center conduct patient outcomes assessments in adult neurology, psychiatry, and dialysis clinics. Their role includes clinic management, development of critical pathways of care, evaluation of medication use, outcomes assessment, and co-ordination of clinical trials.

*(Q) (G) GUERRERO, R.M., NICKMAN, N.A. and BAIR, J.N., 1990. Using pharmacists' perceptions in planning changes in pharmacy practice. *American Journal of Hospital Pharmacy,* **47**(9), pp. 2026-2030.

*(Q) (G) HARRISON, J., SCAHILL, S. and SHERIDAN, J., 2011. New Zealand pharmacists' alignment with their professional body's vision for the future. *Research in Social and Administrative Pharmacy,* .

**Harrison *et al.* (2011)** described the changing context of NZ pharmacy practice, and the move towards a more patient-focussed service. The article explored New Zealand pharmacists' alignment with their professional body's vision for the future (The Pharmaceutical Society of New Zealand (PSNZ) commissioned the development of a vision for pharmacy. This vision, Focus on the Future: The Ten Year Vision for Pharmacists in New Zealand (2004-2014).

There were 132 hospital pharmacists out of 980 respondents. Although a small number, demographic information is included here to add to the picture of international pharmacy practice:

Sex: 19.7% male (cf 41% community); 87.3 female (cf 57.3%community - 1.7 missing data)

Hours worked per week: 47% reported working over 40 hours a week (cf 51.9% community); 34.8% working 31-40 hours per week (cf 22.6% community), and 18.3% under 30 hours (cf 26.7%).

% of time spent on clinical activities:  62.1 % reported spending over 60% of time on clinical activities (cf 47.4% comm); 15.2% between 41 and 60% of time (cf 14.7% comm), and 22.7 spent less than

40% of their time on clinical activities (cf 36.9% comm).

(T) HAWKINS, B., 2010. ASHP guidelines on the safe use of automated dispensing devices. *American Journal of Health-System Pharmacy,* **67**(6), pp. 483-490.

(S) HERTIG, J., JENKINS, M., MARK, S. and WEBER, R., 2011. Director's forum - Developing patient-centered services, part 1: A primer on pharmacy practice models. *Hospital pharmacy,* **46**(1), pp. 61-65.

(G) HOLLAND, R.W. and NIMMO, C.M., 1999. Transitions, part 1: Beyond pharmaceutical care. *American Journal of Health-System Pharmacy,* **56**(17), pp. 1758-1764.

Describing an international Good Pharmacy Practice (GPP) model, and a Total Pharmacy Care (TPC) model. TPC combines 5 existing models: drug information; self-care; clinical pharmacy; pharmaceutical care, and distribution.

Interesting figure about pharmacy practice development on p1759.

Adoption of the clinical pharmacy model was the beginning of social value for hospital pharmacists.

Distinction between clinical pharmacy and pharmaceutical care – taking responsibility for functions rather than providing them.

Self-care may be at odds with pharmaceutical care.

GPP, proposed by FIP in 1993, has 4 distinct fields:

- health promotion and ill-health prevention;
- supply and use of prescribed medicines and other health care products;
- self-care;
- influencing prescribing and medicine use.

Difficult to implement worldwide.

TPC flow diagram on p1762.

The shift to pharmaceutical care emphasised the increasing professionalisation of the pharmacist. For pharmacists embracing the CP model, the shift to PC is largely one of attitude.

Resistance of other professionals to the changing model of pharmacy practice threatens it. Leadership will be crucial.

***Hospital Pharmacy in Canada Editorial Board. Hospital Pharmacy in Canada 2009/10 Report.*** Available at http://www.lillyhospitalsurvey.ca/hpc2/content/2010_report/2009_2010_full_E.pdf

The Report explored whether named pharmacists were assigned to 'Patient care programs' (a healthcare delivery system structured around a group with similar needs, such as child health, mental health or critical care). They felt that the formal assignment of a pharmacist to a patient care program was a good indicator that a satisfactory level of input was being given to that area of care. Formal assignment was reported by 78% of hospital respondents. They recognised, however, that smaller

hospitals may not be able to assign pharmacists in this way. The likelihood of a positive response to this was higher in hospitals with a teaching affiliation.

Clinical practice models [p10]

In the 2009/10 survey, 95% (152/160) of respondents provided information on the clinical practice models in place within their hospital.

Not surprisingly, many hospitals use more than one practice model. The percentage of respondents that use each pharmacy practice model, either for all beds or for a portion of all beds in their facility, varied from 74% (113/152) for an integrated drug distribution/clinical practice model, 38% (57/152) for a drug distribution centred model, 30% (46/152) for a clinical practice centred model and 11% (17/152) for a separate clinical and drug distribution practice model.

The percentage of inpatient beds covered by the drug distribution model is higher in smaller hospital (31% in 50-200 beds vs. 18 % in 201-500 beds vs. 12 % in > 500 beds), and in non-teaching hospitals (24 % in non-teaching vs. 9% in teaching).

Clinical pharmacy competencies [p13]

Based upon the clinical pharmacist competencies proposed by ACCP, respondents to the 2009/10 survey were asked, for the second time, to rank in descending order (with 1 being the highest priority and 5 being the lowest priority) the importance that their pharmacy department attaches to each of the clinical pharmacist competencies.

The 26% (42/160) of respondents who evaluate the provision of pharmacy direct patient care services by auditing a sample of clinical activities, provided a complete ranking of competencies.

Respondents reported a higher priority (with 1 being the highest priority and 5 being the lowest priority) for clinical problem solving, judgment and decision making (average 1.1 ± 0.4), therapeutic knowledge (2.6 ± 0.9) and communication and education (2.9 ± 0.9), three competencies that are relevant to direct patient care activities. Respondents reported a lower priority (higher average) for the management of patient populations (4.0 ± 1.2) and for medical information evaluation and management (4.3 ± 0.7), two competencies that relate more to indirect patient care activities. Respondents reported the same ranking order in 2007/08.

Prescribing rights [p14]

There was a decrease in the number of respondents reporting that pharmacists have prescribing rights approved within their hospital, from 61% (99/163) in 2007/08 to 55% (88/159) in 2009/10.

There was a decrease in dependent (supplementary) prescribing rights and a slight increase in independent prescribing rights.

Drug distribution [p21]

The unit dose system reduces the incidence of medication errors, decreases medication related activities for nursing, makes efficient use of pharmacy and nursing personnel, improves drug monitoring, reduces drug inventories, enables activity-based costing, reduces waste and pilferage, is adaptable to computerized procedures, and improves job satisfaction for healthcare professionals. For these reasons, The Canadian Society of Hospital Pharmacists has endorsed the unit dose system as the drug system of choice in organized healthcare settings in Canada.1

Centralized unit dose systems, in which unit dose medications are dispensed from the central pharmacy, for each patient, were reported to be in use by 70% of all respondents, compared to 64% (103/162) in 2007/08.

In previous years, decentralized unit dose systems were considered as a whole and were not separated into satellite pharmacy and automated dispensing models. In this year's survey these two types of decentralized models were separately addressed.

Decentralized unit dose systems, in which unit dose medications are dispensed from a satellite pharmacy, for each patient, were reported to be in use by 8% of all respondents.

Decentralized unit dose systems, in which unit dose medications are dispensed from automated dispensing cabinets located in patient care areas, were reported to be in use by 53% (84/159) of all respondents. In 2007/08, 36% (59/162) of respondents reported that they used automated dispensing cabinets.

Opening hours [p25]

Ninety-eight percent (155/158) of all respondents reported that the pharmacy was closed for a period of hours each day. This is essentially unchanged from 2007/08. One respondent in British Columbia, one in the Prairies, and one in Ontario reported that the pharmacy was open 24 hours a day.

Human Resources shortages [p37-8]

Fifty-eight percent (93/159) of respondents reported having pharmacist position vacancies on March 31, 2010, which is about the same as in 2007/08 when 60% (98/163) reported having pharmacist vacancies. The average reported vacancy rate for pharmacists in 2009/10 was 8.2% which was lower than the vacancy rate reported in the 2007/08 report (10.4%). In the 2005/06 report the vacancy rate was 13.3%.

Overall, respondents reported a total of 235 pharmacist position vacancies nationally. This is down from 292 pharmacist position vacancies in 2007/08 and 270 vacancies in 2005/06. As noted in past reports, this number underestimates the total national number of vacancies as not all hospitals participated in the survey. The average number of pharmacist vacancies per respondent is down from 1.8 (292/163) in 2007/08 to 1.5 (235/159) in 2009/10.

The overall reported vacancy rate for technicians was 1.5% in 2009/10 (Table D-1), compared to 1.4% in 2007/08. This vacancy rate is low when compared to the pharmacist vacancy rate, but the trend is upward.

Staff composition of the average pharmacy department [p42]

The average number of pharmacist positions reported represents 40% of total pharmacy staffing.

Management positions represent 4% of total pharmacy staffing, similar to the previous report (5%), when looking at all management positions combined.

Technician/Assistant positions represent 51% (49% in 2007/08) of total pharmacy staffing.

Support personnel represents 3.4% (3.8% in 2007/08) of total pharmacy staffing.

Pharmacist activities [p43]

Respondents reported that pharmacists spent approximately 47% of their time performing clinical activities in 2009/10, compared to 45% in 2007/08, while spending correspondingly less time in drug distribution. When the historical trend is examined since 1997/98, the time spent on clinical activities has slowly but steadily increased from 33% to 47%.

Medicines Reconciliation [p56]

When a patient visits the Emergency Department, 49% of respondents reported the presence of a formal process to obtain a complete and accurate list of the patient's current home medications for selected patient groups. A further 27% reported that this process was in place for all patients. On average, 76% (121/159) of respondents reported that they obtain a complete and accurate list of the patient's medication for all or some patients who visit the ER.

When a patient is admitted to the organization, 57% of respondents reported having a formal process to obtain a complete and accurate list of the patient's current medications for all patients and 31% of respondents reported doing so for selected patient groups. Noticeable differences exist, based on hospital size, with respect to whether or not the process is in place for all patients. The highest percentage of respondents who reported that the process was in place for all patients was from hospitals with 50-200 beds (71%), followed by hospitals with 201-500 beds (56%) and hospitals with more than 500 beds (44%).

Patient education [p62]

Twenty-eight percent of respondents reported providing a copy of the medication record to some or all patients, compared to 41% (65/158) in 2007/08. Twenty-five percent of respondents reported that they provide a copy of a medication record to all patients, a notable increase from the 6% (9/158) of respondents in 2007/08. A copy of the medication administration record is provided to selected patient groups by 25% of the respondents, compared to 35% (56/158) in 2007-08.

Pharmacy Information Systems [p64-73]

Almost all respondents (99%, 158/160) across all sectors and all sizes of hospitals reported that they have a pharmacy information system (PIS). Eighty percent (125/156) reported that the pharmacy information system includes clinical decision support functionality, vs. 91% (150/164) of respondents in the 2007/08 report, 83% (118/142) in the 2005/06 report and 40% (58/144) in the 2003/04 report. Caution should be exercised in trying to compare these responses since "clinical decision support systems" were defined differently in the earlier surveys. The reported availability of a pharmacy information system with clinical decision support functionality was similar across most provinces and hospitals, with the exception of the Prairie region, and small hospitals with 50-200 beds, where the availability of such systems was lower.

The 2009/10 survey results indicate that there has been some progress in the implementation of CPOE systems. Eight percent (13/160) of respondents reported they had an operational CPOE system in place, compared with 5% (9/165) in 2007/08 and 6% (8/142) in 2005/06. (Table F-4)

The majority of respondents, 89%, reported that pharmacy staff had the ability to access patient care information at the patient care unit level, via either a portable computer or a fixed desktop computer.

Sixty-eight percent of respondents in the 2009/10 survey reported that smart pumps were being used in their hospital, vs. 61% (101/165) in 2007/08. In the 2007/08 survey, teaching hospitals were less likely to have implemented smart pumps than non-teaching hospitals.

The use of barcode applications in the medication management systems of Canadian hospitals is slowly increasing. Forty-nine percent of respondents in the 2009/10 survey reported that they were using barcoding vs. 37% (60/164) of respondents in the 2007/08 report and 35% (50/142) in the 2005/06 report.

Deployment of Pharmacy Technicians [p115-6]

In the 2009/10 survey, 71% of respondents reported that pharmacy technicians carried out tasks that directly support pharmacists in carrying out their clinical activities, as compared to 66% (107/163) of respondents in the previous survey.

Ninety percent of respondents reported that their technicians were involved in resolving drug distribution problems on patient care units, and technician support to the TPN team was reported by 7% of respondents.

Fifty-two percent of respondents reported that their technicians were involved in carrying out medication reconciliation on admission (captured as "admission drug histories" in the last survey), and 7% reported that their technicians were involved in medication reconciliation on discharge. Technician involvement in medication counseling dropped to 12% of respondents in 2009/10, compared to 21% (22/107) in 2007/08. This is likely explained by the addition of medication reconciliation at discharge to the 2009/10 survey. If the percentage of 2009/10 respondents who reported that their technicians were involved in medication reconciliation on discharge (7%) is added to the percentage of respondents who reported that their technicians were involved in medication counseling (12%), the sum of 19% is similar to the 21% of respondents in the 2007/08 survey who reported that their technicians were involved in medication counseling.

Drug therapy evaluation and monitoring by technicians via collecting data for drug utilization was reported by 18% of respondents. Drug dosage adjustment through the use of nomograms by technicians was reported by 4% of respondents. Technician support to the drug use evaluation program, by collecting drug utilization data for review, was reported by 29% of respondents and support to the P&T committee was reported by 14% of respondents. Technician support to the medication safety committee was reported by 38% of respondents.

Overall, 43% of respondents reported that some of their pharmacy technicians were certified by one of the recognized organizations.

*International Pharmacy Federation (FIP) (2008). The Final Basel Statements on the future of hospital pharmacy.* FIP, The Hague: December 2008. Available at www.fip.org/statements

The **FIP** "Basel Statements" about the future of hospital pharmacy - agreed by 348 hospital pharmacists, representing 98 nations, in Basel in 2008 – comprise 14 overarching consensus statements and then 61 further statements grouped under the following themes: Procurement; Influences on Prescribing; Preparation and Delivery; Administration; Monitoring of Medication Practice, and Human Resources and Training. The thrust of the vision is that pharmacists take responsibility for - and exert influence upon - all medicines-related activities in the hospital, using their skills for the benefit of the patient. They pre-date the FIP/WHO GPP standards, but are consistent with that vision.

*International Pharmacy Federation (FIP) (2009a). FIP Statement on Collaborative Pharmacy Practice.* FIP Istanbul, 2009. Available at www.fip.org/statements

*International Pharmacy Federation (FIP) (2009b). FIP Reference Paper on Collaborative Pharmacy Practice.* FIP Istanbul, 2009. Available at www.fip.org/statements

Five levels of collaborative pharmacy practice[7] have been identified in the reference paper supporting the **FIP** Statement on Collaborative Pharmacy Practice 2010 (FIP, 2009):

■   Level 1 - Minimal contact between pharmacists and other healthcare professionals

■   Level 2 – System wide "pharmacy only" or "pharmacist only" authority to supply medicines

■   Level 3 - Reactive advice to other healthcare professionals

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[7] Defined by FIP in the Statement as "The advanced clinical practice where pharmacists collaborate with other healthcare professionals in order to care for patients, carers and public".

- Level 4 - Prospective advice and/or referral by another healthcare professional
- Level 5 - Collaborative Pharmacy Practice (CPP) - Authority to initiate or modify medicine therapy

The statement includes a recommendation that "Each country take steps to prepare their pharmacists and healthcare systems for collaborative pharmacy practice with the intention to move through the various defined levels, culminating, where possible, in advanced collaborative pharmacy practice".

In order for this to take place, FIP recognised that critical elements of the strategy would include:

- Appropriate access to patient records
- Agreed communication between pharmacists and other healthcare professionals
- Evidence-based research
- Pharmacist competence
- Quality assurance
- Regulatory support
- A sustainable business model.

*International Pharmacy Federation / World Health Organisation (2011). FIP/WHO Joint Guidelines on Good Pharmacy Practice - Standards for Quality Services*. Available at [www.fip.org/statements](www.fip.org/statements)

In **2011, FIP and WHO** published guidelines on Good Pharmacy Practice (GPP) for all sectors of the profession. The underlying philosophy was that "The mission of pharmacy practice is to contribute to health improvement and to help patients with health problems to make the best use of their medicines". There were "six components to this mission:

- •being readily available to patients with or without an appointment;
- •identifying and managing or triaging health-related problems;
- •health promotion;
- •assuring effectiveness of medicines;
- •preventing harm from medicines; and
- •making responsible use of limited health-care resources". (FIP/WHO 2011, p6.)

The guidance also recognised that "Just as pharmacy practice will vary among nations, it will also vary among practice locations. Therefore, standards should recognize the uniqueness of different pharmacy practice settings (e.g. community and hospital pharmacy)". (p9)

(T) (W) IVEY, M.F., 1993. Shifting pharmacy's paradigm. *American Journal of Hospital Pharmacy,* **50**(9), pp. 1869-1874.

(W) KALMAN, M.K., WITKOWSKI, D.E. and OGAWA, G.S., 1992. Increasing pharmacy productivity by expanding the role of pharmacy technicians. *American Journal of Hospital Pharmacy,* **49**(1), pp. 84-89.

(V) (S) (P) KLINGER, E.V., YEH, Y.-., CHURCHILL, W., CLAPP, M. and REDDY, P., 2010. Implementation of a center for drug policy across a system of hospitals. *American Journal of Health-System Pharmacy,* **67**(9), pp. 702-704.

(V) (W) (T) KNOER, S.J., PASTOR III, J.D. and PHELPS, P.K., 2010. Lessons learned from a pharmacy practice model change at an academic medical center. *American Journal of Health-System Pharmacy,* **67**(21), pp. 1862-1869.

"Hospital and health-system pharmacists need to engage now in the development of a future practice model that is responsive to health care reform and the health system of the future."

"A department cannot focus on high-level clinical services or changes to the practice model until it is safely, accurately, and efficiently dispensing medications to patients."

Workforce – "To make sure pharmacy work is being done by the right people in a way that optimises patient care."

"Technicians became the 'face of pharmacy' for nursing with respect to drug distribution."

"All staff members would work 'at the top of their license'. Pharmacists' tasks were ones requiring clinical judgement and cognitive assessment."

Model of team leader and clinical specialist. Teams of 5-8 pharmacists were created. Techs were assigned to teams according to personal interest.

Technicians now had direct responsibility to the team for medication distribution.

24/7 coverage.

Productivity has increased.

Lessons learned:

- You need sound operations first
- Anticipate politics
- Communicate with key leaders (hospital administration and nursing staff key to this)
- Communicate with key physicians
- Create a list of FAQs
- Evaluate clinical skills vs leadership skills
- Optimise the use of technicians and automation
- Be a role model

(V) (S) KOLAR, G.R., 1997. Outsourcing: Route to a new pharmacy practice model. *American Journal of Health-System Pharmacy,* **54**(1), pp. 48-52.

Clinical pharmacists were put on the patient care units

New Drug Management System (DMS), which allows pharmacists to maintain the control needed for safe distribution of drugs whilst creating freedom to develop clinical practice.

Benchmarked their systems with Walmart, Federal Express and Office Depot: these industries move products more efficiently and accurately than pharmacy.

Functional interfaces between devices and vendors was important.

Two partners – a manufacturer of automated distribution devices and a wholesaler.

Majority of drug products dispensed by Pyxis on patient units in conjunction with bespoke pharmacy software.

Two categories of drugs – standard (90-95% of orders) and non-standard

Non-standard can be added into Pyxis as needed

Automated carousels, interfaced with wholesaler, in central pharmacy – nonstandard deliveries cause an alarm

Technicians leave pharmacy every 30min to add nonstandard drug deliveries to Pyxis

Bar coded labels

DMS has eliminated 90% of new-order process of filling, checking and delivering drugs and 90% of the floor-stock process

Adding a carousel to other associated hospitals facilitates transfer of stock

Used a combination of automated devices and software to create cost reduction and free up time

Working on strategies for taking bar code to bedside

Workforce - Started with 114 FTE personnel in pharmacy. Now have 76.6 (27 pharmacists and 49.6 technical and clerical staff).


*(Q) (V) (E) KOSTRZEWSKI, A.J., DHILLON, S., GOODSMAN, D. and TAYLOR, K.M.G., 2009. The influence of continuing professional development portfolio records on pharmacy practice. *International Journal of Pharmacy Practice,***17**(2), pp. 107-113.

(V) (T) LAI, J.S., YOKOYAMA, G., LOUIE, C. and LIGHTWOOD, J., 2007. Impact of computerized prescriber order entry (CPOE) on clinical pharmacy practice: A hypothesis-generating study. *Hospital pharmacy,* **42**(10), pp. 931-938.

*(Q) LEBLANC, J.M., SEOANE-VAZQUEZ, E., and DASTA, J.F., 2007. Survey of hospital pharmacist activities outside of the United States. *American Journal of Health-System Pharmacy*, **64**(16), pp. 1748-1755.

The three most common specialities were intensive care, general medicine, and cardiology.

Low involvement in pharmacokinetic consultations (28%). Regional variation.

There was wide variability in supervision and medication preparation.

More than 70% of respondents indicated having a good to excellent relationship with nurses and physicians.

There were 37.8% involved in research.

(T) LEE, M.P., 1995. Automation and the future practice of pharmacy--changing the focus of pharmacy. *Pharmacy practice management quarterly,* **15**(3), pp. 23-35.

(V) (T) LEFKOWITZ, S., CHEIKEN, H. and BARNHART, M.R., 1991. A trial of the use of bar code technology to restructure a drug distribution and administration system. *Hospital pharmacy,* **26**(3), pp. 239-242.

(W) LERKIATBUNDIT, S., 2000. Predictors of job satisfaction in pharmacists. *Journal of Social and Administrative Pharmacy,* **17**(1), pp. 45-50.

(S) LITTLE, J., DAVIS, S., GOFF, J., MULVANITY, M. and MARK, S., 2011. Director's forum - Developing patient-centered services, Part 4: Considerations in implementing a pediatric pharmacy practice model. *Hospital pharmacy,* **46**(4), pp. 291-296.

(E) MACKEIGAN, L.D., 1996. Patient outcomes and hospital pharmacy practice. *Canadian Journal of Hospital Pharmacy,* **49**(6), pp. 300-304.

(T) MARTIN, E.D., BURGESS, N.G. and DOECKE, C.J., 2000. Evaluation of an Automated Drug Distribution System in an Australian Teaching Hospital: Part 1. Implementation. *Australian Journal of Hospital Pharmacy,* **30**(3), pp. 94-97.

(V) (S) MCROBBIE, D., BEDNALL, R. and WEST, T., 2003. Assessing the impact of re-engineering of pharmacy services to general medical wards. *Pharmaceutical Journal,* **270**(7239), pp. 342-345.

MURFF, H.J., 2007. Medication errors in hospital care: Incidence and reduction strategies. *Journal of Pharmaceutical Finance, Economics and Policy,* **15**(4), pp. 5-71.

(W) MYERS, C.E., 2011. Opportunities and challenges related to pharmacy technicians in supporting optimal pharmacy practice models in health systems. *American Journal of Health-System Pharmacy,* **68**(12), pp. 1128-1136.

This paper describes the US context, in which there is a diversity of accreditation, training, education and roles in relation to pharmacy technicians. Myers argues for standardisation of technician training and certification, in order to improve patient safety and free up pharmacists to focus on patient care.

*(Q) (G) NELSON, S.P. and ABRAMOWITZ, P.W., 2004. Using the ASHP best practices self-assessment tool. *American Journal of Health-System Pharmacy,* **61**(6), pp. 562-563.

The ASHP Best Practice Tool has four quadrants:

- Fostering growth
- Improving efficiencies
- Pursuing excellence
- Workplace of choice

The Best Practice Tool has now evolved into a Hospital Self-Assessment Tool (SAT), as part of the Pharmacy Practice Model Initiative. "The PPMI Hospital Self-Assessment was developed to assess an individual hospital's conformity with the recommendations from the PPMI Summit. The tool consists of 106 questions assessing adoption of the PPMI recommendations at the hospital level.

Upon completing the questions, the tool will allow the user to develop a list of priorities (an "Action List") individualized to their own hospital/health system. Hospitals will also have the opportunity to generate reports comparing their data with aggregated data collected from similar hospitals within and across their state. A list of resources will also be provided to assist hospitals in implementing change in their institution.

Anyone can complete an assessment, but an individual hospital can only have one "official" submission that will be used for data comparisons. All data will be kept confidential and only aggregated data will be reported."

The tool takes includes sections on whether the hospital displays the characteristics of 'optiaml' models, e.g in relation to influence within the hospital, leadership, and services offered, as well as separate section on the use of IT.

The SAT is available at www.ppmiassessment.org.

(S) NESBIT, T.W., SHERMOCK, K.M., BOBEK, M.B., CAPOZZI, D.L., FLORES, P.A., LEONARD, M.C., LONG, J.K., MILITELLO, M.A., WHITE, D.A., BARONE, L.D., GOLDMAN, M.P. and KVANCZ, D.A., 2001. Implementation and pharmacoeconomic analysis of a clinical staff pharmacist practice model. *American Journal of Health-System Pharmacy,* **58**(9), pp. 784-790.

Workforce –This involved 3 FTE clinical services pharmacists CSPs serving 200 patients per day (haematology-oncology, medical-surgical intensive care, and general medicine).

CPD/Ed – Use of specialist mentors to CSPs.

Selected on basis of motivation, knowledge base, interpersonal skills and oral communication skills.

Received a minimum of 80 hours formalised education and training from clinical specialists.

Up to 2 weeks of one-to-one training from mentor for that practice area.

Case-based program and examinations.

Training on documentation continued until 2 raters agreed on CSP category assignment of interventions for more than 85%.

Cost of program for 12 months was $187,852. Cost savings and cost avoidance for the same period from their actions was $580,511. CSP model yielded a net benefit every month.

Concluded that the program had potential to minimise risk, decrease cost and improve outcomes.

Documentation of CSP activities was supported by technology.

Interprof – CSPs were strategically positioned.

(V) (W) NICOLE, P. and ROUSE, M.J., 2010. Scope of contemporary pharmacy practice: Roles, responsibilities, and functions of pharmacists and pharmacy technicians Executive summary. *American Journal of Health-System Pharmacy,* **67**(12), pp. 1030-1031.

(W) NIMMO, C.M. and HOLLAND, R.W., 1999. Transitions in pharmacy practice, part 2: Who does what and why. *American Journal of Health-System Pharmacy,* **56**(19), pp. 1981-1987.

CPD/Ed – Professional competencies required by the 5 practice models – drug information, self care, clinical pharmacy, pharmaceutical care, distribution.

"Professional competence in any of the practice models is defined as the sum of skills, professional socialisation, and judgement rooted in experience pertinent to the model."

"Professional competence equation" is the sum of these parts:

| Skills | Professional socialisation | Judgement |
|---|---|---|
| Psychomotor Problem solving | Attitudes Values | Practice with feedback Reflection on practice |

(V) (W) OKAFOR, M.C. and THOMAS III, J., 2008. Presence of innovation adoption-facilitating elements in hospitals, and relationship to implementation of clinical guidelines. *Annals of Pharmacotherapy,* **42**(3), pp. 354-360.

The presence of IAE within a hospital was associated with higher levels of clinical guideline implementation. IAE include paper/online practice prompts, change champions, practice audit/feedback.

*(Q) (T) (W) (S) PEDERSEN, C.A., SCHNEIDER, P.J. and SCHECKELHOFF, D.J., 2011. ASHP national survey of pharmacy practice in hospital settings: Prescribing and transcribing - 2010. *American Journal of Health-System Pharmacy,***68**(8), pp. 669-688.

Syst - Patient-specific pharmacist activities are increasing (eg review of medication orders).

"Patient safety is now a priority for medication management."

Committee and formulary information on p671-3.

Interprof - Almost complete acceptance of pharmacist recommendations by prescribers.

IT – EHR 58.6% and CPOE 19% being widely adopted. Bar code 34.5%. smart pumps 65%.

Workforce – Pharmacist and tech staffing has increased significantly, while vacancy rates have declined. Mean number of 15.4 FTE pharmacists and 13.2 FTE pharmacy technicians per 100 beds. Varies by hospital size with smallest hospitals having the most FTE pharmacists and techs per 100 beds.

The pharmacist/bed rate has increased almost 50%, from 10.4 FTE in 2002, probably to take on more patient-centred roles. Technician staffing had also increased by a third over the last 9 years.

Vacancy rate 2.8% FTE pharmacist and 3.6% FTE techs. Turnover rate 5.7% pharmacist and 12.1% technician.

Drug information - "use of a stand-alone electronic drug information product available on terminals throughout the hospital" - 79.2%

-"providing electronic drug information on individual hand-held devices" - 25.5%

- "embedding electronic drug information in CPOE systems - 19.1%

"Overall, 88.6% of hospital pharmacy directors reported that electronic sources of drug information are available on their hospital network; 8.6% said electronic drug information is available in the pharmacy department only, and 2.8% said such information is not available in their hospital. The availability of electronic drug information varies by hospital size ($p < 0.05$); for example, 100% of hospitals with 400 or more staffed beds have drug information available on the hospital network, compared with only 78% of hospitals with fewer than 50 staffed beds."

Transcribing. "The most common way by which medication orders are received in the pharmacy is digital image capture (35.3%), followed by handwritten orders (25.3%) and fax (23.3%); electronic transmittal of orders via CPOE systems was reported by 16.1% of hospitals. Larger hospitals are more likely to use CPOE and digital image capture to deliver medication orders to the pharmacy department."

Medication-use safety technologies. – " EMRs. Overall, 58.6% of hospitals have partially or completely implemented an EMR system . Fully 7.7% of hospitals have a complete EMR system with no paper records, 50.9% of hospitals have a  partial EMR with some paper components, and 41.4% have an all-paper system with no EMR. EMR use varies by hospital size, with larger hospitals being more likely to use an EMR system or  components of it.

Use of CPOE systems. About 19% of hospitals have CPOE systems with clinical decision-support CDS) systems; larger hospitals are more likely to have CPOE systems. Only 3.5% of hospitals with CPOE systems have not integrated the CPOE and pharmacy computer systems.

Bar-coding technology. Overall, 34.5% of hospitals have bar-code assisted medication administration (BCMA) systems to verify patient identity and electronically check doses administered by nurses. Hospitals with 200–299 staffed beds are most likely to have BCMA systems.

Smart infusion pumps. Overall, 65.0% of hospitals used smart infusion pumps; use of the devices varies by hospital size, with the largest hospitals being the most likely to have smart infusion pumps."

e-prescribing – "Prescribers can transmit prescriptions electronically (e-prescribe) to pharmacies outside their health system in 35.4% of hospitals. Larger hospitals are more likely than smaller hospitals to have e-prescribing functionality ($p < 0.05$). For example, 34.4% of hospitals with fewer than 50 staffed beds have the ability to e-prescribe from their outpatient clinics to pharmacies outside the system, compared with 28.7% of hospitals with 50–99 beds, 26.4% of hospitals with 100–199 beds, 42.9% of hospitals with 200–299 beds, 37.5% of hospitals with 300–399 beds, 56.5% of hospitals with 400–599 beds, and 67.3% of hospitals with 600 or more staffed beds."

*(Q) (T) (S) PEDERSEN, C.A., SCHNEIDER, P.J. and SCHECKELHOFF, D.J., 2010. ASHP national survey of pharmacy practice in hospital settings: Monitoring and patient education - 2009. *American Journal of Health-System Pharmacy,* **67**(7), pp. 542-558.

Syst – Virtually all hospitals (97.3%) had pharmacists monitoring medication therapy in some capacity. Nearly half monitored 75% or more of their patients. Majority of hospitals (64.7%) used an integrated practice model using clinical generalists – a patient-centred integrated model (24.4% drug distribution centred and 10.9% clinical specialist centred).

| Monitoring task | % of hospitals (n=553) |
|---|---|
| Serum medication concentration | 92.0 |
| Order initial serum concentration | 80.1 |
| Adjust dosage | 79.2 |
| Review ADR (interdisc) | 89.3 |
| Assessment of safety culture | 62.8 |

Interprof - Most hospitals assigned oversight for patient education about medication to nursing staff (89%) but many hospitals (68.9%) reported that pharmacists supplied education to 1-25% of patients. ADE reporting came most often from nursing staff.

IT –

| CPOE and clinical decision support | 15.4% |
|---|---|
| Bar-code-assisted administration | 27.9% |
| Smart infusion pumps | 56.2% |
| Complete EHR | 8.8% |

*(Q) (E) PEDERSEN, C.A., SCHNEIDER, P.J. and SCHECKELHOFF, D.J., 2009. ASHP national survey of pharmacy practice in hospital settings: Dispensing and administration - 2008. *American Journal of Health-System Pharmacy,***66**(10), pp. 926-946.

Syst – Most hospitals had a centralised medication distribution system, but there was evidence of growth in decentralised models since last survey in 2005.

% of unit dose medicines increased, as did the use of 2-pharmacist checks for high-risk drugs and high-risk patient groups.

IT – Automated dispensing cabinets used by 83% and robots by 10%. Differed by hospital size: ADCs used in >98%of >300 staffed beds and 64% in those with <50 beds. Robots - >42% of those with >600 staffed beds and 6% of <50 beds.

MARs were increasingly computerised.

Bar code technology in 25%, smart infusion pumps in 59%.

Environment – Hours of operation increasing, with 36.2% providing round-the-clock services.

Workforce – vacancy rate of 5.9% for pharmacists and 4.7% for technicians; turnover rate of 8.6% for pharmacists and 13.8% or technicians.

Only 6.8% had a pharmacist working in the ED. Increasing recognition that pharmacy input is needed there.

Technician tasks are listed here on p938.

(V) (E) (T) (W) PICKETTE, S.G., MUNCEY, L. and WHAM, D., 2010. Implementation of a standard pharmacy clinical practice model in a multihospital system. *American Journal of Health-System Pharmacy,* **67**(9), pp. 751-756.

(G) PIERPAOLI, P.G., 1995. An iconoclastic perspective on progress in pharmacy practice. *American Journal of Health-System Pharmacy,* **52**(16), pp. 1763-1770.

*(Q) (V) (WF) POLLARD, S.R. and CLARK, J.S., 2009. Survey of health-system pharmacy leadership pathways. *American Journal of Health-System Pharmacy,* **66**(10), pp. 947-952.

- ■ Leadership pathways:
- ■ Leaders are choosing among 4 administrative degrees – MBA, Master of Health Administration, Master of Public Administration and MPH.
- ■ Leaders would have liked more training or experience with finance/budget management (52%), human resource management (52%), quality improvement (41%) before accepting their first pharmacy leadership position. (n=205).
- ■ On the job experience is the most common leadership pathway of current leaders.
- ■ Medication-use policy, human resource management, interpersonal skills are the most valued skill-set to a health-system pharmacy leader.

(V) (G) PROT-LABARTHE, S., BUSSIE☐RES, J.-., BRION, F. and BOURDON, O., 2007. Comparison of hospital pharmacy practice in France and Canada: Can different practice perspectives complement each other? *Pharmacy World and Science,* **29**(5), pp. 526-533.

This paper compared pharmacy services in a hospital in France with one in Canada, concluding that the Canadian service was patient oriented and the French service product oriented. They noted that there was little information available to compare hospital pharmacy practice in France with other countries. They suggested that "International comparisons can contribute to improved pharmacy practice by encouraging cooperation, sharing successes, providing examples of specialized pharmacy services and encouraging student exchanges."

(V) (S) RADLEY, A., MILLAR, B. and HAMLEY, J., 2001. Development of patient-centred performance indicators to guide the delivery of pharmaceutical care in a district general hospital. *Pharmacy World and Science,* **23**(3), pp. 111-115.

(V) (W) RAMSEY, E.Z., MILLER, A.D., ARMITSTEAD, J.A. and SMITH, K.M., 2009. Pharmacy resident recruitment as a practical learning experience for current residents. *American Journal of Health-System Pharmacy,* **66**(4), pp. 329-330+332.

* (Q?) RICKERT, D.R., 1988. The relationship between pharmacy practice setting and job design. *Journal of pharmaceutical marketing & management,* **2**(3), pp. 149-163.

***Royal Pharmaceutical Society (2012). Professional Standards for Hospital Pharmacy Services: optimising patient outcomes from medicines. RPS, London: July 2012. Available at*** http://www.rpharms.com/support-pdfs/rps---professional-standards-for-hospital-pharmacy.pdf

The core principles of the Basel statements have influenced national hospital pharmacy standards, including the recent **Royal Pharmaceutical Society** standards for hospital pharmacy services in Great Britain, published in July 2012. The foreword to these standards states that "In partnership with patients and with multidisciplinary collaboration, a quality pharmacy service strives to optimise patient outcomes through the judicious, safe, clinically effective, appropriate and cost effective use of medicines". These elements of multidisciplinary working, partnership with patients, and cost-effectiveness of therapy are echoed across the international hospital pharmacy literature.

*(Q) (T) SANBORN, M.D. and KRUEGER, J.L., 1995. Survey of automation in hospital pharmacy practice. *American Journal of Health-System Pharmacy : AJHP : Official Journal of the American Society of Health-System Pharmacists,***52**(1), pp. 97-98.

(T) SCHEEPERS-HOEKS, A.M.J.W., GROULS, R.J.E., NEEF, C. and KORSTEN, H.H.M., 2009. Strategy for implementation and first results of advanced clinical decision support in hospital pharmacy practice, *Studies in Health Technology and Informatics* 2009, pp. 142-148.

(V) (E) SCHNEIDER, P.J. and SILL JR., B.E., 1995. Education and training to provide pharmaceutical care. *International Pharmacy Journal,* **9**(4), pp. 156-160.

SCHNELL, B.R. and GESY, K.F., 1986. The Canadian Hospital Pharmacy Workload Measurement Study. *Canadian Journal of Hospital Pharmacy,* **39**(3), pp. 47-52.

SCHNELL, B.R., GESY, K.F. and GAUCHER, M.E., 1981. The development of a Canadian hospital pharmacy workload measurement system. *Canadian Journal of Hospital Pharmacy,* **34**(3), pp. 75-78.

SCHONDELMEYER, S.W., 1982. Strategy to effect change in pharmacy practice. *American Journal of Hospital Pharmacy,* **39**(12), pp. 2137-2142.

(V) (T) (S) (W) SCHUMOCK, G.T., MICHAUD, J. and GUENETTE, A.J., 1999. Re-engineering: An opportunity to advance clinical practice in a community hospital. *American Journal of Health-System Pharmacy,* **56**(19), pp. 1945-1949.

(S) SEXTON, J., HO, Y.J., GREEN, C.F. and CALDWELL, N.A., 2000. Ensuring seamless care at hospital discharge: A national survey. *Journal of clinical pharmacy and therapeutics,* **25**(5), pp. 385-393.

IP - 95% of trusts (153/161) never involved community pharmacists in the discharge process, or in less than 10% of discharges. Only when unusual/unlicensed preparations were prescribed, compliance aids were needed, or when the hospital pharmacist felt the regimen was complex.

Recommends sending/faxing the discharge Rx direct to GPs from the hospital pharmacy.

Recommends provision of extra copies to the patient, marked for the attention of the GP and community pharmacist

Syst – Rapid discharge took place in most hospitals. Ward pharmacist counselling will only be effective if there is full individual patient dispensing.

Recommends the checking by pharmacists of all discharge prescriptions against the ward chart.

(T) SISKA, M.H. and TRIBBLE, D.A., 2011. Opportunities and challenges related to technology in supporting optimal pharmacy practice models in hospitals and health systems. *American Journal of Health-System Pharmacy,* **68**(12), pp. 1116-1126.

IT - "The use of technology and automation to support pharmacy practice dates back to the 1970s and has frequently been implicated as both the problem and solution for optimising the role of the pharmacist in providing direct patient care."

Core health information technology HIT systems supporting medication management, and their penetration into US hospitals in 2011, are:

| | |
|---|---|
| CPOE and clinical decision-support systems | 15% |
| Medication reconciliation systems | 10% |
| Pharmacy systems | Approx 100%, but only 50% of those can interface with EHR |
| Medication distribution and storage | 83% |
| Repackaging automation | 92% |
| Medication administration systems<br><br>■ electronic medication administration records<br>■ bar-code-assisted medication administration technology<br>■ smart pumps | 20% (all 3 elements) |
| EHR | 5-60%, depending on EHR definition.<br><br>Only 2% have a system meeting the federal government's 'meaningful use' criteria.<br><br>More likely in larger hospitals, urban hospitals, and teaching hospitals. |

Significant challenges to HIT adoption are:

| | |
|---|---|
| Financial | 2005 study estimated cost of CPOE at $63,000 per bed.<br><br>Cost includes hardware, software, maintenance and support, training, worker adaptation (temp loss of productivity). |
| Work force | Few HIT professionals. Insufficient training in the field.<br><br>Multidisc clinical informatics workforce needed. |
| Strategic | Lack of an overall vision for what the new medication-use process might look like. Considered independent departments rather than "a tightly connected process for health care delivery." |

| | |
|---|---|
| | Leads to fragmented technology solutions. Often implemented as reactive to a critical incident, without thoughts of the future implications. |
| Cultural | "Implementation of an integrated medication management system is a major cultural event." Professionals tend to work in silos, with IT to match. "It requires committed leaders, an environment for innovation...and a willingness to forego perfection in pursuing modest incremental improvements." Introducing HIT into clinical workflows is difficult and disruptive. |
| Structural | Health information exchange (anytime-anywhere access) is essential. Common standards must be set to ensure system interoperability. |
| Technical | Designed primarily to automate recurring tasks or to mimic paper-based interactions. Offer little support for cognitive tasks. Existing HIT rarely takes advantage of human-computer interaction principles. Can introduce new sources of errors and different safety concerns. |
| Privacy and security issues | Conflicting state and federal policies. Difficult to gain access to information across the continuum of care. |

Workforce / IT - "In the ideal future, the medication distribution system is overseen by a pharmacist but is exclusively operated by advanced technical practitioners who are appropriately trained and credentialed. The medication selection and distribution process is governed by in-process quality assurance steps; standardised practices minimise the opportunity for errors in product selection, preparation and distribution."

**The Society of Hospital Pharmacists of Australia (2005). The SHPA standards of practice for clinical pharmacy. J Pharm Pract Res 2005; 35 (2): 122-46. Available at** http://www.shpa.org.au/lib/pdf/practice_standards/clinical_pharm_ro.pdf

**The Society of Hospital Pharmacists of Australia (2011). Revised information on clinical pharmacist staffing levels. SHPA, Collingwood Victoria: May 2011. Available at** http://www.shpa.org.au/lib/pdf/practice_standards/Supplementary_clinical_pharmacy_staffing_levels-May2011_ro.pdf

**The Society of Hospital Pharmacists of Australia (SHPA)** published advice on staffing levels for clinical pharmacy services in May 2011. These suggestions were based upon the following service features:

■ Provision of a comprehensive clinical pharmacy service

■ A bed occupancy rate of 95%;

■ An average length of stay of 6 days;

■ Minimal dispensing or medicine distribution activities performed by the clinical pharmacist;

■ A component of clinical supervision e.g. undergraduate and postgraduate pharmacy students; and

■ A five-day-a-week service with an eight-hour working day (allowance was made for attending ward/clinical unit rounds, pharmacy staff meetings, liaison with other pharmacy staff re: prescriptions etc.)

These ratios allowed for significantly more pharmacist input than in their original 2005 standards. Surgical wards, for example, changed from one FTE clinical pharmacist for 40 beds in 2005 to 25 beds in 2011.

They also recognised that adequate support staff must be in place to perform non-clinical functions, and that pharmacy technicians could support the clinical activities of pharmacists. Indeed, in their clinical practice standards (2005), the SHPA included a table that detailed the clinical supporting activities of technicians. For example, in the context of taking an accurate medication history, the SHPA identified that technicians could detect new patient admissions, communicate medicines supply information with other health professionals, and assist in managing the storage and retrieval of the patient's own medicines.

SHPA defined clinical pharmacy practice as "The practice of pharmacy as part of a multidisciplinary healthcare team directed at achieving the quality use of medicines (QUM). They thought it might include:

■ Participation in the management of individual patients;

■ Application of the best available evidence in daily clinical practice;

■ Contribution of clinical knowledge and skills to the healthcare team;

■ Identification and reduction in risks associated with medicines use;

■ Involvement in the education of patients, carers and other he\lth professionals; and

■ Involvement in research.

(G) SÝKORA, J., 2009. Hospital pharmacy practice in small hospitals. *EJHP Practice,* **15**(3), pp. 74.

(S) THOMPSON, B., CONRAD, G., GUM, M.O., KESSLER, J.M., LARSON, T., MOORE, D., MORRISON, K., PRICE, M. and HAWKINS, B., 2010. ASHP guidelines on remote medication order processing. *American Journal of Health-System Pharmacy,* **67**(8), pp. 672-677.

The ASHP has also published guidelines on Remote Medication Order Processing, where medication orders are filled through automated medication storage and distribution devices (2010). The article describes the process of, and presents guidelines for, remote review of medication orders, including reference to two different models where hospitals without 24 hour pharmacy support rely on those that do. They note that the rapid advances in technology, complexity of the issues and different

organisational arrangements mean that professional judgement must be used to adapt the guidelines to different contexts.

(V) (S) THOMPSON, C.A., 2011. Pharmacy practice models get improved. *American Journal of Health-System Pharmacy,* **68**(9), pp. 774-783.

(S) THOMPSON, C.A., 2010. Pharmacy Practice Model Initiative finishes consensus-building process*. American Journal of Health-System Pharmacy,* **67**(24), pp. 2078-2082.

(V) (I) TRAYNOR, K., 2009. Hospital project exposes medical students to pharmacy practice. *American Journal of Health-System Pharmacy,* **66**(13),.

(V) (S) TYLER, L.S., COLE, S.W., MAY, J.R., MILIARES, M., VALENTINO, M.A., VERMEULEN JR., L.C., WILSON, A.L. and HAWKINS, B., 2008. ASHP Guidelines on the Pharmacy and Therapeutics Committee and the Formulary System. *American Journal of Health-System Pharmacy,* **65**(13), pp. 1272-1283.

***UKCPA General Level Framework and Advanced Consultant Level Framework for Practice.***

E&T/CPD – ACLF – 6 clusters of competencies

GLF – 4 clusters of competencies

Each cluster has three levels of advancement – foundation, excellence and mastery

(V) (S) (I) (W) VAN DEM BEMT, B.J.F., 2011. An integrated pharmaceutical care framework. *EJHP Practice*, **17**(5), pp. 26-27.

Syst – A 29-activity framework for pharmaceutical care. The 29 components are 29 essential products of the hospital pharmacy. Each product should demonstrate measurable added value for patients, physicians and managers.

Interprof – Linked closely to an existing 6-step treatment plan for physicians.

Workforce – Recognition that any member of hospital staff can do each activity, as long as a pharmacist retains responsibility for quality.

*(Q) (T) (S) (W) VERMEULEN, L.C., ROUGH, S.S., THIELKE, T.S., SHANE, R.R., IVEY, M.F., WOODWARD, B.W., PIERPAOLI, P.G., THOMLEY, S.M., BORR, C.A. and ZILZ, D.A., 2007. Strategic approach for improving the medication-use process in health systems: The high-performance pharmacy practice framework. *American Journal of Health-System Pharmacy,* **64**(16), pp. 1699-1710.

Syst - High performance pharmacy practice framework – "One that aspires to maximise its contributions to the clinical outcomes of patients and the financial position of the health system by functioning at the highest levels of effectiveness and efficiency."

Seven elements:

- medication preparation and delivery
- patient care service
- medication safety
- medication use policy
- financial performance
- human resources
- education

Developed qualitative (feasibility, financial return and quality/safety return)

"Pharmacists who are just beginning a formalised plan to improve practice may want to start with a performance element that is totally within the control of the pharmacy department before moving on to multidisciplinary initiatives." e.g. pharmacist recruitment and retention, which provide a moderate improvement in quality or safety.

Looking initially for simple, high feasibility elements that have a high payoff in terms of finance and/or safety/quality.

Can align elements to the priorities of the health system, or elements that are regularly reported to the board and to the public.

The framework can also be used as a justification tool, an educational tool, and/or a career decision-making tool.

Workforce – importance of the leader being strong, and well connected beyond pharmacy, in the health system

(V) (E) (W) WALKER, P.C., KINSEY, K.S., KRAFT, M.D., MASON, N.A. and CLARK, J.S., 2011. Improving student education and patient care through an innovative introductory pharmacy practice experience. *American Journal of Health-System Pharmacy,* **68**(8), pp. 655-660.

*(Q) (T) WARNER, A., MENACHEMI, N. and BROOKS, R.G., 2005. Information technologies relevant to pharmacy practice in hospitals: Results of a statewide survey. *Hospital pharmacy,* **40**(3), pp. 233-239.

(S) (W) WILLEMS, L., RAYMAKERS, A., SERMEUS, W., VLEUGELS, A. and LAEKEMAN, G., 2005. Survey of hospital pharmacy practice in Flemish-speaking Belgium. *American Journal of Health-System Pharmacy,* **62**(3), pp. 321-324.

(E) (I) (W) WOODS, T.M., LUCAS, A.J. and ROBKE, J.T., 2011. Making a case for a patient-centered integrated pharmacy practice model. *American Journal of Health-System Pharmacy,* **68**(3), pp. 259-263.

Syst – Three models of pharmacy practice in the US.

***Drug distribution-centered model DDC:*** medication distribution and the processing of medication orders constitute the simgular focus of the pharmacy department.

***Clinical-specialist-centered model CSC:*** Variant on the DDC model. Involves one group of pharmacists – usually in a central inpatient pharmacy – whose only focus is drug distribution. The other group of pharmacists function independently on wards, doing rounds and clinical pharmacy activities. (The two groups may not be integrated very well!)

***Patient-centered integrated practice model PCIP*** (Considered most common in the US): Nearly all pharmacists have distributive and clinical responsibilities. Depends heavily on well-trained, high-functioning pharmacy technicians to manage drug distribution logistics. Pharmacists can assume multiple clinical and operational roles.

There may be a combination of models. PCIP best supports high-quality patient care.

Workforce – In PCIP, the individual's own preferences and interests may need to be subordinate to the needs of patients and the wider dept.

(E) (W) WULLER, W.R. and LUER, M.S., 2008. A sequence of introductory pharmacy practice experiences to address the new standards for experiential learning. *American Journal of Pharmaceutical Education,* **72**(4),.

(G) ZELLMER, W.A., 2001. Vision for pharmacy practice in hospitals and health systems. *American Journal of Health-System Pharmacy,* **58**(16), pp. 1505.

(G) ZELLMER, W.A. and WEBB, J.W., 2005. Reason and history as guides for hospital pharmacy practice leaders. *American Journal of Health-System Pharmacy,* **62**(8), pp. 838-844.

Workforce – Growing interest in the chief-pharmacy-officer concept, on a par with the chief medical officer and chief nursing officer of an institiution.

Inspired by Abraham Lincoln, he writes about the 3 As of the ethical life of a pharmacist: acknowledgement (of the gifts given to us), awareness (of the needs of those whom we serve) and alignment (of our work with those needs).

Change is the point of leadership, but not for its own sake.

"Unless progress is made in the field as a whole, not just at a few showcase settings, there is risk of regression."

"Utilise the resources of hospital pharmacy to assist in the development and improvement of the profession as a whole." (Mirror to Hospital Pharmacy 1964)

"The dominant (practice) model...reflects an impersonal, clerical, order-fulfilment function rather than a professional interaction with a client."

"There is little strategic coordination between the sectors of pharmacy."

That individual pharmacists' ambitions may be eclipsing that of the team.

The pharmacy department should define its mission in terms of achieving the desired outcomes from medication use, as well as conducting safe and efficient product distribution.

A call to hospital pharmacists to engage in public policy issues in health care as a knowledgeable and trustworthy voice, both individually and collectively.

ZELLMER, W.A., 2010. Pharmacy's future: Transformation, diffusion, and imagination. *Am J Health Syst Pharm,* 67, pp. 1199-1204.

The "transformation of pharmacy practice will not march in a straight line toward some ultimate perfection. Rather, it is likely to follow a haphazard course, leading to a variety of practice models that have core traits in common with the early concept of clinical pharmacy. The pace of change may fluctuate between exhilarating advances and disappointing setbacks, depending on the forces in the environment and the quality of the profession's leadership".

(V) (S) (W) ZILZ, D.A., WOODWARD, B.W., THIELKE, T.S., SHANE, R.R. and SCOTT, B., 2004. Leadership skills for a high-performance pharmacy practice. *American Journal of Health-System Pharmacy,* **61**(23), pp. 2562-2574.

Workforce – Leadership in hospital pharmacy. Synergy between leadership and high-performance practice. "This requires leaders committed to a clear vision for excellent practice. These pharmacy leaders must continuously enhance their team's commitment to that vision, using recognised benchmarks of best practice to extend pharmacy's influence across the continuum of care."

Components of leadership:

- Core self
- Vision
- Relationships
- Learning
- Mentoring

Assessing a pharmacy leader's influence is done through:

Spheres of influence (Pharmacy team, health-system team, outside the institution).

Pharmacy leaders as opportunists and risk takers:

- Translating trends
- Transferring knowledge
- Filing ideas (front-burner, back-burner approach)
- Being an opportunist
- Taking risks

Making the transition from pharmacist or pharmacy manager to leader is almost a transformation! While experience helps, some pharmacists develop/exhibit leadership qualities early in their careers, and should be encouraged to seek opportunities.

Successful pharmacy leaders must have a lifestyle with three elements:

- Meaningful relationships with peers;
- Supportive spouse or partner
- Play as hard as they work