

SURVEY

EAHP survey 2010 on hospital pharmacy in Europe: parts 4 and 5. Clinical services and patient safety

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ABSTRACT

Decentralised clinical services, with a pharmacist working in the ward at least 50% of the time or with pharmacists visiting the ward daily, are not very common in Europe. For-profit hospitals offer the service remarkably less than other hospitals, and 39.8% of hospital pharmacies offer clinical services occasionally. There is a variety of patient oriented clinical activities delivered by European hospital pharmacies, including the provision of drug information, pharmacokinetic consultations, therapeutic drug monitoring, management prevention of adverse drug reactions and medication errors. Hospital pharmacy involvement in managing the interface between primary and hospital care is less common. In general, clinical activities are not well documented. For inpatients, on average, only 14.7% and 21.9% of the hospital pharmacies that took part in the survey said they write down their interventions in the medical records and in pharmacy records, respectively. IT systems are broadly used in the provision of drug information but also in profiling patient medication and for dosage calculations. Patient safety is a major interest of hospital pharmacists and, on average, 55.0% of hospital pharmacies recorded that they have implemented a system to ensure patient safety.

INTRODUCTION

The European Association of Hospital Pharmacists' (EAHP) pan-European survey on hospital pharmacy practice is an important source in understanding the future challenges and needs for development in Europe. The methodology and the background of the 2010 survey were previously published in this journal.¹ In this article, we present data on clinical services and implementation of safety procedures for patients.

RESULTS

Decentralised clinical services, with a pharmacist working in the ward at least 50% of the time or with pharmacists visiting the ward daily, are not very common in Europe (figure 1, n=981). Only a few countries (ie, the UK and Ireland) have developed these services to a significant extent. There is a remarkable difference between for-profit and non-for-profit hospitals in this respect: while for-profit hospitals offer these services on a European average of 3.2% and 3.5%, respectively, corresponding figures for not-for-profit hospitals are 9.5% and 10.3%, respectively. In general, hospitals offer clinical services in the ward occasionally (European average 39.8%, range by country 3.6–79.2%) with

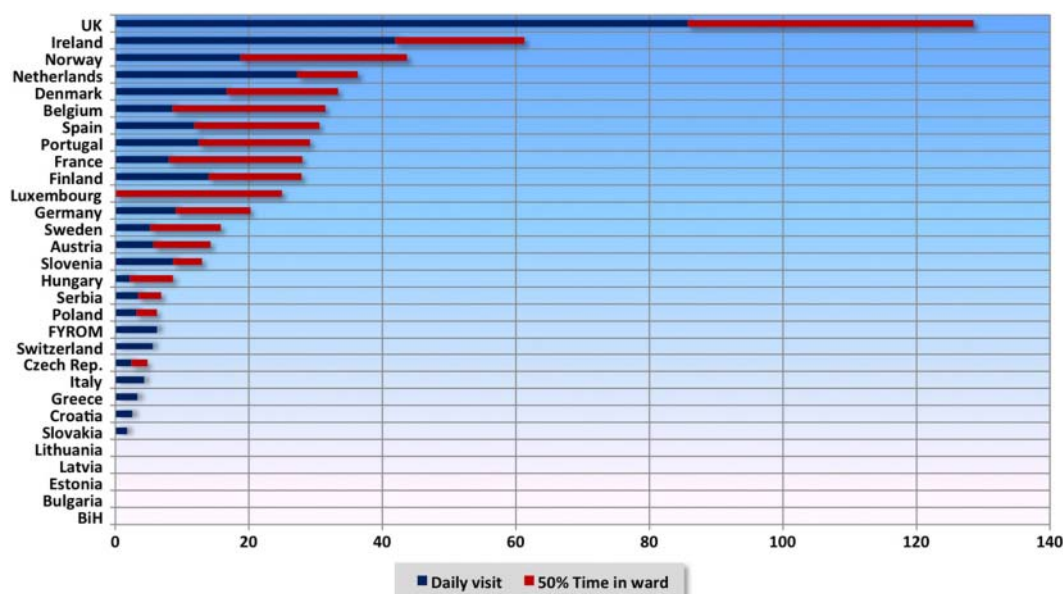


Figure 1 Percentage of pharmacies with either daily visits on the wards by pharmacists or having pharmacists working at least 50% of their time on the ward (n=981). Total may be >100% as some pharmacies have both services. BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

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Research

Table 1 Patient oriented activities by country (percentage of pharmacies with)

Country	TDM n=1061	Drug information	Patient visits at admission	Patient counselling at discharge	Pharmacokinetic consultation (n=966)		Patient care service on ADR (n=966)		Patient care service concerning medication errors (n=968)	
					Inpatients	Outpatients	Inpatients	Outpatients	Inpatients	Outpatients
All countries	25.0	54.6	16.9	22.1	18.7	5.5	50.1	23.4	50.0	21.4
Austria	5.7	74.3	17.1	8.6	8.3	0.0	52.8	0.0	45.5	3.0
Belgium	23.5	64.7	23.5	23.5	23.5	0.0	52.8	0.0	80.6	2.8
BiH	16.7	50.0	33.3	66.7	33.3	0.0	16.7	0.0	50.0	0.0
Bulgaria	14.5	61.8	12.7	18.2	27.3	7.3	25.9	11.1	22.2	5.6
Croatia	29.0	51.6	22.6	19.4	7.7	5.1	22.5	2.5	7.7	0.0
Czech Republic	30.6	40.8	16.3	57.1	7.3	4.9	19.5	41.5	15.0	32.5
Denmark	16.7	66.7	16.7	16.7	16.7	0.0	50.0	33.3	100	16.7
Estonia	0.0	16.7	5.6	5.6	0.0	0.0	5.6	0.0	0.0	0.0
Finland	7.3	27.3	5.5	14.5	2.4	0.0	40.0	12.5	46.3	9.8
France	11.8	70.6	23.5	23.5	14.3	4.8	76.2	28.6	76.2	19.0
FYROM	5.9	17.6	23.5	52.9	18.8	0.0	37.5	0.0	25.0	0.0
Germany	27.8	68.5	24.1	11.1	35.4	2.0	54.0	5.0	59.2	7.1
Greece	9.4	78.1	31.3	28.1	3.3	3.3	46.7	46.7	48.4	48.4
Hungary	29.2	70.8	33.3	47.9	12.8	6.4	61.7	44.7	48.9	26.7
Ireland	46.4	67.9	39.3	39.3	60.7	10.7	71.4	25.0	89.7	34.5
Italy	55.6	64.1	10.3	31.6	0.9	0.0	77.8	32.5	69.6	28.7
Latvia	0.0	26.9	23.1	19.2	0.0	0.0	14.8	0.0	14.3	0.0
Lithuania	50.0	50.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0
Luxembourg	16.7	50.0	0.0	50.0	20.0	0.0	60.0	40.0	80.0	40.0
Netherlands	53.3	40.0	6.7	13.3	100	100	80.0	30.0	100	30.0
Norway	25.0	33.3	25.0	41.7	20.0	0.0	20.0	26.7	42.9	35.7
Poland	6.8	37.3	11.9	8.5	0.0	0.0	31.3	0.0	23.5	0.0
Portugal	35.7	64.3	10.7	7.1	30.8	7.7	76.0	80.0	73.1	65.4
Serbia	0.0	61.3	0.0	0.0	28.6	3.6	70.4	22.2	56.7	16.7
Slovakia	17.2	41.4	0.0	0.0	3.4	0.0	31.6	12.3	22.4	10.3
Slovenia	30.0	50.0	20.0	15.0	39.1	4.3	52.2	8.7	39.1	4.3
Spain	31.5	50.6	15.7	22.5	45.8	27.1	74.1	81.0	80.0	78.3
Sweden	21.4	42.9	0.0	0.0	0.0	0.0	26.7	20.0	26.7	20.0
Switzerland	31.6	84.2	15.8	5.3	16.7	0.0	57.9	10.5	73.7	10.5
UK	34.6	50.0	46.2	53.8	64.3	50.0	76.9	61.5	100	85.7

ADR, adverse drug reactions; BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia; TDM, therapeutic drug monitoring.

Table 2 Clinical counselling activities by country (percentage of pharmacies with)

Country	Anticoagulant therapy n=897	LLD	Antibiotics	CIN	Immunosuppressive therapy	Other	TPN n=959	Enteral nutrition
All countries	13.6	5.6	38.1	19.6	10.8	14.4	10.3	31.9
Austria	16.1	0.0	48.4	38.7	16.1	3.2	2.9	82.9
Belgium	12.9	3.2	41.9	12.9	0.0	9.7	20.6	52.9
BiH	16.7	0.0	66.7	0.0	0.0	33.3	0.0	33.3
Bulgaria	11.3	7.5	37.7	9.4	5.7	15.1	0.0	5.6
Croatia	10.5	7.9	28.9	2.6	7.9	5.3	0.0	20.0
Czech Republic	12.8	10.3	20.5	10.3	7.7	15.4	2.4	46.3
Denmark	0.0	0.0	0.0	16.7	0.0	0.0	50.0	0.0
Estonia	0.0	0.0	0.0	0.0	0.0	5.6	0.0	5.6
Finland	5.4	5.4	27.0	8.1	5.4	8.1	4.9	9.8
France	31.6	5.3	47.4	10.5	10.5	10.5	21.1	52.6
FYROM	18.8	6.3	37.5	6.3	0.0	12.5	0.0	0.0
Germany	13.5	6.3	50.0	35.4	9.4	15.6	9.2	54.1
Greece	43.3	30.0	60.0	40.0	40.0	46.7	9.7	0.0

Continued

Table 2 Continued

Country	Anticoagulant therapy n=897	LLD	Antibiotics	CIN	Immunosuppressive therapy	Other	TPN n=959	Enteral nutrition
Hungary	20.0	15.6	48.9	22.2	15.6	20.0	9.1	25.0
Ireland	35.7	0.0	60.7	28.6	17.9	25.0	17.2	24.1
Italy	1.2	1.2	8.2	5.9	2.4	4.7	14.7	43.1
Latvia	0.0	0.0	18.5	0.0	0.0	3.7	0.0	0.0
Lithuania	33.3	0.0	100	33.3	66.7	66.7	0.0	0.0
Luxembourg	25.0	0.0	25.0	50.0	0.0	25.0	0.0	40.0
Netherlands	37.5	12.5	75.0	50.0	50.0	25.0	77.8	11.1
Norway	8.3	0.0	8.3	16.7	16.7	8.3	14.3	14.3
Poland	5.9	2.9	20.6	5.9	2.9	0.0	0.0	12.5
Portugal	4.2	0.0	66.7	54.2	37.5	8.3	19.2	53.8
Serbia	24.1	3.4	58.6	17.2	10.3	44.8	11.1	7.4
Slovakia	1.9	0.0	31.5	5.6	7.4	5.6	10.3	6.9
Slovenia	15.0	10.0	45.0	5.0	5.0	20.0	4.3	17.4
Spain	16.9	8.5	69.5	55.9	20.3	28.8	11.9	67.8
Sweden	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0
Switzerland	5.6	0.0	5.6	5.6	0.0	0.0	16.7	72.2
UK	69.2	7.7	76.9	53.8	46.2	23.1	64.3	35.7

BiH, Bosnia and Herzegovina; CIN, cytotoxic induced nausea; FYROM, Former Yugoslav Republic of Macedonia; LLD, lipid lowering drugs; TPN, total parenteral nutrition.

an increasing percentage proportional to size by number of beds. In 24.5% of hospitals (range by country 0.0% to 90.9%, n=990), technicians are involved in services in the ward mainly in relation to stocking (20.7%) and information activities (10.1%). Only in Denmark, The Netherlands and the UK is

counselling part of the technician's activities (>50% of the hospitals). In other countries, this practice is less usual and thus the average in Europe is only 4.9%.

There are a variety of patient oriented clinical activities in European hospital pharmacies (table 1). Drug information is the

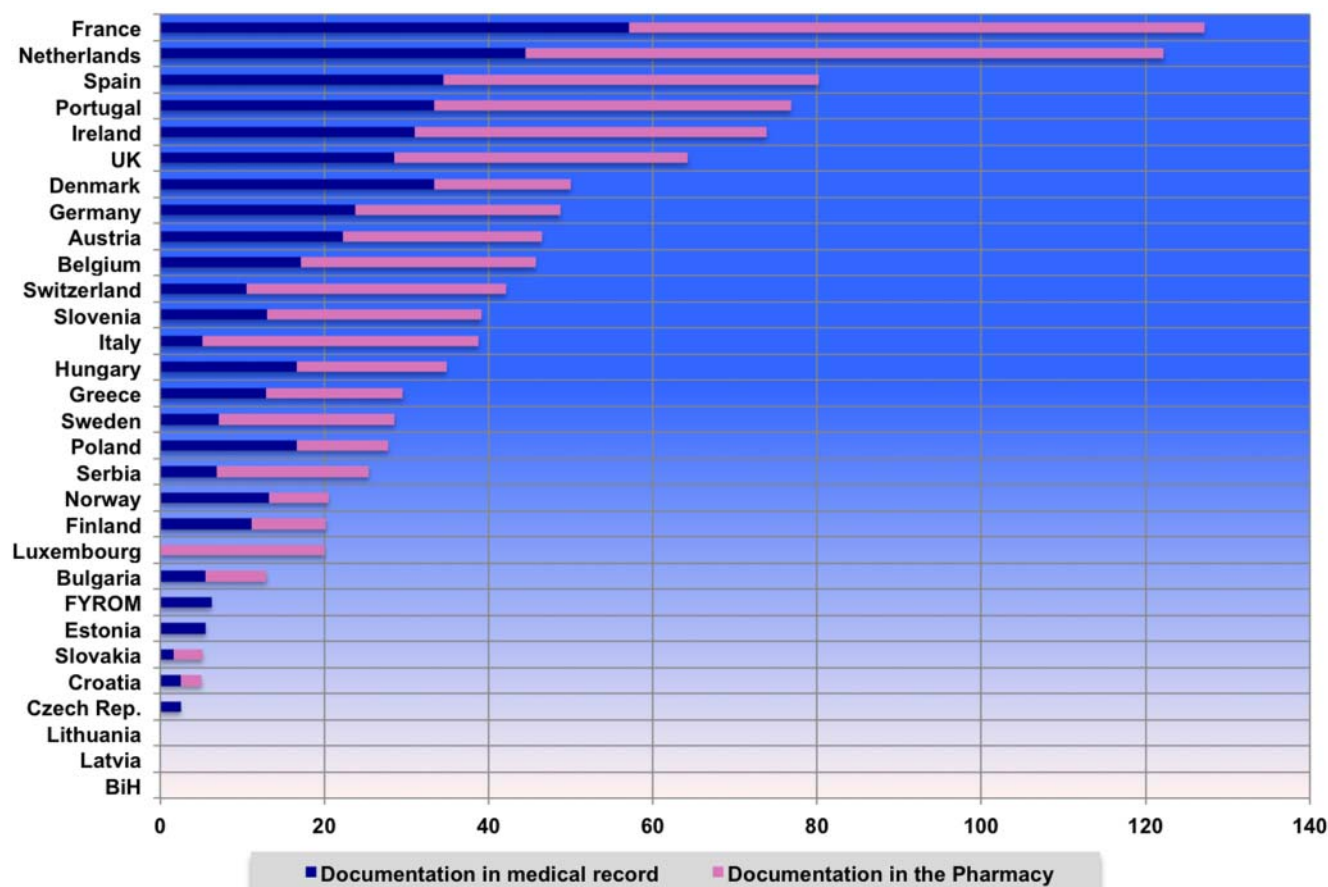


Figure 2 Percentage of pharmacies documenting their clinical activities (inpatients) in medicals records or in the pharmacy (n=950 and n=935, respectively). Total may be >100% as some pharmacies use both documentation systems. BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

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Table 3 Use of IT technology in clinical services by country (n=984)

Country	Patient medication profiling	Drug information databases	Dosage calculation
All countries	31.4	62.2	27.0
Austria	11.4	88.6	45.7
Belgium	73.5	76.5	44.1
BiH	33.3	83.3	16.7
Bulgaria	31.5	25.9	1.9
Croatia	5.3	26.3	5.3
Czech Republic	14.3	76.2	31.0
Denmark	33.3	83.3	50.0
Estonia	0.0	29.4	5.9
Finland	24.4	53.7	9.8
France	68.0	84.0	12.0
FYROM	6.3	25.0	0.0
Germany	29.0	86.0	56.0
Greece	58.1	77.4	9.7
Hungary	27.7	78.7	14.9
Ireland	35.5	61.3	32.3
Italy	24.6	68.4	22.8
Latvia	15.4	3.8	3.8
Lithuania	0.0	0.0	0.0
Luxembourg	20.0	100	40.0
Netherlands	81.8	100	90.9
Norway	21.4	92.9	21.4
Poland	4.5	11.4	9.1
Portugal	92.3	34.6	50.0
Serbia	0.0	35.7	7.1
Slovakia	10.3	36.2	1.7
Slovenia	9.1	86.4	22.7
Spain	94.9	98.3	69.5
Sweden	0.0	83.3	38.9
Switzerland	44.4	88.9	50.0
UK	64.3	71.4	50.0

BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

most common of these (54.6% of pharmacies), and on average 29.2% of surveyed hospitals have a specific pharmacist dedicated to information services (n=989), corresponding to a median of 1.0 full time equivalent (n=273); 25.0% of pharmacies offer the service additionally for healthcare professionals and patients outside of hospital (n=967), mostly (90%) for free (n=242). In 21.2% of pharmacies (n=987), the drug information centre is a formal division or programme of the hospital. On average, half of hospital pharmacies also offer specific services for inpatients concerning prevention, monitoring, documenting, reporting and managing of adverse drug reactions and medication errors. The survey results indicate such services are not implemented to a similar level for outpatient services.

Pharmacokinetic consultation is offered for inpatients and outpatients and includes, in order of the most common categories: antibiotics (aminoglycosides, teicoplanine, vancomycin); antiepileptic drugs (carbamazepine, phenobarbitone, phenytoin); immunosuppressive drugs (cyclosporin, tacrolimus); and others such as lithium, digoxin, theophylline and warfarin (n=857). Therapeutic drug monitoring as an additional service to pharmacokinetic consultation is performed, on average, by approximately 25% of hospital pharmacies.

Management of the interface between primary and hospital care is not yet a priority of hospital pharmacists as, on average, only 16.9% of pharmacies offer this service on admission and 22.1% at discharge. There is large heterogeneity in the results between countries but not by size or type of hospital (data not shown).

Regarding counselling activities in hospital, the most common activity is related to the use of antibiotics, followed by enteral nutrition and cytotoxic induced nausea, with significant heterogeneity between countries and activities (table 2).

In general, the EAHP survey suggests that hospital pharmacy clinical activities are not well documented. On average, only 14.7% (inpatients) and 5.3% (outpatients) of pharmacies record their interventions in medical records (n=950). Documentation in the pharmacy is implemented in 21.9% (inpatients) and 10.2% (outpatients) of pharmacies (n=935). Again, there were notable differences across Europe (figure 2), with the countries in the geographic east generally indicating less recording of hospital pharmacy clinical activities.

There was a weak correlation ($r^2=0.3591$) between the index of activity of pharmacies and the documentation index (defined as the total percentage of clinical activity in the ward and the total percentage of documentation per country, respectively) showing that documentation seems to be considered optional. Written standards are in use for drug information in 39.6% of hospital pharmacies, for pharmacokinetic consultation in 11.3%, for therapeutic drug monitoring in 18.5%, for enteral nutrition in 22.3% and for patient counselling in 22.1% of pharmacies (n=961), with large heterogeneity across European countries and a trend to more frequent use in large hospitals (data not shown).

IT systems are broadly used in drug information but also in profiling patient medication and for dosage calculations (table 3, n=984). Results from Latvia and Lithuania may demonstrate a need for improvement.

Patient safety is a major concern for hospital pharmacists and, on average, 55.0% of hospital pharmacies responding to the survey have implemented a system to ensure patient safety (figure 3, n=914), despite some discernible gaps, especially in southern and eastern parts of Europe. The type of hospital did not remarkably influence implementation but there was a small trend to higher percentages for larger hospitals. On average, 55.1% of hospital pharmacies have a clinical incident reporting system, 38.1% established a committee for safe medication practice and 35.2% have a dedicated team including physicians, pharmacists and nurses (n=928); 24.8% of pharmacies were involved in national surveys on safe medication practice (median 6 surveys/country with a median response rate of 81%, n=872) and 19.8% in campaigns (median 5 campaigns, n=701).

LIMITATIONS

In addition to the general limitations of the survey,¹ the definition of 'clinical activity' might be perceived differently, depending on cultural aspects in different countries. Also, the function of a pharmacist working on a ward can vary from country to country, as was clearly evident from the answers to the questions about activities of technicians. We were not able to differentiate more, and thus we have to take some bias into account.

DISCUSSION

Compared with the results of our survey in 2005,² it appears only small changes are visible in clinical practice in European hospital pharmacy (data not shown). The difference between US and European practice³—even taking into account the



Figure 3 Percentage of hospital pharmacies with an implemented system to ensure patient safety (n=914). BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

limitations discussed above—is wide. In the USA, in 34% of hospitals, pharmacists work on the ward for 8 h/day³; in Europe, only 6% of pharmacies have pharmacists spending at least 50% of their time on the ward. In 71% of US hospitals, pharmacists review and approve all medication orders before the first dose is administered (except in procedure and emergency situations). We do not have specific data on this for Europe but the results on general clinical activities do not suggest such involvement. It is important to develop this role in terms of patient safety and proper use of medicines, as studies repeatedly indicate the value hospital pharmacists can bring to safe patient care in this area. Our data also show that development of these roles is of major interest to European hospital pharmacists.

The survey suggests that the level to which hospital pharmacists are documenting pharmaceutical interventions in medical records or in the pharmacy is quite low and should be improved to create more awareness of the added value of hospital pharmacists. The fact that a weak but still detectable correlation is evident between the index of activity of pharmacies and the documentation index could be interpreted as showing that good documentation helps persuade hospital administrations to provide the resources necessary to enable clinical pharmacy services.

Management of medication at the interface between primary and hospital care is generally not common in European hospitals. There is a need for improvement, as hospital pharmacists

have a major contribution to make in reducing errors in this very sensitive field of patient care.

Key messages

- ▶ Clinical services are still not very well implemented in Europe
- ▶ There is a lack of documentation of clinical activities
- ▶ Patient safety is in focus of the activities of Hospital pharmacists in Europe but the management of the interface between hospitals and primary care needs some improvement

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Competing interests None.

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REFERENCES

- 1 Frontini R, Mirhajja-Gala T, Sykora J. *Eur J Hosp Pharm* 2012;19:385–7. doi:10.1136/ejhp-2012-000162
- 2 Miharija-Gala T, Surugue J. EAHP survey 2005. *EJHP* 2007;13:93–182.
- 3 Pedersen CA, Schneider PJ, Scheckelhoff DJ. ASHP national survey of pharmacy practice in hospital settings: dispensing and administration—2011. *Am J Health Syst Pharm* 2012;69:768–85.



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