Health Education England

PHARMACISTS IN EMERGENCY DEPARTMENTS
A COMMISIONED STUDY BY HEALTH EDUCATION ENGLAND

Executive Summary: Pharmacist Development in Emergency Medicine

The HEE Emergency Department (ED) Pharmacy programme was developed to address the following questions:

- ***"To what extent can pharmacists manage patients in the ED?"***
- ***"What extra training is needed to develop an enhanced clinical ED pharmacist?"***

From December 2013, a West Midlands test-of-concept pilot study was followed by inclusion of the three pilot pharmacists onto a twelve month, multi-professional Advanced Practice pilot, aligned to national Advanced Practice planning. These two studies justified a national scaling of the ED Pharmacy study, from March – April 2015.

This report will provide a summary description of those projects and their outcomes and will precede the summary evaluation report.

1. Pilot – Pharmacists in Emergency Departments [PIED-WM]

The 2013-14 West Midlands ED Pharmacy pilot methodology followed a dual-site, cross-sectional, observation study of patients attending Emergency Departments in the West Midlands. Primary (pharmacist independent prescriber) and secondary (multi-professional medical and non-medical) categorisation of clinical presentations were undertaken, according to the potential for pharmacist clinical management. The pharmacists, with support from their ED teams and supervised by an EM consultant, surveyed a cross-section of ED patient presentations over a five week period in 2014; categorising those patients according to whether the patient could be managed under the following categories:

i. **"CP:"** By a community pharmacist (avoided ED attendance)
ii. "**IP:"** By an Independent Prescriber pharmacist as part of a multi-disciplinary team approach in the ED.
iii. **"IPT:"** By an Independent Prescriber pharmacist in the ED, with an additional 12 months of clinical skills training, aligned to the national "advanced practice" framework (as part of a multi-disciplinary team approach) – a double module including clinical examination skills and clinical health assessment and diagnostics (Level 7, PGDip)
iv. **"MT:"** By the medical team only – unsuitable for pharmacist intervention.

782 patients were evaluated over a five week period, from two West Midlands Acute Trust EDs – Worcester Acute Hospitals Trust and Birmingham Children's Hospital Foundation Trust.

The pilot was considered a success; fulfilling its primary aim of demonstrating an evidence base to justify further study (suggesting the potential for pharmacists to manage up to 48.2% of ED attendees).

2. National ED Pharmacy Project [PIED-Eng]

As with the West Midlands pilot, the national project involved a multisite, cross-sectional, observational study. To capture an effective national cross-section and encourage local engagement, each of the 13 LETBs were asked to nominate Trust EDs in their local area. The study commenced in March 2015, across 12 of the 13 LETBs. 49 Trust EDs submitted data, with a total of 18,613 sets of patient data received (each site was asked to provide anonymized details of approx. 400 cases). All data related to a five week period, between March and April 2015. The purposive sample was taken from a cross-section of attendees and care pathways, to reflect the usual workload characteristics of the departments.

Primary categorisation of presentations was undertaken by the data capture independent prescriber pharmacists (IPPs) at the study sites. These staff had access to the full patient details at the point of data capture. Clinical supervision was provided at each site by at least one EM Consultant and the pharmacist was encouraged to review data with the assistance of the ED clinical team.

Secondary categorisation was undertaken with reference to the anonymised summary information, recorded for this purpose by the data capture IPPs. Secondary categorisation was designed to confirm validity of primary categorisation. Randomised cases were sent to each of the secondary categorisers (14 pharmacists, 6 ED doctors, 4 ED nurses), who **each** received anonymised details of 800 cases, to categorise into the four categories (as described at [1]).

Primary and secondary categorisations were compared and the level of agreement between the two identified.

The national project data-set included age, presenting complaint and clinical grouping, relating to each patient presentation. To inform decisions about training needs, competency mapping, curriculum design and future modification of existing curricula, each pharmacist was also asked to capture specific training needs, relating to each patient presentation.

3. National Project Outcomes

Primary categorisation of 18,613 ED cases found that 35.7% of cases have the potential for clinical management by a pharmacist (CP=4%, IP=4%, IPT=28%), usually working as part of a multi-professional clinical team in the ED. The "IPT" category is dependent on further advanced clinical training, aligned to the Advanced Clinical Practice training pathway, as described at 1(iii).

Secondary categorisation of the data (75% of total data set; n=13,990) supports the validity of the primary categorisation findings, with **36.0 - 36.7%** having potential for clinical management by a pharmacist. It should be noted that Doctors assessed the potential for pharmacist management at **37.4%**. If further training were to concentrate on the two main clinical areas then (achievable) IPT becomes 19% - that is, pharmacists (overall) could manage 27% of cases attending ED.

The **training needs** identified by the primary categorizers (n=46) were split into four themes:

1. **Clinical examination and assessment** (42 sites, n=4510)
2. **Diagnostic skills** (36 sites, n=1381)
3. **Medical management and treatment** (46 sites, n=1236)
4. **Training course component** (16 sites, n=359)

Specifics in each theme were identified.

Note: IP pharmacists already have a minimum of eight years' training and experiential learning at Masters level. Future work-stream development will include the mapping of pharmacist training against the HEE **Advanced Clinical Practice** framework.

Conclusion

With additional Advanced Practice training, there is potential for IP pharmacists to manage up to 36% of ED attendees, where those attendees present with symptoms likely to be seen in the Minors Area of the ED, under the overall supervision of a doctor. Based specifically on completion of a 12 month (Level 7, PGDip) Advanced Practice-level training course - with modules in clinical examination skills and clinical health assessment and diagnostics - it is estimated that the achievable level of pharmacist management may be 27% of all cases. This study provides an evidence base for maximising advanced clinical training for ED pharmacists.

4. Alignment to Existing Training - Advanced Practice

The PIED-WM project relied for its "IPT" categorisation on a 12 month training programme, aligned to the national Advanced Practice pathway. To properly evidence the potential for this as an appropriate pharmacist training pathway, Health Education England-West Midlands launched a pilot postgraduate certificate in "***Advanced Clinical Practice for Healthcare Professionals***" from May 2014 – May 2015. The course recruited a 15-strong multi-professional cohort, which included the three pharmacists from the ED Pharmacy pilot. This (Master's level, 12 month) programme comprised two modules in ***"Clinical Investigations and Diagnostics"*** and ***"Clinical Examination Skills,"*** mirroring the "IPT" categorisation of the PIED-WM and PIED-ENG projects. Successes of the course included the three pharmacists all passing every element of assessment at first attempt. The pharmacists attained a wide range of new clinical skills including cardiac arrest management, phlebotomy, wound management and undertaking vital signs. The project suggested that Pharmacists are capable of undertaking an Advanced Practice programme of study competently and confidently.

Summary Evaluation Report

November 2015

This evaluation was funded by Health Education England and undertaken by the Academic Practice Unit, Aston University / Birmingham Children's Hospital.

Evaluation Lead: Dr David Terry

Senior Researchers: Dr Chi Huynh and Dr Kostas Petridis

Research Associates: Hirminder Ubhi, Alex Guelfout, Jo Correa-West, Beth Barratt.

We are grateful to all the participants and organisations who contributed to the evaluation.

Introduction

At present there are concerns about maintaining appropriate clinical staffing levels in Emergency Departments (ED) in England.[1] Concerns about maintaining the clinical workforce are also experienced in other countries.[2][3] One possible solution is the extension of clinical activity performed by non-medical staff – including pharmacists.[4] Subsidiary clinical management of ED attendees may support patient through-put, relieve pressure on medical staff and reduce costs.

Extending the pharmacist's role in ED may also contribute to error minimisation.[3][5] Publications concerning pharmacists working within ED are usually focused on drug management or their role in 'Rapid Response Teams'.[6][7]

Over the last 10 years there has been an expansion of Universities training pharmacists, leading to an excess of registered pharmacists in England.

Advanced clinical pharmacy practice may be particularly relevant for pharmacist prescribers.

Since 2006 clinical pharmacists in Great Britain have been able to undertake further training in order to have full independent prescribing rights. In March 2015 there were 2,191 pharmacists with independent prescribing rights registered with the national regulatory body, the General Pharmaceutical Council.

Study aims:

- To determine the potential for pharmacists to manage patients within ED;
- To identify the clinical areas most likely to be impacted by extending the role of the pharmacists (using a defined Impact Index); and
- To identify the training needs for the future ED workforce of pharmacists.

METHOD

A. Primary categorisation

Multisite, cross-sectional observational study conducted by independent prescribing pharmacist data collectors within 49 hospital sites in England (primary categorization).

The data capture pharmacists were asked to identify patient attendance at their Emergency Department, record anonymized details of the cases, and categorize each into one of four possible categories. The purposive sample was taken from a cross-section of attendees and care pathways to reflect the usual workload characteristics of the departments. An anonymized data-set for each attendee was recorded and managed using MS Excel 2007 and a purpose built MS Access database. Each site was requested to provide anonymized details of 400 cases.

The four categorizations were:

i. **CP (Community Pharmacist):** Could be managed by a Community Pharmacist (CP) working in a community pharmacy. (That is: attendance at ED was not necessary). CPs have at least 5 years training.
ii. **IP (Independent Prescriber Pharmacist):** Could be managed by a hospital pharmacist with Independent Prescriber status. IPs have further post-registration training that gives them some clinical assessment skills and allows them to be fully independent prescribers. IPs have at least 8 years training / experience.
iii. **IPT (Independent Prescriber Pharmacist with additional training):** Could be managed by a hospital pharmacist with Independent Prescriber status **and** additional clinical training, aligned to the Advanced Practice pathway. The study is designed to identify what further training would be most useful – both within and supplementary to existing Advanced Practice training pathways.
iv. **MT (Medical Team):** Unsuitable for pharmacist management - requires Medical Team management.

Primary categorization of harvested presentations was undertaken by the data capture independent prescriber pharmacists (IPPs) at the study sites. These staff had access to the full patient details at the point of data capture.

B. Secondary categorisation

Secondary categorization was undertaken by reference to the anonymized summary information recorded for this purpose by the data capture IPPs.

The data-set included age, presenting complaint and clinical grouping. Blind secondary categorization was undertaken by 14 pharmacists, 6 ED doctors and 4 ED nurses. This was completed personally by each of the secondary categorisers without consultation and without reference to categories assigned by others.

Randomised cases were sent to each of the secondary categorisers who received anonymized details of 800 cases to categorize into the four categories as previously described. The primary and secondary categorizations were compared and the level of agreement between the two identified.

C. Impact index

Cases were assigned a clinical grouping in relation to the nature of their admission, for example general medicine, cardiology, surgery and renal. An impact index score was calculated to provide a measure of the potential for pharmacists to support the clinical workload in that grouping. The impact index algorithm accommodates both the workload associated with the clinical group and the potential proportion of patients that may be managed by pharmacists.

The impact index was calculated as: -

Impact (i) =

$$\frac{\text{Total cases of CP, IP, IPT in the clinical group}}{\text{Total number of cases in the clinical group}} \times \frac{\text{Total number of cases per clinical group}}{\text{total number of cases (excluding those where clinical grouping was not assigned)}}$$

The algebraic expression is:

Impact(i) = % workload of grouping (w) x % ability of pharmacists to manage that clinical group (a).

$$I(i) = w \times a$$

The higher the Impact Index the greater potential for pharmacists to support the clinical workload in that grouping.

Clinical grouping is not fully synonymous with the usual case mix of clinical specialties, but rather is a subset of Emergency Department attendees.

Clinical grouping is used in this study to group presentations to identify clinical areas suitable for inclusion in advanced practice training.

Results: Summary of Key Findings

18,613 Emergency Department cases were observed from **49 sites** between March and July 2015.

The age ranged from 0 to 115 years with a median age of 44 years and mode age of 27 years.

The most frequent clinical groupings were: General Medicine (36.4%), Orthopaedics (16.5%), Cardiology (5%), General Surgery (4.9%) and Respiratory (4%).

Primary categorization found that 36% of cases were suitable for management by a pharmacist.

The **clinical groupings** where pharmacists can potentially have the highest impact are listed below: clinical grouping (Impact Index):

- **General Medicine** (13.2)
- **Orthopaedics** (9.7)
- **Respiratory** (1.8)
- **ENT** (1.6)
- **Gastroenterology** (1.3).

Table 1: Demographics and clinical grouping of the emergency presentations from 49 sites – Primary data

	Description	Finding
Demographics and general information	**Number of sites**	49
	Number of ED cases (patients)	18613
	Gender of patients	9633 (52%) Female 8980 (48%) Male
	Age of patients	Average (median) age = 44 years Average (mode) age = 27 years Average (mean) age = 46.5 years Range: - 0 – 115 years
	Clinical groupings (the five most frequent clinical groupings)	General Medicine – 6774 (36.4%) Orthopaedics – 3072 (16.5%) Cardiology – 930 (5%) General Surgery – 903 (4.9%) Respiratory – 751 (4%)

Table 2: Primary categorization and Impact Index

<table>
<tr><th></th><th>Description</th><th>Finding</th></tr>
<tr><td rowspan="2">Primary categorization</td><td>Primary categorization of cases from the data</td><td>CP = 726 (3.9%)
IP = 719 (3.9%)
IPT = 5202 (27.9%)
MT = 11966 (64.3%)

Total number of cases that can be managed by a pharmacist = 6647 (35.7%)</td></tr>
<tr><td>Top 5 Impact Index by clinical grouping</td><td>
<table>
<tr><th></th><th>Total cases</th><th>Total cases ∑CP, IP, IPT</th><th>Impact index</th></tr>
<tr><td>Medicine-General</td><td>6774</td><td>2212</td><td>13.2%</td></tr>
<tr><td>Orthopaedics</td><td>3072</td><td>1627</td><td>9.7%</td></tr>
<tr><td>Respiratory</td><td>751</td><td>308</td><td>1.8%</td></tr>
<tr><td>ENT</td><td>513</td><td>276</td><td>1.6%</td></tr>
<tr><td>Gastroenterology</td><td>723</td><td>212</td><td>1.3%</td></tr>
</table>
</td></tr>
</table>

Table 3: Secondary categorization and Impact Index

<table>
<tr><th></th><th>Description</th><th>Finding</th></tr>
<tr><td>secondary categorization</td><td>Secondary categorisation - either a pharmacist, nurse or doctor</td><td>Secondary categorization
<table>
<tr><th></th><th>Count</th><th>%</th></tr>
<tr><td>CP</td><td>479</td><td>2.4%</td></tr>
<tr><td>IP</td><td>1784</td><td>8.9%</td></tr>
<tr><td>IPT</td><td>4937</td><td>24.7%</td></tr>
<tr><td>MT</td><td>12777</td><td>64.0%</td></tr>
<tr><td>Total</td><td>19977</td><td>100%</td></tr>
<tr><td>Total Pharms</td><td>7200</td><td>36.04%</td></tr>
</table>
Secondary categorization ALL combined (14 Pharmacists, 6 Doctors, 4 Nurses) – calculation type = B (*). Some cases received secondary categorization more than once.
Secondary categorization, using mean per case – calculation type = A (*).
<table>
<tr><th></th><th>Count</th><th>%</th></tr>
<tr><td>CP</td><td>246</td><td>1.8%</td></tr>
<tr><td>CP/IP</td><td>33</td><td>0.2%</td></tr>
<tr><td>IP</td><td>794</td><td>5.7%</td></tr>
<tr><td>IP/IPT</td><td>339</td><td>2.4%</td></tr>
<tr><td>IPT</td><td>3716</td><td>26.6%</td></tr>
<tr><td>IPT/MT</td><td>828</td><td>5.9%</td></tr>
<tr><td>MT</td><td>8034</td><td>57.4%</td></tr>
<tr><td>Total</td><td>13990</td><td>100%</td></tr>
<tr><td>Total Pharms</td><td>5128</td><td>36.7%</td></tr>
</table>
</td></tr>
</table>

		** Type A calculation: award numerical values to ordinal data (CP=1, IP=2, IPT=3, IPT=4). Take mean of score for each case, and express each case to one of 7 categories (CP, CP/IP, IP, IP/IPT, IPT, IPT/MT, MT).* *Type B calculation: sum all secondary categorizations expressed in the four categories (CP, IP, IPT, MT).*
	Top 5 Impact Index per clinical grouping (secondary categorization)	

	Pharms within category (count)	Pharms within category (%)	Cat %	Impact Index
Medicine - General	2173	33.2%	39.8%	13.2%
Orthopaedics	1628	53.3%	18.6%	9.9%
Respiratory	306	41.1%	4.5%	1.9%
ENT	276	54.4%	3.1%	1.7%
Gastroenterology	211	29.5%	4.35%	1.3%

Primary (Pharmacist)-secondary (Doctor) categorizer agreement

In order to analyse whether there is agreement between primary categoriser (Pharmacist) and secondary categoriser (Doctors) the following hypotheses are assumed:

- The mean responses between Pharmacists and Doctors are equal $\mu_{Prahm}=\mu_{Doct}$
- The mean responses between Pharmacists and Doctors are not equal $\mu_{Prahm}\neq\mu_{Doct}$

By conducting ANOVA analysis, the p-value equals to 0.00 (less than significance level, 0.05), thus, the means are not equal. This is interpreted as a difference in the responses between pharmacists (Primary Categorisers) and doctors (Secondary Categorisers).

	Primary (Pharmacists)	%	Secondary (Doctors)	%
CP	180	3.91	183	3.98
CP/IP			5	0.11
IP	211	4.58	493	10.71
IP/IPT			6	0.13
IPT	1334	28.99	1014	22.03
IPT/MT			39	0.85
MT	2877	62.52	2862	62.19
Total Cases	**4602**		**4602**	
Total Pharm management	**1,725**	**37.48**	**1,721**	**37.40**

However, the final overall results are very similar, with pharmacists considering 37.48% patients could be managed by pharmacists, and doctors considering 37.40% patients could be managed by a pharmacist. Calculation type A.

Table 4: Regional variations

		Primary Category					Secondary Category (calc type B)				
Region	Number of sites	CP	IP	IPT	Pharmacist combined	MT	CP	IP	IPT	Pharmacist combined	MT
		%	%	%	%	%	%	%	%	%	%
Buckinghamshire Oxfordshire	4	4.2	3.9	22.0	**30.1**	69.86	2.87	9.36	26.01	38.2	61.76
East Anglia	4	2.6	1.8	32.1	**36.5**	63.54	1.95	6.15	22.29	30.4	69.61
East Midlands	4	2.8	5.9	32.6	**41.3**	58.75	1.80	7.04	23.93	32.8	67.23
London	8	10.0	8.0	23.4	**41.5**	58.55	3.82	11.51	23.56	38.9	61.11
North East	4	0.6	0.6	39.9	**41.0**	59.00	1.99	9.25	23.78	35.0	64.98
North West	8	2.0	3.6	32.7	**38.3**	61.75	2.65	10.45	26.85	40.0	60.05
South	2	1.6	6.0	17.8	**25.4**	74.63	1.84	9.45	23.62	34.9	65.09
South East	4	1.3	1.4	26.0	**28.7**	71.31	1.61	8.99	20.81	31.4	68.59
South west	5	4.6	4.2	33.0	**41.7**	58.30	1.46	7.29	28.67	37.4	62.58
West Midlands	2	2.4	2.2	11.5	**16.1**	83.93	2.72	7.83	32.43	43.0	57.03
Yorkshire and Humber	4	7.4	2.9	19.4	**29.7**	70.31	3.03	8.26	21.60	32.9	67.11
Total	**49**	**3.9**	**3.9**	**27.9**	**35.7**	**64.29**	**2.40**	**8.93**	**25**	**36.0**	**64**

As shown in the Table 4 above, regions varied in their opinions concerning pharmacists' potential to manage ED patients, with results ranging from 16.1% to 43% with the West Midlands being a clear outlier according to their primary categorization.

Training Needs: Content Analysis

The training needs identified by the primary categorizers (primary categorizers from 46 sites provided suggestions) were split into four themes, with the top 10 subthemes included in the tables below:

1. **Clinical examination and assessment** (42 sites, n=4510)
2. **Diagnostic skills** (36 sites, n=1381)
3. **Medical management and treatment** (46 sites, n=1236)
4. **Training course component** (16 sites, n=359)

Table 5: Clinical examination and assessment (42 sites, n=4510)

Subtheme (top 10)	Number of categorisers involved in providing training needs information	Number of times suggested (n)
1. X-ray request and interpretation	31	1428
2. Body examination (e.g. external body)	37	959
3. Clinical examination and assessment	12	295
4. Clinical skills	2	266
5. Neurological assessment	20	220
6. Paediatrics	17	137
7. Chest examination	27	132
8. Respiratory assessment or examination	15	93
9. Eye examination	18	92
10. Observations	5	76

Table 6: Diagnostic skills (36 sites, n=1381)

Subtheme (top 10)	Number of categorisers involved in providing training needs information	Number of times suggested (n)
1. ECG	23	546
2. Bloods	14	426
3. Urine testing	10	258
4. Arterial blood gas interpretation	4	22
5. Differential diagnosis	4	20
6. Troponin T	4	12
7. D-dimer test request	4	11
8. CT Scan interpretation	2	7
9. Blood pressure	5	6
10. Doppler	2	5

Table 7: Medical management and treatment (46 sites, n=1236)

Subtheme (top 10)	Number of categorisers involved in providing training needs information	Number of times suggested (n)
1. Trauma and injury management	14	136
2. Wound care	16	109
3. Analgesia	3	107
4. Paediatric	13	62
5. Fracture management	7	57
6. Minor illnesses	3	42
7. Pain management	7	37
8. Nosebleeds	7	33
9. Respiratory treatment	7	33
10. Skin conditions	7	32

Table 8: Training course component (16 sites, n=359)

Subtheme	Number of categorisers involved in providing training needs information	Number of times suggested (n)
1. Minor injuries course	14	316
2. Radiology	1	41
3. Dermatology clinical skills	1	1
4. Knowledge of compartment syndrome	1	1

Conclusions

- Categorization of 18,613 ED cases confirms the potential for pharmacists to clinically manage up to 36% of ED attendees, as part of a multi-professional ED team, under the overall supervision of a doctor.
    - With existing training (CPs and IPs) pharmacists can manage 8% of ED cases.
    - Further training aligned to the Advanced Clinical Practice training pathway (IPTs) increases the potential of pharmacists to manage a further 28% of cases.
- Secondary categorization of the data (a total of 75%, n=13990) supports the validity of the primary categorization findings.
- Impact index findings suggest that pharmacists with advanced training (IPTs) may be most usefully directed to patients in the general medicine and orthopaedic clinical groupings.
    - If training were to concentrate on the two areas with the highest Impact Index (probably achievable in 12 months advanced clinical training) then, (achievable) IPT becomes 19%, i.e. pharmacists overall could manage 27% of cases attending ED.

Publication Outputs to Date

Conference Abstracts

- An abstract of the study results (full data) was presented at the Health Services Research & Pharmacy Practice Conference (HSRPP) as an abstract titled: "*The potential for pharmacists to manage patients attending emergency departments.*" The presentation was given by Dr Terry and Matt Aiello at the University of Reading, on 7th April 2016.

- An abstract of the study results (full data) was presented at the national Clinical Pharmacy Congress as a conference abstract. The presentation was given by Matt Aiello in London, on 22nd April 2016.

- An abstract of the study results (full data) was presented at the Irish National Health Summit as a conference abstract. The presentation was given by Matt Aiello in Dublin, on 22nd February 2016.

- An abstract of the interim results were submitted to the American Society of Hospital Pharmacists – 2015 Midyear Clinical Meeting as a conference poster abstract. The poster was presented by Dr Terry in New Orleans, Louisiana, 8th December 2015.

- A subset of the paediatric interim dataset (for patients aged from 0-16) was submitted on 30th June 2015 as a conference abstract at the Neonatal and Paediatric Pharmacists Group (NPPG) conference. This was accepted as a poster and oral presentation. The presentation was given by Dr Terry in Cheshire on 7th November 2015.

Peer-Reviewed Journals

- The West-Midland's dual site pilot project conducted at Birmingham Children's Hospital NHS Foundation Trust, Heart of England NHS Foundation Trust and Worcester Acute Hospitals NHS Trust has been submitted to peer reviewed journals for consideration.
- The PIED-ENG project data has been submitted to peer reviewed journals for consideration.

Further detail is available on request from the project team – please contact Matt Aiello (Health Education England – West Midlands local office): matthew.aiello@wm.hee.nhs.uk

Future Work and Dissemination

The research team at the Academic Practice Unit will continue to explore the rich dataset and conduct further analysis of the data as follows:

- **Identify training needs for the 1 year training programme** from the "IPT" further training comments made by the pharmacist primary categorisers, and secondary categorisers (doctors, nurses and pharmacist).
- **Analyse the medication history of patients reported in the Emergency Department** – to identify if there is a relationship between patients with certain long term medications in relation to incidence of admission.

With the agreement of HEE, the PIED project team will now undergo further analysis and exploration of the data, and will publish findings in suitable research reports. We envisage publishing the findings to this study to relevant conferences as abstracts and producing peer review papers from this study.

APU staff will develop and conduct an electronic survey of key stakeholders to identify their experiences, opinions, beliefs and expectations concerning pharmacists in Emergency Departments as front line clinical staff.

REFERENCES

1. **Paw RC. Emergency department staffing in England and Wales, April 2007.**
   ***Emerg Med J* 2008;25:420–3. doi:10.1136/emj.2007.054197**

2. **Weeks GR, Ciabotti L, Gorman E, *et al.* Can a redesign of emergency pharmacist roles improve medication management? A prospective study in three Australian hospitals.**
   ***Res Soc Adm Pharm* 2014;10:679–92.**

3. **Zeraatchi A, Talebian M-T, Nejati A, *et al.* Frequency and types of the medication errors in an academic emergency department in Iran: The emergent need for clinical pharmacy services in emergency departments.**
   ***J Res Pharm Pract* 2013;2:118.**

4. **Stevens M., Brady J, Cannon JB. Pharmacists in the emergency department: A study of feasibility and cost.**
   ***Acad Emerg Med*;20:1069–6563.**

5. **Jacknin G, Nakamura T, Smally AJ, *et al.* Using pharmacists to optimize patient outcomes and costs in the ED.**
   ***Am J Emerg Med* 2014;32:673–7.**

6. **Roulet L, Asseray N, Ballereau F. Establishing a pharmacy presence in the emergency department: opportunities and challenges in the French setting.**
   ***Int J Clin Pharm* 2014;36:471–5.**

7. **McFadzean E, Isles C, Moffat J, *et al.* Is there a role for a prescribing pharmacist in preventing prescribing errors in a medical admission unit?**
   ***Pharm J* 2003;270:896–9.**

8. **Hughes E, Aiello M, Terry D. Clinical pharmacists in urgent and acute care - the future pharmacist.**
   ***Commissioning* 2014;1:48–53.**