

Pharmacy vision

Board of
Pharmaceutical
Practice future
trends report

2017



International
Pharmaceutical
Federation

Colophon

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International Pharmaceutical Federation (FIP)
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Recommended citation: International Pharmaceutical Federation (FIP). Pharmacy vision: Board of Pharmaceutical Practice trends report. The Hague: International Pharmaceutical Federation; 2017.

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Contents

Foreword	4
Acknowledgements	6
1 Background	7
1.1 Introduction	7
2 Vision for pharmacy and its place in the health care system	8
2.1 Pillar I: Pharmacists providing value	8
2.1.1 Current situations, trends and challenges	8
2.1.2 Future of industrial pharmacy	12
2.1.3 Objectives for pharmacists	13
2.1.4 Objectives for the BPP	13
2.1.5 Proposed action	14
2.2 Pillar II: Interprofessional teams and collaborative practice	15
2.2.1 Current situation, trends and challenges	15
2.2.2 Objectives for pharmacists	16
2.2.3 Objectives for the BPP	16
2.2.4 Proposed action	17
2.3 Pillar III: New technologies (e-health and m-health)	18
2.3.1 Current situation, trends and challenges	18
2.3.2 Definitions	19
2.3.3 Benefits of e-health and m-health	19
2.3.4 Challenges of e-health and m-health	20
2.3.5 Interaction with patient groups	20
2.3.6 The role of the pharmacist	21
2.3.7 Objectives for pharmacists	22
2.3.8 Objectives for the BPP	22
2.3.9 Proposed action	22
2.4 Ethics underpinning each pillar	23
3 Conclusions	25
4 Glossary	26
5 BPP strategic plan	28
References	32

Foreword

Dear Reader,

It is a pleasure to present to you “Pharmacy vision: Board of Pharmaceutical Practice future trends report”. This document is the fruit of a long process within the Board of Pharmaceutical Practice (BPP), based on the FIP Vision 2020. To understand the spirit of this report, I would like to specify that the core tasks of pharmacists, although important, are not discussed in this document. It was also not our intention to present a complete catalogue of the different functions and jobs done by pharmacists in practice. Our objective was to create a document representing the groundwork, which allows renewing of the BPP strategy and elaborating a new BPP action plan for the next few years.

To fulfil this objective, it was important first to have a global view of the profession’s evolution in practice — including the main areas of pharmacy practice (represented by the eight sections of the BPP) — in order to obtain a broader picture of the situation. The process started at our board meeting in March 2015, with a brainstorming exercise on the challenges facing each section in the next few years. It was important to have a “bottom-up” approach in order to get a pragmatic, practice-oriented and consensual result. After active participation and animated discussions by all the sections’ leaders, a working group with at least one member of each section was established to elaborate and write a draft document.

All the inputs we obtained during this discussion were analysed and we defined three main topics as pillars:

- Pillar I. Pharmacists providing value;
- Pillar II. Interprofessional teams and collaborative care; and
- Pillar III. New technologies (e-health, m-health).

Ethics, as a basic concept, has implications on each of the pillars and is not the subject of a special pillar.

For each pillar, one or more statement(s) describe comprehensive impacts of the vision in practice. It was important that the BPP not only focuses on its own objectives but also gives some suggestions to pharmacists and their professional organisations. The proposed action list at the end of each chapter should facilitate an analysis of the possibilities and can help setting the priorities regarding the trends that pharmacists need to focus on.

This document should be considered as a working paper for anyone who is willing to create change actively and move our profession forward. It should help the reader to identify the importance of specific trends in his or her country. Furthermore, it can assist choice of appropriate method(s) and time schedule to implement the defined actions according to the political, structural, economic, environmental and educational level of pharmacy in each country. I am convinced that our global vision and the strategy for practice should be the same all over the world, with only the tactics and the timeframe of implementation to be adapted to each country.

The BPP strategic plan is presented in Chapter 5. It should be considered as an active document, intended for future evolution, successive updates or expansions, as needed over time. It represents the synthesis of the trends described for practice in this document and gives the BPP clear objectives and tasks according to the needs of the profession. Without a vision and a clear strategy, it is difficult or impossible to anticipate the future and make the right decisions.

It was fascinating to participate in the process. I learnt a lot about the concerns over the challenges of different sections. It was an honour and a pleasure to profit from the expertise of all BPP members. Judging by the result, I can say that all the time and the passion invested in creating this document was worthwhile. I am proud to offer you this working document and I encourage everyone to use it to update his or her strategy.

As a conclusion, I want to thank everyone who contributed to this report. Without the work of all the volunteers, it would not have been possible for the BPP to accomplish this huge piece of work and provide you with this useful tool for practice. I want especially to thank the working group members for their valued collaboration and their expertise. Through their work, I, as Chair of the BPP, could give a concrete shape to my thoughts. A special thank you goes to Ms Zuzana Kusynová from the FIP head office, for her marvellous and tremendous engagement during the entire process, implementing over a thousand revisions and comments of BPP members, which also shows the extraordinary participation of everyone.

I hope you will enjoy reading this report as much as we all enjoyed working on it.

Long live pharmacy!
Long live the BPP!

Dominique Jordan

*Chair (2014–2018)
Board of Pharmaceutical Practice
International Pharmaceutical Federation*

Acknowledgements

FIP wishes to thank the working group under the leadership of its Chair Dominique Jordan (Chair of FIP's Board of Pharmaceutical Practice 2014–2018, Switzerland) and its Co-Chair Wafa Dahdal (Academic Pharmacy Section, USA) and the following members (in alphabetical order): Michael Anisfeld (Industrial Pharmacy Section, USA), Parisa Aslani (Health and Medicines Information Section, Australia), Julien Fonsart (Clinical Biology Section, France), Ola Al Ahdab (Social and Administrative Pharmacy Section, Lebanon), Sylvain Grenier (Military and Emergency Pharmacy Section, Canada), Marianne Ivey (Hospital Pharmacy Section, USA), Zuzana Kusynová (FIP Policy Advisor and Project Manager, Netherlands), and Luis Lourenço (Community Pharmacy Section, Portugal). The report benefited from the review and contribution of Betty Chaar (FIP Expert Group on Ethics, Australia).

1 Background

1.1 Introduction

The International Pharmaceutical Federation (FIP) is the global body representing pharmacists and pharmaceutical scientists, founded in 1912. Through our 139 national organisations, academic institutional members and individual members, FIP represents over three million pharmacists and pharmaceutical scientists around the world.

The mission of FIP¹ is “to improve global health by advancing pharmaceutical education, pharmaceutical sciences and pharmaceutical practice, thus encouraging, promoting and enabling better discovery, development, access to and safe use of appropriate, cost-effective, quality medicines worldwide.”

In 2011, FIP adopted as one of its three main strategic objectives *to advance pharmacy practice in all settings*.² This is the ambitious goal aspired to in the work of the Board of Pharmaceutical Practice (BPP) and its sections.³ The BPP strongly promotes good communication between pharmaceutical practitioners, pharmaceutical scientists and other health care providers. The ultimate objective is to unify the profession and, as a result, bring about an improvement in health care standards, for the benefit of patients.

The BPP represents the interests of all aspects of the practice of the profession of pharmacy throughout the world, regardless of any national or local issues. The sections of the BPP cover the following practice settings:

- Academic pharmacy
- Clinical biology
- Community pharmacy
- Health and medicines information
- Hospital pharmacy
- Industrial pharmacy
- Military and emergency pharmacy
- Social and administrative pharmacy

In the years 2010 to 2014, the BPP endeavoured to pursue FIP’s 2020 Vision. FIP as a whole has focused on maximising the effectiveness and collaboration of practice, science and education. In this spirit, the BPP has actively sought opportunities for joint action with the Board of Pharmaceutical Sciences (BPS) in advancing pharmacy practice globally, in every setting and in every health system. It has also meaningfully contributed to FIP Education (FIPeD) activities.

As the environment within which pharmacists function constantly changes, and trends affecting the profession fluctuate, the BPP aims to provide up-to-date guidance and leadership to the sections and their members in the conduct of their activities. In this way, they can be better prepared for the challenges in the uptake of new opportunities and in meeting the needs of societies and nations.

In 2015, the BPP established a working group in order to identify the trends and opportunities facing pharmacy, and to formulate a vision for the future of the profession, with the ultimate aim of preparing a strategy for the board. This internal BPP document is a result of collaborative efforts between BPP sections in different areas of practice. This document extends the strategic plan established under the leadership of the BPP Chairman for 2014 to 2018. It serves as an operational blueprint for the BPP in the coming years. It provides a platform for defining the next action points for the work of the BPP and aligns with the new FIP mission, vision and strategic plan.

This vision is not intended to encompass all the diverse aspects of pharmacy. It focuses on what was mutually agreed by the BPP as the key pillars on which to focus for the next few years, and to derive concrete points of action and work for the BPP. This does not detract from keeping an open mind to anything else that may accelerate into a trend in the near future.

2 Vision for pharmacy and its place in the health care system

The vision for pharmacy comprises three pillars: (i) Pharmacists providing value; (ii) Interprofessional teams and collaborative care; and (iii) New technologies (e-health and m-health). Principles of professional ethics underpin each of these pillars.

2.1 Pillar I. Pharmacists providing value

Vision statement 1: Pharmacists will expand patient care services to all health care settings and new practice models. Services should be evidence-based, outcomes-oriented and patient-centred, and range from health and wellness to prevention and comprehensive medication management.

Vision statement 2: Pharmacists will attain appropriate competencies that correspond to the complexity of the services provided.

Vision statement 3: Pharmacists will use current or new financing and remuneration models to sustain patient care services.

Vision statement 4: Pharmacists will evaluate the quality and outcomes of patient care services.

2.1.1 Current situations, trends and challenges

Considerable advancement has been achieved in the pharmacy profession over the past two decades. While progress has occurred in different parts of the globe at a varied pace, the profession is progressively transitioning from a traditional product-oriented focus to a focus on the ultimate beneficiary of pharmacist services, namely, the patient. Concurrent and enabling developments have taken and are taking place in legislative and regulatory arenas, health system infrastructures, and pharmacy education and training. These developments align with the change in the focus of the profession.

Trends and advancements are occurring in several areas related to the practice and competencies of the pharmacist, and remuneration for services. The following areas are of particular note:

- Expanded scope of practice and range of pharmacist-provided patient care services
- Provision of patient-centred care
- Attainment of authority to prescribe
- Advanced practice and specialisation
- Credentialing and privileging
- Remuneration for patient care services
- Documentation of the value of patient care services

Advancements in each of these areas reflect the collective efforts of various stakeholders to the strategic transformation of the profession towards patient-centred care. A brief summary of the advancements in each of the areas follows.

2.1.1.1 Expanded scope of practice and range of pharmacist-provided patient care services

Assuming greater roles as health care professionals and providers, pharmacists in many parts of the world now enhance patients' access to quality services at various levels of care and throughout the continuum of health care systems. Pharmacist-provided services contribute to meeting and achieving national health care needs and goals.

Pharmacists have adopted broader roles and responsibilities, providing more clinical services both independently and as part of interprofessional health care teams. An expansion in the number and type of pharmacist-provided services is taking place in all practice settings.

Clinical pharmacy practice is well established in many developed countries.⁴⁻⁷ Greater recognition by health authorities and advancement in clinical practice are also being realised in developing countries.⁸ The critical need to identify new and innovative models of care for pharmacist-provided services is well recognised by professional pharmacy organisations around the globe.⁹⁻¹⁶

Significant divergence exists in the level of pharmacist-provided patient care activities and services. In countries where clinical pharmacy practice is well established, pharmacists have successfully expanded services to include advanced, quality, direct patient care services, where they provide comprehensive medication management to patients with conditions/diseases of various complexities and in different health care settings.^{17,18} On the other hand, the type and level of clinical services provided in other countries are at early, introductory stages and are limited to particular activities.

Because of the accessibility of community pharmacists, particular focus is being placed on introducing unique patient care services and practice models in the community pharmacy setting.¹⁹⁻²¹ The patient-centred services provided include immunisation and administration of vaccines, management of minor ailments and referrals, screening, prevention and health promotion, support of self care, delivery of precision/personalised pharmacotherapy, and provision of comprehensive medication management in acute and ambulatory care settings. Preventive health services commonly provided by pharmacists include health screening for diabetes, cholesterol, hypertension and osteoporosis; tobacco cessation; and patient counselling/health education.²²⁻²⁷ All these are leveraging the existing and improved skills of pharmacists in a readily accessible environment such as community pharmacy.

A number of countries also allow pharmacists who have attained the required competencies to work in a wider scope of practice that typically includes performing patient assessments, ordering and interpreting laboratory tests related to medication therapy, referral of patients to other health care providers, evaluation and management of minor ailments, and initiation, adjustment or discontinuation of medication. Clinical pharmacist competencies and a template for the evaluation of the clinical pharmacist have been published.²⁸

Access to care is expanding while consistency in quality is ensured, with opportunities for new roles for pharmacists in fields such as health technology assessment, clinical biology/laboratory, peer-to-peer professional education and hospital pharmacy.^a

Challenges to the expansion of pharmacist services include: limitations set forth by legislation and restrictive practice or registration provisions;⁴ lack of competent human resources with the expertise required to lead the transition to patient-oriented roles; lack of support from or recognition by other health care professionals and the public, constraining health system infrastructures; and limited access to patient data.

During emergency and disaster situations, pharmacists are frequently called on and are well positioned to provide health system as well as patient-oriented support by extending their scope of practice. These enhanced activities build on pharmacists' existing skills sets but educational support is required to ensure these capabilities are available when required.^b A system of recognition of competence and skills is increasingly in place in cross-border care.

2.1.1.2 Provision of patient-centred care

Greater emphasis is being placed on patient education and engagement in patient care. Pharmacists are increasingly providing patient education and medicines reconciliation services in communities, hospitals and homes. In addition, pharmacists are being integrated into team-based, integrated practice models that deliver patient-centred care (e.g., the Patient-Centred Medical Home [PCMH] model in the USA²⁹⁻³²).

Pharmacist-provided clinical care results in improvements in medication adherence as well as reductions in hospital admissions and health-related costs.³³ Studies have demonstrated the positive clinical, economic and humanistic benefits of pharmacist-directed patient care in a variety of settings.³⁴

Patient-centred care, in its broader term of patient-centricity, has also communication aspects relevant to education (problem-based learning), peer-to-peer education (marketing/sales) and industry (patient literacy and patient inserts), etc.

^a For more information, read FIP's Basel Statements at: www.fip.org/baselstatements.

^b For more information, read the 2016 FIP report "Responding to disasters: Guidelines for pharmacy" at www.fip.org/publications

2.1.1.3 Authority to prescribe

Another important trend is the increase in pharmacists' authority to prescribe. Pharmacists in the UK, Switzerland, Canada and New Zealand can attain the qualification of pharmacist prescriber or non-medical prescriber.³⁵⁻⁴⁰ Pharmacists who meet certain requirements and attain the prescriber qualification have the authority to prescribe medicines within their scope of practice. The extent of authority varies by country and jurisdiction, and may be supplemental or independent. In the USA, for example, pharmacists have limited prescribing authority that most commonly occurs through collaborative practice agreements or under state-wide protocols. In addition, several states limit pharmacists' prescribing authority to specified products of importance to public health. Further studies are needed to evaluate the uptake and outcomes associated with pharmacist prescribing.

2.1.1.4 Advanced practice and specialisation

There is great interest in the development and recognition of advanced and specialised pharmacy services that deliver care to complex and specific patient populations.⁴¹⁻⁵¹ Debate is ongoing in some countries on their definition of advanced and specialised practice.

According to the US Council on Credentialing in Pharmacy, advanced and specialised practitioners are defined based on their level of knowledge, skills and experience (from entry level to advanced), and the breadth of patient/practice focus (from broad to narrow [specialised] scope of practice).⁵¹ In addition in the USA, pharmacists who meet specified requirements in some states can earn the "advanced practice pharmacist" designation, which enables them to deliver care under an expanded scope of practice.⁴⁰

2.1.1.5 Credentialing

Parallel to the advancement in pharmacy practice and emerging pharmacist roles, greater emphasis is being placed on credentialing to demonstrate competence. A credential is defined as documented evidence of professional qualifications.⁵²⁻⁵⁴ Credentials include academic degrees, licensure, certificates (from residency or training programmes) and certifications.⁵²

Advancements in clinical pharmacy education, postgraduate training programmes and certifications are taking place across the globe to better prepare pharmacists for their new, advanced and specialised roles. Pharmacy and health professional organisations and governmental agencies in several countries have recognised the need for and importance of pharmacists attaining the appropriate credentials that are commensurate with the type and complexity of services provided.

Pharmacy education: The challenges of development, distribution and responsible use of medicines can only be met with an adaptable pharmacy workforce that deploys its knowledge, skills and abilities to the fullest degree in a wide array of environments and in collaboration with other stakeholders in health care.

FIP in its [vision for education and workforce](#)⁵⁵ stated that pharmacists and pharmaceutical scientists accept responsibility for the development and sustainability of an adaptable and capable global workforce, working in partnership for better health care through transformative and continuous education. Our professional workforce will continuously strive to develop new medicines and to improve the use of existing medicines for better health care. Furthermore, education and training for all members of the pharmacy workforce in all practice and science-oriented environments should reflect the best evidence and experience for an excellent education.^{55, 56}

Access to systems for continuing professional development are essential for maintaining and advancing the competencies and capabilities of pharmacists and pharmaceutical scientists throughout their careers.⁵⁶ Pharmacy education reform includes a shift to a focus on clinical pharmacy education. The number of professional programmes and degrees conferred in clinical competencies of pharmacists worldwide have risen and continue to rise significantly each year.⁵⁷ Curricula structures, durations and educational outcomes differ by country and programme.^{58, 59}

Professional leadership organisations and government agencies can contribute to this vision by supporting progressive policies for professional development and practitioner recognition processes.⁵⁵

Postgraduate training programmes: Similarly, the number and type of postgraduate training programmes offered have expanded. Some are short-term programmes designed to focus on training practising pharmacists to deliver particular services, for example, those offered in Iran, South Africa and Switzerland, and for hospital pharmacy in the Netherlands.^{50, 51}

Others, such as residency training programmes, are offered over one or several years. These practice-based experiences are designed to train generalists or specialist practitioners. Postgraduate residency programmes are well established in both general pharmacy practice and specialty practice areas. In the USA, for example, they are accredited by the American Society of Health-System Pharmacists. One-year and multi-year residency programmes that follow the same requirements and structure are now offered in several other countries, such as Saudi Arabia and Singapore.

Certifications: Certifications for generalist, advanced and specialist practitioners are important developments in pharmacist credentialing. In the USA, specialty pharmacy certifications are well established and recognised by other health care professionals. In addition to multidisciplinary and pharmacist-only certifications administered by various medical and professional organisations, the Board of Pharmacy Specialties (BPS), established in 1973, currently recognises the following pharmacist-only specialty areas: ambulatory care pharmacy, critical care pharmacy, nuclear pharmacy, nutrition support pharmacy, oncology pharmacy, paediatric pharmacy, pharmacotherapy (with added qualifications in infectious diseases and cardiology) and psychiatric pharmacy.⁶⁰ Several other specialty areas are currently under consideration. Certifications conferred by the BPS are recognised internationally.

To ensure optimal direct patient care provided by pharmacists, competencies have been developed.⁶¹ Minimum qualifications of professional degree, postgraduate training, and/or certifications that ensure attainment of competence should be required for provision of direct patient care services.⁶²⁻⁶⁷ Required qualifications should be commensurate with the type and complexity of services provided in order to ensure safe and effective patient care.

A challenge is that while some countries have advanced the education, postgraduate training and range of certifications, the concept of pharmacy specialisation and certification is just beginning to be introduced in others. The competent workforce needed to educate and train pharmacists for the new roles is lacking in some settings.

2.1.1.6 Remuneration and compensation for patient care services

Payment models and fees for pharmacy services are highly variable.⁶⁸ While some professional services are reimbursed by government agencies or private insurance plans, others are paid for directly by patients, supported by prescription dispensing fees or funded by grants or agreements with academic institutions.⁶⁸

Remuneration for particular clinical activities, independent of dispensing fees by national governments or private insurance plans, exists in Australia, Canada, Europe, New Zealand and the USA.⁶⁸ The types of services remunerated vary in complexity and include, but are not limited to, completion of a medication review, with or without care plan development, smoking cessation counselling, patient medication adherence consultations, minor ailment programmes and comprehensive medication management. Remuneration fees vary by type of service and some are time-dependent — pharmacists are encouraged to examine the time required to perform these activities and the outcomes achieved to ensure that fees are adequate to sustain these patient care activities.⁶⁸ Public remuneration for pharmacist administration of injections also varies by country.⁶⁹ In some countries, injection services are not eligible for public funding and in others public remuneration programmes exist.⁷⁰

As clinical services expand, it is critical to ensure that they are economically viable and that all payment options are utilised, but without placing undue strain on household finances. Where pharmacy clinical services exist, the vast majority of payments occur via a fee-for-service payment model. New pay-for-performance models that include quality incentives are increasingly being used by payers to improve the quality of care and patient outcomes.^{71,72}

Globally, there appear to be rapid changes happening in the ways countries structure their community pharmacy remuneration systems. Governments and health insurers have taken a lead role in initiating and driving price and margin reductions to achieve budget control. This trend has intensified in recent years, within the context of an overall economic crisis, with an accelerated negative impact for pharmacies, which has resulted in decreasing opportunities for pharmacy associations to shape remuneration models.⁶⁸ Current trends include diminishing remuneration for dispensing activities, rapid shrinking of business autonomy, an increase in the demand for and acceptance of remuneration for pharmacist-provided professional services, realisation of the critical need to shift to payment structures that render services with focus on the pharmacists' clinical skills self-sustainable,⁷³ and a gradual shift to value-based reimbursement. These services are not only delivered to patients, but also to other health care professionals and sometimes to payers. Challenges include restrictive laws and regulations limiting remuneration for professional pharmacist services,⁴ payment models that inadequately compensate the pharmacist for clinical services, and a lack of health system infrastructures that allow for reimbursement for services with a focus on the pharmacists' clinical skills.

2.1.1.7 Documenting the value of patient care services

Studies of pharmacist-provided patient care services in various practice settings, such as hospital, ambulatory and community, demonstrate improved clinical outcomes.⁷⁷ Studies of the economic impact of services with a focus on pharmacists' clinical skills show that pharmacist services are generally found to be cost-effective or provide a good cost-benefit ratio.⁷⁴⁻⁷⁷

With the establishment of new patient care services and expansion to innovative practice models, studies documenting the clinical, humanistic and economic outcomes associated with the provision of such services are lacking. Practice-based research to evaluate processes and outcomes associated with pharmacist-provided services, particularly those that involve new roles and new practice models, are needed to guide the development and improvement of quality, economically sustainable services.

Challenges include the limited expertise and resources available to conduct quality, practice-changing research.

2.1.2 Future of industrial pharmacy

Until the 1970s, the role of the pharmacist was essentially product-centred, with pharmacy education geared towards providing the pharmacist with knowledge on the source of medicines from natural species (pharmacognosy), the action of medicines on the body (pharmacology), formulation of medicines into dosage forms usable by patients (pharmaceutics), and analysis of medicines and raw materials of natural origin (pharmaceutical chemistry).⁷⁹

Worldwide, these four elements made up the bulk of a first degree in pharmacy. However, in the developed world from the 1980s onwards, the role of the pharmacist has undergone a fundamental change. In simple terms, on one hand the role of the pharmacist was recognised as being more focused on ensuring the right treatment reaches the right patient and ensuring the correct use of medicines (counselling). On the other hand the need for pharmacists' knowledge was high in understanding the fundamentals of how medicines are developed, manufactured, tested and monitored for their safety and efficacy once they have been registered and are being used by patients.⁷⁹

The role of pharmacists in industry depends on historical and cultural norms, and varies between countries and continents. In the European Union, in the pharmaceutical industry, pharmacists can have the function of being "qualified persons" — the only individuals in Europe who can legally release batches of medicines to the market. In Scandinavian countries, it is common for about 25% of senior factory staff to be pharmacy graduates.

Worldwide there is a wide variety of pharmacists' jobs in regulatory, marketing, health economics and outcomes research (HEOR)/values, medical affairs, publication management, medical education and sales functions, and these are currently on the rise.

Pharmacists working in industry, for example in the manufacture and testing of medicines, do not necessarily have direct patient interaction. Pharmacists are integral in supply chain management, regulatory affairs, health technology assessment, etc — clearly in the practice field but not directly involved in patient-centred care. However, patient-centricity has been the leading principle of pharmacists adding value in medicines development, ensuring access to care, peer-to-peer education, health technology assessment, patient safety, development and fostering of patient counselling and clinical skills. Some of the modern pharmacists' roles in industry face their own challenges with patient-centricity: communication (peer-to-peer education, patient leaflets, direct-to-consumer advertising), medicines development driving (for example, with patient advocacy for genetics therapies, such as spinal muscular atrophy), and new models of financing medicines development (such as public private partnerships). In military and emergency pharmacy, besides their key role in the supply chain, pharmacists increasingly take the lead in patient counselling and in coordinating the range of people's needs (often beyond health ones) in disaster relief situations.

The pharmacy degree is, by its nature, generalist. Although pharmacists may not have specific skills in one small fraction of science, with a general scientific education they can play a significant role in medicines development and research, manufacturing and quality assurance, monitoring the safe use of medicines from a scientific perspective, and promoting medicines in a responsible and transparent way. An industrial pharmacist can make a significant contribution in changing the playing field of world economics, and evolving health care and reimbursement systems and regulations. Those give rise to a need for pharmacists or pharmaceutical scientists to deepen the knowledge they are able to provide and to develop special skills.

Other examples where a pharmacist could play a significant role, if industrial pharmacy were taught as part of an undergraduate degree, are in military or emergency situations, and in regulatory affairs/medicines registration, where knowledge of medicines development phases and manufacturing plays an important role. Medicines are often not readily available in wars and humanitarian disasters, and the ability to manufacture either locally for local consumption or multinationally to fill medicines shortages (for example, refugee crises, life-threatening diseases such as Ebola, avian flu, anti-radiation medication) is vital for populations at risk. Currently there is a discussion around humanitarian pharmacists' competency framework development.

A particular threat that could worsen pharmacists' future role in industry is that the undergraduate curriculum does not mention industrial pharmacy as such, for example in the USA^c. In the USA, pharmacists are in great demand in the pharmaceutical industry as sales representatives, interacting with physicians to promote medicines on a professional-to-professional basis, but they are slowly disappearing from manufacturing roles. This applies to other developed countries as well. Because of a lack of research on this topic, the evidence to support a change is limited.

On a positive note, in France and in some French speaking countries such as Belgium and Morocco, students in their final year can choose to specialise in industrial pharmacy.^d In a number of countries, for example, India, South Africa and Mexico, pharmacy students are prepared for careers in the pharmaceutical industry, and pharmacists are widely employed in it.⁵⁷

There is certainly room for improvement to attune pharmacy education to the needs of industrial pharmacists in the future at both national and multinational level.

2.1.3 Objectives for pharmacists

- Attain and maintain competence by acquiring the appropriate credentials and privileges needed to deliver safe and effective patient care;
- Deliver quality, evidence-based, outcomes-oriented, patient-centred care;
- Exploit all funding sources and new payment financing and remuneration models in order to sustain patient care services;
- Promote pharmacist research that evaluates and disseminates the outcomes associated with provision of new pharmacy services, including but not limited to uptake, clinical outcomes and cost effectiveness;
- Continue to improve all aspects of services rendered, document the achieved results and ensure success in new pharmacist roles and models of care;
- Promote professional services to all stakeholders, including but not limited to patients and carers, other health care professionals, administrators, payers and policymakers;
- Address the needs of pharmacy and public health in all fields (including industrial, military, emergency, supply chain management) at national and multinational levels.

2.1.4 Objectives for the BPP

- Promote innovation in pharmacy practice across all settings and the development of quality, patient-centred services;
- Support credentialing and privileging of pharmacists delivering direct patient care services, including advanced and specialty pharmacy services;
- Advocate laws and regulations that allow competent pharmacists to effectively and efficiently deliver direct patient care services in all practice settings;
- Encourage pharmacist-led innovation and advocate prompt reimbursement of new services across all fields of pharmacy practice;
- Support national pharmacists associations in emphasising the need for quality, practice-based research to generate evidence on the value of pharmacist services;
- Prepare reports on the topic to promote best practices dissemination and support for further studies.

^c The American Association of Colleges of Pharmacy document entitled "Doctor of pharmacy (Pharm. D.) degree" which describes the course of study to earn a primary degree in pharmacy, has no mention of industrial pharmacy in its description of a four-year curriculum — www.aacp.org/resources/student/pharmacyforyou/documents/pharmd.pdf

^d After five years of pharmaceutical studies (masters), students can choose to specialise in their sixth year in industrial pharmacy (Maitre de Spécialisation en Pharmacie d'Industrie).

2.1.5 Proposed action

In light of the above vision and current global trends, the following areas were selected to be followed. The BPP should give priority to the work that is in line with the action points outlined in the areas below.

2.1.5.1 Practice

- Establish new pharmacist services that align with health care needs and goals, advance access to patient care and are integrated into evolving practice models;
- Expand the type and number of direct patient care services provided by competent pharmacists, including but not limited to preventive health care, management of minor ailments, and provision of comprehensive medication management for acute and chronic conditions/diseases;
- Allocate the resources needed to implement and expand pharmacist services;
- Incorporate new technologies into pharmacy practice (e.g., electronic medical records, point-of-care testing) and emerging sciences (e.g., personalised pharmacotherapy) to enhance patient care and improve outcomes, in accordance with local laws;
- Conduct practice-based research to evaluate and document the value of pharmacist services, particularly those that involve new pharmacist roles and practice models. In doing so, assign specific, measurable and realistic metrics to evaluate the quality and impact of pharmacist services. Metrics should include, but not be limited to, patient outcomes, cost-effectiveness, quality and cost of service provision, and patient satisfaction.

2.1.5.2 Education

The BPP meaningfully contributes to the FIP Education initiative. The BPP promotes the outcomes of the 2016 FIP Global Conference on Pharmacy and Pharmaceutical Sciences Education. It should advocate, in line with the conference's outcomes, that:

- The design of pharmacy curricula should take into account the changing needs of health care and pharmacist roles;
- Quality professional degree programmes focus on clinical aspects of pharmacy education, as needed to meet the growing demand for services;
- Quality postgraduate training programmes necessary for pharmacists to achieve the required competencies are established for the new roles including, but not limited to, advanced and specialised patient care services, practice models and leadership skills that facilitate change;
- Quality continuing education and continuing professional development programmes help the pharmacist attain and maintain the required competencies to provide safe and effective patient care;
- Pharmacy practice and pharmacy education work in tandem to advance practice, and that educational programmes incorporate innovative practice models for students to conceptualise and apply skills in new models of care;
- Quality experiential education is a key component in advancing pharmacy education and practice;
- Quality research is conducted on the value of pharmacist services in all practice settings.

2.1.5.3 Legislation and regulation

- Reform health system practice and infrastructure to establish the reimbursement models necessary to sustain services, with a focus on the pharmacists' clinical skills;
- Delineate minimum competencies and required experiences, including but not limited to education, postgraduate training, and certifications and privileges, for pharmacists who provide direct patient care. Competencies should be commensurate with the level and complexity of care provided;
- Define requirements for maintenance of competence;
- Allocate the funds and resources needed to conduct quality practice-based research;
- Enact legislation that broadens the scope of practice, to authorise competent pharmacists to:
 - Provide preventive services;
 - Manage common minor ailments;
 - Provide comprehensive medication management;
 - Conduct patient assessments, as necessary for screening and management of patients;
 - Order and interpret laboratory tests, including point-of-care and pharmacogenetic testing, where relevant to the care provided (in collaboration with medicines laboratory specialists where defined by local law);
 - Educate patients on their medication and care;
 - Develop collaborative practice agreements with other health care providers and health systems;

- Initiate, adjust and discontinue medication;
- Use pharmacy technicians or other assistant personnel to perform appropriate tasks under the supervision of a pharmacist in order to allow pharmacists to apply more time to advanced services that require their knowledge and experience.
- Enact laws and amend regulations to authorise reimbursement and expand payment for services, including direct patient care services, provided by pharmacists who have attained the required competencies.

2.1.5.4 Communication

- Enhance and maintain strategic communications with all stakeholders to increase their awareness of and promote support for new pharmacist roles, to educate them about pharmacist credentialing and privileging, and to underscore the value of patient care services provided by pharmacists.

2.2 Pillar II: Interprofessional teams and collaborative practice

Vision statement 5: Pharmacists will practise within collaborative interprofessional teams to enhance access, quality, efficiency and affordability of health care^e

2.2.1 Current situation, trends and challenges

2.2.1.1 Current situation

According to the World Health Organization (WHO), “collaborative practice happens when multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care across settings”.⁸⁰

Several national initiatives support integrated models of care. The Ministry of Health in New Zealand published its Draft Pharmacy Action Plan 2015–2020 for consultation. It describes the future direction of pharmacy services in the health system.⁸¹ It signals how pharmacists, other health practitioners, funders, key organisations and the ministry will work together to support change, innovation and new integrated models of care that will improve health outcomes for all New Zealanders. The document highlights the four key enablers to support this change as follows: leadership, information and other technologies, workforce and regulation.

The Department of Health in the UK adopted a community pharmacy proposal for change in 2016/2017, with the development of clinical pharmacists working in general practitioner (GP) practices, care homes and primary care/urgent care hubs.⁸²

The minor ailment scheme in the UK allows pharmacists to supply an emergency medicine during GP out-of-office hours. The pharmacist then communicates directly with the relevant GPs to inform them that a supply has been made and monitors future prescriptions to ensure that the patient does not receive more medicines than they require. A different and additional interesting example is provided by provisions for pharmacists delivering vaccinations to carers and frontline health care workers.^{83, 84}

2.2.1.2 Trends

National competencies for multidisciplinary interprofessional collaborative practice have been developed and greater emphasis is being placed on interprofessional education and practice for pharmacists.^{85–87} Pharmacists are increasingly assuming active roles in interprofessional health care teams.

Current trends in hospitals show how professional human resource development is occurring in the face of increasing challenges (clinical, technological and financial). Close collaboration between pharmacists, physicians and nurses has proven to be beneficial in interdisciplinary rounds, which improve patient outcomes due to improved teamwork.^{88, 89}

^e Please note that current literature interchangeably uses the terms multidisciplinary, multi-disciplinary, interprofessional, inter-professional, interdisciplinary, interdisciplinary rounds and team-based care.

In the acute care setting, pharmacists are integrated in health care teams and participate in patient care rounds in an increasing number of countries and institutions. The same is true in interprofessional ambulatory care and integrated, patient-centred practice models (including the so-called “patient-centred medical home” model).⁹⁰

Increased availability of biomarker and pharmacogenomics technologies brings a need to determine the personalised use of medicines for specific patients and to collaborate with other researchers in determining their appropriate use. Technological advances in biologic medicines, health economics, personalised medicines, and self-assessment and care require expertise.

A pharmacy specialised workforce vetted (credentialed) by an expert interprofessional body could be authorised to create and use standards for specific patient populations.

Emergency pharmacists may well be required to be part of a multidisciplinary team — either in a clinical sense or as part of a regional response/management team.

2.2.1.3 Care transitions

A transition from one health care setting (and health care professional) to another increases the risk of medication errors due to a lack of information transfer and collaboration. Several strategies have been applied to improve care transitions and reduce adverse clinical outcomes. Pharmacist intervention within a team — during and after a hospital stay — has been frequently studied and shows a variable effect on these outcomes.⁹¹ In a published systematic review of the optimal role for pharmacists in care transitions, the authors concluded that it is important to secure continuity of care by integrating pharmacists in these multifaceted programmes across health care settings, and to increase the collaboration between these teams.⁹¹

2.2.1.4 Challenges

There are relatively few robust published studies of interprofessional teamwork involving pharmacists. For example, interprofessional teamwork in the form of interdisciplinary rounds (IDRs), where medical practitioners perform rounds with other health care professionals (e.g., pharmacists) on inpatient medicines wards, has been described as a way of improving outcomes in some studies. However, there is no clear definition of IDRs in the literature.⁹²

Evidence and a consensus are key for the development of guidelines for shared care protocols for all involved in health care teams that include a pharmacist in key related tasks.⁹³

2.2.2 Objectives for pharmacists

As part of the envisaged future, in a multidisciplinary team pharmacists will:

- Collaborate to provide primary care, public health services and wellness counselling;
- Collaborate in team-based, direct patient care to promote patient safety and optimal therapeutics, minimising medicines-related problems and improving outcomes;
- Maintain competencies through education and training;
- Work from a common patient database and shared care protocols across sectors of patient care settings that have been developed collaboratively using available evidence;
- Collaborate with legislators to develop and update regulations that facilitate advanced scope of practice and related activities for pharmacists within a multidisciplinary, collaborative team;
- Support the development of standards, guidelines and responsibilities for health care professionals involved in interprofessional collaborative teams;
- Develop interprofessional communication skills.

2.2.3 Objectives for the BPP

As part of the envisaged future, the BPP will:

- Promote the role and value of the pharmacist in interprofessional teams;
- Advocate (i) developing the best model for effective interdisciplinary work;⁹⁴ (ii) future studies on team composition and its impact on outcomes;⁹² and (iii) the need for close collaboration between pharmacists and medical practitioners;⁸¹

- Share research evidence on the effect of interprofessional care on therapeutic outcomes;
- Promote collaboration with pharmaceutical scientists;
- Collect information on future trends and comment upon how the pharmacy will be placed in the health system;
- Formulate a common global vision and strategy for pharmacy education and practice that includes interprofessional delivery of health care.

2.2.4 Proposed action

In light of the above vision and the global trends, the following actions are to be followed:

2.2.4.1 Practice

Enabling policy

- Develop clearly articulated goals and key measures for success for interprofessional care delivery;
- Encourage cooperation from administrators and practitioners to develop interprofessional health care guidelines in policies;
- Support reliance on international policy in the development of national level policies;
- Support reliance on national level policies in the development of local level policies.

Quality research

- Conduct research to assure sources of scientific evidence that can be used to identify and meet patient health needs;
- Conduct robust research supporting the value of interprofessional teams;
- Report and publish studies on interprofessional team activities to assess current related trends and challenges;
- Set process measures/key indicators, such as satisfaction, impact measures, proportion involved;
- Identify and address barriers to interprofessional team care through research.

Best practice

- Identify examples of best practice delivered by interprofessional teams;
- Share good practices and proposed plans through professional meetings and publications;
- Identify facilitators, enablers and barriers of best practices in collaborative interprofessional teamwork;
- Share challenges and solutions that lead to successful interprofessional team care delivery;
- Disseminate outcomes of practice changes that incorporated pharmacists as part of the interprofessional teams;
- Recognise the increasing importance of technician roles in the face of staff shortages;
- Explore the transferability of successful teamwork processes in industries other than pharmacy, such as aviation.

2.2.4.2 Education

- Start early in undergraduate/university training to build competency and shared understanding;⁹⁵
- Implement undergraduate and postgraduate educational and training experiences with physicians, nurses and other health care professionals;
- Make activities scalable to all types and sizes of health care organisations;
- Ensure interprofessional health care delivery is sustainable in the long term in order to measure real impact in quality research;
- Conduct didactic education and observations with actual health care teams;
- Allow advanced pharmacy students to participate in interprofessional teams actively involved in patient care;
- Analyse practice change models (in quality research) within health care systems across primary and secondary care;

- Implement undergraduate and postgraduate educational and training experiences where pharmacists join physicians, nurses and other health care professionals in the care of patients;
- Develop interprofessional and leadership skills, and maintain competencies through education and training;
- Require continuing professional development training and education to be undertaken with other disciplines.

2.2.4.3 Legislation and regulation

- Collaborate with regulators/legislators to develop and update:
 - Related regulation and legislation that facilitate the advanced scope of practice and related activities for pharmacists within interprofessional health care teams;
 - Shared care protocols for related interprofessional tasks to describe where responsibilities should lie to enhance patient care;
- Promote regulation and legislation to ensure the safety of patient care across multidisciplinary teams, including medicines acquisition, prescribing, administration, monitoring and effects.

2.2.4.4 Communication

- Communicate effectively within interprofessional teams, so as to achieve a prerequisite for quality health care services and successful shared care guidelines concerning the provision of best service, patient safety, dosage, side effects and monitoring pharmacotherapy outcomes;
- Collaborate to create, update and promote the responsible use of medicines/health resources.

2.3 Pillar III: New technologies (e-health and m-health)

Vision statement 6: Pharmacists will employ technologies to enhance the exchange of health care information, increase access to care, facilitate communications with the patient and other health care professionals, and improve patient care outcomes and validation of tools.

Technologies encompass far-reaching themes. Questions arise around the role of new technologies in therapeutics. These include questions on cellular therapy and immunotherapy, on the emergence of pharmacogenetics information to guide therapy, on the role of automation and on many other areas. While recognising the importance of these, for the sake of the objective of this document this pillar narrows its scope to the technologies connected to e-health and m-health only.

2.3.1 Current situation, trends and challenges

*“Cutting-edge technology, especially in communication and information transfer, will enable the greatest advances yet in public health. Eventually, we will have access to health information 24 hours a day, seven days a week, encouraging personal wellness and prevention, and leading to better informed decisions about health care”.*⁹⁶

Most pharmacists’ services delivered in community and hospital settings have been face-to-face, with specialised modes of delivery such as telehealth and telemedicine^f developing in recent years, in particular to support service delivery to remote and rural communities where access to in-person pharmacy services and other health care professionals is limited.

^f Telemedicine is the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities.

Some distinguish telemedicine from telehealth with the former restricted to service delivery by physicians only, and the latter signifying services provided by health care professionals in general, including nurses, pharmacists and others. (http://www.who.int/goe/publications/goe_telemedicine_2010.pdf)

While telehealth and telemedicine may be regarded as e-health, the primary difference is that both involve the exchange of clinical information as part of the delivery of a health care service.

Traditionally, the public has relied on health care professionals — highly accessible community pharmacists in particular — to obtain information and advice about a range of health conditions, diseases and medicines.⁹⁷ Although pharmacists remain a key source of information, the internet is growing in its importance as a source of quick, easy-to-access and, to some degree, reliable and accurate information. A survey in 2010 found that 80% of internet users in the USA searched for online health information.⁹⁸ This is a considerable proportion that will only increase and diversify as people access the range of static and user-generated sites, such as blogs, discussion forums and social networking sites, to obtain, provide and share information with others. While some consumers prefer to be passive users of information on the internet, others are becoming more active and participatory in user-generated sites. Furthermore, consumers are adopting and using a range of electronic applications (apps) for reasons that include self-diagnosis, medication management, lifestyle and diet changes, and adherence to therapy, appointment reminders and medicines information.⁹⁹

The balance of power, in terms of information, is changing, and consumers are more likely to visit pharmacies when already more informed (or in possession of erroneous information). This can assist the education/advice-giving role of the pharmacist if the consumer has been appropriately informed, or it can present a challenge if the pharmacist is required to address misconceptions, misunderstandings or misinformation. Either way, it could be argued that while the community pharmacy remains a significant location visited by consumers, the internet is introducing a new opportunity for the profession of pharmacy. Not only will pharmacists continue to address the needs of their consumers face-to-face and within the pharmacy setting, in light of their patients' access to the internet they will also need to consider delivering services virtually.

In the adoption of its virtual role, pharmacy requires an in-depth understanding of the playing field, as well as of the opportunities that currently exist and those that may be created or that will present themselves in the near future.

2.3.2 Definitions

e-Health

e-Health has been defined as “an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterises not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology.”¹⁰⁰

In his editorial, Eysenbach⁹⁶ has emphasised that the “e” in e-health means more than just “electronic”. He has defined 10 characteristics, which he believes in combination make up the “e”: efficiency, enhancing quality of care, evidence-based, empowerment of consumers, encouragement of new relationships, education, enabling information exchange and communication, extending health care, ethics and equity. Even more importantly, he believes that e-health should be easy-to-use, entertaining and exciting.

m-Health

The WHO Global Observatory for e-Health⁹⁷ defined m-health as follows: “A component of e-health. m-health or mobile health is a medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices. m-health involves the use and capitalisation on a mobile phone's core utility of voice and short messaging service (SMS) as well as more complex functionalities and applications including general packet radio service (GPRS), third and fourth generation mobile telecommunications (3G and 4G systems), global positioning system (GPS), and Bluetooth technology.”

In short, m-health can be defined as “mobile computing, medical sensor and communications technologies for health-care”.¹⁰¹ m-Health as a concept represents the evolution from traditional desktop platforms to mobile technology, assisted by the advent of wireless technology. As the hardware becomes smaller, more portable and, in some cases, even wearable, -health can progress and strengthen through an increase in the number of resources available as well as in the number of users. m-Health may be regarded as a subset of e-health, with e-health providing the framework for m-health to function. For example, collection of data through an app will require a central database for storage of and access to population and individual data.¹⁰²

2.3.3 Benefits of e-health and m-health

Both e-health and m-health have the potential to increase access to health care through: the decentralisation of health care; improved accessibility to information and sharing of patient-specific information and data; improved delivery of health services; and individualising care. m-Health specifically has the potential to expand access to health care and increase use of preventive strategies, especially in developing countries and in rural and remote regions. e-Health has an even greater potential to shift health care from a paternalistic model to a tailored approach that addresses the needs of individuals, taking into account their health literacy

and information needs, as well as behavioural and affective needs, therefore engaging individuals more effectively in self-management of their chronic diseases and overall health.

It is believed that two key drivers for e-health are the increasing cost of health care in developed countries, primarily due to the ageing population (more older people with chronic diseases) and an increasing need for public health and preventive health care for both developed and developing countries.¹⁰³ This highlights a recognition that effective and integrative use of e-health has the potential to reduce the health care burden globally.

2.3.4 Challenges of e-health and m-health

Any new and innovative technology can present challenges that impede its implementation and use, therefore affecting its wide dissemination and realisation of benefits. Challenges presented by e-health and m-health can be categorised broadly into access and cost. They include: the technological literacy of the population and health care practitioners; privacy, specifically of patient data and information; integration as part of existing health care practices and services delivered (logistical challenges); ethical considerations around information flow and access to patient data by several stakeholders; accuracy of information kept; and, importantly, liability and ownership of data.

2.3.5 Interaction with patient groups

Largely due to social media and internet connectivity, there is a growing phenomenon of patient groups that are becoming increasingly empowered. Some of these groups bring patients together and offer information, experience and resources exchange that may help anyone dealing with challenges to be addressed by the group. Others serve as advocates, providing support or driving research. Many have formed large not-for-profit advocacy groups and offer a range of services, such as helping patients to find a doctor, organising conferences or working to gain the support of policy makers.¹⁰⁴

Some of these groups advocate the creation of policies that help or protect individuals with rare or genetic conditions. Examples of large umbrella groups for rare diseases include the [Genetic Alliance](#) (worldwide), [Global Genes](#) (worldwide), [EURORDIS](#) (European Rare Disease Organisation) and [NORD](#) (National Organization for Rare Disorders in the USA). They supported the passage of the [European Union Regulation on Orphan Medicinal Products](#), the [Orphan Drug Act](#) in the USA, and the [Genetic and Information Nondiscrimination Act](#) (GINA), to name a few. These groups may also provide information and resources for specific medical conditions, but their activities and resources tend to be focused more on helping the rare disease community at large.¹⁰⁴

There is an opportunity for pharmacists to be involved through interacting with the patient groups and providing support with a range of services, such as helping patients to access information about their medication and polypharmacy, or acting as advocates for them.

2.3.6 The role of the pharmacist

The pharmacist's role (and that of other health care professionals) can be viewed through Eysenbach's 10 Es in e-health,¹⁰⁰ primarily as an individual pharmacist but also within a pharmacy itself:

"e"	Role of the pharmacist
Efficiency	To achieve efficiency in e-health and, therefore, in overall health care and care of individuals, it is important that there is effective and enhanced communication between key stakeholders, including patients/consumers as well as other health care professionals. Establishing improved communication networks and interprofessional collaboration using e-health as the platform for patient care can lead to more efficient and enhanced continuity of care for patients.
Enhancing quality of care	One of the pharmacist's roles is to ensure and enhance the quality of care received by patients/consumers. Where appropriate and possible, pharmacists should use e-health or more specific m-health platforms to deliver services to patients. Enhanced quality of care also depends on an effective and efficient systems set up.
Evidence-based	Underpinning the clinical services delivered by pharmacists is reliance on and use of evidence-based information. This is also essential in the use of e-health to provide information and/or services to patients and consumers in general.
Empowerment	Empowering patients to participate actively in treatment decision-making is central to patient-centred care. This approach should also be adopted in the use of e-health and m-health services delivered by all pharmacists.
Encouragement of new relationships	The shift towards patient-centred care, and therefore patient empowerment in e-health service delivery, should ensure that there is shared treatment (or other) decision-making.
Education	Educating patients, the public and health care professionals, is at the core of all pharmacists' clinical services. This role should be extended to services delivered via e-health and m-health.
Enabling information exchange	The efficiency and effectiveness of e-health as a means of delivering tailored services for patients and consumers will depend on how well information is exchanged between all key stakeholders. e-Health and m-health can be instrumental in efficient transfer of information and data. Bearing in mind the challenges associated with patient information and data being maintained and transferred via e-health, pharmacists can play a significant role not only as custodians of information to ensure privacy and accessibility by appropriate stakeholders, but also as the key link in the intricate network of people involved in this information exchange.
Extending scope of health care	Inherent in the concept of e-health is its ability to extend the scope of the health care delivered by a range of health care professionals, and consequently the treatment and preventive services that the public can receive via the internet. e-Health presents an unparalleled opportunity for pharmacy to think outside the box, and not only deliver services beyond their traditional geographical boundaries, but also in collaboration with other health care professionals and engage the public in long-term service delivery.
Ethics	Use of e-health in pharmacy practice provides a different context and environment, where practitioners have to be cognisant of the requirements for informed consent, privacy and ethical practice. e-Professionalism is a developing concept where an extension of professionalism from pharmacy practice in the hospital or community settings, for example, may not be adequate. There is a need for review and refinement when considering delivery of services using e-health.
Equity	Although use of the internet and mobile technology is increasing globally, this does not imply that delivery of services by pharmacists should be shifting to the e- and m-health platforms. As would be expected, factors such as technological literacy, access and cost, among others, are likely to impede universal acceptance of e-health as the primary mode of health care delivery. Pharmacists therefore must embrace this new platform as just one of many avenues for delivery of services.

2.3.7 Objectives for pharmacists

- To achieve efficiency in e-health and m-health, as well as other existing and future health technologies;
- To enhance the quality of patient care through the use of health technologies;
- To use evidence-based information to evaluate the effectiveness of health technologies in quality patient care;
- To collate data on the use and impact of health technologies in the practice of pharmacy and delivery of patient-centred pharmaceutical services;
- To empower patients through the use of health technologies to participate actively in treatment decision-making;
- To empower patients and the public to use health technologies effectively for self-care and self-management;
- To engage in patient-centred care through the use of health technologies;
- To educate patients about their health, medicines and medical conditions through a range of health technologies, including e-health and m-health;
- To engage in collating, transferring and providing information via a range of health technology tools and resources;
- To extend the scope of pharmacists' practice to deliver cognitive pharmaceutical services via a range of health technologies;
- To ensure that ethical practice underpins all pharmaceutical services delivered via health technologies;
- To ensure that pharmacists use e-health, m-health and other health technologies to deliver pharmaceutical services that are appropriate for the needs and wants of individual patients and their carers.

2.3.8 Objectives for the BPP

- To lead pharmacy internationally to be:
 - At the forefront of new technologies, e-health and m-health;
 - Actively involved and engaged in the development, delivery and evaluation of new technologies, e-health and m-health, within an interprofessional collaborative team;
 - Actively involved and engaged in delivering appropriate services to the public and patients with the specific aim of quality use of medicines, and the broader aims of health and well-being.

2.3.9 Proposed action

In light of the above vision and the global trends in e-health and m-health, the following actions are to be followed:

- Health literacy support and standardisation of information to be adopted to increase literacy levels, with an emphasis on:
 - Well-being monitoring;
 - Medication management;
 - Self-diagnosis;
 - Disease management;
- Social media, encompassing social networking sites (for example, Facebook, Twitter, YouTube);
- Appearance of new manufacturing and blood testing technologies (for example, 3D printing of medicines);
- Availability of big data and the associated ethical implications;
- Direct-to-consumer advertising;
- e-Pharmacy, at the pharmacy level (for example, mail-order pharmacy, centralised pharmacy supplies, internet supply of medicines) and at the interprofessional level (for example, electronic-transmission of prescriptions).

2.3.9.1 Practice

Broadly, strategies that encompass practice foster greater leadership and engagement of pharmacy in the areas identified. New technologies should be considered as effective tools that pharmacists can use in their daily activities to promote quality use of medicines and optimal patient care. It should be determined what has contributed to some countries being early adopters and others late adopters of e-health and m-health.

2.3.9.2 Education

Pharmacists should acquire skills and knowledge in the developing areas of new technologies, e-health and m-health. A needs-analysis will identify the gaps in education that can be addressed at the undergraduate and post-registration levels. This is a dynamic process that should be conducted frequently, considering the rapid development and growth of new technologies.

2.3.9.3 Legislation and regulation

At the pharmacy organisation level, there is a need to ensure that appropriate legislation, policies and guidelines are developed and implemented to ensure patient safety with the changing and emerging avenues of obtaining medicines and health-related information and services.

2.3.9.4 Communication

Underpinning changes in practice, education and legislation is effective communication within the profession, and outside the profession with the public, patients, other health care professionals, policy makers and third party payers. Stakeholders in this area should be identified, as should the best way to convey information effectively via new technologies.

2.4 Ethics underpinning each pillar

Ethical principles of professionalism and care underpin every aspect of pharmacy practice. It is imperative that all pharmacists adhere to the basic principles of bioethics, which are based on: (i) respect for the individual; (ii) doing what is in the best interests of the individual (beneficence); (iii) avoiding harm (non-maleficence); and (iv) justice, in the undertaking of patient care.

As new trends emerge and state-of-the-art technologies are made available, new accompanying ethical challenges may also emerge, necessitating regular and thorough updating of codes of ethics and articulation of new forms of accountabilities. Current specific challenges emerging include: those relating to access to medicines and justice of distribution in a complex supply chain; those relating to social media; those relating to complementary medicines and homoeopathy in pharmacy; and those relating to taking our place in the interprofessional arena currently being promoted and adopted for the best interests of the patient. Conducting the business of pharmacy in an ethically sustainable environment is also becoming a strong concern for the profession.

Ethical considerations about these newly emerging challenges not only need to be included in codes of ethics revisions, but also clearly need to be taught to future pharmacists within their basic training curricula, as well as included in the context of continuing education and professional development. There is mounting evidence that professional ethics should be taught as a distinct subject, and not treated as a minor adjunct to the regulatory requirements of the profession.

The traditional model of independent pharmacy ownership has given way to chains and multinational operators. Mail-order pharmacy and epharmacy (e.g., internet) has changed the availability and accessibility of services and may compromise pharmacists' independent professional judgements and decisions. Appropriate regulation is needed in order to provide the best possible pharmaceutical care and social contract with the patient. Because of prevailing social, economic and political forces, there will continue to be immense tension between corporate and professional imperatives in pharmacy. Pharmacists, regardless of practice setting, should have the motivation and the professional autonomy necessary always to serve the best interests of patients and to preserve the public's trust.^g

FIP takes a leading role in the establishment of the ethical framework for pharmacy practice, and the BPP envisages continuing to build upon these foundations to maintain global standards of ethical practice.

Furthermore, one of the emerging words on the global health agenda is sustainability. Ethical responsibility for the management of medicines includes minimising the environmental impact that they can have during research and development all the way through to disposal. FIP is supporting full engagement of the pharmacy profession in reducing the environmental impact of medicines.^h Pharmacists and pharmaceutical scientists

^g For more information read the 2014 FIP reference paper "Pharmacist ethics and professional autonomy: Imperatives for keeping pharmacy aligned with the public interest" at: www.fip.org/www/uploads/database_file.php?id=358&table_id=

^h For more information, please read the 2015 FIP report on "Green pharmacy practice: Taking responsibility for the environmental impact of medicines" at: www.fip.org/publications

can provide meaningful leadership in this area where leadership is desperately needed. This is a great opportunity for the profession.¹⁰⁵

3 Conclusions

Pharmacists providing value, interprofessional teams and collaborative practice, and new technologies (e-health and m-health) are all related to each other as enablers of pharmacy services within modern health care systems. Principles of professional ethics underpin each of these three pillars.

Pharmacy practice is turning towards patient-centred care in all its areas of practice (including fields like industrial pharmacy, where pharmacists are not necessarily in direct contact with patients).

Pharmacists' scope of practice is expanding with the range of services they provide, including prescribing. In parallel with the advancement of emerging roles, a greater emphasis is being placed on credentialing. Debate is ongoing on the definition of advanced and specialised practice.

As pharmacist-provided services expand, it is critical that these are economically viable and that all payment options are utilised. Studies documenting the clinical, humanistic and economic outcomes associated with the provision of such services are needed to guide their development and improve their quality and economic sustainability.

Assuring a competent pharmaceutical workforce, the feasibility of funding and the management of change to accomplish best practices are important components of progress in pharmacy. Moreover, pharmacists increasingly no longer practise in silos, but with other health care professionals in interprofessional collaborative practice.

The earlier interprofessional collaboration starts (already in undergraduate/university training), the more it becomes second nature. Best practice for interprofessional teams must be developed and shared. Team-based health care services take advantage of the expertise of pharmacists and pharmacy services in delivering patient care.

New technologies are emerging at high speed. m-Health and e-health have the potential to improve access to information, care and well-being through the decentralisation of health care, sharing patient-specific information and data, delivery of health care and preventive services and individualising care.

Any proposed action should consider practice, education, legislation and regulation and communication, all within an ethical framework.

This pharmacy vision represents a collaborative effort of all the sections of the BPP. It extends the strategic plan established under the leadership of the BPP Chairman for 2014–2018. It builds on the three key pillars that will provide a focus over the next few years for deriving concrete points of action and work for the BPP. This does not detract from keeping an open mind to anything else that may accelerate into a trend in the near future.

4 Glossary

Accreditation

According to the Council on Credentialing in Pharmacy, accreditation is the process by which an association, organisation or governmental agency grants public recognition to an organisation, site or programme that meets certain established qualifications or standards, as determined through initial and periodic evaluations.⁵²

Certification

According to the Council on Credentialing in Pharmacy, certification is a voluntary process by which a non-governmental agency or an association grants recognition to an individual who has met certain predetermined qualifications specified by that organisation. This formal recognition is granted to show the public that the individual has attained the required level of knowledge, skill and/or experience in a well defined, often specialised, area of the total discipline. Certification usually requires initial assessment and periodic reassessments of the individual's knowledge, skill and/or experience.⁵²

Clinical Pharmacy

In broad terms, every pharmacist is a clinical pharmacist. In the 2011 Joint FIP/WHO guidelines on good pharmacy practice document, the aim of pharmacy practice is defined as to “contribute to health improvement and to help patients with health problems to make the best use of their medicines”. This clearly includes a clinical role.

According to the American College of Clinical Pharmacy (ACCP), the abridged definition of clinical pharmacy is “that area of pharmacy concerned with the science and practice of rational medication use”. The unabridged definition is that clinical pharmacy is “the health science discipline in which pharmacists provide patient care that optimises medication therapy and promotes health, wellness and disease prevention”. It further delineates three parts to the definition: the discipline of clinical pharmacy, the clinical pharmacist, and the roles of the clinical pharmacist within the health care system. The definition unequivocally states that the clinical pharmacist:

- Cares for patients in all health care settings;
- Applies evidence-based guidelines, evolving sciences and emerging technologies;
- Applies legal, ethical, social, cultural, economic and professional principles;
- Assumes responsibility and accountability for managing therapy in direct patient care settings;
- Practises independently and in consultation/collaboration with other health care professionals; and
- Generates, disseminates and applies new knowledge that contributes to improved health and quality of life.¹⁰⁶

According to the European Society of Clinical Pharmacy (ESCP), clinical pharmacy is a health speciality that describes the activities and services of the clinical pharmacist to develop and promote the rational and appropriate use of medicinal products and devices. Clinical pharmacy includes all the services performed by pharmacists practising in hospitals, community pharmacies, nursing homes, home-based care services, clinics and any other setting where medicines are prescribed and used.¹⁰⁷

Competency

Competency is the knowledge, skills, behaviours and attitudes that an individual accumulates, develops and acquires through education, training and work experience.¹⁰⁸

Comprehensive medication management

According to the Patient-Centered Primary Care Collaborative, comprehensive medication management is defined as the standard of care that ensures each patient's medications (i.e., prescription medicines, non-prescription medicines, vitamins or nutritional supplements) are individually assessed to determine that each medication is appropriate for the patient, effective for the medical condition, safe given the comorbidities and other medications being taken, and able to be taken by the patient as intended. Comprehensive medication management includes an individualised care plan that achieves the intended goals of therapy with appropriate follow-up to determine actual patient outcomes. This all occurs because the patient understands,

agrees with and actively participates in the treatment regimen, thus optimising each patient's medication experience and clinical outcomes.²⁹

Credentialing

According to the Council on Credentialing in Pharmacy, credentialing is: (i) the process of granting a credential (a designation that indicates qualifications in a subject or an area); and (ii) the process by which an organisation or institution obtains, verifies and assesses an individual's qualifications to provide patient care services.⁵²

Interprofessional education

According to the World Health Organization (WHO), interprofessional education occurs when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes.¹⁰⁹

Interprofessional collaborative practice

Collaborative practice in health care occurs when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver quality care across settings.¹⁰⁹ The World Health Professions Alliance (WHPA), of which FIP is a founding member, has developed a statement on interprofessional collaborative practice.

Multidisciplinary

The term "multidisciplinary" implies collaboration between multiple health care professionals/professions and also encompasses disciplines that may not be regarded as professions. It encompasses the role of the pharmacist in its broadest sense (i.e., not just the pharmacist that is involved in patient care). Some work/research also includes the patient's carer as part of the multidisciplinary team.

Patient-, people- and person-centred

In this document, the term "patient-centred" (care or health services) has been used as it is a widely accepted term in the medical profession. This term can be extended by using "people-centred care" or "person-centred care" instead; these terms emphasise a focus on the health needs and expectations of people and communities rather than on diseases.

According to the World Health Organization (WHO), people-centred health services are an approach to care that consciously adopts the perspectives of individuals, families and communities, and sees them as participants as well as beneficiaries of trusted health systems that respond to their needs and preferences in humane and holistic ways. A people-centred approach requires that people have the education and support they need to make decisions and participate in their own care.

Person-centred care sees the person as a whole with many levels of needs and goals that come from their own personal social determinants of health.¹¹⁰

Privileging

According to the Council on Credentialing in Pharmacy, privileging is the process by which a health care organisation, having reviewed an individual health care provider's credentials and performance and found them satisfactory, authorises that individual to perform a specific scope of patient care services within that organisation.⁵²

5 BPP strategic plan

This Board of Pharmaceutical Practice (BPP) Strategic Plan continues the work of the previous strategic plan 2010–2014, with the account of new trends, challenges (and threads) and opportunities reflected in the BPP Vision. It is a living document developed under the leadership of the 2014–2018 BPP Chair. It can be evolved in the future through successive updates, or be expanded as needed over time.

Mission and tasks

Mission

The Board of Pharmaceutical Practice (BPP), as a component group in FIP, is responsible for advancing the overall vision, mission and strategic plan of the FIP — “2020 Vision”. The missionⁱ of FIP is “to improve global health by advancing pharmaceutical education, pharmaceutical sciences and pharmaceutical practice thus encouraging, promoting and enabling better discovery, development, access to and responsible use of appropriate, cost-effective, quality medicines worldwide.”

In order to achieve this, FIP has set three strategic objectives:

- Advance pharmacy practice in all settings;
- Advance the pharmaceutical sciences;
- Increase FIP’s role in reforming pharmacy practice and pharmaceutical sciences education.

The 2020 Vision document also lists four tactical approaches:

- Build constructive partnerships;
- Increase the visibility of FIP in the global environment;
- Increase revenues for FIP to accomplish its global mission;
- Increase effective communications.

Specifically, the mission and tasks of the BPP have been outlined in general terms as follows:

- The BPP represents the interests of all aspects of the practice of the profession of pharmacy throughout the whole world, regardless of any national or local issues;
- The development and advancement of the profession in all its many facets is encouraged;
- Good communication between pharmaceutical practitioners, pharmaceutical scientists and other health care providers is strongly promoted. The ultimate objective is to unify the profession and, as a result, bring about an increase in the standards of health care and its systems of delivery for the benefit of the patient.

The BPP, with these ends in mind, will thus endeavour to:

- Raise professional standards;
- Promote safe and effective use of medicines;
- Advance pharmacy education and develop and expand continuing education;
- Encourage research into all fields of pharmaceutical practice;
- Recognise and reward excellence in pharmaceutical practice;
- Expand the services, practice models, influence and role of the pharmacist;
- Increase, strengthen and expand the functions of the various sections of FIP;
- Increase the membership, and thereby influence the activities of FIP on a worldwide basis.

ⁱ 2016 FIP Mission (At: www.fip.org/Statutes)

Tasks

With the role and responsibility of the BPP being to handle all professional aspects of FIP's activities, the board's main tasks are to:

- Prepare the professional programmes of the congress and, where applicable, other conferences of FIP which are professional in nature;
- Maintain contact with the relevant interested parties and assist in the co-ordination of professional activities of the sections;
- Coordinate the professional activities of FIP in relation with other professional organisations;
- Formulate policy recommendations and establish strategic directions and priorities within the stated mission of the board;
- Set up working groups where the subject matter is outside the responsibility of any one of the sections or covers the interest of more than one section.

Strategic emphasis 2014–2018

Pharmacists are distinguished from other health care professionals by their grounding in and reliance on the pharmaceutical sciences in their day-to-day practice.

Any separation, therefore, between practice and science will always be somewhat artificial, and reflect organisational history and habit more than anything concrete or enduring.

Equally, both science and practice rely on and interact continually with pharmaceutical education. Many pharmaceutical practitioners and pharmaceutical scientists are also pharmaceutical educators, whether as faculty members or as preceptors of pharmacy students.

In African idiom, the image of the three-legged cooking pot is often invoked as a symbol of stability — however uneven the ground, a three-legged pot will always stand firm.

In addressing the 2020 Vision, FIP as a whole needs to maximise the effectiveness of all three “legs” — practice, science and education. The BPP will, therefore, continue actively to seek opportunities for joint action with the Board of Pharmaceutical Sciences (BPS) in advancing pharmacy practice globally, in every setting and in every health system. It will also, together with the BPS, contribute meaningfully to FIP Education (FIPeD) activities.

The BPP therefore continues in the following strategic emphases, which will guide its actions over the period 2014–2018:

1. Celebrating the diversity of practice in pharmacy and ensuring that every pharmacist in practice is served by a section and/or special interest group that meets her/his professional development needs, and that engages meaningfully with the issues she/he feels are important at every stage of her/his career;
2. Improving the quality of pharmacy practice in every setting, informed specifically by the need for improved access, quality and safety in the use of medicines;
3. Advancing evidence-based best practices in all aspects of pharmaceutical practice, in every practice setting;
4. Promoting education programmes that overcome current barriers (e.g., quality, scope, curriculum, access) in order to prepare pharmacists to deliver improved quality of practice;
5. Identifying appropriate economic models that will enable improved quality of pharmacy practice in every setting.

The BPP will encourage more pharmacists globally to become individual members of FIP, and will facilitate easier access to both multiple sections of the BPP as well as to the special interest groups of the BPS. In this way, individual members will gain most from the diversity of opportunities with FIP, but also be able to contribute across the entire spectrum of their interests and competencies. The BPP breaks down the real and perceived divisions between sections and between the BPP and BPS through joint working groups and joint conference programming.

The BPP will identify opportunities for improving the quality of pharmacy practice in every setting, including beyond the medicines use process. It will encourage research and develop policies that improve access, quality and safety in the use of medicines. In particular, it will advocate for use of appropriate economic models that will enable improved quality of pharmacy practice, and interprofessional collaboration in every setting. Furthermore, the BPP will foster personal and collective accountability for practice in order to meet the needs of societies and nations.

Objectives for the BPP based on the common BPP vision document

In 2015, the BPP established a working group in order to identify the trends, opportunities, and challenges to formulate a common vision for all areas of pharmacy practice. Based on this document, three pillars were identified to support the future of pharmacy in the health care system: (i) Pharmacists providing value; (ii) Interprofessional teams and collaborative care; and (iii) New technologies (e-health and m-health) — all underpinned by ethics.

Each of the pillars are within the objectives for the BPP:

Pillar I (Pharmacists providing value)

- Promote innovation in pharmacy practice and develop quality patient care services;
- Support credentialing and privileging of pharmacists delivering direct patient care services, including advanced and specialty pharmacy services;
- Advocate for laws and regulations that allow competent pharmacists to effectively and efficiently deliver direct patient care services in all practice settings;
- Advocate for reimbursement for patient-oriented services provided by pharmacists who have attained prerequisite competencies;
- Support national pharmacists associations in emphasising the need for quality practice-based research to generate evidence on the value of pharmacist services. Prepare reports on the topic to promote best practices dissemination and support for further studies.

Pillar II (Interprofessional teams and collaborative care)

- Share research evidence on the effect of interprofessional care on therapeutic outcomes;
- Promote the role and value of the pharmacist in interprofessional teams;
- Collect and comment upon how pharmacy will be positioned in the health system;
- Formulate a base for the BPP Strategic Plan 2015–2019 that will reflect the three pillars of the BPP vision;
- Formulate a common global vision and strategy for pharmacy education and practice that includes interprofessional delivery of health care.

Pillar III (New technologies)

To lead pharmacy internationally to be:

- At the forefront of new technologies, e-health and m-health;
- Actively involved and engaged in the development, delivery and evaluation of new technologies, e-health and m-health, within an interprofessional collaborative team;
- Actively involved and engaged in delivering appropriate services to the public and patients with the specific aim of quality use of medicines, and the broader aims of health and well-being.

The objectives can be achieved through following action points for the BPP:

1. Define priorities to achieve:
 - Patient-centred services;
 - Remuneration;
 - Documentation to promote best practices dissemination and support for scientific studies.
2. Ensure collaboration by:
 - Engagement with all stakeholders;
 - Promotion of the value of pharmacists in interprofessional teams;
 - Creation of a common vision for all pharmacists all over the world, celebrating diversity of pharmacy practice.
3. Support pharmacists to be at the forefront of new technologies:
 - Encourage pharmacists to use new technologies (e-health and m-health) to develop, deliver and evaluate new services for quality use of medicines, and the broader aims of health and well-being, within an interprofessional collaborative team

This strategic plan was adopted by BPP in March 2017.

References

1. International Pharmaceutical Federation (FIP). FIP Statutes. The Hague: FIP; 2016 [cited 2017 Jan 18]. Available from: http://www.fip.nl/files/fip/Statutes/FIP_Statutes_-_2016.pdf
2. International Pharmaceutical Federation (FIP). Board of Pharmaceutical Practice (BPP): Advancing the 2020 Vision [Online]. The Hague: FIP; 2012 [cited 2016 Jul 26]. Available from: http://www.fip.org/files/fip/BPP/BPP_Vision_Flyer_Dec_2012_WEB.pdf
3. International Pharmaceutical Federation (FIP). 2020 Vision: FIP's Vision, Mission and Strategic Plan. The Hague: FIP; 2011. [cited 2016 Jul 26]. Available from: <http://www.fip.org/files/fip/strategic%20plan%20no%20annexes.pdf>
4. Isasi F, Krofah E. The expanding role of pharmacists in a transformed health care system. Washington, D.C.: National Governors Association Center for Best Practices, 2015 Jan 13 [cited 2017 Jan 19]. Available from: <https://www.nga.org/files/live/sites/NGA/files/pdf/2015/1501TheExpandingRoleOfPharmacists.pdf>
5. Council on Credentialing in Pharmacy. Scope of contemporary pharmacy practice: roles, responsibilities, and functions of pharmacists and pharmacy technicians. Washington, DC. Council on Credentialing in Pharmacy; 2009 Feb [cited 2017 Jan 19]. Available from: http://www.pharmacycredentialing.org/Contemporary_Pharmacy_Practice.pdf
6. Taylor G. Clinical pharmacy COSP — standards of practice for clinical pharmacy services. *J Pharm Pract Res.* 2013; 43(2) Suppl.
7. Hospital Pharmacy Administration Central Administration of Pharmaceutical Affairs. The Egyptian Clinical Pharmacy Standards of Practice. Egyptian Drug Authority; 2014 [cited 2017 Jan 19]. Available from: http://eda.mohp.gov.eg/Files/409_Egyptian_clinical_pharmacy_standards_En.pdf
8. South African Pharmacy Council. Scopes of practice qualifications for specialist pharmacists. Board Notice 152 of 2014. Pretoria; 2014 Dec 12 [cited 2017 Jan 19]. Available from: http://www.gov.za/sites/www.gov.za/files/38327_bn152.pdf
9. Task Force on a Blueprint for Pharmacy. Blueprint for Pharmacy: the vision for pharmacy. Ottawa (ON): Canadian Pharmacists Association; 2008 [cited 2017 Jan 19]. Available from: https://www.pharmacists.ca/cpha-ca/assets/File/pharmacy-in-canada/blueprint/The%20Vision%20for%20%20Pharmacy_Apr%201%2009.pdf
10. Royal Pharmaceutical Society. New models of pharmacy: what is emerging and what is possible. A review of the literature. London: Royal Pharmaceutical Society; 2013 [cited 2017 Jan 19]. Available from: <https://www.rpharms.com/promoting-pharmacy-pdfs/new-models-of-pharmacy-literature-review.pdf>
11. Focus on the Future. Ten year vision for pharmacists in New Zealand. Wellington: Pharmacy Sector Action Group, Pharmaceutical Society of New Zealand; 2004 [cited 2017 Jan 19]. Available from: https://www.psnz.org.nz/Folder?Action=View%20File&Folder_id=86&File=10_yea_plan.pdf
12. Jackson J, Kelly B, Gilbert A et al. Building upon pharmacists' practice in Australia: A vision for the profession. Canberra: Pharmaceutical Society of Australia; 2014. [cited 2017 Jan 19] Available from: <http://www.psa.org.au/downloads/ent/uploads/filebase/corporate/advocacy/A-vision-for-the-profession-1.pdf>
13. Department of Health (UK). Pharmacy in England: Building on strengths — delivering the future. London: Her Majesty's Government; 2008. [cited 2017 Jan 19] Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228858/7341.pdf
14. Smith J, Picton C, Dayan M. Now or never: shaping pharmacy for the future. Royal Pharmaceutical Society. 2013 Nov. [cited 2017 Jan 19] Available from: <https://www.rpharms.com/promoting-pharmacy-pdfs/moc-report-full.pdf>
15. Scottish Government. Prescription for excellence: a vision and action plan for the right pharmaceutical care through integrated partnerships and innovation. Edinburgh, Scottish Government; 2013. [cited 2017 Jan 19] Available from: <http://www.gov.scot/resource/0043/00434053.pdf>
16. American Society of Health-System Pharmacists. The consensus of the Pharmacy Practice Model Summit. *Am J Health-Syst Pharm.* 2011 Jun; 68 (12):1148–52
17. Giberson S, Yoder S, Lee MP. Improving patient and health system outcomes through advanced pharmacy practice. A report to the U.S. Surgeon General. Office of the Chief Pharmacist. U.S. Public Health Service. 2011 Dec. [cited 2017 Jan 19] Available from: http://www.accp.com/docs/positions/misc/improving_patient_and_health_system_outcomes.pdf

18. American College of Clinical Pharmacy. Comprehensive medication management in team-based care. Lenexa: The American College of Clinical Pharmacy; 2015 [cited 2017 Jan 19]. Available from: <https://www.accp.com/docs/positions/misc/CMM%20Brief.pdf>
19. Kearney AT. The future of community pharmacy in England. London: A.T.Kearney; 2012 [cited 2017 Jan 19]. Available from: <https://www.atkearney.nl/documents/10192/649132/The+Future+of+Community+Pharmacy.pdf/1838dede-b95a-4989-8600-6b435bd00171>
20. Erni P, von Overbeck J, Reich O et al. netCare, a new collaborative primary health care service based in Swiss community pharmacies. *Res Social Adm Pharm*. 2016 Jul–Aug; 12(4):622–6.
21. Tsuyuki RT, Al Hamarneh YN, Jones CA et al. The effectiveness of pharmacist interventions on cardiovascular risk. The Multicenter Randomized Controlled RxEACH Trial. *J Am Coll Cardiol* 2016 Jun 21; 67(24):2846–54.
22. American Public Health Association. The role of the pharmacist in public health. Policy Number: 200614; 2006 Nov. [cited 2017 Jan 19] Available from: <http://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/07/13/05/the-role-of-the-pharmacist-in-public-health>
23. European Pharmacists Forum. The role of pharmacy in supporting the public's health: An EPF white paper and call to action; 2015 Mar. [cited 2017 Jan 18] Available from: <http://www.europeanpharmacistsforum.com/documents/10429/974c6fe8-939c-4cae-9fbed0515be16cc>
24. International Pharmaceutical Federation (FIP). An overview of current pharmacy impact on immunization: A global report. The Hague: FIP; 2016 [cited 2017 Jan 19]. Available from: https://fip.org/files/fip/publications/FIP_report_on_Immunisation.pdf
25. International Pharmaceutical Federation (FIP). Fighting antimicrobial resistance: The contribution of pharmacists. The Hague: FIP; 2015. [cited 2017 Jan 19] Available from: <http://www.fip.nl/files/fip/publications/2015-11-Fighting-antimicrobial-resistance.pdf>
26. International Pharmaceutical Federation (FIP). Focus on mental health: the contribution of pharmacists. The Hague: FIP; 2015. [cited 2017 Jan 19] Available from: http://fip.org/files/Focus_on_mental_health_final.pdf
27. International Pharmaceutical Federation (FIP). Establishing tobacco-free communities: a practical guide for pharmacists. The Hague: FIP; 2015. [cited 2017 Jan 19] Available from: <http://fip.org/files/fip/publications/2015-12-Establishing-tobacco-free-communities.pdf>
28. American College of Clinical Pharmacy (ACCP). ACCP clinical pharmacist competencies. pre-publication draft. [cited 2017 March 19] Available from: http://www.accp.com/docs/positions/guidelines/Competencies_Final_2.25.17.pdf
29. Patient-Centered Primary Care Collaborative (PCPCC). The patient-centered medical home: integrating comprehensive medication management to optimize patient outcomes resource guide, 2nd ed. Washington, DC: Patient-Centered Primary Care Collaborative; 2012. [cited 2017 Jan 19]. Available from: <https://www.accp.com/docs/positions/misc/CMM%20Resource%20Guide.pdf>
30. Schottenfeld L, Petersen D, Peikes D et al. Creating patient-centered team-based primary care. AHRQ Pub. No. 16-0002-EF. Rockville, MD: Agency for Healthcare Research and Quality; 2016 Mar [cited 2017 Jan 19]. Available from: <https://www.pcmh.ahrq.gov/sites/default/files/attachments/creating-patient-centered-team-based-primary-care-white-paper.pdf>
31. Smith M, Bates DW, Bodenheimer T et al. Why pharmacists belong in the medical home. *Health Aff*. 2010; 29(5):906–13.
32. Nigro SC, Garwood CL, Berlie H et al. Clinical pharmacists as key members of the patient-centered medical home: an opinion statement of the ambulatory care practice and research network of the American College of Clinical Pharmacy. *Pharmacotherapy* 2014 Jan; 34 (1):96–108.
33. Zhong H, Ni XJ, Cui M et al. Evaluation of pharmacist care for patients with chronic obstructive pulmonary disease: a systematic review and meta-analysis. *Int J Clin Pharm*. 2014 Dec; 36(6):1230–40.
34. Touchette DR, Doloresco F, Suda KJ et al. Economic evaluations of clinical pharmacy services: 2006–2010. *Pharmacotherapy*. 2014 Aug; 34(8):771–93.
35. National Prescribing Service Limited. Competencies required to prescribe medicines: putting quality use of medicines into practice. Sydney: National Prescribing Service Limited; 2012. [cited 2017 Jan 19] Available from: https://www.nps.org.au/__data/assets/pdf_file/0004/149719/Prescribing_Competencies_Framework.pdf
36. Bundesgesetz über Arzneimittel und Medizinprodukte. Art. 24 Abgabe verschreibungspflichtiger Arzneimittel. 2000 Dec 15 [Updated 2014 Jan 1, cited 2017 Jan 18]. Available from: <https://www.admin.ch/opc/de/classified-compilation/20002716/index.html#a24>

37. Pharmacy Council of New Zealand. Standards and guidance for pharmacist prescribers. 2013 Jul [cited 2017 Jan 19]. Available from: http://www.pharmacycouncil.org.nz/cms_show_download.php?id=397
38. Canadian Pharmacists Association. CPhA position statement on pharmacist prescribing. Ottawa, ON: Canadian Pharmacists Association; 2011 Oct. [cited 2017 Jan 19] Available from: <http://www.pharmacists.ca/cpha-ca/assets/File/cpha-on-the-issues/PPPharmacistPrescribing.pdf>
39. Canadian Pharmacists Association. Pharmacists' scope of practice in Canada. Ottawa, ON: Canadian Pharmacists Association; 2016 Dec [cited 2017 Jan 19]. Available from: https://www.pharmacists.ca/cpha-ca/assets/File/cpha-on-the-issues/ScopeofPracticeinCanada_DEC2016.pdf
40. Royal Pharmaceutical Society. A competency framework for all prescribers. 2016 Jul. [cited 2017 Jan 19] Available from: <http://www.rpharms.com/support-pdfs/prescribing-competency-framework.pdf>
41. International Pharmaceutical Federation (FIP). Advanced practice and specialisation in pharmacy: global report 2015. The Hague: FIP; 2015. Available from: http://www.fip.org/files/fip/PharmacyEducation/Adv_and_Spec_Survey/FIPEd_Advanced_2015_web_v2.pdf
42. Joint Partners Credentialing Task Group. Professional recognition and professional advancement: for our practitioners, for our profession and for our patients. 2013 Feb [cited 2017 Jan 19]. Available from: http://www.ukcpa.net/wp-content/uploads/2010/11/JPCT-Report_Professional-Recognition-and-Professional-Advancement.pdf
43. Jorgenson D, Penm J, MacKinnon N et al. A needs assessment of community pharmacists for pharmacist specialization in Canada. *Int J Pharm Pract*. 2016 Aug 4. doi: 10.1111/ijpp.12297
44. Intergage Consulting Group/Blueprint for Pharmacy. Needs assessment of specialization in pharmacy in Canada. Ottawa, ON: Canadian Pharmacists Association; 2015 Jul. [cited 2017 Jan 19] Available from: <https://www.pharmacists.ca/cpha-ca/assets/File/pharmacy-in-canada/blueprint/Needs%20Assessment%20of%20Specialization%20in%20Pharmacy%20in%20Canada%20-%20Final%20Report.pdf>
45. Skromeda K, Cooper J. Report on pharmacy specialization in Canada. *Can Pharm J (Ott)*. 2015 Nov; 148(6): 357–360.
46. Advanced Pharmacy Practice Framework Steering Committee. An advanced pharmacy practice framework for Australia. Canberra: Pharmaceutical Society of Australia; 2012 Oct [cited 2017 Jan 19]. Available from: <http://advancedpharmacypractice.com.au/download/framework/advanced-pharmacy-practice-framework.pdf>
47. Australian Pharmacy Council. Advanced and extended pharmacy practice: an environmental snapshot. Canberra: Australian Pharmacy Council Ltd; 2013 Sep [cited 2017 Jan 19]. Available from: https://www.pharmacycouncil.org.au/media/1102/environmental-snapshot_advanced-extended-practice_web.pdf
48. Specialists Accreditation Board of Singapore. Criteria for specialist pharmacist accreditation [Online]. 2014 [Updated 2015 Nov 5, cited 2017 Jan 19]. Available from: http://www.healthprofessionals.gov.sg/content/hprof/psab/en/topnav/specialist_accreditation/specialist_pharmacist_accreditation.html
49. Competency Development and Evaluation Group (CoDEG). Advanced to consultant level framework: a developmental framework for pharmacists progressing to advanced levels of practice. London, UK: CoDEG; 2009. Available from: <http://www.jpbsoutheast.org/fileadmin/codeg/pdf/ACLF.pdf>
50. Schweizerischer Verein der Amts- und Spitalapotheker (GSASA). Apotheker Grundausbildung [Online]. 2017 [cited 2017 Jan 18]. Available from: <http://www.gsasa.ch/seiten/bildung/grundausbildung/?oid=1469&lang=D>
51. Koninklijke Nederlandse Maatschappij ter bevordering der Pharmacie. Commissies [Online]. The Hague: KNMP; 2016 [cited 2016 Dec 12]. Available from: <https://www.knmp.nl/professie/opleiding-en-her-registratie/ziekenhuisapothekers/commissies>
52. Council on Credentialing in Pharmacy. Credentialing in pharmacy: a resource paper. Washington, DC: 2010 Nov [cited 2017 Jan 18]. Available from: <http://www.pharmacycredentialing.org/Files/CCPWhitePaper2010.pdf>
53. Council on Credentialing in Pharmacy. Credentialing and privileging of pharmacists: a resource paper from the Council on Credentialing in Pharmacy. *Am J Health-Syst Pharm*. 2014; 71:1891–900.
54. Council on Credentialing in Pharmacy. Guiding principles for post-licensure credentialing of pharmacists [Online]. 2011. [cited 2017 Jan 19]. Available from: <http://www.pharmacycredentialing.org/Files/GuidingPrinciplesPharmacistCredentialing.pdf>
55. International Pharmaceutical Federation (FIP). Nanjing Declaration: Global vision for a global pharmaceutical workforce by advancing practice and science through transformative education for better health care. The Hague: FIP; 2016 [cited 2017 Jan 18]. Available from:

- http://www.fip.org/files/fip/PharmacyEducation/Global_Conference_docs/FIP_global_vision_online_version.pdf
56. International Pharmaceutical Federation (FIP). Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education. The Hague: FIP; 2016 [cited 2017 April 4]. Available from: http://www.fip.org/files/fip/PharmacyEducation/Global_Conference_docs/Nanjing_Statements.pdf
 57. International Pharmaceutical Federation (FIP). 2013 FIPEd global education report. The Hague: FIP; 2013 [cited 2017 Jan 19]. Available from: http://fip.org/files/fip/FIPEd_Global_Education_Report_2013.pdf
 58. International Pharmaceutical Federation (FIP). FIP statement of policy: quality assurance of pharmacy education. The Hague: FIP; 2009 [cited 2017 Jan 19]. Available from: http://www.fip.nl/www/uploads/database_file.php?id=302&table_id=
 59. International Pharmaceutical Federation. Quality assurance of pharmacy education: the FIP global framework. 2nd Edition. 2014. [cited 2017 Jan 19] Available from: http://fip.org/files/fip/PharmacyEducation/Quality_Assurance/QA_Framework_2nd_Edition_online_version.pdf
 60. Board of Pharmacy Specialties. Board of Pharmacy Specialties white paper: five-year vision for pharmacy specialties. 2013. [cited 2017 Jan 19] Available from: https://www.accp.com/docs/positions/misc/BPS_Whitepaper_Jan2013.pdf
 61. Burke JM, Miller WA, Spencer AP et al. Clinical pharmacist competencies: American College of Clinical Pharmacy. *Pharmacotherapy*. 2008; 28:806–15.
 62. American College of Clinical Pharmacy. Standards of practice for clinical pharmacists. *Pharmacotherapy* 2014 34:794–7.
 63. American College of Clinical Pharmacy. Board of Regents commentary. Qualifications of pharmacists who provide direct patient care: perspectives on the need for residency training and board certification. *Pharmacotherapy* 2013; 33:888–91.
 64. Murphy JE, Nappi JM, Bosso JA et al. American College of Clinical Pharmacy's vision of the future: postgraduate pharmacy residency training as a prerequisite for direct patient care practice. *Pharmacotherapy* 2006; 26 (5): 722–33.
 65. American Society of Health-System Pharmacists. Credentialing, privileging, and competency (1415) [Online]. In: *Pharmacy Management: Human Resources*. Available from: <https://www.ashp.org/DocLibrary/BestPractices/HRPositions.aspx>
 66. Council on Education and Workforce Development. ASHP long-range vision for the pharmacy work force in hospitals and health systems: ensuring the best use of medicines in hospitals and health systems. *Am J Health-Syst Pharm*. 2007 Jun; 64 (12):1320–30.
 67. American College of Clinical Pharmacy, Shord SS, Schwinghammer TL et al. Desired professional development pathways for clinical pharmacists. *Pharmacotherapy* 2013 Apr; 33(4):e34–e42.
 68. International Pharmaceutical Federation (FIP). Sustainability of pharmacy services: advancing global health. International overview of remuneration models for community and hospital pharmacy. The Hague: FIP; 2015 [cited 2017 Jan 20]. Available from: http://fip.org/files/fip/Sustainability-Pharmacy-Services_Executive_summary_2.pdf
 69. Houle SK, Grindrod KA, Chatterley T et al. Paying pharmacists for patient care: A systematic review of remunerated pharmacy clinical care services. *Can Pharm J*. 2014 Jul; 147(4):209–32. [cited 2017 Jan 20] Available from: <http://doi.org/10.1177/1715163514536678>
 70. Houle SK, Grindrod KA, Chatterley T et al. Public funded remuneration for the administration of injections by pharmacists: An international review. *Can Pharm J*. 2013 Nov; 146(6):353–64.
 71. Bharadia R, Lorenz K, Cor K et al.. Financial remuneration is positively correlated with the number of clinical activities: an example from diabetes management in Alberta community pharmacies. *Int J Pharm Pract*. 2017 Feb 27. [cited 4 April 2017] Available from: <http://doi: 10.1111/ijpp.12331>
 72. Garrison LP, Towse A, Briggs A et al. Performance-based risk-sharing arrangements — good practices for design, implementation, and evaluation: report of the ISPOR Good Practices for Performance-Based Risk-Sharing Arrangements Task Force. *Value Health* 2013 Jul-Aug; 16(5):703–19.
 73. Stubbings J, Nutescu E, Durley SF et al. Payment for clinical pharmacy services revisited. *Pharmacotherapy* 2011 Jan; 31 (1):1–8.
 74. Giberson S, Yoder S, Lee MP. Improving patient and health system outcomes through advanced pharmacy practice. A report to the U.S. Surgeon General. Office of the Chief Pharmacist. U.S. Public Health Service. 2011 Dec.
 75. Schumock GT, Meek PD, Ploetz PA. Economic evaluations of clinical 1988–1995. *Pharmacotherapy* 1996;16: 1188–208.
 76. Schumock GT, Butler MG, Meek PD et al. Evidence of the economic benefit of clinical pharmacy services: 1996–2000. *Pharmacotherapy* 2003 Jan;23: 113–32.

77. Perez A, Doloresco F, Hoffman JM, Meek PD, Touchette DR, Vermeulen LC, et al. Economic evaluations of clinical pharmacy services: 2001–2005. *Pharmacotherapy* 2009 Jan;29 (1):128
78. International Pharmaceutical Federation (FIP). Joint FIP/WHO guidelines on good pharmacy practice: standards for quality of pharmacy services. WHO Technical Report Series, No. 961, 2011. Geneva: World Health Organization; 2011 [cited 2017 Jan 18]. Available from: http://www.fip.org/www/uploads/database_file.php?id=331&table_id=
79. Wiedenmayer K, Summers R, Mackie C et al. Developing pharmacy practice: a focus on patient care. The Hague: World Health Organization and International Pharmaceutical Federation; 2006 [cited 2017 Jan 18]. Available from: <http://www.fip.nl/files/fip/publications/DevelopingPharmacyPractice/DevelopingPharmacyPractice EN.pdf>
80. World Health Organization (WHO). Framework for action on interprofessional education and collaborative practice. 2010. Geneva, Switzerland: WHO [cited 2017 Jan 20]. Available from: http://www.who.int/hrh/resources/framework_action/en/
81. Ministry of Health (New Zealand). Draft pharmacy action plan 2015–2020: For consultation. Wellington: Ministry of Health; 2015 Oct [cited 2017 Jan 20]. Available from: www.health.govt.nz/system/files/documents/publications/pharmacy-action-plan-2015-2020-consultation-document-oct15.docx
82. Department of Health (UK). Community Pharmacy in 2016/17 and beyond- Proposals [Online]. 2015 [cited 2017 Jan 20]. Available from: www.gov.uk/government/uploads/system/uploads/attachment_data/file/495774/Community_pharmacy_in_2016-17_and_beyond_A.pdf
83. National Health Service. Community pharmacies. Helping with winter pressures: three services for commissioners to consider. 2013 Dec [cited 2017 Jan 18]. Available from: www.england.nhs.uk/wp-content/uploads/2013/12/winter-pressure_community-pharmacy-services.pdf
84. Centre for Pharmacy Postgraduate Education (CPPE). Minor ailment learning program: a starting point for pharmacists. Manchester: CPPE; 2009 Mar [cited 2017 Jan 18]. Available from: https://www.cppe.ac.uk/learningdocuments/pdfs/minor_ailments_mar09.pdf
85. Interprofessional Education Collaborative. Core competencies for interprofessional collaborative practice: 2016 update. Washington, DC: Interprofessional Education Collaborative; 2016 [cited 2017 Jan 18]. Available from: https://ipecollaborative.org/uploads/IPEC-2016-Updated-Core-Competencies-Report_final_release_.PDF
86. Canadian Interprofessional Health Collaborative. A national interprofessional competency framework. Vancouver, British Columbia, Canada: Canadian Interprofessional Health Collaborative; 2010 Feb. [cited 2017 Jan 18] Available from: http://www.cihc.ca/files/CIHC_IPCompetencies_Feb1210.pdf
87. Page RL, Hume AL, Trujillo JM et al. Interprofessional education: principles and application: a framework for clinical pharmacy. *Pharmacotherapy* 2009;29 (3):145e–64e.
88. O'Leary KJ, Johnson JK, Auerbach AD. Do interdisciplinary rounds improve patient outcomes? Only if they improve teamwork. *J Hosp Med.* 2016 Jul;11(7):524–5. doi: 10.1002/jhm.2587. Epub 2016 Apr 6.
89. Fleming A, Browne J, Byrne S. The effect of interventions to reduce potentially inappropriate antibiotic prescribing in long-term care facilities: a systematic review of randomized controlled trials. *Drugs Aging* 2013 Jun;30(6):401–8.
90. Zink T, Kralewski J, Dowd B. The Transition of Primary Care Group Practices to Next Generation Models: Satisfaction of Staff, Clinicians, and Patients. *J Am Board Fam Med.* 2017 1/2;30(1):16–24. doi: 10.3122/jabfm.2017.01.160118.
91. Ensing HT, Stuijt CC, van den Bemt BJ et al. Identifying the optimal role for pharmacists in care transitions: a systematic review. *J Manag Care Spec Pharm.* 2015 Aug; 21(8):614–36
92. Bhamidipati VS, Elliott DJ, Justice EM et al. Structure and outcomes of interdisciplinary rounds in hospitalized medicine patients: a systematic review and suggested taxonomy. *J Hosp Med.* 2016 Jul;11(7):513–23. doi: 10.1002/jhm.2575.
93. DAS-Taskforce 2015, Baron R, Binder A et al. Evidence and consensus based guideline for the management of delirium, analgesia, and sedation in intensive care medicine. Revision 2015 (DAS-Guideline 2015) — short version. *Ger Med Sci.* 2015 Nov; 13:Doc19.
94. Oishi A, Murtagh FE. The challenges of uncertainty and interprofessional collaboration in palliative care for non-cancer patients in the community: a systematic review of views from patients, carers and health-care professionals. *Palliat Med.* 2014 Oct;28(9):1081–98. doi: 10.1177/0269216314531999. Epub 2014 May 12.
95. Croker A, Fisher K, Smith T. When students from different professions are co-located: the importance of interprofessional rapport for learning to work together. *Jan, J Interprof Care.* 2015; 10., 29(1):41–8. doi: 10.3109/13561820.2014.937481.

96. Coop CE. Editorial: A personal role in health care reform. *Am J Public Health*. 1995 Jun; 85(6): 759–760.
97. Iwanowicz SL, Marciniak MW, Zeolla MM. Obtaining and providing health information in the community pharmacy setting. *Am J Pharm Educ*. 2006 Jun 15; 70(3): 57
98. Fox S. *The social life of health information*, 2011. Washington, DC: Pew Internet & American Life Project, 2011
99. Kamel Boulos MN, Brewer AC, Karimkhani C et al. Mobile medical and health apps: state of the art, concerns, regulatory control and certification. *Online J Public Health Inform*. 2014; 5(3): 229
100. Eysenbach G. What is e-health? *J Med Internet Res* 2001; 3(2):e20.
101. Istepanian RSH, Jovanov E, Zhang YT. Guest editorial: Introduction to the special section on m-health: beyond seamless mobility and global wireless health-care connectivity. *IEEE Transactions on Information Technology in Biomedicine*. 2004 Nov; 8(4): 405–14.
102. WHO Global Observatory for eHealth series. *mHealth: New horizons for health through mobile technologies*, Volume 3. 2011 [cited 2017 Jan 19]. Available from: http://www.who.int/goe/publications/goe_mhealth_web.pdf
103. Mair FS, May C, O'Donnell C et al. Factors that promote or inhibit the implementation of e-health systems: an explanatory systematic review. *Bull World Health Organ*. 2012 May; 90(5): 357–64.
104. National Institutes of Health. Support for patients and families [Online]. Maryland: U.S. Department of Health and Human Services; 2016 Aug 11 [cited 2017 Jan 19]. Available from: <https://rarediseases.info.nih.gov/guides/pages/120/support-for-patients-and-families>
105. International Pharmaceutical Federation (FIP). *Green pharmacy practice: taking responsibility for the environmental impact of medicines*. The Hague: FIP; 2015 [cited 2017 Jan 19]. Available from: <http://fip.org/files/fip/publications/2015-12-Green-Pharmacy-Practice.pdf>
106. American College of Clinical Pharmacy. The definition of clinical pharmacy. *Pharmacotherapy* 2008; 28(6):816–17.
107. Frimodt-Møller N. Clinical microbiologist/ID vs. pharmacist in infectious diseases: co-operation or confrontation? [Online]. Copenhagen: National Center for Antimicrobials and Infection Control. [Cited 2017 Jan 20]. Available from: https://www.escmid.org/escmid_publications/escmid_elibrary/material/?mid=714
108. International Pharmaceutical Federation (FIP). *FIP Education Initiatives: Pharmacy Education Taskforce — a global competency framework*. The Hague: FIP, 2012. [Cited 2017 Jan 20] Available from: www.fip.org/files/fip/PharmacyEducation/GbCF/GbCF_v1_online_A4.pdf
109. World Health Organization (WHO). *WHO global strategy on people-centred and integrated health services*. Geneva: WHO; 2015. [Cited 2017 Jan 20] Available from: http://apps.who.int/iris/bitstream/10665/155002/1/WHO_HIS_SDS_2015.6_eng.pdf
110. World Health Organization (WHO). *WHO Global Strategy on People-Centred and Integrated Health Services*. Geneva: World Health Organization; 2015. [Cited 2017 Jan 20] Available from: http://apps.who.int/iris/bitstream/10665/155002/1/WHO_HIS_SDS_2015.6_eng.pdf

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| 2017 / 04