Vahe Meliksetyan FOUNDATION

CIVITTA

CLINICAL PHARMACY IN ARMENIA

SECTOR DEVELOPMENT AND DEMAND ANALYSIS RESEARCH

Qualitative and quantitative research results
International best practices research and comparison

2022- 2023

CLINICAL PHARMACY SECTOR RESEARCH

PROJECT DESCRIPTION

Civitta Armenia consulting company and **Vahe Meliksetyan educational and medical foundation** performed a research of healthcare and clinical pharmacy sector in Armenia

PROJECT GOALS

Identifying sectoral problems — Evaluate current state of Armenia's clinical pharmacy sector and identify problematic areas and issues.

Recommen-dations for policy development — Provide recommendations for sector development based on results of the research and the best international practices

PROJECT COMPONENTS

- **International best practices research,** based on the analysis of seven countries (USA, Canada, Australia, Belgium, UK, Japan and Belarus) , covering best practices, system setup and specifics.
- **Quantitative research**, based on survey of 400 patients undergoing treatment in hospitals and outpatient medical centers.
- **Qualitative research**, covering interviews with more than 20 medical professionals in hospitals and government agencies in Armenia and internationally.
- **Healthcare system research** covering issues of clinical pharmacy sector in Armenia.

AGENDA

1. **Executive Summary**
2. Armenian Market Research
3. International Market Research
4. Appendices

CLINICAL PHARMACISTS PERFORM A WIDE VARIETY OF FUNCTIONS ACROSS DIFFERENT HEALTHCARE SYSTEMS INTERNATIONALLY

In the countries where the clinical pharmacy sector is developed clinical pharmacists work directly with physicians, other health professionals, and patients to ensure the best possible health outcomes from the medications

Scopes of practice vary, and typically depend on the longevity of clinical pharmacy practice in the country and the level of sophistication of pharmacy education; in the most developed healthcare systems, **clinical pharmacists are an integral part of healthcare teams present at all stages of the patient care process**

MEDICAL RECONCILIATION

CPs identify the medicines patients were taking before admission to hospital and make sure they are still appropriate

PRE-PRESCRIPTION CONSULTATION

While GP's main responsibility is to diagnose a patient, they can turn to clinical pharmacist for recommendations on the initial prescription

PRESCRIPTION CHECK

Prescriptions go to a clinical pharmacist for approval, to check it for therapeutic appropriateness, dosage, possible medication interactions

WARD ROUNDS

During the ward visits, clinical pharmacists discuss medication-related issues and make recommendations to medical staff, nursing staff and patients

ADVERSE EFFECTS MANAGEMENT

Clinical pharmacists suggest the most appropriate alternative therapies from patient health and financial sustainability points of view

EDUCATION

Clinical pharmacists constantly educate other healthcare staff on new medicines, educate patient about the correct use of their meds during their stay, and especially at discharge from hospital

CIVITTA Source: CIVITTA analysis

GENERAL: CLINICAL PHARMACISTS' FUNCTIONS MOSTLY ALIGN ACROSS THE DEVELOPED SYSTEMS AND INCLUDE DIRECT INTERACTION WITH PATIENTS AND DOCTORS

CLINICAL PHARMACIST FUNCTIONS

Clearly defined and established clinical pharmacy practice	✓ ✓ ✓ ✓ ✓
Medical reconciliation	✓ ✓ ✓ ✓ ✓ ✓ ✓
Interview patients	✓ ✓ ✓ ✓ ✓ ✓ ✓
Rounds	✓ ✓ ✓ ✓ ✓ ✓
Counseling on the initial prescription (Generally rare)	✓ ✓ ✓ ✓ ✓ ✓
Review prior to administering	✓ ✓ ✓ ✓ ✓ ✓ ✓
Prescribing (Depending on the state; Depending on the province)	✓ ✓ ✓
Participation in difficult cases	✓ ✓ ✓ ✓ ✓ ✓ ✓

** Sweden overview is done based on the interviews with local experts*

CIVITTA Source: CIVITTA analysis

CLINICAL PHARMACY BENEFITS HEALTHCARE SYSTEMS ACROSS THE WORLD IN MULTIPLE WAYS, FROM PATIENT HEALTH TO A MACRO LEVEL SAVINGS

Positive impact of clinical pharmacy practice on patient-health, hospital efficacy, and healthcare system in general is universally recognized

Clinical pharmacists from multiple countries noted various benefits, which depend on the system's characteristics in each country

PATIENT

Achieved patient treatment goals, avoided adverse effects, prevented medication errors

- Clinical pharmacists are the most equipped specialists for choosing the most appropriate medication for each patient

Improved medication adherence, reduced cost to the patient

- One of clinical pharmacist's functions is to educate patients on their medication and why they need to use it
- Prescriptions are more precise; patients don't need to spend as much money on unnecessary meds → more likely to adhere to the medication plan

Reduced time to reach patient treatment goals

Improved patient health-related quality of life

HOSPITAL

Reduced time for patients in hospitals, lower readmission rate

- Lower hospital occupancy → reduced costs for in-hospital medications and staff salaries
- Saved doctor's time → the time is spent more efficiently; doctors can spend more time on each patient

Education on advancements in pharmacotherapy for hospital staff

- Increased effectiveness and expertise for healthcare establishment as a whole

HEALTHCARE SYSTEM

Significant savings on state-funded staff, services, medications

- Generally more effective treatment processes

Healthcare system is more able to efficiently react to emergency conditions (e.g., pandemic)

- Reduced number of hospitalizations

Improved macroindicators related to health and quality of life

- Increased life expectancy
- Increased quality of life

ARMENIA: CLINICAL PHARMACY IS BASICALLY NON-EXISTENT IN ARMENIA; BARRIERS TO THE DEVELOPMENT COME FROM BOTH SUPPLY AND DEMAND OF THE SPECIALISTS

- Clinical pharmacy is almost non-existent today in Armenia: clinical pharmacists are not recognized as must-have specialists; the number of practicing clinical pharmacists is close to zero
- **Barriers to the development come from two sources**

Pharmacy education does not focus enough on clinical pharmacy aspects

Bachelor's degree in Pharmacy (4 years)

- General pharmacy education
- Graduates are not expected to be able to perform clinical functions on the patients

Master's degree in Pharmacy (1 year)

- Very theoretical, almost no real-life practical hours in hospitals
- Includes clinical pharmacy hours, however, these are not very numerous and not as useful without sufficient practice

Licensing (renewed every 5 years)

- Educational system is not as practice-oriented as it should be. "Clinical pharmacy" in the curriculum does not really reflect the actual requirements for a specialist
- **Education system needs reforming, incl. introduction of more theoretical hours dedicated to clinical pharmacy, as well as real practical training**

Hospitals lack motivation and resources to introduce clinical pharmacist position

There are no clinical pharmacists currently practicing in the hospitals

- Even though people in some hospitals understand the potential benefit of having such specialists, they are not willing to invest in establishing a full-time position
- Many other hospitals don't have clear understanding of clinical pharmacist's functions

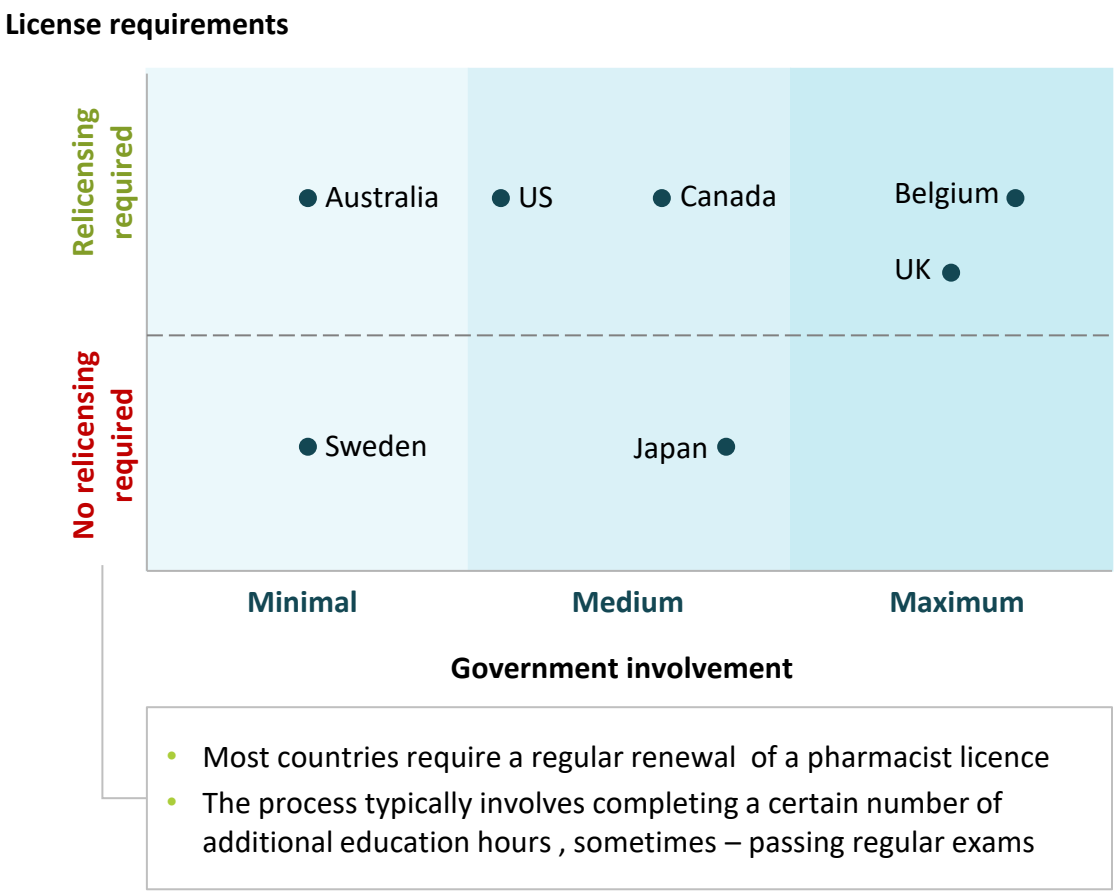
Hospitals need additional motivation to start introducing the practice; judging from the experience of other countries, such may come:

a) **from the government** – funding of CP positions, information dissemination

b) **from enthusiasts on a local level** (though such options is less effective and wide) – information dissemination, influence on local decision-makers

REGULATION: FOR PUBLIC HEALTHCARE SYSTEMS, GOVERNMENT PARTICIPATION IN ESTABLISHING CLINICAL PHARMACY PROVES TO BE EFFECTIVE AND EVEN NECESSARY

CLINICAL PHARMACY REGULATION



- Most countries require a regular renewal of a pharmacist licence
- The process typically involves completing a certain number of additional education hours , sometimes – passing regular exams

INSIGHTS

Government involvement in the development of clinical pharmacy varies significantly across healthcare systems:

- **MINIMAL |** The system in such countries is typically underdeveloped; pioneers and enthusiasts are working towards growing clinical pharmacy, but no legal enforcement, significant state funding, or informational support are provided
- **MEDIUM |** Involvement is not universal:
  - Certain push can be given by the government at the early stages of development (like expanding clinical pharmacy faculties across the country)
  - Dedicated funding for a certain number of CPs with no efforts for improving regulation
- **MAXIMUM |** Such systems are the ones with the highest potential, since the efforts of pioneering clinical pharmacists are enhanced by administrative support from the government (funding for CP position in the hospitals, grants for education, legal requirements for number of clinical pharmacists for hospitals, etc.)

CIVITTA Source: CIVITTA analysis

EDUCATION: PHARMACY EDUCATION MUST PROVIDE PRACTICE- AND PATIENT-ORIENTED STUDIES, TO ENSURE ENOUGH EXPERIENCE BEFORE UNSUPERVISED WORK

EDUCATION FOR CLINICAL PHARMACISTS

	Required specialized degree	Residency	Years before practice	Guided practice
		✓	8-10 years	1-2 years
		✓	5 years	1 year
		✓	8-10 years	1-2 years
		✓	5-9 years	1-3 years
	✓		5-8 years	0.5-2 years
		✓	6 years	0.5 years
	✓		6 years	0.5 years

INSIGHTS

- **Required specialized degrees** are not that common and are typically characteristic of the countries with younger clinical pharmacy practice
  - Such degrees are **used to bridge the gap** between the existing pharmacy education and the healthcare needs the clinical pharmacist is supposed to address
  - **In the countries with more established and mature systems** general pharmacy education is complex and practice-oriented enough to cover all the necessary aspects, including practical training and clinical pharmacy subjects
- **Clinical pharmacy residency is another feature of the developed systems**, where more attention is given to practice- and patient-oriented education.
  - For organizing such programs, a certain number of practicing clinical pharmacists is needed to guide the young specialists, which is why it is not likely to fully develop soon in the younger systems
- Important to note, in the younger systems the clinical pharmacists' competencies are commonly obtained not only through education, but through vast practice experience

CIVITTA Source: CIVITTA analysis

SUMMARY OF SURVEY RESULTS

- **43 percent of the surveyed patients** reported having an **accompanying disease**, and **31 percent** who **receive more than one treatment** at the same time. According to clinical pharmacists, such patients require a **doctor and a clinical pharmacist to work together to monitor possible drug interactions**. As the results of the quantitative survey showed **each third patient does not get an evaluation of possible medication interaction**.
- **27 percent** of respondents reported that they **take various medications** without a doctor's prescription, and **22 percent** reported that they **change the type of medication or** the dosage of medication they take, following the advice of a pharmacy specialist without consulting their doctor. In general, there is a popular adverse phenomenon of non-compliance with the medical prescriptions, that can be improved by the development of the clinical pharmacy practice.
- For **93 percent of patients receiving chemotherapy**, **the doctor or nurse calculates the prescription dosage.** According to clinical pharmacists, **there are drugs with a narrow therapeutic index (high toxicity) for which dosage calculation must be carried by a pharmacist**, not a doctor. Failure to comply with this rule is common in cases where patients are hospitalized or stay in the hospital longer or develop side effects.
- **27 percent** of patients believe that doctors´ **prescriptions should be approached with suspicion** and discuss them with other doctors or pharmacists.
- **34 percent** of patients believe that an **independent professional body is needed** to oversee the proper prescription of medication by doctors.

ARMENIA: ALL DOCTORS, WHO WERE INTERVIEWED SAID THAT JUST ONE CLINICAL PHARMACIST IN THEIR DEPARTMENT/HOSPITAL WOULD ALREADY BE A GREAT HELP

Clinical pharmacist's functions are mostly performed by doctors and nurses, and some functions are not performed at all

Who performs the function in Armenia

Because of high overload, doctors cannot always dedicate adequate time to the medical problems of one patient

- When prescribing a medication doctors write the dosages and instructions, however sometimes due to high workload they do not have enough time to provide sufficient and clear explanations to the patient
- Due to overload, each patient gets less of doctor's time, leading to higher probability of error
- Overload makes it harder for the doctors to keep up with the scientific news in pharmaceuticals, resulting in prescriptions of less effective medications that affect the time of patient's recovery and higher costs
- In difficult circumstances, one person's decision-making increases the likelihood of error, especially for more complex cases, and for narrow therapeutic index medications.
- The presence of a clinical pharmacist will enable to monitor the side effects of drugs with greater efficacy, which in turn will lead to decrease in the frequency of new diseases

According to all health-care professionals who participated in the in-depth interviews, the presence of a clinical pharmacist will have a positive impact on their work. A single clinical pharmacist is sufficient to perform the intended functions, regardless of the number of patients administered at a hospital or department

CIVITTA Source: CIVITTA analysis

ARMENIA: STATE AGENCY REPRESENTATIVES AGREE THAT CLINICAL PHARMACY SERVICE WILL BE BENEFICIAL FOR THE SYSTEM

State officials believe that hospitals do not perform evaluation of medicine treatment effectiveness, and there are no statistics on multiple treatments, delays in treatment, and inefficient use of financial resources.

Collecting and transmitting comprehensive and detailed information about medicines to the medical staff

Because doctors are not pharmacists and have high overload, public officials believe that a clinical pharmacist can fill this gap at the hospital by continuously studying and researching the medicine market and regularly updating doctors about it

Increasing the Effectiveness of Treatment

Because there's no evaluation of the effectiveness of medical treatment, according to public officials, a clinical pharmacist can fill in that gap, collect feedback from patients, which will be used to evaluate the effectiveness of treatment and make changes treatment plan if necessary.

According to government officials, there is a need to define the profession of a pharmacist, pharmacologist, and a clinical pharmacist

NECESSARY ACTIONS

- Clarify the responsibilities and functions of pharmacists, pharmacologists, and clinical pharmacists at a legislative level:
- Legally define what job positions can be filled by pharmacists, pharmacologists, and clinical pharmacists, and what are the education requirements for each profession
- Legally define activities performed by pharmacies
- Define the framework of Inspection Agency’s monitoring, based on the changes mentioned above.

ARMENIA: CLINICAL PHARMACISTS WORKING IN ARMENIA RAISE THE PROBLEMS OF EDUCATION SYSTEM AND GOVERNMENT SUPPORT

The education system does not prepare professionals equipped with practical knowledge to work as a clinical pharmacist

- Educational institutions do not prepare professionals with sufficient practical skills to work in hospital.
- In educational institutions, clinical pharmacy does not get sufficient attention and is treated as a less important field.

Low levels of cooperation with doctors

- Pharmacist – doctor collaboration is not working well, doctors often avoid involving a clinical pharmacist, seeing them not as supporters but rather as competitors.
- All of this has resulted in a decline in the profitability of clinical pharmaceuticals.

No Government policy in the field

- Hospital licensing does not require the presence of a clinical pharmacist, as opposed to an epidemiologist, for example.
- In the absence of systematic changes of the clinical pharmacy field, individuals have taken on the responsibility for its development, whereas with government assistance it could grow with higher momentum and efficiency.

RESEARCH RESULTS INDICATE THAT THE CLINICAL PHARMACY ACTIVITIES WILL INCREASE THE EFFECTIVENESS OF MEDICAL TREATMENT

REDUCE THE QUANTITY OF PRESCRUBED MEDICATION	• More effective medications will be prescribed, which will optimize the amount of medication and the dosage.
DECREASE IN REHOSPITALIZATION RATE	The number of rehospitalization cases will decrease as a result of • More efficient prescriptions, • More accurate calculation of the prescription dosages for medicine with narrow therapeutic index, • Better control over the side effects.
IMPROVING MEDICAL TREATMENT INDICATORS	• Reduction in treatment length • Reduction in rehospitalization rates • Improving quality of life indicators • Increate in life expectancy rates
EFFICIENT USE OF DOCTORS' TIME	• Better teamwork • Sharing responsibility • More patients can be treats as a result of savings doctors' time • Reduction in medication errors and increased medical efficacy as a result of more efficient prescriptions
EDUCATING DOCTORS ABOUT MEDICAL TREATMENT	• Regular knowledge update about medical treatment • Increasing awareness of proper administration of medications

CIVITTA Source: Civitta analysis

IN ARMENIA, THE DEVELOPMENT OF CLINICAL PHARMACY REQUIRES OVERCOMING THE FOLLOWING OBSTACLES

FLAWS IN THE EDUCATIONAL SYSTEM	• Lack of practical knowledge in the educational program • “Labeling” pharmacy as a less important profession
LACK OF GOVERNMENT POLICY	• Hospital licensing does not require a presence of a clinical pharmacist • Luck of reforms in clinical pharmacy sector • No clear definition for the professions of clinical pharmacists, pharmacologists and pharmacists
LOW LEVEL OF INFORMATION	• Doctors and medical staff do not have sufficient information about the international best practices and generally do not know how a clinical pharmacist can increase the effectiveness of treatment
MISTRUST	• Due to lack of information doctors do not have trust in clinical pharmacists and are concerned about transferring their “personal” functions to them
INFORMAL AGREEMENTS	• There are doctors who have informal arrangements with drug manufacturers/selling companies, and due to that oppose the institute of clinical pharmacists at their hospital

CIVITTA Source: Civitta analysis

INCREASED TREATMENT EFFICIENCY WILL ENABLE YOU TO ACHIEVE GOVERNMENT COST REDUCTION BUDGETS FOR HOSPITALS AND PATIENTS

PATIENT EXPENSES	• Medicine cost reduction • Reduction in the length of treatment and related costs
HOSPITAL EXPENSES	• Doctors' time savings, opportunities to work with more patients, reduced ratio of health-care professionals/patients • Savings of hospital spending on medicine • Decrease in hospital bed occupancy rates • Reduction in treatment costs per patient
GOVERNMENT BUDGET	• Reduction in medicine purchase costs • Decrease in hospital expenses per one patient • More patients have access to healthcare within the same budget • Increase in the number of treated patients per hospital • Reduction in sickness (temporary unemployment) allowances funded by budget • Development of medical tourism
EMPLOYERS	• Reduction in sickness (temporary unemployment) allowances

PRIORITIES FOR CLINICAL PHARMACY DEVELOPMENT IN ARMENIA: EDUCATION SYSTEM

EDUCATION SYSTEM REFORM

- **Review of the university education program**
  - Expanding professional courses
  - **Increasing the number of practical hours**
  - Introducing patient-centered approach
- **Developing additional programs**
  - Masters' degree program development
  - Adapting the postgraduate vocational training format based on the best international practices
  - **Developing continuous learning programs**
- **Creating residency positions with public funding**
  - Selection of residency hospitals
  - Developing the leaders/mentors group for residents

Educational program upgrade will require detailed comparison of best practices among university programs internationally

- Review of the theoretical courses based on the best practices of the most developed countries
- Developing practical courses
- Reforming the education to introduce patient-centered approach
- Involvement of international specialists in the faculty and training of the local faculty based on the international experience

- Developing a two-dimensional system, developing a theoretical and practical education program based on the best international experience and programs
- Provide opportunities for practice area specialization
- Cooperation with leading international universities

- Providing government financing for residency
- Practical agreements with hospitals, selection of base hospitals
- Creating mentors group based on the collaboration with specialists from different practices

CIVITTA Source: Civitta analysis

PRIORITIES FOR THE DEVELOPMENT OF CLINICAL PHARMACY IN ARMENIA: GOVERNMENT POLICY, COMMUNITY CREATION

PRIORITIES	Suggested functions
Increasing the role of the Association of Clinical Pharmacists, which will unite the professionals in the field	• Uniting the professionals, organizing activities to foster cooperation between experts in the field • International cooperation and sharing experience • Developing **standards for clinical pharmacy practice** • Participation in developing standard medical treatment guidelines • Developing educational and experience sharing programs • Working with hospitals, distributing information and educating about the advantage of clinical pharmacy • Developing legislation changes
Legislative framework for the implementation of the program, establishing industry standards	• Legislative definition of the profession of clinical pharmacist • Developing a clinical pharmacy development action plan, with implementation timetable • Creating clinical pharmacist's positions at hospitals and funding • Monitoring and evaluating results
Clinical pharmacy development program implementation with state support and financing	
Separation of educational and licensing processes for clinical pharmacists (based on international example)	• Developing licensing procedures and evaluation criteria • Preparatory work for the licensing authorities • Implementation timetable • Developing the re-licensing process and requirements

CIVITTA Source: Civitta analysis

AGENDA

1. Executive Summary
2. **Armenian Market Research**
   - **Research Methodology**
   - Research results
   - Key findings
3. International Market Research
4. Appendices

THE OBJECTIVE OF RESEARCH IS TO STUDY THE PROSPECTS FOR THE DEVELOPMENT OF CLINICAL PHARMACY PROFESSION IN ARMENIA

Goals of the research

- Describe the pharmacy sector in Armenia and evaluate the level of clinical pharmacy development
- Describe the advantages and obstacles of clinical pharmacy development
- Describe the experience, perceptions, and attitudes of patients at different stages of medical treatment

Methodology

- **Desk Research**
- **Quantitative research** (survey completed by the respondents)
- **Qualitative Research**

QUANTITATIVE SURVEY WAS CONDUCTED AMONG PATIENTS, WHILE THE QUALITATIVE INTERVIEWS WERE CONDUCTED AMONG DOCTORS, EXPERTS, CLINICAL PHARMACISTS, AND GOVERNMENT REPRESENTATIVES

The surveys were conducted in health-care facilities, which is the main limitation of this study's sample.

Quantitative

401 patient

- **Therapeutic** 174 (43%)
- **Cardiovascular** 125 (31%)
- **Endocrine** 61 (15%)
- **Oncological** 41 (10%)

- **Yerevan** 170 (42%)
- **Regions** 231 (58%)

- **Male** 180 (45%)
- **Female** 218 (35%)

- **Full or part-term employee** 181 (46%)
- **Temporary Employee** 17 (4%)
- **Unemployed** 121 (31%)
- **Student** 11 (3%)
- **Retirement** 66 (17%)

- **Low income** 155 (44%)
- **Average income** 119 (34%)
- **Higher income** 79 (22%)

Survey was conducted in April/May 2022

Qualitative

In-depth interviews

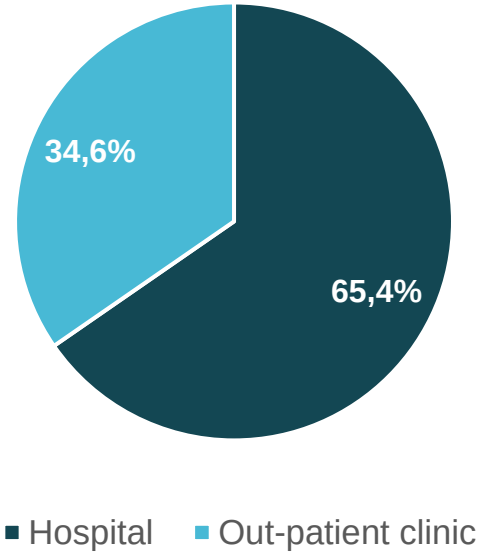
Expert interviews

Interviews were conducted in May/September 2022:

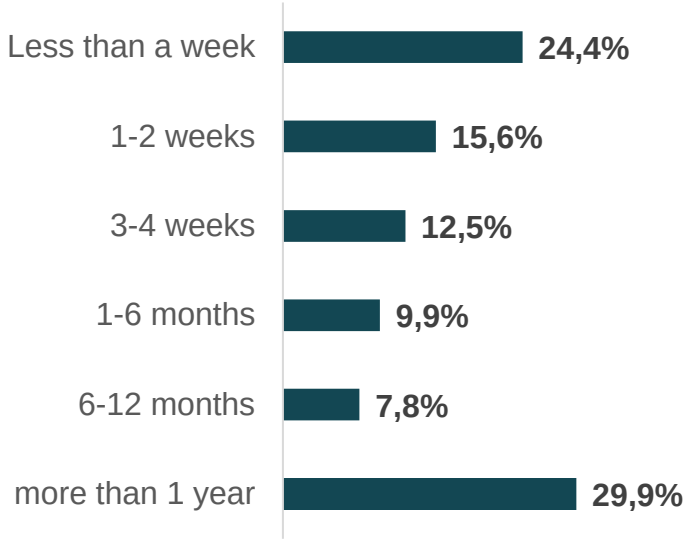
CIVITTA Source: Civitta analysis

SURVEY WAS CONDUCTED AMONG PATIENTS WITH THERAPEUTIC, CARDIOVASCULAR, ENDOCRINE, AND ONCOLOGICAL DISEASES

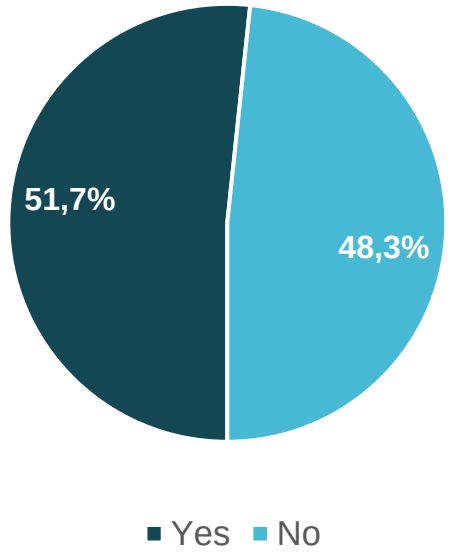
Where are you getting the treatment?



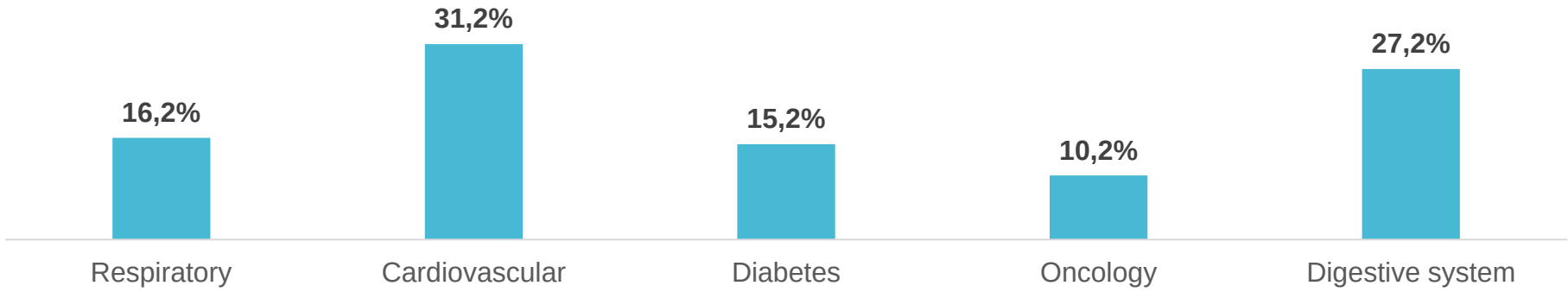
How long have you been getting the treatment?



Are you getting treatment for the first time?



What medical condition are you getting treatment for?



CIVITTA Source: Civitta analysis

APPENDIX 1: PARTICIPANTS OF EXPERT INTERVIEWS

1. Michael Adamyan, director of the “Nork Marash” Medical Center (partially answered by a hospital pharmacist)
2. Anna Balyan, head of polyclinic at Heratsi Hospital No. 1
3. Gevorg Tamamyan, director of the Armenian Center for Child Cancer and Blood Diseases
4. Hovhannes Vardzelyan, director of the Austrian Hospital in Gyumri
5. Hripsime Apresyan, pediatrician - infectionist
6. Mher Javakyan, deputy chief physician of Heratsi Hospital No. 1
7. Lucine Navasardyan, physician-endocrinologist, Muratsan Endocrinological Clinic
8. Samvel Danielyan, director of the Yolyan Blood Center
9. Tatyana Oganisyan, president of the VIVA Foundation, therapist, gastroenterologist
10. Tsolak Sargsyan, Physician-Cardiologist, Heratsi Hospital No. 1
11. Yelena Aghajanova, head of the Muratsan Endocrinological Clinic, head of endocrinology department
12. Silva Melkonyan, “Astghik" MC, clinical pharmacist
13. Vardan Hambardzumyan, “Astghik" MC, clinical pharmacist
14. Varduhi Grigoryan, Secretary-general of the Ministry of Health
15. Lilith Ghazaryan, Vice president of the Experimental Center for Medicine and Medical Technology after Emil Gabrielyan
16. Slavic Sargsyan, Deputy director of the Inspection Agency of the Ministry of Health and Employment
17. David Sayamyan, Head of medical department of the Inspection Agency of the Ministry of Health and Employment

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CURRENT STATE: THE FUNCTIONS OF CLINICAL PHARMACISTS ARE DISTRIBUTED BETWEEN DOCTORS AND NURSES, WHICH CAN LEAD TO LOWER PERFORMANCE

Usually, clinical pharmacist is expected to participate at **all stages of treatment process** and to **interact with patients**

Today in Armenia the profession of clinical pharmacy does not exist, so the functions are assigned to other healthcare professionals

CURRENT PROCESS IN ARMENIA

COLLECTION OF MEDICAL HISTORY

Anamnesis is collected from the words of the patients by multiple healthcare professionals, patients are asked to bring their medicines, list of doses, etc.

*Patients are generally told to **bring with them the medication they are taking**, the note with doses, everything, to determine what drugs they are taking. #1*

If an adult patient says he or she has high blood pressure, diabetes, or something else, we take this into account to avoid unnecessary problems. #8

*We do, we collect anamnesis, we ask. **It's a team effort**. The doctor does it, there is a resident, a nurse. #3*

TREATMENT PROCESS

The treatment is chosen primarily following the guidelines approved by the Ministry of Health, in difficult cases a doctor makes decisions solely out of their experience.

International standards are used in the most advanced hospitals and polyclinics. However, there is no legal enforcement for the use of those at the systematic level.

*According to the **guidelines, based on international guidelines**...Unfortunately, there is a guideline called **pricing policy**, isn't it? #1*

*We **do not have a guide for all cases**, so sometimes the doctor prescribes medication based on his ideas and knowledge. #2*

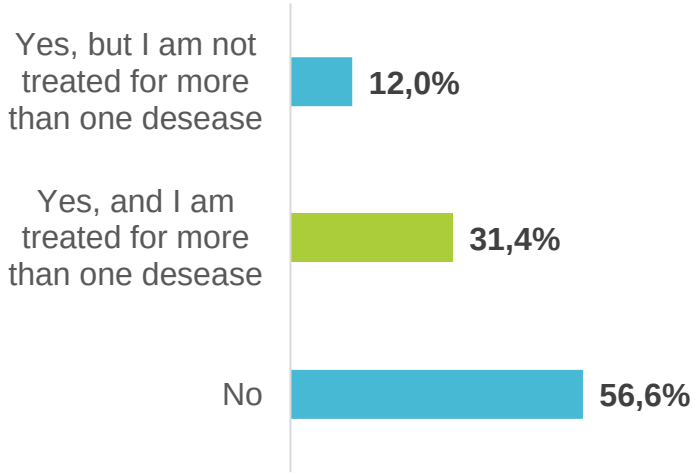
*The doctor usually does not make decisions on his own. If there is a diagnosis, there is a protocol for it, according to it the treatment is chosen. **For special cases, a council is convened**. #8*

*…Given my contact with local patients, I can say that **they are prescribed drugs that are not compatible**. Doctors do not always change the dose for the elderly, or take into account comorbidities, contraindications. That is, **I have not seen anyone consider clinical compatibility**. #9*

CURRENT STATE: IN THE OPINION OF EVERY 3RD PATIENT, THERE WAS NO EVALUATION OF POSSIBLE MEDICINAL INTERACTIONS

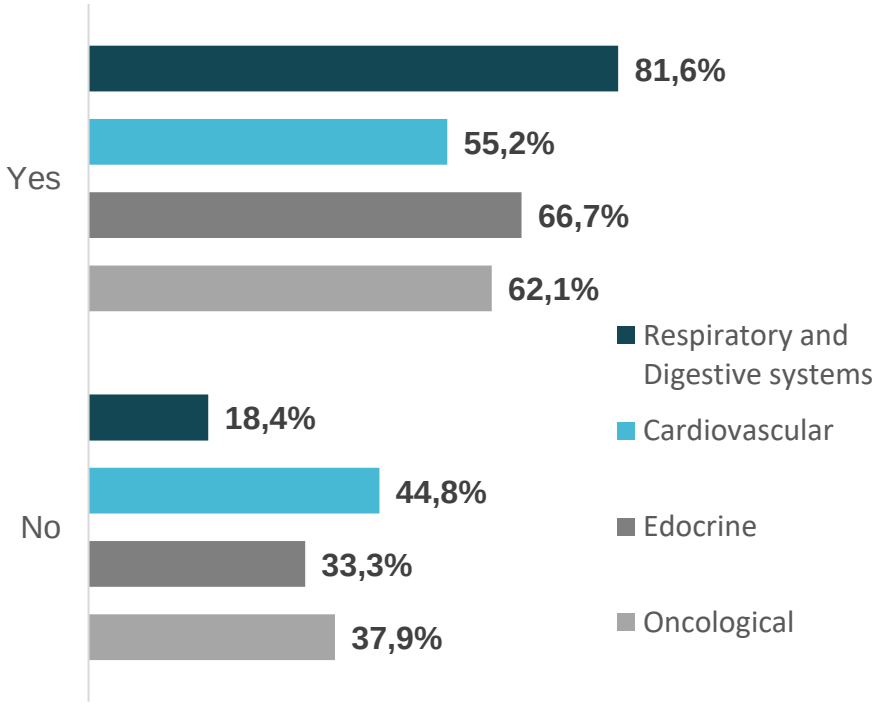
Nearly half of those surveyed have an accompanying disease, and there is a high percentage of patients who receive treatment for a variety of problems. A specific medical area specialist usually does not have the same level of knowledge of medical treatment of other diseases. This proves that there is a need for a comprehensive approach to patients during treatment, which is also confirmed by the participants of in-depth interviews

Do you have more than one disease?



"If a patient takes more than one drug, it is necessary for a clinical pharmacist to approve them." Clinical pharmacist interview

Has there been a possible drug interaction control?



Source: Civitta analysis

CURRENT STATE: DOCTORS TAKE ON RESPONSIBILITY OF COMMUNICATING TO PATIENTS THE DETAILS OF THEIR TREATMENT

PRESCRIPTION AT DISCHARGE

While making a prescription, doctors write a note with dosage and instructions, however, considering their heavy workload, sometimes not enough time is dedicated, which is why explanations can be unclear, and patients end up misusing the medicines.

*When the drug is prescribed, **everything is explained in detail**, how that drug works, and of course you do not explain to everyone in the same manner, but accustom depending on the level of education #11*

*…It **must be mentioned on the sheet**, the medicine, the dose, how many times a day, mainly at what time the medicine is more effective. #1*

*Sometimes there are cases when the patient comes, two lines are written on a plain piece of paper **without much clarification**…The other side of the issue is that **patients do not understand correctly**, or make their own modifications based on their knowledge, information on the Internet…Such cases are not uncommon. #10*

Most clinical work is performed solely by the doctor

Pros

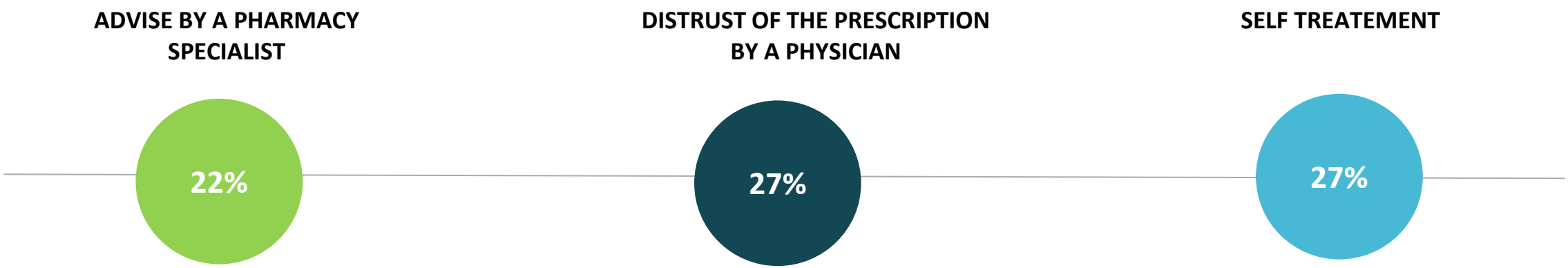
- Less time is spent discussing the best solution
- Decision is made based on direct contact with a patient
- Clear responsibility on one person

Cons

- Doctors tend to be **overloaded with work**, which can lead to cutting corners time- and attention-wise for patients
- **Lack of extensive knowledge of modern medicine**
  - Less effective meds are prescribed, affecting patient's recovery time
  - More of those not effective meds can be prescribed, affecting patient's/hospital's spending
- In difficult cases decisions are not always founded on the best available knowledge, but rather **judgement of a single person**

CURRENT STATE: DEVIATING FROM DOCTOR'S INSTRUCTIONS IS A COMMON CASE

To what extend to you agree with the statement? *(% of agreement)*



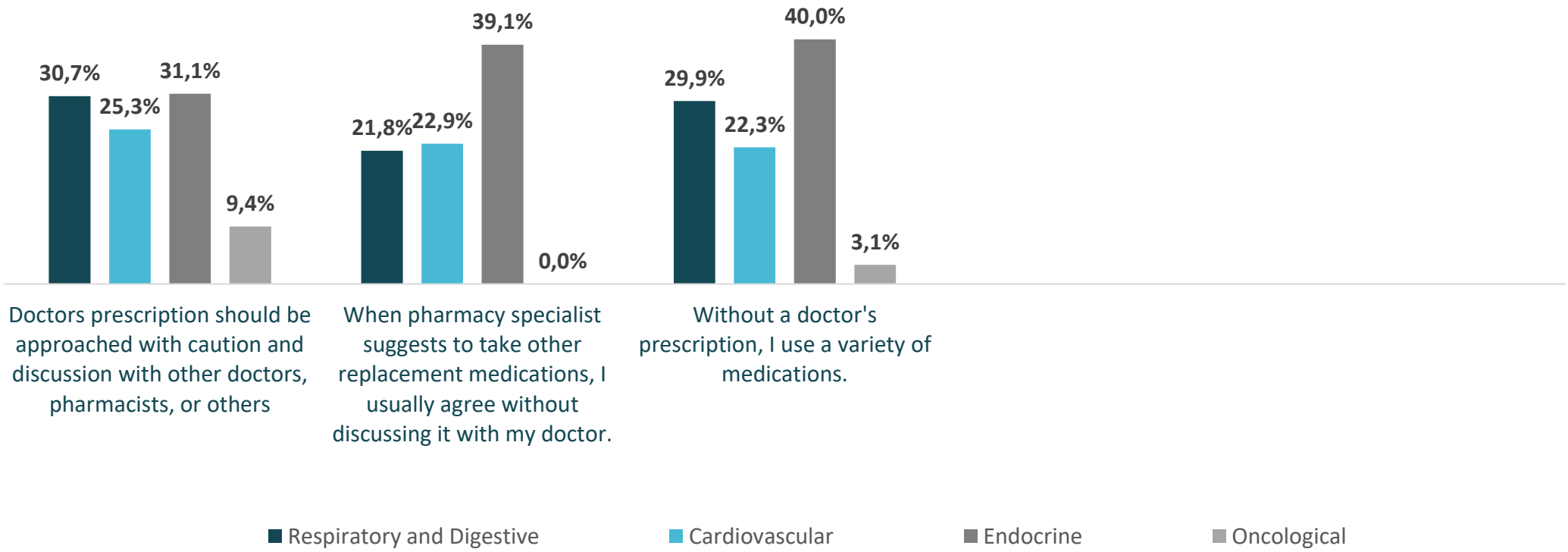
Note. Because the surveys were conducted in hospitals, some data can be skewed from the real picture: naturally, patients will be less inclined to admit at the hospital that they do not follow the doctor's instructions. The actual level of self-medication is expected to be higher.

CIVITTA Source: Civitta analysis

CURRENT STATE: DEVIATIONS FROM DOCTOR'S PRESCRIPTIONS ARE MOST COMMON AMONG PATIENTS WITH ENDOCRINE DESEASES

To what extend to you agree with the statement? *(% of agreement)*

With the exception of oncological patients, every third patient is practicing self-treatment

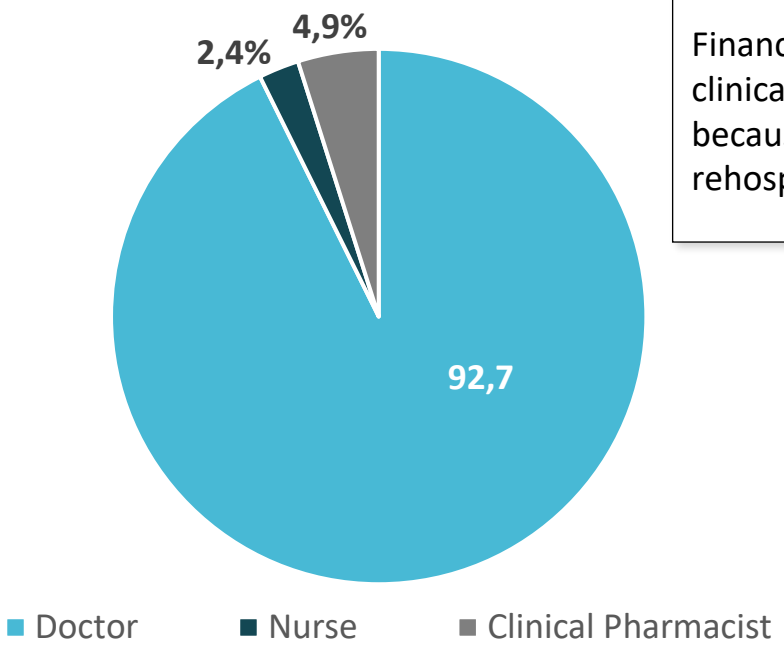


Source: Civitta analysis

CURRENT STATE: DOSAGE CALUCALTION FOR PATIENTS IS MAINLY DONE BY THE DOCTORS, WHICH, ACCORDING TO CLINICAL PHARMACISTS, CARRIES MANY RISKS

Who performed the dosage calculation for the prescription?*

***The question was asked to oncological patients**



Financially, the presence of a clinical pharmacist is effective because it will reduce the rehospitalization rates.

Clinical pharmacists in Armenia point out that there are drugs with a narrow therapeutic index, for which it is extremely important that the dose is calculated correctly. This should be done by a clinical pharmacist, otherwise there are many cases where patients are hospitalized.

There are medications that have a very low therapeutic index, are toxic, and the right dosage should be calculated. Each drug has its own formula, which takes into account different physiological indicators: age, gender, weight, height, body surface, kidney function, liver function, etc. here are standardized prescriptions that lead to side effects and rehabilitation. #13

You could say that there are clinical pharmacists only in oncology, they are called chemotherapists who do nothing else than medication dosage calculations. #13

Source: Civitta analysis

CLINICAL PHARMACISTS IN ARMENIA ARE MOSTLY EXPECTED TO HELP THROUGH THEIR DEEP MEDICATION EXPERTISE

INTRODUCING CP POSITION COULD SOLVE MANY OF THE CURRENT ISSUES (both knowledge- and responsibility-wise)

COMMONLY MENTIONED FUNCTIONS TO TRANSFER TO CLINICAL PHARMACISTS

Functions currently performed: doctors | nurses | unique

Depending on the required scope of responsibilities CPs could be less expensive than doctors (salaries & education)

The clinical pharmacist can keep in touch with the patient, find out how the medicine is delivered, if there are any side effects. #7

Follow the patient's treatment

Participate in medical discussions

I would very much like to have a very literate clinical pharmacist to discuss, for example, complicated surgery. #2

At the moment, nurses are collecting drugs under the supervision of doctors, which should be done by a clinical pharmacist. #3

Distributing drugs

Lectures on new drugs

There should be lectures…The specialist must report that there is a new drug… The important thing is that it is not information from a pharmaceutical company. #9

The clinical pharmacist participates in the tours only in complicated cases. #9

Take part in the visits

Check prescript-tions

I am in favor of making it mandatory for me to be someone who controls the circulation of medications, prescriptions, especially in antibiotics. #14

First of all, I imagine that a clinical pharmacist should monitor drug prescriptions and interactions. #14

Precise scope of functions would depend on the needs of particular departments and the expertise of current staff

CLINICAL PHARMACISTS WORKING IN ARMENIA ARE MOSTLY LIMITED TO PROVIDING ADVICE TO DOCTORS

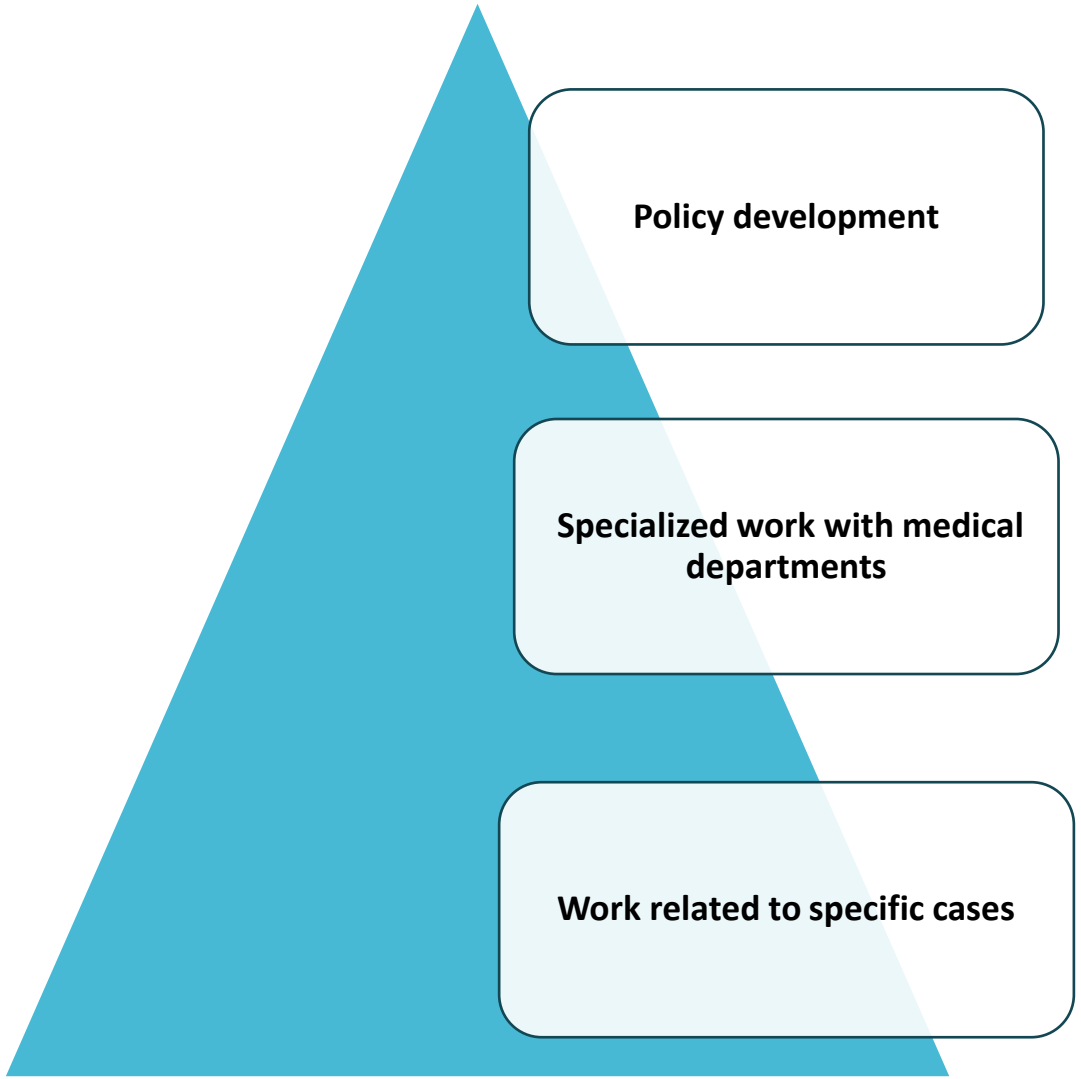
Because the practice of clinical pharmacy is not advanced in Armenia, the functions of pharmacists are not well defined. Depending on the specialist, the functions and understanding of the role of a clinical pharmacist in the hospitals may vary.

Activities	Clinical Pharmacist 1	Clinical Pharmacist 2
Medical reconciliation: collecting accurate data about the medications taken by the patient, including name, prescription, frequency, and administration way	✓	✓
An interview with the patient about currently used medications by the patient at the time of admission	X	X
Participating in hospital rounds with doctors	✓	X
Consultation with a doctor during the first prescription of medication	X	X
Advice on medicine prescription	✓	✓
Clarifications to patients about the prescribed medications at the point od patient discharge from hospital	✓	✓
Contacting the patient after discharge from hospital about the effectiveness of the treatment	X	X

Based on in-depth interviews with two clinical pharmacists working in Armenia.

CIVITTA Source: expert interviews

ACCORDING TO CLINICAL PHARMACISTS, THEIR ROLE IN PATIENT TREATMENT SHOULD BE CONSIDERED AS IMPORTANT AS THAT OF A PHYSICIAN

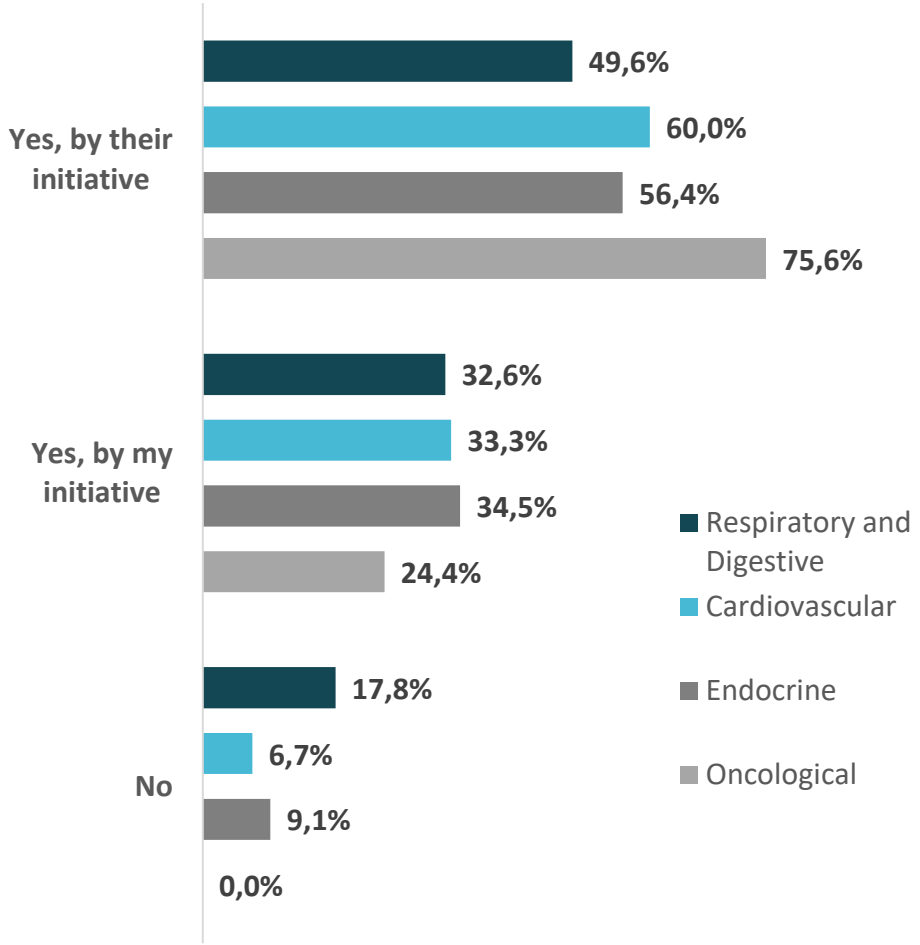


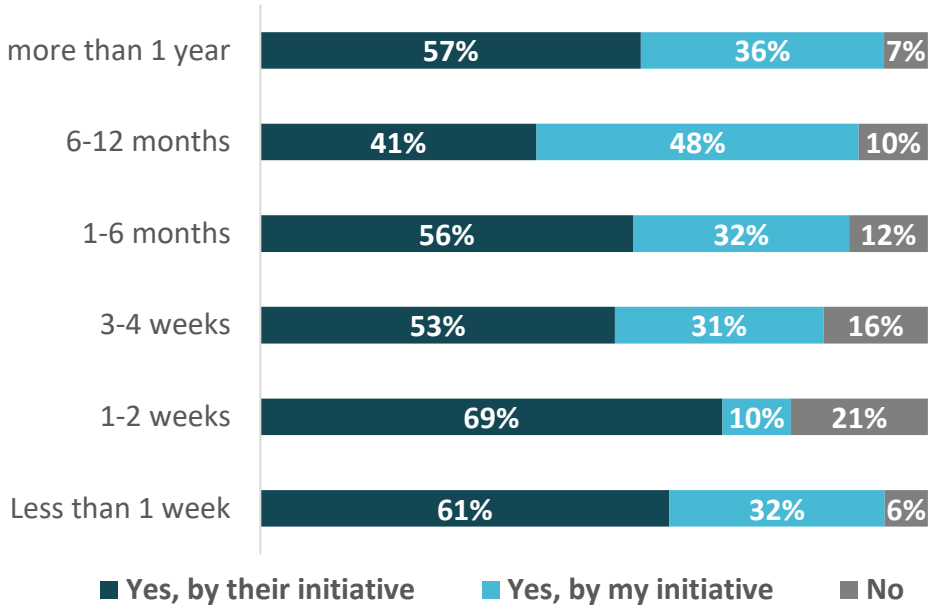
- A clinical pharmacist should develop the medical treatment policy at the hospital. By studying the best experience in the world, he or she should localize the guidelines for Armenia and develop medical treatment standards. For example, the prescription of anti-inflammatory medicine should be performed in accordance with guidelines
- A clinical pharmacist should work with drug manufacturers, research the market, and decide what medicines the hospital should get.
- A clinical pharmacist should work on the registration of side effects of medications: he or she should be the connecting link between the state, the hospital, and the patient. When a drug is prescribed and it has side effects, it is necessary to quickly notify governmental authorities to perform additional studies for the medication.
- Each department should have its own clinical pharmacist, who specializes in the field and works more closely with the physicians. Clinical pharmacists believe that there are departments that require the presence of a clinical pharmacist more than others, such us intensive care, cardiovascular diseases, traumatology and dialysis.
- A clinical pharmacist should perform a prescription dosage calculation, especially in the case of toxic drugs when accuracy down to milligrams is needed.
- In complex individual cases a clinical pharmacist should work with the patient individually, alongside the physician .

AMONG PATIENTS WITH CHRONIC ILNESSES 14 PERCENT IN THE REGIONS AND 7 PERCENT IN YEREVAN REPORTED THAT MEDICAL PERSONNEL DID NOT MAINTAIN CONTACT WITH THEM AFTER BEING DISCHARGED

Were you contacted by the doctor or medical staff to monitor the effects of medication on your health? *

* The question was asked to patients with chronic illness





Patients with chronic diseases most of the time get a feedback check, however one-third of them personally initiated the contact.

The feedback check is least common for patients with respiratory and digestive diseases.

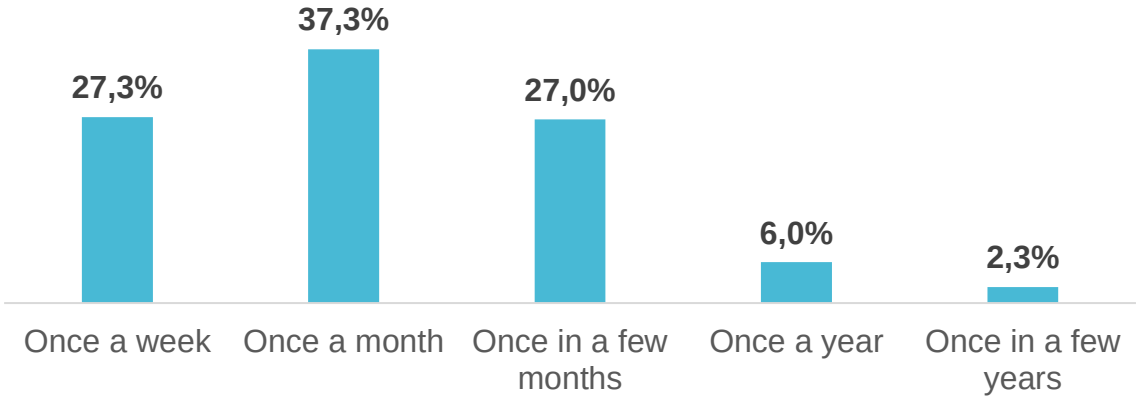
After the patient is discharged, we lose them. When they are out, it is possible to have a contact, if they initiate it. #12

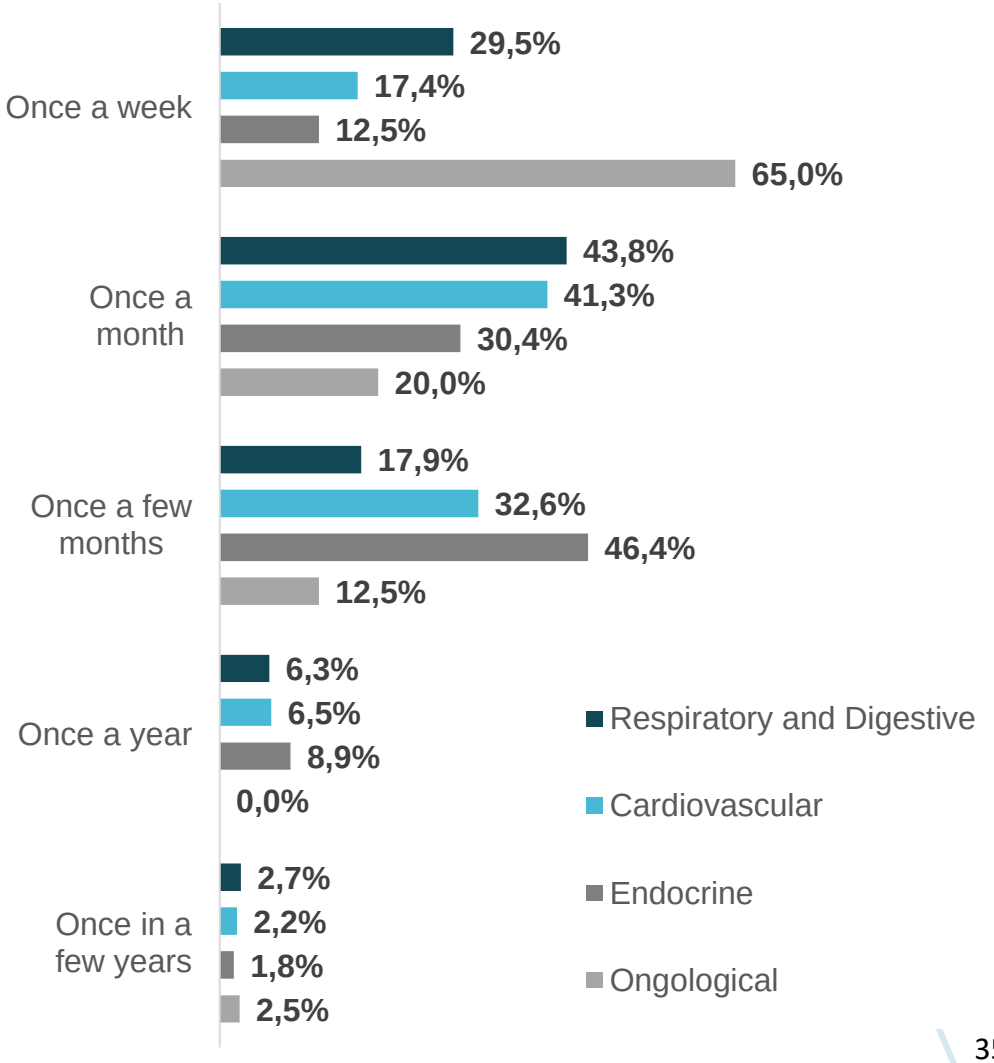
Source: Civitta analysis

65 PERCENT OF PATIENTS WITH ONCOLOGICAL DISEASE KEEP IN TOUCH WITH THE DOCTOR ONCE A WEEK, WHICH THIS IS THE HIGHEST INDICATOR AMONG ALL GROUPS

How often do you keep in touch with your doctor? *

* The question was asked to patients with chronic illness.





Source: Civitta analysis

DURING THE EXPERT INTERVIEWS TWO MAIN DIRECTIONS OF BENEFITS FROM CLINICAL PHARMACIST'S WORK WERE IDENTIFIED

PATIENT

More effective treatment

*Sometimes it happens that a patient is **unfoundedly prescribed a large dosage of medications**, it's because of the lack of a clinical pharmacist. #11*

Side effects reduced

*The benefit is that the patient **will not have unnecessary complications**, which may lead to other diseases. #2*

*Minimization of all negative effects, **misdiagnosis of interactions, omission of drugs, all kinds of negative side effects** will be minimized. #5*

*The issue of **drug dosing and combination will be at a better level**, we will be able to reduce the problems of side effects caused by drug incompatibility as much as possible #10*

Reduced cost

*If a clinical pharmacist can explain that the effect of a cheaper alternative to an expensive drug is the same, with fewer side effects, the **patient's costs will be reduced**. #7*

*First of all, the **cost to each patient is affected**. Since I can prescribe ten drugs, the clinical pharmacist can tell me to skip five of those, that will be more effective than all of them. #9*

HOSPITAL

Shorter treatment period

The treatment period is very important for both the state and the hospital, the shorter it is, the better both for the state and us. #4

Better drugs used

*They will **gather information** and say that there have been many side effects from one drug and few from the other. We will know these statistics. #7*

Directly reduced costs

We will benefit by reducing prescriptions for unnecessarily large amounts of drugs. #10

Benefits of clinical pharmacy are a lot more complex; only things mentioned during the interviews are shown on the slide

Positive effects from clinical pharmacy are intertwined, and lead to one another (e.g., shorter treatment period is tied both to patient's health and costs for the hospital)

CLINICAL PHARMACISTS ESTIMATE THAT THEIR INVOLVEMENT IN THE TREATMENT PROCESS WILL INCREASE THE EFFECTIVENESS OF TREATMENT

It will help doctors to reduce their overload because doctors will no longer need to study medication continuously, read research on them, which is quite time-consuming, and most of the time the doctor does not have enough time for it.

Clinical pharmacists will collect information and tell us which drug has the most side effects and which has less. We will know this statistics, and when we write the prescription, we will take it as basis. #7

It will increase the effectiveness of the treatment as more appropriate medications will be prescribed. This will reduce the treatment period and improve the quality of life for the patients.

Better prescriptions will reduce the cost of treatment. The patient will not have to undergo several different treatments for the same problem.

From a public health perspective, the correct use of antimicrobial drugs will decrease the risk of growth of antibiotic resistance

GOVERNMENT REPRESENTATIVES BELIEVE THAT HOSPITALS DO NOT PROPERLY EVALUATE THE EFFECTIVENESS OF TREATMENT

According to government representatives, there is no evaluation of the effectiveness of medical treatment in hospitals today, no statistics on multiple treatments, delays in treatment, and ineffective use of finances.

We do not have clear statistics on how many days the patient remains in the hospital. There's a prescribed guideline that, for example, in three days, you should be released if you have a specific illness. Those parameters are largely based on international practice. But sometimes international practice is not helpful, as the local situation is completely different.
There is no information of rehospitalization rates, cost of treatment, how many days the treatment takes, nothing. #14

In the United States, Europe they have a planning program, which states that there will be a review of the prescription of antimicrobial drugs, 72 hours to decide if they should keep the prescription or change the medicine or the dosage. Then the pharmacist also checks it. If the drug is resistant according to research, they switch to a second-option antibiotics, there's a clear plan. So the internal audit can check later if everything was done according to the rules. #15

A clinical pharmacist can help solve the following problems:

Collecting comprehensive and detailed information about the medicine and providing it to medical personnel

Because doctors are not pharmacists and are quite overloaded, public officials say that a clinical pharmacist can fill this gap at the hospital by continuously studying and researching the medicine market and regularly updating the staff on it.

Increasing the effectiveness of treatment

Since there's no evaluation of the effectiveness of pharmaceutical therapy, according to government representatives, a clinical pharmacist can collect feedback from patients that will help to evaluate the effectiveness of treatment and make changes medical therapy if necessary.

MAJORITY OF INTERVIEWED STAKEHOLDERS STATED THAT ONE CLINICAL PHARMACIST FOR THEIR DEPARTMENT/HOSPITAL WOULD ALREADY BE HELPLFUL

100%

of interviewed doctors & directors believe clinical pharmacy is potentially beneficial

I am in favour of a very strong teamwork; I'd rather not solve the problem myself in some cases. Maybe it is medical cowardice, maybe on the contrary, it is over-care for the patient, but I can say for sure, the patients I take care of are 100% safe. #2

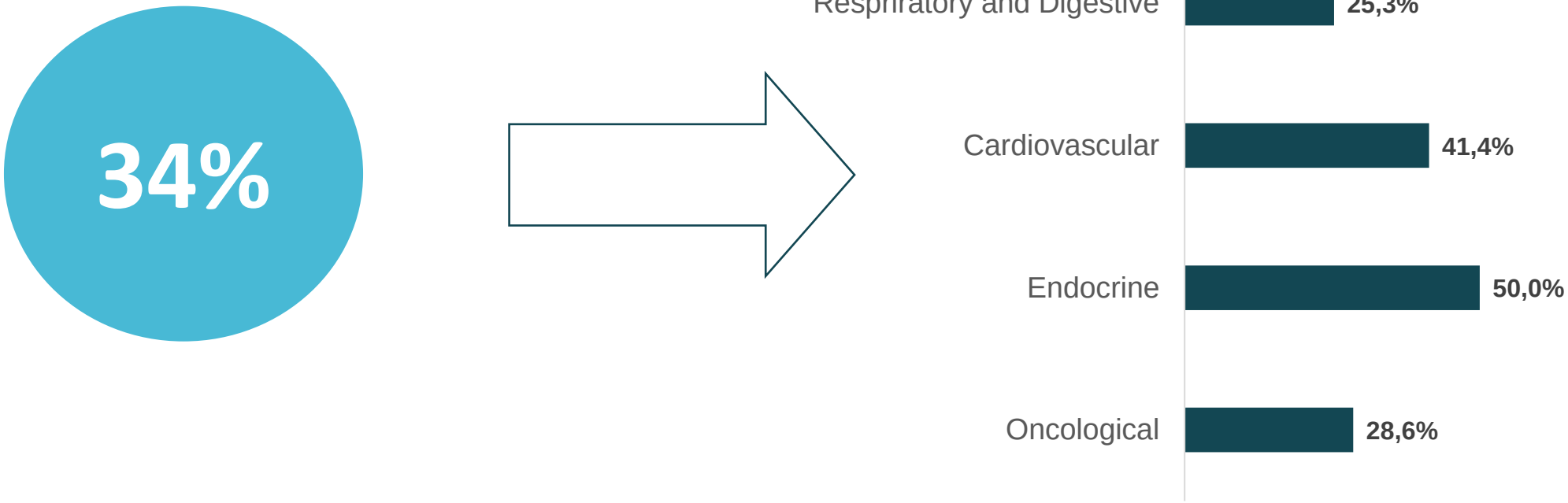
…Multiple drugs will definitely have synergism, antagonism, etc. With this in mind, the doctor needs someone to control him or her. ***One head is good, two are better****. #8*

ONE CLINICAL PHARMACIST
is considered to be enough to satisfy the needs in most cases, regardless of the size of hospital/department

Necessary number of clinical pharmacy specialist depends on multiple factors, including the overall complexity in work of specific departments, the level of advancement of a hospital (e.g. university hospital staff has enough expertise, while small town polyclinic staff might not have ample access to information resources).

ACCORDING TO 34 PERCENT OF RESPONDENTS, THERE IS A NEED TO CREATE AN INDEPENDENT PROFESSIONAL BODY TO OVERSEE THE MEDICINE PRESCRIPTION

Is there a need to create an independent professional body to advise and oversee the proper prescriptions of medication by doctors?



Source: Civitta analysis

CERTAIN HOLDBACKS WERE IDENTIFIED DURING THE INTERVIEWS, SOME ARE MORE MANAGEABLE THAN OTHERS

More challenging

UNIVERSITIES

- **Educational system does not produce specialists able to work in clinical pharmacy**

***Something must change in universities**, because there is not enough space for professional subjects…**Students mainly become medicine sellers** in the pharmacy, right? That is, they do not develop anything else, we do not develop science, we do not develop a profession, #1*

*I think the **(pharmacy) internship** in the hospitals has the same problem as the medical one, it **does not exist**, we go to factories more, that is, we get acquainted with the production process. #1*

FINANCIG

- **Lack of financing in education and healthcare institutions**

*…Maybe today it is a **financial luxury**, in the sense that the employer has to keep a clinical pharmacist, it raises the salary fund by one person, but conceptually, in terms of the idea, it is certainly a very good idea. #2*

*No, **they (hospitals) are not willing to pay** for the expenses, but are ready to support the program development, courses, training, assistance. #6*

***The hospital will not finance**, maybe the private ones will, but I do not know such a hospital. #10*

DOCTORS

- **Some doctors are not 100% ready to share their scope**

*That is to say, naturally difficult…for doctors it is **difficult to understand what the clinical pharmacist is for**, why they are needed, there are certain stereotypes present. #5*

*It may be a **matter of ambition**. The doctor may prescribe something, and the pharmacist may dispute it. #10*

*Now, doctors are usually busy in hospitals, they **may not have time to discuss certain issues**, but it also depends on how convincing the specialist will be, how good they will describe how they can benefit the treatment quality. #11*

Solutions

Requires developing curriculum and financing studies & internships

While in the short-term the expenses will increase, in the long-term a clinical pharmacist will contribute to cost reductions as the treatment efficiency will grow and rehospitalization rates will decrease.

Inform the doctors of the functions of a clinical pharmacist, emphasizing that a clinical pharmacist, taking on some functions, also shares the responsibility for the treatment result.

CIVITTA Source: expert interviews

STATE OFFICIALS SUPPORT THE IDEA OF INTRODUCING A CLINICAL PHARMACIST POSITION AT THE HOSPITALS

Advantages

More effective treatment and higher levels of public health

If the clinical pharmacist in the hospital, works with the doctors, ultimately, this teamwork will increase the efficiency. Eventually it's best to include the presence of a clinical pharmacist as a condition for licensing the hospital. If you have this number of beds, you need one clinical pharmacist, If there is a smaller number of beds, one pharmacist can serve a few hospitals, for example, if the hospital is small. But it must be through licensing. #15

There is no control over adherence to guidelines for medical prescriptions. The investment in clinical pharmacists will raise public health levels in the first place. #14

Monitoring side effects of drugs

We have already submitted a proposal several times, one of which refers to side effects control. In our view, if there is a pharmacist who collects data on side effects at the level of medical care and then sends it the Experimental Center, then control of the side effects will be most effective.#15

Reduction of the risk of informal agreements between doctors and pharmaceutical companies

According to representatives of the Inspection Center, there are occasions when doctors have informal agreements with pharmaceutical companies and prescribe medications regardless of their effectiveness. The presence of a clinical pharmacist will prevent such transactions and increase the transparency of healthcare functions.

- While interviewees emphasize the importance of the development of the clinical pharmacy, there is no legislative change planned at this time.
- According to the Ministry of Health, the initiative should come from the Experimental Center, and its opinion should be central to the decision-making process.

- The Experimental Center is ready to be actively involved in the process.
- Representatives of the Inspection Center believe that they have no role in the development of the law and can act only in advisory capacity.

CIVITTA Source: expert interviews

ACCORDING TO STATE OFFICIALS THERE IS A NEED TO DEFINE THE PROFESSIONS OF A PHARMACIST, CLINICAL PHARMACIST AND PHARMACOLOGIST

Today, pharmacists and pharmacologists perform the same functions, but educational degrees and length of study vary

In the Law on Healthcare services pharmacists are mentioned only once when the education credits are defined.

I searched for long to find the pharmacist's definition, and instead I found a list of professions, which included pharmacy bachelor, pharmacy master, while in many places you can encounter pharmacists, pharmacologists, especially in the last Healthcare law where the change was made, it says for example that the health-care professional is also a pharmacist, but the health-care professional's definition contains a "doctor's qualification," and then it reads, that a pharmacist will get this many educational credits, a pharmacologist that many educational credits, but I can't understand who the pharmacist is and who the pharmacologist is.

The Law of Licensing of RA does not distinguish between a pharmacist and a pharmacologist.

Moreover, when I open the Decision 867 derived from the Licensing Act, which is about licensing pharmacies, pharmacist and pharmacologist are just listed together. It means there are no differences in functions, in fact, if I have a pharmacy, I can hire a pharmacist or a pharmacologist. It mentions only one difference that if medicine is prepared in the pharmacy there must be a pharmacist and, if not it can be a pharmacologist. There are fewer pharmacies that prepare medicines than those that do not, therefore it is unclear why people get the pharmacy education in the university if they can study for two years and work at a pharmacy. #15

Official Classification of Professions and Professional specializations	Education Requirement Code*	Work complexity code**
Pharmacist: Industrial production	6, 7	2, 3
Pharmacist, manufacturing laboratories,	6, 7	1, 2, 3
Pharmacist - toxicologist	6, 7	1, 2, 3
Pharmacologist at the hospital	6, 7	2, 3
Pharmacologist for retail sales	6, 7	2, 3
Pharmacologist chemist	7, 8	2, 3
Pharmacologist, pharma technology	7, 8	2, 3
Pharmacologist, pharmaceutical organization	7, 8	2
Specialist in medicine technology	7, 8	2, 3
Clinical pharmacologist	7, 8	2, 3

- ** 6 - bachelor's degree, 7 - master's degree, 8 - scientific degree*
- *** 1 - simple, 2 - average, 3 - complex*

NECESSARY ACTIONS

- Clarify the responsibilities and functions of pharmacists, pharmacologists, and clinical pharmacists at a legislative level:
- Legally define what job positions can be filled by pharmacists, pharmacologists, and clinical pharmacists, and what are the education requirements for each profession
- Legally define activities performed by pharmacies
- Define the framework of Inspection Agency's monitoring, based on the changes mentioned above.

Source: Expert interviews

https://www.arlis.am/documentview.aspx?docID=104598 , https://www.arlis.am/documentview.aspx?docID=104958, https://www.arlis.am/documentview.aspx?docid=37565

ACCORDING TO CLINICAL PHARMACISTS, THE DEVELOPMENT OF THE FIELD SHOULD BEGIN WITH ADDING COMPULSORY CLINICAL PHARMACIST POSITIONS IN THE HOSPITALS

CURRENT ISSUES

Education is only theoretical

Educational institutions do not prepare professionals with sufficient practical skills to work in hospitals.

In educational institutions, clinical pharmacy does not get enough attention and is a less important area. In most cases, students are urged to change the sphere or choose a different profession to be able to find a job.

We give a generation that needs only a diploma. Everything they learned is not applied at work. I love and emphasize all subjects, and pharmacy science is the subject that turns a student into pharmacist, and the largest volume of classes should be allocated to it and to the targeted medicine fields that are most necessary in hospital work. #12

The level of collaboration with doctors is low

Most doctors oppose the establishment of the new profession by labeling clinical pharmacist as a less important worker, although both doctors and clinical pharmacists receive medical education.

All these factors decrease the motivation of the specialist to work as a clinical pharmacist

Unfortunately, the pharmacist is a medicine seller for a doctor. This is one of our main challenges when pharmacists are seen only for pharmaceutical sales because of a lack of education and forget that pharmacists are the ones who created those medicines. Pharmaceutical chemists graduate from the faculty of pharmaceuticals. #12

There is no government policy

Hospital licensing does not require the presence of a clinical pharmacist, as opposed to an epidemiologist, for example.

In the absence of systematic changes of the clinical pharmacy field, individuals have taken on the responsibility for its development, whereas with government assistance it could grow with higher momentum and efficiency.

SUPPORT FROM STATE AND UNIVERSITY & HOSPITAL AUTHORITIES IS CRUCIAL FOR DEVELOPING CLINICAL PHARMACY IN THE COUNTRY

CREATING A POSITION

Most basic and necessary form of state support: establishing a position of “clinical pharmacists” and a legal requirement to fill it

> *Like no one imagines a hospital without an epidemiologist, one should not imagine a hospital without a clinical pharmacist. **The staff, the phenomenon must exist**. If we have any profession, but we do not have a position for that, the profession loses its role. #5*
>
> *The involvement of the state can first be in the **creating the position**, in the training and supervision of specialists, as in the process with the involvement of specialists from the Ministry of Health. #10*

FINANCING OPTIONS

Financial support is needed for both education and employment of clinical pharmacists; the most probable sources are state and grant financing

> *The **state order can be a form of financial support**. Hospitals can also be obliged to hire specialists. #10*
>
> ***Ministry could transfer those postgraduates**, then for 5 years it is called a targeted residency, within which they go to work in the regions for 5 years. №4*

INFORMATION DISSEMINATION

Educating hospitals on the value that the clinical pharmacists can bring is crucial for integration of such specialists into healthcare system

> *We need to train specialists, **talk to hospitals, explain the role**. Hospitals should see the role, so should specialists who come to work in hospitals. #3*
>
> *A lot depends on the **hospital director’s awareness of clinical pharmacist, understanding** of the importance of this role. #8*

Source: expert interviews

AGENDA

1. Executive Summary
2. **Armenian Market Research**
   - Research Methodology
   - Research results
   - **Key findings**
3. International Market Research
4. Appendices

SUMMARY OF SURVEY RESULTS

- **43 percent of the surveyed patients** reported having an **accompanying disease**, and **31 percent** who **receive more than one treatment** at the same time. According to clinical pharmacists, such patients require a **doctor and a clinical pharmacist to work together to monitor possible drug interactions**. As the results of the quantitative survey showed **each third patient does not get an evaluation of possible medication interaction**.
- **27 percent** of respondents reported that they **take various medications** without a doctor's prescription, and **22 percent** reported that they **change the type of medication or** the dosage of medication they take, following the advice of a pharmacy specialist without consulting their doctor. In general, there is a popular adverse phenomenon of non-compliance with the medical prescriptions, that can be improved by the development of the clinical pharmacy practice.
- For **93 percent of patients receiving chemotherapy**, **the doctor or nurse calculates the prescription dosage** According to clinical pharmacists, **there are drugs with a narrow therapeutic index (high toxicity) for which dosage calculation must be carried by a pharmacist**, not a doctor. Failure to comply with this rule is common in cases where patients are hospitalized or stay in the hospital longer or develop side effects.
- **27 percent** of patients believe that doctors´ **prescriptions should be approached with suspicion** and discuss them with other doctors or pharmacists.
- **34 percent** of patients believe that an **independent professional body is needed** to oversee the proper prescription of medication by doctors.

RESEARCH RESULTS INDICATE THAT THE CLINICAL PHARMACY ACTIVITIES WILL INCREASE THE EFFECTIVENESS OF MEDICAL TREATMENT

REDUCE THE QUANTITY OF PRESCRIBED MEDICATION	• More effective medications will be prescribed, which will optimize the amount of medication and the dosage.
DECREASE IN REHOSPITALIZATION RATE	The number of rehospitalization cases will decrease as a result of • More efficient prescriptions, • More accurate calculation of the prescription dosages for medicine with narrow therapeutic index, • Better control over the side effects.
IMPROVING MEDICAL TREATMENT INDICATORS	• Reduction in treatment length • Reduction in rehospitalization rates • Improving quality of life indicators • Increate in life expectancy rates
EFFICIENT USE OF DOCTORS' TIME	• Better teamwork • Sharing responsibility • More patients can be treated as a result of savings doctors' time • Reduction in medication errors and increased medical efficacy as a result of more efficient prescriptions
EDUCATING DOCTORS ABOUT MEDICAL TREATMENT	• Regular knowledge update about medical treatment • Increasing awareness of proper administration of medications

CIVITTA Source: Civitta analysis

IN ARMENIA, THE DEVELOPMENT OF CLINICAL PHARMACY REQUIRES OVERCOMING THE FOLLOWING OBSTACLES

FLAWS IN THE EDUCATIONAL SYSTEM	• Lack of practical knowledge in the educational program • “Labeling” pharmacy as a less important profession
LACK OF GOVERNMENT POLICY	• Hospital licensing does not require a presence of a clinical pharmacist • Luck of reforms in clinical pharmacy sector • No clear definition for the professions of clinical pharmacists, pharmacologists and pharmacists
LOW LEVEL OF INFORMATION	• Doctors and medical staff do not have sufficient information about the international best practices and generally do not know how a clinical pharmacist can increase the effectiveness of treatment
MISTRUST	• Due to lack of information doctors do not have trust in clinical pharmacist and are concerned about transferring their “personal” functions to them
INFORMAL AGREEMENTS	• There are doctors who have informal arrangements with drug manufacturers/selling companies, and due to that oppose the institute of clinical pharmacists at their hospital

CIVITTA Source: Civitta analysis

INCREASED TREATMENT EFFICIENCY WILL ENABLE TO ACHIEVE GOVERNMENT COST REDUCTION BUDGETS FOR HOSPITALS AND PATIENTS

PATIENT EXPENSES	• Medicine cost reduction • Reduction in the length of treatment and related costs
HOSPITAL EXPENSES	• Doctors' time savings, opportunities to work with more patients, reduced ratio of health-care professionals/patients • Savings of hospital spending on medicine • Decrease in hospital bed occupancy rates • Reduction in treatment costs per patient
GOVERNMENT BUDGET	• Reduction in medicine purchase costs • Decrease in hospital expenses per one patient • More patients have access to healthcare within the same budget • Increase in the number of treated patients per hospital • Reduction in sickness (temporary unemployment) allowances funded by budget • Developing of medical tourism
EMPLOYERS	• Reduction in sickness (temporary unemployment) allowances

CIVITTA • Source: Civitta analysis

AGENDA

1. Executive Summary
2. Armenian Market Research
3. **International Market Research**
   - United States
   - United Kingdom
   - Canada
   - Australia
   - Belgium
   - Japan
   - Belarus
4. Appendices

CLINICAL PHARMACISTS PERFORM A WIDE VARIETY OF FUNCTIONS ACROSS DIFFERENT HEALTHCARE SYSTEMS

Clinical pharmacists work directly with physicians, other health professionals, and patients to ensure the best possible health outcomes from the medications

Scopes of practice vary, and typically depend on the longevity of clinical pharmacy practice in the country and the level of sophistication of pharmacy education; in the most developed healthcare systems, **clinical pharmacists are an integral part of healthcare teams present at all stages of the patient care process**

MEDICAL RECONCILIATION

CPs identify the medicines patients were taking before admission to hospital and make sure they are still appropriate

PRE-PRESCRIPTION CONSULTATION

While GPs' main responsibility is to diagnose a patient, they can turn to CP for recommendations on the initial prescription

PRESCRIPTION CHECK

Prescriptions go to CP for approval, to check it for therapeutic appropriateness, dosage, possible medication interactions

WARD ROUNDS

During the ward visits, CPs discuss medication-related issues and make recommendations to medical staff, nursing staff and patients

ADVERSE EFFECTS MANAGEMENT

CPs suggest the most appropriate alternative therapies from patient health and financial sustainability points of view

EDUCATION

CPs constantly educate other healthcare staff on new medicines, educates patient about the correct use of their meds during their stay, and especially at discharge from hospital

CIVITTA Source: CIVITTA analysis

CLINICAL PHARMACY BENEFITS HEALTHCARE SYSTEMS ACROSS THE WORLD IN MULTIPLE WAYS, FROM PATIENT HEALTH TO A MACRO LEVEL SAVINGS

Positive impact of clinical pharmacy practice on patient-health, hospital efficacy, and healthcare system in general is universally recognized

Clinical pharmacists from multiple countries noted various benefits, which depend on the system's characteristics in each country

PATIENT

Achieved patient treatment goals, avoided adverse effects, prevented medication errors

- Clinical pharmacists are the most equipped specialists for choosing the most appropriate medication for each patient

Improved medication adherence, reduced cost to the patient

- One of clinical pharmacist's functions is to educate patients on their medication and why they need to use it
- Prescriptions are more precise; patients don't need to spend as much money on unnecessary meds → more likely to adhere to the medication plan

Reduced time to reach patient treatment goals

Improved patient health-related quality of life

HOSPITAL

Reduced time for patients in hospitals, lower readmission rate

- Lower hospital occupancy → reduced costs for in-hospital medications and staff salaries
- Saved doctor's time → the time is spent more efficiently; doctors can spend more time on each patient

Education on advancements in pharmacotherapy for hospital staff

- Increased effectiveness and expertise for healthcare establishment as a whole

HEALTHCARE SYSTEM

Significant savings on state-funded staff, services, medications

- Generally more effective treatment processes

Healthcare system is more able to efficiently react to emergency conditions (e.g., pandemic)

- Reduced number of hospitalizations

Improved macroindicators related to health and quality of life

- Increased life expectancy
- Increased quality of life

CIVITTA Source: CIVITTA analysis

ARMENIA: CLINICAL PHARMACY IS BASICALLY NON-EXISTENT IN ARMENIA; BARRIERS TO THE DEVELOPMENT COME FROM BOTH SUPPLY AND DEMAND OF THE SPECIALISTS

- Clinical pharmacy is almost non-existent today in Armenia: clinical pharmacists are not recognized as must-have specialists; the number of practicing CPs is close to zero
- **Barriers to the development come from two sources**

Pharmacy education does not focus enough on clinical pharmacy aspects

Bachelor's degree in Pharmacy (4 years)

- General pharmacy education
- Graduates are not expected to be able to perform clinical functions on the patients

Master's degree in Pharmacy (1 year)

- Very theoretical, almost no real-life practical hours in hospitals
- Includes clinical pharmacy hours, however, these are not very numerous and not as useful without sufficient practice

Licensing (renewed every 5 years)

- Educational system is not as practice-oriented as it should be. "Clinical pharmacy" in the curriculum does not really reflect the actual requirements for a specialist
- **Education system needs reforming, incl. introduction of more theoretical hours dedicated to clinical pharmacy, as well as real practical training**

Hospitals lack motivation and resources to introduce clinical pharmacist position

There are no clinical pharmacists currently practicing in the hospitals

- Even though people in some hospitals understand the potential benefit of having such specialists, they are not willing to invest in establishing a full-time position
- Many other hospitals don't have clear understanding of clinical pharmacist's functions

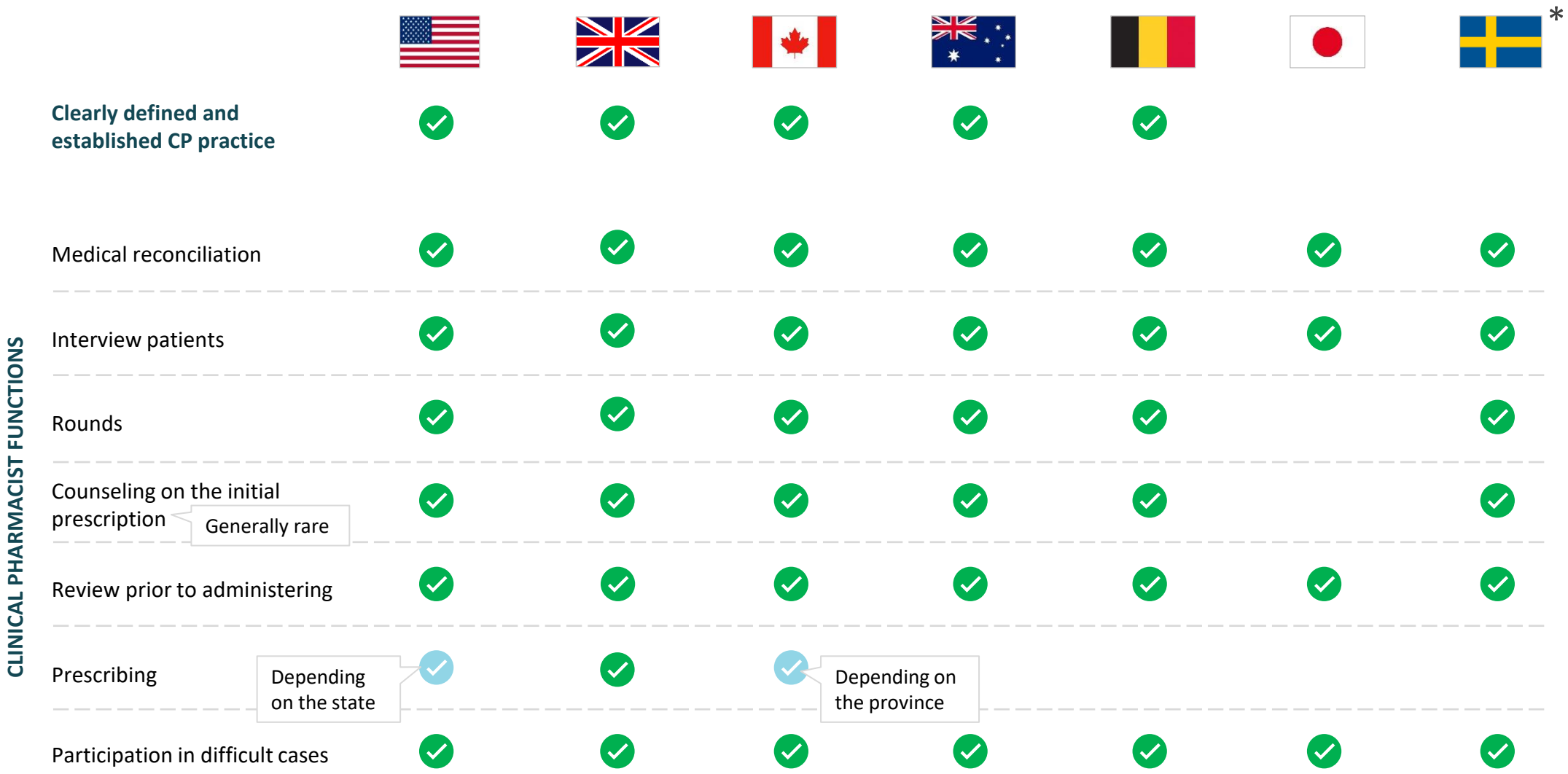
Hospitals need additional motivation to start introducing the practice; judging from the experience of other countries, such may come:

a) **from the government** – funding of CP positions, information dissemination

b) **from enthusiasts on a local level** (though such options is less effective and wide) – information dissemination, influence on local decision-makers

Source: expert interviews, Yerevan State Medical University

GENERAL: CLINICAL PHARMACISTS' FUNCTIONS MOSTLY ALIGN ACROSS THE DEVELOPED SYSTEMS AND INCLUDE DIRECT INTERACTION WITH PATIENTS AND DOCTORS



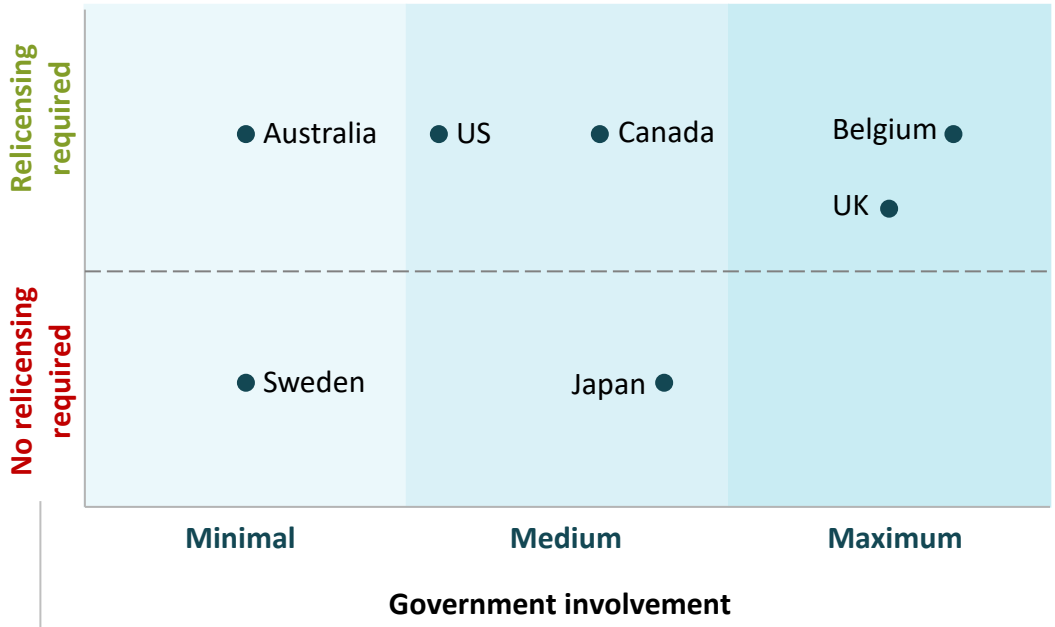
** Sweden overview is done based on the interviews with local experts*

Source: CIVITTA analysis

REGULATION: FOR PUBLIC HEALTHCARE SYSTEMS, GOVERNMENT PARTICIPATION IN ESTABLISHING CLINICAL PHARMACY PROVES TO BE EFFECTIVE AND EVEN NECESSARY

CLINICAL PHARMACY REGULATION

License requirements



- Most countries require for a regular renewal of a pharmacist licence
- The process typically involves completing a certain number of additional education hours , sometimes – passing regular exams

INSIGHTS

Government involvement in the development of clinical pharmacy varies significantly across healthcare systems:

- **MINIMAL |** The system in such countries is typically underdeveloped; pioneers and enthusiasts are working towards growing clinical pharmacy, but no legal enforcement, significant state funding, or informational support are provided
- **MEDIUM |** Involvement is not universal:
  - Certain push can be given by the government at the early stages of development (like expanding clinical pharmacy faculties across the country)
  - Dedicated funding for a certain number of CPs with no efforts for improving regulation
- **MAXIMUM |** Such systems are the ones with the highest potential, since the efforts of pioneering clinical pharmacists are enhanced by administrative support from the government (funding for CP position in the hospitals, grants for education, legal requirements for number of clinical pharmacists for hospitals, etc.)

CIVITTA Source: CIVITTA analysis

EDUCATION: PHARMACY EDUCATION MUST PROVIDE PRACTICE- AND PATIENT-ORIENTED STUDIES, TO ENSURE ENOUGH EXPERIENCE BEFORE UNSUPERVISED WORK

EDUCATION FOR CLINICAL PHARMACISTS

	Required specialized degree	Residency	Years before practice	Guided practice
		✓	8-10 years	1-2 years
		✓	5 years	1 year
		✓	8-10 years	1-2 years
		✓	5-9 years	1-3 years
	✓		5-8 years	0.5-2 years
		✓	6 years	0.5 years
	✓		6 years	0.5 years

INSIGHTS

- **Required specialized degrees** are not that common and are typically characteristic of the countries with younger clinical pharmacy practice
  - Such degrees are **used to bridge the gap** between the existing pharmacy education and the healthcare needs the clinical pharmacist is supposed to address
  - **In the countries with more established and mature systems** general pharmacy education is complex and practice-oriented enough to cover all the necessary aspects, including practical training and clinical pharmacy subjects
- **Clinical pharmacy residency is another feature of the developed systems**, where more attention is given to practice- and patient-oriented education.
  - For organizing such programs, a certain number of practicing clinical pharmacists is needed to guide the young specialists, which is why it is not likely to fully develop soon in the younger systems
- Important to note, in the younger systems the clinical pharmacists' competencies are commonly obtained not only through education, but through vast practice experience

AGENDA

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2. Armenian Market Research
3. **International Market Research**
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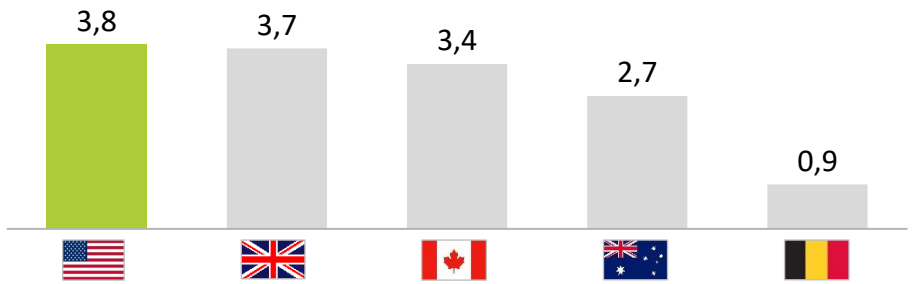
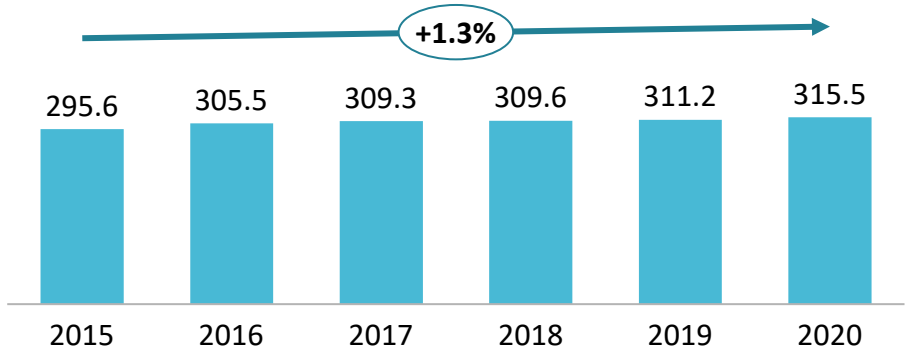
\ OPERATIONS: CLINICAL PHARMACISTS IN THE US ARE SELF-STANDING SPECIALISTS, THAT ARE IN DEMAND IN THE LABOR MARKET

CLINICAL PHARMACISTS PER 100 HOSPITAL BEDS*



PRACTICING PHARMACISTS IN THE US, K, 2015 TO 2020



*CIVITTA calculations based on industry statistics

CLINICAL PHARMACIST'S RESPONSIBILITIES

Clinical pharmacist works **directly with medical professionals and patients** They optimize patient outcomes through a variety of channels, including:

- providing recommendations for evidence-based medication selection on patient care rounds
- offering medication information to other health care providers and patients
- monitoring therapeutic responses
- reconciling medications as patients transition across the continuum of care

Clinical pharmacist **helps make specific decisions** (e.g., if a patient is having an adverse reaction to a specific medication, the CP will suggest alternative therapies)

Doctors often give **clinical pharmacists a great deal of control over prescribing medications and monitoring patients** (detailed knowledge about medications and their effects & extensive experience with patients)

 Source: Clinical pharmacists: practitioners who are essential members of your clinical care team

IMPACT: IMPLEMENTATION OF CLINICAL PHARMACY AFFECTS THE QUALITY OF HEALTHCARE SYSTEM IN TWO DIRECTIONS

Clinical pharmacy services can be perceived as expensive by hospital managers; the reality is that clinical pharmacy can significantly improve **medication budgets** and **patient outcomes**

A variety of surveys was conducted to evaluate the impact of clinical pharmacists on a healthcare system of the US; estimations vary, but the **significant positive impact is out of doubt**

	Direction	Considerations/examples of impact
1	**Financial sustainability**	• A clinical pharmacist, who rounded with a critical care team, more effectively identified and prevented more adverse medication events than pharmacists involved in order entry and verification, and avoided the potential expenditure of over $210,000 in 4.5 months • Clinical pharmacists help decline pharmacy expenses by 50.76% by controlling the use of three high-cost medications, including albumin, intravenous (IV) pantoprazole and IV immune globulin • **Each US dollar spent on clinical pharmacist resulted in savings of just under $50 in the medication budget**
2	**Patient health**	• The benefit of clinical pharmacist education, monitoring and intervention was demonstrated in a prospective, randomized study of 800 heart failure or hypertension patients - The patients with clinical pharmacist interventions had a 34% lower risk of any adverse medication event (ADE) or medication error (ME), including a significantly lower risk of ADE, preventable ADE, potential ADE, and medication errors compared with control patients treated at the same clinics

Source: Clinical pharmacists: practitioners who are essential members of your clinical care team, Relationship between the number of hospital pharmacists and hospital pharmaceutical expenditure https://www.wolterskluwer.com/en/expert-insights/how-hospitals-leverage-pharmacy-teams-to-reduce-costs-and-improve-clinical-outcomes

SEVERAL INTERNAL FACTORS HAVE PLAYED A MAJOR ROLE IN TRANSFORMING US CLINICAL PHARMACY OVER THE LAST DECADES

Clinical pharmacy establishment in the US went hand in hand with the general hospital pharmacy development
The biggest enabling changes occurred in two areas: **reforms in educational system** eventually led to the formation of the current **institutional design**

A EDUCATION & RESIDENCY

EDUCATION

Unified
- Expansion of clinical pharmacy faculties with federal funding
- Formation of doctor pharmacy degree (Pharm.D.)
- Setting Pharm.D. as the sole professional degree

Patient-care oriented
- Shift from the science of meds to the science of medication therapy

Standardized
- American Council on Pharmaceutical Education (ACPE) to set educational standards and accredit colleges in pharmacy

RESIDENCY

Hospital pharmacy **residency establishment & standards formation**
- Hospital pharmacy residency allowed for decentralization of well-educated pharmacists throughout hospitals and brought pharmacy specialists closer to patients

Foundation for clinical pharmacy development (pharmacists closer to patients, increased number of medication, and new need for ph. expertise)

B INSTITUTIONAL DESIGN

American College of Clinical Pharmacy created by pioneers disappointed by pace of clinical pharmacy development
- Society to specifically represent and promote clinical pharmacy at the institutional level
- Promotion of R&D, improvement of standards, further specialization
- Formation of pharmacy as a clinical profession

New residency standards were divided into **accreditation for clinical pharmacy practice** and **specialty pharmacy practice**, ultimately fixing clinical pharmacy and unique practice areas in pharmacy in the US healthcare system

Formation pf Pharmacy as a clinical profession, establishment of new required expertise in healthcare institutions

Source: Evolution of Clinical Pharmacy in the US and Future Directions for Patient Care, Overview of the History of Hospital Pharmacy in the United States

EDUCATION: PHARMACIST EDUCATION, TRAINING, CREDENTIALING, AND PROFESSIONAL PRACTICE MODELS CLOSELY MIRROR THOSE OF PHYSICIANS IN THE US

EDUCATIONAL PROCESS FOR A CLINICAL PHARMACIST

Licensing process

Prerequisite courses (2-4 years)

Pharm.D. (4 years)
Minimum educational requirement for a pharmacist's license

DIDACTIC CURRICULUM

- **Foundation of pharmacy science courses** (pharmacokinetics, pharmacology, medicinal chemistry, and pharmacotherapy)
- **Additional didactic curriculum** (medication safety, pharmacy law and ethics, biostatistics, toxicology, epidemiology, hands-on skill-based labs, evidence-based practice, innovation, and business management)

PRACTICAL CURRICULUM

- **Introductory Pharmacy Practice Experiences (IPPE)**: 2-4 week experiences in both community and hospital pharmacy settings
- **Advanced Pharmacy Practice Experiences (APPE)**: 4-6 weeks after the completion of didactic training
- **Interprofessional Education (IPE)**: Pharmacy student interactions together with other healthcare providers and students like patient rounds

Residency (1-2 years)
Required credential for entry-level health-system pharmacy practice

POST-GRADUATE YEAR ONE (PGY-1)

- **Baseline of residency training**, organized, directed, accredited program that builds upon knowledge gained from pharmacy school
- Designed to enhance general competencies in managing medication use systems and supports optimal medication therapy outcomes for patients with a broad range of disease states

POST-GRADUATE YEAR TWO (PGY-2)

- Specialty residency, as its **focus is within a specific area of pharmacy practice**, such as oncology, pediatrics, ambulatory care, or management
- A PGY-2 residency increases the depth of knowledge related to medication therapy and clinical leadership in the specific area of focus

Residency capacity is limited and finding a place can be an issue for Pharm.D. graduates

License renewal (every 1-3 years)

- Pharmacists are required to complete **continuing education (CE) hours**
- Requirements vary by state, but most require licensees to complete at least 30 hours of CE per biennial license period

Source: A review of American pharmacy: education, training, technology, and practice

INSTITUTIONAL DESIGN: THE FRAMEWORKS OF PHARMACY REGULATION IS UNIFIED ACROSS THE COUNTRY

CURRENT REGULATION

- **Scopes of practice vary from state to state**
- **Licenses are only valid in the state they were issued in**, meaning for a pharmacist to practice in a new state they would need to get a license from a local Board of Pharmacy
- **In some states clinical pharmacists can prescribe**, in others they can't

- Any licensed pharmacist can become a hospital pharmacist, and, then a clinical pharmacist
- There is **no particular license needed for practicing clinical pharmacy**, only the general one; it's a matter of pharmacist's expertise, experience, and training

PHARMACY REGULATION BODIES IN THE US

Regulatory body

Body	Functions
National Association of Boards of Pharmacy	• NABP was initially established to assist in creating uniform education and licensure standards • Supports patient and prescription medication safety, through examinations that assess pharmacist competency, licensure transfer and verification services, various pharmacy accreditation programs
State Boards of Pharmacy (50 total, 1 for each state)	The Board of Pharmacy regulates the pharmacy practice and is **responsible for licensing** (NAPLEX exam + State exam) and reaccreditation processes in each state
Professional Associations and Societies	The American College of Clinical Pharmacy (ACCP) is the main organization for clinical pharmacists

Source: expert interviews, American College of Clinical Pharmacy, National Association of Boards of Pharmacy

INSTITUTIONAL DESIGN: INSTITUTIONALIZATION OF CLINICAL PHARMACY IS NEEDED ABOVE ALL TO CREATE GENERALLY ACCEPTED STANDARDS, NOT LEGISLATION

CURRENT REGULATION

- The American College of Clinical Pharmacy (ACCP) is a professional and scientific society that provides leadership, education, advocacy, and resources for clinical pharmacists. There are more than 15 000 members in the organization, and there are many more practicing clinical pharmacists
- ACCP **does not have legislative power** or direct influence on institutions that do
- The greatest value of the organization comes from **creating a framework** for clinical pharmacy operation, which eventually promotes **peer pressure on the new specialists** to align with generally excepted standards of practice in the field
- ACCP annually publishes its **Strategic Plan** and frequently updates **Standards of Practice** for clinical pharmacists

STANDARDS OF PRACTICE

*A practice standard is an **authoritative advisory document**, issued by an expert body, offering advice on the minimum requirements or optimal method for addressing an important issue or problem*

*A practice standard **does not have the force of law***

- This document sets forth ACCP's **expectations for clinical pharmacists** within the United States and countries around the world where clinical pharmacy is emerging. It is also intended to serve as a reference for those designing and assessing clinical pharmacy education and training programs
- In addition to articulating the clinical pharmacist's process of care and documentation, the standards address the clinical pharmacist's involvement in collaborative, team-based practice and privileging; professional development and maintenance of competence; professionalism and ethics; research and scholarship; and other professional responsibilities
- **The standards define for the public, health professionals, and policy-makers what they can and should expect of clinical pharmacists**

Source: American College of Clinical Pharmacy, ACCP Standards of practice

CONCLUSIONS: US CLINICAL PHARMACY HAS DEVELOPED INTO A WELL-ROUNDED SYSTEM THROUGH A SERIES OF CONSEQUENTIAL TOP-DOWN CHANGES

1

- Clinical pharmacists can be self-standing and valuable employees, providing **significant positive effect for patient health and pharmacy spendings** in the hospitals
- The keys to ensuring such benefit is to:
  a) educate pharmacists in the patient-care directed manner, introduce ample practical hours during the study years
  b) disseminate pharmacy graduates among healthcare institutions, make sure they are integrated into interprofessional medical teams
  c) give clinical pharmacists enough direct exposure to patients, e.g. by including them in the patient rounding process

2

- The biggest milestone in the development of clinical pharmacy practice – **standardization and unification** of pharmacy degree, shifting the **focus in education towards patient-care**
- **National clinical pharmacy society is an important elemen**t for promoting the collaboration between specialists, gathering the efforts to enable positive changes in the sphere, and generally take a lead in the system formation process

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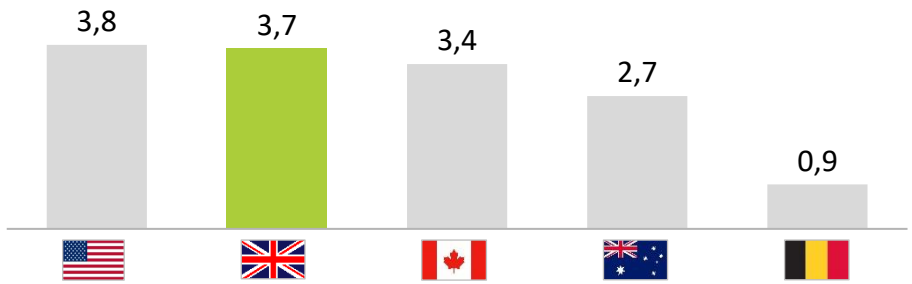
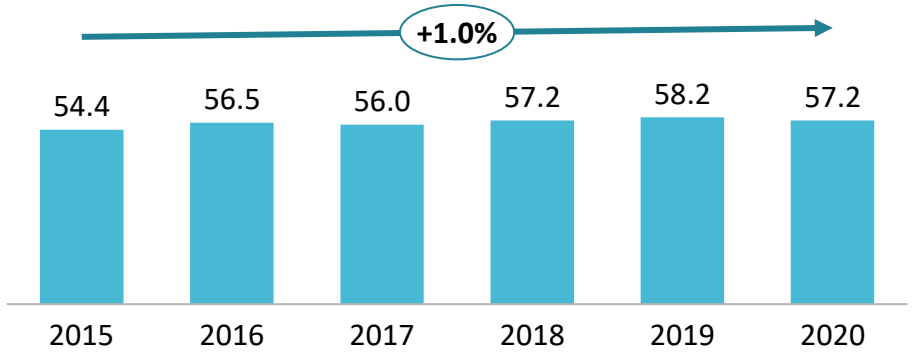
OPERATIONS: CLINICAL PHARMACY IN THE UK IS A WELL-ESTABLISHED PRACTICE THAT IMPLIES DIRECT CONTACT WITH PATIENTS AND OFTEN AUTONOMOUS PRESCRIBING

CLINICAL PHARMACISTS PER 100 HOSPITAL BEDS



PRACTICING PHARMACISTS IN THE UK, K, 2015 TO 2020



CLINICAL PHARMACIST'S RESPONSIBILITIES

Clinical pharmacists work as part of the general practice team to improve value and outcomes from medicines and consult with and treat patients directly; precise responsibilities include:

- check prescriptions for errors, ensuring the medicine, dosage, form are appropriate and safe for the individual patient
- participate in ward rounds to take patient drug histories
- liaise with other medical staff on problems patients may experience when taking their medicines
- discuss treatments with patients' relatives, community pharmacists and GPs
- answer questions about medicines from within the hospital, other hospitals and the general public
- carry out teaching within the pharmacy department and in other areas of the hospital if CP has substantial experience

Some pharmacists go through a special training to qualify as an independent prescriber

Practice scope of clinical pharmacists in the UK is one of the widest comparing to other countries, with some even prescribing independently

CIVITTA Source: Hospital Pharmacist job profile

EDUCATION: PHARMACY EDUCATION IN THE UK IS ATYPICALLY SHORT FOR THE ESSENTIAL ROLE PHARMACISTS ARE GIVEN IN THE HEALTHCARE SYSTEM

EDUCATIONAL PROCESS FOR A CLINICAL PHARMACIST

Registration process

MPharm (4 years)

- Full-time course integrates **pharmaceutical science into the practice of clinical pharmacy** and equips students with the theoretical knowledge, professional behaviours and clinical skills
- Some universities offer a 5-year integrated programme which incorporates the pre-registration training year into a single programme

Pre-registration work placement (1 year)

The key features of pre-registration training are:

- **pre-registration work under supervision of a tutor** in a community or hospital pharmacy
- it takes at least 52 weeks (if done full time)

Optional: Pharmacist independent prescriber (6 months)

- To qualify as an independent prescriber, one must complete a GPhC-accredited course. The course is part-time and often delivered through a combo of face-to-face and self-directed study
- On successful completion of the course, one receives a practice certificate in independent prescribing
- A pharmacist independent prescriber may prescribe autonomously for any condition within their clinical competence

Regular renewal of a license (annually)

- Continuing Professional Development (CPD) is the process by which pharmacists keep up-to-date through learning
- It is a **mandatory requirement to complete a minimum of nine CPD** entries per year to remain on the GPhC register

To register with the General Pharmaceutical Council, one must complete a **registration assessment** (exam)
The assessment makes sure that all trainees have reached the same minimum standard of ability, no matter where they have trained in Great Britain

Source: Pharmacy Education in the United Kingdom, Pharmacist independent prescriber

INSTITUTIONAL DESIGN: GOVERNMENT HAS ACTIVELY PARTICIPATED IN PROMOTING CLINICAL PHARMACY PRACTICE FROM THE VERY BEGINNING…

HISTORY & CURRENT REGULATION

The official development of CP began **in 1970**, with the **publication of the government-commissioned report** on the Hospital Pharmaceutical Service (Noel Hall report)

- It was **a major facilitator for change**: report stated that hospital pharmacists could no longer be regarded only as dispensers of medicines, they should have a role in ensuring safe and cost-effective use of medicines on the wards

Since then, several influential policy documents have been published; however, there are **no agreed priorities, measures or defined outcomes for the future of hospital clinical pharmacy**

Any licensed pharmacist can become a hospital pharmacist, and, then a clinical pharmacist

There is **no particular license needed for practicing clinical pharmacy**, only the general one; it's a matter of pharmacist's expertise, experience, and training

PHARMACY REGULATION BODIES IN THE UK

Regulatory body

Body	Functions
General Pharmaceutical Council (GPhC)	Main regulatory organisation. Functions include: • setting **standards for the education and training** of pharmacists, and approving and accrediting their qualifications • **maintaining a register of pharmacists** • setting the **standards for pharmacy professionals** • taking action to restrict the ability to practise for pharmacists who do not meet the standards
UK Clinical Pharmacy Association	Main benefits of the professional association: • practitioner-led **education and training** for the pharmacy workforce • support and expertise from the **community** • **pioneering national initiatives** for pharmacy including curriculum development and professional recognition of advanced practice

Source: Evidence for the outcomes and impact of clinical pharmacy: context of UK hospital pharmacy practice, General Pharmaceutical Council, UK Clinical Pharmacy Association

IMPACT: …AND IS DOING IT STILL: EXPANDING CLINICAL PHARMACY IS AMONG THE PRIORITIES OF STATE HEALTHCARE SYSTEM DUE TO ITS PROVEN EFFECTIVENESS

In the last years, the program dedicated to expanding clinical pharmacy service specifically in the primary care was implemented. The pilot scheme for CPs working in general practice launched in 2015 and funded 89 applications from GP federations who recruited more than 450 FTEs to work across 658 GP practices

As part of the program, the National Health Service England funded report, undertaken by experts from the School of Pharmacy at the University of Nottingham. Below are some **findings, regarding the CP efficacy:**

	Direction of impact	Considerations/examples of impact
1	**Financial sustainability**	• **The costs** identified with introducing CP specialists to primary care are most significant in year 1, reducing in year 2 and year 3 – The funding is proportional to the cost or time investment required in the early stages of implementation, dependent on actual costs to sites in the first year • Equally **the effects** of the role develop over time being limited in year 1, especially for those without independent prescribing competency, but increase over the second year to a point of autonomous work and self-sustainability in year 3 • Over the 9-month period for which data were available, the 5.4 FTE pharmacists operating in GP practices identified 23 172 interventions. 95% of interventions identified reportedly resulted in savings of around £1 000 000 • That means, **every FTE clinical pharmacist saved around 24 K EUR a month**
2	**Patient health & GP time**	• Clinical pharmacists significantly increase patient appointment capacity and reduce pressure on GPs • By placing a clinical pharmacist in GP surgeries it has **reduced the need for patient GP appointments by 30%**, making a significant impact on GP workloads and patient outcomes

CIVITTA Source: Clinical Pharmacists in General Practice: Pilot scheme

CONCLUSIONS: UK CLINICAL PHARMACY IS ONE OF THE MOST DEVELOPED IN THE WORLD, WHICH IS GROUNDED BY THE GOVERNMENT FUNDING AND POLICY SUPPORT

1

- Clinical pharmacy in the UK is a long-standing practice, which has been started in 1970s and keeps actively developing to this day
  - **Government has been active** in terms of policy-making from the very beginning, and today expanding clinical pharmacy is among the priorities of state healthcare system due to its proven effectiveness
- Clinical pharmacists perform a **broad range of functions**, many have **independent prescribing competency** as part of healthcare teams in all types of clinical facilities

2

- **Pharmacy education in the UK is atypically short** for the essential role pharmacists are given in the healthcare system
  - Nonetheless, it includes ample practice time, and to acquire prescribing rights pharmacists must undertake an additional training
- In the last years, the scheme for **expanding clinical pharmacy service in the primary care** specifically was in the progress

AGENDA

1. Հետազոտության հիմնական արդյունքներ
2. Հայաստանյան շուկայի հետազոտություն
3. **Միջազգային շուկայի հետազոտություն**
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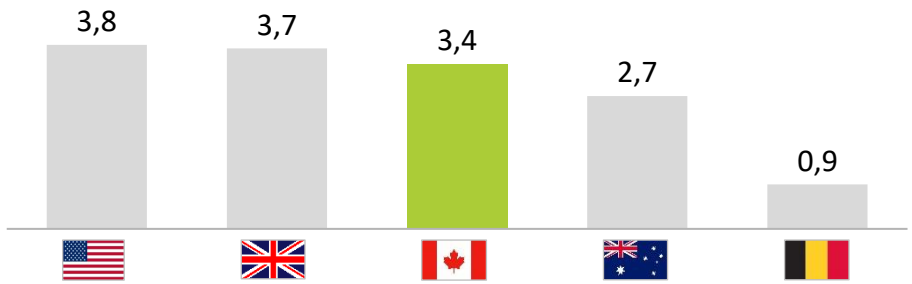
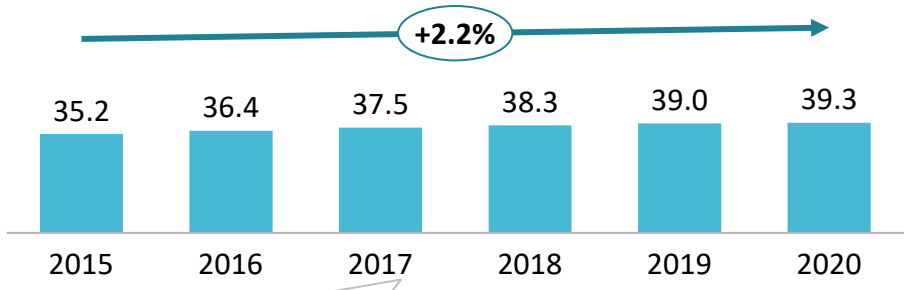
4. Հավելվածներ

OPERATIONS: CLINICAL PHARMACISTS' FUNCTIONS ARE QUITE VAST AND AN ESSENTIAL PART OF HEALTHCARE SYSTEM; SCOPES OF PRACTICE VARY ACROSS CANADA

CLINICAL PHARMACISTS PER 100 HOSPITAL BEDS



PRACTICING PHARMACISTS IN CANADA, K, 2015 TO 2020



- The demand for pharmacists in general is constantly growing
- Number of inpatient clinical pharmacists in Canada is smaller compared to the US, however, they have an **established and constant place in the healthcare system**

CLINICAL PHARMACIST'S RESPONSIBILITIES

Clinical pharmacists (CP) are present throughout the treatment process along with other healthcare professionals:

- Upon the admission of the patient, medical reconciliation with all the patient's medications (prescription and over-the-counter) is done by CP
- Doctor diagnoses a patient with condition, prescribes something or already goes to CP to choose the best medication
- Prescription goes to CP for approval to check for therapeutic appropriateness, dosage, possible medication interactions
- If any problems with the treatment arise, CP comes up with a solution to modify the treatment

More recently **the concept has been extended from hospitals to ambulatory patients**

- Community pharmacists assess the appropriateness of prescriptions, educate patients about the medications and disease states prior to releasing the prescriptions, monitor the effectiveness of prescription medications

In Canada, **the doctor mainly focuses on diagnostics part, and CP on selection and managing of specific medication**

CIVITTA Source: expert interviews

IMPACT: CLINICAL PHARMACY IMPOVES EFFECTIVENES OF HEALHCARE SYSTEM AS A WHOLE, AFFECTING BOTH PATIENTS' HEALTH AND EXPENSES

ESSENSE OF CLINICAL PHARMACY IMPACT ON HEALTHCARE SYSTEM

CP is responsible for checking the appropriateness of chosen medication, optimization of the treatment

Initially

- ↓ expenses on medicines (correct dosage)
- ↓ physician time spent per case (each specialist works in their area of expertise, which is more efficient)
- ↑ patient result (better precision of chosen medicine)

Consequently

- ↓ readmission rate
- ↓ adverse and side effects
- ↓ healthcare system time & funds spent per patient:
  - time of hospital staff
  - general hospital expenses
  - expenses on additional medicines

In case of adverse effects, CP takes over solving the issue, using their expertise to the fullest

EXPERT OPINION & IMPACT ESTIMATION

According to expert estimates, **clinical pharmacists activity saves Canadian healthcare system:**

~300$
per every hospital patient

*"The healthcare system is public, so **government here gets the direct financial benefit** from clinical pharmacy functioning"*

*"In Armenia **standard treatment guidelines are not really followed**, doctors prescribe different medicines for identical cases, combine vital medicine with supplements in their prescriptions. Patients are not sure what to do and due to a lack of funds may not buy essential meds, which means the **patient burden on the healthcare system would persist for longer**. Clinical pharmacists in Armenia would be very effective for helping with the issue"*

EDUCATION: EDUCATIONAL SYSTEM RELIES HEAVILY ON PUBLIC FUNDING AND GRADUALLY UNIFIES ACROSS THE COUNTRY

The Canadian system for health professional education is characterized by a **strong, research intensive public university system** with no private standalone schools of pharmacy, and the **public sector universities having good funding**

OPTIONS OF EDUCATIONAL PROCESS FOR A CLINICAL PHARMACIST

1. **BPharm (4 years)** Min. qualification to practice pharmacy → **Pharm.D. (4 years)** Post-professional degree → **Residency (1-2 years)**

2. **Prerequisite courses (2-4 years)** Base for a professional degree → **Pharm.D. (4 years)** Min. qualification to practice pharmacy → **Residency (1-2 years)**

Licensing process

- **Many hospitals prefer when pharmacists have completed pharmacy doctor courses or clinical residency, but it's not a must**
  - There are over 30 accredited residency programs (>100 graduates/year)
  - Residency capacity is an issue in Canada as well as in the US

ADDITIONAL NOTES

- Educational process for becoming a clinical pharmacist **varies across provinces**
- **Pharmacy curricula in the US and Canada are mostly similar** (many clinical pharmacy subjects, such as pharmacotherapy, therapeutics, pharmaceutical care, medication calculations and skills-based lab courses)
- **Any pharmacists (community & hospital) must get a license to practice**. It's not granted just upon graduation, one needs to take a Board exam, then apply to provincial regulatory body where the final decision on granting the license is made
- Recent trend for clinical pharmacists is to choose certain area of practice as a specialization. Pharmacist specialization is not formally recognized in Canada, CPs can perform in each area through a regular license; however, there are **numerous specialized educational courses available**, provided by universities or associations

CIVITTA

Source: Education of Pharmacists in Canada, Comparison of professional pharmacy degrees and health systems in United States, Canada, Spain and Mexico

INSTITUTIONAL DESIGN: REGULATION SYSTEMS VARY SIGNIFICANTLY ACROSS DIFFERENT PROVINCES

HEALTHCARE SYSTEM REGULATION IN CANADA

There is a constitutionally defined separation of powers between the federal (national) and provincial governments

FEDERAL GOVERNMENT
- establishing standards for health care
- providing financial support

PROVINCES
- administering health care and post-secondary education

A patchwork of different regulations and educational and licensure requirements exist

- E.g., in some cases it might be easier and quicker for a pharmacist educated in British Columbia to become licensed in Washington State than for that pharmacist to become licensed in the province of Quebec

PHARMACY REGULATION IN CANADA

Regulatory body

Body	Functions
National Association of Pharmacy Regulatory Authorities	NAPRA has a mandate from its membership to work on their behalf in certain areas such as: • Creating national standards and guidelines • Engaging in dialogue with government agencies and various health-related professional organizations
Provincial Colleges of Pharmacy (13 total, 1 for each province and territory)	College of Pharmacy is a regulatory body; every pharmacist in Canada is registered with one of such, since they grant licences
Professional Associations and Societies	Associations are not regulatory, but do a lot to promote clinical pharmacy development They provide trainings, establish practice standards and KPIs for clinical pharmacists, etc.

Source: Pharmacy Regulation in Canada

INSTITUTIONAL DESIGN: THE ELEMENT OF STANDARDIZATION IN HOSPITAL CLINICAL PHARMACY OPERATION IN CANADA IS THE SYSTEM OF CPKPIs

A group of hospital pharmacists, in cooperation with CSHP developed a core set of cpkpis with the goal of advancing clinical pharmacy practice to improve patient outcomes

1. **Medication reconciliation on admission**
   Share of patients who receive documented admission medication reconciliation and resolution of identified discrepancies by a pharmacist
2. **Pharmaceutical care plan**
   Share of patients for whom a pharmaceutical care plan was developed and initiated
3. **Medication therapy problems**
   Number of medication therapy problems addressed by a pharmacist per admission
4. **Interprofessional patient care rounds**
   Share of patients for whom pharmacists participate in interprofessional patient care rounds
5. **Patient education during hospital stay**
   Share of patients who receive education about their disease and medications during hospital stay
6. **Patient education at discharge**
   Share of patients who receive medication education by a pharmacist at discharge
7. **Medication reconciliation at discharge**
   Share of patients who receive documented discharge medication reconciliation and resolution of identified discrepancies by a pharmacist
8. **Bundled patient care interventions**
   Share of patients who receive comprehensive direct patient care from a pharmacist working in collaboration with the health care team

PATIENT ADMISSION
1. Medication reconciliation on admission

PATIENT AT THE HOSPITAL
2. Pharmaceutical care plan
3. Medication therapy problems
4. Interprofessional patient care rounds
5. Patient education during hospital stay

PATIENT DISCHARGE
6. Patient education at discharge
7. Medication reconciliation at discharge

8. BUNDLED PATIENT CARE INTERVENTIONS

\ CONCLUSIONS: CANADIAN CLINICAL PHARMACY SYSTEM IS QUITE SIMILAR TO THE US AND IS ONE OF THE MOST DEVELOPED IN THE WORLD

1

- Clinical pharmacists (CP) are **integral members of healthcare teams** present throughout all the treatment process
  - Doctor mainly focuses on diagnostics part, and clinical pharmacist – on selection and managing of specific medication
  - According to various estimates, clinical pharmacists save Canadian healthcare system around 400$ per every hospital patient
- Regulation systems vary significantly across different provinces, as a result **a patchwork of different regulations** and educational and licensure requirements exist

2

- The Canadian system for health professional education is characterized by a **strong, research intensive public university system** with no private standalone schools of pharmacy, and the **public sector universities having good funding**
- **Pharmacy curricula in the US and Canada are mostly similar** (many clinical pharmacy subjects, such as pharmacotherapy, therapeutics, pharmaceutical care, medication calculations and skills-based lab courses)
- Recent trend for clinical pharmacists is to choose certain **area of practice as a specialization**

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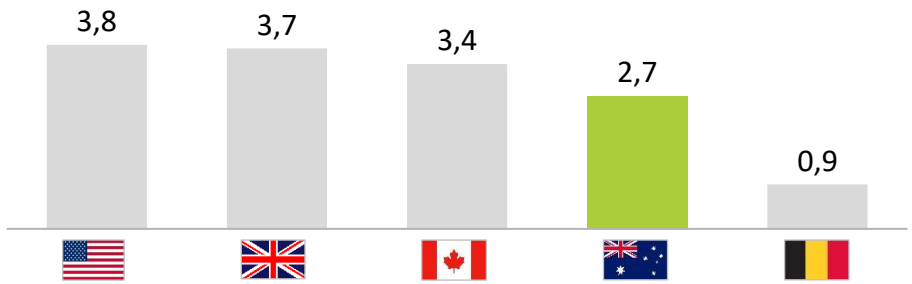
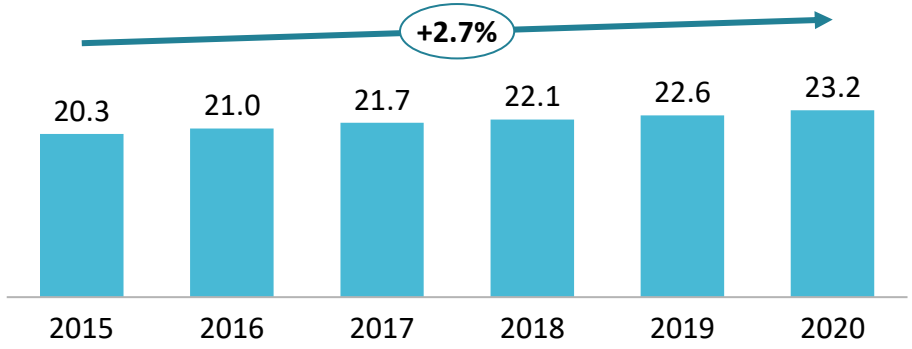
OPERATIONS: IN AUSTRALIA, BOTH COMMUNITY AND HOSPITAL CLINICAL PHARMACY SYSTEMS ARE WELL-DEVELOPED AND WIDESPREAD

CLINICAL PHARMACISTS PER 100 HOSPITAL BEDS



PRACTICING PHARMACISTS IN AUSTRALIA, K, 2015 TO 2020



CLINICAL PHARMACIST'S RESPONSIBILITIES

HOSPITAL PHARMACISTS

- Activities within hospital pharmacy can include ensuring medication is supplied to the relevant parts of the wards, performing clinical pharmacy activities in the wards, ensuring the appropriateness and safety of medications prescribed, and interacting with ward nursing and medical staff to discuss patient needs, discharge counselling

COMMUNITY PHARMACISTS clinical services include:

- Home Medicines Review for independent patients and nursing home residents based on a referral letter from their doctor: CP goes to patient's home, checks every medication they are on and compare it to the referral letter from the doctor; afterwards, they write a report to the doctor
- Visiting nursing home: CP assesses medication plans for everyone living in the home and discusses this plan with their carers, organizes lectures for carers regarding the medication they use

In Australia, pharmacists perform clinical functions **in hospitals** as part of a healthcare team and **in community** as self-standing specialists

CIVITTA Source: expert interviews, Pharmacy Practice in Australia

EDUCATION: AUSTRALIA HAS A WELL-DEVELOPED PHARMACY EDUCATION SYSTEM WITH AMPLE PRACTICE-ORIENTED HOURS AND CONTINUOUS TRAINING

EDUCATIONAL PROCESS FOR A CLINICAL PHARMACIST

Licensing process

Pharmacy degree (4-6 years)
Mostly undergraduate programs

OPTION 1

BPharm (4 years)

OPTION 2

Bachelor's degree in related discipline

+

MPharm (2 years)

Meant for students with ample knowledge of the basic science subjects taught during the first years of BPharm

Internship (1 year)
Pre-registration training period

Difference to the US model:

- Pharmacists are required to have at least one year of formal work experience in a pharmacy setting before residency program

Residency (2 years)

- In 2017, SHPA's launched first pharmacy residency in Australia
- The concept is not widespread yet: there are currently ~200 registered residents across 44 hospitals

Postgraduate clinical pharmacy training (1.5 - 5 years)

- Several pharmacy schools offer postgraduate pharmacy training in form of Graduate Certificate, Graduate Diploma, Master and Doctor of Clinical Pharmacy
- The curriculum contains pharmacotherapy and patient care, evaluation and research, leadership and management

Courses are designed for pharmacists practicing in a clinical environment, and are usually offered as part-time, distance learning

To register with the Pharmacy Board of Australia, a person will need:

- recognized pharmacy degree from an accredited program,
- completed 1824 hours of approved supervised practice,
- undertook an Internship Training Program and passed the designated exams held by the Board

The **quality of pharmacy education** and training in Australia is **regulated and monitored by several governmental and professional organizations** to ensure its standard

Source: Pharmacy education in Australia with a special focus on clinical pharmacy education

INSTITUTIONAL DESIGN: AS IN THE OTHER COUNTRIES, IN AUSTRALIA REGULATION FRAMEWORK IS PRESENTED BY REGULATORY BODIES AND PROFESSIONAL SOCIETIES

PHARMACY REGULATION IN AUSTRALIA

Regulatory body

Body	Functions
Pharmacy Board of Australia (working under the Australian Health Practitioner Regulation Agency)	• Registering pharmacists and students • Developing standards, codes and guidelines for the pharmacy profession • Handling notifications, complaints, investigations and disciplinary hearings
Australian Pharmacy Council	National accreditation authority for pharmacy education and training: • Accredit pharmacy programs in Australia • Assess the competency of Australian pharmacy interns • Assess the skills of pharmacists who qualified outside Australia
Professional Associations and Societies: • **Society of Hospital Pharmacists** – clinical pharmacists • **Pharmaceutical Society of Australia** – pharmacists from all sectors	Such organizations develop **practice standards**, promote knowledge sharing, provide additional trainings, etc.

Clinical pharmacy in Australia has been guided through the development and update of the Standards of Practice for Clinical Pharmacy, published in 2013

STANDARDS OF PRACTICE[1]

- Provide general guides of practice
- Provide tools for self-assessment
- Provide guidance on the staffing levels required to provide optimal services

Source: Standards of practice, Pharmacy Board of Australia

IMPACT: IT IS A MATTER OF FINDING THE RIGHT PLACE FOR A CLINICAL PHARMACIST IN A HEALTHCARE SYSTEM TO MAKE THEIR ROLE THE MOST BENEFICIAL

KEY DIRECTIONS OF CLINICAL PHARMACIST'S POSITIVE IMPACT*

PATIENTS

When patients have to take multiple medications they get confused, and want to know why they need to use specific meds. The chance for adverse effects is significantly higher

With help of clinical pharmacists, patients become more aware of their medications and can better monitor the side effects.

DOCTORS

The majority of time you would find that medication compliance is very low. Even though the doctor prescribes the meds, and the patient is saying they are using it, you would find 40-50% of patients are actually not. CPs services can give a hint for why a health issue of the particular patient is not getting better.

Thanks to a clinical pharmacist, doctor becomes more aware of what the patient uses. So, the benefit for the doctor is identifying the problem of the patient without additional appointments or surgeries

GOVERNMENT

CPs work directly effects several important macro indicators: decreases the mortality rates, reduces the number of hospitalization by reducing the adverse effects

**Expert opinion*

CASCADE PRESCRIBING

- ↓ doctor prescribes a medicine
- ↓ patient experiences side effects
- ↓ instead of changing the initial medication, the doctor prescribes a new one to solve the side effect
  - the patient uses 2 meds, which might cause new side effects

For every $1 invested into hospital pharmacy services, approximately **$23 is saved** in the Australian healthcare system

- ↓ length of stay
- ↓ readmission risk
- ↓ need for medical procedures
- ↑ increased safety
- ↑ quality of medicines use

CIVITTA Source: expert interviews, Hospital pharmacy workforce at a glance

CONCLUSIONS: AUSTRALIAN CLINICAL PHARMACY IS A WELL-ESTABLISHED AND CONTINUOUSLY DEVELOPING ONE

1

- In Australia, both **community and hospital clinical pharmacy systems are well-developed** and widespread
  - Functions of CPs in hospitals are similar to the other developed systems, and include taking a medication history, medication reconciliation on transitions of care, medication review, provision of up-to-date medication lists and counselling to patients

2

- **Educational system for pharmacists is practice-oriented**: the residency is a relatively new thing for Australia, but the required before practice year of internship is a long-standing feature
- The institutional order is set closely to other advanced countries, presented by **regulatory bodies and professional societies**, which bring benefit by introducing practice standards, promoting knowledge sharing, providing additional trainings, etc.

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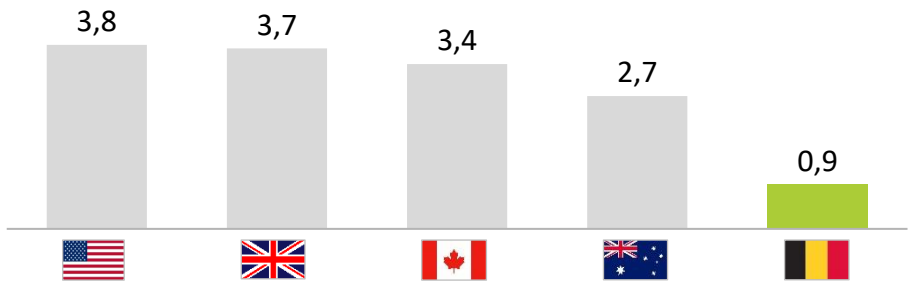
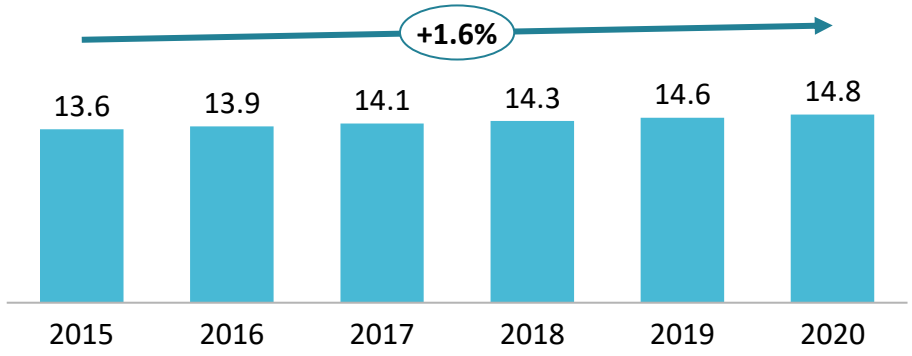
\ OPERATIONS: CLINICAL PHARMACY ESTABLISHMENT WAS QUITE RECENT; THERE ARE NOT MANY CPs TODAY, BUT THE NUMBER OF DESIGNATED POSITIONS KEEPS GROWING

CLINICAL PHARMACISTS PER 100 HOSPITAL BEDS



WORKFORCE OF PHARMACISTS IN BELGIUM, K, 2015 TO 2020



CLINICAL PHARMACIST'S RESPONSIBILITIES

- Hospital pharmacists, recognized and registered by the Belgian government, are only authorized to deliver medication, all kind of devices or substances for diagnostic purposes prescribed by the patient's doctor; they do not have any contact with patients directly
- **Clinical pharmacy is a relatively new practice in Belgium**; the first pilot program aimed at development clinical pharmacy functions in the hospitals was introduced in 2007 and involved 27 specialists
- In hospitals, clinical pharmacists are active on the wards, where they **analyse the patient pharmacotherapy having full access to medical and laboratory data**. They recommend medication therapy changes with regard to efficacy, safety, costs, and patients' preferences, and answer questions concerning medications. Clinical pharmacists can also be implicated in medication reconciliation, patient counselling, and education of other health care providers

Clinical pharmacists in Belgium are not numerous yet, the practice is still actively developing; **the functions of clinical pharmacists in the country mostly** align with the best international practices (prescribing is not within the scope)

CIVITTA Source: Development of clinical pharmacy in Belgian hospitals through pilot projects funded by the government

EDUCATION: HOSPITAL PHARMACISTS MUST UNDERTAKE LIFELONG LEARNING; THERE IS A FRAMEWORK FOR ACCREDITATION SPECIFICALLY FOR HOSPITAL PHARMACISTS

EDUCATIONAL PROCESS FOR A CLINICAL PHARMACIST

Registration process

General

Bachelor in Pharmacy (3 years) + Master in Pharmacy (2 years)
Min. qualification to practice as a community pharmacist

- The Bachelor's degree in Pharmacy offers theoretical knowledge and practical training in field of pharmaceutical sciences. The students have courses of organic and inorganic chemistry, biochemistry, pharmacology, physiology, etc.
- Master's program includes 6 months of training in a community pharmacy

Government provides a limited pay for students during the practice years

Master in Hospital Pharmacy (3 years)
Mandatory requirement to practice in hospital setting

Access is limited by a selection test, taking into account study results during previous years (~50 entrants a year)

The program is composed of:

- 1 academic year
- 2 years (3500 hours of practical training) of hospital internship in the following modules:
  - Distribution
  - Nosocomial Infections
  - **Clinical Pharmacy**
  - Preparations

Hospital pharmacists

Regular renewal of a license (every 5 years)

- Recognition as hospital pharmacists must be renewed and conditions to be renewed include continuing training
- Over each 5-year period, a hospital pharmacist must earn accreditation points in the following domains: organization and management of the hospital pharmacy, control and prevention of infections, pharmacotherapy, hospital technology, and radiopharmaceuticals

CIVITTA Source: expert interviews

INSTITUTIONAL DESIGN: REGULATION SYSTEM IN BELGIUM IS ARRANGED SIMILARLY TO OTHER COUNTRIES WITH DISTINCT REGIONAL BODIES

PHARMACY REGULATION IN BELGIUM

Regulatory body

Body	Functions
Federal Public Service Health, Food Chain Safety and Environment	General regulation of a pharmacist profession The Federal Public Service Health, Food Chain Safety and Environment (FPS Health) registers and delivers a licence number that authorises hospital pharmacists access to practise
Order of Pharmacists: • **10 Provincial Councils** • **2 Boards of Appeal** • **National Council**	Pharmacists must be registered on the list of the competent Order of Pharmacists to get a license and practice
Belgian Association of Hospital Pharmacists (BAHP): • **Association of Belgian Hospital Pharmacists (AFPHB)** – French • **Flemish Association of Hospital Pharmacists (VZA)** – Dutch	Associations represent **more than 1300 hospital pharmacists** in 163 hospital pharmacies across Belgium • organise educational events for hospital pharmacists and associates • facilitate communication and exchange of expertise • encourage an integral approach of patient care and contribute as an association by collaborating fully with other healthcare authorities

Source: expert interviews, Federal Public Service Health, Food Chain Safety and Environment

ESTABLISHMENT: IT TOOK AROUND 10 YEARS FOR BELGIAN CLINICAL PHARMACY ENTHUSIASTS TO GET PROFESSION RECOGNIZED ON A FEDERAL LEVEL

CLINICAL PHARMACY ESTABLISHMENT IN BELGIUM

2004

Belgian Association of Hospital Pharmacists **requested the federal government** to finance pilot projects **for the development of clinical pharmacy**, based on the positive experience of a few teaching and non-teaching hospitals in Belgium

2006

The government agreed to start up funded clinical pharmacy projects and dedicated an amount for the salary of 20 full-time hospital pharmacists within the hospital budget

2007

The budget for starting up pilot projects was liberated, and a national **Advisory Working Group on Clinical Pharmacy** was started; the group consisted of members of the Belgian Government and practicing clinical pharmacist, pharmacologists and physicians. They were responsible for the selection, evaluation, and guidance of the pilot projects and for reporting the results to the government

All hospitals in Belgium were informed about the pilot projects and could apply for a full-time or half-time clinical pharmacist

Out of 80 submissions, **27 hospitals were selected**. Criteria for selection were a multidisciplinary approach, patient-oriented interventions, seamless pharmaceutical care, documentation of interventions

2009

27 projects of clinical pharmacy were permanently established, the positive outcomes resulted in an increased budget for the pilot projects toward 54 hospitals

2014

It was decided to **inject a budget for 0.25 full-time equivalent (FTE) of clinical pharmacists per 200 beds** in general and academic/university hospitals

Currently, the minimum number of pharmacists is set by law at 1 per 150 beds (and hospital funding is contingent upon meeting this minimum)

CIVITTA Source: Development of clinical pharmacy in Belgian hospitals through pilot projects funded by the government

CONCLUSIONS: CLINICAL PHARMACY ACTIVELY DEVELOPS IN BELGIUM; GOVERNMENT CONTROLS THE CONSISTENCY OF ITS DEVELOPMENT

1

- **Clinical pharmacy is still a developing practice in Belgium**, and the number of specialists is not significant yet
- The functions of clinical pharmacists in the country are quite wide and align with the best international practices
- To practice as a clinical pharmacist, one must complete **a dedicated Masters degree:**
  - Access is limited by a selection test (~50 entrants a year) and is growing in accordance with the country's needs
  - Government financially supports students during the studies
- Hospital pharmacists must undertake **lifelong learning to maintain their accreditation**

2

- It took around 10 years for Belgian clinical pharmacy enthusiasts **to get profession recognized on a federal level**
  - An expert group was responsible for the selection, evaluation, and guidance of the pilot projects and for reporting the results to the government
  - Establishment of clinical pharmacy was gradual and relied on proven results of its effectiveness

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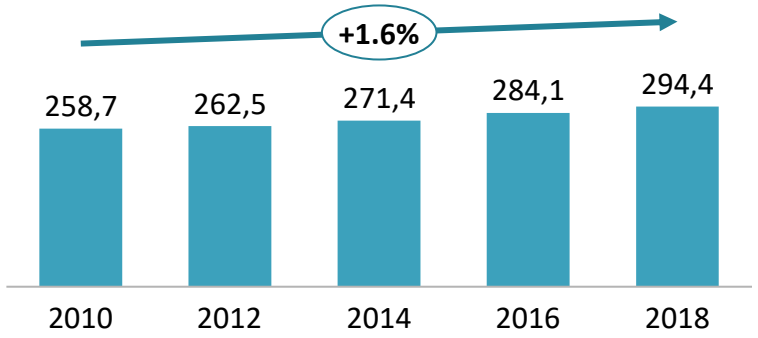
OPERATIONS: CLINICAL PHARMACISTS' FUNCTIONS ARE SIMILAR TO THAT OF GENERAL HOSPITAL PHARMACISTS, WITH MANY TECHNICAL ASPECTS

WORKFORCE OF PHARMACISTS IN JAPAN, K, 2010 TO 2018



~55K pharmacists work in the hospitals

- To become a clinical pharmacist, the first step is to work at a hospital that provides medication management guidance (not every hospital has such position)
- **The number of job offers is small**

CLINICAL PHARMACIST'S RESPONSIBILITIES

- The hospital pharmacist mainly handles the dispensing of medicines (pharmacy technicians don't exist in Japan), medication guidance, and medication history management. Tasks related to inpatient **medication management guidance** include interviews with hospitalized patients to confirm their current medication use, and checks for medication interactions, history of allergies and adverse effects
- Before medication administration, pharmacists review the patient's medical card to confirm that the dosage, rate of administration, and potential for medication interactions are appropriate
- After the medications are administered, pharmacists monitor effects through direct interaction with patients, sharing of information with other medical professionals, and, when necessary, providing suggestions for further prescriptions. Pharmacists also instruct patients on how to continue taking their medications after discharge, in accordance with individual lifestyle

Clinical pharmacy in Japan is not fully developed. Japanese "clinical pharmacists" don't differ significantly from hospital pharmacists, bearing a lot of technical functions, while having limited impact on the prescription decision-making

CIVITTA Source: Pharmacy Practice in Japan

\ ESTABLISHMENT: CLINICAL PHARMACY HAS BEEN SLOWLY DEVELOPING FOR A LONG TIME, BUT NUMBER OF DEDICATED SPECIALISTS IS STILL RELATIVELY LOW

CLINICAL PHARMACY ESTABLISHMENT IN JAPAN

1970s Chief tasks of the hospital pharmacist were **focused in the dispensary**

Pharmacists' jobs have moved from the pharmacy to the wards

1988 At that time, medical facilities with more than 300 beds, a medication information room, and 2 drug information pharmacists (involved in the management of pharmaceutical information) were eligible to implement a **reimbursement system for pharmacists for certain services**—providing drug information to doctors or nurses, assisting with drug administration, preparing injectable drugs—on a "per inpatient per month" basis

1994 **New system of fees for inpatient drug management guidance** was started, without the requirement for specific bed numbers: the main requirement was the presence of 2 full-time pharmacists, with one of these pharmacists working in drug information

In addition, **medical remuneration points were increased**, and the relevant tasks became critical parts of a hospital pharmacist's duties

2012 Tasks of hospital pharmacist teams and pharmacists working in hospital wards have recently been recognized, which resulted in the introduction of "ward pharmacist implementation addition fees" in 2012

New facility regulations include **allowances for dedicated pharmacists for each ward** (20 dedicated pharmacist-hours per week for each ward)

2014 **Points were newly added** for pharmacists' work in hospital wards, to reduce physicians' tasks and to promote team medicine in hospital wards

Pharmacists are expected to communicate with patients and to become involved in optimal control of drug therapy as members of the medical team in hospital wards. However, still not many hospitals have dedicated medication management guidance staff

CIVITTA Source: Pharmacy Practice in Japan

EDUCATION: JAPANESE EDUCATION FOR PHARMACISTS WAS REFORMED TO PROVIDE STUDENTS WITH MORE PRACTICAL EXPERIENCE

EDUCATIONAL PROCESS FOR A CLINICAL PHARMACIST

Licensing process

Bachelor degree in Pharmacy (6 years)
Min. qualification to practice pharmacy

In 2006 the Japanese pharmaceutical curriculum was **extended from 4 to 6 years**, and Model Core Curriculums (account for 70 % of the curriculum of each university; the remaining 30 % - original curriculum of each university) were introduced

- **Pre-clinical communication-skills training of pharmacy practice for the 4th-grade** pharmacy students
- In the 4th year the students are required to pass standardized national examinations: clinical examination for practical skills
- In the 5th year, students who have passed these national exams go through **training in hospital and community pharmacies** for 2.5 months each

Residency (1-2 years)
Required credential for entry-level health-system pharmacy practice

- Pharmacy residency training programs are **not widespread**
- **The programs are not officially approved** and are managed by individual institutions
- Similar in **organization and scope** to residency training programs **in the US and Canada**
- At most of the hospitals offering residency programs, the budget designated for part-time pharmacists is utilized for pharmacy residents, residents receive salaries similar to those of part-time pharmacists
- **Current problems include** necessity of program approval by a third party (such as a professional society) and budget constraints

Specialized courses provided by associations and societies

- As a member of medical care team, hospital pharmacists are required to have the latest knowledge and expertise in order to provide better treatment to their patients
- After passing certain trainings pharmacists can get certified by pharmacist professional associations and academic societies as **specialized pharmacists**

After graduation from the 6-year program, students must pass a national licensing examination to become a pharmacist

Source: Evaluation of pharmacy practice program in the 6-year pharmaceutical education curriculum in Japan: hospital pharmacy practice program, List of universities with pharmacist training courses

INSTITUTIONAL DESIGN: MINISTRY OF HEALTH IS THE ONLY BODY REGULATING LEGAL ASPECTS OF PHARMACY PRACTICE

PHARMACY REGULATION IN AUSTRALIA

Regulatory body

Body	Functions
Ministry of health, labour and welfare	Regulatory body issuing licenses to newly graduated pharmacists
Professional Associations and Societies	Numerous organisations specializing in various pharmacy directions provide specialized courses for practicing pharmacists • **Japan Hospital Pharmacist Association -** the most relevant association

一般社団法人
日本病院薬剤師会
Japanese Society of Hospital Pharmacists

- The Japanese Society of Hospital Pharmacists (JSHP), is an organization whose membership comprises pharmacists and other professionals who work at hospitals, clinics and long-term care facilities
- The JSHP carries out a variety of activities through the members' voluntary efforts to enhance their professional skills and knowledge, promoting lifelong education to train and foster pharmacists capable of handling the latest medicine
- Each month, the JSHP publishes The Journal of Japanese Society of Hospital Pharmacists, and introduces academic papers written by members, as well as the latest information on medicine use, and hospital pharmacists such as the JSHP Newsletter and training reports

Source: About application procedure of pharmacist license, Japanese Society of Hospital Pharmacists

CONCLUSIONS: CLINICAL PHARMACY IS NOT AS DISTINCTIVELY FORMED IN JAPAN AS IT IS IN THE OTHER COUNTRIES

1

- Clinical pharmacy in Japan **is not distinctively developed**
  - The **number of job offers for clinical pharmacists is small**
  - Functions in “medication management guidance” are not as wide as of specialists in the other countries and mostly consist of general hospital pharmacists’ obligations
- **The educational system** was reformed in the 2000s **to include more practice-oriented hours** and make graduates more suited for communicating with the patients, however, it **hasn’t led to a respective shift in the services provided**

2

- The foundation is laid for further development and separation of clinical pharmacy in the country, with a more practice-oriented educational system and multiple professional associations in place
- A constantly growing need for medical staff (due to the rate of population aging) is likely to drive the widening of pharmacists’ functions in patient care in the nearest future

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OPERATIONS: CLINICAL PHARMACY IN BELARUS IS ONLY REALLY DEVELOPING ON THE PAPER, LACKING SOME CRUCIAL GUIDANCE

! There is no true clinical pharmacy in Belarus; core functions of a clinical pharmacist are performed by clinical pharmacologists

- **2008** Order to establish clinical pharmacology service (incl. core functions of clinical pharmacy)
- **2009** Qualification requirements for clinical pharmacologists developed
- **2017** **Order on the organization of the work of a clinical pharmacologist in a healthcare organization**[1]

CLINICAL PHARMACOLOGIST CORE RESPONSIBILITIES

- Consults doctors and patients to rationalize pharmacotherapy
- Tracks the use of medicines in the clinics
- Actively participates in solving the cases with adverse effects / resistance to treatment
- Educates other healthcare staff on new discoveries in pharmacology

DISTINCTIVE FEATURES AND LIMITATIONS OF THE SYSTEM

1. Clinical pharmacologists have **no administrative power in the decision-making on the hospital medicines policy**
2. Clinical pharmacologists **don't have to complete a bachelor/masters degree in pharmacy**. Clinical pharmacologist positions are taken by doctors, who graduated from the general medicine and pediatrics faculties of medical universities
3. There is an **officially set requirement for clinical pharmacologists staffing**: every hospital with **300+ beds must have at least 1 CP**
    - Such standard is **disproportionate**: hospitals with 400 and 1000 beds would be legally required to hire the same number of specialists
    - Due to a lack of specialized workforce, often the post is **taken by doctors of other specialties**, in some organizations – on a half- or quarter-time basis (just to fit with the legal requirement)

There is a **notable disconnect between the legislatively proposed standards and their real-life implementation**. On the front, the system fairly resembles successful international practices, but its effectiveness is low

CIVITTA Source: Order on the organization of work of a doctor of a clinical pharmacologist of a healthcare organization, Clinical pharmacology and rational pharmacotherapy: a multidisciplinary approach

EDUCATION: EDUCATIONAL SYSTEM IS FAR FROM BEING DEVELOPED; SERIOUS CHANGES NEED TO TAKE PLACE IN GENERAL PHARMACISTS' EDUCATION

OPTIONS FOR EDUCATION IN CLINICAL PHARMACY

	1 Retraining in clinical pharmacology (4 months)	2 Advanced training in specific topics of clinical pharmacology practice (2-4 weeks)
DESCRIPTION	Retraining is considered an accelerated option for additional higher education Development of professional competencies, w/o basic disciplines → reduced length	Courses are devoted to topical issues of the rational use of medicines in general therapeutics and narrower specialties, and are focused on the practical needs of healthcare
AVAILABLE FOR	Doctors who graduated from the general medicine and pediatrics faculties of medical universities	Clinical pharmacists, deputy chief doctors, GPs, operating surgeons, urologists, gynecologists, residents, pharmacists
CAPACITY	~ 12 course participants a year	~ 140 course participants a year
	Allows to take on the post of a hospital clinical pharmacologist	Increases specialist's qualification; **doesn't allow to become a clinical pharmacologist**

INSIGHTS

- Undergraduate or postgraduate **degrees in clinical or hospital pharmacy are not present** in Belarus
- The only options for practicing in the field of clinical pharmacy:
  - completing a **retraining program** as a practicing specialist
  - completing a **residency** in clinical pharmacology
- Some clinical pharmacy hours are taught in the curricula of various degrees; however, the number of hours is limited and is reducing every year

Courses are provided by the Department of Clinical Pharmacology and Pharmacotherapy of the Bel. Medical Academy of Postgraduate Education

Source: Department of Clinical Pharmacology and Pharmacotherapy

\ CONCLUSIONS: CLINICAL PHARMACY IS NOT RECOGNIZED BY BELARUSIAN STATE, A LOT COULD BE DONE TO INTRODUCE ITS POTENTIAL POSITIVE IMPACT

1

- The development of clinical pharmacy in Belarus is stagnating: first steps were taken in the late 2000s, and the system is very far from functioning fully and successfully
- It appears that the crucial guidance from the motivated experts is lacking: the legal requirements are disconnected from reality, proper educational system for pharmacists in a hospital setting is not in place
  - Undergraduate or postgraduate degrees in clinical or hospital pharmacy are not present in Belarus
  - Legal requirements for CP staffing are not effective
  - There is no professional society or association promoting the development of CP; the only close thing is the aforementioned Department of Clinical Pharmacology and Pharmacotherapy (10 staff members)

2

- First solutions for making such system more effective could include:
  - Most importantly: shift of general pharmacy education to a more patient-oriented approach & ensuring the continuous education for practicing clinical pharmacists
  - Changing the formulation of the requirement for CPs per bed: experts assess the minimal need in Belarus to be at 1 CP for *every* 250-300 beds
  - Information dissemination among hospitals on the potential use of pharmacists performing clinical functions

AGENDA

1. Executive Summary
2. Armenian Market Research
3. International Market Research
4. **Appendices**

SOURCES

- Evolution of Clinical Pharmacy in the US and Future Directions for Patient Care
- Overview of the History of Hospital Pharmacy in the United States
- Clinical pharmacists: practitioners who are essential members of your clinical care team
- Relationship between the number of hospital pharmacists and hospital pharmaceutical expenditure
- Standards of Practice for Clinical Pharmacists
- A review of American pharmacy: education, training, technology, and practice
- The Pharmacist Workforce in the U.S.: Supply, Distribution, Education Pathways, and State Responses to Emergency Surges in Demand
- American College of Clinical Pharmacy

- Evidence for the outcomes and impact of clinical pharmacy: context of UK hospital pharmacy practice
- Clinical Pharmacists in General Practice: Pilot scheme
- Pharmacist education and training
- Pharmacy Education in the United Kingdom
- Pharmacist independent prescriber
- General Pharmaceutical Council
- UK Clinical Pharmacy Association
- Hospital Pharmacist job profile

- Education of Pharmacists in Canada
- Comparison of professional pharmacy degrees and health systems in United States, Canada, Spain and Mexico
- Pharmacy Regulation in Canada
- Hospital Pharmacy in Canada
- Report 2016/17
- The Evolving Role and Impact of Integrating Pharmacists into Primary Care Teams: Experience from Ontario, Canada
- Canadian Consensus on Clinical Pharmacy Key Performance Indicators: Quick Reference Guide

- Pharmacy Practice in Australia
- The implementation of a pharmacy residency program – A qualitative study on the diffusion of an innovation
- Pharmacy education in Australia with a special focus on clinical pharmacy education
- The impact of clinical services provided by community pharmacies on the Australian healthcare system: a review of the literature
- A prospective multicentre study of pharmacist initiated changes to drug therapy and patient management in acute care government funded hospitals
- Hospital pharmacy workforce at a glance

SOURCES

- Hospital Pharmacy in Belgium: From Moving Boxes to Providing Optimal Therapy
- A Short History of the Development of Hospital Pharmacy in Belgium
- Development of clinical pharmacy in Belgian hospitals through pilot projects funded by the government
- Health Systems in Transition

- Clinical pharmacology and rational pharmacotherapy: a multidisciplinary approach
- Order on the organization of work of a doctor of a clinical pharmacologist of a healthcare organization
- Department of Clinical Pharmacology and Pharmacotherapy

- Evaluation of pharmacy practice program in the 6-year pharmaceutical education curriculum in Japan: hospital pharmacy practice program
- General Incorporated Association Japanese Society of Hospital Pharmacists
- Comparison of Community Pharmacy Practice in Japan and US State of Illinois
- The direction of clinical pharmacy education in Japan
- Pharmacy Practice in Japan
- About application procedure of pharmacist license
- Japanese Society of Hospital Pharmacists

CIVITTA International
info@civitta.com
+372 735 2802
www.civitta.com

CIVITTA Lithuania
info.lt@civitta.com
+370 685 266 80
www.civitta.lt

CIVITTA Latvia
Info.lv@civitta.com
+371 277 055 85
www.civitta.lv

CIVITTA Finland
Info.fi@civitta.com
+358 505 261 694
www.civitta.fi

CIVITTA Denmark
Info.dk@civitta.com
+452 762 80 83
www.civitta.com

CIVITTA Slovakia
info.sk@civitta.com
+421 901 700 574
www.civitta.sk

CIVITTA Poland
Info.pl@civitta.com
+48 690 001 286
www.civitta.pl

CIVITTA Ukraine
Info.ua@civitta.com
+380 442 270 140
www.civitta.com.ua

CIVITTA Belarus
Info.by@civitta.com
+375 296 018 517
www.civitta.by

CIVITTA Estonia
info.ee@civitta.com
+372 646 448 8
www.civitta.ee

CIVITTA Romania
Info.ro@civitta.com
+403 180 535 88
www.civitta.ro

CIVITTA Moldova
Info.md@civitta.com
+373 797 550 99
www.civitta.md

CIVITTA Armenia
Info.am@civitta.com
+374 10 546 434
www.civitta.com

CIVITTA Serbia
Info.rs@civitta.com
+381 11 2435 489
www.civitta.rs

CIVITTA Bulgaria
Info.bg@civitta.com
+359 884 076 576
www.civitta.bg

CIVITTA North Macedonia
info.mk@civitta.com
+389 75 230 439
www.civitta.com

CIVITTA Kosovo
info.ks@civitta.com
+383 493 380 55
www.civitta.com