

The impact of the modification of the composition and the quantity of extemporaneous preparation on its price value



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ABSTRACT

Background: The aim of this study is the analysis and estimation of the impact of the modification of the composition of extemporaneous preparation dispensed by the community pharmacy on their price value. The modification of ointment base, dosage form, active ingredient and excipient concentration, prescribing two separate preparations instead of double quantity of extemporaneous preparation, prices of the ingredients and packaging have been evaluated.

Material and method: 1407 prescriptions have been prescribed by 330 doctors providing their practice in 212 medical institutions. On the basis of these prescriptions five community pharmacies situated in Olsztyn, Elbląg, Pasiek and Iława in Warmian-Masurian Voivodeship made 1407 extemporaneous preparations in 2011. The information contained in prescriptions has become a foundation for creating a database using MS Excel tool. Statistical analysis and arithmetic mean have been applied.

Results: The average price value of the extemporaneous preparations in the

test material amounts to PLN 34.05. The price value of 90% of the extemporaneous preparations is within PLN 15.89 – PLN 50.00 . The price value of 10% is above PLN 50.00 including 1% over PLN 100.00. The modification of the ointment base has triggered, on average, a 38% increase of the price value, the modification of dosage form - 37%, prescribing two separate preparations instead of double quantity of the extemporaneous preparation - 32%, modification of active ingredient concentration - 23%, modification of excipient concentration - 14%. The purchase prices of ingredients and packaging have not been uniform.

INTRODUCTION

The extemporaneous preparation has been defined under the act of the law – Pharmaceutical law and defines a medicinal product compounded of pharmaceutical material or ready-made medicinal products within 48 hours of submitting the prescription by a patient or within 4 hours when the composition of the extemporaneous preparation contains narcotic drugs or carries an annotation „dispense immediately” a pharmacy upon a doctor’s prescription

or the one prescribed by a veterinarian¹. All aspects regarding the conditions of composition, quality assessment and the rules of the reimbursement are regulated by the law. Since 2002 newly formed community pharmacies are obliged to be adjusted to make extemporaneous preparations. An applicant who wishes to obtain a license to operate a community pharmacy is required to hold appropriate premises. The area of the premises consists of the basic and sub- areas. The basic area includes among others space to compound extemporaneous preparations; extemporaneous preparation area which may be equipped with a lock and washing space. Both types of space have an increased fold of ventilation against other areas of a pharmacy². A pharmacy consists among others of prescription area covered with easily washable material, resistant to chemical substances, weight-ranging scales, a device to receive purified water with a properly secured collecting vessel if the pharmacy makes purified water, a table covered with easily washable material resistant to chemical substances, glass to compound extemporaneous preparations, containers and prescription utensils properly labeled and prepared to compound extemporaneous preparations separated from containers and utensils for potent drugs. If a pharmacy compounds preparations in aseptic conditions then it is to be equipped with the area with the laminar flow to compound medications in aseptic conditions and a sterilizer³.

In the Warmian-Mazurian voivodeship, according to the NHF data in 2011, ca 200 thousand extemporaneous preparations compounded were reimbursed for over PLN 6 million⁴. The market value consists of the following factors: the purchase price of pharmaceutical materials, the purchase price of packaging, the cost of compounding an extemporaneous preparation – taxa laborum and the 25% pharmacy margin. The only fixed element is the taxa laborum which in 2011 amounted to PLN 12.33 among others for powders divided up to 20

pieces, non-divided powders (simple and compound) up to 80g, suppositories, globules and rods up to 12 pieces, solutions, concoctions, suspensions, emulsions up to 250 g, liquid medications for external use (if they contain alcohol, the quantity of alcohol based on 95% may not exceed 100g) up to 500 g, ointments, creams, liniments and pastes up to 100g, drops for internal and external use up to 40g and up to PLN 24.66 - for eye, ear and nose drops as well as eye ointments compounded in aseptic conditions up to 10g and the previously mentioned forms of medications compounded in aseptic conditions in accordance with the requirements of Polish Pharmacopoeia or with recommendations prescribed by a doctor or containing an antibiotic⁵.

AIM OF THE STUDY

The purpose of this paper was the analysis and assessment of the impact of the modification and composition of extemporaneous preparations compounded in the group of community pharmacies on their price value. The modifications of the ointment base, the form of the extemporaneous preparation, the prescribing of two separate preparations instead of the double quantity of the extemporaneous preparation, the modification of the active ingredient concentration in the extemporaneous preparation, the modification of the excipient ingredient concentration in the extemporaneous preparation as well as the modification of the ingredients and packaging were evaluated.

MATERIALS AND METHODS

1407 prescriptions issued in 2011 which constituted the basis to compound 1407 extemporaneous preparations in a selected group of pharmacies in the area of Olsztyn, Elblag, Paslek and Ilawa in the Warmian-Mazurian Voivodeship were analyzed and assessed. Out of the analyzed prescriptions the following data were drawn: the composition of the extemporaneous preparation, the

1407 PRESCRIPTIONS ISSUED IN 2011 WHICH CONSTITUTED THE BASIS TO COMPOUND 1407 EXTEMPORANEOUS PREPARATIONS IN A SELECTED GROUP OF PHARMACIES IN THE AREA OF OLSZTYN, ELBLAG, PASLEK AND ILAWA IN THE WARMIAN-MASURIAN VOIVODSHIP WERE ANALYZED AND ASSESSED.

form of the preparation, the quantity of the preparation in grams and pieces as well as the value of the extemporaneous preparation compounded.

With the obtained data data bases were prepared with the MS EXCEL tool. The statistical analysis with the use of the measures of distribution was applied.

RESULTS

In the analyzed group of five pharmacies 1407 extemporaneous preparations were compounded within one year. The

compositions of the preparations were defined by 330 medical doctors working in 212 medical institutions. The average price value of the extemporaneous preparation amounted to PLN 34.05. The value of 90% of preparations was within the range of PLN 15.89 - PLN 50.00. The value of 10% of preparations was over PLN 50.00 including 1% of preparations worth over PLN 100.00. Figure 1 presents the quantity and price value of the extemporaneous preparations compounded on the basis of the analyzed group of prescriptions.

PLN 15.89 - PLN 20.00	145
PLN 20.01 - PLN 30.00	547
PLN 30.01 - PLN 40.00	385
PLN 40.01 - PLN 50.00	189
PLN 50.01 - PLN 60.00	53
PLN 60.01 - PLN 70.00	41
PLN 70.01 - PLN 80.00	28
PLN 80.01 - PLN 90.00	6
PLN 90.01 - PLN 100.00	5
over PLN 100.00	8
Total	1407

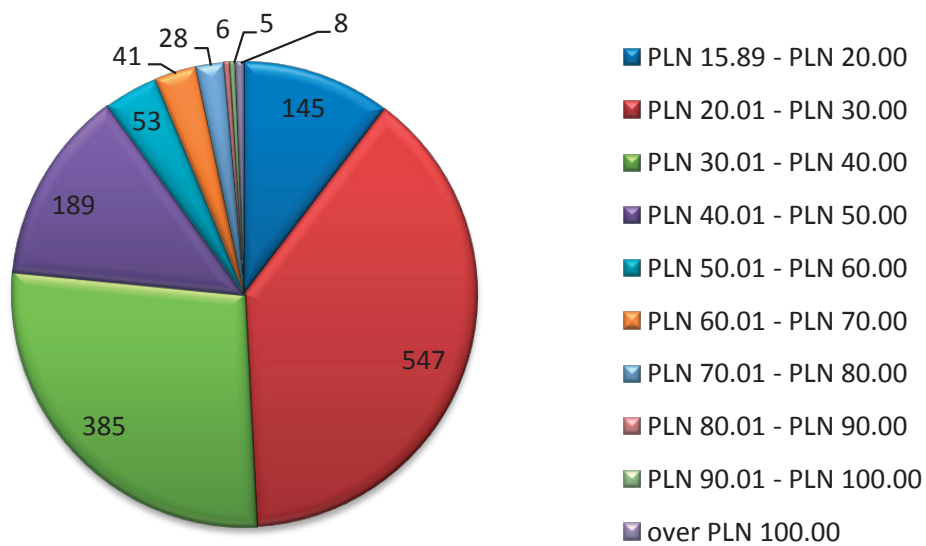


Figure 1 The quantity and the price value of the extemporaneous preparations made on the basis of the analyzed group of prescriptions

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Table 1. The examples of the increase of the price value of the extemporaneous preparation connected with change of the ointment base

ITEM	COMPOSITION OF EXTEMPORANEOUS PREPARATION	MODIFICATION OF OINTMENT BASE	PRICE VALUE INCREASE
1.	3% SOL. ACIDI BORICI; LANOLINI; VASELINI FLAVI AA AD 100,0	VASELINUM ALBUM, LANOLINUM W RÓWNYCH CZĘŚCIACH	+41%
		EUCERINUM, LANOLINUM IN EQUAL PARTS	+53%
2.	ACIDI SALICYLICI 10,0; HASCOBAZA AD 100,0	LEKOBAZA	+54%
3.	ACIDI SALICYLICI 20,0; VASELINI ALBI AD 200,0	LEKOBAZA	+161%
4.	ACIDI SALICYLICI 5,0; VASELINI ALBI AD 100,0	OLEUM RICINI 10,0; OLEUM RAPAE 85,0	+15%
		OLEUM RICINI, OLEUM RAPAE IN EQUAL PARTS	+29%
5.	HYDROCORTISONI 0,15; VASELINI ALBI AD 50,0	HASCOBAZA	+13%
6.	HYDROCORTISONI 0,25; VIT.A 50 000J.M.; VASELINI ALBI AD 50,0	HASCOBAZA	+19%
7.	HYDROCORTISONI 0,5; VASELINI ALBI AD 100,0	UNGUENTUM CHOLESTEROLI	+11%
		GLICEROLUM 10,0; LANOLINUM 89,5	+11%
		HASCOBAZA	+22%
		LEKOBAZA	+42%
		GLICEROLUM 10,0; LEKOBAZA 89,5	+49%
8.	UREA 10,0; EUCERINI; VASELINI ALBI AA AD 100,0	HASCOBAZA	+3%
9.	UREA 5,0; AQUA DESTILATAE, EUCERINI, VASELINI ALBI AA AD 100,0	AQUA DESTILATA Q.S.; EUCERINUM; VASELINUM ALBUM IN EQUAL PARTS	+25%
		HASCOBAZA	+37%
10.	VIT.A 10,0; VIT.E 10,0; HASCOBAZA AD 200,0	LEKOBAZA	+15%

Modification of the ointment base

Different ointment bases were used to prepare the ointment of the defined composition and the quantity of active substances. The type the applied base influences the price value of the extemporaneous preparations. The observed changes referred to the following modification:

- the modification of the lipophilic anhydrous hydrocarbon (petrolatum) base into the amphiphilic (Hascobaza and Lekobaza) base,

- the modification of the lipophilic anhydrous hydrocarbon (petrolatum) base into the absorbent (cholesterol ointment) base,

- the modification of the absorbent hydrated base (the combination of water, petrolatum and lanoline) into the amphiphilic (Hascobaza) base,

- the modification of the absorbent hydrated base (the combination of water and eucerin) into the absorbent (cholesterol ointment) base,

- the change of the lipophilic anhydrous hydrocarbon (petrolatum) base into a different lipophilic absorbent hydrated base (the combination of canola and castor oils – the simultaneous modification of the form of the extemporaneous preparation),

- the modification of the absorbent base (the

Table 2. The examples of the price value increase connected with the modification of the form of the extemporaneous preparation

ITEM	COMPOSITION OF EXTEMPORANEOUS PREPARATION	MODIFICATION OF COMPOSITION OF EXTEMPORANEOUS PREPARATION (CHANGE OF FORM)	PRICE VALUE INCREASE
1.	0,3% SOL. ZINCI SULFURICI 100,0	ZINCI SULFURICI 0,3; AQUA DESTILATAE 20,0; EUCERINI AD 100,0	+80%
2.	ACIDI SALICYLICI 10,0; OL. RICINI; OL.RAPAE AA AD 100,0	ACIDI SALICYLICI 10,0; VASELINI ALBI AD 100,0	+54%
3.	ACIDI SALICYLICI 5,0; VASELINI ALBI AD 100,0	ACIDI SALICYLICI 5,0; OL. RICINI 10,0; OL. RAPAE AD 100,0	+20%
4.	ACIDI SALICYLIICHTYOLI 3,0; ZINCI OXYDATI 20,0; OL. RAPAE AD 100,0 CI 5,0; VASELINI ALBI AD 100,0	ICHTYOLI 3,0; ZINCI OXYDATI; TALCI VENETI AA 25,0; AQUA DESTILATAE AD 100,0	+13%
5.	VIT.E 20,0; OL. MENTHAЕ PIPERIRTAЕ 0,4; GLICEROLI AD 200,0	VIT.E 20,0; UNG. CHOLESTEROLI AD 200,0	+57%
6.	ZINCI OXYDATI 50,0; OL. RAPAE 50,0	ZINCI OXYDATI 50,0; TALCI VENETI 50,0; 40% FORMALINI 20GTT.	+39%

cholesterol ointment) into the amphiphilic base (Hascobaza),

- the modifications in the proportions of the compound of the bases.

It has been proven that the modification of the base triggered the price value increase of the extemporaneous preparation by 38% on average, the biggest increase was noted with the modification of petrolatum into Lekobaza or Hascobaza. It is particularly evident in the case of ointment containing 10% of salicylic acid made in the double quantity (Table 1 item 3) where the modification of the base attributed to the increase of the price value of the extemporaneous preparation by 161%. In Table 1 the examples of the analyzed increases of the price value of the extemporaneous preparation.

MODIFICATION OF THE FORM OF THE EXTEMPORANEOUS PREPARATION

In the analyzed prescriptions it has been found that the performed modification of the extemporaneous preparation related to the modification of the applied base. The active ingredient and its quantity were not changed. The observed changes covered the following modifications of the extemporaneous preparation:

- the modification of the aqueous solution into the absorbent hydrated base,

- the modification of the oil solution into the ointment of anhydrous hydrocarbon lipophilic base,

- the modification of the anhydrous hydrocarbon lipophilic base into the oil solution,

- the modification of the oil solution into the aqueous suspension,

- the modification of the glycerol solution into the absorbent ointment base,

- the modification of the oil solution into the undivided powder for external use.

The examples of the compositions of extemporaneous preparations before and after the modification including the level of the increase of the price value are shown in Table 2. It was demonstrated that the modification of the form of the drug caused the increase of the price value of the extemporaneous preparations by 37% on average. The highest increase was observed in the case of the change of the aqueous solution into the absorbent ointment base, which caused the 80% increase of the price value of the extemporaneous preparation (Table 2 item 1).

MODIFICATION OF PRESCRIBING TWO SEPARATE PREPARATIONS INSTEAD OF THE DOUBLE QUANTITY OF THE EXTEMPORANEOUS PREPARATION

In 2011 in justified cases a medical doctor could prescribe the double quantity of the extemporaneous preparation if the drug stability was maintained over the period of the use of the drug⁷. A pharmacist compounding and calculating the price of the extemporaneous preparation charged one cost of the compounding of the extemporaneous preparation – taxa laborum (PLN 12.33) and the cost of packaging. In the case of a medical doctor prescribing the drug with two separate prescriptions, a pharmacist preparing and calculating the price of the extemporaneous preparation charged a double costs of the compounding of the extemporaneous preparation – 2 x taxa laborum (2 x PLN 12.33 = PLN 24.66) and the cost of two pieces of packaging. On the basis of the conducted analysis it has been found that prescribing two separate preparations instead of the double quantity of the extemporaneous preparation increased the price value by 32% on average. In Table 3 the examples of such prescriptions are shown.

Table 3. The examples of the price value increase connected with the prescribing of two separate preparations instead of the double quantity of the extemporaneous preparation

ITEM	COMPOSITION OF EXTEMPORANEOUS PREPARATION – ONE PRESCRIPTION	COMPOSITION OF EXTEMPORANEOUS PREPARATION – TWO PRESCRIPTIONS	PRICE VALUE INCREASE
1.	10% UNG. KALII IODATI 200,0	10% UNG. KALII IODATI 100,0	+32%
2.	2% UNG. DETREOMYCINI 200,0	2% UNG. DETREOMYCINI 100,0	+22%
3.	ACIDI SALICYLICI 20,0; VASELINI ALBI AD 200,0	ACIDI SALICYLICI 10,0; VASELINI ALBI AD 100,0	+35%
4.	ACIDI SALICYLICI 10,0; VASELINI ALBI AD 200,0	ACIDI SALICYLICI 20,0; VASELINI ALBI AD 100,0	+22%
5.	AQUA DESTILATAE; EUCERINI; VASELINI ALBI AA AD 200,0	AQUA DESTILATAE; EUCERINI; VASELINI ALBI AA AD 100,0	+25%
6.	HYDROCORTISONI 1,0; VASELINI AD 200,0	HYDROCORTISONI 0,5; VASELINI ALBI AD 100,0	+ 23%
7.	HYDROCORTISONI 2,0; HASCBAZA AD 200,0	HYDROCORTISONI 1,0; HASCBAZA AD 100	+24%
8.	HYDROCORTISONI 2,0; VASELINI ALBI AD 200,0	HYDROCORTISONI 1,0; VASELINI ALBI AD 100,0	+41%
9.	UREA 10,0; HASCBAZA AD 200,0	UREA 5,0; HASCBAZA AD 100,0	+27%
10.	3% SOL. ACIDI BORICI 30,0; UNG.CHOLESTEROLI AD 200,0	3% SOL. ACIDI BORICI 15,0; UNG.CHOLESTEROLI AD 100,0	+48%

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MODIFICATION OF THE ACTIVE INGREDIENT CONCENTRATION

The composition of many drugs of the same character differed solely with the active ingredient concentration. Consequently the increase of the active ingredient concentration attributed to the increase of the price value of the extemporaneous preparation by 23% on average. In the case of sulfur ointment compounded on the basis

of petrolatum the sulfur concentration increased from 10% to 30% (Table 4 item 11) and attributed to the decrease of the price value of the preparation. The applied active ingredient i.e. the precipitated sulfur was in this case cheaper than the ointment base i.e. petrolatum. The increase of the cheaper ingredient to replace the more expensive one caused the decrease of the price value of the extemporaneous preparation.

Table 4. The examples of the price change relating to the change of the active ingredient concentration in the extemporaneous preparation

ITEM	COMPOSITION OF EXTEMPORANEOUS PREPARATION	CHANGE OF ACTIVE INGREDIENT CONCENTRATION	PRICE VALUE INCREASE
1.	0,25% SOL. ZINCI SULFURICI 250,0	0,5% SOL. ZINCI SULFURICI 250,0	+19%
2.	0,3% SOL. ZINCI SULFURICI 500,0	0,5% SOL. ZINCI SULFURICI 500,0	+39%
3.	3% SOL. ICTHYOLI 500,0	10% SOL. ICTHYOLI 500,0	+32%
4.	2% SOL. KALII IODATI 500,0	10% SOL. KALII IODATI 500,0	+83%
5.	2% SOL. NOVOCAINI 500,0	3% SOL. NOVOCAINI 500,0	+6%
6.	HYDROCORTISONI 0,5; VASELINI ALBI AD 100,0	HYDROCORTISONI 1,0; VASELINI ALBI AD 100,0	+32%
7.	HYDROCORTISONI 0,12; HASCObAZA AD 50,0	HYDROCORTISONI 0,25; HASCObAZA AD 50,0	+5%
8.	NATRII THIOSULFURICI 1,5; GLICERINI 5,0; AQUA DESTILATA AD 100,0	NATRII THIOSULFURICI 2,0; GLICERINI 5,0; AQUA DESTILATA AD 100,0	+5%
9.	VIT.A 10 000J.M.; UNG.CHOLESTEROLI AD 100,0	VIT.A 50 000J.M.; UNG.CHOLESTEROLI AD 100,0	+19%
10.	HYDROCORTISONI 0,5; HASCObAZA AD 100,0	HYDROCORTISONI 1,0; HASCObAZA AD 100,0	+41%
11.	SULF. PPTI. 10,0; VASELINI ALBI AD 200,0	SULF. PPTI. 30,0; VASELINI ALBI AD 200,0	-6%

MODIFICATION OF EXCEPIENT CONCENTRATION

Excipients are the chemical substances or their compounds which may not in the applied quantities have any pharmacological effect of their own nor may they react adversely and influence the preparation stability⁸. Adding such substances is essential to make a proper form of the drug substance,

to increase its stability, to improve organoleptic parameters as well as to improve respective pharmacokinetic properties. It has been found that the increase of quantity of excipients in the drug form increased the price value of the extemporaneous preparation by 14% on average. Table 5 presents examples of such prescriptions.

Table 5. The examples of the increase of the price value related to the modification of the excipient concentration

ITEM	COMPOSITION OF EXTEMPORANEOUS PREPARATION	MODIFICATION OF EXCEPIENT CONCENTRATION	PRICE VALUE INCREASE
1.	ACIDI SALICYLICI 5,0; OL. RICINI 10,0; OL. RAPAE AD 100,0	ACIDI SALICYLICI 5,0; OL. RICINI 25,0; OL. RAPAE AD 100,0	+11%
2.	HYDROCORTISONI 0,375; 3% SOL. ACIDI BORICI 10,0; VASELINI ALBI; EUCERINI AA AD 100,0	HYDROCORTISONI 0,375; MENTHOLI 0,5; 3% SOL. ACIDI BORICI 10,0; VASELINI ALBI; EUCERINI AA AD 100,0	+5%
3.	UREA 5,0; AQUA DESTILATAE; EUCERINI; VASELINI ALBI AA AD 100,0	UREA 5,0; AQUA DESTILATAE Q.S.; EUCERINI; VASELINI ALBI AD 100,0	+25%
4.	VIT.A+D3 10,0; GLICEROLI 200,0; OL. MENTHAE PIPERITAE 0,05	VIT.A+D3 10,0; GLICEROLI 200,0; OL. MENTHAE PIPERITAE 0,1	+5%
5.	VIT.A+D3 10,0; GLICEROLI 400,0; OL. MENTHAE PIPERITAE 0,05	VIT.A+D3 10,0; GLICEROLI 400,0; OL. MENTHAE PIPERITAE 0,1	+6%
6.	ZINCI OXYDATI 0,2; LINOMAG 1,0; OL. LINI AD 100,0	ZINCI OXYDATI 0,2; LINOMAG 3,0; OL. LINI AD 100,0	+40%

MODIFICATION OF THE CHANGE OF PRICES OF INGREDIENTS AND PACKAGING

Different price values of extemporaneous preparations of the same composition made and priced at different pharmacies has been found. The purchase prices of pharmaceutical ingredients and packaging were not uniform. Despite the lack of modification in the

composition of the extemporaneous preparation price values differed within the range of a few up to more than ten percent. The following factors influenced the different price values: the purchase price of pharmaceutical ingredients dependent of the warehouse and the size of the bulk packaging (small packaging reflects a higher price per 1 g of the pharmaceutical ingredient), the pur-

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chase price of packaging of an extemporaneous preparation (the price of the ointment packaging of 100g ranged from PLN 0,60 to PLN 6) as well as the incorrect valuation of extemporaneous preparations. In Table 6 the examples of the price increase of the extemporaneous preparations of the same composition made in different pharmacies are presented.

Table 6. The examples of the price value increase of the extemporaneous preparations of the same composition compounded in different pharmacies

ITEM	COMPOSITION OF EXTEMPORANEOUS PREPARATION	PHARMACY WHERE THE PREPARATION WAS MADE	PRICE VALUE IN PLN (INCREASE)
1.	10% UNG. KALII IODATI 50,0	PHARMACY NO 3	29.57
		PHARMACY NO 4	32.19 (+9%)
		PHARMACY NO 5	32.58 (+10%)
2.	3% SOL. ACIDI BORICI; LANOLINI; EUCERINI AA AD 100,0	PHARMACY NO 5	28.86
		PHARMACY NO 3	32.06 (+11%)
3.	3% SOL. ACIDI BORICI; VASELINI ALBI; PARAFFINI LIQ.; LANOLINI AA 25,0	PHARMACY NO 1	23.56
		PHARMACY NO 5	24.53 (+4%)
4.	NATRII THIOSULFURICI 2,0; GLICERINI 5,0; AQUAE DESTILATAE AD 100,0	PHARMACY NO 3	17.84
		PHARMACY NO 5	19.09 (+7%)
		PHARMACY NO 4	19.56 (+10%)

DISCUSSION

The possibility to compound an extemporaneous preparation in a community pharmacy with a prescription from a medical doctor complements pharmacotherapy and is the response to the lack of ready-made drugs manufactured by the pharmaceutical industry as well as provides adjustment to customized patients' needs.

The composition of the extemporaneous preparation is determined by the doctor prescribing the drug. Each modification of the composition of the extemporaneous preparation is connected with the quality and quantity of ingredients to compound it. Con-

sequently this results in the change of the price value of the extemporaneous preparation made. The greatest impact on the increase of the price value of the extemporaneous preparation has been found with the modification of the ointment base from the traditional lipophilic to the novel amphiphilic base. The amphiphilic base is universal and its application allows for making multiphase

ointment types, or depending on the quantity and types of medical substance prescribed and water, the emulsion of the o/w or w/o types may be compounded. This universal characteristic is not provided by the cheaper lipophilic or absorbent bases. A similar impact on the price value is found with the modification of the form of the preparation connected with the modification of the applied base. This same active ingredient contained in the extemporaneous preparation i.e. aqueous solution, oil solution, glycerol solution, ointment, suspension, powder for external use determine a different price value of the extemporaneous preparation compounded.

Significant savings of public money has been observed when prescribing two separate preparations instead of double quantity of extemporaneous preparation. The saving amounted to the cost of compounding the extemporaneous preparation and the cost of one piece of packaging. Currently this solution is impossible due to the fact of the law forbidding to prescribe double quantity of an extemporaneous preparation⁶.

The modification of the concentration of the active ingredient triggered both the increase as well as the decrease of the price value of the extemporaneous preparation. If the purchase price of the active ingredient per 1 g was higher than the purchase price of the solvent or the ointment base then the price value increased. If the purchase price of the active ingredient per 1g was lower than the purchase price of the solvent or the ointment base, then the price value of the extemporaneous preparation decreased. The lowest increase was marked with the change of the excipient concentration.

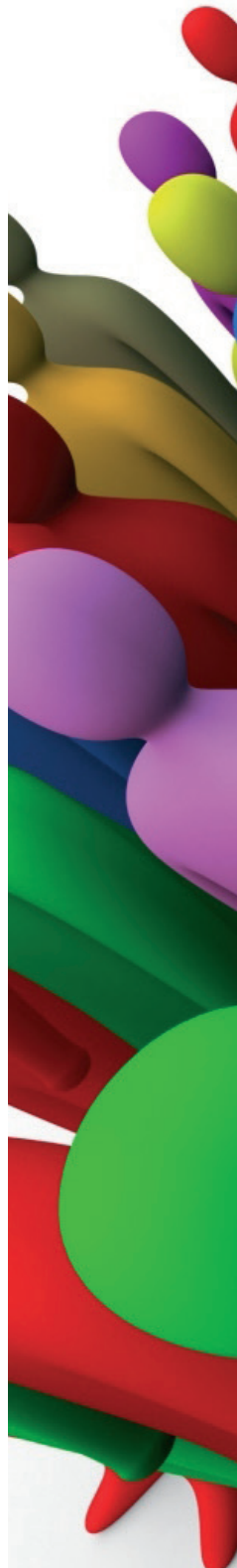
Despite the same composition extemporaneous preparations reached different price values in different pharmacies. The pharmacies which compound many extemporaneous preparations have been buying pharmaceutical ingredients in larger wholesale packaging with no risk of exceeding the expiration date and of incurring losses. However pharmacies which rarely compound extemporaneous preparations purchased pharmaceutical ingredients in smaller packaging what increased the price of 1 g. The prices of packaging were also different. Additionally a different price value is related to the incorrect pricing of the extemporaneous preparation.

CONCLUSIONS

1. It has been demonstrated that the modification of the change and number of ingredients used to compound the extemporaneous preparation has influenced the price value.

2. The increase of the price value also has resulted from the variable price of the purchase of pharmaceutical ingredients and packaging.

3. The different price values of the extemporaneous preparations of the same composition have been found in different pharmacies. ■



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