# Dysfunctions in feeding and coexisting diseases in people after heart attack, depending on a place of residence

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## Abstract

*Background.* In a group of various factors of ischemic heart disease risk, significant meaning is connected with feeding abnormalities. They might create favorable grounds to develop coexisting diseases that influence coronary heart disease process, and also unfavorably affect prospective prognosis. *The aim of the study.* The aim of the work was to evaluate the dependence between coexisting diseases and feeding patterns of people after infarct living in a city and district of Słupsk. *Material and methods.* The examined material was provided by 300 respondents – randomly chosen patients from provincial cardiology clinic, after infarct, living in the city and province of Słupsk. A survey questionnaire, that remains the original examination tool, was specially prepared to verify the examination hypothesis. The questionnaire includes, general and detailed questions about health, behavior and coexisting diseases. The authors used a diagnostic questionnaire method to collect the empirical material and the Pears'n square Chi test and contingency indicator (C) in statistic analysis. *Results.* The obtained results allowed to formulate the frequency of coexisting diseases: Arterial hypertension, diabetes, overweight sub form to increase value BMI (Body Mass Index). *Geriatria 2011; 5: 187-193.*

Keywords: cardiac muscle infarct, coexisting diseases, nutrition, place of living

## Introduction

Diseases of cardiovascular system cause currently almost 50% of deaths and in modern times they are found out the leading cause of death worldwide. Mortality from cardiovascular system diseases gradually increases with age. The studies show that men are more likely to be stricken with heart disease, it is also confirmed that people characterized by low social and economic status from the Central and Eastern Europe and emigrants that from the South Asia are prone to heart problems. Their conclusions are the resultant of social and economic differences in the occurrence of conventional risk factors such as: smoking, arterial blood pressure, cholesterol and glucose level in blood [1]. The mentioned factors, poor diets and engaging in activities that increase the risk of developing cardiac disease contribute to generate oxidiace stress, inflammatory conditions and thrombosis. They also affect the function of endothelium, modify secretion of insulin and metabolism of homocistein [2].

The scientists have observed declining tendency morbility in Central and Eastern Europe, however values of mortality unfortunately remain upward. Men from Eastern Europe in 35-74 years of age are 10 times more likely to die than those from France. Downward tendency in mortality from cardiovascular system diseases is connected with some significant changes in a daily diet and attitude towards smoking observed in the East and West Europe [3]. Change of eating habits and lifestyles might prevent cardiovascular diseases.

Exposure to various risk factors, especially poor diet, and decrease of the urgency of taking preventing measures might cause ischemia. They create favorable grounds to develop coexisting diseases influencing cardiovascular diseases and distant prognosis. That is why non-pharmaceutical treatments – and preventive treatments – should be based on a well balanced diet, characterized by limited consumption of saturated fat acids and cholesterol from animal fat and reach in

non-processed vegetables and fruit. It is described as dietary / nutritional treatment [5]. Undernutrition is an example of the effectiveness of this kind of treatment.

The results of research on preventive treatments confirm that a change of a lifestyle including hipolipemic diet is very effective and reduces the risk of a secondary cardiac infarct and aggravation of coronary heart disease [6].

## Purpose

The aim of the paper is to determine frequency of the occurrence of coexisting diseases: high blood pressure, diabetes, overweight in the form of slightly higher BMI values, and analyze a diet and supplementation of diet at people after the cardiac infarct from the city and county of Słupsk.

## Material and methods

Cross-sectional research was conducted between April 2009 and June 2010. The authors examined 300 people after cardiac infarct the during period of one year after the acute infarct. The examined patients, selected randomly, live in the city and county of Słupsk. The patients were examined in the cardiologic health center of District Hospital in Słupsk. Each person was treated cardiologicaly including rehabilitation and educational activities, according to a post-infarct standard procedure. The authors of the paper used a method of a diagnostic survey. A survey questionnaire, was specially prepared to verify the examination hypothesis.

The questionnaire includes, general and detailed questions about health behavior patterns and coexisting diseases. The questionnaire also includes questions about sex, age and education.

The authors used a diagnostic questionnaire method to collect the empiric material and Pearson's chi – squared test and contingency indicator (C) in statistic analysis.

## Research results

The collected data allowed to find out the frequency of the occurrence of coexisting diseases: high blood pressure, diabetes, overweight and analyze a diet and supplementation of diet in people after cardiac infarct depending on a place of residence.

The most frequent group comprised of people over

60 years of age – 40.7%. Another category comprised of patients in 41 and 50 years of age from rural districts – 38% (urban districts 25.3%). Considerable differences can be observed in morbidity of cardiac infarct in a group of people between 23-30 years of age (10.7%) from the urban districts in comparison to people from the rural areas (2%) and in another age group of people between 31-40 years of age the infarct incident occurred more frequently is the groupof people from urban districts (10%) than among people from the county of Słupsk (2%).

The researched group comprised of 49% of women and 51% of men from the city of Słupsk and 40% of women and 60% of men from the county of Słupsk.

After analyzing the level of education of the respondents the authors found out that 44.7% of the rspondents from the urban districts and 29.4% from the rural areas were high school graduates, 30% from the urban districts and 7.3% from the rural areas have university education, 4% from the urban districts and 17.3% from the rural areas have vocation education and finally 2.7% from the urban districts and 18.7% from the rural areas have elementary education.

After statistical analysis of the declared anti-health behavior-patterns among the studied group from the city and county of Słupsk, the authors observed that 53.3% of people from urban districts eat only 2 meals a day, some of them have big meals (20.7%) and eat them in a hurry. 26% of respondents do not care what they eat, they want their meals to taste good, however 48.7% of respondents from the rural areas eat two meals a day regularly, 23.3% of them also do not care about quality of food and declare more frequent consumption of carbohydrates – 4 times a week (28.3%) although 36% of respondents are overweight and 30% are obese. 41.3% of respondents from the urban districts are overweight and 31.3% are obese. Obesity remains one of the risk factors. It is related to lipid and carbohydrate distribution disorder and circulatory system diseases.

Low-fat diet can lower cholesterol level with 8-14%, and in people with coronary heart diseases lowering cholesterol level by 1% reduces the risk of infraction by 2-3%. The studies show that 36% of respondents form the urban districts and 24% from the rural areas prefer salty foods. 26% of respondents from the rural areas and 18% from the urban districts prefer spicy foods.

High consumption of salt causes an increase of mass of the left ventricle of the heart and stiffness of conductive arteries, makes resistance arteries thicker

Table 1. Patients' nutritional self-estimation of anti- health behavior- patterns

| Specification | Urban districts | | Rural areas | |
|---|---|---|---|---|
| | Absolute numbers | % | Absolute numbers | % |
| **Rationality of diet** | | | | |
| - 3 meals a day | 18 | 12.0 | 23 | 5.3 |
| - 2 meals a day | 80 | 53.3 | 54 | 48.7 |
| **Quality of diet** | | | | |
| - I eat fat and heavy meals | 5 | 3.3 | 13 | 8.7 |
| - I eat irregularly and in a hurry | 28 | 18.7 | 26 | 17.3 |
| - I do not care what I eat, it must taste good | 39 | 26.0 | 35 | 23.3 |
| - I often eat late and heavy meals | 13 | 8.7 | 3 | 2.0 |
| **Flavor preferences** | | | | |
| - I eat salty meals | 54 | 36.0 | 36 | 24.0 |
| - I eat hot/spicy food | 27 | 18.0 | 39 | 26.0 |
| **Frequency of carbohydrates consumption** | | | | |
| - I eat 3-4 times a week | 39 | 26.0 | 43 | 28.7 |
| **Frequency of meat and fats consumption** | | | | |
| - I eat fatty foods and meat 4 times a week | 30 | 20.0 | 22 | 14.7 |
| - each meal - meat and gravy | 6 | 4.0 | 20 | 13.3 |
| **Frequency of smoking** | | | | |
| - everyday | 52 | 36,4 | 59 | 39,3 |
| - at least once a week | 8 | 9,9 | 13 | 8,7 |
| - less than once a week | 5 | 1,4 | 2 | 1,3 |
| **Number of cigarettes a day** | | | | |
| - everyday - less than a box | 13 | 8,7 | 20 | 13,3 |
| - everyday - 1 box | 23 | 15,3 | 19 | 12,7 |
| - everyday - more than a box | 33 | 22,0 | 34 | 22,7 |
| **Consumption of vitamins and minerals** | | | | |
| - I buy vitamins and mineral products advertised in media | 16 | 10,7 | 13 | 8,7 |
| - I do not use any vitamins and mineral products | 68 | 45,3 | 64 | 42,7 |
| - I Am not interested in this form of diet supplementation | 28 | 18,7 | 40 | 26,7 |
| $x^2_{obl}$ = **196,979** relation - critical value<br>$x^2_{0,05;d f}$ = 126,5741<br>**r = 0,1943** low – correlation indicator | | | | |

and narrow, it also influences the performance of kidney and coronary arteries that might become another risk factor of secondary cardiac infarct among the studied group since 36% of respondents form the urban districts and 24% respondents from the rural areas declare to add more salt to their foods.

Smoking remains one of the main risk factors of cardiac infarct. The results of that paper seem to be terrifying since 47.7% of respondents form the urban districts and 49.3% of respondents from the rural areas smoke cigarettes regularly. Smoking remains a modifiable risk factor therefore the question is whether a complex treatment process, including education is not effective enough to give up smoking.

The research shows the smokers increase three times the risk of cardiac infarct in comparison non--smokers. Smoking up to 5 cigarettes a day increases the risk of ischemia by 40%. After analyzing the numbers of smoked cigarettes the authors do not notice any significant differences between respondents from the urban and rural districts. Smoking generates a second risk connected with coronary heart disease. Also passive smoking is considered dangerous in people after coronary heart disease.

A great number of patients underestimate a beneficial influence of the vitamins on health. In their opinion using vitamins cannot be considered a serious treatment. However the records show that a great number of people in developed countries show deficiency of vitamins. Patients suffering from circulatory system diseases stemming from the deficiency of one or various vitamins. It is commonly known that B vitamins improve contractions of the heart.

The study shows that 45.3% of respondents from the urban districts and 42.7% from the rural areas do not take any vitamins and minerals. 18.7% of respondents from the urban districts and 26.7% respondents from the rural areas are not interested in this form of diet supplementation. 10% of the researched group buys the advertised products. Therefore the respondents

Table 2.   Patients' nutritional self-estimation of pro-health behavior - patterns

| Specification | Urban districts | | Rural districts | |
|---|---|---|---|---|
| | Absolute numbers | % | Absolute numbers | % |
| **Rationality of diet**<br>- 4-5 meals a day | 51 | 34.0 | 54 | 36.0 |
| **Quality of diet**<br>- each meal is heavy however<br>- I eat last meal about 6 pm, it is a light meal | 31<br>34 | 20.7<br>22.7 | 22<br>51 | 14.7<br>34.0 |
| **Flavor preferences**<br>- I do not eat spicy foods<br>- I eat lightly salted foods | 61<br>8 | 40.7<br>5.3 | 54<br>21 | 36.0<br>14.0 |
| **Frequency of carbohydrates consumption**<br>- I eat once a week<br>- I eat limited amounts of them<br>- I do not eat, because I do not like it<br>- I do not eat, because I have a tendency to gain weight | 31<br>50<br>7<br>23 | 20.7<br>33.3<br>4.7<br>15.3 | 33<br>56<br>12<br>6 | 22.0<br>37.3<br>8.0<br>4.0 |
| **Frequency of meat and fats consumption**<br>- I eat meat, but I avoid fat meals<br>- I eat poultry more often than pork<br>- I eat meat once a week<br>- I eat fish and poultry | 61<br>38<br>7<br>8 | 40.7<br>25.3<br>4.7<br>5.3 | 45<br>53<br>4<br>6 | 30.0<br>35.3<br>2.7<br>4.0 |
| **Frequency of smoking**<br>- I do not smoke | 85 | 56,7 | 75 | 50 |
| **Consumption of vitamins and minerals**<br>- I have vitamins and minerals regularly | 38 | 25,3 | 33 | 22,0 |
| $x^2_{obl}$ = **193,814** relation, critical value<br>$x^2_{0,05;df}$ =125,4584<br>$r$ = **0,1947** correlation indicator | | | | |

do not probably know about benefits resulting from vitamin and mineral treatments.

Pro-health behavior-patterns in people after heart attack include: any activities resulting with better quality of health and any activities aimed at improvement of self-estimation of patient's health condition and taking preventive treatments.

After statistical calculation of pro-health behavior – patterns with reference to rationality and quality of a diet, the authors observed that 12% of respondents from the urban districts and 18.3% of respondents from the rural areas have 4-5 meals a day. The authors found out that 22.7% of respondents from the urban districts returned to work without limiting hours of work while only 10.7% of respondents from the rural areas returned to their previous duties.

The patients after coronary infract are advised to modify their dietary habits and go on the Mediterranean diet. One of basic ingredients of the diet is fish. Unfortunately 5.3% of respondents form the urban districts and 4% of respondents from the rural areas eat only fish and poultry. Among the studied group 40.4% of respondents form the urban districts and 30% of respondents from the rural areas eat meat however they declare they do not eat fatty foods. Therefore the dietary habits preceding infarct have remained unchanged. It is a conclusion that describes an attitude of the respondents towards their health, its condition, risk estimation of another incidence. Although The Mediterranean diet remains one of the most popular and affordable remedial measures, people still maintain relatively poor diets.

An increase of smoked cigarettes by one cigarette a day increases the risk of dying from CHNS by 2.7% in men and 5.3% in women [7]. The studies show that 50% of respondents from the rural areas and 47.3% of respondents from the city of Słupsk smoke habitually.

25.3% of respondents from the city and 22% of respondents from the rural areas take vitamins and minerals regularly. It is not a satisfactory result since 10.7% of respondents from the city and 7.33% of respondents from the rural areas declare their financial situation is very good. 36% of respondents from the city and 29.3% of respondents from the rural areas declare their financial situation is good.

A proper low-fat diet can lower cholesterol level by 8-14%. In patients after cardiac muscle infract lowering cholesterol level by 1% decreases the risk of another

Table 3.　Consumption of selected grocery products by the respondents

| Product | Frequency of consumption of grocery products | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1-3 times a day | | 4-6 times a week | | 1-3 times a month | | Hardy ever | |
| | N | | N | | N | | N | |
| | C | R | C | R | C | R | C | R |
| White bread | 97 | 89 | 20 | 29 | 22 | 19 | 11 | 13 |
| Wholegrain bread | 54 | 40 | 30 | 31 | 34 | 31 | 29 | 45 |
| Pasta | 18 | 14 | 15 | 31 | 91 | 85 | 24 | 20 |
| Grits | 8 | 12 | 20 | 26 | 75 | 70 | 45 | 42 |
| Whole fat milk | 35 | 48 | 23 | 30 | 45 | 29 | 47 | 43 |
| Skimmed milk | 34 | 28 | 20 | 30 | 41 | 39 | 55 | 52 |
| Milk products | 31 | 35 | 37 | 43 | 57 | 58 | 25 | 14 |
| Cheese | 36 | 31 | 36 | 33 | 56 | 65 | 22 | 21 |
| Soured cream | 21 | 38 | 31 | 29 | 67 | 51 | 31 | 32 |
| Butter | 61 | 51 | 24 | 26 | 27 | 39 | 38 | 34 |
| Lard, bacon | 27 | 34 | 27 | 31 | 50 | 32 | 46 | 53 |
| Vegetable fats | 33 | 35 | 20 | 36 | 54 | 56 | 43 | 23 |
| Eggs | 26 | 35 | 22 | 30 | 79 | 57 | 23 | 28 |
| Pork | 22 | 37 | 18 | 25 | 90 | 56 | 18 | 32 |
| Beef | 15 | 27 | 11 | 29 | 53 | 49 | 61 | 45 |
| Veal | 17 | 28 | 22 | 29 | 65 | 41 | 46 | 52 |
| Poultry | 18 | 25 | 30 | 30 | 81 | 63 | 21 | 32 |
| Fish | 23 | 33 | 27 | 34 | 84 | 61 | 15 | 22 |
| Potatoes | 42 | 36 | 34 | 45 | 55 | 46 | 19 | 23 |
| Raw vegetables | 37 | 45 | 35 | 40 | 51 | 38 | 26 | 27 |
| Cooked vegetables | 41 | 45 | 37 | 36 | 53 | 45 | 19 | 24 |
| Raw fruit | 48 | 38 | 29 | 42 | 40 | 44 | 33 | 26 |
| Processed fruit | 31 | 32 | 37 | 27 | 51 | 53 | 31 | 38 |
| Fruit – vegetable juice | 42 | 38 | 26 | 27 | 55 | 43 | 26 | 42 |
| Legouminous plants | 44 | 29 | 19 | 36 | 39 | 40 | 47 | 45 |
| Sugar, sweets | 60 | 67 | 20 | 24 | 39 | 27 | 26 | 32 |
| Coffee | 75 | 86 | 23 | 22 | 24 | 20 | 27 | 22 |
| Green tea, ginger tea | 23 | 25 | 22 | 14 | 20 | 17 | 84 | 94 |

Source: authors' research

C - the city of Słupsk; R - district of Słupsk (rural areas)

incidence by 2-3%.

The patients should limit a daily intake of saturated fats to 7% of total demand. You can do it by eating lean meat, fish, poultry and low-fat milk products. 34 respondents (22%) from the city of Słupsk and 28 respondents (18%) from the rural areas have skimmed milk few times a day, however 35 respondents (23%) from the city of Słupsk and 48 respondents (32%) from the rural areas have whole-fat milk. In this particular case discrepancy is probably the result of an easy access to whole-fat milk products in the rural areas.

It is recommended to limit to 25-35% of caloryfic demand from fats and replace them with mono- and polyunsaturated fats. It is also recommended to increase an intake of vegetable stanols and sterols to 2 g/d. The results show that there is no difference in an intake of animal saturated fats depending on a place of living, 60% of respondents cover daily demand with saturated fats 1-3 times a day, while only 22% of respondents take vegetable fats.

People should eat foods reach with fiber, such as wholegrain bread, legumes and vegetables (minimum amounts – 400 g/d). The results show that 36% of respondents from the city of Słupsk eat wholegrain bread 1-3 times a day, however 30% of respondents from the rural areas eat hardly any wholegrain bread. The

Table 4. The occurrence of coexisting diseases in the studied group (respondents could choose more than one answer)

| Coexisting diseases | Rural districts | | Urban districts | |
|---|---|---|---|---|
| | N | % | N | % |
| Coronary heart disease | 75 | 50,0 | 67 | 44,67 |
| Hypertension | 62 | 41,3 | 38 | 25,3 |
| Diabetes | 49 | 32,6 | 44 | 29,3 |
| Overweight and obesity | 99 | 66,0 | 109 | 72,6 |
| Kidney diseases | 23 | 15,3 | 15 | 10 |
| Rother diseases | 7 | 4,6 | 12 | 8,0 |

Source: authors' research

respondents from the city of Słupsk eat legumes more often that those from the rural districts.

## Discussion of results

According to Tokarz A. [6] the elderly people with cardiovascular diseases eat 3 (46.5%) and 4 (43.0%) meals a day in similar proportions and only 10.5% of people have 5 meals a day. The authors of the's paper confirm the above results since 65.3% of respondents from the city of Słupsk and 54% respondents from the county of Słupsk have 4-5 meals a day. Every third respondent from the city and county of Słupsk hardly ever eats legumes. This structure of fiber consumption shows similar features observed in research to Warsaw population where 54% of the studied group did not have any fiber in their diets. However 66.3% of respondents from Warsaw - a big urban agglomeration – declares to take a daily intake of vitamins and minerals, while only 25.3% of respondents from the city of Słupsk and 22% of respondents from the county of Słupsk supplement regularly their diets with vitamins and minerals.

According to Harton A. [4] the level of education influences people's dietary habits. The authors confirm that well educated people reduce an intake of whole fat milk and tend to have more vegetable oils, olive and fish. Although the mentioned problem was not a subject of the research the authors discovered that only 56% of respondents from the city of Słupsk and 40% of respondents from the county of Słupsk have fish 1-3 times a month. Osler and associates [8] studied a group of 3698 men and 3618 women (Danes) in a period of 15 years and observed inversely proportional general mortality in people who follow well-balanced diet basis. Unfortunately this kind of relation does not concern people who follow western diet basis. Similar studies of prospective character led by Hu and associates [2] on a group of 44875 Americans, mostly Caucasian,

with the use of a questionnaire applying to frequency of groceries consumption in a well balanced diet and western diet show that the risk of ischemia increases in the group of people who follow western diet basis and this tendency is not influenced by other aspects of their lifestyles. The authors conducted their research using similar methods and confirm the conclusions also in relation to coexisting diseases.

## Conclusions

1. Evaluation of dietary habits of patients after cardiac muscle infarct from the city and county of Słupsk shows numerous irregularities influencing the occurrence of coexisting diseases.
2. A place of residence influences significantly pro--health behavior patterns in people after cardiac muscle infarct. The respondents from the rural areas tend to smoke heavily, and seldom supplement a daily diet with vitamins and minerals.
3. The respondents from the urban districts do not care about structure of the food.
4. The research shows undesirable health behavior patterns in people after cardiac muscle infarct in the studied region and poor knowledge about pro--health behavior patterns.

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**Konflikt interesów / Conflict of interest**
Brak/None

## References

1. GRAHAM I., ATAR D., BORCH – JOHNSEN K. i wsp.: Europejskie wytyczne dotyczące prewencji chorób sercowo- naczyniowych w praktyce klinicznej. Medycyna Praktyczna 2007;12:54-80.
2. Hu FB, Rimm EB, Stampfer MJ, et al. Prospective study of major dietary patterns and risk of coronary heart disease in men. Am J Clin Nutr 2000;72:912-21.
3. Gaziano JM. Global burden of cardiovascular disease. In Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine, edn 6, vol.2. Edited by Braunwald E, et al. Philadelphia: WB Saunders; 2005. p. 1-19.
4. Harton A, et al. Ocena sposobu żywienia pacjentów z niedokrwienną chorobą serca w wieku powyżej 60 lat. Przegląd Lekarski 2005;62(Suppl 3):39.
5. Lochs H, Pichard C, Allison SP. Evidence supports nutritional support. Clinical Nutrition 2006;25:180-6.
6. Tokarz A. i wsp. Ocena sposobu żywienia i suplementacji u ludzi starszych z chorobami sercowo-naczyniowymi z terenu Warszawy. Rocznik Państwowego Zakładu Higieny 2008;59:465.
7. Piotrowski W. Global risk of death duo to cardiovascular diseases in the east Warsaw - the Pol-MONICA project. Kardiologia Polska 2001;55:543.
8. Osler M, Heitmann BL, Gerdes LU, et al. Dietary patterns and mortality in Danish men and women: a prospective observational study. Br J Nutr 2001;85:219-25.

## Choroby otępienne. Teoria i praktyka

Wyd. II, pod red. Jerzego Leszka, Wydawnictwo Continuo, Wrocław 2011, 560 s.
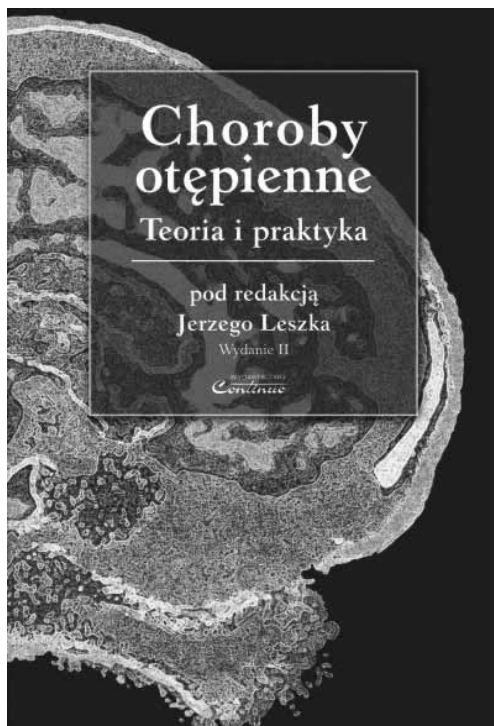


Na podstawie własnej praktyki zawodowej i doświadczeń badawczych Autorzy poszczególnych rozdziałów – wybitni znawcy tematu – przedstawiają najbardziej aktualną wiedzę dotyczącą patomechanizmów zaburzeń otępiennych, aspektów epidemiologicznych, diagnostycznych, klinicznych, strategii terapeutycznych oraz implikacji lekarskich.

Różnorodność ujęcia i podejścia do zagadnienia decyduje o niewątpliwej wartości dokonanego, po raz drugi po ośmiu latach, zbioru, zawierającego 33 rozdziały (20 nowych, 13 zmienionych i uaktualnionych). Podobnie jak poprzednio powstało dzieło unikatowe, które w sposób wszechstronny i wieloaspektowy – integrując różne obszary wiedzy – umożliwia holistyczne spojrzenie na problematykę zaburzeń otępiennych, zajmujących bardzo ważne miejsce wśród chorób wieku podeszłego.

Publikacja stanowi aktualne, nowoczesne i bardzo różnorodne tematycznie źródło wiedzy. Jest przeznaczona nie tylko dla specjalistów zajmujących się tematyką otępień, ale także dla wszystkich, którzy chcą się zapoznać z aspektami prawnymi, etycznymi czy organizacyjnymi opieki i leczenia chorych z otępieniem.

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