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# Biomedical Rationality: Ontology, Scientific Grounds and Reflexivity

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## Abstract

A novel and complex core concept of "biomedical reality" has been formulated in the context of metaphysical knowledge. In meaning, it is close to digitalisation, though differs methodologically. Scientific grounds suggest that it is a backbone in the characteristic of the human ontos, representing multidisciplinary understanding of values of the existing technology-related model of living. A phenomenon of reflexivity has been considered as an onto-gnoseological key element, an interpretative principle, and a condition for new-style rational thinking in the contemporary scientific paradigm. Causality of processes in the living matter and a basis for bio-rationality as a crossing reality point are modelled based on connective-tissue individuality. Evaluation and parametric analysis of the phenomenon through generalising new data of neuroscience demonstrates that there is a theoretical and methodological perspective of this idea within subject-matter- and attribute-based approaches. In the system of personality attributes, operational nature of the concept of reflexivity and its components, namely, vectoriality, efficiency, intensity, are incorporated as predictors in the path to the truth, and the medical truth, in particular. Involving the patient's personality as a component of a 5-PSM model of medicine, being the most dynamic sector of science, implies that reflexivity is seen as a tool-significant resource in objectifying information. In terms of post-nonclassical science, focused on the paradigm of holistic nature of information-based and physical reality, reflexivity in the medical mind set ensures that doctors are concentrated on the essence of disease and the personality of a patient in diagnostics.

**Keywords:** Ontos •Multi-disciplinary nature • Paradigm

## Introduction

When medical paradigms have regularly been updated, the problem of creating general meta-orientation has remained relevant in the modern society. The methods of philosophical knowledge are used to study the problem. A technology-related component of society development is accordingly associated with the parameters of information and its quality; value-based and cultural component is linked to current patterns of discussing the information lifestyle in society and commitment to preserve culture. While forming the values of the seventh technology-related life pattern, their rational basis is examined [1], which has increasingly been related to multidisciplinary nature.

A need for systematising multidisciplinary knowledge, that socio-humanistic knowledge, specific scientific fields and medicine accumulated, has made it necessary to define biomedical rationality in practical terms [2]. In post-nonclassical science, the latter is related to how the human image is represented and how the disease determination is understood. Since inter-disciplinary knowledge, accumulated in certain fields of medical science and humanistic knowledge, must be systematised, a practical need for defining biomedical rationality arises in relation to a specific model of a human being and post-nonclassical period views on the disease reasons.

From scientific and practical perspective, it is implied that the concept of biomedical rationality constitutes a special type of scientific rationality. It is created by post-nonclassical thinking, which assigns a decisive role to the life phenomenon. A profound ontological notion of the phenomenon develops based on its genetic relation to existence. Value-gnoseological and methodological aspects of this type of rationality in the contemporary history have come to be comprehended in a different way, when intertwined with virtuality, formed by human consciousness, numerous technical and technology-related works, and existential situations of humans. Life sciences or "organic" sciences, namely, biology, medicine, and humanistic knowledge, have a notion of medical rationality. Here, besides the category of "life", there are notions of human health and medical truth as an adequate knowledge of living matter. The authors employ the term "biomedical rationality" in this research study as principal and system-forming.

Consideration of this complex concept requires bringing natural science, humanistic approaches and medicine together as a synthetic type of knowledge. Meta-language should also be unified for fundamental research. As an increasingly complex subject-object modification, biomedical rationality is linked to diverse self-developing reflexive active environments and their parameters. The mode of cyclical contracting meta-time in conditions of network information technologies cause's radical information changes in the human life. Mutual complementarity enables "consciousness" and "embodiment" levels to form a unified wholeness, whose perfection is the essence in finding medical truth. Biomedical rationality as a historically developing pattern, towards which biomedical knowledge is on the way, in fact remains a human concern.

## Materials and Methods

The study aims at conducting a theoretical meta-analysis of the ontology of bio-rationality phenomenon in the system of its scientific grounds. The phenomenon is implemented through reflexivity, a basis of the ontos of a human being as a social actor. Based on the concepts of agent-oriented, humanistic, system-constructive value-based approach, and the principle of medicine anthropocentricity, we define "biomedical rationality" as a new category and an interpretative and predictive concept of contemporary science. Finding medical truth as an adequate knowledge about the

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body suggests a broader theoretical understanding of the nature of social phenomena, whereas their increasingly extensive cognitive grounds - examination of ontological nature through reflexivity. Biomedical rationality and its field are presented as a factor of the efficiency of therapeutic and pharmacotherapeutic treatment.

At the first stage of the research study, the data were collected about scientific grounds of this phenomenon, involving philosophic, general scientific, worldview, methodological and gnoseological, and social grounds as such. In conformity with the attributive approach to human sociality in philosophy, a system of foundations for examining the phenomenon of biomedical rationality was formulated.

By its content, the general philosophic methodology has expressed the most common traits of used scientific methods, having served as their general basis. Philosophic grounds of analysing the bases of the biomedical rationality phenomenon constitute a system of ideological theories, concepts, and principles of methodological and educational significance to examine human nature and human reasoning mechanisms. The study of spiritual and social hypostases overrides a philosophic cognitive process with its concepts of life value and sense, philosophy of life. The bases of ontological human nature are examined through reflexivity.

A system of philosophic and worldview, gnoseological, methodological and social grounds of the research were used to analyse the phenomenon. Worldview grounds involved fundamental principles, reflecting universal properties and laws of the existence of objects and processes, the most important aspects of reality: Space and time unity, dependence of space and time attributes on structural relationships within material systems, principle of causality, integrity, and system-based organisation of material objects and processes. Interpretative gnoseological and methodological grounds have been employed as standard and guiding provisions to integrate scientific knowledge about the phenomenon. These are: The principle of mutual complementarity of knowledge, descriptive and interpretative approaches, unity of theory and experiment, and relationship between general cognitive methods, namely, analysis and synthesis, analogy and modelling, system-based and structural approaches. A subject-matter-based approach, a theory of self-organising natural, socio-technical systems, information-based approach, and modelling were employed as general scientific grounds to analyse the phenomenon of biomedical rationality. An information-based approach is employed as a tool for examining unity of information and energy and interrelations between complex system-based objects, a human being. It served as a methodological basis for characterising a complex of interactions between the living organism and the ambient, understanding the essential nature of a wide range of states of a subject and its consciousness in its rational activity.

At the second stage, there have been formed the concepts of medical paradigm and the category of bio-rationality as such, as an interpretative-predictive concept in the contemporary history. To this end, interdisciplinary, and analytic-synthetic, descriptive approaches were employed.

The concept of reflexivity within the context of general methodology of holistic study of a human being and its attitudes is used as a design concept in relation to both individual ontological personal space and health in general. Reflexivity serves as an interpretative principle and a means for objectifying knowledge (self-control, self-analysis, etc.), a method to hold the interior spiritual experience fixed. A subject-matter-based approach, applied to the research subject in the article, facilitates it, combining micro- and macro-levels of description, performed according to the principle of mutual complementarity of knowledge.

Adopted in philosophy axiological approach to real phenomena enabled consideration of human views from the paradigm aspect as a subject-matter of various psychophysiological functions in general, and medical mind set as a type of subject-matter-organised professional mind set, in particular. A direct effect of professional medical mind set on treatment efficiency, irrespective of other domain-specific impacts, constitutes a sufficient condition for the beneficial effect of treatment in the context of biomedical rationality. A mind set-specific approach to solving the problem of grounds for biomedical rationality and health has been used as macroscopic in the situation of renewing a scientific paradigm.

At the third stage of the research study, the results were finalised, and general conclusions were drawn.

## Results

As part of devising a concerted strategy for social advancement and reform, the development is underway of specific scientific approaches reflected in the works on economy [3,4], sociology [5-8], medicine [9,10]. They were aimed at coordinating the components that bring together an event-related plane of historical, socio-technical, cultural, and economic processes and their time interval. All the studies note that without humanising a personality social development and new way of thinking are impossible [3]. In the current situation, all the context of post- non-classical science is focused on the paradigm of holistic nature of physical and information-based reality. This paradigm serves as a general methodology for holistic study of humans, their social activity/views, focusing the attitude on values, life, health, and their own future.

Within an integrated worldview project of our times, the principle of mutual complementarity of knowledge makes it possible to create a new specific historical rationality as a trait of human reasoning. According to the estimates of Russian researchers, it assimilates different types of rationality, i.e., formal, substantive, and other, incorporated into attitudes and beliefs [11]. In the cultural context, scientific rationality exists as a totality of methods and a value-based position that defines a selection of natural-scientific and philosophic tools for examining humans and their inherent phenomena.

The problem of grounds as one of most essential problems of scientific knowledge has a value-system-based significance for the development of knowledge about interaction between the world and a human being. Philosophic grounds as an integrated knowledge form an intrinsic part of the content of natural science and medical sciences, defining their worldview and methodological structure. An interpretative-predictive significance of a specific concept or phenomenon depends on an initial philosophic attitude. In analysing philosophic grounds of a specific science, of importance are both specific problems as such, and their result-oriented solutions, enriching scientific knowledge. The obtained solutions are incorporated into the system of scientific bases, or biomedical bases in this research study. Philosophic grounds of the analysis of bases for the phenomenon of biomedical rationality constitute a framework built from the complex of ideological theories, concepts, and principles of methodological and educational significance to consider human nature and the mechanisms of reflexive thinking. This complex imparts integrity and enables interpretative function in relation to empirical facts. Natural science and medicine specify them in scientific understanding of human nature in his biological dimension. Philosophic cognitive process as such overrides the boundaries of fixing and studying spiritual, social hypostases, using the levels that define values, sense of life, and human objectives through the worldview as a subject-matter of physiological functions and a communication tool. Constant self-development of humans as creatures of nature and history suggests constant augmentation of cognitive grounds and examination of human ontological nature through reflexivity.

Thus, philosophic-worldview, gnoseological and methodological and social grounds of its examination should be specified when analysing any phenomenon. Among worldview principles are fundamental principles, reflecting universal properties and existential laws of objects and processes, the most essential aspects of reality: Space-time unity, dependence of spatial and temporal properties on structural relationships in material systems, causality principle and system-based organisation of material objects and processes. Gnoseological and methodological grounds have an interpretative value in relation to the integration of scientific knowledge of the phenomenon, also fulfilling the role of standard guiding frameworks.

In the present article these are: the principle of mutual complementarity of knowledge, descriptive and interpretative approaches, unity of theory and experiment, as well as a relationship between general cognitive methods, namely, analysis and synthesis, analogy and modelling, system-based and structural approaches. General scientific grounds of analysing biomedical rationality include its essential and making it holistic approaches and principles, employed in most sciences: Subject-matter-based approach, theory of self-organising open non-equilibrium systems. An information-based approach is employed as a tool to study information-energy unity and interrelations between complex system-based objects, to which humans belong. Finally, social grounds involve a system of principles and provisions, which specify a place of the phenomenon in contemporary science, in the general human understanding, and its purpose in terms of satisfying social and spiritual needs, interrelation between science, practice and social phenomena.

At each historical stage of advancing anthropological agenda, worldview factors facilitate philosophic speculation about humans. Various areas of anthropology constantly require philosophic reflexivity, and it is intended to examine how human accomplishments, history, socium, culture [12], medicine, and science follow from the structure of human existence. Philosophic understanding of a human being of early 21st century in its bodily-psychic-spiritual integrity, in the entire wholeness of his existence was initially formalised as a subject of ontological paradigm in science, going back to the conceptual basis of human psychology [13].

Nevertheless, the activity of a human being as a unique social actor as related to socio-technological and natural environments has constantly been expanded and transforms his ontological space [5], changing outlines of rational thinking and behaviour. Studying the latter is incorporated into bio-rationality, being as a common denominator, a new methodology and method of thinking. In the 21st century, it is introduced by mutual efforts of bio-medicine, socio-humanitarian knowledge, and culture [14]. The phenomenon is recognised as close to the idea of digitalisation in meaning, though with differences in methodology.

Medicine as the most dynamic branch of science with increasing digitalisation (including epidemiology) and information volumes, and urban development, more and more utilises meta-data about population and objective profile of each person, and, hence, system bases to study processes and phenomena [15]. As it is stated in the modern literature, practices of digital self-tracking (Quantified Self-movement, and other) and "securitisation of health risks" as a result of technicalisation of diagnostics in not conducive to a reasonable improvement of self-preservation instinct and an individual's caring his own health, in the light of the spiritual worldview. Significance of reflexive thinking, which ensures that doctors are concentrated on the essence of disease and the personality of a patient in diagnostics, is therefore of instrumental self-value. The concept of evidence-based medicine with its value-estimative methodology, adopted by modern medicine, has no meta-level, and hence, is unable to be universal without evaluation and standardisation logic, existing in philosophic axiology.

The space of values and estimates, transforming knowledge into social action, existing in bio-rationality as in the style and method of thinking, enables authors to introduce a term "biomedical rationality" or "biomedical rationality". The concept contains the knowledge about a contemporary human being and his health as a system-defined wholeness, related to the activity of self-developing reflexive-active environments and acts as an interpretative-predictive concept of meta-level.

Reliability, accuracy, conclusiveness, and validity of diagnosis, with theory rightly corresponding to practice, constitute the basis of scientific nature of contemporary medicine. In this case, there exists an initial determination to standardise and make valid the knowledge about personality and organism with allowance for advanced development trends. Rationalisation of medicine is combined with modernisation of the scientific examination of humans in the 6th technology-related pattern of living, namely, Nano-, Bio-, Info-Cognitive Technologies (NBICT) and their positive convergence. Life pattern is built with prevailing cause-and-effect approach to the processes and phenomena. The existing under such conditions biomedical rationality has less deterministic approach to consciousness, which, in line with its synthetic features, forms a proper direction of meaningful existential bases.

Intersection of realities in medical bio-rationality encompasses the spaces of interaction between both sick, and healthy subject (including physiological and pathological processes in its so matopsychic organisation), and the activity of specialists, educated in the context of historically formed field of medicine, activity of medical and preventive and scientific organisations, health care and pharmaceutics, with their local conditioning during a specific period of social development. Such a versatile structure is defined as medical reality, implying the existence of medicine as such with a certain ontological status, structure and object. As a type of reality, it expresses the society mind set during a specific period of history, and, at the same time, it is a process and a result. It also incorporates the notion of a style of scientific rationality as thinking, which does not function without the transformative role of actively thinking and learning subject, with his ontology and possibilities.

Medicalization of the space of human existence as one of life phenomena demonstrates that the existing medicine of diseases is limited [16]. It should be postponed through the development of methods for optimising drug administration, since to date complete cancellation is impossible. Key principles of pharmacological therapy were created over centuries, based on the concepts of disease causality and the needs of society. Approaches to pharmacotherapy are updated according to the achievements in the multidisciplinary field. In terms of such a situation, the authors define the concept of biomedical rationality as a special type of scientific rationality, in which of main importance during post non-classical period are the phenomena of a human being, his health, and medical truth as a specific knowledge. In the context of as general rational knowledge of the world as possible, formed by philosophy and biomedical science, the concept expresses the activity of heterogeneous self-developing reflexive-active environments with their ontological properties [17]. The basic component of biomedical rationality combines symbols, socio-cultural patterns, values, paradigms, skills, automatisms and stereotypes of thinking, among which there are those persons, are unconscious of. The variable component incorporates the parameter of ontological etno-skepticism, fixing the dynamics of the unique states of an individual in the social group in terms of health-disease and functional response to pathological deviations in time-space, at its own ontogenetic stage. The understanding at the level of a utility model will make it possible to make rational treatment decisions in the present-day classic medicine, based on the principles of an integral body functioning in variable environments.

Biomedical rationality is an essential object of analysing in terms of both its conceptual meaningfulness and the result of reflecting reality in the consciousness of a human being as a subject of social actions. Paradigm-related aspect is inconsistent with no definition of the worldview, its essence, role, and value. The worldview system determines the specific features of self-consciousness of a personality and its attitude towards the world, meaningfulness of his actions. This means that the environment is mastered "out linearly". Let us note that connective-tissue-motivational causality, as a basis for human life activities and the specifics of its ontos at the same time, shows itself as a circuit connection. All the remaining control circuits, namely, nervous, endocrine, muscle, and other are superimposed on the bio-energetic and thermal circuit of controlling all physiological and pathological processes [18]. Second, this causality shows itself as a basis of rationalism, including biomedical one. For a doctor it means an intellectual orientation in theoretical knowledge with mastering practical professional specifics at the same time, from specialised to macro-philosophic aspects. To describe the problem, such terms as "medical mind set" and "ordinary mind set" were used [19], which, if operationalized, are of instrumental and practical interest to form the bases of contemporary medicine.

The fact that medical mind set as a type of subject-matter-organised professional mind set, directly affects the treatment efficiency, irrespective of pharmacological and surgical influence, is studied in the works of

authors. Being a tool of verbal effect, worldview serves as a system and a cognitive basis of medical knowledge as such as a system of semantic (cognitive) charge. This basis is constantly constituted during inactivation of properties and potential of a person and is a cognitive action. A doctor's mind set or medical mind set represent a humanitarian component, which, due to its algorithmisation, has a therapeutic (treatment) function and is a sufficient condition for a beneficial effect of treatment. Hence, the process of forming bio-rationality of a new social pattern of life starts in the field of medicine of humanitarian sciences and humanitarian culture from the parameter of spirituality when it is connected with bio-dimensionality. It encompasses integrity of a person in all its complexity and demonstrates a need for engaging a patient's personality. Involvement of patients as one more component of the 4PSM-model of medicine implies transition to the 5PSM-model, where reflexivity serves as an operational concept.

A human being as a prerequisite and an element of created by him artificial complexity, in a reflexive manner self-creates himself through language and culture, and the analysis of processes on human subject-matter precedes the cognitive process as a functional process. The grounds of examining the spheres of activity of a person are related to its affiliation with society and activity of a human being, as, first, a family creature, second, personal individuality, raising its self-esteem, third, active individual, realising its potential, with some constitutionalism and environmentalism. In this case, the relationship between spiritual values and cultural-typical subject matter of personal attitudes at a fundamental spiritual-anthropological level becomes principal. It is of relevance in the contemporary social philosophy and social science. Creation of an individual metaphysical world predefines the construction of social reality, facilitating profound and broad understanding of value-based grounds of social practice, their transition into existing historical traditions.

So, the model of scientific-gnoseological grounds of biomedical rationality as multi-disciplinarity synthetical phenomenon and subjective-objective modification (meta-level of structural ) is presented in the Table 1.

<table>
<tr><th colspan="2">Philosophical grounds</th></tr>
<tr><td colspan="2">1. The principle of the integrity and universal interconnection of the world.<br>2. Principles of self-movement (internal activity) and self-detection of matter.<br>3. The principle of information reflection.<br>4. The principle of systemic and self-organization of matter.<br>5. The principle of dependence of space-time properties on structural relations in material systems.<br>6. Causal approach in dialectics as the basis of rationalism</td></tr>
<tr><th colspan="2">General scientific and worldview grounds</th></tr>
<tr><td colspan="2">1. The principle of relativity and complementarity of knowledge. 2. General theory of systems.<br>2. The general law of harmony. 4. Substrate, attributive and cybernetic approaches.<br>3. Theory of the self-organization of open non-equilibrium systems (synergy).</td></tr>
<tr><th colspan="2">Natural Science grounds</th></tr>
<tr><th>Biomedical:</th><th>Physical:</th></tr>
<tr><td>4. The principle of unity of living and non-living nature.<br>5. Evolution-genetic approach.<br>6. Bioinformation approach.<br>7. Theory of functional systems.<br>8. Theory of dissipative structures<br>9. The principle of irreversibility.<br>10. The reflex concept of the mental processes of I. M. Sechenov and the theory of higher nervous activity of I. P. Pavlov.<br>11. The principle of information subordination and selective mobilization of structures.<br>12. The principle of conformity of theory with practice.<br>13. Agento-oriented approach in modeling complex social objects in medicine.<br>14. The combine-material theory in medicine.</td><td>1. The law of conservation and transformation of matter, energy and information.<br>2. The principle of non-equilibrium of dissipative structures.<br>3. Principle of system elements coherence.<br>4. Principle of quantum integrity of structural units of the system.<br>5. Principle of physical-field information interactions</td></tr>
<tr><th colspan="2">Social (socio-humanitarian) grounds</th></tr>
<tr><td colspan="2">1. Hermeneutic approach (oriented towards the inner world of personality).<br>2. Axiological (value-evaluation approach).<br>3. The principle of periodic change of value thinking.<br>4. The principle of self-determination of social objects.<br>5. The principle of understanding.<br>6. Integrated approach.</td></tr>
</table>

| Psychological and pedagogical: | Sociological: |
|---|---|
| 1. Teaching about psychological personality types. | 1. Complex approach in sociological research. |
| 2. An active approach. | 2. Holistic logic-semantic model of personality rationality (by structural and factor operationalization of conceptual concepts in reflection). |
| 3. The principle of self-determination and arbitrary self-regulation of behavior and activity. | 3. The principle of individual assessment of rationality (as opposed to statistical). |
| 4. Motive-dynamic strategy of personal organization study. | 4. The principle of multilevel estimation and digital processing algorithm. |
| 5. The concept of human potential. | 5. The concept of social interaction as an information exchange. |

**Table 1.** Meta level of structural multi-disciplinarity synthetical phenomenon and subjective-objective modification.

## Discussion

Medical literature discusses these problems from different perspectives, namely, socio-cultural, organisational, legal [20,21], for instance, from the aspect of upgrading healthcare based on humanistic concept in management [22]. The situation in today's medicine is often presented through a technocratic lens. Relevance of focusing on patients is shown as a legal category, in particular, and the potential of certain instrumental approaches [22], i.e., agent-oriented, and other [23], that had covered social, physical, and biological aspects of human life activity and medicine. Agent-oriented approach as a recent one is deemed a tool for modelling complex social objects, supplementing classic methods of modelling and predicting [24]. Hence, it can also be employed in examining healthcare as a complex and multi-aspect system. At the same time, it should be stated that there is a partial scientific specifics and methodological inconsistency in approaches, complexity in ensuring doctor's concentration of the essence of disease and the personality of a patient as principal diagnostic values.

Modern literature notes few fundamental works devoted to the analysis of social and technology-related life pattern and their effect on the way of thinking [25,26]. The existing publications contain multidisciplinary synthesis. Discussions about the value of the 7th socio-humanitarian technology-related pattern of living in understanding biomedical rationality in the current situation are quite natural. The above shows its role in expanding the reflexive field in scientific activity, value-based correlation between knowledge about an object and means and operations of the activity (including medical activity) [27]. As fundamental for the existing medicine, rationalistic worldview is built on some base principles. Philosophy as a rationalised worldview and multi-dimensional method of treatment, as the main principles of using constitutes: First, value-based worldview response of an individual to life situations; second, sensory and rational comprehension of disease. The fact should be emphasised of synthesising these positions under conditions of increasing theorisation of knowledge and problematic nature that serves as the basic prerequisite to cognition, specifically, medical. Scientific rationality as a totality of methods and value-based position defines selection of tools for examining humans and their phenomena.

Social nature of humans is characterised by the phenomena of complexity, information-related nature, adherence to pluralism, global communication nature, multi-dimensionality, network structured ness [28]. These positions, in our opinion, define personal interactions with the ambient, qualitative specifics, and potential of social matter from the standpoint of attributive approach in the science philosophy. Reflecting the essence of a normal state of consciousness and social nature, reflexivity serves as its attributive component [29]. In the model of biomedical rationality, reflexivity is an ontological basis of manifestations of living and activity and is of scientific-practical interest in this article.

The degree, to which reflexivity is studied, has its own traditions in social sciences [30], in medicine and psychological and pedagogical knowledge [31-35]. Within a multi-aspect scientific search, a meta-model of reflexivity is formed in the context of meta-ontology, i.e., multi-dimensional unity of consciousness, activity, and thinking, personality, applied to any type of activity. However, despite good points of specific research studies, they unravel incompletely the mechanisms of reflexivity, specifically relevant for post non-classical time.

Process-related mechanisms of reflexivity, to which all the types of determining personal activity, namely, biological, social, psychic, and spiritual, date back, are provided structurally and functionally with a subject-matter-based organisation of human nature. Reflexivity (from Latin "reflexio") as a self-awareness, becomes a type of theoretical activity on qualitative transformation of information, coded onto-genetically in neurones. Empirical studies on neurobiology indicate compositional and other types of neuronal coding and synergism of their functional activity [36], ensuring architectonics and specific features of this process at the biological level of organisation [37]. Specifics of the process of neuronal provision for the activity of individual consciousness and self-consciousness, are characterised by S. Dehaene as "a global neuronal working space" [38], including symbolic, geometrically organised one [39], what allows for inferring that there is a bio-subject-matter basis for the formation of adaptive and cognitive structures, significant to study construction mechanisms of human ontos transformations.

Pursuant to a subject-matter-based approach to the levelness of human organisation, existence is perceived differentially, depending on processing of the information by neurons and their algebraic topology [40]. Only after this, consciousness and the brain introduce the reality into the system of category-based thinking of an individual, into the system of his values and attitudes. Thus determined processing of information, neurobiological predictively and activity in a subject-matter manner contributes to designing and correcting life scenarios.

Reflexivity as self-comprehension and intellectual activity, including, professional doctor's activity, becomes a type of such design and any other theoretical activity on qualitative transformation of the information coded ontogenetically in neurones [38]. Studying subjective introspection contributed to evaluation of the value of anthropological subject-matter-based component in medical communication.

The problem of substantial basis of morpho, anthropogenesis, and cognitive phylogenesis and life in general is worked out in synergetic and connective-tissue medicine to have a rational notion of their causality, in which the body connective tissue has a provision role. The effect of the psychic, as an ideal specific content of the brain neuro dynamic codes, on the physical basis means embodiment and signal transmission of information [18]. Diagnostics as a cognitive comprehension is conditioned by an area is active and epistemically affects the processes of homeostasis in the body: From information-based level to the level of tissues. Cognitive states and processes depend on not only anthropological subject-matter-based component, but also on exterior factors [41]. It also affects the intensity of motivational and connective-tissue responses to both functional characteristic of the connective tissue and the processes therein, serving as a therapeutic value. This thesis implicitly contains the provision about the language as a core part of ontological attributes of a human being, combining symbolic forms with psycho-physical organisation in its ontos

(down to the unconscious). Connective-tissue-motivational causality as a basis for human living simultaneously shows itself as a basis for rationalism, including biomedical.

With regard to the worldview as the macroscopic whole and fundamental for biomedical rationality, it should be noted that equal attention must be given to the movement of parameters, characterising the worldview on the part of the microscopic whole. Studying micro-level processes shows that the time and surviving of this time by a person and events, interrelated with reflexivity through goal-setting and space, with the ambient objects are the basis for the activity of interior neurophysiological processes in encouraging any activity [17]. Besides subject-matter-based, to analyse existential-epistemological and anthropological aspects of the problem, the authors have employed an intentional approach owing to which the qualities and ontological attributes of reflexivity, potential manifestations of personal experience and social activity were examined. Reflexivity shows itself as orientation towards changing and renewing the order of events, life intentions, and is of instrumental value for socio-humanitarian technologies, as their ideal component. We have also introduced the concept of the reflexivity vectoriality due to a model-forming potential of reflexivity in the system of personal traits in relation to itself and the ambient. The content of reflexivity is in its relationship with trueness of knowledge; hence, the efficiency as productivity of finding the truth, intensity as the degree of assurance in the correctness of efforts on the way to the truth must be estimated. Efficiency and intensity are formed in the system of ideas about its own self within the frameworks of the world image of a person. Thus, reflexivity on a subject-matter is characterised by the moments of intentionality, efficiency, and intensity of processes. Meaning of the information, its estimative and parametric aspect constitute a potential of reflexivity to assess the reality. The phenomenon of connective-tissue individuality [18], was taken as a basis for multidisciplinary understanding of human integrity, occupying one of the key positions in the rational medical way of thinking. When describing human social nature, it comes to be a new method that enables modelling of the beginnings of information-based causality of all regional processes in the living matter, and the worldview algorithms.

We have studied epistemic determination of the mechanisms of self-formation, self-creation of a person in analysing field-type conditionality of rational therapeutic effect as a subject-subject interaction [17]. Substantiality as a totality of active environments of information-based origin in the course of diagnostic cognitive process undergoes changes, depending on changes in information and energy accumulator's bio energetically controlling each specific situation. Mechanisms of semiotic and motivational-connective-tissue subject-matter nature of a human being (informativeness, energy level, vitality) are shown as quintessential determinations. Analysis of the problem has demonstrated that the time, accumulated and inducing any process, is an actively functioning beginning. Prior to energy accumulation, time determines the state of energy-related complexes on a subject matter, internal system of conditions, and above-mentioned parameters of vectoriality, intensity of reflexive processes and deployment of value-based motivation of a person based on syntheses in the intellect.

Practical medicine in the modern world devotes considerable attention to a patient as an immediate participant in the treatment process. In the light of bio-rationality, fundamentals of curing soul and body, whose potential has been known from ancient times, must return to the concept of emerging "human-centred" or "patient-centred" medicine. Hence, their mechanisms are examined in the field of semiotic systems due to the interest of practical healthcare in using instrumental potential of the worldview treatment. Of importance in the latter is a symbolic nature of the human psyche, which field is in contact with molecular and sub-molecular structures of the living matter. A human being is actively studied through all the environments, he transforms, and their characteristics, transforming, in its turn, him as such; namely, through information environment, and in structural and predictable interrelationship with it. Symbolic space and semiotic systems constitute objectifications in this case.

Solving social problems in the contemporary period depends on the optimal model of intercultural interaction, disrupted nature of the human essence, explored in contemporary anthropology through level-and subject-matter-based approaches. Understanding the socio-metaphysical world of a person, its moral law, and role of self-consciousness occupies a special place. In philosophy, it is pertinent to interpret evolution of the sphere of values. Foundations for studying the spheres of personal activity relate to controversial "human images" at all levels of stating and solving an anthropologic problem of 19–20 centuries. Metaphysical world of a person predefines the reality, facilitating understanding value-based grounds of social practice, their transition to historical traditions.

Current crisis of human nature named as eco-physiological, reflects the influence of treatment conditions on adaptive and transformative potential of the body. The problem is discussed to study thoroughly the life quality of a person, his social activity and origins of anthropological activity [42]. Understanding the system of regulatory mechanisms of the processes, determining the above-stated manifestations, implies appealing to the spiritual sphere of a person in forming information-based space, which generally fits in the pattern of the existing model of medicine directly through reflexivity. A synthetic model of medicine with a specific subject component, which incorporates ethico-social, value-based and existential layers is the resultant of the clinical practice transition to molecular and sub-molecular levels. In the light of discussing the phenomenon of bio-rationality, a 4PSM-model of medicine [43], constructed based on holistic understanding of patient and his traits, implements simultaneously a number of principles: personalisation, preventiveness, and participativity, what is fully realised solely through the medicine of humanitarian sciences and culture [44].

Hence, reflexivity is an essential ontological basis for the model of biomedical rationality that has a crucial significance in the new scientific paradigm. Studying reflexive thinking from the estimation and parametric aspect is of instrumental value, since reflexivity enables doctors to concentrate their attention on the essence of disease and the personality of a patient in diagnostics, which field is holistic. This occurs since reflexivity serves as an interpretative principle and means to objectify knowledge (self-control, self-analysis, etc.), a method for holding the interior spiritual ontological experience of a person fixed.

## Conclusion

When clinical practice seeks for attaining molecular and sub-molecular levels of research, an interaction between instrumental methods and potential treatment of a worldview type of both micro- and macro-level structures is relevant. The latter employ a symbolism of mental personal organization. Such an importance emerges from the need for further work with multi-level organisation of consciousness. Its understanding will solve the problem of a place and role of the supra-social and supra-biological in humans when the body responses are formed to the ambient challenges. For this reason, of importance is to further improve the medicine to cure diseases in the form of medical practices and technologies, aimed at innovations via traditions, at humanisation and development of fully functional healthcare.

Hence, the following conclusions can be drawn from this paper:

1. Ontology of medical reality was first described in the system of scientific grounds of the phenomenon of biomedical rationality. The phenomenon is characterised by philosophic, onto-gnoseological, methodological and social grounds, which field defines its inter-disciplinarily.

2. From a paradigm-related aspect, biomedical rationality is theoretically defined and applied as an interpretative-predictive concept to form onto-gnoseological grounds of fundamental research: first, human health pattern in the form of regularly renewed substantival schemes of his interactions with social, natural, and virtual environments, and second, changes in

activity and psychosomatic activity over time under all the listed conditions.

3. The process of reflexivity has been considered at the macro-level as a basis for the model of rationality and an interpretative principle. At the micro-level, reflexivity is understood as a tool for objectifying knowledge and epistemically determining the mechanisms of human self-construction and algorithms for organising an individual existential order, what is of practice-oriented value in the new scientific paradigm.

4. Within subject-matter- and attribute-based approaches, an estimation and parametric aspect of reflexive thinking is specified in relation to the typology and specifics of the worldview. Through reflexivity, first, self-understanding takes place, and a spiritual path becomes defined; second, doctors are concentrated on the essence of disease and the personality of a patient in diagnostics, which field is holistic with the available meta-data.

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The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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