


# Hormones and “natural enhancement” of the body: personalized aging in anti-aging medicine

## Hormônios e o “aprimoramento natural” do corpo: a personalização do processo de envelhecimento na medicina *anti-aging*

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### Abstract

This article discusses the role of hormonal therapies in the narrative concerning longevity present in anti-aging medicine. The objective is identifying the meaning that hormones have in the body enhancement process aimed to preserve natural functions and enable the personalization of aging. This analysis is part of a study conducted in Brazil with practitioners of anti-aging medicine, patients and objector members of the Brazilian Council of Medicine, by means of semi-structured interviews and fieldwork observation. The discussion addresses the formation of an international network of professionals and institutions supporting anti-aging practices in a disadvantageous institutional context in Brazil. Anti-aging medicine proposes a holistic approach to aging and focuses on enhancing health conditions throughout the patient’s life instead of targeting aging-related diseases. Hormones are considered “fuel” for life processes and conceived as elements that can integrate the particularity of each patient and the general aspect of natural tendencies in the aging process. That perspective strengthens the conception of natural enhancement, using the body’s own resources. Bioidentical hormone modulation contrasts with the pharmaceutical industry in a narrative that alters the boundaries between therapy and enhancement, natural and artificial, treatment and lifestyle.

**Keywords:** Aging; Hormones; Longevity; Anti-Aging Medicine; Enhancement.

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## Resumo

Este artigo discute o papel das terapias hormonais na construção de uma narrativa da saúde para a longevidade da medicina *anti-aging*. O objetivo é identificar o significado dos hormônios na constituição de um processo de aprimoramento do corpo para manter suas funções naturais e possibilitar a personalização do envelhecimento. A análise é parte da pesquisa realizada no Brasil com médicos praticantes, pacientes e médicos críticos, membros do Conselho Federal de Medicina (CFM), por meio de entrevistas semiestruturadas e observação em campo. Discute-se o estabelecimento de uma rede internacional de profissionais e instituições que viabiliza a expansão das práticas *anti-aging* em um contexto institucional desfavorável. Na proposição de uma abordagem holística do envelhecimento, a medicina *anti-aging* se concentra não em doenças típicas da velhice, mas no aprimoramento das condições de saúde ao longo da vida. Considerados “combustíveis” da vida, os hormônios se destacam como elementos de integração entre a particularidade dos pacientes e a generalidade do processo natural de envelhecimento, fortalecendo uma perspectiva de aprimoramento natural, com recursos do próprio corpo. A modulação com hormônios bioidênticos é contraposta à hegemonia da indústria farmacêutica em uma narrativa que altera as fronteiras entre terapia e aprimoramento, natural e artificial, tratamento e estilo de vida.

**Palavras-chave:** Envelhecimento; Hormônios; Longevidade; Medicina Anti-Aging; Aprimoramento.

This article discusses the role of hormonal therapies in the construction of health narrative for the longevity of anti-aging medicine. Its objective is to identify the meaning of hormones in the process of body enhancement, aiming to preserve natural functions over time and enable personalized aging.

The trajectory of anti-aging medicine associates different medical practices with the idea of reversing or softening the physical signs of the aging process. The boundaries that define it as a specific practice are not evident and stable, since interventions that may change aging arise from different contexts. From elixirs of alchemists to vitamin supplements, several experiments pointing out the potential use of body extracts to change the physical signs of aging are associated with the history of anti-aging practices (Olshansky; Hayflick; Carnes, 2008).

This is the case of organotherapy, which preceded the development and institutionalization of endocrinology and emphasized the use of body substances extracted from other animals to change physiological processes. Scientists like Charles Brown-Séguard, in the 19th century, and Serge Voronoff, in the 20th century, received attention due to their treatments in organotherapy, as they claimed to reverse signs of aging. Their practices highlighted the relevance of substances secreted by the body and their effects on performance. Although Brown-Séguard was a pioneer in analyzing the function of testicles and ovaries as producers of endogenous secretions and the relationship of these substances with sexual differences, thus contributing to endocrinology, his ideas were considered fraudulent, just like those of Voronoff later (Cuperschmid, 2014; Tramontano, 2017).

The parameter of scientificity and the fraud accusations were essential for the development of anti-aging medicine, especially in its relationship with the institutional field of medicine. Since the

rise of the biomedical model in the 19th century, anti-aging propositions became peripheral, understood as an objective with a small chance of success due to incompatibility with scientific methods (Mykytyn, 2007). Proposition, as discussed by Latour (2004), is understood as a statement to be considered true or false. Then, different resources and strategies of body manipulation emerged as possible ways to be explored in the fight against aging, involving different actors that articulate to defend or contest each of these resources. With the development of endocrinology, hormones gained relevance when explaining about body functioning and started to be explored in different areas of research, consolidating as a field of possibilities for medical interventions. However, hormonal therapies to fight against the effects of aging are associated with the stigma of fraud of anti-aging developments.

Anti-aging medicine develops worldwide in a context that contrasts optimism with promises of new interventions from emerging sciences, such as genetics and regenerative medicine, and distrust around the idea of controlling the aging process. The institutionalization of groups of professionals committed to medical practice projects dedicated to body aging intervention ensures visibility and systematization to this type of approach, defining a field of medical-scientific disputes and controversies.

The American Academy of Anti-Aging Medicine (A4M), founded in 1993 in the United States, has developed a pioneering work in the dissemination of this type of approach and training of specialized professionals. In Brazil, institutions looking for alternatives to handle aging issues diverge from a traditional medical approach to the development of a form of medicine based on the anti-aging model influenced by the A4M.

With a legal and institutional conflict between these institutions and the Brazilian Federal Council of Medicine (CFM), this study sought to

identify the connections that define anti-aging medicine in Brazil, considering its insertion in the international context. The Brazilian Academy of Anti-Aging Medicine (ABMAE) was the starting point for the identification of elements that comprise anti-aging medicine in the country. This study was conducted through semi-structured interviews with six CFM physicians, 14 anti-aging medicine physicians, and five patients undergoing treatments, as well as field observation in three contexts: (1) a Geriatrics Seminar organized by the CFM, where the legal situation of anti-aging medicine in Brazil was discussed; (2) a medical training course provided by ABMAE; and (3) 6th International Congress on Human Longevity Sciences, organized by the Grupo Longevidade Saudável. Documents and publications of professionals analyzed during this study were also reviewed. The different contexts and methods were integrated to identify institutions, spokespersons, references and processes constituting anti-aging medicine and understand the factors of its development.

Actor-network theory (ANT) was the theoretical and methodological approach of this study, with the analysis focused on controversies in order to characterize the specific approach of anti-aging medicine (Latour, 2004, 2011, 2012). This study sought to identify the processes - not groups - that create connections that differentiate anti-aging medicine in the biomedical approach to aging. In this context, hormones are the critical point of institutional confrontation, showing positions, ideas and actors that define aging as an object of medical treatment.

Latour (2012) highlights that the contexts of conflict enable the observation of the process of associations and disputes which define the facts that organize life in society. Mapping of controversies consists in monitoring temporary and dynamic movements of construction of these facts. The study design was defined in order to analyze the process to recruit allies and

associations that shape the network where anti-aging medicine is established, in opposition to other practices in the context of biomedicine. This analysis is organized around three main aspects: (1) the perspective of practicing physicians; (2) the perception of opponents, especially representatives of official medical institutions; and (3) the point of view of patients.

## The institutional context: hormones and controversies that define the anti-aging approach

The institutional conflict between the CFM and anti-aging medicine practitioners revealed a group of concepts, practices and methods that are associated with this segment, creating a division between an officially recognized medical approach and an approach that does not fit current biomedical standards due to absent evidence by established scientific standards. In 2012, the CFM published CFM Document no. 29/2012 as a result of an analysis conducted by the institution's Geriatrics Technical Chamber regarding anti-aging treatments. This evaluation was conducted as an initiative of the head of the Grupo Longevidade Saudável, which sought to regulate practices in the country and considered the bibliographic references provided by the applicant and articles published by platforms containing the main scientific studies in the biomedical area, such as MedLine and PubMed. The result was unfavorable to anti-aging practices, resulting in prohibition through CFM resolution no. 1,999/2012, a document that forbids the use of hormones, vitamin supplements and mineral salts to delay or reverse the physical and cognitive signs of aging. According to the CFM, there was no consistent evidence and sufficient clinical studies to attest that these methods would 'modulate healthy aging.'

The CFM document and resolution highlight, among the therapies, the use of hormones as the main strategy of an anti-aging approach, since they are associated with the possibility of reversing the main signs of aging, such as loss of muscle mass. However, hormone replacement for purposes without proof of benefits is considered dangerous, as it would cause several side effects, including cancer (CFM, 2012a, 2012b).

Practicing physicians of anti-aging medicine interviewed in this study report hormones are not the only type of treatment they provide and that, alone, they cannot reverse the problems presented by patients. On the other hand, they recognize their potential and invest in hormonal modulation as a critical dimension of a balanced body.

The approach of anti-aging medicine is a critical opposition to the consolidated medical model, creating a health narrative that differs not only in terms of types of treatments proposed, but also in the conception of health and aging. Although the CFM resolution questioned the current possibility of 'modulating healthy aging,' the narrative of anti-aging medicine, contrary to what one might expect, is not focused on reversing the aging process itself. The concept of aging is fragmented in health and disease processes, from a systematic point of view in the long run. Instead of a perspective of aging as a natural dimension of the human condition, inevitable, and with its own logic, the narrative of anti-aging medicine highlights a cumulative and integrated process of conditions that lead to the maintenance or deterioration of the body. Aging conditions are the result of other health processes throughout life. In this perspective, it is possible to change the way one ages by acting on specific health conditions.

The idea of maintenance is associated with prevention, defended as the main differentiator of the anti-aging approach. In this process, hormones are considered as an essential element, since the whole metabolism process depends on

the interactions between different hormones to occur. Considering hormonal decline increases with aging, improving hormone levels throughout life would prevent the decline of several physical and cognitive functions.

*When didn't you need water in your life? Never. You'll need water until the end, until you die. It's the same with hormones. [...] You see that still today the term andropause is not considered. It seems that the only 'pause' that conservatives still believe is the pause in the female ovary. So they only talk about menopause. As if ovaries were the only thing that would age and lose its functions in humans. So, women's ovary age, nothing else ages in women, not even in men.* (Endocrinologist, anti-aging medicine practitioner. Rio de Janeiro, 2015)

The narrative of anti-aging medicine highlights a process of hormone deficiency, or 'pauses,' which are not recognized as pathologies by medical institutions, especially endocrinology. This is the case of 'thyropause' and 'adrenal fatigue,' concepts that define conditions caused by reduced hormone production by the thyroid and adrenal glands, respectively. Hormones are considered substances that can unbalance individuals, in physical, cognitive, and behavioral perspectives.

*Nature is like this: in your 20s and 30s, you're 100%. Why? Because nature wants you to reproduce and continue your species. Our goal is to continue our species. Reproduce and die. But we insist, right? We continue to live. Then, what happens? In your 30s, you start losing several substances, but mainly hormones, and in your 50s, you'll decline. So, what do we try to do? We try to keep exactly the same condition as that from your 20s and 30s. So the reference level the laboratory is going to rate me, it will put here the normal value, for example, for DHEA [dehydroepiandrosterone] or testosterone, it*

*will provide the normal value by age, that is, it will accept this physiological loss process that everyone will go through. I won't accept it here in anti-aging medicine.* (Nutritionist, anti-aging medicine practitioner. Curitiba, 2017)

When analyzing the uses of growth hormone since it was approved and made available by the Food and Drugs Administration (FDA) in the United States in 1985, Conrad and Potter (2004) highlighted the controversies involved in its function and types of therapies. Originally indicated to treat people with reduced endogenous production, especially children with growth below normal levels, growth hormone was investigated regarding its effects for other uses. The authors discuss the limits between therapies with growth hormone to compensate for growth deficiency and its use in aesthetic and physical performance enhancement. In this sense, the synthetic production of this hormone in the 1990s promoted the access to this resource, changing the limits accepted as legitimate by medical institutions and increasing off-label uses.

An important aspect highlighted by the authors refers to the process of expanding the conception of legitimate therapeutic use associated with characteristics that are valued and relevant from a social point of view. For children with short stature, this condition is not always related to the reduced production of growth hormone. The parameter becomes the stature itself, when it represents a deviation from the standards. Although each population has an average stature that is considered normal, some individuals are at the extremes - either very tall or very low. However, the stigma of short stature, especially for men, leads to the use of hormone as a therapy. Its potential effect on human growth, associated with a social expectation about the ideal stature, allows a parallel of both conditions - with and

without hormone deficiency - as targets of medical intervention.

The identification and deep analysis of the biological processes that are influenced by a certain hormone generate speculations that favor experiences of alternative uses. In the case of growth hormone, studies that suggested its influence on somatic processes led to its indication not only for growth, but also for muscle recovery and improvement of physical performance, which attracted mainly athletes.

The emergence of several therapies with this hormone created divergences and promoted a reorientation of regulatory processes which, in the perspective of scientificity and risk minimization in medical practice, aims to limit the use of these substances to certain conditions with institutionalized procedures. However, the potential effects of hormones have created networks of opposed interests in this regulatory process, involving different actors, such as politicians, laboratories and medical entities. In this context, professionals, especially physicians who are responsible for the diagnosis and determination of proper therapy, have a strategic position that allows them flexibility to move between the areas of conflict.

Practitioners of anti-aging medicine are interested in a medical practice that is opposed to consolidated parameters and practices, seeking alternatives to conventional treatments. The official medical model is considered impersonal, mechanistic and fragmented, preventing an approach that identifies initial factors leading to body disorders over time. The proposition of holistic and non-curative medicine establishes a constant improvement of the body as an objective of medical practice, bringing the dimension of enhancement closer to repair and restoration of normality. Through this health narrative, hormones become a strategic aspect in the development of an approach focused on body functionality and performance over time to change aging-related

decline. With well-defined properties in this process of controversies about the benefits and side effects of therapies, hormones also shape the connections between the different actors that comprise anti-aging medicine in Brazil.

Given the institutional limitations, anti-aging medicine practitioners are associated with several knowledge areas, such as sports medicine, orthomolecular medicine, nutrition and hormonal physiology studies. Through partnerships, events and professional training courses, institutions dedicated to anti-aging practices have created a network of national and international actors to support each other and exchange information and resources. This network enables specialization of professionals and provision of diagnosis and treatments, including genetic tests and supplementation with substances not produced or not regulated for sale in Brazil.

An important aspect of anti-aging medicine is that it is not practiced by actors outside official biomedical institutions, as an alternative therapy. These professionals were trained at traditional institutions, which are members of official medical associations. However, these cardiologists, plastic surgeons, endocrinologists and nutritionists have a common medical practice, which overlaps their traditional specialties.

In Brazil, ABMAE and Grupo Longevidade Saudável lead professional training courses and event organization in this field. Many professionals create their own companies and promote lectures and training courses in specific practices, expanding the scope of the anti-aging narrative. The Brazilian Society for Physiology Studies (SOBRAF), managed by the leader of the Grupo Longevidade Saudável, highlights the relevance of hormones in this medical proposition. It has built relations with international institutions, including A4M, Cenegenics Education and Research Foundation - Age Management Medicine, as well as the World Society of Anti-Aging Medicine (WOSAAM) and



the International Hormone Society, both led by Belgian physician Thierry Hertoghe.

Among the physicians analyzed, the term 'anti-aging' is used with ambiguity. Some discomfort was observed regarding the use of this term, without a clear idea about its true meaning, deviating from the notion of seeking eternal youth. Physicians, especially after the publication of Resolution no. 1,999/2012 by the CFM, are not allowed to use the term 'anti-aging' as a medical category. However, in publications and descriptions on web pages and promotional materials of these professionals, 'anti-aging' is used for the purpose of distinction.

The term 'anti-aging' is more than a name, a concept that incorporates the trajectory of controversies around the objective of changing the aging process. It is a relevant part of the associations that define the science of aging, with specific practices and boundaries in the biomedical approach. The term 'anti-aging' was used in this study because it reflects the context of controversies in the development of practices analyzed in this review.

During the 6th International Congress on Human Longevity Sciences, one of the main events in the area, held in São Paulo, Brazil, by the Grupo Longevidade Saudável, a systematic correlation was identified between the potential of hormones and the goal of fighting against aging. Most of the conferences held in this three-day event addressed the various uses of hormones. The group of lecturers had prominent professionals in hormonal therapies who reported their experiences and discussed the best techniques for the therapeutic process. The possibility of controlling aging explicitly permeated the whole debate, since body improvement in different aspects is associated with prevention of decline related to advancing age. This perspective of intervention is characterized by the proposition of constant reconstruction of natural processes of the body, extending the ideal functioning of

the body, which, however, fights against decline as a necessary process of the natural course of life. These interventions are directed to building a new lifestyle.

## Metabolism, lifestyle and hormonal physiology: totality and particularities

In the perspective of anti-aging medicine, hormones are fuels that can be used to prevent decline. However, hormonal physiology is conceived as an integrated process and its maintenance depends on its components working in harmony. In this sense, hormone treatments are not limited to replacement. The notion of hormonal modulation proposes a holistic medicine with a health approach addressing different processes that contribute to the determination of a state of health or disease.

One of the main concepts of the health narrative in anti-aging medicine is metabolism, which, as a system, depends on each of its components to function properly. Since aging is perceived as a result of accumulated failures and insufficiencies, it is possible to prevent decline over the years by maintaining metabolic processes. Metabolism constitutes the materiality of life while creating a constant interaction with the environment, with influence of external factors and the conduct of individuals. The main anti-aging strategy would consist in keeping the body with the nutrients and hormones required for basic functions and eliminate harmful elements, restoring the ideal and natural conditions of body functioning.

Different levels of aging are observed since the amount and type of accumulated damage vary according to one's living conditions and the biological changes do not necessarily keep up with advancing age. Therefore, a chronologically older person may be biologically younger. Metabolism emphasizes the individuality of aging conditions as it articulates universal natural processes with

the particularities of the context experienced by each person. In this sense, an orientation to lifestyle reorganization is established, with adaptation of individual habits, such as diet, physical activities and stress control, to ensure favorable living conditions for the body.

Hormonal modulation shows this integration as it is based on the balance of the entire hormonal physiology, involving nutrition, physical conditioning and control of emotions.

*There's no point in using hormonal modulation in a patient who doesn't have a healthy diet, who doesn't practice exercises and who is always irritated, in a bad mood. I won't have good results. Hormones are not going to perform miracles.* (Nutritionist, anti-aging medicine practitioner. Curitiba, 2017)

The concept of hormonal modulation as a multi-factor process can be associated with an influence of the orthomolecular perspective on the anti-aging approach. Linus Pauling (1901-1994) is considered a pioneer in this practice; he coined the term 'orthomolecular,' which expresses the concept of the human body as a structure of molecules. Pauling (1978, p. 4) defends the idea that it is necessary to 'have the right molecules present in the right amounts in the body' to be healthy and have a long life.

The biochemical processes depending on metabolism need the correct amount and type of molecules to produce elements that are essential for body functions. Then, the therapeutic practice developed by Pauling consists in providing the necessary resources for the healthy development of the body and eliminating harmful influence on proper biochemical reactions. This approach highlights the interaction process between individuals and the environment, identifying contact with substances and diet as determinants of body composition.

Therefore, the practice of hormonal modulation requires patient re-education, involving an evaluation of living conditions to achieve the expected effects. This type of intervention goes beyond a punctual treatment provided by the health professional, mainly depending on the patient's own actions.

One of the main differentiators of the approach of anti-aging medicine is the relationship between physicians and patients. The professionals have a trajectory in common of treatments and lifestyle, acting as examples to their patients. This practice helps build a connection as they share a lifestyle.

Anti-aging medicine addresses physical and cognitive changes that occur with aging, gradually deviating from proper conditions for the development of skills and abilities. This decline does not favor individuality as limitations force people to stop doing things they liked to do and which characterized their particular trajectory. The individual essence is lost in the process of becoming 'old,' a generic condition marked by disability. Interventions, conceived as a process of recovery and maintenance, are not seen as something artificial that changes the natural condition of individuals - 'lifestyle medicine' defines interventions more as self-care than as medical treatment. The use of hormones, associated with changes in behavior, is presented as a method to recover natural functions, allowing people to continue with their activities.

For patients, therapies are an option to help deal with aging itself. The patients analyzed in this study share with their physicians complaints about the conventional medical model, particularly regarding its inability to solve health issues often without diagnosis, which became an obstacle to personal trajectories.

*Then I saw an endocrinologist. Three endocrinologists. Three. Then one said: "No, there's*



*nothing wrong. You look great.” “Isn't it the thyroid, doctor? Nothing, no disorder?” “No, for your age, you look great!” Damn it! So feeling depressed, fat, with a migraine means looking great for a traditional doctor. I almost said: “Honey, I'm one step to commit suicide! I'm very close to it! I've always been an athlete my whole life, but now I am 10 kg fatter, I've had a migraine for ten years and no doctor has been able to find what it is! And you are telling me I'm fine. What kind of medicine is this?!” (Female physical education professional and career coach, 56 years old. São Paulo, 2017)*

All patients surveyed in this study reported they were aware of the controversies involved in the treatments to which they had access and the disapproval of this form of medicine by the CFM and other health regulatory bodies. However, as they criticize the conventional model of medicine, this factor became an advantage and a reason for seeking this type of treatment. Patients see in this medical practice a chance to give personal meaning to the treatment, with a perception of active participation in this process.

*Then I started to get out of this bubble of believing what any magazine or TV news said and I started to understand more about articles, I read. For example, when someone says good things about milk, I go and read all meta-analyses, recent and old studies published without sponsorship from the dairy industry, and you see information that don't match. You see that person is paid to say that. So I took this path to get to know more about anti-aging information and what well-being actually is, which means you have hormonal balance, circadian cycle. (Actor and entrepreneur, 30 years old. Rio de Janeiro, 2017)*

Patients do not see treatments as a search for eternal youth, but as a tool to take care of themselves and maintain physical and cognitive

conditions and continue their life projects. They see treatments as a change in their attitudes towards a healthier lifestyle, unlike an earlier medical model where they would be restricted to reactive measures for specific symptoms. In the logic of 'lifestyle medicine,' patients describe a process of re-education and self-awareness, in which everyday habits are interpreted as long-term consequences. The use of supplements and hormones is opposed to dependence on drugs, which are perceived as artificial resources.

Nikolas Rose (2011) presents the 'self' concept as a regulatory ideal, comprised of regimes of subjectivation where the perception of the self and the construction of a self-assessment ethics occur through an apparatus of specific techniques and technologies. In contemporary societies, regulations that are part of this process are, above all, formulated by expert speeches, which transform life experience issues into technical issues to find more efficient ways to manage quality of life. The constitution of the self is historically situated, reflecting political and economic values and conditions that characterize an era. Then, the prevalence of values such as autonomy, freedom, independence and the responsibility of individuals for their self-realization contrast the expected decline of aging with the ideal person based on individuality and particularity of one's trajectory.

In the context of promoting active aging, an ambiguous condition is observed. More than a parameter for public policies, active aging has become a process of education, preparation and adaptation for aging (Antônio, 2015). Then a contrast is found between a natural process, where physical and cognitive decline is expected, and a call to conduct one's own aging to remain active. Patients have a common concern of reacting against body decline to maintain their personalities. By highlighting the individual conditions of the aging process and exploring

the possibility of defining how to age according to personal trajectories, anti-aging medicine acts on this ambiguous condition experienced by patients. By moving away from an approach to old age, it offers the advantage of helping these patients deal with long-term interventions as self-care and adapt to the aging process. Its emphasis on lifestyle is associated with the tendency to overcome the dichotomous perspective between health and disease in contemporary biomedicine (Rose, 2013). Quality of life itself, in terms of performance and functionality, sets the parameters of normality and health.

Although patients claim the treatment requires dedication, due to its many changes and substances to be administered, it is perceived as a recomposition of natural elements, of something that is part of what they are, eliminating the idea of deficiencies that should be controlled. Likewise, in the perspective of professionals, hormonal modulation is a tool to help stop drug treatments, because a balanced body would not require such therapies. In contrast to artificial substances, the body's own resources should be used as a tool to improve well-being and personality. If the body naturally loses these elements, an intervention is proposed: reproduction of nature.

## **Bioidentical hormones: reconstitution of nature's logic**

The main conflicts between practitioners of anti-aging medicine and the CFM are observed in economic and/or marketing areas. Financial interests involved in medical practice emerge as a factor in disputes around the scientificity and ethics of the treatments offered to patients. This debate includes the process where medical procedures are tested, evaluated and approved. The scientificity criteria are questioned by both sides and the economic factor stands out as a parameter for mutual accusations. In this conflict, different

actors are associated in opposed groups, showing the network that defines and differentiates anti-aging practices from an official model of medicine. An attempt to place anti-aging medicine away from big industries is observed, as they are responsible for the harmful artificiality of the modern lifestyle.

As the narrative of anti-aging medicine becomes an opposition and a criticism to consolidated practices and parameters in biomedicine, a direct connection is seen between the limitations of regulations for the access and use of resources and procedures and the interests of different sectors with influence on medical practice, mainly observed in the pharmaceutical industry. The CFM is accused of institutionally representing the interests of these actors. Although this industry has played a key role in popularizing off-label uses of medicines, including hormones (Azize, 2002; Rohden, 2011), it is associated with limitations imposed to the types of hormonal therapies that are officially known to control processes of clinical experiments and regularization of substances.

The association with fraud shapes the institutional status and the condition of professionals in the medical community. An opposition movement is seen, not only due to a supposedly lack of proof of benefits from the use of hormones, but mainly about the conceptions that define the legitimacy of these treatments. An appeal to nature creates a rhetorical strategy in which natural resources cannot be more dangerous than many artificial uses already accepted by health authorities. This is the case with the use of hormonal contraceptives, widely criticized and condemned by practitioners of anti-aging medicine. Considered as 'chemical castration' of women, contraceptives are explored as evidence that the parameters used for the approval of hormone uses are not solely based on efficacy and risks to patient health, but involve social and financial interests. Physicians report these drugs have also been

used in treatments not related to reproduction, with prescriptions for skin issues, including for teenagers, despite the numerous side effects of altering hormonal physiology.

In CFM document and resolution, the term 'bioidentical hormones' - used to distinguish them from hormonal therapies in anti-aging medicine - is a polemic subject. It is considered a marketing action, since the hormones offered by the pharmaceutical industry are manufactured to behave exactly like the hormones produced in the body. Therefore, there would be no difference to justify such distinction.

Bioidentical hormones are widely discussed today, which are hormonal substances that have exactly the same chemical and molecular structure found in hormones produced in the human body. This name has been used improperly only for manipulated hormones, as if they were new treatment options, when, in fact, bioidentical hormones have been produced for a long time by pharmaceutical companies and can be found in drugstores. (CFM, 2012b)

As the review presented by CFM points out, the narrative of anti-aging medicine seeks to eliminate elements or practices of greater artificiality, using this aspect as opposition to the official medical model.

*Rivotril is number one in sales here in Brazil. [...] The pharmaceutical industry is not interested in making you buy melatonin. Melatonin won't make you addicted, melatonin won't give you side effects, you don't have to increase the dose, it's natural. It cannot be patented, just like any other hormone.* (General practitioner, anti-aging medicine practitioner. Rio de Janeiro, 2015)

The conception of bioidentical hormone is associated by anti-aging medicine practitioners not only with its composition, but also its production for medical use and form of application. These professionals avoid using medicines

produced on a large scale by the pharmaceutical industry, requesting the services of compounding pharmacies. The manufacture process offers the possibility of treatment personalization and a better control of the prescriber. Patents are linked with the need to change, even if minimally, the structure of marketed hormones, as it would not be possible to patent something made by nature. Thus, the manufacture process would allow a direct access to manufactured substances that can reproduce the original structure.

Hormonal therapies are mainly provided via transdermal delivery, in gel or cream, and through small chips or pellets implanted under the skin, seeking the best possible reproduction of the natural dynamics of hormonal physiology. In this sense, hormonal implants are presented as an evolutionary method and the most efficient way, as they do not depend on a patient action, avoiding external influence. As Manica and Nucci (2017) reported, technological improvements in the use of hormones through implants and microchips are associated with the possibility of personalizing processes of hormonal physiology. The artificiality of hormonal treatments for different uses is confronted by the idea of an intervention adapted to the natural conditions of the body, which would reduce discomfort and side effects.

The notion of bioidentical hormones used in hormonal therapies is associated with the dimensions of metabolism and lifestyle strategy to build a medical practice that guides patients to the maintenance of their nature, while resuming a universal order and reconstituting the particularities of each body system and each trajectory with specific objectives.

## Final considerations

The approach of anti-aging medicine in contemporary times is based on a very controversial condition historically created while trying to identify ways to control the aging process. Then,

its disadvantage regarding the parameters of scientificity that legitimize biomedical institutions, and which are regulated by such institutions, becomes a strategic advantage, as it explores the contradictions of aging experiences. The hegemonic biomedical perspective that highlights the natural and inevitable character of aging-related decline is experienced by patients as an obstacle to the demands and expectations of an increasingly longer life.

The paradigm of active aging paradoxically creates a context that favor the strengthening of anti-aging ideas due to an ambiguous perspective that it is necessary to be prepared to grow old and accept aging as an inevitable process, which must be experienced beyond the mere condition physical. Anti-aging medicine explores this contrast, proposing a reformulated concept of aging. An emphasis on metabolic processes as defining the conditions of aging in the long run favors a medical approach that deviates from the idea of specific care in old age and allows patients to see the treatment process as self-care to resist the effects over time and continue their personal trajectories.

Lifestyle medicine, through hormonal modulation, redirects the relationship of patients with biomedical practices towards a constant concern about the quality of living conditions. Through self-improvement, the aging process is perceived by professionals and patients as a chance to experience aging in a particular way, far from a generic experience of becoming 'old.'

The adaptation of medical interventions to the reproduction of natural living conditions expresses a resignification of the anti-aging notion, not intended to be an opposition to aging, but a change in the way one ages. As a 'healthy longevity medicine,' it conditions the possibility of good aging to the maintenance of body functions, allowing one to personalize this process. As fuels

that keep machines running, hormones are a privileged means to restore particular natures.

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