

Revista Bioética ISSN: 1983-8042 ISSN: 1983-8034

Conselho Federal de Medicina

Garcia, Carlos Alberto Severo Humanidades: ensino de "nova" dimensão ética na educação médica Revista Bioética, vol. 28, no. 3, 2020, July-September, pp. 479-485 Conselho Federal de Medicina

DOI: https://doi.org/10.1590/1983-80422020283410

Available in: https://www.redalyc.org/articulo.oa?id=361570652011



Complete issue

More information about this article

Journal's webpage in redalyc.org



Scientific Information System Redalyc

Network of Scientific Journals from Latin America and the Caribbean, Spain and Portugal

Project academic non-profit, developed under the open access initiative



Print version ISSN 1983-8042 On-line version ISSN 1983-8034

Rev. Bioét. vol.28 no.3 Brasília July/Sept. 2020

Doi: 10.1590/1983-80422020283410

#### **RESEARCH**

# Humanities: teaching a "new" ethical dimension in medical education

Carlos Alberto Severo Garcia Júnior

Departamento de Ciências da Saúde, Universidade Federal de Santa Catarina, Araranguá/SC, Brasil.

#### **Abstract**

This study presents the process of ethical formation through the Medical Humanities subject of a medical undergraduate program in Southern Brazil. This is a qualitative research carried out with 28 medical students between the 1st and 7th periods. Data collection took place by focus groups and the results, obtained by content analysis, were divided into two thematic categories: production of self and of the ethical dimension in medical education; and proposals of changes in "humanistic" training. We concluded that it is necessary to identify the ethical problems present in the teaching-learning process itself, develop opportunities for other means of connection between professors and students and discuss issues inherent to medical ethics.

Keywords: Bioethics. Education, medical. Students, medical. Education, higher. Brazil.

#### Resumo

## Humanidades: ensino de "nova" dimensão ética na educação médica

O objetivo deste estudo é apresentar o processo de formação ética por meio da disciplina Humanidades Médicas do curso de medicina de instituição de ensino superior do Sul do Brasil. Trata-se de pesquisa qualitativa realizada com 28 alunos matriculados entre o 1º e o 7º período. Os dados foram coletados em grupos focais, e os resultados, obtidos por análise de conteúdo, foram divididos em duas categorias temáticas: produção de si e de práticas relativas à dimensão ética da medicina; e propostas de mudança na formação humanística. Conclui-se que é necessário identificar os problemas éticos do processo de ensino-aprendizagem, desenvolver oportunidades para outras formas de conexão entre docentes e discentes e problematizar questões inerentes à ética médica.

Palavras-chave: Bioética. Educação médica. Estudantes de medicina. Educação superior. Brasil.

## Resumen

# Humanidades: enseñanza de una "nueva" dimensión ética en la educación médica

El objetivo de este estudio es presentar el proceso de formación ética a través de la asignatura de Humanidades Médicas de la carrera de medicina de una institución de educación superior en el Sur de Brasil. Se trata de una investigación cualitativa llevada a cabo con 28 estudiantes de medicina entre el 1.º y el 7.º período. La recolección de datos se realizó a través de grupos focales, y los resultados, obtenidos por análisis de contenido, se dividieron en dos categorías temáticas: producción de uno mismo y prácticas relacionadas con la dimensión ética de la medicina; y propuestas de cambio en la formación humanística. Se concluye que es necesario identificar los problemas éticos del proceso de enseñanza-aprendizaje, desarrollar oportunidades para otras formas de conexión entre docentes y estudiantes y problematizar cuestiones inherentes a la ética médica.

Palabras clave: Bioética. Educación médica. Estudiantes de medicina. Educación superior. Brasil.

Approval	CFP-Univ	<i>ı</i> ali 2.71	1.376

The authors declare no conflict of interest.

In the last two decades, the subject of humanizing healthcare has gained prominence in Brazil, due to access difficulties and the low quality of services. Such precarity results from the dehumanization and "technification" of care, associated with the acceleration of production and consumption<sup>1</sup>. In response, attempts to formulate and reconfigure human relations in healthcare increased, especially in the medical field.

The proposals eventually consolidated a counter-hegemonic movement to overcome the fragility of human relations in care. In 2000, the 11th National Health Conference pointed out the need to expand access, improve quality and humanize care, assigning the government the responsibility to guarantee citizenship<sup>2</sup>. In 2003, the National Policy for the Humanization of Care and Management in the Brazilian Unified Health System sought to build a public policy based on the inseparability between care and management and on valuing the protagonism, co-responsibility and autonomy of subjects and collectivities <sup>3</sup>.

In the same period, the medical curriculum was reorganized, incorporating demands from society. In 2001, the new National Curriculum Guidelines (DCN) established the need to include ethical and humanistic dimensions in health professionals' education <sup>4</sup>. Almost two decades later, it is clear that the DCNs have valued the human and social sciences by establishing them as transversal axes <sup>5</sup>.

As Rios <sup>6</sup> points out, in medical science knowledge from various fields converge, such as sociology, history, anthropology, arts, philosophy, education, linguistics and bioethics. Thus, there would be an area of the "medical humanities," whose object of study are the development, characteristics, needs and consequences of human relations in medicine, emphasizing the interaction between reality and formation. But despite the establishment of this field and the advances achieved by the DCN, many difficulties remain to be faced, such as *lack of integration with clinical disciplines, programmatic content detached from real problems of healthcare, inadequate teaching methodologies, unprepared professors*<sup>7</sup>.

Medical humanities remain a diffuse territory, whose limits are still being built and experienced. The challenge of consolidating the humanization of health goes beyond methodological issues and integration of courses. It is in the field of relations, encounters, living work, in action, that students and professors actually act, interact and affect each other <sup>8-10</sup>. In this sense, this study presents how the

process of ethical education in an undergraduate medical course in Southern Brazil occurs.

#### Method

This is a qualitative research that seeks to unveil social processes, meanings, motives, aspirations, attitudes, beliefs and values involved in the field of medical humanities. Its descriptive approach aims to study characteristics of a given group and its distribution, collecting opinions and associating variables <sup>11</sup>. Focus groups were formed <sup>12</sup>, and the data obtained were examined by thematic content analysis, which identifies meanings from the stages of pre-analysis, exploration, treatment and interpretation of the interview text <sup>11</sup>.

The research was conducted at University of Vale do Itajaí (Univali), a private higher education institution founded in 1964, located in the city of Itajaí, Santa Catarina, Brazil. The medical course was implemented at the university in 1998, and counts 29 classes graduated until December 2018. Its curriculum matrix has a total course load of 8,295 hours and offers two transversal axes: technical, focused on general training, and attitudinal, which considers ethical, humanistic and social aspects of the medical practice <sup>13</sup>.

We interviewed 28 students enrolled between the 1st and 7th period of the medical program, which encompasses the humanities courses. The number of participants was defined so the sample contained at least four students from each of these seven semesters, two women and two men, drawn from the enrollment list. The division between genders sought to give the research scope and parity.

The criterion used to define the number of groups was data saturation, achieved in the fourth focus group, covering the problem investigated in different dimensions. The guide-topic used helped to conduct the interviews, besides working as a preliminary scheme to analyze the transcriptions <sup>12</sup>. The statements were recorded and later transcribed, always preserving the identity of the participants. Data were collected in August 2018, and the study was approved by the Univali research ethics committee.

## **Results and discussion**

From the data analysis, two major thematic categories emerged: production of self and

practices related to the ethical dimension of medical education; and proposals for changes in the humanistic education. Both are analyzed in the following sections.

#### Ethical dimension of medical education

The findings of this study corroborate the importance of the humanities <sup>9</sup> and the ethical-aesthetic-political paradigm for the medical profession. "Ethics" means the commitment of students, professors and educational institutions to medical training. "Aesthetics" concerns the creative and sensitive process involved in the production of care and subjectivity of those involved. And "politics" refers to the social and institutional organization of training practices.

At the university studied, medical humanities became a curricular axis as of 2015. Previously, it offered the subjects Medical Ethics, and Bioethics. In his article, Grisard <sup>14</sup> recovers part of the history of the institutionalization process of these two courses at Univali. According to the author, there were several reasons to include, increasingly, the contents of medical ethics and bioethics in the undergraduate medical program at Univali. They were not arguments from an ephemeral trend, as this does not exist when it comes to teaching medical ethics in medical schools. They were certainly not arguments to be different, nor to please any official institution, academic or otherwise, or medical entities – which, with very

few exceptions, were never concerned with the teaching of medical ethics <sup>15</sup>.

Although the author highlights the "apolitical" character of the change in the curriculum, without institutional ties or influence of "trends," it is inevitable not to associate this transformation with the protectionist movement and the issue of medical identity. And Grisard's <sup>14</sup> experience in another institutional space – the Santa Catarina Regional Council of Medicine –, witnessing several complaints for ethical violation and lack of knowledge, perhaps led him to encourage the inclusion of these subjects.

The changes brought forth by the DCN<sup>4</sup> in 2001 – which established principles, foundations and purposes for medical education and an ideal profile of graduates – were auspicious, as they allowed the Ministries of Health and Education to be brought together. Years later, with the broad adherence to the document in pedagogical projects, commitment – explicit or implicit – with the training of critical and reflective professionals increases to produce a "good image" of the course <sup>16</sup>.

In 2015, with the implementation of the new pedagogical project of the Univali's medicine program, the medical humanities axis became part of the curriculum <sup>13</sup>, gaining credibility among professors and students. Currently the courses of the axis span over seven periods, totaling 210 hours. The subject name remains the same in each semester ("Medical Humanities"), but each period has its own syllabus and characteristics (Chart 1).

Chart 1. Periods, syllabuses, course load and credits of medical humanities subjects

Period	Syllabus	Course load and credits
1st	Health in the social context, in historical and cultural analysis. Medicine: different conceptions, many views. Humanization and health.	
2nd	Being a doctor in sociocultural evolution. Modernity and the concept of being a doctor. The history of the clinic. The doctor-scientist, the specialist, the clinician, the general practitioner.	
3rd	The relation of the individual with the health-disease process. Interdisciplinary teamwork. The person-doctor relationship. Meetings at the clinic.	
4th	Care: philosophical, anthropological, psychological and sociological aspects. Ethics of care and principle of responsibility. Care in the family context, health services, public policies and the environment.	30 hours – 2 credits
5th	Bioethics: historical, legal, philosophical and anthropological aspects. Bioethics: the ill, the community, the health services. Bioethics in research and its relations with ethical issues. Bioethics and human rights.	
6th	Deontological ethics. The Code of Medical Ethics. The epistemology of the code. Rights and duties of the medical profession.	
7th	Considerations on birth, life, illness, aging and death. Controversial issues and ethical dilemmas in medical practice. Thanatology and communicating bad news.	

Source: adapted from University of Vale do Itajaí<sup>17</sup>.

The challenges for medical training range from deficits of previous schooling, persistent in professional formation, to the duration of the course, which imposes the need to acquire psychomotor, cognitive and affective skills in only six years with a curriculum focused on biological contents, to the detriment of humanistic aspects <sup>18</sup>. However, changes in the ideal profile of the doctor, shifting the focus from disease to health promotion, have reverberated in education, confronting the Flexnerian and integrality paradigms <sup>19</sup>. These transformations are based on recommendations from international and national forums, with different affiliations <sup>20</sup>.

When attending medical school, the student undergoes a socialization process in which the sociocultural experience integrates with the learning of technical aspects <sup>16</sup>. Such process is complex, and is not by chance that students declare feeling helpless to face the responsibilities inherent to the profession. Training comprises: 1) relating act, speech and attitude, regardless of the topic or content addressed; 2) valuing pedagogical methodologies and techniques open to experimentation and expression; and 3) connecting with reality and developing critical sense. These three aspects are challenges and permanent themes in the debates on medicine's ethical dimension, especially in establishing borders and interdisciplinarity.

In statements collected from the focus groups, we can observe contradictions in the relationship between student, professor and medical school:

"Often the professor has a place of knowledge and authority. Students should be empowered to seek knowledge, to know if it is right or wrong. I think within medicine we have the problem of time. We don't have enough time to monitor everything the professor says, because I have to memorize many other things, doses of a medication, for example, for exams. I don't question it because I don't have that power. I would like to do it because I doubt some things" (Focal Group 3).

Sharing the ethical conception of the teaching-learning process does not protect the student from misunderstandings and anxieties inherent to this process. In the focus groups, the students considered that the subject revolves around performance evaluation and wondered about the possibility of getting involved with the topic without adopting a negligent attitude. The participants questioned the contradiction of being evaluated in a qualitative process that results in a "grade"

(quantitative) and proposed "active methodologies," capable of facilitating learning. They suggested using instruments that could connect students and content, such as news and magazine articles, debate circles, writing messages to colleagues from other periods, video classes, short films and documentaries, inviting professionals from other areas and extension and research projects.

# **Changes in humanistic education**

"Humanistic education" refers to the transmission of values and attitudes that correlate psychological, ethno-racial, socioeconomic, cultural and environmental dimensions with the biological dimension. It is important to have a regular subject to clarify dilemmas, problems and ethical conflicts in training and professional practice. However, themes linked to the humanities must be discussed throughout the medical course, especially in clinical and surgical specialties, in which there is direct contact with people and their experiences of illness.

As the students said, "in medical humanities there are many other topics to be addressed that we will not have in the clinic, for example" (Focal Group 1). Such topics were indicated in the focus groups, allowing ideas and intentions to be shared. These proposals, with the themes organized in period syllabus, are organized in Chart 2.

The diversity of topics indicates the scope of interests of the course, but in itself does not guarantee the innovation and comprehensiveness of medical education. One of the obstacles to overcome is the reduced course load of medical humanities in comparison with other areas. Gaining space in an already overloaded curriculum and the lack of consensus on content and pedagogical methods are barriers to integrating the humanities.8.

Some students consider that the theory is often "great," but remains to be put into practice – a generic note, which ignores the large number of doctors and medical professors who integrate the medical humanities in their work. On the other hand, the students' opinion highlights the need to implement theoretical learning in activities developed in university-based services (outpatient clinics, hospitals and health centers). When practice illustrates ethical dilemmas, problems, or conflicts, the connection between students and professors is enhanced.

**Chart 2.** Periods and topics for medical humanities courses

Period	Topics
1st	Doctor-patient relationship before death and mourning; spirituality and medicine; drugs (social, historical and cultural context); education and human rights; medicalization of life; money and savings in relation to health.
2nd	Hippocratic texts; narrative medicine; paradigms of Western and Eastern medicine.
3rd	Humanistic training <i>versus</i> technical training; care for the environment; empathy, solidarity, compassion and comprehensive care; humanized childbirth.
4th	Alternative therapies (healers, shamans, prayers, herbs, etc.); art and care; diet and nutrition in culture; gender and transsexuality; ethics and work; self-care; care and suicide.
5th	Principlist ethics; vulnerable populations; social bioethics; everyday bioethics; patient safety; bioethical models of doctor-patient relationship.
6th	Medical act (premises and limits); defensive medicine; medical error; epistemology of the code of ethics and deontology.
7th	Brain death; vivisection; abortion; stages of grief; eugenics.

Vasconcelos <sup>20</sup> highlights the importance of "alternative" practices that break with the dominant model, pointing out three essential elements to transform the curriculum: 1) addressing personal and family situations; 2) contact with patients and community; and 3) contact with professors and colleagues at the university <sup>20</sup>. Change requires pedagogical spaces that value subjective experiences, and, along these lines, Rios highlights the challenge of relating *sense and sensibility in medical training* <sup>21</sup>. Finally, Vasconcelos <sup>20</sup> still draws attention to the importance of evaluation criteria, which can transform reality.

Some universities have presented innovative experiences of integrating medical humanities. One is the Federal University of Pernambuco, Caruaru campus, which created the Laboratory of Sensibilities, Skills and Expression to value the perception of self and the establishment of bonds as forms of care. Another example is the subject Medicine and Humanities, from the University of São Paulo, which aims to stimulate the perception of the humanistic sense of medical practice, developing students' capacity for reflection by introducing values, attitudes and skills essential to healthcare.

On October 18, 2018, commemorating Doctor's Day, the Federal Council of Medicine started publishing on its website the blog of its Commission on Medical Humanities, entitled "Humans." It is a platform created by the council to *stimulate the doctor's sensibility, promote the humanistic exercise of the profession and disseminate* (...) *reflections and teachings on ethical issues* <sup>22</sup>.

Many are the initiatives to support the humanities in the physician-patient relationship, which highlights the need for exchanges and dialogues that seek more equitable and inclusive configurations. The ethical-aesthetic-political evidence of this appreciation of the human dimension is noteworthy. As the interviewed students point out, "if people were aware that they have to treat the other as human, not as a 'this', or a 'that', everyone would already have in their heads how to treat someone" (Focus Group 2).

Although not unanimous, this interest affects medical humanities courses, inspiring education strategies that value the students' relationship with themselves and with the educational institution. More and more pedagogical practices are sought, capable of motivating students and professors, rescuing basic premises for the care of oneself and the other, recognizing the changes generated by the training process itself, experiencing the protagonism and collective dimension of education and interfering with the modes of management and institutional care. Yet students identify the paradox of a course that aims to "humanize" future doctors:

"There should be no humanities course. I talk to my friends and they all ask me: what is this Medical Humanities course? [laughs] I say it's a ludicrous class. The medicine demigods need a lesson to be human. We forget that we are human because we have knowledge, because we study six years, have the privilege or choice to spend six years, with father or mother helping and supporting" (Focal Group 4).

Pedagogical strategies should be developed to provoke and share experiences of artistic creation as an aesthetic-political object of communication with the world. One possibility is to propose the creation of a panel with photos by the students, with topics such as "limits and ethical issues in medicine." Another would be to create a "care portfolio" to compile and systematize the student's individual

experience using a reflexive narrative, presenting, for example, the care of a classmate during the semester, portraying the relationship with oneself and with the other in the process of critical and duly substantiated analysis. This portfolio would build the learning path with exchanges between colleagues, evidencing progress, questions and difficulties, proposing provisional synthesis of individual and collective experience, formulating questions and evaluating the place of "anonymous care".

Regardless of the methods, the challenge is to build relationships based on the attention and listening of the other, encouraging experiences and narratives of students and professors in dialogue with ethical debates. The narrated experiences, although personal, allow to transmit and link stories, expanding understanding and sensitizing the other. These personal experiences, when they become collective, renew knowledge.

## **Final considerations**

Humanizing medical training is a permanent exercise of reframing higher education institutions. Specifically, it is about evaluating problems in the teaching-learning process and developing opportunities for other forms of connection between professors and students, debating issues inherent to medical ethics. Such an approach puts the Flexnerian paradigm and the ethical-aesthetic-political paradigm of integrality in dialogue, in a constant movement of reflection on education,

shedding light on schisms between doctrines, ideologies and groupings in the field of medical education itself.

The ethical dimension demands active participation from the academic community, emphasizing the relationship between students and professors. Meetings to discuss content, teaching strategies, evaluation and methodology can collaborate to integrate theory and practice and develop critical skills and attitudes.

This study identified ethical issues in the professor-student relationship. Professors often expect to "convey" content to students, and students, in turn, often crave "practical learning" in the form of standard responses. This process includes constructing a project that is both *specific* and *generic*, with diverse and diffuse understandings of the results to be achieved and the ideal ethical, critical and reflective profile of the doctor.

The current emphasis on the relationship between medicine and the humanities is part of a counter-hegemonic movement. Building strategies and configurations that maintain an evaluative-formative-participatory educational process — that is, a methodological line developed at the intersection of different instances — can be a clue to a constructivist invention of knowledge. This dimension of medical education must go beyond the demand for "improvement" of knowledge about the jurisdiction of ethical behavior: integrating the humanities can no longer represent a foundation of defensive medicine able to avoid lawsuits for malpractice, imprudence and negligence.

## References

- Gallian D, Pondé LF, Ruiz R. Humanização, humanismos e humanidades: problematizando conceitos e práticas no contexto da saúde no Brasil. Rev Int Humanid Méd [Internet]. 2012 [acesso 10 ago 2018];1(1):5-15. DOI: 10.37467/gka-revmedica.v1.1293
- Brasil. Ministério da Saúde. 11ª Conferência Nacional de Saúde: o Brasil falando como quer ser tratado [Internet]. Brasília: Ministério da Saúde; 2002 [acesso 4 mar 2020]. Disponível: https://bit.ly/2P2wgKn
- Brasil. Ministério da Saúde. Humaniza SUS: documento base para gestores e trabalhadores do SUS [Internet]. 4ª ed. Brasília: Ministério da Saúde; 2010 [acesso 9 jan 2020]. Disponível: https://bit.ly/3gk20io
- Conselho Nacional de Educação. Câmara de Educação Superior. Resolução CNE/CES nº 4, de 7 de novembro de 2001. Institui diretrizes curriculares nacionais do curso de graduação em medicina. Diário Oficial da União [Internet]. Brasília, 9 nov 2001 [acesso 9 jan 2020]. Disponível: https://bit.ly/3gbjjlR
- Conselho Nacional de Educação. Câmara de Educação Superior. Resolução CNE/CES nº 3, de 20 de junho de 2014. Institui diretrizes curriculares nacionais do curso de graduação em medicina e dá outras providências. Diário Oficial da União [Internet]. Brasília, 23 jun 2014 [acesso 9 jan 2020]. Disponível: https://bit.ly/334JRSe
- Rios IC. Humanidades médicas como campo de conhecimento em medicina. Rev Bras Educ Méd [Internet]. 2016 [acesso 20 nov 2018];40(1):21-9. DOI: 10.1590/1981-52712015v40n1e01032015
- 7. Rios IC. Op. cit. p. 28.

- 8. Horton MEK. The orphan child: humanities in modern medical education. Philos Ethics Humanit Med [Internet]. 2019 [acesso 28 jul 2020];14(1). DOI: 10.1186/s13010-018-0067-y
- Stewart KA. Transforming undergraduate global health education through a humanitiesfocused curriculum. Pedagogy Health Promot [Internet]. 2020 [acesso 28 jul 2020];6(1):9-13. DOI: 10.1177/2373379919900534
- Shalev D, McCann R. Can the medical humanities make trainees more compassionate?
   A neurobehavioral perspective. Acad Psychiatry [Internet]. 2020 [acesso 28 jul 2020].
   DOI: 10.1007/s40596-020-01180-6
- Minayo MCS. O desafio do conhecimento: pesquisa qualitativa em saúde. 14ª ed. São Paulo: Hucitec; 2010.
- 12. Gaskell G. Entrevistas individuais e grupais. In: Bauer MW, Gaskell G, editores. Pesquisa qualitativa com texto, imagem e som: um manual prático. 3ª ed. Petrópolis: Vozes; 2002. p. 64-89.
- Universidade do Vale do Itajaí. Medicina [Internet]. Projeto pedagógico; [s.d.] [acesso 20 nov 2018]. Disponível: https://bit.ly/2X5tnFp
- 14. Grisard N. Ética médica e bioética: a disciplina em falta na graduação médica. Bioética [Internet]. 2002 [acesso 2 nov 2018];10(1):97-114. Disponível: https://bit.ly/2BBD6f9
- 15. Grisard N. Op. cit. p. 100.
- 16. Barbosa Neto F. As diretrizes curriculares contribuíram para a formação de um médico mais crítico e reflexivo? In: Streit DS, Barbosa Neto F, Lampert JB, Lemos JMC, Batista NA, organizadores. Educação médica: 10 anos de diretrizes curriculares nacionais. Rio de Janeiro: Associação Brasileira de Educação Médica; 2012. p. 127-41.
- 17. Universidade do Vale do Itajaí. Medicina [Internet]. Disciplinas; [s.d.] [acesso 20 nov 2018]. Disponível: https://bit.ly/3iTq7p8
- Gomes AP, Rego S. Paulo Freire: contribuindo para pensar mudanças de estratégias no ensino de medicina. Rev Bras Educ Méd [Internet]. 2014 [acesso 12 out 2018];38(3):299-307. DOI: 10.1590/S0100-55022014000300003
- 19. Lampert JB. Tendências de mudanças na formação médica no Brasil: tipologia das escolas. 2ª ed. São Paulo: Hucitec; 2009.
- Vasconcelos EM. Formar profissionais de saúde capazes de cuidar do florescer da vida. In: Vasconcelos EM, Frota LH, Simon E, organizadores. Perplexidade na universidade: vivências nos cursos de saúde. São Paulo: Hucitec; 2006. p. 265-308.
- 21. Rios IC. Humanidades e medicina: razão e sensibilidade na formação médica. Ciênc Saúde Coletiva [Internet]. 2010 [acesso 17 out 2018];15(supl 1):1725-32. p. 1725. DOI: 10.1590/S1413-81232010000700084
- 22. Conselho Federal de Medicina. Humanos: blog da Comissão de Humanidades Médicas do CFM [Internet]. Sobre; 2018 [acesso 4 mar 2020]. Disponível: https://bit.ly/2CNQUE7

# Correspondence

Rod. Governador Jorge Lacerda, 3.201, Jardim das Avenidas CEP 88906-072. Araranguá/SC, Brasil.

Carlos Alberto Severo Garcia Júnior – PhD – carlos.garcia.junior@ufsc.br

0000-0003-3367-4151

