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## RADIOFREQUENCY ABLATION OF THE PREVALENCE IN THE TREATMENT OF HEPATOCELLULAR CARCINOMA: A PERSPECTIVE OF HUMAN SCIENCES

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**Abstract:** The choice for the use of radiofrequency ablation (RFA) and health technology in the treatment of hepatocellular carcinoma (HCC) is widely recurrent in half doctors. This article attempts from the selection of some scientific articles indexed in healthcare journals that reported the use of health technology in the treatment of HCC highlight the prevalence of RFA health technology. The objectives of this article are extended to the interdisciplinary process involving the areas of humanities and health intersect when using RFA technology in the treatment of HCC. We lay hold of a systematic review so that together with historical categories called "space experience" and "horizon of expectation" methodology derived from the human sciences can together produce results that favor the scientific, technological, social and economic advancement involving the use of RFA in the treatment of HCC. The importance of RFA health technology for the treatment of HCC to be the predominant technology became evident that particular treatment, so raising more and more participation from different areas of knowledge guided by an interdisciplinary process aiming higher accuracy in the technological development of this equipment (RFA) that pro turn translate into social and economic benefits of the whole network involved.

**Keywords:** Radiofrequency ablation; hepatocellular carcinoma; health technology; interdisciplinarity.

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Resumo: A escolha pelo uso da ablação por radiofrequência (ARF) como tecnologia em saúde no tratamento do carcinoma hepatocelular (HCC) é amplamente recorrente nos meio médicos. Esse artigo pretende a partir da seleção de alguns artigos científicos indexados em revistas da área da saúde que relatam o uso de tecnologia em saúde no tratamento do HCC evidenciar a prevalência da tecnologia em saúde ARF. Os objetivos desse artigo estão apoiados no processo interdisciplinar envolvendo as áreas da ciências humanas e da saúde interseccionadas pelo uso da tecnologia ARF no tratamento do HCC. Lançamos mão de uma revisão sistemática para que em conjunto com categorias históricas denominadas “espaço de experiência” e “horizonte de expectativa” metodologia oriundas da ciências humanas possam juntas gerar resultados que favoreçam o avanço científico, tecnológico, social e econômico envolvendo o uso do ARF no tratamento do HCC. Ficou evidente a importância da tecnologia em saúde ARF para o tratamento de HCC por ser uma tecnologia predominante nesse tratamento específico, por isso suscitando cada vez mais a participação de áreas distintas do saber pautadas em processo interdisciplinar objetivando maior acurácia no desenvolvimento tecnológico desse equipamento (ARF) que por sua vez traduzirá em benefícios sociais e econômicos de toda rede envolvida.

Palavras-chaves: Ablação por radiofrequência; carcinoma hepatocelular; tecnologia em saúde; interdisciplinaridade.

## INTRODUCTION

The turn of the nineteenth to the twentieth century brought with it, among other things, the advent of technology, immensely supported by technical advancement. Important sectors of societies — such as the health sector — capitalized upon this innovation, to thereby meet the increasing demands of the population regarding improvements in their quality of life. Thus, what does technology want? Technology wants what we want — a long list of merits that we want. When a technology finds its ideal role in the world, it becomes an active agent in increasing the options, choices, and possibilities for others<sup>1</sup>. With the rising cost of research, it is necessary to consider the economic factors in technology, however difficult this may be. Certainly, there is no excuse for performing a particular job in an expensive manner when it can be performed just as effectively at a lesser expense. Considering its likely cost however, it is much more difficult to decide whether a given project should be performed at all. Sometimes, applied research has very definite criteria, such as the potential monetary benefits of a successful project, along with a rough estimate of the

likelihood of success<sup>2</sup>. The relationship between society and science is reciprocal, where the relationships between forms of knowledge, scientific practices, and intervention policies are evident<sup>3</sup>. The need for multiple origins, whether social, economic, or scientific — arising from the ongoing social development process — mediates the process of research, development, and application of technologies, as in the case of science and health technologies.

Chronic diseases, as described by Maria Cecília de Souza Minayo and Luiza Gualhano<sup>4</sup>, are a major contemporary challenge that affects not only Brazil but also most countries of the world. Brazil has a rich history of epidemiological surveillance, responsible for the eradication, elimination, and reduction of various infectious diseases. Moreover, efforts have been made to improve the integrity and accuracy of vital statistics, along with the launch of new methods and approaches to monitor noncommunicable diseases and behavioral risk factors<sup>4</sup>. However, to achieve this, it is important to identify the elements necessary for developing this knowledge. One of the possible strategies suggested by Everardo Duarte Nunes<sup>5</sup> presents five central dimensions for creating a corpus of theoretical and methodological concepts on health. These dimensions are narrative, auto/biography, history, the presence of the subject in healthcare, and ethics. In the field of health, these dimensions are complementary, because all texts, especially in the humanities and social sciences, are embodied in the “warp of the plot”, according to Hayden White. Thus, a narrative can be anthropological, sociological, political, historical, and dialectical auto-report-biography. However, during research, these dimensions are faced by the problem of intersubjectivity with regard to the relationship of the researcher and the researched<sup>5</sup>. Sufficient evidence suggests that the interdisciplinary process — as in the human and social sciences, as mentioned above — in the construction of knowledge in healthcare assists the study, research, and scientific development of the health-disease dimension. Moreover, the use of technology in the treatment of some diseases, considering the interdisciplinary nature of scientific development, can often lead to an increase in the quality of its application or the final result.

Meanwhile, cancer, which is considered a non-communicable chronic disease, is a malignant neoplasm with a high mortality rate in its early stage. Further, it is difficult to diagnose, a fact that reduces the efficiency of its treatment. Its incidence is often linked to cultural factors such as the intake of food and/or beverages<sup>6</sup>. Hepatocellular carcinoma (HCC) is the most common solid tumor worldwide, with an estimated incidence of one million new patients a year. It presents

different clinico-pathological features in the initial and advanced phases<sup>7</sup>. Most primary liver cancers are not suitable for curative operation at the time of diagnosis<sup>8</sup>. Therefore, several non-surgical alternative techniques, coupled with new healthcare technologies, have been and are continuing to be developed. However, the radiofrequency ablation (RFA) health technology has become the most widely used therapeutic option for unresectable HCCs because, upon analysis, results indicated RFA to be a safe technique/technology involving less performance time and morbidity, and minimal mortality<sup>9</sup>. A recent study evaluating the therapeutic effects of RFA and surgical liver resection in the treatment of small HCCs described RFA as a technique/technology that involves less complications, shorter hospital stay, and increased long-term efficacy<sup>9</sup>. RFA is a technology based on the application of high-frequency electrical currents that can pass through living tissue without causing electric shock, muscle contractions, or pain<sup>10</sup>. It consists of the transformation of electromagnetic energy into thermal energy at the contact point between the electrode and the tissue, forming a kind of electrical arc. This physical phenomenon produces the agitation and collision of ions, gradually heating the cancer cells to the point of destruction<sup>6</sup>. The increase in temperature and exposure time is configured to achieve the desired effect: permanent destruction, coagulation, or carbonization of the tissues, in addition to altering the volume of the destroyed tissue. In this case, technology assumes a fundamental role in fulfilling the basic desire of advanced societies, which is to constantly facilitate the wellbeing of the citizens, using scientific development to search for results that help to improve people's quality of life. In fact, it is only through a very detailed presentation of the interactions between science and society, throughout history, that we can even begin to understand what science means and what its future may hold<sup>11</sup>.

The prominent factor that motivates the present study is the identification of scientific works indexed in healthcare magazines that are considered relevant in academia, which present results involving the use of health technologies, such as radio frequency ablation (RFA) in the treatment of hepatocellular carcinoma (HCC), and consequently, the interpretation of these data in light of the human sciences. Considering the above factors, the current research problem can be stated as follows: Based upon the “space of experience” represented by the treatment of HCC via the RFA health technology, what are the “horizons of expectation” that this health-disease process generates for the respective society? Since the advancement of science is based on both progressive as well as reflective aspects<sup>12</sup>, the plausibility of research is demonstrated based on documentary and/or

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experimental analysis in the context of qualitative research. According to Cellard<sup>13</sup>, some precautions must be taken while surveying this methodological specificity. This includes locating relevant texts and evaluating their credibility, and understanding the message of the text and being content with what is available<sup>13</sup>. Therefore, in the present study, we collected data based on the methodology proposed for the construction of meta-analyses, using the following MeSH health descriptors: [(“Cost-Benefit Analysis”) AND “Ablation Techniques”] AND “Liver Neoplasms,” in the database of the US National Library of Medicine National Institutes of Health (PubMed.gov).

Therefore, the research objective can be described as follows: the objective of this study was to perform an analysis from the standpoint of the human sciences, based upon the indexed publications regarding the use of RFA in the treatment of HCC, focusing on the aspects of the cost benefits related to the use of this technology in the population.

## RESEARCH PROCEDURES

To evaluate the impact of the use of the health technology being examined in the present study, i.e., the use of RFA in the treatment of HCC, the present study used historical categories called “space of experience” and “horizons of expectation,” developed by the humanities theorist Reinhart Kosseleck. These historical categories are concerned with issues involving space and time. Experience and expectation are two categories that are important while addressing historical time, because they intertwine the past and future. They are also appropriate when one attempts to discover historic time, because, enriched in their content, they direct concrete actions in social and political movement<sup>14</sup>. The work involves inductive research, according to Dantas and Cavalcante<sup>15</sup>, i.e., the researcher develops the concepts, ideas, and an understanding based upon patterns found in the data, rather than collecting data to prove theories, hypotheses, and preconceived models.

### Selection of Journals and Articles

The present work first aimed to survey the academic research published in leading journals on international health, related to the topics of RFA health technology/HCC treatment/cost benefits. To choose these journals, a search was conducted with the MeSH terms for health descriptors, the most well-known vocabulary among controlled descriptors—MEDLINE/PubMed.gov<sup>16</sup>. This methodology, which is commonly used to perform meta-analyses, assisted us in our research, considering that we needed to collect data that are directly linked to the area of health.

Table 1 schematically presents the disposition of indexes used in the study, as stated, emphasizing on the selected MeSH descriptors, as well as highlighting the database that was used.

Table 1: Descriptors used in the database

Database	MeSH Terms
PubMed.gov	Search: (“Cost-Benefit Analysis” [Mesh]) AND “Ablation Techniques” [Mesh] AND “Liver Neoplasms” [Mesh]

Source: Research data

By running a search with the MeSH terms — Cost-Benefit Analysis AND Ablation Techniques AND Liver Neoplasms — on the PubMed database (US National Library of Medicine National Institutes of Health, <http://www.ncbi.nlm.nih.gov/pubmed>), we obtained 15 articles. These articles, which matched the searched MeSH terms to some extent, fit into the “space of experience” related to the use of the RFA health technology for the treatment of HCC. Thus, these articles were the foundation for the analysis of the “horizons of expectation” generated from this health-disease process that is consolidated in the social and economic impacts of this process. It should

be noted that the PubMed database was the main source of information for accessing the data used in the present study.

Table 2 presents the findings of the above mentioned procedure. This first set of results made it possible to infer, by analyzing the indexed articles, an understanding of the scientific conditions related to the proposed topic in relation to scientific development in healthcare. Based upon this initial result, data was collected (primarily by analyzing and reading the titles and abstracts of published articles) during this first round.

Table 2: Results of the search using MeSH terms (Title; Year of Publication; Periodical)

Title	Publication	Periodical
The clinical effectiveness and cost-effectiveness of ablative therapies in the management of liver metastases: Systematic review and economic evaluation	2014; 18(7)	Health Technol Assess
Cost-effectiveness of simultaneous resection and RFA versus 2-stage hepatectomy for bilobar colorectal liver metastases	2014; 109:516-520	J Surg Oncol cost
cost-effectiveness of hepatic resection versus percutaneous radiofrequency ablation for early hepatocellular carcinoma	2013; 59:j 300-307	J Hepatol
Comparison of FDG-PET, MRI and CT for post radiofrequency ablation evaluation of hepatic tumors	2013; 27:58-64	Ann Nucl Med

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interventional radiologic treatment of hepatocellular carcinoma—a cost analysis from the payer perspective	2012; 23:306-314	J Vasc Interv Radiol
Percutaneous radiofrequency ablation of hepatocellular carcinoma compared to percutaneous ethanol injection in treatment of cirrhotic patients: An Italian randomized controlled trial	2011; 31:2291-2296	Anticancer Res Percutaneous
Percutaneous ethanol injection in the treatment of hepatocellular carcinoma in cirrhosis: A simple, effective and cheap procedure for percutaneous ablation	2010; 19(4):461-467	J Gastrointestin Liver Dis
Survival and cost-effectiveness analysis of competing strategies in the management of small hepatocellular carcinoma	2010; 16:1186-1194	Liver Transplant
Management of hepatocellular carcinoma in Asia: Consensus statement from the Asian Oncology Summit 2009	2009; 10:page range	Lancet Oncol
Hepatocellular adenoma: Cost-effectiveness of different treatment strategies <sup>1</sup>	2009; 252 (3)	Radiol
Percutaneous, laparoscopic, and open surgical radiofrequency ablation of malignant liver lesions	2007; 132:293-299	Klinik und Poliklinik für Visceral- und Gefäßchirurgie, Universität zu Köln



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Lebermetastasen kolorektaler karzinome—darf das drg-system das operative vorgehen beeinflussen?	2007; 132:287-292	Kreiskliniken AltöttingBurghausen
Metastatic colorectal carcinoma: effectiveness of percutaneous radiofrequency ablation versus that of hepatic resection	Cost- 2004; 233:729-739	Radiol
Combined resection and radiofrequency ablation for advanced hepatic malignancies: Results in	2003; 10(9):105969	Ann Surg Oncol
Cost-effectiveness of percutaneous radiofrequency ablation for malignant hepatic neoplasms	2001; 12(7):823-33	J Vasc Interv Radiol

172 patients

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Source: Research data.

The titles and abstracts were read to analyze whether the focus of the article was the use of the RFA health technology in the treatment of HCC, and its costs and benefits. Thus, only articles that intended to explore the epidemiological data with regard to HCC, mediated by the chosen health technology and guided by the health-disease process, were considered. The aim was to identify the social and economic developments linked to this kind of facts. Among these studies, articles that compared the applied health technologies, the types of HCC treated, and the results of this group, were found suitable. It is noteworthy that, among these topics, we considered the studies that were clearly able to contribute to the reflection on the “space of experience” of the treatment and the “horizons of expectation” of its impact on society.

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It is evident that our selection process did not address the articles that compared the treatment of the respective lesion by RFA technology with other health technologies, as well as those that compared the treatment of different types of lesions. At this stage, the focus was to study the articles that, in general, addressed the use of RFA, solely to treat HCC.

However, we realized that it was essential to read all the articles thoroughly, since it helped the researchers gain a broad understanding of the matter, and thus, helped in the inferences related to the surveyed data and the research question.

## RESULTS AND DISCUSSION

After the articles were selected, the objective was to identify a basis of information for the analysis and implementation of the study, seeking, in this regard, greater precision in discarding the articles that were beyond the general scope of the search, i.e., the prevalent use of RFA in the treatment of HCC. To this end, a database was prepared based on the following variables: a) health technologies involved in the treatment of RFA; b) treatment time; c) type of treated lesions.

Figure 1 was plotted for all the 15 articles—separate in the first round—to identify the types of health technologies that were more apparent in these studies. This data was intended to help in the interpretation of the studies that laid greater emphasis on the RFA health technology for the treatment of HCC.

Figure 1: The types of health technologies for the treatment of HCC discussed in the selected articles (prevalence of RF)

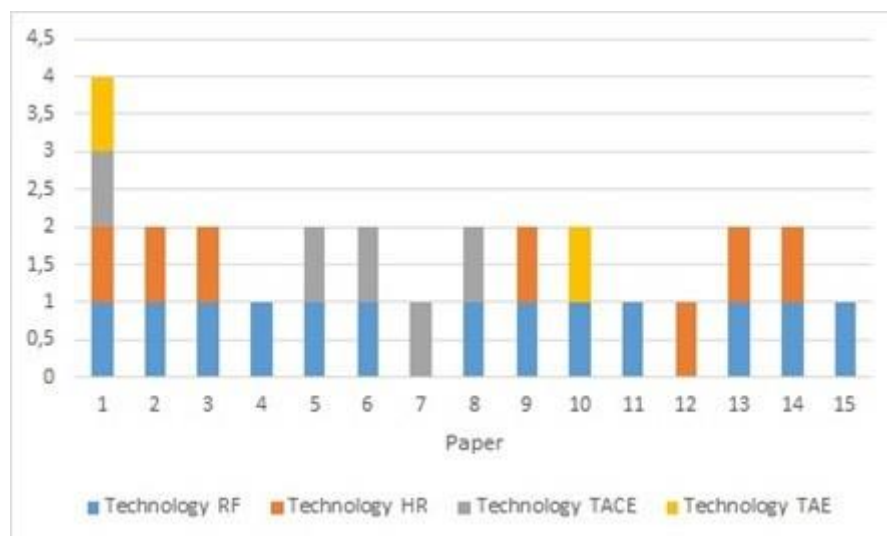


Figure 1 indicates that out of the 15 related articles, only one did not mention the RFA technology, outlining the importance of this technology in HCC treatments. Thus, the need for technological and scientific intensification for the use of RFA, as well as the imperative need to develop and maintain public policies that explore this scenario for the wellbeing of society in general, is emphasized. Percutaneous radio frequency (RF) ablation is a promising technique in the treatment of hepatic malignancies<sup>17</sup>. Figure 1 shows that its prevalence in studies involving health technologies for the treatment of HCC is constant, which illustrates the importance of this health technology in the treatment of liver cancer. More recent data demonstrate that, over time, the use of RFA is more effective. Consequently, it is the predominant choice for treatments compared to the surgical technique of liver resection<sup>18</sup>.

Furthermore, in the first half of the present study, the selected articles were analyzed by searching MeSH terms in the PubMed database, thereby addressing the data that was most closely linked to the objective of the study.

The relationship between the use of technology in the field of health, as well as the application of such technology for the wellbeing of the society, was the basis for the analysis conducted in the present study. The results of the studies selected for analysis, i.e., the 15 chosen articles, led to some discoveries based on interdisciplinary reflections on the use of the RFA health technology in the treatment of HCC. The analyses conducted through the use of the abstracts provided some clues related to our research question. However, they were not enough to infer if the use of the RFA technology would be the best option for the treatment of HCC.

Based on the abstracts, we sought to identify whether the research problem and the research objectives of each of the analyzed articles were clear and related to our research interest, or, at least, whether there was evidence to help the inference. Therefore, Table 3 was prepared to verify this point.

Table 3: Characteristics revealed from the analysis of the abstracts

	Research Problem		Research Objective		Source of Information	
	Yes	No	Yes	No	Indications Abstract	No Indications
Qty	6	9	6	9	12	3
%	40	60	40	60	80	20

Source: Research data.

Of the 15 analyzed abstracts, 6 presented a research problem and research objective connected to the use of RFA in the treatment of HCC, while the remaining 9 did not do the same. However, 12 abstracts indicated the use of this technology with regard to the health problem of health, while 3 did not. This classification was facilitated by the realization while reading the abstracts, as well as by the inferences drawn during doing so. Noting that virtually all articles, in some way, addressed the RFA health technology in the treatment of HCC, all the texts were read completely. Thus, we

attempted to sort the articles according to their approach to the RFA technology, the ultimate aim of the study reported in the article, and other methodological characteristics.

Table 4 illustrates whether the research problem was linked to the RFA technology for the treatment of HCC, whether the guiding questions of the study reported in the article exhibited the same, whether there was a reference to other types of technologies beyond RFA, and the extent to which the articles presented the information regarding the use of RFA.

Table 4: Characteristics revealed by reading the articles completely

	Research Problem		Guiding Questions		Technologies		Sources of Information			
	Yes	No	Yes	No	RFA	Others	Abs.	Intr.	Meto.	Resul
Qty	6	9	8	7	13	11	11	11	13	11
%	40	60	53,33	46,66	86,66	73,33	73,33	73,33	86,66	73,33

Source: Research data.

Most of the articles did not discuss the RFA health technology directly with reference to the study problem. However, the same was implied in the text. However, 86.66% of the articles directly addressed the use of RFA in the treatment of HCC throughout the text. Further, 53.33% of the articles directly cited the use of RFA in the guiding question(s), while 46.66% did not do so. Meanwhile, an average of 75% of the articles cited the use of RFA in the treatment of HCC in the abstract, introduction, results, and methodology sections.

The data shown here indicate that in the existing research, the treatment of HCC using RFA is mostly compared with other types of more traditional health technologies. This indicates that RFA, despite being a newly developed technique, is also perceived by the health professionals as a prominent therapy, even when surgical resection is possible, because it is associated with fewer side effects (14, 21). In turn, RFA can be understood as a less expensive health technology, not only in

terms of its scientific and technological development, but also in its application in the segment of the society that needs it.

Based on the characteristics revealed by thoroughly reading the articles, we prepared Table 5 to evaluate the relationships between the samples more closely — as provided by the data presented in the 15 articles analyzed — and to test our claim presented in the current study. Pursuant to Pires<sup>19,20</sup>, from a qualitative perspective, the relationship between the sample—in this case, the selected articles — and the objective is favored more than the technical sampling rules<sup>20</sup>.

Table 5: Characteristics revealed in the complete reading of the articles

Study	Results	Conclusions
Loveman (2014) (1)	Radio frequency ablation is more effective as compared to surgical resection.	Substantial evidence, but further study is needed.
Abbott (2014) (2)	RFA had a higher level of usage as compared to surgical resection.	RFA is associated with lower costs and higher survival rates.
Cucchetti (2013) (3)	Life expectancy was similar for RFA and surgical resection.	Depending on the stage of the disease, both RFA and SR have similar costs.
Chen (2013) (4)	No comments (N/C)	No comments (N/C)
Ray (2012) (5)	Cost reduction in the use of RFA as compared to other technology.	Indication of RFA as low cost, but further evidence is needed
Giorgio (2011) (6)	The recurrence of HCC was lower in the group that received RFA therapy.	In this case, the cost of RFA was higher

Giorgio (2010) (7)	No comments (N/C)	No comments (N/C)
Naugler (2010) (8)	The average life span for those treated with RFA was longer.	Both RFA as well as the other technologies showed the same results.
Poon (2009) (9)	No comments (N/C)	No comments (N/C)
van der Sluis (2009) (10)	Depending on the lesion, RFA was more effective and less costly.	The most favorable strategy was treatment with RFA.
Stippel (2007) (11)	11 studies support the use of RFA in patients with multiple metastases.	The cost/benefit ratio will improve in studies concerning RFA.
Grundmann (2007) (12)	The use of RFA in the treatment of HCC can be an economically justified procedure.	The RFA procedure is preferred due to aspects related to cost/benefit. However, further research is needed.
Gazelle (2004) (13)	RFA has limitations in the treatment of specific lesions.	Another type of health technology appears more effective than RFA.
Izzo F (2003) (14)	Not very conclusive for our study.	Not very conclusive for our study.
Shetty, (2001) (15)	The treatment of HCC by RFA in conjunction with other health technologies can be considered the least costly.	More policies involving the use of RFA for treating HCC can lead to better results regarding cost-effectiveness.

Source: Research data.

RFA health technology is an approach in the health-disease process, to treats HCC. In this case, technological development is easily aligned with minimizing the impact of diseases such as HCC on daily life. Therefore, analyzing the therapeutic approach from an interdisciplinary perspective can lower new viewpoints and assumptions that together enable scientific and technological advances.

Table 5 offers the possibility to reflect on how important it is to consider the use of RFA in HCC. Moreover, it is important to realize that the impact of this technology on health still had extensive limitations, which brings to mind the need to study it comprehensively, involving other disciplines such as bioengineering. The studies listed in Table 5 have one characteristic in common: RFA is considered a health technology necessary for the treatment of HCC. However, this technological and scientific advancement is not in the hands of the healthcare professionals, but rather is in those of the individuals who develop more effective and efficient prototypes, i.e., those who work with bioengineering. According to Wilson<sup>2</sup>, the cost of a technology is directly related to the benefit that may be made available to the population<sup>2</sup>.

Bredt<sup>21</sup> clarifies that, in the context of the lesions in early stages, very early HCC is defined as asymptomatic HCC, a single tumor smaller than 2 cm in diameter. The treatment recommended by the European Association for Study of the Liver as well as by the American Association for Study of the Liver (EASL -AASLD), for patients with very early HCC with good liver function (Child-Pugh A), is resection, demonstrating an overall survival rate, and that without relapse in 5 years, of 70 and 68%, respectively. However, RFA can also produce acceptable results for very early HCC, with a 62% rate for survival of 5 years free of disease, and 78% for 5 years of overall survival<sup>21</sup>.

The internationally indexed articles selected in the present study, presented in Table 5, were considered our “space of experience,” where, as shown in the table, they described a positive scenario for the use of the RFA health technology. The chances of success when using this health technology to treat HCC, as determined by our survey, are promising. In this sense, the “horizons of expectation” in the health-disease process involving the use of RFA in the treatment of HCC points to a greater interaction between some areas of knowledge — such as health and



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bioengineering — such that, together, in the interdisciplinary process, they can evaluate the result of the application of this technology, as well as continually reflect upon its improvement.

Scientific research, even at the early stage, is intended to increase the accuracy of the RFA health technology in the treatment of HCC. However, the speed of technologically improving RFA in the ablation of carcinoma, thus generating an increase in the rate of treatment and healing, enhances the degree to which the areas of health and bioengineering interact for the wellbeing of patients.

## CONCLUSION

In Brazil, HCC is the eighth most common form of cancer. In absolute numbers, there are about 10,000 new cases each year<sup>22</sup>. Since 2014, the use of RFA in the treatment of HCC is included in the coverage offered by private health plans. However, the Brazilian Unified Health System (SUS) already offered this coverage long before this.

The “space of experience” represented by the data that were selected from the articles utilized in the present study demonstrates that the use of RFA in the treatment of HCC is an expanding reality. According to this “space of experience,” the application of this technology in the treatment of cancer can exponentially increase the quality of life of patients.

In societies such as that of Brazil, where intervention policies are responsible for the social wellbeing of much of the population, especially when it comes to public health, such research concerning life sciences and health technologies often materializes through narratives. This helps in the interdisciplinary process, increasing the chances of successful technological advances in healthcare, such as RFA.

The “horizons of expectation” consolidated through this reality point to the fact that this health technology, if closely monitored by policymakers in public health, due to its acceptance in scientific circle in the area of health, and it being considered a technology with a lower cost/benefit as compared to others of the same nature, can soon gradually increase the rates of treatment and cure of the health-disease process involving liver carcinoma

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