

### Cultura en Vena White paper

Roadmap for incorporating MIRs (Musicians In Residence) in healthcare settings

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## Prologue

Ángela had only been in Laura's womb for twenty-eight weeks when she was born by planned caesarean section. It was a very preterm birth. Weighing barely 500 grams, little Ángela had to spend three more months under a medical team's watchful eye in intensive care before she was allowed to leave hospital. During that time, Laura and her partner took turns staying with the baby. "One day, some kids came round and asked if they could play for us," Laura says. "I actually needed it. Music helps you channel your emotions and makes your situation seem less dramatic for a while. You even stop hearing the monitors. The whole world grows calm. Psychologically, I found it healing, and I think it did Ángela some good too." The day she latched onto her mother's breast for the first time, Sandra sang a sweet flamenco lullaby in the hospital room.

But the gift of music did not just benefit mother and child; healthcare workers were also grateful for the soothing musical balm, which offered them a moment of peace in an otherwise hectic workday. Of course, the same feelings of well-being and satisfaction also washed over Sandra, the "music donor", who was grateful for the unique experience of performing live before such a special audience.

On another occasion, a fifteen-year-old girl in the Adolescent Psychiatric Ward at Gregorio Marañón, who according to her doctor had been completely unresponsive for the past three weeks, with a total lack of psychomotor activity, stood up during a percussion concert and began moving her body to the beat. Neither the doctors nor the musician, David, could believe their eyes.

These are the kinds of extraordinary experiences that have taken place in hospital rooms where live music managed to overcome the beeping monitors, alarms and noisy machines for a time—music intended to help hospital patients recover and mitigate the stress of their loved ones and healthcare workers.

Since prehistoric times, humans have known that music has the power to dispel sadness and alter moods. Orpheus tamed the wild beasts of ancient Greece with his lyre, and today thousands of fans intone anthems in a stadium. Music appeals to our emotions; it can calm and soothe, whip us into a frenzy, unearth buried memories, forge bonds... Music is certainly good for our health, but can it heal? Do we have any scientific proof of how music affects our brain or our vital signs? Does it improve test results or alleviate the symptoms of an illness? Can it influence a patient's prognosis or recovery time?



The MIR Project, a three-year study that aimed to prove the benefits of bedside music, began in September 2016.

#### The MIR Project: Researching the effects of live music

After more than four years bringing music into hospital settings—having organised over 1,600 mini concerts for more than 30,000 listeners, including patients, family members and healthcare workers—the Música en Vena association decided to go one step further and initiate a research project to compile scientific evidence of the positive effects observed during that time.

In September 2016 we launched the MIR: Musicians In Residence Project, a three-year study to prove that bedside music can be an adjuvant to medical treatments, observing all the protocols and safeguards of the scientific method. Although it originated with Música en Vena, in 2019 the development, promotion and implementation of this project was turned over to Fundación Cultura en Vena, a foundation created by the same team of people who managed the MIR Project.

This is the first scientific study ever conducted in Spain on the effects of live music on different pathologies and that has a triple impact: humanisation of healthcare, clinical research and job creation.

The project includes seven research studies that use physiological and biological parameters to measure the effect of music on patients with certain conditions. The first round of the MIR Project was carried out with the vital cooperation and scientific and technical support of Hospital Universitario 12 de Octubre in Madrid, after being approved by the hospital's Ethics Committee for Clinical Research (CEIC).

"What we want to prove with this study is that music can be used as medication, something that can help patients and has no side effects," as Dr Juan Carlos Montejo, Head of the Intensive Care Unit (ICU) at Hospital 12 de Octubre in Madrid, explained at the beginning of the project. For Carmen Martínez de Pancorbo, Chief Executive of Hospital 12 de Octubre, the MIR Project was more about "turning an eminently social initiative into a research project, one which allows us to prove that live music is clinically effective for improving prognosis and results in patient health." Will musicians ever be considered essential hospital staff? "The way to achieve that is by compiling scientific evidence that these results are good for patients and, moreover, create a more pleasant, peaceful environment for healthcare professionals to work in," Martínez de Pancorbo added.



As Ana María Díaz-Oliver, Head of Corporate Social Responsibility at Hospital Universitario 12 de Octubre, asked, "What could be better than to facilitate projects that improve the health of our patients, our family members, our professionals, and create employment opportunities for musicians to boot?"

In addition to the humanisation of hospitals and scientific research, creating quality jobs for young musicians is the third pillar of the MIR Project. "As someone who writes songs and makes music, it's a privilege to accompany a human being at such a difficult time in their life, when they're in hospital. I truly believe that music heals," musician Jorge Drexler emphatically declared after one of his bedside concerts prior to the launch of the MIR Project, which has provided employment for 46 young professional musicians.

This paper offers a summary of how the three-year research phase of the MIR Project unfolded, sharing the lessons we learned and our success stories with the scientific community and other healthcare facilities. We hope that this information will be used as a roadmap to replicate and improve on our project and move closer to the incorporation of live music in treatment protocols.

The MIR Project, implemented at Hospital 12 de Octubre, was made possible thanks to the financial support of Fundación Daniel y Nina Carasso, the Edmond de Rothschild Foundations and Fundación Reale Seguros, in partnership with Fundación SGAE (Sociedad General de Autores y Editores), Sociedad de Artistas Intérpretes o Ejecutantes de España (AIE), and Hinves Pianos.



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The MIR Project was conceived and led by Juan Alberto García de Cubas during his term as director and co-founder of Música en Vena, and will be developed, promoted and implemented by Cultura en Vena.

## Challenges

The MIR (Musicians In Residence) Project has proved that live music can play a pivotal role in healthcare settings. Scientific literature has supported this idea for years, and the use of live music was recently recommended by both the WHO Regional Office for Europe and the European Commission.

These are the **10 goals we achieved during our three years of research**, and the **10** challenges the project will need to overcome in the scaling stage.

#### CHALLENGE 1

Include live music as an adjuvant to clinical treatments for improving patient health results.

#### CHALLENGE 2

Normalise the presence of musicians on medical teams, with a specific role to play in treatment protocols.

#### CHALLENGE 3

Improve how patients and family members view hospital care.

#### CHALLENGE 4

Improve how healthcare professionals feel about their work environment.

#### CHALLENGE 5

Publish conclusive evidence of the real benefits of music for human health and well-being.

#### CHALLENGE 6

Improve job prospects for young musicians by creating employment opportunities in a new field.

#### CHALLENGE 7

Generate new content, outlets for expression and artistic production related to music and health.

#### CHALLENGE 8

Build a network of musical-medical experts who will drive research and publish results.

#### CHALLENGE 9

Work on the project's national and international scalability.

#### CHALLENGE 10

Present best practices related to music and health to cultural and healthcare institutions to achieve a political impact that will support their application.



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Goya in a Hospital? exhibition. Ambulatory Art programme by Cultura en Vena, Hospital Puerta de Hierro, Majadahonda, Madrid. 2021



## **General figures**



# **46** musicians hired.

Over 500 professional musicians showed up for the 3 auditions.

98.5% of musicians believe that music should be just another expressive way to earn a living.

years of scientific research to conduct

3

7 years of clinical studies.

More than 450 patients received live music sessions with the aim of improving their hospital stay.

95% of patients said they felt better with live music. 89% of family members feel music should be offered every day.



Over 95% of surveyed patient relatives and medical professionals perceive music as something that helps patients improve.

Total sample: 93 patient relatives and 97 medical professionals surveyed.

## 3,000+ hours of live music.

More than 2,200 pieces performed in over 1,300 music sessions.





**33 healthcare professionals** were on the research teams for each clinical trial.

87% of healthcare professionals believe that music had a positive effect on the patients and on themselves.

78% would use live music as a complementary resource in their work.

Emergency Culture exhibition. Ambulatory Art programme by Cultura en Vena, Hospital Clínico San Carlos, Madrid. 2021 12-

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## State of the art

The connection between music and health is nothing new. Every civilisation and nation in human history has been aware of the healing powers of music, and of the arts in general. Even in prehistoric times, people realised that music could ease anguish and believed in the divine origin of sound itself. The ancient Greeks used different vocal timbres to heal the sick.

The first scientific studies of the links between music and health were conducted in England and the United States after World War I, using music therapy to help soldiers cope with post-traumatic stress.

In the broader field of art therapy, which includes other arts in addition to music, research has progressed by leaps and bounds over the last two decades: studies on this subject now number in the thousands.

In November 2019, the World Health Organization (WHO), via its Regional Office for Europe, released a ground-breaking analysis of 900 scientific publications from around the world in its report <u>What is the evidence on the role of the arts in improving health</u> <u>and well-being?</u><sup>1</sup> In an unprecedented move, the WHO Health Evidence Network called upon European governments to incorporate the arts in their health and well-being policies, using them not only to prevent illness and promote good health, but also in the management and treatment of illness. The WHO report concluded that "bringing art into people's lives through activities including dancing, singing, and going to museums and concerts offers an added dimension to how we can improve physical and mental health," according to Piroska Östlin, WHO Regional Director for Europe.

Although Europe as a region is slowly but steadily moving forward in this field, the pace of progress varies from one country to the next. For example, in the United Kingdom—which has already made great strides in applying artistic practices to healthcare—the concept of "arts in health" is already firmly established and has strong institutional support from every party in Parliament. The All-Party Parliamentary Group on Arts, Health and Well-being <u>published a comprehensive report in 2017</u> on how the arts can be creatively used to improve personal health and well-being from infancy to old age.<sup>2</sup> This British initiative is an excellent example of what can be accomplished if we "all pull together".

In Spain, in September 2020 the Senate issued an <u>institutional statement</u> addressed to the Spanish government, urging it to consider culture an essential commodity.<sup>3</sup> The original text is quite a statement of intent, indicating the direction we must take in the coming years: "We should include culture and the arts in the framework of health-care, as music, art and cultural activities have great benefits for our bodies and our emotions."

The Cochrane Library contains numerous studies and theories that describe the different effects of music and art on the human organism. These include:

- Physical effects: lowers blood pressure, heart rate and breathing rate and stimulates peristalsis, reducing nausea.<sup>4, 5, 6, 7, 8</sup>
- Biochemical effects: increases number of neuromodulators and neurotransmitters, strengthens the immune system.<sup>9, 10, 11</sup>
- Psychological/emotional effects: reduces anxiety and pain perception.<sup>12, 13, 14, 15, 16</sup>
- Cognitive/intellectual effects: stimulates imagination and creativity and facilitates learning, memory and executive functions.<sup>17, 18, 19</sup>
- Social effects: promotes dialogue and eases group tensions.

At Cultura en Vena, in addition to finding scientific evidence for some of these positive effects that music has on people, we also want to help achieve the priorities set out in *Health 2020: <u>A European policy framework and strategy for the 21st century</u><sup>20</sup> and in the WHO's <u>13th General Programme of Work 2019-2023</u>.<sup>21</sup> For all these reasons, we hope and trust that our work will continue to support the great collective effort of building a society where art and health go hand-in-hand.* 

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#### **Progress on the institutional front**

Despite their most heroic efforts, social enterprises alone cannot cement a sustainable, long-term partnership between health and the arts. Government institutions must create the frameworks needed to make that happen. In the interval between the release of the WHO report in 2019 and the publication of this white paper, several very interesting processes have been set in motion, such as the aforementioned institutional statement made by the Spanish Senate in September 2020 and other, more recent initiatives:

Culture for Health: this is a cross-sectorial, trans-European project funded by the European Commission that aims to generate knowledge and compile policy guidelines on how to enhance well-being and health through culture. Several Cultura en Vena initiatives, including the MIR Project, have been included in this European framework:

- Emergency Culture
- Goya in a Hospital?
- Ambulatory Art
- Musicians In Residence

WHO Collaborating Centre for Arts & Health: created in 2021, this centre aims to carry out world-class research into how the arts, culture and heritage affect mental and physical health. It is working with the culture/healthcare ecosystem to develop arts and health policy globally and will provide training and resources to support this new field.

Art, health and the Inter-American Development Bank: In January 2022, the Inter-American Development Bank presented an interesting publication titled *Healing a Broken World: The Power of Art for Social Transformation in the Post-Pandemic Era.* At an international symposium held a few months later, the Cultura en Vena team was able to share our experience with the MIR Project.

Cultura en Vena appeared before the Assembly of Madrid (legislative body of the region of Madrid) to inform all the political parties represented there of the arts and health projects currently in progress.

Cultura en Vena appeared before the regional Parliament of Navarre after a motion to support artistic practices in healthcare settings was passed almost unanimously by all political parties in that body.

On 21 June 2022, World Music Day, the president of the Congress of Deputies made an institutional statement on behalf of the entire Spanish Parliament, acknowledging the role of music in healthcare.





#### Other "sister" initiatives

More and more people are working in the same direction as us, using art and culture as a tool to meet social and health-related needs. We at Cultura en Vena want to continue networking and coordinating with them. Some of these "sister" initiatives, projects and organisations are described below.

#### Música en Vena

<u>WHEN AND WHERE</u> Created in 2012, based in Madrid, nationwide scope.

 $\underline{\mathsf{WHAT}}$  Bring live music of every genre to healthcare centres.

#### Musicians On Call

WHEN AND WHERE Started in New York in 1999.

WHAT Bring live and recorded music to patient bedsides in healthcare facilities across the United States.

#### Music in Hospitals & Care

WHEN AND WHERE Created in 1948 as the Council for Music in Hospitals.

 $\underline{\mathsf{W}\mathsf{HAT}}$  Bring live music to people of all ages in hospitals and care facilities throughout the United Kingdom.

#### Música para Despertar

WHEN AND WHERE Launched in 2013 in Granada, with a national and international presence.

 $\underline{\mathsf{WHAT}}$  Share the power of music to help people with Alzheimer's.

#### Músicos por la Salud

<u>WHEN AND WHERE</u> A project of Fundación Social District begun in 2015, nationwide scope.

 $\underline{\mathsf{WHAT}}$  Give live mini concerts in hospitals.

#### Live Music Now

WHEN AND WHERE Founded in 1977 by Yehudi Menuhin, one of the greatest violinists of all time, who also had a strong social conscience.

WHAT Offer live music in care homes, hospitals, schools, hospices and community settings across the United Kingdom.

#### Asociación Música para Vivir

WHEN AND WHERE Created in 2011, based in the Principality of Andorra and Nicaragua.

WHAT Improve the lives of children and young people in Central America and the Caribbean through music.

#### Música para el Autismo

<u>when and where</u> Established in 2013, based in Valencia.

WHAT Contribute to the personal development of people with autism through music and other arts.

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## Music and health through the ages

This timeline, though it is certainly not exhaustive, is a general overview of the most important milestones in the relationship between music and health from the ancient civilisations to the present day.

**PALAEOLITHIC** The discovery of a 35,000-year-old flute in southern Germany has made anthropologists think that music strengthened social ties and improved new forms of communication, indirectly driving the demographic expansion of modern humans.

**ANCIENT CHINA** The therapeutic use of music is mentioned in the seminal text on traditional Chinese medicine, *The Yellow Emperor's Inner Classic* (ca. 2600 BC). The five tones of the Chinese musical scale were integrated in the theory of the five elements (water, fire, metal, wood and earth), and each element was associated with a musical note and an organ of the human body.

**ANCIENT EGYPT** Papyri dated to around 1500 BC seem to suggest that the Egyptians used music as a balm for healing the body, calming the mind and purifying the soul. They also believed that music had the ability to improve a woman's fertility.

**INDIA** In Ayurveda, the ancient Indian system of medicine, mantras (chants) were believed to have therapeutic properties. The *Atharvaveda*, a medical text written in northern India around 1200–1000 BC, contains over 6,000 mantras and 700 hymns. According to the *Sushruta Samhita*, another Ayurvedic medical text (third or fourth century AD), gentle sounds and pleasant sights promote good digestion.

**ANCIENT GREECE** Pythagoras (sixth century BC), in his theory of "the music of the spheres", stated that mathematical and musical relationships between the heavenly bodies were the source of the universe's harmony. As those proportions were reflected in the human soul, music had the power to restore harmony in individuals—for example, in cases of mental illness. Plato (fifth-fourth century BC) believed in the divine nature of music and its pleasing and sedative powers. In *The Republic*, he noted the importance of music for the education of youth and underscored the moral superiority of certain scales to others (Greek modes). Aristotle (fourth century BC) acknowledged the great power that music had over people. In *Politics*, he wondered about the Greek musical modes and their suitability for different purposes, such as education versus recreation. When formulating his theory of ethos, he argued that music affects one's mood and character according to its rhythm, melody and harmony (the pillars of music therapy).

The relationship between music and health has evolved over the centuries, from magical healing rituals to highly specific therapies based on hundreds of scientific studies.

**ANCIENT ROME** In *De institutione musica*, the philosopher Boethius (fifth-sixth century AD) defended the importance of music for balancing the four humours of the human body.

**ISLAMIC WORLD** The Persian physician and philosopher Avicenna (11th century) mentioned the arts (dance, music, poetry, painting and others) over 150 times in his seminal *Canon of Medicine* (1020).

**MIDDLE AGES** Abbess Hildegard of Bingen (11th-12th century), a polymath, pioneer of monastic medicine and author of the medical treatises *Physica* and *Causae et curae*, believed that "every creature has its own sound". Music was considered a branch of philosophy and mathematics, and in medicine it was recommended to prevent and cure afflictions of the spirit. Its prescription is associated with the *regimina sanitatis* and pain management. The physician and theologian Arnau de Vilanova (13th-14th century) recommended using music therapy to "distract the intellect of the spirits with musical instruments" and to treat pain.

**RENAISSANCE** People still believed that heavenly bodies, musical tones and bodily humours were all connected. The first studies on melancholia appeared in Europe, with some references to music. In *Le Istitutioni Harmoniche* (1558), Italian theoretician and composer Gioseffo Zarlino claimed that the four musical modes corresponded to the four humours of the body and the four elements. In her *Nueva filosofía de la naturaleza del hombre*, Spanish philosopher Oliva Sabuco (1562–1646) wrote a chapter with the descriptive title "On music, which doth cheer and strengthen the brain and bring health to every ailment". English clergyman and scholar Robert Burton (1577-1640), in *The Anatomy of Melancholy* (1621), stated that melancholic music could alleviate melancholy as well as induce it, freeing the mind from that state and finding balance based on the homoeopathic principle of using the apparent cause of an ailment to cure it.

**MODERN HISTORY** During the 18th century, medical treatises increasingly mentioned music, and the first scientific studies of its effects on the body were conducted. Many doctors with musical training debated the therapeutic power of music in their writings. For instance, in 1748 the French physician Joseph-Louis Roger published a treatise titled *Traité des effets de la musique sur le corps humain* in which he analysed the basic principles of acoustics, the human perception of sound, and the psychology of music and speculated on the possible curative effects of sound vibrations on the body. Meanwhile, in his *Reflections on the Power of Music* (1749), British surgeon Richard Brocklesby acknowledged the tremendous therapeutic potential of music but warned of the need for further scientific research in this field.

**17TH AND 18TH CENTURIES** A relationship was established between music therapy and tarantism (a form of convulsive hysterical behaviour with psychiatric symptoms, popularly associated with a tarantula's bite). *Dissertatio de historia, anatome, morsu et effectibus tarantulae,* a work by the Italian physician Giorgio Baglivi (1668–1707), influenced Spanish musical therapy treatises on tarantism. The most important was *Tarantismo observado en España* (1787) by Francisco Xavier Cid, which included 35 cases of tarantulees treated with music.

**19TH CENTURY** Scientific discoveries ushered in a new way of practising medicine, less holistic and more focused on biology, occasionally to the detriment of certain aspects of healthcare. Even so, new uses were found for music in health, particularly in psychiatry. Illenau Asylum (Baden, Germany) exemplified arts-in-health activism. They had a choir, a band, a chamber orchestra, 140 performances each year, and a music instructor on staff to work with the medical personnel. They even compiled a hymnal that was used in other German asylums. In 1879, the great English composer Edward Elgar was appointed resident composer and bandmaster of the Worcester County Lunatic Asylum, where he wrote dances for the patients. In France, psychiatrist Wilhelm Horn reported that the eight stone baths of an asylum bath house had been fitted with an organ, drums and cymbals as an unusual form of shock therapy.

**20TH CENTURY** The two world wars inspired numerous music programmes for convalescent soldiers. Most were focused on entertainment rather than music therapy per se, but there were some like the "Music in Reconditioning in ASF (Army Service Forces) Convalescent and General Hospitals" programme, launched in the USA in 1945, which used all-women military bands to boost the wounded men's morale.

1950: the National Association for Music Therapy is founded in the United States.

1958: the British Society for Music Therapy and Remedial Music, which would go on to publish the immensely prestigious *British Journal of Music Therapy*, is established in the United Kingdom.

1974: Paris hosts the 1st International Music Therapy Congress. The Asociación Español de Musicoterapia is also founded in Spain, although it did not begin operating until 1976.

1985: the World Federation of Music Therapy is founded in Italy.

1999: the African continent's first music therapy programme is launched in Pretoria, South Africa.

#### **21ST CENTURY**

2012: the Música en Vena association embarks on a mission to improve hospital stays with live music.

2016–2019: the Música en Vena association conducts its scientific study of Musicians In Residence at Hospital 12 de Octubre in Madrid.

2017: Oxford University Press publishes <u>Arts in Health: Designing and Researching</u> <u>Interventions</u>, by Daisy Fancourt, a seminal reference book that systematically explains how to design and deliver arts-in-health interventions, making it a valuable handbook for professional artists, project managers and healthcare workers who want to implement the arts in healthcare settings.



2019: the Regional Office for Europe of the World Health Organization publishes a report that highlights the importance of the arts in the health and well-being of its citizens and, for the first time, urges governments to include art and culture in healthcare systems and protocols, and to systematically support scientific research in this field: <u>What is the evidence on the role of the arts in improving health and well-being? A scoping review</u>.

December 2019: Fundación Cultura en Vena is created with the aim of, among other things, continuing the MIR Project, publishing and sharing the results, and bringing Musicians In Residence to as many hospitals as possible.

2020: the coronavirus pandemic hits Spain, exposing the strengths and weaknesses of our healthcare system and culture industry. In September, the <u>Senate</u> urges the Spanish government to declare culture an essential commodity.

"We should include culture and the arts in the framework of healthcare, as music, art and cultural activities have great benefits for our bodies and our emotions."

### **Current challenges**

#### Why we need MIRs in healthcare settings

The coronavirus pandemic has altered priorities in healthcare and revealed the system's shortcomings. In March 2020, COVID took centre stage, and we began to feel the pain of those terrible daily figures, numbers that represented solitary death, loss with no goodbyes, grieving at a distance... During the long weeks of lockdown, the lack of hugs and physical contact forced us to get creative and think of different ways to promote well-being. Sharing music with neighbours on the balcony was a relief, reading became a refuge, and home cinemas and TikTok choreographies offered a welcome escape. We instinctively—or perhaps not so instinctively—turned to culture as our lifeline.

That involuntary solitude, which we've all experienced in one way or another at some point in our lives, merely revealed, exacerbated and magnified another form of solitude that has always existed but often receives little attention: the loneliness of being ill.

Going through an illness is a difficult journey, and like all of life's trials, it is always better if you don't have to walk it alone. Culture knows no bounds: it can slip through the cracks of social distancing, face masks and barriers without compromising anyone's personal safety. Not only is it safe, but it can even deliver small doses of well-being. A crooning voice can be a caress, a melody can ease pain and suffering, and a catchy rhythm can banish negative thoughts.

So how can we bring culture into those rooms, corridors and waiting areas? How can we intervene, always with the utmost respect for the situation and privacy of patients and their companions, in hospital settings filled with personal, subjective inner lives, thoughts, beliefs and experiences? How can we make the hospital experience better for patients, their family members and healthcare workers? How can we harness and pool resources from the arts and culture industry to give good health an edge in the fight against illness?

#### Health and culture, assets worth protecting

The MIR Project now finds itself at an important crossroads. After the great positive impact achieved during the years of research, the pandemic broke out just when we were about to start implementing and scaling the methodology.

The MIR dream can become a reality if we find co-funding mechanisms to keep musicians on the payroll. We know that, right now, Spain's public healthcare system cannot afford to cover the full cost of employing MIRs.



We therefore want to focus on sharing our knowledge, publicising the results of our research, seeking partners in the healthcare industry to find co-funding mechanisms, and creating new job opportunities in other care sectors.

We welcome any and all support as we rise to meet these new challenges and achieve outcomes that will bring about real social and cultural change:

- Change humanisation policies

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- Introduce artistic working methods in healthcare settings
- Incorporate music in medical protocols
- Improve employment opportunities for young musicians
- Create new musician training channels

In the current scenario, it is vital that institutions and citizens join forces and work together towards a common goal: treating public health as a shared asset that we must all care for and protect, and underscoring the role of culture in personal well-being. At Cultura en Vena, we are working to articulate and define a real public health need which will inspire our leaders to create the necessary legislative frameworks for integrating the arts in healthcare protocols as a warranted, stable, enduring reality.

## Basic principles and definitions

When exploring the relationship between music and health, we must begin with a clear definition of what "health" is, how we understand the role of music in this context, and what we mean by the term "well-being".

#### HEALTH

In 1948 the World Health Organization gave the following definition: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

We at Cultura en Vena share this holistic concept of health, which includes the psycho-social and every other facet of human life. Until recently, medicine has perhaps been too focused on pharmacology and technology (although these are certainly essential for saving lives) to see all that art and culture have to offer. Balanced health-care requires resources and effort on both sides of the scale: we need something to offset the system's shortcomings. Culture is an effective emotional scalpel that completes the physician's toolkit, and artistic practices in healthcare settings can be an adjuvant to conventional courses of treatment.

When we speak of the effects of music on human health, we are actually talking about the way music directly benefits the central nervous system, as described in numerous scientific works.<sup>22</sup>

#### MUSIC THERAPY

This is defined as "the professional use of music and its elements as an intervention in medical, educational, and everyday environments with individuals, groups, families, or communities who seek to optimize their quality of life and improve their physical, social, communicative, emotional, intellectual, and spiritual health and wellbeing. Research, practice, education, and clinical training in music therapy are based on professional standards according to cultural, social, and political contexts," according to the <u>World Federation of Music Therapy (2011)</u>. Music therapy is sometimes confused with music education, which would be the equivalent of mistaking a music therapist for a music teacher. In music therapy, music is a means to a specific, individual, therapeutic end, whereas in music education, music is an end in itself.

22. Särkämö T, Altenmüller E, Rodríguez-Fornells A, Peretz I. "Editorial: Music, Brain, and Rehabilitation: Emerging Therapeutic Applications and Potential Neural Mechanisms", Frontiers in Human Neuroscience [Internet]. 2016 Mar 9 [cited 2017 Sep 17];10. Available at: http://journal.frontiersin.org/Article/10.3389/fnhum.2016.00103/ abstract.

THE HOSPITAL OF THE FUTURE → BASIC PRINCIPLES AND DEFINITIONS

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" <u>World Health Organization, 1948</u>

Although the MIR Project has many of the same goals as music therapy and also harnesses the benefits of music as a therapeutic tool, the processes and resources are not the same. The MIR project is not music therapy because it does not involve music therapists; it simply aims to prove the therapeutic power of live music performed by professional musicians.

#### MUSIC EDUCATION

In music education, teachers attempt to help students develop musical skills. Music education has content that can be compiled in a curriculum and aspires to achieve universal artistic objectives based on the intrinsic beauty of music, the art of musical performance.

#### **MUSIC-BASED INTERVENTIONS**

This refers to all experimental protocols that use music in various forms to study its therapeutic effects. There are several terms to define the different types of music-based interventions that can be carried out with patients.<sup>23</sup> Some of them are:

**Medical music:** Music-based interventions carried out by a healthcare professional with a view to promoting health, but often without a clearly defined aim or reciprocal interaction as in music therapy.

**Rhythmic auditory stimulation:** Music therapy rehabilitation technique to improve motor functions with a natural cadence, such as walking, using rhythmic auditory stimuli to set the pace and synchronise those movements.

**Music-based physical therapy (making music)**: This is a form of physical therapy in which patients try to recover impaired motor functions by performing and playing a musical instrument.

**Melodic intonation therapy (MIT)** This is a treatment method for patients with nonfluent aphasia in which syllables are assigned to certain intonation patterns; with an initially slow and specific intonation, beginning with two syllables and working up to entire sentence, it aims to recover fluency and overcome language difficulties in patients affected by cortical language disorders (strokes, neurosurgical processes, neurodegenerative disorders with aphasia, etc.).

#### Sihvonen AJ, Särkämö T, Leo V, Tervaniemi M, Altenmüller E, Soinila S. "Music-based interventions in neurological rehabilitation", The Lancet Neurology. 2017 Aug;16(8):648–60.

MIR (Musician In Residence): a highly qualified professional musician employed by a hospital to carry out bedside music interventions.

**Music interventions in hospitals:** Live musical performances in a hospital setting given by professional musicians.

#### **MUSICIAN IN RESIDENCE**

An MIR (Musician In Residence) is a highly qualified professional musician, perfectly integrated in the staff of a hospital, whose job is to carry out bedside music-based interventions. They give mini concerts for specific patients who meet the criteria set by each hospital ward and whose well-being may be improved by live music. MIRs must possess a specific set of artistic and personal qualities.<sup>24</sup>

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24. For more information on the ideal MIR candidate, see Part 3 of the chapter on Methodology (page 4ø).



Raquel Ovejas (violin), Musician In Residence


## Proposal and aims

Can the arts be used in an accessible, affordable, transversal way to provide patient-centred care that will improve their health and well-being?

After four years spent observing the amazing effects of live music on countless patients during the hospital interventions organised by Música en Vena, the association's director at the time, Juan Alberto García de Cubas, now president of Cultura en Vena, initiated a research project to find scientific evidence of those effects. And so, in 2016, the MIR Project was born: in Spanish, the programme is called *Músicos Internos Residentes*, a play on the better-known meaning of the MIR acronym—*Médicos Internos Residentes*, doctors who are completing their specialty training—meant to highlight the goal of making professional musicians part of the regular hospital staff.

The MIR Project aims to clinically prove that music has a positive impact on patient health, using young unemployed musicians to do so.

"We had organised hundreds of concerts, worked with thousands of musicians, and benefited many more patients who had been transformed by the power of music. That's why we decided, via the Música en Vena association, to undertake seven unprecedented clinical studies with the fundamental cooperation of Hospital 12 de Octubre, after getting approval from the hospital's Ethics Committee for Clinical Research," says Juan Alberto García de Cubas, who continues to spearhead the MIR Project from his new position at Fundación Cultura en Vena.

The MIR Project was designed to have a triple impact:

- Hospital humanisation: improve clinical protocols through the experience of live music offered by a first-class professional musician.
- Clinical research: participate in the search for scientific evidence of how music benefits people's health.
- Musician employability: create new circuits that offer innovative career opportunities for young unemployed musicians.

Within Cultura en Vena's general aim of implementing artistic practices in hospital settings, the MIR Project has the more specific goal of normalising the presence of musicians in clinical protocols, with scientific evidence to support and justify the need for live music in certain medical treatments.

Patients improve, doctors are surprised by the results, and musicians find an expressive new way to earn a living: a necessary project. Why is a Bach partita necessary in intensive care, a *soleá* in a neonatal ward, or a jazz standard in neurology?

#### What does the MIR Project hope to achieve?

The MIR Project has five main aims:

- To demonstrate the positive effects of music on hospitalised patients
- To prove that live music is an effective complementary therapy within the protocols for humanising healthcare settings
- To create job opportunities for young unemployed musicians
- To integrate music in the scientific method as a means of improving the experience of illness and quality of care perceived by patients, family members and healthcare workers
- To create new outlets for music, art and culture

In 2016, seven clinical research studies were begun in the Intensive Care, Neonatal, Rehabilitation, Haematology, Cardiology, Occupational Medicine and Neurology departments at Hospital Universitario 12 de Octubre in Madrid, after being approved by the hospital's Ethics Committee for Clinical Research. To this end, 46 Musicians In Residence were hired for a three-year period.

In the following pages, we will see how the research was carried out and how the same model could be adopted by other hospitals in Spain.

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# Methodology

By combining Música en Vena association's years of past experience organising mini concerts in hospitals with scientific research protocols, we designed a working methodology that basically consists of 10 key steps:

## 1

Create a multidisciplinary advisory board comprising musicians, doctors and music therapists, and a general project management and coordination team

## 2

Post a job offer aimed at professional (or end-of-studies) musicians in the predetermined musical genres.

## 3

Evaluate and select candidates in auditions and interviews supervised by the Advisory Board

## 4

Carefully select the musical repertoire, curated by the Advisory Board in collaboration with the chosen musicians

## 5

Train and inform healthcare personnel.

## 6

Define the care protocol, i.e., the musician's role in the healthcare setting (rules, norms and ethical principles).

## 7

Define the music intervention protocol: phases (beginning, middle, end), methodological bases, interactions with patients and family members, data collection.

## 8

Supervise the first interventions, accompanying MIRs at their "hospital debut"

## 9

Measure impact using our MIR matrix; measure qualitative and quantitative data.

### 10

Analyse and evaluate..

THE MIR PROJECT → METHODOLOGY

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The MIR Project methodology, with all its merits and shortcomings, aspires to set an example that will encourage others to replicate and perfect the experience.

## 1. The Advisory Board

In order to guarantee rigorous standards in every phase of the project, <mark>it is essential to create an Advisory Board</mark> of professionals from different fields. This board must include:

- One or more highly skilled and widely renowned professional musicians
- One or more healthcare professionals, preferably with a predilection for the arts and, consequently, this project
- One or more music therapists, preferably with extensive hospital experience and an open mind regarding the potential therapeutic uses of music
- One or more clinical psychologists, whose expertise is particularly valuable for conducting personal interviews of MIR candidates

Among other things, the Advisory Board is responsible for selecting the MIRs, choosing the most suitable repertoire, monitoring music interventions to see that they are conducted successfully and, ultimately, making sure that everyone involved (patients, relatives, hospital staff and MIRs) is getting the most they can out of the project. The Advisory Board should meet periodically (at least once a month) to discuss any necessary improvements.

In the MIR Project carried out by Música en Vena, which we hope will inspire other hospitals to include MIRs on their staff, the Advisory Board members were:

- Marta Espinós: pianist and musical curator
- Yerko Ivánovic: UCM medical school graduate, specialist in physical medicine, rehabilitation and neurology, pianist and composer
- Belinda Sánchez Mozo: pianist with a bachelor's degree in piano and chamber music and a master's in music therapy
- José Luis Temes: orchestra conductor and winner of the National Music Prize
- Ana María Díaz-Oliver: clinical psychologist and Head of Corporate Social Responsibility at Hospital Universitario 12 de Octubre
- Cristina Ferriz: pianist and educator

**THE VOICE OF EXPERIENCE!** It is also essential to have someone on board who can coordinate and plan the meetings, issue the call for applicants, process applications, schedule candidate interviews and auditions, etc. A person with these kinds of clerical and management skills is vital to the project's success.

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In addition to artistic and professional excellence, Musicians In Residence must possess personal qualities such as empathy, flexibility and the ability to adapt to difficult situations, all of which are essential in a hospital setting



## 2. The job offer

In order to find the people best suited to work as Musicians In Residence at a hospital, after forming the Advisory Board, the next step is to post a public job offer aimed at professional musicians, preferably ones in the early stages of their career, as they are more likely to face unemployment or job insecurity. Musicians on the verge of completing their education are also eligible.

Finding the right people: Any job offer to find MIR candidates should include the following information<sup>25</sup>

Who are we? Where are we? Information about the project organisers and the hospital where it will be carried out

What do we hope to achieve with this project? Project aims: live bedside music interventions

Who are we looking for?

- MIR tasks and responsibilities
- Musical needs (soloists or duos, type of instrument, style of music)
- Requirements (availability, education/training)
- Other factors (unemployed status, music therapy studies, experience with social projects, etc.)

What are we offering? Characteristics of the job position:

- Contract term
- Type of contract
- Total worked hours (if applicable)
- Total weekly hours
- Pay: specify weekday, weekend and holiday pay if applicable

What do applicants need to submit, how and by when? Contact details and proper channel for submitting applications, indicating what must be sent (CV, artistic portfolio, cover letter, links to recent jobs, etc.) and the deadline for sending it. This offer can be posted on the website of the organisation that will carry out the MIR Project, LinkedIn or other job search portals.

**THE VOICE OF EXPERIENCE!** To make sure the job offer is widely circulated, we recommend contacting:

- Institutions: municipal arts councils, music schools and conservatories, associations of professional musicians, symphony orchestras, groups, ensembles, etc.

- Social enterprises: non-profit organisations involved in music, healthcare or social outreach initiatives

- Media: general, arts, specialised (music, medicine, etc.)



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25. See the sample call for applicants used for the MIR Project in the appendices.

### 3. MIR selection

#### **Requirements**

MIRs need to have a certain set of artistic and personal qualities. The selection process must evaluate a wide range of factors, from professional skills to the psychological ability to adapt (emotionally and professionally) to complex situations like those often encountered in healthcare facilities.

- Professional skills: an MIR is expected to meet high artistic, musical and technical standards in performance, communication, stage presence, etc.
- Psychological adaptability: each candidate is personally and individually evaluated to determine their degree of empathy, sensitivity, capacity for non-musical interaction with patients (whenever possible) and their companions, ability to adapt to unexpected hospital situations, resilience, and ability to assimilate and respond to emotionally challenging circumstances.

#### The selection process

The selection process is divided into three stages: pre-selection based on CV, interview and audition. The Advisory Board is entirely responsible for all three stages.

- Pre-selection based on CV: once the application deadline has passed, the board will make a preliminary selection of candidates based on their education and work experience.
- Interview: pre-selected candidates will be given a personal interview to evaluate their merits and, most importantly, assess certain factors (motivation, attitude, eye contact, expression, language, posture, etc.) that reveal their psychological aptitude.
- Audition: The selected candidates will demonstrate their musical skill in auditions.

**THE VOICE OF EXPERIENCE!** To avoid unnecessary commutes or travel, we advise screening candidates in a preliminary video interview. The face-to-face interview and audition can later be scheduled for the same day. We recommend booking at least 30 minutes for each person. During our auditions, we found it very useful to create role-playing scenarios, where the candidates had to cope with situations which, though fictional, were based on the very real circumstances they would encounter in hospitals. "Imagine that I'm a patient recovering from a serious heart attack. Yester-day my health was fine, and today I'm in fear of my life. Being admitted to hospital has sent my stress and anxiety levels through the roof... and now you walk into my room."

## 4. The repertoire

After selecting the MIRs, the Advisory Board must analyse their repertoires. Each piece will be a soothing balm for patients and family members, a small dose of comfort and relief during their hospital stay. For this reason, every little "music phial" must be chosen with the utmost care, thinking of the patient's welfare. The sonority, rhythm and harmony of each tune is assessed to ensure that listening ears will benefit from

the music as much as possible. After painstaking evaluation, the MIR Project came up with a list of 280 hand-picked musical pieces in a wide variety of genres, from tango and flamenco to jazz and classical music. Our repertoire included compositions by Beethoven, Led Zeppelin, Paco de Lucía and Caetano Veloso.<sup>26</sup>

#### Selection criteria

Instruments, both monophonic and polyphonic, were selected based on criteria such as suitability to a hospital setting, medical department and patient type, the acoustics of a particular space, etc. We also assessed the following specific instrumental parameters:

Timbre: physical vibrations were paramount, so we only used 100% acoustic instruments, with no electronic components or amplifiers. We also gave priority to chordophones (plucked, bowed or strummed) and aerophones (human voices, woodwinds). For now, the project does not use membranophones or idiophones (percussion instruments).

**Range:** we gave priority to instruments whose range (detectable frequency spectrum) falls within that of the human voice, specifically adapted to the department or ward where they were to be played. In Neonatal Care, for instance, the repertoire was based largely on vocal pieces performed by women's voices.

Volume: we prioritised instruments whose average volume and sound power fall within the range of recommended decibels for each hospital area and medical specialty.

**THE VOICE OF EXPERIENCE!** Even with a more or less fixed and stable repertoire, it's important to stay flexible, open to improvisation and requests from patients or their relatives. A musician's ability to do so will vary depending on their background —classical musicians, for instance, tend not to improvise—but they should always be prepared to make some last-minute changes, because the same pieces or songs will not always have the same effect on everyone: personal experience, cultural bias and even generational bias affect how a person receives and internally processes the music they hear.

## 5. Training and informing healthcare personnel

#### Why is this essential?

Getting healthcare workers involved is the next step on the road to success with the MIR Project. MIRs and healthcare professionals have many values in common: passion for what they do, the pursuit of excellence, empathy, sensitivity, dedication... They should all feel like part of the same team, using different skills with a shared human concern to achieve the same goal: the ultimate well-being of patients and their family members.

#### **Responsibilities of healthcare personnel**

No one knows the specific characteristics of a hospital ward better than the healthcare professionals who keep it running. We therefore recommend choosing at least one or two people from every department to be "MIR coordinators", in charge of facilitating communication between the musicians and other ward personnel.

26. See the MIR Project repertory appendix.

THE MIR PROJECT → METHODOLOGY

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Specifically, these coordinators must:

Explain to the MIRs what they need to consider when working in that particular area (for example, if they need to wear a cap, how they should address the patients depending on their condition, etc.).

Inform the rest of the ward personnel about the MIR Project: when the music interventions will take place, who will be giving them, how long they will last, in what room or area the music will be offered... In other words, MIR coordinators need to tell their colleagues what to expect from the musicians.

**THE VOICE OF EXPERIENCE!** Something we found effective was surveying healthcare workers throughout the project to get their opinions. The surveys told us how the staff felt after the live music performances, whether they believed the music helped to improve their work environment, if they thought it helped patients to feel better, and if they would be interested in receiving specialised music-in-health training, among other questions.<sup>27</sup>

## 6. The care protocol

#### The musician's role in the healthcare setting

Training and preparing musicians before they enter a hospital is another pillar of the MIR methodology. This entails telling MIRs everything they need to know about what they will encounter, possible reactions from hospital staff, patients and relatives, etc. In the case of the project at Hospital Universitario 12 de Octubre, this preparatory MIR training was provided by the Advisory Board and the team of experts from Música en Vena, who had organised over 2,400 mini concerts in hospitals with the participation of 6,000 musicians.

The aim is to create the optimal conditions for giving a live performance in a hospital, which bears little resemblance to the stages on which musicians are used to performing. It is essential for MIRs to understand that playing on a stage and playing in a hospital room are two very different things:

#### Playing on a stage or in an auditorium

- The musician is the centre of attention, the priority
- The audience is silent
- The lighting is designed to help the musician concentrate
- The audience came specifically to hear a concert
- Time "stands still" so the music can be fully enjoyed

- The musician is focused on their performance and does not necessarily heed the audience's reactions

#### Playing in a hospital room or bay

- The patient is the centre of attention, the priority. The musician is simply another actor on stage, and not the most important one
- Total silence is impossible. Beeping devices and machines, voices and interruptions are to be expected

27. See the appendix with a sample survey for healthcare personnel.

THE MIR PROJECT → METHODOLOGY

Now that we have an enormous body of scientific literature confirming their effectiveness, the time has come to implement therapeutic music-based interventions in the Spanish healthcare system. The MIR Project is willing and eager to share its experience with other hospitals interested in applying it

Raquel Ovejas (violin), Musician In Residence



- The lighting is designed to facilitate patient care
- The audience is "surprised" by this musical gift, which they did not choose and may not actively listen to
- Hospital business must continue as usual, and the musician should not interfere
- The musician must be attentive to the reactions of the patient for whom they are playing and open to possible suggestions from healthcare workers

**THE VOICE OF EXPERIENCE!** Some MIRs share their thoughts: "I never would have imagined myself playing by a hospital bed, for a patient, in such an intimate way. It's an amazing personal and professional opportunity. Giving the best of yourself as a person and as a musician. Combining both to turn music into a caress, a hand tenderly reaching out to the patient, is like saying, 'I'm here, I'm with you, and we're going to take care of you as best we can.'" Elisa Ortiz, cellist

"Patients also need to speak the language of emotions, not just receive chemical medication. It's about playing from the heart to connect with that person at that moment in time." Marta Mansilla, flautist

## 7. The music intervention protocol

This is the crux of an MIR's daily job. The following information was compiled in a document that served as a guide for MIRs who were just getting started in the clinical study. These instructions helped them to organise their work in stages as described below:

#### **Before measurement**

- 1. Determine the musical parameters of the repertory:
- Fixed repertoire: Pieces selected by the artist and the Advisory Board
- Flexible repertoire: Pieces chosen based on the tastes, musical background and social context of the patient, as well as the active observation of the musician

In both cases, the musician must adapt the dynamics, rhythm, melody and harmony of each piece to the patient's physiological and emotional circumstances, always under medical supervision. Whenever possible, music should be played by heart so that the musician can actively observe the patient's reaction instead of reading a score.

#### 2. Know the patient's condition:

- The musician should ask medical personnel for information on the patient's condition prior to the intervention: baseline status, level of sedation and degree of consciousness, reduced sedation, weaning, medication, anxiety, acceptance of hospitalisation, etc.
- The musician should have a record of past music sessions (number, length and what happened during the concerts) received by the patient
- 3. Connect with healthcare personnel:
- Small things like saying hello and goodbye, introducing yourself to the nurses or other co-workers, and asking about their own tastes in music when performing a piece can establish rapport and create a positive work environment for everyone.

#### Upon arrival at the hospital

When they enter the hospital, the musician must:

- Wash their hands with hydro-alcoholic solution, before and after being with a patient, and don their work coat<sup>28</sup>
- Ask for the patient's bed number and review their session history
- Speak with healthcare personnel to verify that the measurement session can proceed
- Set up the instrument and prepare the repertoire sheets, which will be filled out during the measurement session<sup>29</sup>

#### **During measurement**

During the measurement session, the musician needs to:

Establish a bond with the patient and their family. Providing an introduction and information at the beginning of the performance is very important for the patient. Before each session the musician must introduce themselves, stating their name, their instrument and the piece/s they will perform, even if the patient is unconscious (for example, "Hi, my name is Maria and I play the violin; we're going to begin the music intervention now, I hope you like it."). If the patient is conscious, it is important for them to know that they will be receiving a musical stimulus. If the patient cannot give information about their tastes in music, the musician should try to speak with their family members. Asking relatives about their musical background, whenever possible, can reveal important information that should be recorded and remembered when preparing future music sessions.

#### Perform and make decisions in light of:

- The patient's physical and emotional state
- Prior comments from medical staff
- Comments from relatives
- Conclude the interaction with the patient, relatives and healthcare workers. Speak with healthcare personnel to end the measurement session. Have the patient, family members and healthcare workers fill out the questionnaire. Remind the patient that a colleague will be back the next day to perform for them again. Say goodbye to the family.

**THE VOICE OF EXPERIENCE!** This protocol can be turned into a practical checklist which MIRs can take to work each day to remember all the steps they need to follow in every intervention.

### 8. Supervision and accompaniment

In our increasingly aged society, we are now keenly aware of the importance of "caring for carers", especially in domestic and family care situations. Yet all too often, we think that high stress levels are par for the course among the professional caregivers who tend to our health in hospitals. "It comes with the job, they're doing what they love..." The pandemic taught us another valuable lesson: no one is indestructible, and we all need support and companionship sometimes.



We recommend using standard white coats with the logo of the organisation running the MIR Project.
 See sample sheet in the appendices.

When professional musicians join the MIR programme and first begin to work in a healthcare environment, it is especially important to monitor their frame of mind. For this reason, we recommend accompanying MIRs at their "hospital debut" and closely supervising their initial interventions.

#### Aims:

- To facilitate the adaptation process, for both the musician and participating hospital staff
- To promote observation: know how musicians are feeling, determine whether they need psychological assistance, etc.

How? Through control and monitoring sessions:

- Meetings between MIRs and MIR coordinators
- Meetings between the Advisory Board and MIRs
- Other control and monitoring measures to help participants continue learning and improving

## 9. The MIR matrix for measuring impact

In order to measure the impact of the MIR Project's music-based interventions, we devised a chart with a series of qualitative and quantitative indicators which we call "the MIR matrix".<sup>30</sup> Later on, analysing those data will let us compile information we can use to generate evidence, detect errors and keep improving the process.

Impact indicators measure the effects that the MIR Project interventions have on people. Those effects or impacts are grouped according to the project's various stakeholders: patients, family members, healthcare workers, musicians, hospital, neighbourhood, medical students, volunteers, government institutions (city councils, regional ministry of health, etc.) and others (music schools, private and public organisations, etc.).

After each session, the MIRs give a specific survey to patients, another to their relatives, and another to healthcare personnel.<sup>31</sup> Analysing their answers to the questions on those forms allows us to determine the project's level of impact.

#### Impact on patients

- How do you feel after hearing the live music?
- Has live music improved your hospital stay?
- Do you feel that live music lessened your pain?
- Do you feel that music reduced background noise in the room?
- Would you like to have live music as a complementary therapy along with your other treatments?

Selected impact indicators:

- % of people who say they feel better after the music interventions
- % decrease in the stress level of patients who participated in the project
- % of patients whose pain lessened
- % reduction in background noise in the hospital after the musical experience
- % of patients who see music as a valid complementary therapy

30. See the complete impact matrix in the appendices.

31. See the surveys for patients, relatives and healthcare workers in the appendices.

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#### Impact on companions

- How do you feel after hearing the live music?
- Does live music help to take your mind off bigger concerns?
- Do you think live music improves the hospital stay for patients and their companions?
- Do you feel that music reduced background noise in the room?
- Would you accept music as a complementary therapy to other treatments?

#### Selected impact indicators:

- % of people who say they feel better after the music interventions
- % of relatives who say they feel more positive after the concerts
- % of relatives who feel more satisfied/looked after
- % reduction in background noise in the hospital after the musical experience
- % of relatives who want music as a complementary therapy

#### Impact on healthcare professionals

- How do you feel after hearing the live music?
- Does live music improve the work environment?
- Do you think live music helps patients feel better?
- Would you use live music as a complementary resource in your work?
- Do you feel that music reduced background noise in the room?
- Would you like to receive specialised music-in-health training?

Selected impact indicators:

- % of healthcare workers who say they feel more relaxed after hearing the music
- % of staff who feel the hospital environment improves with music
- % of healthcare workers who believe music helps
- % of healthcare workers who would use music as a complement
- % reduction in background noise in the hospital after the musical experience
- % of staff interested in specialising in music in health

#### Impact on musicians

- In how many music interventions have you participated?
- Are you satisfied with your job as an MIR?
- Would you like to specialise in music in health?
- How do you feel today?
- Do you think this experience will open more doors for you in the job market?

#### Selected impact indicators:

- No. of concerts per MIR
- % of satisfaction among MIRs
- % of musicians who want to receive further music-in-health training
- % of musicians who feel better after the hospital experience
- % perceived employability

Before and after the MIR experience:

- No. of applications submitted
- No. of music schools and conservatories that presented candidates
- No. of MIRs who found work within 3 months after the project ended

THE MIR PROJECT → METHODOLOGY

If we want music to have a constant presence in the healthcare industry, public institutions must work side-by-side with private organisations to create the necessary legislative and technical frameworks

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#### Impact on the community

In addition to patients, families, healthcare workers and the MIRs, the MIR Project also has an impact on the entire hospital and the surrounding community: the neighbourhood, medical students, musicians who aspire to become MIRs, volunteers, local councils, regional health authorities, financial backers...

The MIR matrix considers all these stakeholders and the MIR Project's potential impact on them. Measuring the social impact of our project will allow us to keep improving it.

## 10. Analysis and evaluation

The final phase of the MIR methodology is the scientific backbone of the project: compiling the data collected in the study and analysing and evaluating it to draw conclusions.

This can be done in different ways, depending on the hospital department where the project is implemented, the aims and the nature of the patients and physical spaces. A subsequent section of this paper explains how the MIR Project was carried out in 7 clinical studies at Hospital Universitario 12 de Octubre in Madrid between 2016 and 2019.

However, all research conducted within the framework of the MIR Project must, at the very least, define the following:

- Research aims
- Materials and methods to be used (sample of the hospitalised population, types of interventions, variables, statistical analysis, etc.)
- Research team and partner
- Conclusions

The data collected using the MIR matrix must be considered and included as a fundamental part of the overall results everywhere the project is implemented, as this information is what will give us a comprehensive understanding of how it is qualitatively perceived by all participants, beyond cut-and-dried measurements.

CULTURA EN VENA WHITE PAPER ON MUSICIANS IN RESIDENCE

Juan Sánchez (guitar), Musician In Residence

Isabel Rodríguez (flute), Musician In Residence



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CULTURA EN VENA WHITE PAPER ON MUSICIANS IN RESIDENCE



The studies began in 2016 and concluded in June 2019. They were led by Juan Alberto García de Cubas within the context of the Música en Vena association, and were designed and carried out by different principal investigators at Hospital 12 de Octubre. The clinical studies employed a case study and control group approach. Since then, the data have been used and results analysed for their presentation and publication by Cultura en Vena as from June 2022. The foundation will then roll out and implement the Musicians In Residence (MIR) project in hospitals.

The completed surveys reveal very high levels of satisfaction among patients, relatives and healthcare personnel with respect to the presence of live music in all the units where the studies were carried out. In all cases, the average levels of acceptance and desire for live music to continue within the different departments are close to 90%.

The research project was made possible thanks to financial support from Fundación Daniel y Nina Carasso, the Edmond de Rothschild Foundations and Fundación Reale Seguros, with the collaboration of Fundación SGAE (Sociedad General de Autores y Editores), Sociedad de Artistas Intérpretes o Ejecutantes de España (AIE), and Hinves Pianos.

## Intensive medicine

### STUDY DETAILS

**WHAT** Live musical performances as a non-pharmacological intervention in the therapy of mechanically ventilated patients admitted to the ICU.

**WHO** Principal investigator: Dr Juan Carlos Montejo, head of the Intensive Care Unit at Hospital 12 de Octubre.

**WHY** The study sought to find evidence on the effects of regular and ongoing live musical performances in mechanically ventilated patients admitted to the ICU and verify whether this may be an effective non-pharmacological intervention in therapy.

**HOW** This was achieved by measuring and observing different critical vital signs of patients that were already being routinely monitored in the ICU, such as blood pressure, brain activity through basic electroencephalography, the amount of sedation/analgesia required and, using validated scales, agitation, confusion, and other expected complications in patients in this setting. Thus, the study aimed to verify whether the intervention is valid at the time of exposure to music and to explore the cumulative effectiveness of the presence of live music.

WHEN The study period ran from 1 February 2017 to 28 February 2020.

#### CHARACTERISTICS OF THE SERVICE

#### Situation of the patients

Intensive care units are unique environments where patients are generally intubated, connected to mechanical ventilation, receive sedation/analgesia and require continuous haemodynamic monitoring, multiple vascular devices, nasogastric tubes, bladder tubes, with the application of renal clearance techniques, external temperature control systems, etc. Mechanically ventilated patients present high levels of stress and anxiety. This is largely due to a variety of factors, including shortness of breath, frequent aspiration of secretions, inability to speak, altered circadian rhythms, high noise levels, uncertainty, discomfort, isolation and fear.

"Incorporating live music into the daily routine of our units is actually not very easy", says Dr Carlos Montejo. "ICUs are hives of continuous activity, where patients come and go, techniques and procedures that have to be performed... and it's very difficult to find a peaceful place for the musician to give a good performance that can be

SEVEN CLINICAL STUDIES → INTENSIVE MEDICINE

adequately transmitted to the patient. Even so, it can be done, provided we're aware of these problems—it can be done". Dr Juan Carlos Montejo.

#### <u>The space</u>

The MIR Project was carried out in three different areas within the Intensive Care Unit: the Multi-purpose ICU, the Cardiology ICU and the Trauma and Emergency ICU. The Cardiological Care ICU has 13 beds where medically-treated heart failure patients and post-cardiac surgery patients are admitted. The Trauma and Emergency ICU has 8 beds where patients with traumatic pathologies are admitted. The Multi-purpose ICU has 14 acute care beds and 3 intermediate care beds.

### **OBJECTIVES**

#### **Primary objective**

Analyse whether the implementation of live musical performances can be an effective non-pharmacological intervention in the therapy of mechanically ventilated patients admitted to an Intensive Care Unit (ICU) at a high complexity hospital.

#### Secondary objectives

- Evaluate the effects of live musical performance on anxiety and pain in patients on invasive mechanical ventilation.
- Assess whether the early implementation of live musical performances in mechanically ventilated patients reduces mechanical ventilation time.
- Analyse the duration of the effect of live musical performances in mechanically ventilated patients.
- Evaluate whether live musical performance has a cumulative effect in mechanically ventilated patients.
- Analyse whether the implementation of live musical performances in mechanically ventilated patients admitted to an ICU at a high complexity hospital:
  - Reduces sedation/analgesia requirements.
  - Improves heart rate.
  - Improves systolic blood pressure.
  - Improves diastolic blood pressure.
  - Improves mean blood pressure.
- Analyse whether the time of day when the live music performance is given bears an influence in these patients.
- Evaluate whether there are any differences depending on the repertoire chosen for the live music performances.

#### MATERIAL AND METHODS

A prospective and randomised study was carried out in the three Intensive Care Units of the Intensive Medicine Department at Hospital Universitario 12 de Octubre.

## "More than 78% of healthcare professionals in my unit consider that music is a tool that should form part of hospital treatment" Dr Juan Carlos Montejo

Head of the Intensive Medicine Department at Hospital 12 de Octubre

#### Sample

The sample included all adult patients admitted to the ICU with mechanical ventilation requirements and in whom the unit's sedation/analgesia protocol was implemented, after their legal representatives had signed the informed consent forms for them to participate in the study.

Dying patients admitted to the ICU who are expected to survive less than 48 hours were excluded, as well as those who were not on mechanical ventilation and those whose legal representative refused to sign the informed consent form.

The patients were distributed into three groups:

- Group A: intervention group in which live musical performances were applied from day one of mechanical ventilation.
- Group B: intervention group in which live musical performances were applied from day three of mechanical ventilation.
- Group C: control group undergoing standard treatment.

Randomisation was performed on a 1:1:1 basis. The controls were carried out during the summer. A total of 232 patients participated in the study, of whom 149 were assigned to the intervention group and 83 to the control group. The characteristics of the patients were similar in both groups and presented no significant differences, thus enabling their comparison.

#### Type of intervention

Live music was performed every day of the week by the MIRs until mechanical ventilation was withdrawn. The musical performance began on day one or day three of mechanical ventilation, depending on the group. Daily 30-minute sessions were held from 1:00 p.m. to 1:30 p.m., allowing families to participate.

The sedation/analgesia protocol of the Intensive Medicine Department was applied to all patients on mechanical ventilation. The monitoring scales established in the protocol were followed to control sedation/analgesia:

- Behavioural Indicators of Pain Scale ("Escala de Conductas Indicadoras de Dolor"—"ESCID"—in Spanish).
- RASS (Richmond Agitation Sedation Scale).
- Monitoring of sedation using the Bispectral Index (BIS).
- Monitoring of brain activity by means of EEG (Masimo).

ST N E	- Delirium monitoring: Confusion Assessment Method scale adapted to the ICU
E MEDIC	(CAM-ICU).
IN TE NSIZ	The SoundEar II noise awareness device and calorimetry were available in the unit.
	Variables analysed
AL ST	- sex
	- age
O Z W	– reason for ICU admission
s N	– ICU admission severity scales [SAPS II / APACHE II]
m	– GCS upon admission
	– airway type
	– ventilation modality
	– mechanical ventilation time
	– extubation time
	– type of sedation/analgesia in perfusion
	- daily dose of sedation/analgesia
	– sedation/analgesia time
	<ul> <li>requirements for extra sedation/analgesia boluses</li> </ul>
	– total extra bolus dose
	<ul> <li>adverse effects related to sedation/analgesia</li> </ul>
	<ul> <li>daily sedation level: sedation quality and sedation quality scores.</li> </ul>
	<ul> <li>relaxation requirements: daily dose of relaxation and hours of relaxation</li> </ul>
	The following variables were analysed:
	– at basal time
	<ul> <li>at the end of the live musical performance sessions</li> </ul>
	– after 30 minutes
	– after 60 minutes
	<ul> <li>8 h after the end of the intervention</li> </ul>
	The indicators:
	– monitoring scales
	- total and extra sedation/analgesia requirements
U O Z	– physiological vital signs: HR; RR; systolic BP; diastolic BP; mean BP
SIDE	<ul> <li>vasoactive drug requirements</li> </ul>
≅ Z_	<ul> <li>anti-hypertensive requirements</li> </ul>
S Z ₹	– calorimetry
	<ul> <li>blood sugar control and insulin requirements</li> </ul>
N NO N	– ambient noise level
PAPE	Cortisol, IL-6 and GH levels were measured at 9 am (basal), prior to the implementation
н Н	of the live musical performances, and 30 minutes after the end of the intervention on
>	days 1, 3, 7 and 10. In addition, ICU stay, hospital stay, ICU mortality, hospital mortality,
∢ Z ⊒	and quality of life at hospital discharge were analysed. A satisfaction and quality of life
A EN	survey was conducted upon ICU discharge and hospital discharge.
JLTUF	Data were gathered using a form containing the study variables and was completed
Ō	blindly (the person responsible for completing the data did not know the group to
	which each patient belonged). This person did not belong to the research team to avoid
$\bigcirc$ $\land$ $\land$	researcher bias during the collection of the data to be studied.
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#### Statistical analysis

The statistical analysis included descriptive statistics and statistical inference between the different variables. The distribution of the samples was contrasted using the Shap-iro-Wilk test of significance and their normality or non-normality was established. Statistical comparisons were performed using the  $\chi^2$  test and Fisher's test for categorical variables, parametric tests (Student's t-test, Student's t-test for paired data and ANOVA for related samples) and non-parametric tests for those variables that did not follow a Gaussian distribution (Wilcoxon and Friedman). A p value less than 0.05 was considered statistically significant. Data were collected and analysed using SPSS (Statistical Package for the Social Sciences), version 19.0. Additional tests not usually performed in patients admitted to the ICU were conducted to determine the levels of cortisol, IL-6 and GH.

#### Research team

The principal investigators in the project were: Dr Juan Carlos Montejo González and Dr Mercedes Catalán González.

Collaborating investigators:

- In the Multi-purpose ICU: Dr Noelia Lázaro Martín and Dr Pablo Pagliarani.
- In the Cardiology ICU: Dr Emilio Renes and Dr Renata García Gigorro.
- In the Trauma and Emergency ICU: Dr Ara Murillo and Dr Marina Sánchez Pozo.

All Intensive Medicine Department staff collaborated in the project.

#### RESULTS

During the entire period analysed, the musicians performed 1,221 musical works [496 (40.6%) in the Cardiology ICU; 676 (55.4%) in the Multi-purpose ICU; and 49 (4%) in the Trauma and Emergency ICU]. It was calculated that an average of 5.98 musical works were performed per musical session [6.12 musical works per musical session in the Cardiology ICU; 5.98 in the Multi-purpose ICU and 4.9 in the Trauma and Emergency ICU].

Eight (8) instruments were used in the musical sessions with eleven (11) combinations of instruments: Clarinet+Guitar; Guitar; Guitar+Flute/Guitar; Guitar+Flute/ Voice; Guitar+Voice; Guitar+Voice/Guitar; Piano; Viola+Cello; Voice; Voice+Guitar; and Voice+Piano.

The most frequently-selected composers were: Miguel Ruiz, on 76 occasions; Francisco García Lorca and Paco Soto (66 occasions respectively); Alberto Viña, on 61 occasions; Antonio Carlos Jobim, 52; Carlos Gardel, 34; Andrea Falconieri, 30; Manuel de Falla, 27; Nicola Piovani and WA Mozart, on 26 occasions respectively.

#### CONCLUSIONS

At the time of this publication, the data gathered were still being analysed for their detailed study. So far, the interim analyses have not revealed any statistical significance in the objectives set out in the project. The final results and detailed analysis will be the subject of a doctoral thesis supervised by the principal investigators.

"This is a single-centre clinical study in which music-based interventions were introduced in the form of live musical performances in the ICU", explains Dr Juan Carlos Montejo, the principal investigator.

## "We hope this project serves as a starting point for the regular presence of music in our ICUs"

Dr Juan Carlos Montejo

Rodrigo Herrero (clarinet) and Miguel Sempere (guitar). Musicians In Residence



"For a period of 3 years, the study enabled the inclusion of music to be considered as another element of the daily treatment of patients in a very high-tech part of the hospital, dominated by the sound of monitors, respirators, haemofilters, ECMOs, etc.

All mechanically ventilated patients who were expected to be on mechanical ventilation for more than 48 hours were included, without differentiating between pathologies, in order to assess the overall effect. For this reason, it is difficult to know which patients benefit most from music overall, although subgroups of patients can be selected during the statistical analysis of the data. In this way, new studies can be designed in the future to focus on more specific pathologies and to evaluate the effect of music on a more individual basis.

We have rigorously focused on the recording of objective data without obtaining statistical significance. Future studies can probably also include variables in which the experiences of patients and their families can provide information to complement physiological data.

The experience of having Musicians In Residence perform music in our ICUs, beyond the scientific data studied here, has been very rewarding for all the professionals, patients and families. In some cases we noted that patient awakening was calmer when it coincided with the music and some patients even remembered the music they were listening to; in other cases, some patients did not want to listen to music when they woke up. Even in situations in which the family was going through the final process of their relative's life, listening to music at that moment provided them with a comforting environment, a sense of an inner peace which they appreciated.

We hope this project will serve as a starting point for the regular presence of music in our ICUs."

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## Neonatology

## **STUDY DETAILS**

**WHAT** Live music can favourably influence the development of premature babies in neonatal intensive care units.

**WHO** Principal investigator, Dr Carmen Pallás, Head of the Neonatology Department at Hospital 12 de Octubre

**WHY** It is known that the lack of adequate auditory stimuli during neonatal admission can interfere with the development of the baby. Some studies recommend parents read to their babies and artistic exercises with music. This study was fuelled by the belief that live music can play an important role in helping the development of preterm infants in neonatal intensive care units.

**HOW** The NIPE (Newborn Infant Parasympathetic Evaluation) method was used to assess the comfort levels of infants. This is a non-invasive method that measures variations in heart rate and this measurement can be used to establish comfort levels in newborns. The conclusions drawn so far indicate that live music is viable in and well tolerated by premature infants and that it could be a useful measure to improve the development of newborns admitted to hospitals.

**WHEN** Three one-hour interventions per week during the morning shift, from 1 March 2017 to 28 February 2018.

#### CHARACTERISTICS OF THE SERVICE

#### Situation of the patients

At neonatal units such as the one in Hospital 12 de Octubre (complexity level iiiC), it is common for there to be, on the one hand, very immature and very premature infants admitted, many weighing less than 1,000 g and even some less than 500g, and, on the other hand, children with malformations, such as congenital heart disease, digestive malformations or other types of malformations requiring surgery in the first days of life, intensive care support, etc. This is a group of extremely fragile patients.



3.2

#### The space

"The problem we faced then was that the unit had a common box-type design and if there was a very unstable or very seriously ill child, or a child who were dying, you could not separate them and that sometimes made the dynamics a little difficult. We have now changed the design into 19 intensive care posts, of which 11 are single rooms, thus allowing us to carry out much more selective interventions, focused on a specific child and family. In spite of all these limitations, Dr Carmen Pallás, head of the Neonatology Department, considers that the experience was very good.

#### **OBJECTIVES**

To compare the degree of comfort of premature infants when exposed to live music while in kangaroo care with the degree of comfort when exposed to music while in the incubator.

#### MATERIAL AND METHODS

#### **Study population**

Seventy-two (72) music sessions were recorded in 29 preterm infants with a mean gestational age of  $28^{+5}$  weeks ( $23^{+6} - 34^{+0}$ ) and a mean corrected gestational age at the start of the music session of 30 weeks ( $24^{+6} - 41^{+4}$ ) with a mean birth weight of 1,112 g (455 g - 2,760 g). The study included 28 live music sessions while the child was in an incubator and 44 while in kangaroo care.

#### Intervention

The music sessions were given by musicians in the unit and included different rhythms and were not limited to lullables. The team comprised 2 musicians who played live music in the unit's boxes. Stable preterm infants whose parents were present at the live music sessions and consented to their participation were included in the study. NIPE recording started 10 minutes before the live music session and was maintained until 10 minutes after the live music session had ended.

#### **Research team**

- Principal investigator: Carmen Pallás Alonso.
- Collaborating investigators: María López Maestro, Juliana Acuña Muga, Esther Cabañes Alonso, Lidia García San José.

#### RESULTS

The group of children exposed to music while in the incubator had a mean pre-session NIPE value (NIPE PRE) of 55 (SD 15.4) and a mean post-session NIPE value (NIPE POST) of 53.1 (SD 11.3), with a mean difference of 1.8 (95% CI -1.8 5.5) (p 0.31). The kangaroo care group presented a recorded mean NIPE PRE value of 63.9 (SD 15.5), a mean NIPE POST of 64 (SD 14.4), with a mean difference of -0.045 (95% CI -4.027 3 .93) (p 0.98). Both NIPE PRE and POST scores were significantly higher in the kangaroo care group than in the incubator group (p = 0.02 and 0.001, respectively).

#### CONCLUSIONS

This study shows how exposure to live music is well tolerated, even by very premature babies, while in kangaroo care. The children maintained their degree of comfort in both the incubator and kangaroo care. As regards exposure to music, there is some concern regarding premature children's tolerance to music because this stimulus can

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"The parents cried several times with the music, and some mothers said the live music moment was the first time they'd been able to cry since their child was born. They were in such a state of shock they hadn't even cried, but the music brought tears to their eyes—tears they admitted were necessary"

Dr María Teresa Moral
Virginia González (voice). Musician In Residence

## "A baby hearing music becomes alert, and that alertness is not bad, it's good because it means the baby is focusing its attention" Dr Carmen Pallás

Head of the Neonatology Department at Hospital 12 de Octubre



sometimes cause a certain degree of stress. Our results are reassuring in this regard. Live music was not observed to increase the degree of comfort of the premature babies, but this is not the desired effect either. As mentioned previously, exposure to live music is one alternative for preventing sensorial hearing loss and it seems to be a safe method because it does not increase stress in the child. As expected, the kangaroo care infants were significantly more comfortable than the incubator infants both before and immediately after music exposure.

Live music will probably play an increasingly important role in our neonatal units. In the future, it may be a very useful tool for improving the development of hospitalised newborns.

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# Rehabilitation

## STUDY DETAILS

WHAT Relationship between live musical interventions and chronic pelvic pain.

WHO Physical Medicine and Rehabilitation Department led by Dr Jesús Vara.

**WHY** Acute pelvic pain is relatively easy to assess, diagnose and treat. However, diagnosis in patients with chronic pelvic pain is complex and often late, and they must be evaluated and treated in a multidisciplinary clinical unit. Given the complexity of these conditions, chronic pelvic pain patients (the majority are women) must be evaluated using a multidisciplinary approach, including an evaluation of their family and psychosocial environment in the anamnesis. The therapeutic approach must be based on all of the above, using all available treatment resources: conservative (rehabilitation, pharmacological and psychological therapy) and surgical approaches, in which laparoscopy is playing an increasingly important role, as the last option.

Chronic pelvic pain is a condition that is difficult to manage clinically and involves different pain production mechanisms, due to both the variety of anatomical structures involved and its chronic nature, without forgetting "pain memory" as the causal agent. Current therapeutic options do not offer definitive results for this syndrome; hence, this study proposes scientific evaluation of the efficacy of music therapy as part of the therapeutic approach and also to be able to assess quality of life after treatment.

No studies have yet been published on music therapy and chronic pelvic pain in the consulted literature (PubMed, EMBASE). The hypothesis in this study was that music therapy associated with rehabilitation can improve quality of life in patients with CPPS.

**HOW** The study analysed the effects of exposure to live music in chronic pelvic pain patients visiting the hospital on an outpatient basis. These patients regularly visit Hospital 12 de Octubre without being admitted to the centre. The treatment group received the rehabilitation intervention (massage therapy, kinesitherapy, TENS (transcutaneous electrical nerve stimulation), percutaneous neuromodulation of the posterior tibial tendon) and live music intervention. The applied procedures consisted of a clinical evaluation of pain, physical examination, measurement of physiological parameters, as well as an instrumental measurement based on validated scales.

#### CHARACTERISTICS OF THE SERVICE

#### Situation of the patients

These are patients who had been frequently visited by different specialists and had undergone multiple diagnostic tests without obtaining satisfactory results. Chronic pelvic pain syndrome (CPPS) is a pathology that occurs more frequently in women.

CPP can be defined as pain in the pelvic region, and may be associated with dyspareunia, vulvodynia and hypertonia of the pelvic floor muscles.

It can be of gynaecological (cyclical or non-cyclical), urological, gastrointestinal, musculature or psychiatric origin. The most frequent organic causes include: interstitial cystitis, endometriosis, pudendal nerve neuropathy, and myofascial pain syndromes. The most affected anatomical structures are the levator ani muscle (comprising 3 fascicles: puborectalis, pubococcygeus, and ileococcygeus), the internal obturator muscle, and the piriformis muscle, as well as the pudendal and obturator nerves. However, a number of patients present no clear etiology, and this may persist despite the treatment performed.

The diagnosis is fundamentally clinical. The most frequently used complementary tests in daily practice are laboratory tests, gynaecological and urinary tract ultrasound, pelvic MRI (mainly of the pelvic floor), and EMF.

Treatment depends on the aetiology of the pain, even if a single aetiological agent is not found in a not insignificant number of patients. Conservative treatment of CPPS includes pharmacological therapy (non-NSAIDs, tramadol, gabapentin/pregabalin, local diazepam) and rehabilitation therapy.

Since November 2015, the pelvic floor unit of the Rehabilitation Department has participated, together with other specialties, in the multidisciplinary evaluation of this syndrome, with a view to improving clinical-therapeutic approaches. The departments involved in the management of this pathology are, in addition to Rehabilitation, Gynaecology, Urology, Gastroenterology, Psychiatry and the Pain Unit.

Patients are referred to the rehabilitation department for evaluation, implementation of conservative treatment therapy and evolution control. They are referred following consultations at the Organic Gynaecology, Pelvic Floor Gynaecology, Urology and Digestive System departments and the Pain Unit.

The Pelvic Floor Unit is formed by a rehabilitation doctor specialised in pelvic floor pathology (Dr Vara Paniagua) and three physiotherapists, equally specialised in this pathology.

Once the patient has been assessed by the rehabilitation doctor, after a clinical evaluation and complementary tests on a case-by-case basis (analysis, ultrasound, MRI, EMG), the doctor prescribes the most appropriate rehabilitation treatment for each patient.

#### **OBJECTIVES**

Analyse the effect of music associated with a rehabilitation programme in patients with chronic pelvic pain (CPP).

#### MATERIAL AND METHODS

The study consisted of a controlled, prospective, longitudinal, randomised trial.

The patients were randomly assigned to two groups:

- Group A: the intervention consisted of completing 20 physiotherapy and live music sessions in the hospital, with a frequency of 2 sessions/week, and an exercise programme at home).
- Group B-control: physiotherapy programme in the hospital and exercises at home, but without music.

Follow-up over 6 months.

#### Variables to be analysed

- Primary variables: self-reported improvement in pain was recorded as yes/no, and pelvic pain scores were obtained using the Visual Analogue Scale (VAS) (0-10).
- Secondary variables: the SF-36 health questionnaire (Spanish version 1.4) was applied to evaluate the perception of health and ability to carry out their usual activities, and the GADI (Generalized Anxiety Disorder Inventory) test to assess the level of overall anxiety.

Baseline evaluation	Clinical evaluation	Nociceptive pain Mixed pain Neuropathic pain	Pharmacotherapy Analgesics: - Tramadol - TCA: amitripyline - Anticonvulsants: ga	abapentin, pregabalin		
	Physical examinatior	Physiological parameters — Instrumental evaluation				
	Control group		Intervention group			
	Rehabilitation treatment		Rehabilitation treatment	Music therapy		
Evaluation at the end of R Evaluation 3 months post-R	HB	l evaluation Physical examin	ation Physiological parar	meters Instrumental evaluation		
Evaluation 6 months post-R	Evaluation 6 months post-RHB					

m

#### **Research team**

- Rehabilitation Department: Jesús Vara, MD; Sofia Garcia, MD; Mª Jesús Guijarro, PT; Mª Luisa Rodríguez, PT; Concepción Martin, PT; Zahara Pintos, PT; Mª José Sánchez, PT and Esperanza de Carlos, MD.
- Gynaecology Department: Eloy Muñoz, MD and Estela Lorenzo, MD.

#### RESULTS

Twenty-nine (29) women aged over 18 fulfilled the inclusion criteria (group A:15, group B:14); 8 (28.8%) dropped out of follow-up, 6 (40%) from group A (p<0.05).

The mean age was 42 years (22-56 years). The most frequent diagnosis was dyspareunia in 10 women (34.48%), 3 (20%) in group A and 7 (50%) in group B, followed by endometriosis in 9 (31%), 5 (33.3%) in group A and 4 (28.5%) in group B, with no significant differences between groups (p=0.52).

Pre-treatment VAS was higher in group A (baseline: 5.8 SD 2.21, peak: 9.07 SD 0.93) than in group B (baseline: 4.71 SD 2.64, peak: 7.70 SD 1.53), significant for peak VAS (p< 0.05); significant improvements in VAS were obtained (baseline and peak) post-treatment (3.11 SD 2.47, 5.93 SD 3.03), 3 months (2.50 SD 2.73, 5.88 SD 3.61) and after 6 months (3.14 SD 3.02, 5.24 SD 3.96) (p<0.05), with no differences between both groups.

Twenty-one women (61.90%) improved clinically at the end of treatment (p<0.05), with no differences between the two groups. The SF-36 variable improved in post-treatment (pre-treatment: 97.66 SD 11.81, post-treatment: 99.69 SD 11.06) (p>0.05), without any differences between both groups, and was not maintained in follow-up.

No differences were observed in the GADI questionnaire throughout the study in any group (p= 0.72).

#### PRELIMINARY CONCLUSIONS

In this study, live music associated with the usual treatment did not improve the therapeutic prognosis in women with CPP.

This fact may be due both to a worse baseline status of the patient and to the larger number of dropouts in the intervention group. Likewise, other limitations of the study were the small number of patients and having randomised the groups without stratifying according to baseline pain, which may have contributed to the fact that no significant differences were observed between both treatments.

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A hospital is radically different to a stage: from the lights and the noise of the machines, to the extreme sensitivity of the listener and all possible contingencies. MIRs must be, physically and emotionally, all-round musicians.

# Haematology

## STUDY DETAILS

**WHAT** Evaluate the effects of live music on patients during their stay in the Transplant Unit (autologous haematopoietic stem cell transplant: cohort study).

**WHO** Principal investigator, Dr Joaquín Martínez López, head of the Haematology Department at Hospital 12 de Octubre.

**WHY** Autologous haematopoietic stem cell transplantation (aHSCT) is a common intervention in the treatment of haematological malignancies, such as lymphoma or multiple myeloma. During this stage, patients are exposed to intensive induction chemotherapies, which can produce severe toxicities that can affect multiple organs. The most common adverse events include asthenia, anorexia, prolonged cytopenias, fever and mucositis<sup>1, 2.</sup> The deterioration of their physical condition, as well as prolonged isolation, often cause anxiety disorders and depression<sup>3, 4.</sup>

According to the Spanish National Transplant Organisation ("Organización Nacional de Transplantes"—"ONT"—in Spanish) and the EBMT (European Group for Blood and Marrow Transplantation), in 2017, 3,321 haematopoietic stem cell transplants (HSCTs) were performed in Spain, of which 2,084 were autologous. The first indication for autologous transplant is myeloma, followed by Non-Hodgkin's and Hodgkin's lymphoma<sup>5.</sup>

Numerous studies have attempted to shed light on therapies that can improve the quality of life of patients during their stay in hospital. Music has been studied in a population subjected to both autologous and allogeneic HSCT, suggesting benefits in psychological well-being and pain perception<sup>6, 7, 8.</sup> Additionally, the differences between live music and recorded music have been studied, with the former having reduced anxiety most according to self-administered patient questionnaires<sup>9.</sup>

**HOW** Based on the hypotheses reflected in the Cochrane review and recent results in haematopoietic transplant units, this study sought to assess the effect on blood pressure and heart rate before and after intervention, with the patients themselves acting as controls, and to evaluate the state of anxiety using the STAI-E form, which the patients answered at different moments during their stay: day of admission, day of infusion, and day 7 of transplant.

SEVEN CLINICAL STUDIES → HAEMATOLOGY

1-9. The notes in this data sheet refer to the numbers in the bibliography (page 86).

#### CHARACTERISTICS OF THE SERVICE

#### Situation of the patients

Patients admitted to the Haematology ward, in 4 beds in isolation. They were patients with MM (multiple myeloma) and NHL (non-Hodgkin's lymphoma) admitted for autologous haematopoietic stem cell transplantation. They listened to piano music 5 days a week for half an hour, always at the same time, around one in the afternoon, from Monday to Friday.

#### The space

A piano was placed in a corridor of the Haematology floor so that it could be heard from the rooms.

#### **OBJECTIVES**

#### Main objectives

- Assess the effect on blood pressure and heart rate.
- Assess the effect on nausea and antiemetic medication.
- Determine the effect on the duration of neutropenia.
- Determine the effect on the severity of mucositis.
- Anxiety assessment using the STAI-1 form and recording of anxiolytic treatment.
- Pain assessment by recording analgesia and visual analogue scale (VAS) (0-10).

#### Secondary objectives

- Evaluate the effect on humour and entertainment in patients and relatives.

#### MATERIAL AND METHODS

#### Sample

The study population consisted of patients aged over 18 years who were admitted for aHSCT. To ensure greater homogeneity of the sample, patients diagnosed with multiple myeloma or lymphoma were eligible for the study. Prior informed consent was requested. During the periods January to May 2018 and November to May 2019, a total of 56 patients were admitted to the abovementioned unit; 24 of them did not meet the criteria since they were admitted for a different transplant, a different pathology or in another location outside the transplant unit. Of the remaining 32 patients, 5 did not give their consent for data collection.

Inclusion criteria:

- patients over 18 years of age
- informed consent for participation in the study

#### Exclusion criteria:

- inability to answer the questionnaire due to very serious illness
- hearing loss
- patient in an emergency situation

SEVEN CLINICAL STUDIES → HAEMATOLOGY

#### **Type of intervention**

Thirty (30) minutes of live piano music each day.

Main repertoire:

- Transcription of the choral music from Hunt Cantata BWV 208, J. S. Bach.
- Prelude No. 4 in E minor Op 28. Frederic Chopin.
- Exit music, Radiohead (related to the previous prelude).
- Blackbird, The Beatles (Brad Meldhau version).

#### Variables to be analysed

Peripheral blood samples and vital sign measurements (TA, HR, RR and SatO2 by means of pulse oximetry) were taken 15 minutes before and 15 minutes after the intervention.

Records of nausea/vomiting episodes and the need for rescue antiemetics during their stay.

This study presents the preliminary results of the study, but it is worth mentioning that once the project has ended, other variables can be analysed such as the presence and duration of mucositis, analgesia, use of antiemetics and graft data with respect to a historical control group of 30 patients.

#### **Research team**

- Principal investigators: Joaquín Martínez-López and Fátima Mirás Calvo.
- Collaborating investigators: Carmen Prieto, Cristina Montero, Rebeca García and María Torralbo.

#### **RESULTS**

The sample obtained comprised 27 patients, of whom 75% answered the STAI questionnaire. Of these, 29% were women and 71% men. The mean age was 58 years (47-65 95% Cl). Table 1 shows the descriptive results of the study variables.

#### Table 1. General characteristics of the sample

Variable	Ν	% 95% CI
N = 27	N	
Sex		
Female	8	29
Male	19	71
Age (mean)	58	(47-65)
Primary diagnosis		
Multiple myeloma	13	48.2
Hodgkin's lymphoma	3	40.7
Non-Hodgkin's lymphoma	11	40.7
Conditioning regimen		
MEL200	9	33.3
BEAM	13	48.2
BUMEL	4	14.8
BCNU-Thiotepa	1	3.7

SEVEN CLINICAL STUDIES → HAEMATOLOGY

To measure the direct effect of live musical intervention on blood pressure and pulse rate, a total of 310 measurements were taken before and after the intervention. Only one trend was observed in heart rate differences (p = 0.058). Statistically significant differences in blood pressure are shown, both in systolic BP (p = 0.01) and in diastolic BP (p = 0.006) (Table 2). However, these differences were not clinically relevant and are of no clinical interest.

#### Table 2. Univariate analysis

Variable	Median	95% CI	p-value
PRE systolic BP (mmHg)	117.8	114,1 - 124,6	0.01
POST systolic BP (mmHg)	116.07	110,5 - 123,5	
PRE diastolic BP (mmHg)	70.5	66.1 - 74.9	0.0061
POST diastolic BP (mmHg)	69.06	64.6 – 73.4	
PRE HR	86.45	79.1 – 73.8	0.058
POST HR	87.9	81 - 94.75	

Significant differences for the p<0.05 value in Student's t-test.

HR: heart rate

As an improvement action, new nursing sessions can be held to highlight the importance of taking measurements within 30 minutes prior to the intervention (12:00 p.m.) and 30 minutes after (1:30 p.m.), in an attempt to minimise interference. Although this entails great difficulty due to the enormous care burden in these patients.

As regards the state of anxiety, results are available in the STAI questionnaire for the group of patients admitted in 2018 (n = 18). In this cohort, no significant differences were observed between the admission date and the infusion date, but there was a tendency for anxiety to decrease on day 7 of the intervention, from a mean score of 24.41 at the time admission to 21.57 on day 7 of transplant as the patients had been exposed to music for longer. (Figure 1). Although these results are preliminary given the small size of the sample, they are promising.



#### CONCLUSIONS

Although these preliminary results are not clinically relevant at present due to the limitation of the small size of the sample (n = 27), they may be promising for improving the psychological well-being of patients. For this reason, it would be necessary to continue the study in order to achieve clinical significance. The control group for this measurement would be the patients admitted during the months in which there is no musical intervention. Once the study has been completed, the data on graft, mucositis, analgesia and rescue antiemetics will be analysed with respect to a historical control group of patients.

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"Half an hour a day of live music in patients undergoing bone marrow transplant improves their tolerance to treatment and their quality of life"

Dr Joaquín Martínez López

HINVES

Irene Martín (piano). Musician In Residence

# Cardiology

## STUDY DETAILS

**WHAT** Evaluation of the cardiovascular and psychological effects of live music in patients hospitalised with acute myocardial infarction in the Coronary Unit.

**WHO** Principal investigator, Dr Roberto Martín Asenjo, specialist in Cardiology at Hospital 12 de Octubre.

**WHY** Patients hospitalised for acute myocardial infarction experience psychological and physiological reactions that can alter their vital signs. It has been proven that the presence of high heart rate (HR), high blood pressure, high incidence of ventricular extrasystoles and low HR variability are associated with a higher risk of mortality in patients hospitalised for acute myocardial infarction. Therefore, the reduction of heart rate and blood pressure are priority objectives of pharmacological treatment in the acute phase of infarction. This study is based on the evidence that music is a stimulus capable of modulating emotions and moods, and that it is capable of bringing about changes in brain structures that modulate cardiac activity (hypothalamus, amygdala, insular and orbitofrontal cortex).

**HOW** By searching for evidence on the ability of live music to reduce blood pressure, heart rate and the incidence of ventricular extrasystoles, as well as improve heart rate variability in patients during the acute phase of myocardial infarction. The study also analysed whether live music improves patient and family satisfaction during admission to the Coronary Unit.

WHEN This study was carried out from September 2017 to June 2018.

#### CHARACTERISTICS OF THE SERVICE

#### Situation of the patients

The participants in the study were patients admitted to the Coronary Unit after suffering a heart attack, a situation in which patients abruptly go from being in a normal state of health to being in a very serious condition that can even compromise their life. This has a very important psychological impact on patients. Additionally, admission generates stress and anxiety, which induces changes in certain physiological variables such as blood pressure and heart rate, adversely affecting the heart of the patient suffering a heart attack. These were generally young patients. "We avoided more delicate and more compromised patients, with symptoms at that time or in discomfort, or who had

to undergo a specific procedure or intervention," explained the research team. "We chose patients who were stable, and who could not receive family visits during their stay, in other words they were alone."

#### The space

The project was carried out in the Coronary Unit after the patient had already started in Intensive Care, with which the Coronary Unit shared the same space. "The music interventions were performed directly for specific patients. Behind closed doors and room by room, hence the emphasis on privacy, so that the musicians were not in the middle of the unit with other patients who were not participating in the study. We did it this way but a different approach could be used. All that would change would be the control method. This approach was good in my opinion", states Martín Asenjo, the principal investigator in this clinical study.

#### **OBJECTIVES**

- To study the variations in heart rate and blood pressure during a live music performance in the acute phase of myocardial infarction.
- To assess the impact on the well-being and satisfaction of acute coronary syndrome patients admitted to the Coronary Unit and their relatives.

#### MATERIAL AND METHODS

#### Sample

56 patients were included (33 men, 23 women), with a mean age of 58 years. 46 of them had previously revascularised ST-segment elevation myocardial infarction (STEMI) (82%), while 10 (18%) were non-ST-elevation myocardial infarctions pending revascularisation. 88% had received treatment with beta-blocker drugs.

#### **Type of intervention**

Musical sessions were organised 3 days a week, with one hour of music in each session. Guitarists, violinists and singers participated in the music interventions. The piano was avoided since "it which would have been more adventurous from a structural or healthcare perspective, and it would have hindered the transit of patients and staff", explains the research team, adding that "the aim was for the project to be as non-invasive as possible in that respect".

"Heart rate and blood pressure were recorded using a Holter during the hour before the music...", explains Dr Martín Asenjo, the principal investigator, "and the same Holter was left on during the music hour and during the following hour, to compare whether there was any type of reduction in any of the parameters that we consider harmful: heart rate, ventricular extrasystoles... That was our working hypothesis, namely that music could reduce events which could be associated with poor prognosis during a heart attack". To summarise, "That was the intervention, one record 1 hour before, 1 hour during and then 1 hour after to see if we could demonstrate any benefit, whether this benefit was maintained over time or was dependent on the music continuing". The patients were admitted for very short stays, so they only received one session of live music.

"The patients who were offered this "musical menu" accepted it gratefully and naturally, you could hear the patients and their families applauding the musicians"

Dr Roberto Martín Asenjo

Doctor specialising in Cardiology at Hospital 12 de Octubre

#### Variables to be analysed

- Epidemiological variables: age, sex, cardiovascular risk factors.
- Characteristics of acute coronary syndrome: type of ACS, revascularisation procedure, ventricular function.
- Physiological variables: heart rate, blood pressure, number of ventricular extrasystoles, heart rate variability.

Each patient included in the study acted as their own controls, measuring the physiological variables in three phases:

- Before the start of the musical intervention.
- During the administration of live music.
- At the end of the music session.

Data collection: The data were gathered when monitoring the provision of healthcare to the patients in the Coronary Unit or, if this data was not available, using a 12-lead Holter ECG.

#### **Statistical analysis**

The data were organised in an Excel file and are being analysed using the SPSS statistical package. Depending on their distribution, continuous variables will be expressed as mean ± standard deviation or median (interquartile range) and will be compared using Student's t-test or the Mann-Whitney U test. Qualitative variables will be expressed as numbers and percentages and will be compared using the Chi-squared test or Fisher's exact test.

#### **Research team**

- Principal investigator: Roberto Martín Asenjo
- Collaborating investigators: Fernando Arribas, Héctor Bueno and Guillermo Moreno

#### PRELIMINARY RESULTS

The mean pre-intervention heart rate was 66 bpm and during intervention it was 65 bpm (difference not significant). During the hour prior to the musical performance, the mean number of ventricular extrasystoles was 5, and during the intervention it was 5.5 (not significant).

There were also no significant differences in blood pressure before and after the intervention.

No differences were found regarding the impact of the intervention in any subgroup of age, sex or type of infarction.

Regarding the subjective assessment of the experience, all the patients and their relatives present rated it as "satisfactory" or "very satisfactory".

#### **PRELIMINARY CONCLUSIONS**

The data were still being analysed at the time of publication of this White Paper.

According to Dr Martín Asenjo, head of the Cardiology department and principal investigator on the project: "Beyond the results of the measurements of physiological variables or the administered questionnaire, the experience was very positive, since the music performances were seamlessly integrated in clinical practice, and also had an impact on the well-being of staff. After this pilot experience, we believe that the integration of such interventions in daily care in a cardiovascular critical care unit would be feasible and would have a positive impact on both the work environment and the well-being of patients and their relatives."

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"The music performances were seamlessly integrated in clinical practice, and also had an impact on the well-being of staff"

Dr Roberto Martín Asenjo



# Neurology

## **STUDY DETAILS**

**WHAT** Music-based interventions in patients with chronic migraine refractory to pharmacological treatment.

**WHO** This previously published study is part of a Final Degree and Master's Project in Medicine at the Complutense University of Madrid. It was carried out by the students Jaime Alonso Maroto and Luis Alberto Nieto, with Dr Jesús Hernández Gallego, head of the Neurology Department at Hospital 12 de Octubre.

WHY Migraine is a highly disabling neurological condition with a prevalence in our country as high as 12.6%. In a certain number of cases, this condition can evolve into chronic migraine, which causes the patient to experience headaches for more than 15 days a month, accompanied by increased sensitivity to light, noise and even intense odours, as well as a wide variety of neurological symptoms in the form of "auras", which lead to significant physical and psychological strain. The magnitude of this problem is such that it represents one of the most important causes of anxiety, depression, work absenteeism and deterioration of social life in our society. Music has been used since time immemorial for its healing potential, but discoveries regarding its role in neurobiology are now the subject of articles and conferences in a growing number of medical specialties. The part of our brain that is responsible for receiving and interpreting melodies is closely related to the parts responsible for emotions and feelings, and these in turn exert an influence through different neural circuits in the region that perceives pain. It is therefore logical that, if the appropriate stimuli are applied in the form of music, a chain reaction is triggered in our nervous system that modulates the sensation of pain, relieving symptoms and thus improving the quality of life of these patients.

**HOW** The study involved live music-based interventions in patients with chronic migraine refractory to pharmacological treatment. Migraine is a pathology characterised by recurrent, very painful and disabling headaches. Its evolution is associated with parameters of anxiety, depression, quality of life and vital signs in a group of female patients with chronic migraine refractory to at least three drugs.

WHEN The study was carried out between the months of March and June 2018.

#### CHARACTERISTICS OF THE SERVICE

#### Situation of the patients

"When a person is in pain all day, every day... it's physically and morally draining. Even if they know it's not a fatal disease, they know they have no option but to live with pain on a daily basis, with much more intense peaks in pain from the age of 18 or earlier until they are 60 or 70 years old. And that's terribly cruel. And on top of that they can't sleep well. Their daily lives are severely affected." This is the blunt explanation given by Dr Jesús Hernández Gallego, head of the Neurology Department at Hospital 12 de Octubre, when describing the situation of people who suffer from chronic migraine. These are patients with chronic migraine who have already received pharmacological treatment without success.

#### The space

The place designated for the live music-based interventions was the hospital chapel, which offered a private, noise-free setting.

#### **OBJECTIVES**

#### Main objective

 Evaluate the clinical evolution of patients with music-based interventions as a coadjuvant strategy to their regular pharmacological treatment through the use of different scales of clinical application in migraine.

#### Secondary objectives

- Assess the impact on their quality of life.
- Observe changes in psychiatric comorbidities with chronic pain, such as anxiety and depression associated with migraine.
- Describe the correlation between the values of the cardiovascular vital signs of systolic blood pressure and heart rate, due to their involvement in the pathophysiology of stress and the cerebral vasodilation characteristic of migraine attacks, and the evolution of the disease.

#### MATERIAL AND METHODS

#### Sample

The study participants were 10 women over 44 years of age with chronic migraine refractory to at least 3 drugs for more than 3 years (including botulinum toxin A), for whom individual treatment strategies were devised for their pathology. The patients were prescribed their routine pharmacological treatment, accompanied by 36 sessions of live music, one hour per day, three times a week, for 12 weeks, with a longitudinal clinical follow-up.

Sample exclusion criteria:

- Non-acceptance of informed consent.
- Abandonment of treatment: withdrawal of consent orally or in writing.
- Presence of other neurological or psychiatric antecedents that might have compromised the attention given to music therapy or the understanding of informed consent, as well as adherence to the therapeutic programme.
- Patient with unfavourable or uncertain short-term prognosis (6 months).

- Having suffered an acute myocardial infarction in the 6 months prior to the study.
- Having a history of a non-minor traumatic head injury in the last 3 months.
- Having a history of prior traumatic brain injury in the last 3 months that had left functional or structural sequelae at brain level.
- Having uncontrolled high blood pressure or a history of vasculitis, due to a lack of pathophysiological knowledge of its relationship with migraine and its potential impact on the planned study.
- Presence of disease with an ominous prognosis that might have compromised continuation in the study.

#### **Type of intervention**

"With the help of the Musicians In Residence, we designed a programme in which these patients visited the hospital three times a week, one hour each day, to listen to live music," explains the research team. It was a quasi-experimental project in which case series were carried out, with 36 sessions in total, and the Wilcoxon signed-rank test.

The musical repertoire consisted of a series of melodies that were performed avoiding the highest frequencies, being replaced, where necessary, by the lowest possible frequencies to avoid triggering or worsening any migraine episode. The instruments consisted of a guitar and clarinet duet, and some transverse flute, guitar and violin soloists. The entire process was performed following the music-based intervention review guidelines adopted by the National Institute of Health.

#### Variables to be analysed

Throughout the entire process, the patients' vital signs, as well as the frequency and intensity of the symptoms and also the degree of psychological, social and occupational impairment associated with their situation, were monitored. The main study variable used was the subjective sensation of pain. For its evaluation, a complete clinical assessment of migraine was carried out using the MIDAS (Migraine Disability Assessment) and HIT-6 questionnaires, specifically designed for migraine, and the SF-36 and WHOQoL-BREF scales, which assess patient-perceived quality of life.

The secondary study variables were the symptoms of psychiatric comorbidities —assessed using the Beck Anxiety and Depression Inventories—and cardiovascular vital signs, monitored using digital blood pressure monitors that objectify blood pressure and heart rate parameters.

The characteristics and scoring system of each questionnaire are summarised below:

- The MIDAS questionnaire can be used to measure the degree of social and occupational incapacity caused by migraine, specifying the number of days that a certain patient stopped performing certain tasks in the last three months. The more days of incapacity, the higher the scores obtained in this test.
- The HIT-6 scale aims to describe the physical and psychological limitations that migraine produces for the patient on a monthly basis when performing daily activities. The more severe the limitations produced in the individual, the higher the scores obtained in this test.
- The SF-36 questionnaire considers various dimensions of the experience of the disease to establish an indicative measure of the health of an individual. Higher scores imply a better state of health.
- The WHOQoL-BREF scale reflects the quality of life perceived in the last month by a certain patient with respect to their illness. Higher scores reflect a better opinion of perceived quality of life.

- The Beck Anxiety Inventory enables the assessment of comorbidity associated with physical and psychological distress caused by the disease. Higher values correlate with higher levels of distress.
- The Beck Depression Inventory evaluates the physical and psychological symptoms associated with depression, which can be used to reflect the psychopathological impact of migraine. Higher values correlate with more patent depressive clinical symptoms.
- For cardiovascular monitoring, all blood pressure levels and heart rates were recorded immediately before and after each session.

#### **Statistical analysis**

The statistical objective was to demonstrate the clinical superiority of the music-based intervention over non-intervention. In order to reach this conclusion, the quantitative variables offered by the questionnaires and scales completed by the patients were analysed using non-parametric tests of paired samples using the Wilcoxon signed-rank sum test. A comparative statistical analysis of the vital signs obtained by means of a digital sphygmomanometer before, during and after the interventions, was also carried out to verify the direct impact of music on the cardiovascular system. For this purpose, a Wilcoxon test was applied to the group mean values of systolic and diastolic blood pressure and heart rate to compare the means obtained before and after each session, which also revealed the differences in each month with respect to the previous month. The software used for this analysis was version 24 of the IBM Statistical Package for the Social Sciences (SPSS).

#### **Research team**

This study is part of a Final Degree and Master's Project in Medicine and was carried out by the students Jaime Alonso Maroto and Luis Alberto Nieto, with the support of Dr Jesús Hernández Gallego as tutor, and Dr Sergio Benavente Lopez as co-tutor.

#### PRELIMINARY RESULTS

After the study, it was found that music—a treatment that is easy to implement and has no side effects—helped reduce the patients' blood pressure and heart rate, social disability was reduced by 59.43%, the physical and psychological limitations of the patients decreased by 14.87%, anxiety was reduced by 47% and depression by 40.24%. All this resulted in an improvement of up to 50% in patient-perceived quality of life.

#### PRELIMINARY CONCLUSIONS

- In patients with chronic migraine refractory to pharmacological treatment who received 36 sessions of music-based interventions over 3 months, the following observations were made:
  - A reduction in pain of 59.43% (MIDAS, p = 0.008) and in disability of 14.87% (HIT-6, p = 0.008)
  - An improvement in perceived quality of life according to WHOQoL-BREF of 16.26% and 50.01 according to the SF-36 questionnaire (p = 0.008)
  - Reductions in anxiety and depression of 46.99% and 40.24%, respectively (p = 0.007)
  - A relationship between music-induced relaxation and cardiovascular status: decrease of 6.69 mmHg in systolic blood pressure (p = 0.019) and heart rate by 6.1 bpm (p = 0.012)

"Music sessions applied to patients with refractory migraine help reduce headache, depression and anxiety, and improve quality of life"

Dr Jesús Hernández Gallego

Head of the Neurology Department at Hospital 12 de Octubre

- This research aims to serve as a pilot study that opens the door for new research projects capable of attracting more funding and that persevere in the use of music as a therapeutic instrument in neurology.
- The consolidation of the "Musician in Residence" figure and the normalisation of music in healthcare settings would be positive.

After the administration of the music therapy proposed by the Resistant Headaches Unit, the patients presented clinical improvements in their chronic migraine—evaluated using the MIDAS and HIT-6 questionnaires—, and in their perceived quality of life measured through the SF-36 and WHOQoL-BREF scales. They also presented psychopathological improvements in psychiatric comorbidities associated with diseases that cause chronic pain (mainly anxiety, depression and stress). These improvements were quantified through the Beck Anxiety and Depression Inventories.

Therefore, this study presents positive data on the interaction of music at neurological level and opens the way for further research in this field. "These results, despite preliminary, were wonderful and ground-breaking in every way, although the impact of this intervention has not been categorically proven. That would have to be confirmed with many more patients, over a much longer period, through a design involving many more people," says Dr Hernández Gallego, the principal investigator in the clinical study.

According to Dr Jaime Alonso Maroto, "The results obtained represent, on the one hand, a small victory for the scientific community and a great cause for hope among patients with this ailment. This study also opens the door for new fields of research, which, with adequate funding, will enable the performance of more long-term and complex studies to consolidate these results. Who knows, maybe in the future we will actually see "musicians in residence" in the corridors of Spanish hospitals and MIRs will play a key role in complementing medical therapy in our times".

"The patients who participated in the study appreciated a sophisticated, beautiful and elegant therapeutic activity based on live music. They felt that it had been worth it, they felt better understood, and their general well-being improved". Dr Jesús Hernández Gallego.

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"Staff attended the sessions showing motivation and expressing their sense of satisfaction and well-being with their participation in this project"

Dr Carmen Muñoz Ruiperez

Raquel Ovejas (violin). Musician In Residence

# Occupational medicine

#### **STUDY DETAILS**

**WHAT** The relationship between live music and the reduction of stress levels and other cardiovascular risk factors in workers at a tertiary care hospital in the autonomous community of Madrid.

**WHO** Principal investigator, Dr Carmen Muñoz Ruiperez, head of the Occupational Medicine and Occupational Risk Prevention Department at Hospital Universitario 12 de Octubre.

**WHY** With a view to reducing the level of stress and other cardiovascular risk factors (CVRF), the study sought to expose healthcare staff at Hospital 12 de Octubre to music sessions with Musicians In Residence and compare their effects in relation to other techniques such as relaxation, to implement a project aimed at reducing these risk factors within the health promotion programme for professionals at Hospital Universitario 12 de Octubre, called "They take care of me too" (*A mí también me cuidan* in Spanish).

**WHAT** The change in the level of general stress and prevalence of other CVRFs, especially blood pressure, was estimated in a comparative study after random assignment to the three study groups (randomised experimental design). Additionally, the efficiency of the response to live music was established according to professional category, age and sex. The participants understood and signed the informed consent in accordance with the provisions established in Organic Law 15/1999 on the Protection of Personal Data.

WHEN The study was carried out between October 2018 and February 2020.

#### CHARACTERISTICS OF THE SERVICE

#### Situation of the patients

Hospital Universitario 12 de Octubre has approximately 7,000 workers. According to internal studies carried out by the Occupational Risk Prevention Department, the prevalence of cardiovascular risk factors was as follows: hypertension, 12.3%; smoking, 24.7%; sedentary lifestyle, 40.9%; overweight, 33.8%; obesity, 10.8%; hypercholesterolemia, 17.3%; diabetes mellitus, 0.9%. The prevalence of work-related stress (distress) in residents is 11% 6 months after the beginning of their residency.

3.7

According to the 6th National Survey of Working Conditions in Spain (2015 EWCS), stress at work "always or almost always" affects 30% of workers, and its magnitude has increased in the last five years.

The estimated mean cardiovascular score in our working population is 4.18 (SD+/4.7) in men and 1.38 (SD+-1.4) in women.

For this study, the study population comprised healthcare personnel who presented cardiovascular risk factors, the most important of which were arterial hypertension and stress.

#### The space

After the necessary agreements had been obtained, the place chosen to hold the live music sessions was the chapel on the 10th floor of the Maternity and Children's Hospital, since this space was available to professionals 3 days a week, 1 hour each day: 30 minutes were dedicated to the group exposed to live music and 30 minutes to the group exposed to relaxation techniques. On Mondays, the group exposed to live music carried out the intervention in the auditorium of the Maternity and Children's Hospital, since the instrument used was the piano and that is the where the instrument is located.

The timetable of the group exposed to the music-based intervention was 11:30-12:00 h and the timetable of the group exposed to relaxation techniques was 11:00-11:30. The control group was not exposed to any intervention.

#### **HYPOTHESIS**

Live music is an effective measure for reducing the level of stress and other cardiovascular risk factors in healthcare workers at Hospital 12 de Octubre when compared with relaxation techniques.

#### **OBJECTIVES**

#### Main objectives

- Overall objective: to identify the impact of live music on the level of stress and other CVRFs in healthcare workers at Hospital 12 de Octubre when compared with relaxation techniques.
- Specific objective: to estimate the change in the overall level of stress and prevalence of other CVRF, in the comparative study after random assignment to the three study groups, two of them exposed to different interventions and a third without any intervention, on a randomised basis (randomised experimental design).

#### Secondary objectives

 The efficiency of the response to live music was established according to professional category, age and sex.

#### **MATERIAL AND METHODS**

#### Sample

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For this study, the study population comprised healthcare personnel who presented cardiovascular risk factors, the most important of which were arterial hypertension and stress. The sample was selected using the database of the Occupational Risk Prevention Department ("Servicio de Prevención de Riesgos Laborables"—"SPRL"—in Spanish) and the Hypertension Unit at Hospital Universitario 12 de Octubre of workers

with hypertension and anxiety identified through the Goldberg questionnaire used by the aforementioned department and who had been invited to participate in the study and who, after signing the informed consent, were given the Work-Related Strain Inventory validated by Revicki, May and Whitley in order to identify this risk factor in the sample. It was estimated that in order to detect variations in blood pressure of between 3-5 mmHg, the groups had to include at least 20-30 people.

#### Inclusion criteria:

- Agreement to participate in the study.
- Healthcare personnel aged 18 or older who had an employment contract with the hospital during the periods in which the study was carried out.
- Completion of the Work-Related Strain Inventory validated by Revicki, May and Whitley.

Exclusion criteria:

- Failure to attend more than one third of the sessions held.
- Psychiatric illness with active symptoms.
- Active treatment with medication to stimulate the nervous system, antidepressants or psychotherapeutic treatment.

#### **Type of intervention**

This was a randomised clinical trial carried out at Hospital 12 de Octubre in Madrid. Once the sample had been selected, the study participants were randomly assigned to groups. In the analysis, they were stratified by age groups and sex to determine the effect in each of them. The 3 branches consisted of: a music-based intervention group, an intervention group with relaxation techniques and a third control group.

The study was carried out during a period of 4 months. A first group received 2-3 weekly sessions of 20-30 minutes of exposure to live music during their working hours. Simultaneously, a second group participated in respiratory relaxation techniques and in the third group only vital signs and analytical values were recorded. Measurements of blood pressure, heart rate, laboratory tests (blood count, glycaemia, kidney function and cortisol) were periodically taken at the beginning of exposure, after 2 months and 4 months after completion of the study. Variables were also measured randomly on a monthly basis, before and after the music-based intervention, to determine the effectiveness of a single intervention.

Finally, the results obtained are being analysed to evaluate the intervention and determine whether music is an effective measure for reducing stress and cardiovascular risk factors compared to other relaxation techniques.

#### Variables to be analysed

Independent:

- Sociodemographic:
  - Age: in completed years.
  - Sex: male, female
  - Professional category: doctors, nurses, nursing assistants, caretakers, administrative staff, catering staff, others.
  - Work shift: morning, afternoon, night, rotating, morning/afternoon, morning/night.
  - Workplace: Hospital 12 de Octubre (Madrid).

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The independent variables were measured at the beginning of the intervention, using an initial data collection form.

Dependent variables:

- Biometrics: blood pressure with manual blood pressure monitors, heart rate measured with pulse oximetry, weight and height.
- Biochemistry: biochemistry with blood glucose, kidney function and cortisol, total and fractionated cholesterol, triglycerides and blood count.
- Questionnaires: Work-Related Strain Inventory (WRSI) validated by Revicki, May and Whitley for healthcare personnel. This questionnaire was translated and validated in 1995 for the Spanish healthcare population by Dr Mingote Adán; cardiovascular score on the Fuster-BEWAT Index and WHO Quality of Life-BREF (WHOQOL-BREF) Questionnaire.

The dependent variables were measured at the beginning of the study, at 2 and 4 months (end of the intervention). In addition, blood pressure and heart rate were measured randomly once a month, before and after each exposure.

#### **Statistical analysis**

For the statistical analysis, a database was configured using Stata or R software in Windows<sup>®</sup>. Qualitative variables were described using their absolute and relative frequency (%), and quantitative variables using measures of centralisation (mean) and dispersion (standard deviation, range). For the comparison of proportions, the statistical  $\chi$ 2, Student's T or Mann Whitney and Kruskal-Wallis U tests were used for those with more than 2 categories according to the variables to be analysed, and with confidence intervals (CI) of 95%. Only values of p<0.05 were considered statistically significant.

#### **Research team**

Principal investigator: Dr Carmen Muñoz Ruiperez, specialist in Occupational Medicine.

Collaborating investigators: Miriam Marco Ibáñez, Sabrina Pozzobon Gil, Liliana Rebolledo Sánchez, Miguel Ángel Alonso López, Ana Isabel García Vaquero and Tito Leoncio Lizarraga Hurtado.

This study is encompassed within the Occupational Medicine End-of-Residency Research Project as part of the Scientific Training Programme on Occupational Medicine for Resident Medical Interns ("MIR"—"Médico Interno Residente"—in Spanish) developed by the National School of Occupational Medicine of the Carlos III Health Institute.

#### RESULTS

Significant differences of more than 5 mmHg were observed in initial and final SBP in the music-based intervention group, as well as changes in other CVRFs after different interventions.

As regards stress, both intervention groups presented reductions in the level of stress, with the decrease in the maximum total score being greater in the live music group. In the relaxation group, mean stress decreased by 3 points. All participants obtained scores below the established cut-off value. No statistically significant differences were observed.

с. С With respect to other CVRFs, no significant differences were found at the end of the sessions. However, the pre-intervention MBP/post-intervention MBP values measured in the relaxation group were statistically significant (p = 0.008).

The groups aged 40-50 and 50-60 years exposed to live music evidenced a decrease in HR, SBP, DBP and MBP, greater than 5 mmHg in the case of SBP, with significant differences in the group aged 40-50 years (p = 0.022).

#### CONCLUSIONS

The study in Occupational Medicine concludes that there is no statistically significant evidence to determine that music is better than relaxation techniques for reducing the level of stress and other cardiovascular risk factors in healthcare workers at Hospital 12 de Octubre, although certain aspects of the use of music in terms of its effect on certain variables could be highlighted and published.

After applying the exclusion criteria, a sample of 48 healthcare workers was obtained, with an average age of 55 years, of whom 75% were women. The predominant professional category was nursing staff (n 30). The sample was distributed into groups as follows: music-based intervention group, n 13; relaxation group, n 14; and control group, n 21. There was greater participation in the relaxation group. Significant differences of more than 5 mmHg were observed in initial and final SBP in the music-based interventions.

As regards stress, both intervention groups presented reductions in the level of stress, with the decrease in the maximum total score being greater in the live music group. All participants scored below the established cut-off value. No statistically significant differences were observed.

With respect to other CVRFs, no significant differences were found at the end of the sessions. However, the pre-intervention MBP/post-intervention MBP values measured in the relaxation group were statistically significant (p = 0.008).

The 40-50 and 50-60 age groups exposed to live music evidenced decreases in Heart Rate (HR), Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Mean Blood Pressure (MAP), which in the case of SBP were greater than 5 mmHg, with significant differences in the 40-50 age group (p = 0.022).

It is recommended that the study be broadened to include a larger sample and longer exposure time.

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## Conclusions

The first implementation of the MIR project amply achieved its overall objectives: to demonstrate, through clinical and artistic practice, the beneficial impact of live music in certain types of patients. A very large percentage of the two professional groups involved—healthcare professionals and musicians—consider that live music is extremely positive for patients, and they would normally use it in practice to complement their work. From the psychosocial standpoint, the benefits of the MIR Project for the well-being of patients, family members and professionals have been demonstrated, positively impacting the mental health of all the groups involved.

The data presented in the different scientific studies reveal the clear need to continue investigating in order to produce conclusive results, since the data obtained do not entirely confirm this benefit. However, having been able to carry out the first scientific study of this nature and magnitude, verify the seamless complementarity between music and clinical practice, and confirm the effective operation of partnerships forged between the public sector, private philanthropy and the third sector, provides a spring-board for the implementation of this project in our country. We can affirm that the true added value of the MIR Project is based on the success of these three pillars, and less on the specific numbers produced by the studies. Moreover, in recent years abundant scientific literature has been published supporting the positive effects of music in different clinical cases—including the latest World Health Organization and European Commission guidelines on art and health—. Therefore, the MIR Project is a tested and legitimate mechanism for focusing research efforts on implementation.

It is crucial to encourage networking between the health and culture sectors to achieve a common goal: to promote culture as a complementary tool in pursuit of the health and well-being of people. At Cultura en Vena we strive to articulate and define a real social and health need that will encourage institutions to create the necessary legislative frameworks to ensure that artistic practices are integrated into healthcare protocols as a justified, stable and lasting reality.

Culture genuinely benefits health.
Bossa nova chord progression beside a patient monitor: music and health in the hospital of the future

(Bossa Nova) A A G A 7 / G<sub>∆7</sub> / A-9 A-9 F# B<sub>∆7</sub> F<sup>#</sup><sub>7sus</sub> B Ga7 /. G<sub>d7</sub> 1. CA7 En



# Musicians In Residence

We evaluated the musicians' aptitudes in various areas, from professional skills to the psychological ability to adapt to complex situations like those often encountered in healthcare facilities. They are all excellent artists, musicians and communicators. From a psychological perspective, we also sought people who were empathetic, sensitive and capable of interacting with patients and their family members in ways other than through music.



<mark>Josefa Gómez "La Jose"</mark> Voice

A self-taught artist, Josefa started out young, singing with different Latin, flamenco and jazz groups. She composed her first songs in 2007 and went further down that road in 2008 with the band Almaderia. She was involved with Ofir, a Sephardic music band, until 2012, touring the Mediterranean and Eastern Europe with them. In 2014 Josefa released her first solo album, "Espiral", and performed in several foreign countries. She has collaborated with Julio Castejón (Asfalto), Miguel Campello and musicians like El Bicho. David de María (with whom she toured all of Spain in 2016 as a backup singer) and Tomasito (recording with him for TVE), among others. "La Jose" has performed at major festivals such as Suma Flamenca and Fringe, and after studying under several masters she is now a vocal teacher and voice therapist.



<mark>Marina Lledó</mark> Voice and piano

Marina studied piano, harmony and music theory at the Escuela de Música Creativa and received classical voice lessons from soprano Idoris Duarte. She participated in national projects like the Mallorca Jazz Festival and has been a special guest of Pepe Rivero (on "Pepe Rivero and Friends"), Pavel Urquiza, Jayme Marques and other noted artists. On the international stage, she has also performed at the Cape Town International Jazz Festival in South Africa and the Fjordjazz Festival in Norway, where she sang some of her own songs with Hans Mathisen and his big band. Marina Lledó's artistic efforts have earned her distinctions such as Best Album in the World Music category at the German Records Critics' Awards.



#### <mark>Juan Sebastián Vázquez</mark> Piano

After regularly attending jazz courses offered by the Juilliard School of Music, Juan enrolled at Musikene - Centro Superior de Música del País Vasco to study jazz piano and began receiving classes from Iñaki Salvador, Bob Sands, Guillermo McGuill, Alejandro Mingot and others. In 2012 he founded the SB3 Trio and recorded his first album with them, "Lluvia de Mayo", which the critics of DistritoJazz picked as one of the top five albums in the country, and which also won the BBK Award for Best Jazz Album of the Year in the Basque Country. He regularly performs at important jazz clubs and festivals (Vitoria-Gasteiz Jazz Festival, San Sebastián International Jazz Festival, Vitoria, Madrid, Café Mercedes Jazz Club).



<mark>Guillermo Vílchez</mark> Guitar

Guillermo studied classical guitar at the Real Conservatorio Superior de Música de Madrid and electric jazz guitar at the Escuela de Música Creativa de Madrid. His first artistic experiences were with Sonámbulos, the Quatre Vingts guitar quartet and Grupo Bumerang, with whom he did three national tours focused on flamenco guitar and electric guitar. He was an associate professor of classical guitar at the Academia de Música y Danza (Conservatorio Profesional) Antonio Soler de Jaén before becoming an associate professor of guitar at the Centro Profesional de Música Soto Mesa. Guillermo is currently working on his latest album with the Barrio Negro band.





<mark>Marta Mansilla</mark> Flute

Born in Madrid, Marta earned a professional music degree from the Conservatorio Profesional de Música Amaniel de Madrid and another in jazz and improvisation from the Escuela de Música Creativa de Madrid, learning from professors like Patxi Pascual and Bob Sands. In 2014 she began taking flamenco classes (at the Uflamenco school) from Pedro Ojesto, Juan Parilla and other instructors. With Parilla's flamenco company, Flamenquillos, she has played at Suma Flamenca, Flamenco on Fire and Teatro Circo Price during Inverfest. Marta has won several competitions, including the singer-songwriter contests of Cáceres and Granada, Jóvenes Creadores organised by the Region of Madrid, and the Pasión Rock contest. She also has a degree in music education from the Universidad Autónoma de Madrid.



<mark>Paula García</mark> Viola

Paula studied music at the Escuela Superior de Música Reina Sofía (2010-2014), the Hochschule für Musik "Felix Mendelssohn Bartholdy" in Leipzig (2014–2015) and the Hochschule für Musik "Hanns Eisler" in Berlin (2015-2017). She has received numerous awards for her work as a soloist and a chamber musician. Her interest in orchestral music has led her to play with Orquesta Nacional de España, Orquesta de Cadaqués, Orquesta de la Comunidad de Madrid, Orquesta de Radio Televisión Española. Hamburger Camerata, Jeune Orchestre Atlantique (JOA), Joven Orquesta Nacional de España (JONDE), Wiener Jeunesse Orchester (WJO), European Union Youth Orchestra (EUYO), Gustav Mahler Jugendorchester (GMJO) and Junge Philharmonie Berlin, among other ensembles.



<mark>Paco Soto</mark> Guitar

After finishing his studies at the Flamenco Song Festival of Las Minas de la Unión and Fundación Cristina Heeren in Seville, Paco moved to Madrid to train under the master Enrique Vargas. Today Paco Soto is considered one of Spain's most promising guitarists. In the course of his career, he has collaborated with many of the greatest flamenco (Rafita de Madrid, Enrique el Piculabe, Ismael de la Rosa, Sonia Olla, María Mezcle...) and jazz artists (Eva Cortés, Julio Botti, Inoidel González, Georvis Pico...) and has toured in Europe, Asia, the Americas and Africa. Paco has worked with institutions such as Ciudad de la Luz. Instituto Cervantes in New York, and Columbia University, where he participated in and organised courses on Federico García Lorca's relationship with flamenco.



<mark>Elisa Ortiz</mark> Cello

Elisa earned her advanced music degree with a specialty in cello in 2016, the same year she completed a degree in advanced musical performance at Universidad Alfonso X El Sabio. having studied under the educator and cellist María Casado and the soloist Asier Polo. She has done remarkable educational research work applied to the cello with psychologist and pianist Francisco Escoda and has a keen interest in the social facet of music, which inspired her to become a cello teacher with the social music project DaLaNota. Elisa has played at numerous venues in the Spanish capital and recently participated in the adaptation of Ibsen's story "Peer Gynt" set to music by Edvard Grieg. She is also a member of Photograph, a group that plays modern music (jazz, funk, etc.) in different clubs and halls across Madrid.



<mark>Gabriel Manzanares</mark> Guitar

Gabriel is currently a guitar student at the Real Conservatorio Superior de Música de Madrid, although he previously studied psychology at the Universidad Complutense de Madrid for one year. In terms of his professional experience, highlights include his collaborations with the Real Escuela Superior de Arte Dramático de Madrid and with the Big Band from the Real Conservatorio Superior de Música de Madrid, with which he has played concerts at the Museo Reina Sofía and Sala Clamores in Madrid. Gabriel's interest in education also led him to teach guitar and music theory in several summer courses.



<mark>Miguel Ruiz</mark> Clarinet

Born in Infantes, Ciudad Real, Miguel studied with Justo Sanz at the Real Conservatorio Superior de Música de Madrid. In the capital, he discovered the world of jazz and enrolled at the Escuela de Música Creativa, where he rounded out his classical training with classes in improvisation, modern harmony and composition-arrangements. After graduating, he won a scholarship from Fundación Conexus to pursue a graduate degree at the prestigious Berklee College of Music. As a classical musician and performer, Miguel has appeared as a soloist on several occasions and has played with various orchestras and chamber groups, among them Quinteto Enara. As a jazz musician and performer, he is a founding member of the groups Half Past Clars, Guitarinet Jazz Duo, Worldquestra and Improvisus Ensemble.



<mark>Aapo Grönlund</mark> Guitar

With a BMus from Finland's Jean Sibelius Academy, Aapo is currently working towards a master's in performance from the same school and attending the Real Conservatorio Superior de Música de Madrid as an Erasmus student. He has given numerous concerts at the Jean Sibelius Academy, Turku Conservatory, Rauma Museum and other venues in Finland. He has also taught guitar and chamber music in summer courses for the Laitila Music Institute. Aapo's commendable dedication to social outreach has led him to give live performances with the Finnish civil service and organise recreational activities for patients with mental illnesses.



<mark>Alberto Viña</mark> Guitar

A Uruguayan with a BMus in guitar from the Real Conservatorio Superior de Música de Madrid, Alberto studied under José Luis Rodrigo. His remarkable versatility allows him to play a wide variety of styles, most notably jazz, classical and tango. Alberto is currently involved with various groups, including the Guitarnet duo, and regularly performs at Bar Docamar. He has played major venues such as Teatro Solís, Sala Clamores, Café Central, Sala Vaz Ferreira and Auditorio Mario Benedetti.







<mark>Carla Pérez</mark> Flute

Carla earned an intermediate music degree with a specialty in flute from the Conservatorio Profesional de Música de Segovia. She later attended the Real Conservatorio Superior de Música de Madrid, where she completed an advanced degree in flute while also pursuing a double BA in Early Childhood and Primary Education with a special mention in Music from the Universidad de Valladolid. She took courses in flamenco for melodic instruments taught by flautist Juan Parrilla and has played with groups such as the Ensamble de Música Contemporánea de Segovia, Banda Municipal de Madrid and Banda Sinfónica del RCSMM. Carla gives private lessons in flute and music theory. She is familiar with different music therapy methods and has even had GIM (Guided Music and Imagery) sessions as a patient.



Erin Corine Johnson Flute and voice

Erin has a BMus in flute performance and pedagogy from the University of Illinois at Urbana-Champaign and an MMus in contemporary performance (production concentration) from the Berklee College of Music, Valencia. She is a bilingual vocalist, multigenre flautist and music educator. Erin gives bilingual classes in music theory, musicology and ethno-musicology, performance and other areas. She is currently a tutor and native workshop instructor at Escuela de Blues de Madrid, specialised in teaching African American music. She is also the author of a course called "English for Singers through Black Music Interpretation".



<mark>Raquel Ovejas</mark> Violin

Raquel graduated from the Real Conservatorio Superior de Música de Madrid in 2013 and was given two JONDE-Fundación BBVA scholarships to receive master classes in Germany. Trained in the field of education, she also completed her professional music degree with an honorary prize in violin. Raquel has played with the Orquesta Nacional de España, Orquestra Simfónica de les Illes Balears, International Youth Orchestra, Joven Orquesta Nacional de España and Joven Orquesta de la Comunidad de Madrid, where she was first violin. She also participates in A Kiss for All the World, an outreach initiative that brings live music to disadvantaged locations across the globe.



<mark>Yoel Molina</mark> Guitar

Yoel has a master's in jazz guitar from the Conservatorium van Amsterdam and advanced music degree with a specialty in jazz from Musikene (San Sebastián). He taught guitar to intermediate students at the Escuela Música Creativa and worked as a substitute teacher for city schools. Yoel taught instrument and ensemble at the NyasJazz seminar in Alicante and has worked with musicians such as Bobby Martínez, Juanma Borroso, Xan Campos and Stephan Frans, among others. He has played at numerous festivals and clubs, including Donostia Jazzaldia, Amsterdam Jazz Festival, 1906 and Rotterdam Jazzdag. He recorded the Larchey Zore album with Charley Rose and appeared on Xan Campos's ESD. He is currently a member of the band Les Bohemes.



<mark>Arantxa Bermejo</mark> Clarinet

Arantxa's higher education began at the Conservatorio Profesional de Música de Alcalá de Henares, where she took the professional music degree course with a specialty in clarinet. She also has a BA in Journalism from Universidad Rev Juan Carlos I and is currently working towards an advanced music degree, specialising in clarinet performance, at the Real Conservatorio Superior de Música de Madrid. She teaches music and movement at Escuela Solmusic and clarinet and music theory at the music school of the Banda Sinfónica Complutense de Alcalá de Henares. She is also bandmaster of the Banda de la Unión Musical "El Maestro". Arantxa was a member of the Orquesta de la Universidad de Alcalá, playing in its various chamber groups, and was second clarinet in the Orquesta Filarmonía. She performed O. Navarro's 2nd Clarinet Concerto as a soloist with the Banda Sinfónica Complutense.



<mark>David Hontalva</mark> Guitar

David teaches music at several academies in the region of Madrid and plays flamenco guitar with different groups, giving performance in Belgium and Switzerland.

projects with dance schools and associations

as well as her own individual initiatives.

#### <mark>Virginia González</mark> Voice

Virginia is a flamenco singer with 10 years' experience who has been involved in various



#### <mark>Andrés Calamardo</mark> Clarinet

Andrés has a professional music degree, with a specialty in clarinet, from the Conservatorio Profesional de Música de Alcalá de Henares, and an advanced music degree, also specialising in clarinet, from Musikene - Centro Superior de Música del País Vasco. He has received classes from instructors of the stature of Martin Fröst and Jean-Louis Sajot, among others. He is currently solo clarinettist with the Banda Sinfónica Complutense de Alcalá de Henares. Andrés was also first clarinet on the Queen Rock Symphonic tour with the One World Symphonic Orchestra. He teaches clarinet and saxophone at the Escuela Municipal de Valdeluz and has played with the Orquesta Sinfónica de Euskadi, Orguesta luventas of Madrid, and Banda Victoria de Los Ángeles, among other ensembles.



<mark>Juan Sánchez</mark> Guitar

Juan began attending the Escuela de Música y Danza de San Fernando de Henares when he was just nine years old. He completed his music education, specialising in guitar performance, under masters like Enrique Vargas and José Manuel Montoya at the Conservatorio Flamenco Casa Patas. He also learned modern harmony with Adrián Alvarado and flamenco dance accompaniment at Escuela Marta de la Vega in Madrid. In addition to playing at Fundación Conservatorio on many occasions, Juan gives flamenco guitar classes at several schools, including Conservatorio Casa Patas, and is involved with Colectivo Estímulo and Flamenco Jazz Project, a company with which he has travelled to Germany and Brussels. He is currently a guitar instructor at Mónica Tello, a creative space and school in Madrid, and belongs to the Tablao Flamenco Torero.



<mark>Irene Senent</mark> Violin

Irene has an advanced degree from the Conservatorio Superior de Música de Aragón. She studied violin teaching for four years and received classes in violin performance from Isabel Vilá, Rolando Prusak, Yuri Nasuskin and other masters, as well as classes in chamber music and string guartet with Cuarteto Quiroga. She is a founding member of Dúo Asiduo. Irene plays with the Orquesta Clásica Europea, Orquesta Sinfónica Goya, Barbieri Symphony Orchestra, Orquesta en el Tejado, Film Symphony Orchestra and Orquesta Clásica Santa Cecilia (Fundación Excelentia). She has taught violin, piano, introduction to music and music theory at Academia Miralbueno, a music school in Zaragoza. She currently teaches violin and group classes at Escuela de Música Cedam in Madrid and is a violin instructor and founding member of the social music DaLaNota.



<mark>Paula Gómez</mark> Guitar and voice

A singer-songwriter from Granada, Paula came to Madrid from Ireland, where she spent five years pursuing a music career. While there, she recorded and released her first album, *Love and Hate*, working with Bill Shanley (Ray Davies), guitarist and producer of her recording debut, and other musicians like Liam Bradley (Van Morrison), Binzer Brennan (The Frames) and Australian guitarist Stephen Housden. The album was a hit with critics and listeners alike, giving Paula the chance to play various festivals in Ireland and Spain and even a major international event like Canadian Music Week in Toronto, Canada.



<mark>Isabel Rodríguez</mark> Flute

Isabel has an advanced music degree in flute performance from the Real Conservatorio Superior de Música de Madrid and an intermediate degree in flute performance from the Conservatorio Profesional de Música de Alcázar de San Juan. She has experience as a flute teacher at MUSHI and a flautist with the Sinfónica JMJ and other orchestras.



<mark>David Sancho</mark> Piano

David graduated from the Conservatorio Superior de Madrid, where he studied piano and education, and later went on to earn a degree in jazz piano at Codarts Rotterdam in the Netherlands. He trained with jazz musicians of the calibre of Kris Goessens and Barry Harris. David won the Hazen Intercentros (2003) and Hazen Comunidad de Madrid (2004) competitions and the Leiden Jazz Award (2011). In the field of classical music, he made a recording of 15 Two-Part Inventions by J. S. Bach (Enclave Creativa). His jazz production ranges from the cutting-edge sound of MONODRAMA (Modern Post Mortem) and SANCHEMA (with guitarist Chema Sáiz) to the hip-hop/jazz fusion of The Breitners (La Vida Sostenible). David also helped with the arrangements and compositions for Miryam Latrece's album Una necesidad. He regularly plays with national jazz figures like Moisés Sánchez, Jorge Pardo and Noa Lur.





<mark>Miguel Matamoro</mark> Piano

A composer and pianist from Galicia, Miguel completed his advanced degree in composition at Musikene - Centro Superior de Música del País Vasco and did a master's course in contemporary instrumental composition at Centro Superior Katarina Gurska. In his years as a student, he also received master classes from Gérard Pesson, Adam Holzmán and many other noted composers. Miguel personally studied under the composer Michael Finnissy. His compositions have been performed at different venues and festivals, including the Quincena Musical de San Sebastián, CentroCentro (Palacio de Cibeles, Madrid), Fundación BBVA (Bilbao), Festival Sinkro (Vitoria) and Salle Igor Stravinsky (Schola Cantorum, Paris).



<mark>Rodrigo Herrero</mark> Clarinet

Rodrigo studied music at the Conservatorio Profesional de Música Arturo Soria ("Per I Jazz" professional clarinet studies) and the Conservatorio Profesional de Música Manuel de Falla de Alcorcón. He has professional experience working as a teacher of guitar, piano, and music and movement, and as a clarinettist, saxophonist, composer and sound technician.



<mark>Miguel Sempere</mark> Guitar

Miguel is a guitarist, producer and arranger with extensive experience as a live and session musician. He has a professional music degree from the Escuela de Música Creativa and training in traditional classical, modern, electric and jazz guitar. He has taught guitar at several music schools, worked with artists like Jorge Pardo, and composed music for pictures.



<mark>Chico Pérez</mark> Piano

Chico received an advanced music degree from the Conservatorio Superior de Música de Jaén in 2016. He studied under Pepe Rivero and Joaquín Chacón at EMC, took flamenco piano lessons with David Peña Dorantes, and received lessons in harmony, piano, jazz and big band. A pianist and keyboardist for *El Rey León* and the All4Gospel Choir, Chico has worked with Jorge Pardo, El Carpeta, Paquete, Juan Debel, etc. He also has composing and teaching experience.



<mark>Elena Frutos</mark> Piano

Elena earned a professional music degree at the Centro Integrado de Música Padre Antonio Soler de San Lorenzo de El Escorial, Madrid, and went on to study at the Conservatorio Superior de Música de Aragón (CSMA), where her end-of-studies project won the highest possible distinction. In June 2018 she completed an MMus in Performance at the Escuela Superior de Música Reina Sofía (ESMRS) in Madrid. She has performed as a soloist with the Orquesta del Centro Integrado de Música de San Lorenzo de El Escorial under the baton of Giuseppe Mancini, the Orquesta Sinfónica de Castilla y León, and the Orquesta Sinfónica Goya. Elena has given piano and chamber music recitals at numerous concerts halls in Spain, the Netherlands, France and Austria.



<mark>Gonzalo Encinal</mark> Piano

With a BA in Advertising and Public Relations, Gonzalo studied modern music, specialising in jazz piano, at ESMUVA and has an official degree in contemporary music composition from Escuela TAI. He regularly plays with different jazz groups and has composed music for the screen, including the score for a short film, *Dragon*, that was selected at Cannes 2016.



<mark>Irene Martín</mark> Piano

Irene has an MA in Music Therapy from Universidad Internacional de La Rioja, another MA in Teacher Training from the Universidad Internacional de Valencia, and an intermediate degree in Performance (piano specialty) from the Conservatorio Superior de Música de Aragón. She has taught at several music academies and schools and worked as a concert pianist.



<mark>Cecilia Krull</mark> Voice

Cecilia's career began with Disney at the tender age of seven, and she has performed with such noted artists as El Chojín and La Unión. Today she is known as one of the best voices in jazz, although her versatility has allowed her to master other genres like pop and soul. Cecilia has appeared at many music festivals and recorded soundtracks for films and TV shows, most notably Vis a vis / Locked Up and La casa de papel / Money Heist (2017).



Nina Sunyer Viola

Nina has an intermediate degree in classical and contemporary performance from ESMUC and has taken various viola courses and master classes (2014). She is a member of JONDE (Joven Orquesta Nacional de España) and has participated in nine symphonic encounters and perfected her orchestral repertoire. She earned a master's in solo viola at the Hochschule für Musik und Tanz Köln under Professor Matthias Buchholz. Nina studied chamber music with Quartet Casals, Harald Schoneweg and Anthony Spiri, and Baroque viola with Richard Gwilt. In her professional career, she has played with orchestras such as the Orquesta Sinfónica del Vallès, Orquesta de Cadaqués, JONDE, Orquesta Nacional de España, Sinfonieorchester Aachen, Camera Musicae and Gran Teatre del Liceu. She also founded several groups and has worked as a teacher.



Anahí Acuña Voice and violin

Anahí began taking violin lessons at the age of four in Paris, where she studied under Guy Comenta to achieve an excellent intermediate degree in classical violin. She began improvising at age 14, and her curiosity led her to embrace jazz and earn an advanced degree in jazz violin from ESMUC. She has been a music teacher and violin instructor at different schools. In January 2014, Anahí participated in a workshop with Wadada Leo Smith. As a violinist, she has played at Sintonizart events and with the Karambamusic group.



Eduard Raventós Cello

Eduard has an intermediate degree in cello from the Conservatori de Música del Liceu, Barcelona, and an advanced degree from the Conservatorio Superior de Música de Salamanca. He also completed a cello specialisation course at the Conservatorio de Música de Aragón. He has worked with youth orchestras like the Joven Orquesta Internacional de Oviedo Filarmonia and the Nationaal Jeugdorkest (NJO) in the Netherlands, and other ensembles, including the Orquesta Sinfónica del Vallès, Orquesta de Cadaqués, OBC and Orquesta Sinfónica de Tenerife. Eduard is involved in social projects at public schools, such as the municipal music schools of Hospitalet and Mataró.



#### Marc López Guitar

In 2013 Marc entered the Escola Superior de Música de Catalunya (ESMUC), where he is currently pursuing an intermediate degree in traditional music performance, specialising in flamenco guitar with master guitarist Rafael Cañizares and accompaniment for flamenco song and dance with singers Jose Miguel Vizcaya, Miriam Vallejo and Jorge Mesa "El Pirata" and dancers Sara Barrero and Susana Escoda. Marc has played a variety of music styles with all sorts of bands and ensembles, sharing the stage with Joan Albert Amargós, Arcángel, Jorge Marró and other renowned musicians. He has also been involved in recording two albums.



<mark>Sara Balasch</mark> Violin

Sara has a master's in violin performance from Codarts Rotterdam, where she studied with Professor Benzion Shamir, and in 2012 she completed an advanced degree in violin performance at the Conservatori Superior de Música del Liceu in Barcelona under professors Gonçal Comellas and Manel Porta. She has worked with Quartet Kalós, Artem Trío, Orquesta Sinfónica del Vallès, Orquesta de Cámara del Penedès, Orquesta Terrasa 48, Orquesta Cadaqués, De Nieuwe Philarmonie Utrecht, Orquesta Sinfónica de las Islas Baleares, Le Concert des Nations with Jordi Savall, and youth orchestras like the JONC and JONDE. Sara also teaches violin and chamber music at various city music schools



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## **Advisory Board**



#### Marta Espinós

Pianist and music curator with an Artist Diploma and MMus in piano performance from the Meadows School of the Arts in Dallas, Texas, where she studied under the great Joaquín Achúcarro and became one of the pianists sponsored by his foundation. A concert pianist with a solid track record, Ms Espinós is also artistic co-director of Lo Otro and deputy director of Fundación Cultura en Vena.



#### Belinda Sánchez Mozo

A pianist with an advanced degree in piano and chamber music and a master's in music therapy, Ms Sánchez studied under Jesús Ángel Rodríguez and Salomon Mikowski in Santa Cruz de Tenerife and Manhattan. She became a certified music therapist in Spain while taking courses at the University of Roehampton and the Royal Hospital for Neuro-disability in London.



#### Yerko Ivánovic

A pianist, composer and doctor specialising in neurology and rehabilitation, Mr Ivánovic studied medicine at UCM. As director of a medical neuro-rehabilitation centre, he used music for therapeutic purposes. He has been a guest lecturer in numerous national and international master's courses and is currently a specialty registrar in Clinical Neurophysiology.

## **External advisers**



José Luis Temes

This orchestra conductor was awarded the National Music Prize in 2009 for his immense contribution to the promotion of Spain's musical heritage. Mr Temes has worked with every major orchestra in Spain and several in Europe. He has conducted countless cycles and festivals, premiering over 300 works and recording more than 100 albums. He has also given over 400 lectures and written books and essays.



#### Ana María Díaz-Oliver

Head of CSR at Hospital Universitario 12 de Octubre, Ms Díaz-Oliver has a BS in Psychology and 14 years' experience in the private sector. In addition, she has spent 13 years working in the human resources, patient services and CSR departments of public hospitals. She has been teaching courses on HR and specific skills for the healthcare industry for over a decade.



#### Cristina Ferriz

Director of the Conservatorio Profesional de Música Victoria de los Ángeles, Madrid, Ms Ferriz has an advanced degree in piano instruction from the Real Conservatorio Superior de Música de Madrid and a graduate degree in piano and chamber music from the Pražská konzervatoř (Prague). She has worked as a tenured professor of piano at the Conservatorio Superior de Salamanca.

## **Medical researchers**



Carmen Pallás

Head of the Neonatal Care Department at Hospital 12 de Octubre. Associate Professor of Paediatrics at the Universidad Complutense. Member of Previnfad, a working group for child and adolescent prevention. Director of the NIDCAP training centre and the donated human milk bank at Hospital 12 de Octubre. Chair of IHAN-UNICEF (Initiative for Humanising Birth and Breastfeeding Care) since 2013.



<mark>Jesús Vara</mark>

Undergraduate degree in medicine from UCM. Master's in disability assessment from the Universidad Autónoma de Madrid (UAM). Master's in paediatric disability assessment from UCM. Consultant specialised in Physical Medicine and Rehabilitation at Hospital Universitario 12 de Octubre, Madrid. Dr Vara is in charge of the Pelvic Floor Rehabilitation Unit.



#### Juan Carlos Montejo

After medical school at the Universidad de Salamanca, in 1985 Dr Montejo became an intensive care specialist at Hospital 12 de Octubre in Madrid and worked there as Head of the ICU until his recent retirement. One of his greatest interests is humanising the ICU to improve the hospital experience for patients, their relatives and healthcare workers.



#### Joaquín Martínez-López

In 2016, he became Head of Haematology at Hospital 12 de Octubre in Madrid, a position he still holds today. Since 2005, Dr Martínez-López has been an associate professor at the medical school of the Universidad Complutense de Madrid. He was also a visiting professor at Harvard Medical School (Dana-Farber Cancer Institute) for three months.

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Roberto Martín Asenjo

Undergraduate degree in medicine from UAM. Cardiology consultant after completing the MIR (specialist training) at Hospital 12 de Octubre. Master's in acute cardiac care. Critical cardiac care certification from the European Society of Cardiology. Dr Martín currently works as a consultant in the Coronary Unit and has a special interest in the quality of healthcare.



Jesús Hernandez Gallego

Head of the Neurology Department at Hospital 12 de Octubre in Madrid. Professor at the medical school of the Universidad Complutense de Madrid.



Carmen Muñoz Ruiperez

Medical doctor, surgeon and Head of the Occupational Medicine, Health and Safety Department at Hospital Universitario 12 de Octubre. Member of the Spanish Association of Specialists in Occupational Medicine (AEEMT), under the aegis of the Spanish Ministry of Health, Social Services and Equality. Member of the Hospital Universitario 12 de Octubre Teaching Committee. Supervisor/coordinator of specialist trainees in Occupational Medicine.



## Credits

#### Fundación Cultura en Vena

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Deputy director: Marta Espinós

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