

# Music at times of critical isolation: pivoting hospital music practice in paediatric critical care during Covid-19

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## Article Info.

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## Abstract

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In the UK, a growth in formal and informal evidence on the benefits to staff and patient wellbeing of therapeutic live music programmes delivered at hospital bedsides has seen an increase in using carefully placed music making initiatives in clinical settings. In sensitive areas of critical care where levels of stress and emotional anxiety are heightened, the importance of close collaboration between musicians and their clinical colleagues is imperative to ensuring such empathetically placed music is responsive and in tune with the wider environment. This article discusses the musical methodology of one such project through a case study of musicians' practice in a critical care environment. It considers the approach taken by two musicians in developing a bespoke music programme for a paediatric critical care unit in a northwest UK paediatric hospital in collaboration with clinical teams of staff. Considering the COVID-19 pandemic and the impact on therapeutic music practices in hospital settings across the world, it discusses how the project has pivoted temporarily as a means of maintaining contact between musicians and ward areas and considers the positive effects of these responsive adaptations and the questions they raise for musician and clinical teams.

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## 1. Introduction

The Paediatric Critical Care (PCC) unit at Royal Manchester Children's Hospital has worked with specialist hospital musicians Ros Hawley and Mark Fisher as part of a hospital music for health programme since 2016. Beginning with initial pilot residencies to introduce live music to both intensive care and high dependency units, the project in PCC has evolved into a full-time residency programme which, pre-pandemic, was structured to offer live music sessions to both clinical spaces three times a week, a programme of staff training and awareness sessions, and resources for patients and staff. Unlike the other specialist musician residencies delivered in our wider programme within the hospital, a key element of the programme in PCC is the use of live music to alter auditory experience of the existing acoustic environment, with the aim to relieve stress and anxiety and provide a more therapeutic and responsive acoustic for child patients, families and staff. Two projects, Soundspaces and Sound

Environments, form the basis for the programme. Soundspaces, a strand originally set up by the music team and funded through the charity Youth Music, allowed exploratory residencies to take place which built on the initial early pilot work. Soundspaces extended the number of sessions offered to PCC and allowed musicians and key staff to form strong working relationships which enabled the project to become embedded within the units. Crucially this strand allowed time for musicians to become familiar with the complexities of each unit and develop a model for their sessions which could be supported by staff. The project focused on addressing areas within hospital environments that experience higher volumes of noise pollution and aimed to explore how live music could ameliorate the effects of noise on patients and their families.

The success of Soundspaces led to the development of a further project, Sound Environments, initiated by PCC Ward Manager Eleanor F. Aston. This project further extended the music provision offered to PCC to include a focus on staff wellbeing and sessions on music awareness within critical care. This project is ongoing and will deliver sessions and resources for staff for them to gain a more nuanced understanding of the benefits of music within their own practice and be able to support child patients and families to access music-making whilst in critical care.

**Fig. 1** (Right-Left) Eleanor, Ros, and Mark on PCC



Due to the coronavirus pandemic, our team, consisting of musicians Ros and Mark, PCC Ward Manager Eleanor Aston and housekeeping staff, with support from clinical psychology professionals, Consultant Paediatric Intensivist **Stephen** Playfor and Susan Fairclough, Head of Therapeutic and Specialised Play Services, have come together in this article. Invited by Ros, we each share perspectives and our existing research related to the music programme. We use this space to consolidate the project, as we begin to explore adaptations to the existing programme and sustain access to music for patients, families and staff within the ward spaces. At the time of writing this exploration was in initial stages and resulted in the team exploring a wider range of access points for music for patients and staff and using recorded music as a complementary resource when needed. This adaptation led to the programme being

acknowledged nationally and internationally through Cardmedic™<sup>1</sup> communication system which enables medical staff to communicate more effectively with patients whilst wearing PPE. In this article our team explores the development of this bespoke music programme in the hospital's Paediatric Critical Care Unit and examines the initial stages of our move to providing musical interaction opportunities to patients and families remotely during the Covid-19 pandemic.

**Fig. 2** Ros and Mark playing at a doorway for a child patient and their family on PCC



## 2. Clinical benefits of music for critically ill children – an Intensivist's Perspective

The administration of drugs is not a substitute for the sympathetic nursing of critically ill children, and careful attention to environmental factors enhances comfort and can reduce the need for pharmacological analgesic and sedative agents. Commonly used non-pharmacological techniques include music therapy, massage, relaxation techniques and play. The importance of these interventions was highlighted in the first consensus guidelines on sedation and analgesia in critically ill children, published in 2006 (Playfor *et al* 2006). At the current time there is very little high-quality data on the impact of music therapy in the paediatric population. The Music Use for Sedation in Critically ill Children (MUSiCC trial) pilot study is a three-arm, randomised controlled trial on the use of music for sedation in PICU comparing music versus noise cancelation versus standard treatment in sedated and mechanically ventilated critically ill children (Garcia Guerra *et al* 2020). This work will hopefully demonstrate the tolerability and feasibility of a music intervention and lead to a definitive trial of music therapy in critically ill children.

<sup>1</sup> Developed by Dr Rachael Grimaldi in response to patients' experiences of increased stress and anxiety due to communication challenges caused by PPE within critical care settings during the pandemic, see <https://www.cardmedic.com/> (accessed 16/10/21).

In wider research involving adult populations which supports the rationale for live music making in PCC, the positive impact of music therapy on critically ill, mechanically ventilated patients has been recognised for more than 20 years (Koch *et al* 1998, Guzzetta 1989, Updike 1990, Chlan 1998) There is evidence that music therapy reduces levels of stress and anxiety generally in mechanically ventilated, critically ill patients and can reduce the need for pharmacological analgesic and sedative agents. Gullick *et al* demonstrated that patient-directed music therapy led to significantly lower anxiety and sedation intensity compared to usual care, whilst acknowledging that their findings may not transfer to sedated or cognitively-impaired patients (Gullick *et al* 2015) . Similar findings were published by Chlan in a randomised, controlled trial that enrolled 373 critically ill patients (Chlan *et al* 2013) .

More recently, it has been suggested that exposure to personalised or relaxing music therapy may also reduce the incidence of delirium in the intensive care unit; an increasingly recognised complication associated with considerable morbidity and cost implications (Khan *et al* 2020). Where music therapy was introduced as part of a bundle of non-pharmacological interventions, Rivosecchi *et al* were able to demonstrate a 50.6% reduction (16.1% vs 9.6%,  $P < 0.001$ ) in time spent delirious in intensive care with the protocol reducing the odds of developing delirium by 57% (odds ratio, 0.43;  $P = 0.005$ ) after controlling for age, Acute Physiology and Chronic Health Evaluation II scores, mechanical ventilation, and dementia (Rivosecchi *et al* 2016). Music therapy may also be effective during painful procedures, reducing patients' pain during procedures such as tracheal tube suction (Yaman Aktaş *et al* 2016).

Music therapy is believed to modulate the central nervous system through dopaminergic neurotransmission; listening to pleasing music leads to a rapid reduction in blood cortisol levels through modulation of the hypothalamic-pituitary adrenal stress axis. These effects can have a beneficial impact on the hypermetabolic responses of critical illness and the pattern of cytokine release (Nelson *et al* 2008, Beaulieu-Boire *et al* 2013).

A Cochrane review undertaken in 2014 demonstrated that the use of music in mechanically ventilated adults was associated with lower levels of anxiety, lower sedation requirements, and improved vital signs, suggesting relaxation (Bradt *et al* 2014). Two further systematic reviews were published in 2019 with mixed results; Guerra and colleagues found limited evidence for the efficacy of music therapy in intensive care (Garcia Guerra *et al* 2019) while Umbrello and colleagues concluded that music therapy is 'consistently associated with a reduction in anxiety and stress of critically ill patients' (Umbrello *et al* 2019).

### **3. Musicians Working in Hospital Settings – Overview**

Due to the relative newness of the model of musician practice in hospitals, there is little research to date on (specifically) musicians' practice or programmes in critical care settings. A forthcoming PhD thesis by Ros Hawley (senior specialist musician) aims to support this development and her research examines in more detail the contribution of ethnomusicology to the study of musician practice in healthcare contexts, and the perspectives she discusses here within this article relating to musical interaction, musician's practice and the acoustemology of the hospital environment. Although Tia DeNora's study of the practice of music therapist Gary Ansdell in adult mental health contexts (De Nora 2013:79-120) is a model for examining community music therapy practice, where descriptive patient/participant case studies are more common; in musician in hospital (or healthcare) practice autoethnographic studies of musicians' practice are yet to be represented.

Studies of European musician in hospital practice are documented in the research of Costanza Preti (2013), and of Preti and Welch (2004, 2009, 2012, 2013). Preti first highlighted employment of hospital musicians as an emerging practice in 2009 with a study examining the range of practice models and provision existing within UK hospitals at that time. She identified these as ranging from concert style performances in hospital spaces to specialised programmes employing musicians trained in engaging

patients at their bedsides on hospital wards. Often this work is delivered by a broad range of organisations including specialist music and health organisations, internal hospital arts programmes, music performance organisations, and volunteer and student training programmes.

Preti's work is not a study of music therapy practice; it examines a model of therapeutic music making centred around the right of hospitalised patients to access to culture<sup>2</sup> later explored by Koivisto and Tähti (2020); a review of music projects in healthcare settings by the UK charity Youth Music (Robinson 2017) also contributes evidence of this model of practice, as does our own research evaluations by the University of Salford school of Health and Society (2013, 2016). Preti's comparative study of two European musicians in hospital programmes examines the emotional impact on musicians who undertake regular programmes of musician in hospital practice. In this research, interviews with musicians, conducted as part of fieldwork research, highlight the practical and pastoral challenges arising for musicians working in hospitals, such as experiences of emotional and musical performance fatigue, and the potential for burnout due to imbalances arising in musicians' career portfolios. Musicians' need to access professional and creative stimuli in other work environments to counterbalance the strains of working long-term in hospital programmes is noted. Although musicians' thoughts and feelings are captured here through interview responses and represented in the research findings overall, there is a lack of documented research relating to individual musician experience of working in hospitals (Hawley 2018; PhD thesis, unpublished).

#### **4. Children, Hospitalisation, and Therapeutic Musical Interaction: A Musician's Perspective**

In understanding the life experience of a child affected by hospitalisation, it is important to consider not only the impact of the environment itself on a child; opportunities for shared interaction of any kind may also be severely reduced. In hospital, understanding of children's competence is fluid due to a child's reliance on the support of caregivers who are not consistently present (Livesley 2010). Music-making as a therapeutic intervention able to readdress this imbalance of need is well documented (Aasgaard 2004; Ruud 2004; Lorenzato 2005; Ansdell 2010; Malloch et al 2012; DeNora 2013). Case studies recounting music therapists' experiences of working with children in palliative care, children and young people receiving oncology treatment, children and young people who have experienced trauma or are displaced from families and communities and have had to seek asylum or refuge, highlight a broad scope of contexts where this model is applied to support children with complex health needs or social situations. Such examples of music therapy practice exemplify the model of community music therapy practice (Pavlicevic and Ansdell 2004), where individual therapists moved their practice away from formalities associated with traditional therapy rooms and university settings, and into the wider community.<sup>3</sup> The shift towards community focused music therapy has drawn together a broader theoretical base and suggests new models of collaborative research. Such developments are also evidenced in the trajectory of medical ethnomusicology (Koen 2017). Stige noted that the emergence of community music therapy 'implies that theories from fields such as systems theory, anthropology, sociology and community psychology are taken into consideration as well as more traditional links..... that are also practiced.' (Stige 2010:05). These recent developments in the study of therapeutic musical interaction allow space for increased inclusion of musicians' practice as research to further enrich theoretical discourse.

Music plays a key role in the development of a child's early communication. A new-born's early communication is embedded in elements of music-making central to the musical experience (Malloch and Trevarthen 2010; Malloch et al. 2012). Use of pulse, vocal inflection, pitch, phrasing, tone, and gesture, form the basis of communicative interactions between parent and child, and are vital to the affirmation of this newly developing relationship (Malloch 1999: 48). For children who spend much of

<sup>2</sup> Culture in this context is as defined by Philippe Bouteloupe, Director of Musique et Santé (who developed a European model for musicians working in hospital settings), during one of the musician's experiences of training with the organisation in 2004-5.

<sup>3</sup> Ruud explores this further in the introduction, Pavlicevic and Ansdell (2004).

their early lives in hospital, challenged by medical diagnosis, opportunities to develop their communicative musicality are limited. With increased probability of isolation these skills become a vitally important opening to maximise communication opportunities. Children who are hospitalised and have additional communication needs and disabilities may experience reduced opportunities to develop communication and social skills. Where child patients communicate non-verbally, gesture, breath, vocalisation, and facial expression, can be acknowledged in therapeutic music-making and responded to by musicians in bedside interactions. A musician working in a hospital can greatly assist in increasing opportunities for this vital component of child development and patient wellbeing. Musical interaction in hospital provides a ‘way in’ to understanding the communication of a child who may not be able to communicate verbally; when framed within music, their moments of communication become more widely visible. The assessment framework Sounds of Intent (SoI)<sup>4</sup>, developed by Adam Ockelford (2008), demonstrates that the very same elements of music-making central to the experience of communicative musicality are vital building blocks in the musical, educational, and social development of a child or young person with even the most profound disabilities (Ockelford 2008:79). Importantly, the programme highlights musical ability in children who are otherwise often negatively categorised by their disabilities. When considering the situation of a hospitalised child with complex medical needs and disabilities, it is clear to see the value in being able to access music-making interventions from an early age. Understanding the importance of music-making for a child with profound and multiple learning disabilities (PMLD), demonstrated in educational programmes as SoI, can only enrich knowledge when offering music-making opportunities to hospitalised children, particularly in environments such as critical care, where children’s complex medical needs mean more time is needed in order for them to be able to respond, and appropriately paced and sensitively communicated musical exchange is essential.

### **5. Music, Listening and the Hospital Environment: A Musician’s Perspective**

A hospital space is a unifying factor in the lives of all those within it – whether patient, visitor, or staff member. Musical interactions at bedside spaces can invite listeners to take their thinking to a different place, and to view their environment from a new auditory perspective. Such interactions provide a temporary therapeutic and personalised distraction to situations of suffering, boredom, or discomfort. The anthropologist Tom Rice, in his study of hospital sound environments, notes a multi-layered understanding of auditory information and sound experience already exists (Rice 2013:38). He states that the sonic environment of a hospital building possesses its own soundscape, made up of machine and human noise, which can be at times jarringly cluttered or silently empty, and lacking in opportunities for individualised control (Rice 2015:104). In hospital, Rice states that listening practices can become methods of surveillance as a patients’ control over who can and cannot hear their conversations and bodily sounds is lost (Rice 2013:21-37); patients may feel that they do not have choices over what they can hear or prefer to listen to. Over time, with longer hospital stays, patients may be able to mediate their own listening to block out sounds, or even become less aware of the existence of sounds (Rice 2013:38). Perceptions of auditory environments inform how people experience them: combinations of sonic images, memories, voices, noises, spaces, and occurrences, form an individual record of experience, drawing on sensory perception, creating personalised sonic envelopes (Bull 2000). People find alternative ways to navigate existing audioscapes by creating their own listening environments, exerting control over their situations by removing themselves from the sound world around them (Bull 2000, DeNora 2013). Tia DeNora’s statement that ‘music is an active ingredient in the organization of self, the shifting of mood, energy level, conduct style, mode of attention and engagement with the world’ (DeNora 2013:61) reflects the experiences of many children and families in critical care who have found musical interactions to be beneficial. DeNora notes the importance of an individual’s social connection to a musical experience in determining how a person responds to music they hear. She notes that, as well as aiding mental focus and blocking out unwanted or less important sounds in urban environments, ‘music’s effects come from the ways in which individuals orient to it, how they interpret it ...within [their] semiotic web of music and extra-musical associations’ (DeNora 2013:61).

<sup>4</sup> See <http://soundsofintent.org/about-soi> (accessed 15/05/20).

When creating personalised listening spaces in hospital environments, people may rely on technology. Using MP3 players, iPods, and headphones gives a clear visual signal to others of exerting a choice to listen to a self-determined soundscape; however, the effectiveness of this as an alternative listening status is dependent on the type and quality of the equipment used; exposure to the visual landscape still remains, and this new personalised sonic environment could even contribute to further noise pollution through the bleeding of sound, affecting those close by (Rice 2013:43; Beer 2007:858). Bull describes mediation of public spaces through listening to chosen music as ‘a way to enable a space for clear thought, imagination and mood maintenance’ (Bull 2005:349). In a busy hospital acoustic, live music may help a patient to clearly prioritise positive sounds over unwanted or meaningless sounds, when there are numerous sounds in competition with each other. Tom Rice’s experiences of listening in a hospital environment point to a use of carefully considered listening practices to gain insight into a patient’s mediation of the clinical acoustic. He describes how, during his research, he developed ‘a carefully situated and emplaced listening – an immersion in the sound environment of the wards’ (Rice 2015:107) to better understand hospital life. When creating personalised musical interactions in critical care spaces, hospital musicians’ listening is also carefully emplaced: we are also constantly listening out to (and for) the environment and the people within it. This process combines focused, attentive, and therapeutic listening (Rice 2015:107), and is necessary in ensuring that our music-making is responsive to the situations of people around us. Bull describes how iPod listeners “personalise the time of their journey through using music as a form of ‘auditory mnemonic’ through which they attempt to construct a sense of narrative within urban spaces” (Bull 2005:349); in a similar way a bedside musical interaction can create a sonic envelope like Bull’s description, giving people an auditory memory of their hospital visit, accompanying them onward to their ward, home, or family life.

## 6. Sound Environments: A Study of Music Practice in Paediatric Critical Care ( PCC)

Building on the Soundspaces project, The Sound Environments Project in Critical Care uses live music to enhance and improve the clinical environment in two ways:

- 1) to alter the existing acoustic with live music, thus reducing levels of stress in staff, patients, and families.
- 2) to enable person/patient centred musical interactions to take place at children’s bedsides, supporting their (and their families) experience of hospitalisation and recovery.

The Sound Environments project is structured to provide up to 3x2-hour sessions per week for one year, covering paediatric intensive care and high dependency wards, delivered by senior music for health specialist musicians from the hospital Music for Health team. Time is included within the sessions for musicians to make notes and preparations for individualised interactions. In addition, time is allocated for two junior musicians to join the project, who will be supported to deliver an additional 20 sessions, with time allocated to develop repertoire and contribute to resources for the project. Training sessions for staff teams are also included, as is funding to purchase a range of tuned and untuned percussion instruments meeting hospital infection control protocols. The aim of the project structure is to ensure that the project is embedded and recognised by all staff, the musicians are known to staff and that there is a shared understanding between musicians and clinicians of the aims and structure of the project. For the musicians, getting to know staff teams, particularly in areas of high staff ratio such as PCC, is important in terms of building relationships and an understanding of the critical care environment. Eleanor F. Aston, Clinical Ward Manager in Paediatric Critical Care (PCC) at The Royal Manchester Children’s Hospital, describes the reasons for developing the programme:

‘I have worked within PCC for over 22 years and have a key interest in making a positive environment for all patients, parents and staff present on our unit.

Paediatric Critical Care (PCC) is an area of high noise, high stress and anxiety-acutely experienced by patients, parents, and staff alike. This directly impacts on the health and well-being of the patients, most of whom are critically ill and desperately require a calm, restful and quiet environment to be able to rest and recover. Patients cannot turn off the beeps on the machines and are often unable to vocalise or communicate their sensory/auditory needs which exacerbate the problem.

There is currently lots of research spanning several decades which shows a correlation between the duration of sleep and an increased mortality risk and cardio-metabolic disease in healthy populations. On average, patients within PCC get on average 3 hours of sleep a day and this is often broken and interrupted. One of the challenges faced on PCC is being able to deliver care to critically ill children, whilst employing strategies to reduce risk factors which gravely impact upon morbidity and mortality (Pisani (2015), (Figuroa-Ramos et al (2009)).

The Soundspaces and Sound Environments projects are specifically designed to explore noise pollution in Paediatric settings – focusing on areas of high noise and stress to explore the role that live music plays in alleviating anxiety caused through such experiences, and working alongside healthcare staff to improve the environment for patients and their families, thus aiding recovery.

The programme delivers a bespoke patient centred interactive music programme that specifically caters for the needs of PCC and its patients. The musicians consult with patients, families, and staff to create specifically composed live music to enhance the units' sound environment, seeking to bring down the overall noise level.

The Sound Environments project has also developed and explored the idea of 'quiet time' where artificial noise levels such as from the machines were consciously reduced. There has also been sound and music awareness training available for unit staff to be able to monitor sound levels and utilize musical techniques to calm and soothe when musicians were not on the units.'

(Eleanor F. Aston, email communication, September 2020)

In the next section we examine the approach taken by the specialist musicians as they work on the PCC units, introducing live music to the clinical areas and engaging with children and families at their bedsides.

## **7. Sharing Hospital Musicians' Approach to Music-Making in Paediatric Critical Care**

Our choices during musical interactions in critical care spaces are influenced by the responses and reactions of the children we observe as we listen, play, and answer them, in music, together. The repertoire we use consists of children's songs and lullabies, folk tunes from a range of cultures, and bespoke composed material developed from our practice and experiences of working in hospital settings (Hawley 2018). For this project Specialist Musician Mark has also developed material specifically for the PCC environment, where there is a clear focus on reducing stress, noise, and anxiety (see <https://mvfisher.net/blog/>).

During interactions, each rendition of a melody or motif we play is subtly varied in tempo, dynamic level and emotional intensity, as we follow a child's individual situation, and we work to gradually build our music-making around a child's (and family's) reactions and needs. In critical care, this work is acutely sensitive, as at times children's responses are as subtle as a change in secretion levels or a momentary opening of eyes, or a change in breathing rates as a child relaxes. We observe bedside monitors as we



play, to note any changes in a child's oxygen saturation levels, and are guided by staff and family when necessary, as to the responses they are witnessing from a child as music is played. At these times we are conscious of the challenges faced by families as they sit next to their child, and are careful to support, but not intrude into personal space. With careful reading of non-verbal signs and gestures, we can assess whether it is appropriate to move closer or further away from a child patient or remain in the same position near to their bedside, or to engage with family members directly. At other times, however, children may lead us directly in music-making through gestures, head turning and body movement, or by their playing of hospital approved percussion instruments.

Such moments of music-making can bring joy and lightness to all in the surrounding environment, as a child's achievements are celebrated. At times these events mark a milestone in a child's recovery process or help a parent to see their child is still 'there', despite their medical condition and being surrounded by medical equipment. The following anonymised examples from our session notes demonstrate two such music-making interactions taking place during a music session, one within the High Dependency Unit, and one within Paediatric Intensive Care:

- 1) On seeing us playing on the ward, a child waves at us. We move towards their bed. Mum is on her phone and a nurse is checking machines; she smiles. We start to play and when the nurse has finished, we move closer. The child is conscious and aware. I tell the child that the music we are playing for them is about a bird flying high in the sky on a summer's day - do they want to try some of our instruments to add some new sounds to the music? The child says yes. The child tries 4 different instruments as we play, conducting the music with shakes and ding sounds made on the instruments, which we follow, changing speed and dynamic. The child laughs. Mum stays quiet, I think giving her child space to play. At the end I ask the child if the sounds could represent anything the bird might have seen on his journey. The child replies: 'mm ..this one is like the trees...this one...it's like a water fall...these are like the sounds of other birds - like baby ones...and these are like crickets and things like that in the grass.'
  
- 2) A child with limited mobility interacts non-verbally during the session by reaching their hand out for the small percussion instruments. The child gently, slowly, turns the instruments round with their hands as we play. When we sing or say the child's name, the child looks up. Staff make way so the child can participate; this continues for some time. As we leave, we hear the nurses congratulate the child on their participation.

As we interact at bedsides, we use body movement to reinforce the mood created by our music. We move around a bedside space within music-making and adjust our height and proximity to each child; at times we remain still to reinforce feelings of calmness. Central to this approach is our collective aim to use improvisation to move us between spaces of musical performance to spaces of personalised musical interaction with children and their families. This approach relies on us being 'in tune' with each other, to know when to collectively make musical changes and adjust our responses.

A busy hospital ward can be a cluttered space full of equipment, trolleys, children's toys, and the sounds of everyday hospital life. Feelings of tension can be clearly sensed: a child's anxiety can increase if they are approached unexpectedly at the bedside, unsure of what might be about to happen, a family may be distressed and exhausted as they wait for their child to wake up or show them any signs of responding to treatment. Sounds compete for auditory attention; knowing when to introduce music relies on our ability to assess a ward area and decide if it is a good time to introduce music. We observe each family's situation carefully as we move around the ward spaces. Do children look interested? Are children sleeping, or sedated? Are parents receptive or needing time alone? Do children and their families need privacy and seclusion or distraction and interaction? Is a treatment about to happen?

We choose when to add music in response to these assessments. Acoustic musical instruments offer a sensory respite from the automated electronic world of machines and monitors that surround a child in critical care. We have observed that the presence of live music invites opportunities for interaction, or at least mild curiosity: rich colours of black, brown, and silver contrast against the putty grey colours of many of the medical machines. The grain of the wood, shadings of wood dye, the fret board behind the strings, the little rods, levers, and screws that hold keys in place spark interest and curiosity as they are scrutinised in close proximity; sound holes on the clarinet appear black and infinite when explored by an inquisitive eye, revealing darkness inside. As we play, we are aware of the responses the music generates, and anticipate these with our own movements and shared interaction. Through this we create a subtle focus on ourselves, the music makers, whilst watching carefully to see who might want to interact with us.

We are aware too that at such difficult times not every family will want us to visit them or engage; our body language has to be sensitive to this, and our communication subtle. In these situations, we are careful to move our music, and focus, away from bedside spaces and into more communal ward spaces in the critical care unit. We also make time during each session to play for staff, at nursing stations and reception areas. This is particularly important in PCC, where staff can experience highly stressful situations as part of their daily work; allowing space for music to acknowledge staff in this way is our way of saying we don't forget them, that we see and hear them in the same way as the children and families we engage with in music.

As we play, we regularly notice people taking moments of time to look up to watch. We have observed that watching musicians play, however briefly, gives people the choice of an alternative visual focus, and a temporary auditory respite from their surroundings. Our fingers and hands interact with our instruments, pressing keys, strumming strings, tapping, and moving our instruments within the making of the music, making patterns of our own. Our movements communicate musical patterns which contrast with the individualised digital patterns displayed on monitor screens. We repeat a musical pattern to provide consistency or to create a sense of calm. We might speed up or get slower in response to our observation of a child's reaction to the music: slower to match breathing, faster to match energy. Entry into a ward space and then moving within it also form part of our music-making techniques: as we travel between spaces in hospital wards and between hospital bedsides, we use our movements to reflect the mood we are creating in the music we play. Our awareness of the impact of live music on the environment and its community, and our care in moving within spaces during moments of musical interaction allow us to create moments of mood change, surprise or relief for child patients and their families.

During the programme feedback from staff and families is collected on postcards. People are invited to write thoughts, comments, or draw pictures representing how the music has made them feel and describe the impact of the music on their experience of PCC. This helps to support the programme in terms of providing evidence of positive patient experience. PCC Ward Manager Eleanor Aston writes:

'Feedback from parents and staff on PCC has been nothing but positive. Comments we have received include:

*'Amazing to listen to, creates a soothing atmosphere'.*

*'Relaxing, makes me get goose bumps. Can see a difference in patient's heart rate when playing close by'.*

*'Such beautiful and calming music. The patients respond so well to it'.*

*'Very mellow and therapeutic. Relaxing, lovely addition to the day'.*

*'Amazing, made my child smile, smile and smile. Such a good experience. Thank you for bringing happiness to our room'.*

The direct benefits to the patients from this project have been a calmer, less noisy environment, relaxation and restfulness, thus aiding and reducing recovery time and alleviating staff stresses.'

(Eleanor F. Aston email correspondence, September 2020)

## **8. Benefits of the Music for Health Programme at Royal Manchester Children's Hospital – a Play Manager's Perspective**

At the Royal Manchester Children's Hospital, the music programme is delivered with the support of The Department of Therapeutic and Specialised Play (TSP), under the direction of Susan Fairclough. Whilst the music programme sits as a distinct strand within the services offered by TSP, the role of play for children in hospital advocates much for the use of carefully placed musical interaction in PCC, as well as the wider hospital, and for the value of playfulness and empathy within musical interaction. Susan states:

'It is important to remember that when children are ill or have limitations and restrictions, they do not always engage in all play activities and may need encouragement, support, additional ideas, and methodologies for them to engage in play. Play, recreation and activities often take place in the playrooms, teen rooms, by the bedside or in play areas. Some children may need to be nursed in an isolation room and due to their condition or treatment are unable to mix with other children. It is key that play is a vital part of these children's routine throughout the day. Being isolated causes considerably greater stress than what is normally experienced by children and young people in hospital. Hogg (1990) says that children/young people in isolation have difficulties due to being away from home in an unnatural, lonely, and alarming situation with no opportunity to play with others.. The Health Play Specialists and Play Leaders understand the importance of play and interaction, including projects, to take place each day offering activities that require a short concentration span as well as those that require longer time. Play activities can be provided to run alongside the child's/young person's length of stay. An example of this is allowing the child/young person to make something like puppets, a puppet theatre and, eventually, a show and encourage projects to interest them for some time as well as activities that have an ending or end product much sooner. Encouraging parents and other staff to engage in play is also required. However, it is essential that patients in isolation have this interaction to help create normality, reduce boredom, and maintain their development.

The Music for Health Team are integral to the healthcare team. They have provided many projects, schemes, and research over the many years they have been linked with the Therapeutic & Specialised Play Service. Working with individual patients and in small groups as well as during atrium music sessions, their live music and interaction has had many benefits to patients, families, and staff. A parent of a long-term patient said "For the first time in five weeks, when they started to play for her, she relaxed. The pain appeared to subside enough for her to get a few minutes of respite. I cannot put into words the feeling of gratitude for those few moments when my daughter appeared to have been removed from her awful situation and transported somewhere else".

What Music for Health provides is inclusive for all age ranges, all abilities, and different cultures. Music making with hospitalised children is evidenced by research from the University of Salford School of Health and Society (Cavanagh et al 2012 and Livesley et al 2016) with support of the Manchester Foundation Trust Charity. The music and musicians empower children/young people and families, supports their resilience, transforms the hospital experience, reduces feelings of stress and anxiety, enables parents to reconnect with their child after a life changing medical event and promotes feelings of hopefulness in dealing with challenging circumstances (Music for Health 2018).'

(Susan Fairclough, Manager, Therapeutic and Specialised Play, email communication, September 2020).

## **9. Covid-19: Adapting our Programme – Musicians’ Experiences of Piloting New Music-Making Activity**

As a team with current restrictions within our hospital relating to COVID-19 we have had to find innovative ways to continue the great work which has already been achieved together. In this section we share two starting points – pilot methodologies- explored (at the time of writing) as a means of developing adaptations to our music-making in PCC, to enable patients, families and staff to access music on the wards. These adaptations are informed by the musician’s approaches to bedside music-making discussed earlier and aim to convey the same intention of responsiveness to the clinical environment and personalisation of musical interaction as much as possible. Moving forward we are planning to deliver our bespoke patient centred interactive music programme virtually using iPad and Microsoft Teams application, with staff utilising musical instruments for the patients to be able to interact with the musicians on the screen. We look forward to reporting on this in future.

## **10. Remote Musical Interaction**

During the first lockdown, a trial of weekly remote music sessions with a young boy and his family as part of a pilot programme using music to support transition for child patients with complex needs at the hospital has formed the basis for our explorations of remote music-making with children with complex healthcare needs. Having time to document these first sessions through fieldnotes has given a valuable insight into how music-making practices were able to be adapted to work on screen as discussed in the excerpt we share here:

‘We developed sessions for him linked to his favourite theme, the sea. These sessions needed to be multi-sensory in nature, to engage and capture the child’s imagination; in effect the sessions were co-created by the child, as we responded to his preferences, choices and instructions for developing activities and sea-themed props and puppets each week. These were then used to represent sea like sounds or instruments he chose to play, and improvisations were developed around his playing. We also used the props and puppets to create musical activities that supported the child to develop his musical skills, such as dynamic control, conducting, counting and pulse, changing speed and tempo, and play and stop games.

We observed that in developing music-making activities that could be communicated through a screen to the child with extra visual and sensory support, we could aim to create an alternative environment for the child to enter into each week, rich in colour, audio and visual stimulus. This space allowed the child to be removed temporarily from their lockdown situation, to play, explore, and engage with live music and musicians, who were still able to be directly responsive to his communication and direction.

The sessions allowed us to explore the potential for working through a computer screen and challenged us to think about how we could continue our interactive approach with children when we were unable to make music in the same space together. In doing this, we explored how to use the space of the computer screen, and experimented with handmade puppets and backdrops, and used sensory materials such as sequined cloths and foil blankets to create sea themed spaces from which to develop music and musical activities. We experimented with using a range of percussion instruments to see which instruments maintained their sound quality when we played them through a usb microphone linked to the PC during sessions. The family also had a range of instruments at home– ocean drum, diatonic bells, shakers, tambourine and xylophone, which the boy used, supported by mum when necessary, as well as making homemade instruments from

pistachio shells in plastic tubs, water bottles and grain, and pots and pans, and finding sounds on their I-pad to contribute to activities during the sessions.’

(Ros (Specialist Musician) fieldnotes after discussion with colleague Mark, September 2020)

**Fig.3** Stop/Go Fish Conductors!! Visual aid puppets created during lockdown for remote child-led musical activity



**Fig. 4** Ocean backdrop created by the musicians during lockdown to accompany a remote music session



We reflected that experimenting with distance and proximity to the screen worked well when using props within musical activities. For example, in creating a sunrise/sunset activity where, as Mark improvised accompanying sunshine music on his guitar, Ros moved the sun slowly up and down, and

closer to the screen; the boy followed the movements of the sun to explore playing louder when the sun came nearer to him, and quieter when it ‘went to bed.’

We feel that in developing these sessions we have been able to find new approaches to musical interaction, which we had not explored before the pandemic, and are hoping to utilise this learning as we go forward to develop our music sessions with children and families in PCC. Aware that the needs of children and families in PCC will be differing, yet equally complex, we are conscious that new learning will take place again as we develop and adapt our approach to meet the needs of this community of child patients and their families. The Sound Environments Project uses a theme of nature and the seasons and we will be working with this theme as we develop our new interactive sessions. Music has already been composed linked to the theme and our further work, and sessions, will build on this foundation. Instruments will be selected to accompany the different season themes and created compositions, with the aim to support and enhance children’s musical experience and optimise opportunities for participation and leadership during sessions. Where it is more appropriate, music will be used to create a calm sensory backdrop for a child and their family, helping to block out sounds from the unit without any pressure to participate. Due to the increased noise levels within the units, we are also investing in small, easily transportable (and cleanable) speakers, which will be carried by housekeeper staff, along with an I-pad to the bedside, to enable a better auditory experience for children inside PCC. We hope to be able to share our further experiences later.

## **11. Recorded Music Resources and Cardmedic™**

In the early stages of lockdown, the team had to address how to maintain access to music within the PCC units. This led to the time being allocated for the musicians to create bespoke compositions for use in the Sound Environments Project, and after discussions with Eleanor, Susan, PCC Clinical Psychology staff and colleagues, the PCC unit was able to gain permission to add Sound Environments sound files to bedside computers for use by patients and staff. Resources made by the musicians included short music and wellbeing videos for staff, and a Music for Health Soundcloud page containing music to support wellbeing. Unexpectedly this work was picked up by another Covid-19 initiative, Cardmedic™. Designed to support communication with patients through flashcards and a downloadable app, its creator, Dr. Rachel Grimaldi, was inspired create the programme after hearing of an adult patient’s experience of intensive care whilst being treated for Covid-19; unable to communicate with staff clearly, they described their experience as a Covid-19 patient in ICU as terrifying and isolating.

The musicians approached Cardmedic™ to raise awareness of how in their experience music could help patients in critical care situations and were delighted to be able to offer music developed for the Sound Environments Project strand to Cardmedic™ for patients in critical care units around the world to access during the pandemic. We feel that the ripple effect created during the pandemic by people’s desire to try to help hospitals and staff within such extreme events developed not only positive new connections within UK healthcare practice; the role of music within critical care units, as an aid to person centred care, became further highlighted, with awareness being raised not only within our hospital, but nationally and internationally. Previously, focus of musical experiences had been on ‘live’ music interaction; here we feel that due to COVID-19 the programme has successfully adapted to include access to recorded music which offers a new opportunity for patients, families and staff to engage with music on PCC and the project. We have been able to observe how often the Sound Environments compositions are played through the Soundcloud page which keeps a record of the number of plays per track. We are interested to see how this new aspect of the music programme will develop further in future.

## **12. Conclusion**

Whilst music in any form cannot provide a cure for patients, the opportunity to make a difference, even temporarily, at a time unlike any other, has given our team strength, focus and pride to carry on with

our programme, find new approaches to musical interaction, and continue to make a difference for children in PCC. Whilst at the beginnings of the implementation of COVID-19 adaptations at the time of writing, our changes have raised awareness of the hospital's music programme nationally and internationally. As with Cardmedic™, we hope that by sharing our journey of music in paediatric critical care in this article, we can support others in the development of music programmes in other critical care spaces and raise awareness of music as part of patient centred, and person-centred care within hospital environments.

The pandemic has forced musicians to rethink the ways they engage with hospitalised children, and, in our experience, has consolidated key processes and techniques we use in our practice to create spaces for therapeutic music-making. We have been excited to find that through sessions we have delivered already that there are still rich opportunities to engage with children through music, and that the screen is now a new tool for us to creatively explore within musical interactions with children. This opportunity has moved our approach to music-making with children with complex needs into a new phase and brings a new dimension to our previous musical interaction practices. The challenge brought to us by Covid-19 has been, and will be, in exploring new screen-based methods of musical interaction whilst maintaining the principles of our practice – to engage, support and make space for children's voices within music-making-as a means to support holistic care of children in hospital. Whilst we (the musicians) undoubtedly miss the experiences of live interactions, and direct contact with children, families and staff in PCC, we are excited to explore the creation of a new approach and to develop this in collaboration with clinical colleagues and teams at the hospital. We hope that development of this approach will ultimately offer a new, additional method of engaging with children and families affected by hospitalisation, even if on site music-making returns to clinical environments in the future.

## References

- Aasgard, T. (2004). A Pied Piper among White Coats and Infusion Pumps: Community Music Therapy in a Paediatric Hospital Setting'. In: M. Pavlicevic and G. Ansdell, eds., *Community Music Therapy*. London; Philadelphia: J. Kingsley Publishers, pp.147–163.
- Ansdell, G. (2010). Belonging through Musicing: Explorations of a Musical Community. In: *Where Music Helps*. Oxon; New York: Routledge, pp.41–62.
- Ansdell, G., Stige, B., Elefant, C. and Pavlicevic, M. (2016). *Where Music Helps: Community Music Therapy in Action and Reflection*. Oxford; New York: Routledge.
- Beaulieu-Boire G, Bourque S, Chagnon F, *et al*. Music and biological stress dampening in mechanically-ventilated patients at the intensive care unit ward-a prospective interventional randomized crossover trial. *J Crit Care* 2013;**28**:442-450.
- Beer, D. (2007). MP3 Player as Mobile Digital Music Collection Portal. In: A. Tatnall, ed., *The Encyclopaedia of Portal Technologies and Applications*. Hershey, USA: Information Science Reference, pp.637–642.
- Bradt J, Dileo C. Music interventions for mechanically ventilated patients. *Cochrane Database Syst Rev* 2014;**12**:CD006902.
- Bull, M. (2000). *Sounding out the City: personal stereos and the management of everyday life*. Oxford and New York: Berg.
- Bull, M. (2005). *No Dead Air! The iPod and the Culture of Mobile Listening*. *Leisure Studies* Vol. 24(4) 343–355.
- Bull, M. (2013). iPod use: an urban aesthetics of sonic ubiquity. *Continuum*, [online] 27(4), pp.495–504. Available at: <https://doi.org/10.1080/10304312.2013.803300>. [Accessed 5 Nov. 2018].
- Cavanagh, A., Livesley, J., Long, T., Dewhurst, R. and Grant, M. (2012). The RNCM Medical Notes Project at the Royal Manchester Children's Hospital: Outcomes for children, families, Musicians and Hospital Staff. [online] University of Salford. Available at: [https://www.salford.ac.uk/\\_data/assets/pdf\\_file/0020/152174/medical-notes.pdf](https://www.salford.ac.uk/_data/assets/pdf_file/0020/152174/medical-notes.pdf). [Accessed 6 Nov. 2018].
- Chlan L. Effectiveness of a music therapy intervention on relaxation and anxiety for patients receiving ventilatory assistance. *Heart Lung* 1998;**27**:169-176.

- Chlan L, Weinert CR, Heiderscheid A, *et al.* Effects of patient-directed music intervention on anxiety and sedative exposure in critically ill patients receiving mechanical ventilatory support: a randomized clinical trial. *JAMA* 2013;**309**:2335-2344.
- DeNora, T. (2013). Music Space as Healing space: Community Music Therapy and the Negotiation of Identity in Mental Healthcare. In: G. Born, ed., *Music Sound and Space: Transformations of Public and Private Experience*. Cambridge; New York: Cambridge University Press, pp.275–291.
- Figueroa-Ramos *et al.* (2009). Sleep and delirium in ICU patients: a review of mechanisms and manifestations; *Intensive Care Med*: 781-795.
- Garcia Guerra G, Almeida L, Zorzela L, *et al*; Canadian Critical Care Trials Group. Efficacy of music on sedation, analgesia and delirium in critically ill patients. A systematic review of randomized controlled trials. *J Crit Care* 2019;**53**:75-80.
- Garcia Guerra G, Joffe A, Sheppard C, *et al*; Canadian Critical Care Trials Group. Music Use for Sedation in Critically ill Children (MUSiCC trial): study protocol for a pilot randomized controlled trial. *Pilot Feasibility Stud* 2020;**6**:31.
- Gullick JG, Kwan XX. Patient-directed music therapy reduces anxiety and sedation exposure in mechanically-ventilated patients: a research critique. *Aust Crit Care* 2015;**28**:103-105.
- Guzzetta CE. Effects of relaxation and music therapy on patients in a coronary care unit with presumptive myocardial infarction. *Heart Lung* 1989;**18**:609-616.
- Hawley, R. (2018). Listen to a Songbird Sing: Musicians, Creativity and the Paediatric Hospital Setting. *International Journal of Community Music*, 11(1), pp.7–20.
- Hawley R. (2021). Music-making in a Paediatric Hospital: A Reflexive Study of Musician Practice. PhD Thesis, unpublished (SOAS, University of London).
- Hogg, C. (1990). *Play in Hospital- Quality Management for Children-* Play in Hospital Liaison Committee.
- Khan SH, Xu C, Purpura R, *et al.* Decreasing Delirium Through Music: A Randomized Pilot Trial. *Am J Crit Care* 2020;**29**:e31-e38.
- Koch ME, Kain ZN, Ayoub C, *et al.* The sedative and analgesic sparing effects of music. *Anesthesiology* 1998;**89**:300-306.
- Koen, B.D. (2017a). ‘Balancing the Culture and Science of Music and Healing’. In: *New Trends in Applied Research in Cultural Context: Studies in Medical Ethnomusicology, Medical Anthropology, Medical Humanities*. S.L.: Sound Health International, pp.173–206.
- Koen, B.D. (2017b). ‘Priming Psychological Flexibility for Wellness, Health and Healing’. In: *New Trends in Applied Research in Cultural Context: Studies in Medical Ethnomusicology, Medical Anthropology, Medical Humanities*. S.L.: Sound Health International, pp.208–237.
- Koivisto, T. and Tähti, T. (2020). Professional entanglements: A qualitative systematic review of healthcare musicians’ work in somatic hospital wards. *Nordic Journal of Music Therapy*, [online] pp.1–21. Available at: <https://doi.org/10.1080/08098131.2020.1768580>. [Accessed 5 Sep. 2020].
- Livesley, J. (2010). Children's experiences as hospital in-patients: voice, competence and work, PhD thesis, University of Salford. Available at: [usir.salford.ac.uk/id/eprint/26780/1/1149543X.pdf](http://usir.salford.ac.uk/id/eprint/26780/1/1149543X.pdf) [Accessed 6 Sep 2020].
- Livesley, J., Cavanagh, A., Garrow, A., Lee, A., Charnock, E., Long, T. (2016). Music-making with hospitalised children: outcomes for children, families, hospital staff and musicians from LIME Medical Notes (2) and Songbirds projects, University of Salford, Salford. Accessible at: <http://usir.salford.ac.uk/id/eprint/40341/> [accessed 6 Sep2020].
- Lorenzato, K. (2005). *Filling a Need While Making Some Noise: A Music therapist’s Guide to Pediatrics*. London; Philadelphia: Jessica Kingsley.
- Malloch, S., Shoemark, H., Črnčec, R., Newnham, C., Paul, C., Prior, M., Coward, S. and Burnham, D. (2012). Music therapy with hospitalized infants—the art and science of communicative musicality. *Infant Ment. Health J.*, [online] 33(4), pp.386–399. Available at: <https://doi.org/10.1002/imhj.21346> [Accessed 5 Sep. 2020].
- Malloch, S. and Trevarthen, C. (2010). Musicality: Communicating the Vitality and Interests of Life. In: *Communicative Musicality. Exploring the Basis of Human Companionship*. Oxford; Toronto: Oxford University Press, pp.1–15.
- Malloch, S.N. (1999). Mothers and infants and communicative musicality. *Musicae Scientiae*, [online] 3(1), pp.29–57. Available at: <https://doi.org/10.1177/10298649000030S104> [Accessed 5 Sep. 2020].
- Nelson A, Hartl W, Jauch KW, *et al.* The impact of music on hypermetabolism in critical illness. *Curr Opin Clin Nutr Metab Care* 2008;**11**:790-794.



- Ockelford, A. (2008). *Sounds of Intent. In: Music for Children and Young People with Complex Needs*. Oxford; New York: Oxford University Press, pp.75–112.
- Pavlicevic, M. and Ansdell, G. (2004). *Community Music Therapy*. London; Philadelphia: J. Kingsley Publishers.
- Pisani et al. (2015). Sleep in the Intensive Care Unit-Concise Clinical Review; *Am J Respir Crit Care Med* please include full words Vol 191, Iss 7, pp 731-738, April 1<sup>st</sup>.
- Playfor S, Jenkins I, Boyles C, et al. United Kingdom Paediatric Intensive Care Society Sedation; Analgesia and Neuromuscular Blockade Working Group. Consensus guidelines on sedation and analgesia in critically ill children. *Intensive Care Med* 2006; **32**: 1125-1136.
- Preti, C. (2009). Music in Hospitals: Defining an Emerging Activity. In: The Second International Conference on Music Communication Science. The Second International Conference on Music Communication Science 3-4 December 2009, Sydney, Australia.
- Preti, C. (2013). Live Music as a Bridge between Paediatric Hospitals and outside communities: A Proposed Research Framework and a Review of the literature. *UNESCO Observatory Multi-Disciplinary Journal in the Arts*, 3(3), pp.1–18.
- Preti, C. and Welch, G.F. (2004). Music in a hospital setting: a multifaceted experience. *British Journal of Music Education*, [online] 21(3), p.329-345. Available at: <https://www.cambridge.org/core/article/musicinahospitalsettingamultifacetedexperience/A119212FE23E38617EC17F994240DD86> [Accessed 12 Jan. 2020].
- Preti, C. and Welch, G.F. (2012). The inherent challenges in creative musical performance in a paediatric hospital setting. *Psychology of Music*, [online] 41(5), pp.647–664. Available at: <https://doi.org/10.1177/0305735612442976> [Accessed 4 Sep. 2020].
- Preti, C. and Welch, G.F. (2013). Professional identities and motivations of musicians playing in healthcare settings: Crosscultural evidence from UK and Italy. *Musicae Scientiae*, [online] 17(4), pp.359–375. Available at: <https://doi.org/10.1177/1029864913486664> [Accessed 4 Sep. 2020].
- Rice, T. (2013b). Broadcasting the Body: The ‘private’ made ‘public’ in hospital soundscapes. In: G. Born, ed., *Music Sound and Space: Transformations of Public and Private Experience*. Cambridge; New York: Cambridge University Press, pp.169–185.
- Rice, T. (2015). Listening. In: D. Novak and M. Sakakeeny, eds., *Keywords in Sound*. London: Duke University Press, pp.99–111.
- Rivosecchi RM, Kane-Gill SL, Svec S, et al. The implementation of a nonpharmacologic protocol to prevent intensive care delirium. *J Crit Care* 2016;**31**:206-211.
- Robinson, K. (2017). *Music in Healthcare Evidence Review*. [online] London: Youth Music. Available at: <https://network.youthmusic.org.uk/file/25179/download?token=PNChjGF1> [Accessed 2 Feb. 2020].
- Ruud, E. (2004). Reclaiming Music. In: M. Pavlicevic and G. Ansdell, eds., *Community Music Therapy*. London; Philadelphia: J. Kingsley Publishers, pp.11–14.
- Stige, B. (2010). Introduction: Music and Health in Community. In: *Where Music Helps: Community Music Therapy in Action and Reflection*. Oxford; New York: Routledge, pp.3-16.
- Updike P. Music therapy results for ICU patients. *Dimens Crit Care Nurs please include full words* 1990;**9**:39-45.
- Umbrello M, Sorrenti T, Mistraletti G, et al. Music therapy reduces stress and anxiety in critically ill patients: a systematic review of randomized clinical trials. *Minerva Anestesiol* 2019;**85**:886-898.
- Yaman Aktaş Y, Karabulut N. The effects of music therapy in endotracheal suctioning of mechanically ventilated patients. *Nurs Crit Care please include full words* 2016;**21**:44-52.

### Additional Resources

website: [www.songbirdsmusic.uk](http://www.songbirdsmusic.uk)

[www.cardmedic.com](http://www.cardmedic.com)

<https://soundcloud.com/m4h2020/sets/sound-environments#>