HEALTH

Can music really help to boost your brain? Tune in and find out

The neuroscientist Dr Julia Jones tells Rachel Carlyle how certain tracks can lower stress, boost sleep and build new brain connections. Plus, a playlist for you to listen to at home

Five minutes a day of extended-exhalation breathing reduced anxiety and boosted mood

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Rachel Carlyle | Saturday November 04 2023, 12.01am, The Times

If asked to describe "healing" music, there's a fair chance you'd think of lapping waves, distant gongs, perhaps even — horror of horrors — panpipes. In fact, a growing body of research is showing that all kinds of music can be used to hack the brain to produce positive effects ranging from lowering stress to sleeping better, focusing harder and even keeping the brain young. No whale sounds required.

A study at McGill University, Montreal, published in the journal Frontiers in Pain Research, revealed that bittersweet and moving music worked best to reduce physical pain, whereas supposedly "relaxing" music did very little. When the 63 participants listened to their all-time favourite tracks — which ranged from Ed Sheeran to Tchaikovsky — they experienced a reduction in pain intensity similar to if they'd taken ibuprofen. And those who'd chosen bittersweet and moving music — the kind most likely to produce chills or a tingle down the spine — reported the greatest reduction in pain.

When study participants listened to their favourite tracks — including music by Ed Sheeran — they experienced a reduction in pain intensity

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This comes as no surprise to Dr Julia Jones, 53, the neuroscientist and author of a bestselling series on longevity, who has spent many years researching the power of music to improve health. She has her own favourites: Coldplay's *Yellow* tops her relaxation playlist, while Miley Cyrus's version of *Heart of Glass* is her energising track of choice. Taking it one step further, she released the first set of original *MusicHacks* tracks developed with Universal Production Music on Spotify and Apple Music — all specifically designed to change your breathing patterns to combat chronic stress and improve sleep.

Part of a burgeoning industry of wellness music, where sounds are manipulated either by AI or real musicians (real in Jones's case), to produce a particular physiological effect, she calls the collection "nutrition for your ears".

"Music has powerful biological benefits but I want to bust the myth that this only works with bland whale-type spa music, which many people find incredibly irritating," Jones says.

Slow the tempo to lower stress

"Dialling down stress through breathing exercises is one of the most important ways to live healthier and for longer," Jones says. We know from years of research that music can help; a review published last year in the journal PLOS One found that it can lower heart rate, blood pressure and levels of the stress hormone cortisol. One strong theory is that the physiological rhythms in our body such as breathing, heart rate and even brainwaves end up synchronising with the rhythm of the music.

Unsurprisingly, slower music is particularly powerful for calm as it slows the breathing, which has been shown to trigger the part of the autonomic nervous system associated with rest and repair (the parasympathetic) — as opposed to the "fight or flight" part (called the sympathetic nervous system or SNS). "Ideally, you want the parasympathetic nervous system to be dominant," Jones says.

Six breaths per minute is the "magic" rate

"The more you practise breathing out the more parasympathetic activity you will encourage," Jones explains. That's why the four tracks in her collection have a unique time pattern of "4:6" — four beats in one bar, followed by six in the next. "We didn't know if extending every other bar by two beats would work — whether it would sound odd, as it hasn't been done before, but we were all amazed to find it sounded quite normal," she says.

The idea is to breathe in for the four-beat bar, and out for the six-beat bar, and listeners have the option to hear her voice guiding the breath over the top of the music or, once they get the hang of it, to hear just the music. "That extended exhale is the key. What you're doing is working the vagus nerve, part of the parasympathetic nervous system, like a muscle. If you think of the fight or flight system as a puppy always ready to leap forward, the vagus nerve is the lead pulling that puppy back to heel."

• How to reduce stress – no yoga necessary

If you breathe as instructed through each 3.5-minute track, you'll be breathing at the "magic" rate of six breaths per minute (typical breathing is fast and shallow and generally 12-15 breaths per minute).

"Six breaths per minute is the rate at which it's most evident that the vagus nerve is dragging back the puppy. It's the kind of slow breathing you might do in a yoga class but you wouldn't necessarily do while washing the dishes or on the train to work," she says.

Some tantalising research at Stanford University seems to show that just five minutes a day of extended-exhalation breathing reduced anxiety and boosted mood — an effect that lasted for the rest of the day. "They showed it worked better than meditation or mindfulness," Jones says.

DrJulia Jones: "Music has powerful biological benefits"
BENJAMIN BOWLES

Avoid tracks with vocals to get to sleep

Next year Jones will be releasing more *MusicHacks* tracks to help you sleep, with a slightly different pattern of 4:7:8 — that's inhaling for four, holding for seven and exhaling for eight. This kind of breathing has ancient roots in yoga practice; it won't necessarily put you to sleep but is designed to reduce anxiety so it's more likely you'll be able to drop off.

It's thought that the most effective music for sleep has a rhythm equivalent to 60 beats per minute, and the listener's heart rate automatically slows to match this within about five minutes.

A leading researcher into music and the brain, Daniel Levitin, is working with a Minneapolis start-up called MIIR, which uses an algorithm to identify music for specific health purposes based on 150 different musical features, such as key, melody, rhythm, tempo and repetition. He says: "We've just run a study that shows that when we used [it] to select music for sleep, you can lower heart rate by 4.2 beats a minute on average — and five or six in some cases, which is clinically significant."

• My mum had dementia — this is what I wish I'd known about brain food

If you're making your own sleep playlist, Jones advises avoiding vocals, because the brain is designed to be alert to human voices, and steering clear of repeating melodies, because our brain will try to predict what comes next.

"You want slow music that's as sparse as possible," she says. "Our brainwaves synchronise to the beat and rhythm of the music, going from gamma levels when you are alert down through alpha and theta levels where you are more relaxed and those neurons are firing at a slower pace and preparing you for delta-wave sleep."

Music that gives you chills unlocks creativity

When listening to music, the brain produces its own version of opioid painkillers, Levitin says (his laboratory was the first to work this out) — which may explain why people listening to music rated their pain lower in the latest study.

Certain "peak" moments in the music may trigger the greatest emotional responses in the brain — the so-called chills. "It's that frisson, where your hair stands on end and you get a shiver down your spine," he says.

The chills aren't just useful for pain management, but to lift mood and energy as they also increase levels of serotonin and dopamine, the body's antidepressants.

"You probably don't want that when trying to get to sleep. But it is good for unlocking creativity," Levitin says.

Your favourite tunes can keep your brain young

"On the physical side of longevity, there's some very strong evidence that listening to music you like can boost the immune system, and it can cause arterial dilation equivalent to a statin," Levitin says.

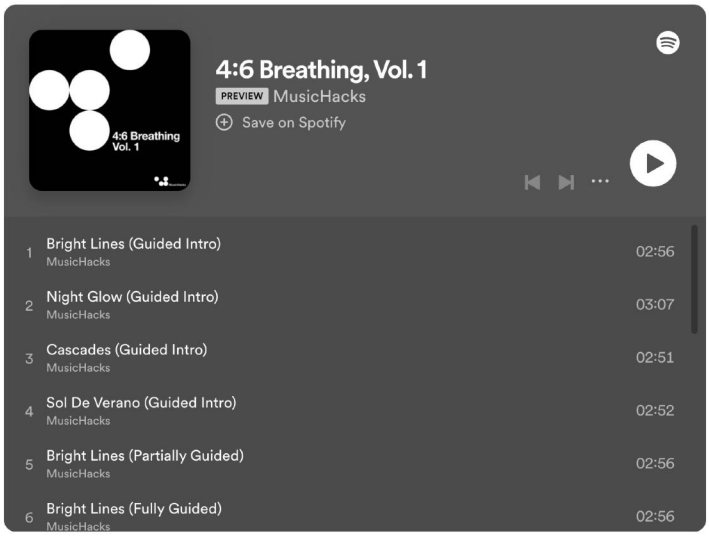
Listening to music can also keep your brain younger, particularly music from your youth, which is encoded very strongly as multisensory memories in the brain, and is able to change your mood quickly via 'the reminiscence effect', which activates multiple neural pathways — especially important for those living with dementia.

"It's really important to keep building new brain connections throughout life," Jones says. "Learning a musical instrument is one of the best ways of doing that because it's so complicated and requires different parts of the brain to work simultaneously. It's hard — that's why people give up. But when you're in that frustrating stage, that's when neural connections are being built."

She's living her own advice: last year she started lessons in lead guitar and met two other midlife women learning instruments following a talk she gave on brain health. They started a band called Pretty Crap (@prettycrapuk) who now play classic rock covers at gigs, including one in September at the Troubadour club in London.

"None of us can believe how much we're enjoying it. I'm particularly intrigued by how it's lowered our subjective age — how old we feel. There's mounting evidence this can boost longevity, perhaps by overriding drivers of biological ageing."

***MusicHacks* is available on Spotify, below, Apple Music and holidity.com**



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