

## Ep #2: The Airway and Childhood Development Connection with Dr. Bill Johnston



### Full Episode Transcript

With Your Host

**Dr. Vijaya Molloy**

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My daughter never slept well as a baby. My son struggles at school. My child is always tired. I often hear comments like this from parents. In this episode, we talk about some of the reasons why.

You are listening to the *Mind Body Mouth* podcast with Dr. Molloy, episode two.

Welcome to Mind Body Mouth, a podcast that explores the link between the health of your mouth and the rest of your body. If you're a patient, parent, or fellow practitioner who's curious about how functional dentistry can improve your overall health, this is the show for you. Here's your host, Australian dentist, Dr. Vijaya Molloy.

Hey guys, welcome back to the show. Thanks for joining me today. I hope you're all having an amazing week. It's the school holidays in Australia, and even though I haven't actually had any official time off, I'm absolutely loving the break from school lunches, afterschool activities and just running around, trying to keep a hectic manic schedule. I'm sure plenty of the mothers and fathers out there would agree with me on this one.

Today's show is essential listening for anyone who has children in their life, whether it's their own child, a niece, nephew, or a grandchild. I will be interviewing Dr. Bill Johnston, ENT specialist. And we will be talking about some essential factors to watch out for in your child's growth and development, or any child's growth and development really. So, without further ado, let's get on with the show.

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Vijaya: Welcome, Bill, and thanks for joining me today. Can you tell us a bit about yourself?

Bill: Thanks, Vijaya, it's great of you to invite me along to the podcast today. My name's Bill Johnston. I'm an ENT specialist based in Hornsby

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and I have a particular interest in the treatment of children and airway problems. And I work locally at the Sydney Adventist Hospital and Hornsby Hospital and I've been in practice for about 15 years with a great interest and love of this area.

Vijaya: So, I've been referring my patients to you for probably about 10 years now. And I send them to you when I have concerns that they might not be breathing as well as they could be. So what sort of things do you check for in a patient that comes to you?

Bill: Vijaya, it is a very common presenting symptom to us as ENT specialists. Obviously, we start with the history. So I like to chat to the parents and say firstly, is this a surprise for you that you've been referred? And often they say not. And I ask them about a history of, you know, has the child got any allergic history; any history of eczema or asthma, any obvious symptoms of allergic rhinitis?

I ask detailed questions about their sleep, the quality of the sleep, whether the child is restless, whether they're awakening at night for unknown reasons, so what the parents have observed, you know, particularly with sleep, in their children.

Vijaya: So, why do you ask them questions about sleep?

Bill: Well, I think sleep is a very objective measure of airway. If it's monitored over a long period of time, I think it really – with video assessment or parent's description – I think we get a really good feel for how disrupted the child's airway is.

Vijaya: And what's the significance of the airway as it relates to the child sleeping?

Bill: If kids have airway compromise, they don't tend to enter as deeper sleep. So kids with sleep-disordered breathing tend to have a more shallow sleep, a more restless sleep. So they're more prone to awakening. And the physiology of that sleep is not good for regeneration.

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Vijaya: And your sleep is meant to restore you and revive you, and with children it's particularly important since their brains are growing at such a rapid rate, isn't it?

Bill: Absolutely, and the physiology of good sleep is that the child should have a low heart rate, a very low respiratory rate. Their drive for breathing should be relaxed. Their skeletal muscles should be relaxed. And by observing the kid's sleep, you can see that all these parameters are being disrupted. Their oxygen levels are up and down, their skeletal muscles are often working hard to overcome the airway compromise, and this really inhibits the quality of the sleep.

Vijaya: It's such an interesting area and it is a particular interest area of mine too. But a lot of parents are not really keen on the idea of an operation for themselves, let alone their children. So how would the conversation go in the instance where you might consider surgery to be a really good option to help the child reach optimal wellbeing but the parent is opposed to that idea?

Bill: Well, look, that's common. And obviously, surgery is always our last resort. But in assessing patients who have these sort of problems, obviously as we've just discussed, we'll go through the history. From a physical examination perspective, we examine the ears. I look at their craniofacial development. I look for the allergic shiners, which is a dark discoloration under the eyes.

Then we do an anterior nasal examination, checking for signs of allergy. We often put a small fiber-optic telescope into the nose very gently, usually with a bit of bribery of a lolly at the end of it. And that enables us to often get a very good assessment of the airway, obviously examine the oral cavity and also looking at their posture. And then once I've examined them, and obviously we usually come up with a diagnosis, I then like to have a good discussion with the parents about the long-term options for treatment.

Vijaya: I have a particular interest in how breathing can affect the way a child's face develops. And you mentioned craniofacial development – can

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you elaborate a little bit on what this actually means and how breathing will impact this?

Bill: The airways, definitely one of the factors that effects craniofacial development. And the most common pathology we see is mouth-breathing. But obviously, with sleep disordered breathing, it's a spectrum of thee problem. Kids should really breathe quietly with their mouth closed.

Some kids will just breathe fairly quietly with their mouth open and then other kids will snore even to a point of having apneas, where there's a complete cessation of breathing. So sleep-disordered breathing is a spectrum.

Craniofacial development is usually complete in adolescence, around the age of 13 or 14 years. And we know that chronic mouth-breathing, particularly at night time, leads to a malposition of the tongue. And the tongue is a very powerful muscle. It has a very important role in stimulating growth in the mid-third of the face.

And if children are sleeping, or even during the day, consistently have their tongue in a low position in the oral cavity, then the very important powerful movements of the tongue musculature in helping with the growth in the mid-third of the face is lost. And the common physical findings we see in these kids is that they often have crowding of their upper teeth.

They have high arching of their palate. They have what we call the long adenoidal facies. They've often got dental changes, so the enamel changes in their teeth because of the drying effect. And often, they have a postural change, so they're often, even during the day, their shoulders are rotated forward and their neck is in a forward position, and this is the moth-breathing posture, which is not a good posture.

Vijaya: And that's not a good posture musculoskeletal either. And I find their academic performance often suffers. And it's interesting how you talk about the tongue, because I often tell my patients, your tongue is the greatest orthodontist we can provide because the tongue exerts, I think,

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500 grams of pressure and it only takes 19 grams of pressure to move teeth.

So if you have the tongue in the right position from day one then you have a greater chance of all the teeth being in the right position and the airway being the correct size. So it's really interesting how it all knits together.

Bill: Oh, it is, absolutely.

Vijaya: So, I've sent patients to you on several occasions for a second opinion. In these situations, parents often know that there is a problem, but they might have seen previous ear, nose, and throat specialists who have advised that no treatment is required. So how might your approach differ from these other specialists?

Bill: Well, I suppose, as children develop, things change. So I might see a patient who may have had assessments several years earlier, but things change. Allergies can progress, adenoids can become larger. So obviously, things will change with time. Obviously, your experience and if you have a special interest in an area, you become more confident in treating it.

From a musculoskeletal perspective, I've been lucky enough to have a brother who's a very good physiotherapist. His name's Gavin Johnston and he's got a huge interest on musculoskeletal treatment. And we spend a lot of time together out on the golf course actually, and over years and years of spending time together, we've discussed different patients and we've both grown to realize how important each other's treatment is.

So I realize that, for my mouth-breathers, particularly in the adults, they get a lot of chronic neck problems because they've had this mouth-breathing posture for so long. So even after correction of their airway, they need good quality physiotherapy to correct their posture. And he sees the kids that have these issues that will benefit from airway correction.

And I think also, it depends on, you know, with your practice, the longer it goes on, the more specialized you become an, for example, I'm quite

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confident in very severe cases of allergy. Some kids even as young as eight years of age could benefit from simple day-surgery to improve their airflow. And because I've been doing it for a long time, I've got a team of anesthesiologists and nursing staff and the right equipment to confidently offer that surgery. But unless it's special interest area and you have the pediatric anesthesiologist et cetera, then the confidence is not universal to offer surgery to that group of patients.

Vijaya: That's interesting. And it's interesting that you talk about working collaboratively with your brother on patients as well because what I often say to my patients is that it's going to need a team to help you get back to health. No one professional is going to be able to achieve this on their own because, as a human being, our needs are so complex, and the problems when they present can be complex as well. So it takes a very varied skill set to really treat this.

Bill: Absolutely, Vijaya. I'm a huge believer in teamwork when it comes to managing these patients. And obviously, with dentists and ENT specialists, we're working more collaboratively as you guys are getting more and more into treating airway.

On treating patients with chronic mouth-breathing, particularly with adults, they've got associated TMJ problems. They've got postural problems, so I need to have good physiotherapists, good dentists with an interest in TMJ problems.

Vijaya: Just let me clarify for a second, by TMJ, you're referring to the temporomandibular joint, the jaw joint; an area that I often look at.

Bill: Absolutely, Vijaya. So, particularly in patients in adolescence and adulthood, we find that if they've been a long-term mouth-breather, the incidence of musculoskeletal problems in this region starts to increase. And the reason is because if you sleep with an obstructed nasal airway, the body needs to make adjustments so that you get good oxygenation through your oral or mouth airway. This means that the patients will sleep with a neck or head forward position with their mouth open.

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Because their mouth is consistently open at nighttime, that's a driver for grinding or clenching of the teeth and it's also a driver of this head forward posture. So these patients can, not uncommonly, have temporomandibular joint problems where they're clenching and grinding at night consistently. And this can lead to headaches, feelings of pressure around the ears, and also to chronically tight neck muscles, which also increases the risk of headache.

And I think diet also has a role. There's a lot of kids out there with food allergies that are exacerbating airway allergies. And we need to look at their diet. Obesity is one of the commonest causes of airway surgery not curing sleep apnea in kids. And obviously, if we have an obese child and we perform surgery on them, unless we manage their weight, we're not going to get the results. So every patient almost always requires a team approach.

Vijaya: Can it lead to tinnitus in adulthood as well?

Bill: Tinnitus is a very multi-variant condition, but increased tension around the temporomandibular joint is definitely known to increase the risk of this symptom. Tinnitus is the ringing sound that's heard in the ears, but it can occur after a rock concert. It can occur as part of hearing loss, listening to music too loud. But patients with TMJ have a higher incidence of tinnitus.

Vijaya: Right, that's really interesting. Just to talk a little bit more about ear infections, so I've been taught that ear infections could be due to a narrow upper jaw and the angle of the lower jaw, is the incorrect angle can prevent the Eustachian tubes of the ear from properly draining the fluid. What do you think of this opinion?

Bill: Look, I definitely think that is one of the problems that affect what we call Eustachian tube function. So Eustachian tube function in kids is their ability to maintain healthy ears. For example, the Eustachian tube when we fly in an aircraft is the pipe in between our nose and ear that bubbles when we're going up and down in an aircraft.



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And children, because of a number of factors, can have problems with their Eustachian tube and this can cause anything from the occasional middle ear infection to frequent middle ear infection, or a condition called glue-ear, when the child actually has a buildup of fluid in their ear which can affect hearing.

And there are many variables that affect Eustachian tube. One is definitely the craniofacial development. It's also genetics. It can be more common in some families than others, children with a history of allergic problems. Allergy tends to cause a diffuse swelling in the lining of the nose. And if you've got diffuse swelling in the lining of the nose, that can affect the airway and that can also affect the Eustachian tube function.

Frequent viral upper respiratory tract infections have contributed to Eustachian tube dysfunction in kids. And children that attend a daycare environment at a young age are scientifically proven to have probably a 50% increase in their viral load. So these are the kids that can get very consistent coughs and runny noses, and that's going to also impact on the Eustachian tube.

There's also a subset of kids that have enlargement of their adenoids. Adenoids are like tonsils. They're a tissue that sit in the back of the nose. And in some children, because of frequent viral infections, their adenoids can enlarge to a point where that impacts on the Eustachian tube function.

Vijaya: Wow, it's so complex. And I often wondered about the daycare exposure as well because a lot of parents have said that their children are sick chronically after they start daycare. That wasn't my experience, so I wasn't sure how accurate that was, but you've mentioned there's actually science behind it. so, how do you manage these children?

Bill: So, as I said, it's a spectrum of problems. You know, obviously, we go through history and examination. We look for physical signs of Eustachian tube problems with fluid behind the eardrum or signs of scarring. It's important to assess their hearing. It's important to optimize any nasal problems.

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For example, if the patients have allergies, we look at allergy testing. We can consider topical steroid sprays if they've got chronically infected noses. We can look at saltwater irrigation and sometimes a short course of antibiotics. As a side issue, some kids are vitamin D deficient. This is an increasing problem in our society.

Vitamin D is synthesized by sun exposure and with increasing indoor activities for children, particularly in children with dark skin, they can have low vitamin D which can significantly impact on their immune function. We've got to have a broad brush and we've got to assess the kids from an airway perspective.

And we've also got to look at the amount of antibiotics they're requiring because of their ear infections, because we now know that antibiotic therapy, particularly in the early years of life, affects the microbiome of the gut. So your microbiome, which is the trillions of bacteria that live in our gut develop in childhood. And we now know that multiple courses of oral antibiotics during early life is going to affect the long-term health of the microbiome. And this has huge long-term implications in terms of weight management, immune function, diet absorption of nutrients, and so it's a very important issue.

Vijaya: So the microbiome even affects long-term weight. That was something I didn't know.

Bill: It's definitely a fact. And just specifically with the ears and the airway, patients, when we've looked at the whole patient, some kids with significantly enlarged adenoids, there's a day-surgical procedure to remove the adenoids, which is a simple procedure. And a child who's got a very obstructed posterior nasal cavity, if we clear that obstruction with a 15-minute day-surgical procedure, it can lead to an improved quality of sleep. It can reduce their risk of ear infections because we improve the Eustachian tube function.

Vijaya: When you talk about the surgery, are you talking about placing grommets?

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Bill: Yeah, there's two common procedures we use in childhood for patients with chronic Eustachian tube dysfunction. It's either adenoidectomy or ventilation tube insertion. We've just discussed the adenoidectomy side, but ventilation tubes are small silicone tubes that are approximately three by two millimeters in diameter. And they are placed into the tympanic membrane as a day-surgical procedure.

Approximately three-millimeter incision is made in the eardrum. Any fluid or infected material from the middle ear cleft is removed and the tube is placed in the drum and some local anesthetic drops put in place. The benefits of ventilation tube insertion is that it tends to improve the hearing for these kids. And some of these kids can have a long-term hearing loss. It tends to reduce the frequency of middle ear infection and it also reduces the need for oral antibiotics to treat middle ear disease.

Vijaya: By these ventilation tubes, you're talking about grommets, is that what grommets are?

Bill: Yeah, grommets is the lay-term for ventilation tubes.

Vijaya: So in placing them, you're potentially reducing the risk for the child needing future antibiotics, which then protects their gut health as well.

Bill: That's one of the benefits of ventilation tubes. Ventilation tubes are not without their problems. The average duration that a ventilation tube will be in situ in the tympanic membrane is somewhere between six to 14 months. And during that time, we do recommend the kids sit up in the bath, because the grommet has a small hole in it and if kids were to lie back in the bath, then the dirt bathwater can pass through the grommet into the middle ear. But the vast majority of ventilation tubes will extrude within that six to 18-month period and normally the tympanic membrane will heal up very quickly after that. Approximately 1% of kids could be left with a perforation in their eardrum after grommets have extruded.

Vijaya: So, once the grommets fall out, would you place them a second time?

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Bill: The incidence of needing to replace a ventilation tube is only about 5%. If the child required an adenoidectomy at the time of insertion of the ventilation tubes, the need for a second insertion of ventilation tubes is low because we've not only drained the fluid at the time of the initial procedure, but we've actually improved the Eustachian tube function by, if you like, improving the plumbing.

And one last comment on that is we would only ever consider reinserting ventilation tubes once the ventilation tubes have fallen out. We never just replace them straight away. We always go through a period of observation and we would only consider replacing the tubes if the child's hearing was deteriorated again or the middle ear infections were to recur on a frequent basis.

Vijaya: So, only if absolutely necessary?

Bill: Absolutely.

Vijaya: Is, I've read research to suggest to suggest that a child who suffers from sleep apnea or is on the spectrum for a sleep disorder may not be fixed, if you like, just with an operation alone and that a more interventional approach may be required to really make a change. So what do you think of this and what sort of advice would you give your patients?

Bill: I think, as we've already discussed in this podcast, there are a number of factors with sleep apnea in children. The commonest and often the biggest problem is enlargement of the adenoids and tonsils. And removing the adenoids and tonsils in the kids that absolutely need it, there's a high success rate of making a big impact. But we've also got to look at the child's weight and look at their diet, because being overweight – unfortunately, childhood obesity is an increasing problem, and that's mandatory that that be managed very carefully.

The other problem that can lead to ongoing issues after adenoid or tonsillectomy is nasal allergy. A lot of the kids who have enlargement of adenoids and tonsils do have an allergic tendency. And as they grow, if that

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allergic tendency progresses, then they can have ongoing nasal obstruction due to swelling of turbinates.

Turbinates are things that we all have in the sidewall of our nose, and in chronic allergy sufferers, they can become very swollen, impacting on airway. And the other thing that's important is their craniofacial development. So with modern orthodontic treatment now, the kids are getting the mid-third of their face expanded by expansile orthodontics, which is definitely going to be reducing the risk of sleep apnea both in childhood and adulthood. So that's just a few of the other factors to look at.

Vijaya: And is there evidence to support the fact that expanding the middle third of the face orthodontically does actually help breathing and improve outcomes for adulthood?

Bill: I think there is definitely, definitely. And obviously, you'd be more aware of the dental literature than I am, but I've seen literature where it's led to improved nasal developments, it's improved septal position in some patients. And we just know that, in the adult population, if they have a crowded mid-third of their face, if they've got relative retrognathia, all the [inaudible 0:21:12.8] of chronic mouth-breathing in children, these are going to increase the risk of sleep apnea in adults.

Vijaya: It's a really interesting topic and it's something that I'm really interested in and it's great to talk to you about this, Bill. Thanks for joining me today.

Bill: Well, thanks for the opportunity to speak, Vijaya. It's been excellent.

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It's been a few months since I recorded that episode with Bill. Since then he's operated on myself and my two older children. And many years ago, he also operated on my husband. So it's been a bit of a family affair for us.

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It might sound a bit like I'm someone who loves the idea about going under the knife. I absolutely am not, but after doing all the research and the reading that I've done, I decided that, for my family, the benefits of the surgery far outweighed the risks, especially when it came to the mental and physical growth and development of my children. And for myself, I've noticed the improved mental clarity and energy levels of being able to breathe properly through my nose, especially at night.

I'm letting you all know this because I can imagine there's some parents out there that might be considering the surgery for themselves or their children but are scared at the idea of going through with it. All I can suggest is do your own research and find a really good doctor who you trust. And if you're in Sydney, I would highly recommend making the trip over to Hornsby to see Bill.

And that's all for today's show, folks.

Thanks everyone for listening to the show today. If you don't want to worry about missing any future episodes you can subscribe on Apple Podcasts or wherever you listen to your podcasts, and if you haven't done so already, I'd really appreciate you leaving me a rating and review. Your feedback would be really useful in helping me create valuable content. Visit [mindbodymouth.com.au/podcastlaunch](http://mindbodymouth.com.au/podcastlaunch) for step by step instructions on how to subscribe, rate and review Mind, Body and Mouth. Until next time.

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