

# HEAR & NOW



**AUTUMN 2011**  
**FROM THE EAR TO THE BRAIN....**

Welcome to the latest issue of Hear and Now. In this issue we learn about the natural spatial organisation process of the human cognitive system and the importance of localisation. We update you on recent findings of an international survey and introduce you to the latest edition to the cognition friendly hearing aid portfolio. Finally we have a wonderful breakfast recipe to help kick start your mornings and provide 'fuel' to your body and your brain. Enjoy the read!

*Adam Shulberg*

**Adam Shulberg,**  
Senior Audiologist and MD, **Cubex Ltd**

## HEARING ...

- ... connects us to our surroundings and makes us feel part of the world
- ... lets us separate those things that interest us from those that don't
- ... makes us feel secure and at ease

### Hearing is spatial

The human auditory system is made up of two ears and the brain. Hearing with both ears is called **binaural hearing**.

This anatomical layout allows the brain to compare sounds coming from the left and right ears.

Sounds will reach one ear fractionally faster and louder than the other – and your brain registers these subtle differences i.e.: sound reaching the left ear first will then travel around the human head (mass) before reaching the right ear. This results in time delay between both ears. As the sound travels around the head, the loudness decreases.

These natural differences in time and loudness of sound between both ears allow the brain to organise and determine the location of different sound sources in the listening environment. This is a natural spatial organisational process of the human cognitive system.

We are constantly bombarded with many different sound sources. The partnership between the brain and the ears gives humans the remarkable ability to deconstruct this complex world of sound, spatially separate multiple sound sources and place them where they belong in the environment. This ability of knowing where sounds are coming from is called **localization**.



## Localisation *The ability to place sounds in space...*

Experiencing sound in this natural arrangement gives us access to **spatial cues** in our environment so that we can intuitively **locate, separate and focus** on the information we want to hear and ignore the information not important to us.

It should therefore come as no surprise to learn that the brain works harder than our ears, especially in noisy environments, such as in a busy restaurant, it can be very exhausting trying to follow conversation in these environments sometimes even for people with normal hearing.

For a person with normal hearing, information is natural and complete and the brain is able to easily sort through all information you apply your attention to through a cognitive process – **organise, select, follow**.



*The ability to place sounds in space is important because:*

*It gives them meaning. Sounds do not happen in isolation. It happens in context. We live in a 3 dimensional world, and the sounds that occur in that world occur in 3D too.*

## Organise, Select, Follow

The brain constantly monitors the acoustic environment for information it can use and creates a mental map of the auditory environment.

The brain uses a **three step cognitive process** to understanding speech. It first **organises** sounds and **selects** those sounds that are most important. Once a sound is identified, the brain **follows it naturally**, enabling the individual with normal hearing to comfortably interact in the listening environment.



### **Organise:**

When entering an environment with many sound sources, the brain automatically tries to separate them. The auditory system organizes the bits of information to prepare the listener to focus on what's interesting and set competing noise aside. A complete mental map of the sound environment is achieved



### **Select:**

The listener can then select the sound stream of interest and focus attention on it.



### **Follow:**

The listener can follow the source over time

Hearing loss distorts sounds, disrupting this process. Localisation is compromised. The information delivered to the brain is incomplete and disorganized. Trying to make sense of the listening environment often leaves the person with hearing loss feeling exhausted after visiting a noisy venue. What should be an organized world of sound is acoustic chaos for the individual with hearing loss.

In the past, research and development of hearing aid technology focused primarily on making things audible and managing noise. Processing chips were not fast or efficient enough to restore spatial hearing.

Today, a variety of technological innovations has made it possible to support the natural spatial organization process of the cognitive system. Devices used in our hearing rehabilitation use the latest breakthrough in microprocessor design and technology, not to indiscriminately raise the volume of what you hear, but to sharpen the focus of what you hear. So you're better able to hone in on a conversation in a wall of party noise, and shift attention from one voice to another as you choose.

## Technology Working for Cognition

We recently participated in an International study of technology that supported the cognitive process of organise, select and follow. We would like to extend a big thank you to all our clients who participated and contributed to the research below. Real user insights gained from such studies is **invaluable and necessary** for development of future products. Take a look at what users are saying:

### Effortless listening, comfort, enjoyment and the confidence to participate actively in conversations

The study was conducted in 4 countries\*, involving 150 users. The purpose of the study was for Audiologists and end-users to evaluate Agil, a high end Cognition Friendly hearing system. To help with understanding and development of future products, the creation of solid insights and knowledge on the product performance and the satisfaction levels achieved with Agil was needed.

Inside Agil are two signature features: **Speech Guard** and **Spatial Sound 2.0**.

### Preserving precious details

Speech Guard supports your auditory system by preserving the finer details that help you separate one word from the next and tell one person's voice from another.

### Providing a sense of direction

The Spatial Sound 2.0 feature helps to improve your natural perception of where sounds are coming from. Combined with Speech Guard, this helps you to locate and select the voice you want to hear, and ignore competing sounds.

### What new users stand to gain

In tests, first-time users gave Agil very high ratings in three important areas:

- How easy it is to understand speech in noisy situations
- How easy Agil is to get used to
- How comfortable Agil is to wear

For following speech in noisy situations, on a ten point scale, the average score for Agil was 7.78 compared to 3.41 with no aid.

For the ability to follow a conversation in a setting with more speakers, Agil was rated 7.77 (Fig. 1)

For ease of listening Agil was rated an impressive 8.36 out of 10. (Fig. 2)

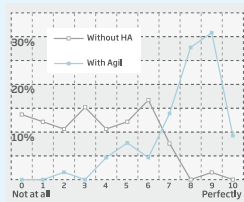


Fig.1 Showing how well first-time users can follow a conversation while ignoring other voices.

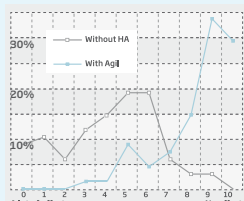


Fig.2 Showing the degree of effort it takes first-time users to follow conversations.

### How experienced users react

Using their previous premium instruments as a reference, the participants gave Agil the following scores:

For following speech in noisy situations, Agil was rated 7.71 on a scale from 1 - 10 compared to a poor 4.11 with previous instruments.

For the ability to follow a conversation in a setting with more speakers, Agil was rated 7.70 (Fig. 3)

For making listening more effortless the score was an impressive 8.38 (Fig. 4)

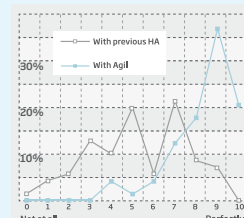


Fig.3 Showing how well experienced users can follow a conversation while ignoring other voices.

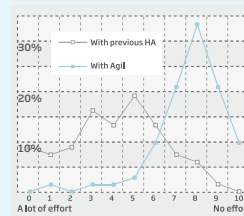
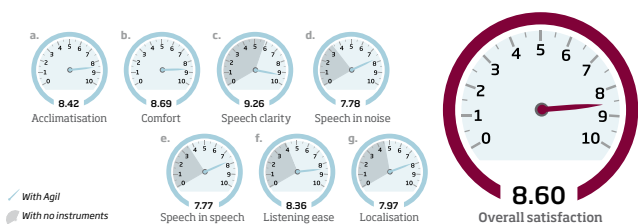


Fig.4 Showing the degree of effort it takes existing users to follow conversations.

The survey was performed in Canada, Germany, the United Kingdom and the United States. The survey collected data from 300 end-users and Audiologists in total. The Audiologists in the survey were selected by Oticon from their experience with Agil and other high end instruments. The participating users had worn Agil for over a month. All ratings were made on a 10-point scale, where 10 is best. For each question, the poorest and the best ratings were given relevant labels, e.g. "Not at all" and "Perfectly"

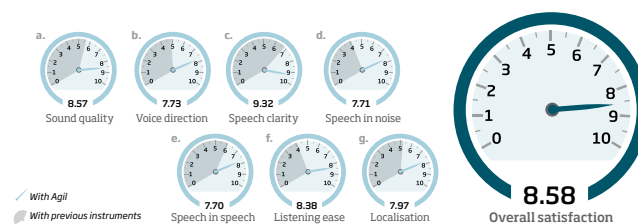
### A summary of the scores obtained:



#### How first-time users rated Agil (average scores out of 10)

- For acclimatisation ease, Agil scored 8.42
- For physical comfort, Agil scored 8.69
- For speech clarity, Agil scored 9.26
- For conversing in noise, Agil scored 7.78
- For conversing in setting with more speakers, the score was 7.77
- For ease of listening, the score was an impressive 8.36
- For sound localisation, Agil scored 7.97

**Overall satisfaction 8.60**



#### How experienced users rated Agil (average scores out of 10)

- For sound quality, Agil scored 8.57
- For ability to determine direction of voices, Agil scored 7.73
- For speech clarity, Agil scored 9.32
- For conversing in noise, Agil scored 7.71
- For conversing in a setting with more speakers, Agil scored 7.70
- For ease of listening, the score was an impressive 8.38
- For sound localisation, Agil scored 7.97

**Overall satisfaction 8.58**

If you would like to understand how these strategies work together to benefit people with hearing loss, please call us on **020 7935 5511** to arrange a live demonstration session with one of our Audiologists and quote Live Demo. This offer is free to clients and friends of CUBEX during the month of October 2011.

# CUBEX Introduces Oticon | Intiga

The world's smallest, most intelligent fully wireless cognition friendly hearing solution driven by user insight\*



## Discreet

Designed to be totally unnoticeable, Intiga is the smallest and most beautiful RITE hearing style ever and it delivers the most uncompromising performance.

Intiga's discreetness challenges that of many "deep-in-the-ear" instruments on the market, while still delivering the optimal combination of audiological features, binaural wireless capabilities and comfort. Intiga does not require any complex impressions or custom moulding work.

Intiga's surface is clean and unbroken. Its subtle organic form and naturally rounded shape follows the physical outline of the ear, achieving a close, comfortable fit, while fully-automated sound processing eliminates the need for push buttons.

## Form, function and comfort

Intiga's brand new speaker system delivers both revolutionary comfort and optimal functionality. The improved shaping, softer wire and greater length variety combine to ensure increased retention, stronger cosmetic appeal and a more individualized fitting.

## Cognition Friendly Technology That Lets You Participate More

**Spatial and speech cues** are **balanced** and **audible**. Intiga's high-speed sound processing chip and wireless technology can work in harmony with your brain to help you organize, select and follow the sounds and voices you want to hear, and ignore competing background sounds letting you **participate actively, effortlessly** and naturally

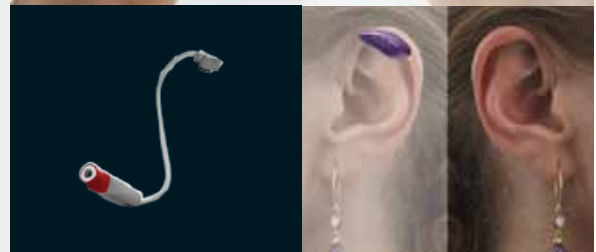
To make your listening situations **easier**, Intiga includes features like:

- Speech Guard
- Spatial Sound 2.0
- Artificial Intelligence
- RITE with improved speaker
- Noise reduction and directional system

## High Quality Connectivity

**ConnectLine** turns **Intiga** into a wireless, hands-free headset for landlines and mobile phones, so you can easily and conveniently talk on the phone anywhere, anytime. When watching television, you receive the sound directly in the hearing instruments at your preferred level, so that the TV sound for the rest of the family can remain at a level which suits them.

*\*compared to available behind-the-ear hearing solutions with binaural processing and streaming capabilities.*



Call us now on 0207 935 5511 to arrange your **RISK FREE** trial and mention Intiga. This offer is available to all clients and friends of Cubex during the month of October 2011.

# New Additions to the team at CUBEX

I am delighted to introduce to you the latest additions to our team of Hearing Care Professionals at CUBEX.



**Mr. Leigh Martin** is a dedicated, progressive clinical Audiologist, and a firm believer that a bio-psychosocial approach to delivering Audiological care is essential.

Having graduated from the University of Bristol's BSc. Audiology program with 1st class honours, Leigh has excelled in the Audiological community, delivering high quality hearing healthcare and innovation in a number of clinical, research and professional roles.

In 2009 Leigh was appointed to the board of directors for the British Academy of Audiology where he represented the profession on many issues, including the future training of Audiologists.

Leigh's research area of interest is auditory processing and in particular Auditory Processing disorders. He is a high achiever having displayed academic posters at several Audiological conferences, organized and presented two academic sessions at the British Academy of Audiology Annual Conference and has recently submitted an academic paper to a peer reviewed journal.



**Miss Orla Kealy** graduated from DeMontfort University with a BSc Honours in Audiology and is currently studying for her Masters in Advanced Clinical Audiology in Bristol University. She has a great passion for Audiology and a strong desire to empower people to live the lives they want with the hearing they have.

Before joining Cubex, Orla spent time in the NHS working in many clinical settings with adults, paediatrics and complex needs patients. In 2009, she joined the British Academy of Audiology, where she currently represents Audiologists throughout the UK, ensuring that the profession is represented at a national and international level. Orla is committed to ensuring that the training needs of future audiologists in the UK are continuously met. She has also participated in research projects with the National Biomedical Research Unit in Hearing.

Using all their skills and extensive training in diagnostics and auditory rehabilitation, Orla and Leigh are equipped to help us deliver scientifically sound services to you, our professional colleagues and to our clients.



## eNEWS

### Hear & Now

Over the years, we have had many of our valued clients request an e-mail version of the Hear and Now newsletter. This summer, we launched our first e-news version of the newsletter and the feedback we have received so far is very promising.

If you would prefer to receive your copy of Hear&Now by e-mail, please sign up at [www.cubex.co.uk/signup](http://www.cubex.co.uk/signup)

### CUBEX launches its first Professional E-Newsletter

For nearly half a century, CUBEX has worked closely with and delivered exemplary support to our professional colleagues in the ENT, GP, Occupational Health and Audiology community.

Last month, we launched our first ever professional newsletter. We provided an update on the Hearing Rehabilitation methods and tests used at CUBEX, focusing specifically on 'Real World' tests of hearing, listening and understanding. We introduced the newest members of the Audiology team. We explored advanced signal processing and technology behind cognition friendly hearing aids, shared findings of a recent study on cognition and hearing, and more.

The feedback we received was extremely positive and we are looking forward to the autumn edition of our professional newsletter. The autumn edition will include discussions and survey findings on sociocusis and noise protection, studies based on cognition friendly technology, updates on tinnitus management, connectivity solutions and more.

If you would like to sign up to receive the CUBEX Professional update, please do so by visiting [www.cubex.co.uk/signup](http://www.cubex.co.uk/signup)



# Food for Brains

We eat in order to live, and food provides us with the energy we need to do it. In the developed world, there is such a large variety of foods available and we are all so busy, that we must take care not to eat unhealthily. It's important to pay attention to what you eat and care about what you put into your body.

Why eat breakfast? It's the first meal of the day, and some people skip it altogether. But it is important to eat a proper meal in the morning. When you wake up, your body is a bit sluggish and needs a boost – that's why it's vital to give it some energy to start the day with. You don't need to eat a large meal but it's a good idea to have some fresh fruit along with some "fuel" to give your body something to run on, like high fibre muesli or whole wheat bread. It gives you a good start to the day.\*

## Nut Museli

### Serves 14

200 g (7 oz) honey  
 600 g (21 oz) coarse oatmeal  
 100 g (3.5 oz) raisins  
 100 g (3.5 oz) natural almonds  
 100 g (3.5 oz) sun-dried cranberries

Cut the almonds into thirds. Bring the honey to boil in a pan, add the oatmeal. Cook for one minute until golden brown, then add the almond pieces. Allow to cool, then fold in the raisins and cranberries. Store the muesli in an airtight container.

You can make enough to last a week, or you can use store-bought muesli, but remember to check the salt and sugar content.



Per serving/person Energy 1272 kJ/ 304 kcal  
 Protein 10.2 E%, Fat 17.2 E%, Carbohydrates 72.6 E%. Approx. 5.4 g Dietary fibre

### Health Tip

Cranberries are positively bursting with antioxidants that can help to stop cardiovascular disease and premature aging.



## Greek Yoghurt with Fruit and Homemade Muesli

### Serves 4

1 apple, ¼ Honeydew melon, 12 red grapes  
 100 g (3.5 oz) mixed berries  
 6 dl (21 fl oz, 2½ CUP) Greek yoghurt 2%  
 300 g (10.5 oz) nut muesli – see above

Cut apple and honeydew melon into small cubes, and cut the grapes in half. Create layers of fruit and Greek yoghurt, and top with a sprinkle of muesli.



Per serving/person Energy 1993 kJ/ 476 kcal,  
 Protein 20 E%, Fat 18.3 E%, Carbohydrates,  
 61.7 E%. Approx. 6.9 g Dietary fibre

### Health Tip

Yoghurt contains probiotics and claims are made that probiotics strengthen the immune system to combat allergies and stress.



CUBEX would like to congratulate Mr. R Gray for his 'food for brains' recipe entry. We hope you find your copy of 'Eating your way to Health and Happiness with the Nordic Diet' inspiring.

\*Source: Oticon 'The energy of cooking'

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