College of Science

Dr Greg O'Beirne, Senior Lecturer in Audiology
Department of Communication Disorders
Tel: +64 3 364 2987 ext. 7085, Fax: + 64 364 2760
Email: gregory.obeirne@canterbury.ac.nz

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

31st March 2008

The Secretary
Oticon Foundation in New Zealand
c/- P.O. Box 9128,
Te Aro, Wellington

Dear Ms Pullar,

Report: Establishment of a Vestibular Disorders Clinic at the University of Canterbury.

I am writing to report on the outcomes of a grant awarded to the Department of Communication Disorders by the Oticon Foundation in New Zealand. The grant of $18,000 was generously supplemented by funds from Oticon New Zealand, and enabled the Department to purchase an Interacoustics VO25B Videooculography System at a total cost of $38,425.50.

Videooculography (VOG) is the technique whereby the movement of the eyes is recorded and analysed in order to provide information on the functioning of the vestibular system. The acquisition of videooculography technology has been the first step in establishing a Vestibular Disorders clinic at the University of Canterbury.

The primary aims of our grant application were to:

i) provide our students with hands-on training in the diagnosis of balance disorders
ii) give our students the ability to undertake Masters research in the vestibular system; and
iii) enhance the delivery of vestibular assessment services in the Canterbury region.

After being notified of the success of our grant application on May 18th 2007, we took delivery of the Videooculography equipment from Oticon New Zealand on 22nd June, and received some introductory training from Oticon's Hilary Gardner. The equipment was set up and in-use in our laboratories in time for the commencement of the teaching of our Vestibular Disorders course on July 16th.

Having access to our own VOG equipment has completely transformed the Vestibular training we are able to offer our MAud students. The grant has enabled theoretical sessions on the measurement of eye movements to be supplemented by lab sessions that both consolidate the theory and broaden the students' practical skill-base. The students have reacted very positively to the presence of the equipment in the lab, and have made a concerted effort to master both the technology and the significance of the measurements.

The Interacoustics VOG equipment formed an integral part of both theoretical and hands-on sessions, and was the subject of the major practical assignment of the course. Students were required to make a large number of VOG recordings on fellow students (including measurement of saccades, sinusoidal tracking of visual stimuli, and optokinetic and post-rotatory nystagmus tests) and submit their findings in a 15 – 20 page written report. A small excerpt from such a report is shown in Appendix 1.

We are now in a position to expand the vestibular research projects offered to our MAud students. While the one student who chose a vestibular project for 2008 decided to focus on vestibular-evoked myogenic potentials (VEMPs), projects using the VOG equipment continue to be offered.

As described below, we have actively publicised these grants and the work done by the Oticon Foundation. We are also grateful for the publicity that the Foundation itself has initiated, including the article in the February edition of the "Soundscape" newsletter (Appendix 2), and the press release issued on March 3rd.

On March 14th we published a 300-word illustrated article in the University of Canterbury's fortnightly news magazine, The Chronicle (Vol. 43, No. 4, p.4), shown in Appendix 3. The Chronicle is distributed in print form to 3200 people including University staff and external subscribers, and is also available electronically at http://www.comsdev.canterbury.ac.nz/chronicle/archive.shtml

The Chronicle story generated a great deal of interest, and was chosen to appear as a news item on the University of Canterbury's main web page from March 17th (see Appendix 4, and also the "Latest News" page shown in Appendix 5). So far, the article has been on the main page for two weeks, and has been seen by approximately 309,000 visitors, of which 220,000 were external to the University of Canterbury. Additionally, this same news item is currently on the main web page of the Department of Communication Disorders (Appendix 6), where it has been seen by around 600 visitors. All of these short items linked to the full text of the Chronicle story, which has been read online by almost 700 visitors.

This publicity has helped raise awareness of i) the diagnosis of vestibular disorders, ii) the depth of training received by Master of Audiology students in the function and dysfunction of both the auditory and vestibular systems, and iii) the support provided by the Oticon Foundation.

As visible in the photos used in the Soundscape and Chronicle articles, both the Oticon Foundation and Oticon New Zealand are prominently acknowledged in temporary signage above the equipment in the laboratory. This is shortly to be replaced by more permanent signage once the lab has been refurbished.

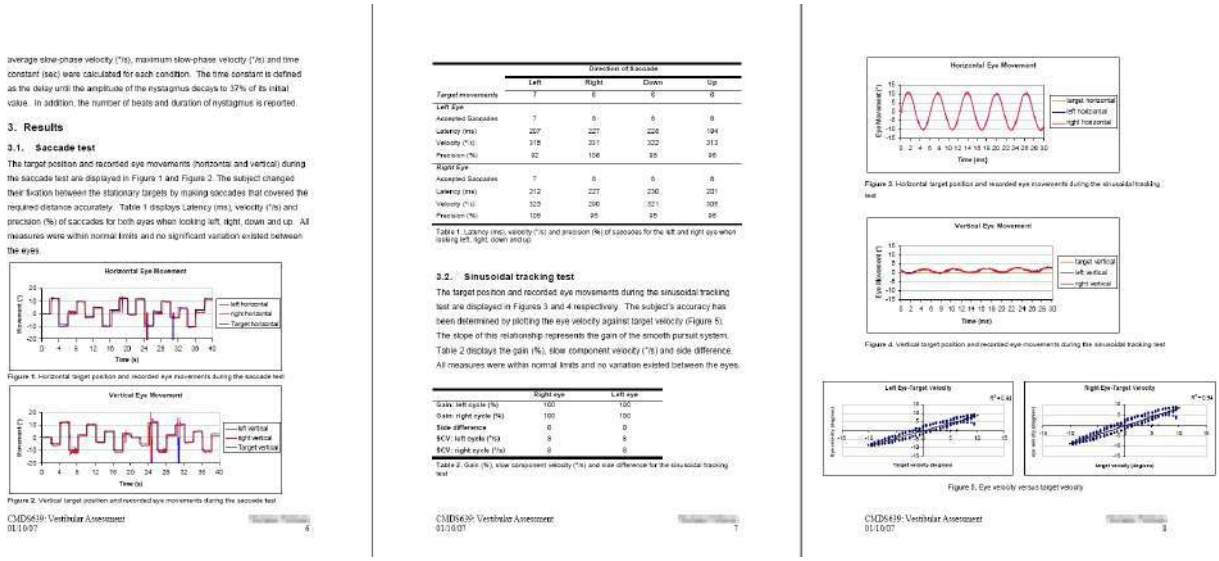
As at March 2008, the Vestibular Disorders clinic is used for teaching and research only. However, in recent months we have added the recording of VEMPs to our clinical repertoire, and hope to include both VEMPs and VOG in the services we make available to the general public within the next year.

On behalf of our students, we thank the trustees of the Oticon Foundation in New Zealand, and Oticon New Zealand, for the generosity shown in the awarding of this grant.

Yours sincerely,

Dr Greg O'Beirne
Senior Lecturer in Audiology
Coordinator of the Postgraduate Audiology Programme
University of Canterbury

Appendices



average slow-phase velocity (°/s), maximum slow-phase velocity (°/s) and time constant (sec) were calculated for each condition. The time constant is defined as the delay until the amplitude of the nystagmus decays to 37% of its initial value. In addition, the number of beats and duration of nystagmus is reported.

3. Results

3.1. Saccade test

The target position and recorded eye movements (horizontal and vertical) during the saccade test are displayed in Figure 1 and Figure 2. The subject changed their fixation between the stationary targets by making saccades that covered the required distance accurately. Table 1 displays Latency (ms), velocity (°/s) and precision (%) of saccades for both eyes when looking left, right, down and up. All measures were within normal limits and no significant variation existed between the eyes.

Horizontal Eye Movement

Figure 1. Horizontal target position and recorded eye movements during the saccade test

Vertical Eye Movement

Figure 2. Vertical target position and recorded eye movements during the saccade test

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Direction of Saccade

	Left	Right	Down	Up
Target movements	7	6	6	6
Left Eye				
Accepted Saccades	7	6	6	6
Latency (ms)	207	227	226	194
Velocity (°/s)	318	291	322	313
Precision (%)	92	106	95	96
Right Eye				
Accepted Saccades	7	6	6	6
Latency (ms)	212	227	236	201
Velocity (°/s)	323	296	321	305
Precision (%)	109	95	95	95

Table 1. Latency (ms), velocity (°/s) and precision (%) of saccades for the left and right eye when looking left, right, down and up.

3.2. Sinusoidal tracking test

The target position and recorded eye movements during the sinusoidal tracking test are displayed in Figures 3 and 4 respectively. The subject's accuracy has been determined by plotting the eye velocity against target velocity (Figure 5). The slope of this relationship represents the gain of the smooth pursuit system. Table 2 displays the gain (%), slow component velocity (°/s) and side difference. All measures were within normal limits and no variation existed between the eyes.

	Right eye	Left eye
Gain: left cycle (%)	100	100
Gain: right cycle (%)	100	100
Side difference	0	0
SCV: left cycle (°/s)	8	8
SCV: right cycle (°/s)	8	8

Table 2. Gain (%), slow component velocity (°/s) and side difference for the sinusoidal tracking test

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Horizontal Eye Movement

Figure 3. Horizontal target position and recorded eye movements during the sinusoidal tracking test

Vertical Eye Movement

Figure 4. Vertical target position and recorded eye movements during the sinusoidal tracking test

Left Eye-Target Velocity

Right Eye-Target Velocity

Figure 5. Eye velocity versus target velocity

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Appendix 1: Example pages from an MAud student VNG laboratory report
Assignment submitted 1st October 2008

Practical, Hands-on Experience with Vestibular Disorders at Canterbury

Helping the University of Canterbury provide students with solid hands-on experience to diagnose vestibular disorders – or dizziness and balance problems - is behind one of the latest Oticon Foundation grants.

Audiology students are now benefiting from the use of an Interacoustics Videooculography System in the University's Vestibular Disorders Clinic.

"We've traditionally taught the theory side of our Vestibular Disorders courses in- house, but students' experience with this type of diagnosis equipment was limited to clinical placements at Christchurch Hospital," says Dr Greg O'Beirne, Senior Lecturer in Audiology.

"Having this equipment in our clinic greatly enhances the clinical education of our students and better equips them for practice in vestibular diagnosis."

The equipment has allowed the establishment of a Vestibular Disorders Clinic which:

- provides students with hands-on training on the diagnosis of balance disorders
- gives students the ability to do Masters research in the vestibular system
- enhances the delivery of vestibular assessment services in Canterbury.

Dr O'Beirne expects that the provision of balance assessment services through the University clinic will also reduce pressure on Christchurch Hospital.

Students Gemma Caukwell (wearing the goggles) and Brenna (adjusting them) test out the new equipment).

Appendix 2: "Soundscape" – Oticon Foundation in New Zealand, February 2008

Grants allow Communication Disorders to diagnose balance-related problems

Audiology students at the University of Canterbury can now gain valuable hands-on experience in diagnosing vestibular disorders — or dizziness and balance problems — thanks to generous grants from the Oticon Foundation and Oticon New Zealand.

The Department of Communication Disorders received funding of $18,000 from the charitable trust in its 2007 funding round, which was generously matched by hearing aid and diagnostic equipment manufacturer Oticon New Zealand, to enable the purchase of a video-nystagmography (balance testing) system for use in research, teaching and the audiology clinic.

Dr Greg O'Beirne, Coordinator of the Postgraduate Audiology Programme, said that masters students took a semester-long course on vestibular disorders but traditionally they received only theoretical instruction on campus.

"Balance disorders are part of the scope of practice for audiologists, so we are really trying to build that skill among our graduates.

Audiology masters students Gemma Caukwell (left) and Brenna Sincock test out the new equipment in the Vestibular Disorders Clinic.

Previously their only exposure to this type of diagnostic equipment was limited to clinical placements at Christchurch Hospital," Dr O'Beirne said.

"Having this new equipment here in our newly established Vestibular Disorders Clinic enables us to provide our students with solid hands-on experience with the type of equipment they are likely to encounter in clinical practice. It also means that we can expand the range of topics we can offer for masters research."

Students began using the Interacoustics videooculography system last semester.

"The infrared camera in the system monitors eye movement. If you've ever watched a child spinning around in a circle you would notice that when they stop spinning their eyes are flicking about — it's that movement of the eyes which gives us a lot of information about the functioning of the vestibular system," said Dr O'Beirne.

There are plans to, within the year, extend the University's Hearing Clinic services to include balance assessment, which Dr O'Beirne expected would reduce the demand on the resources of Christchurch Hospital.

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Appendix 3: "Chronicle" (Vol. 43, No. 4) - University of Canterbury, 14th March 2008

UC Home

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Welcome to the University of Canterbury
Nau Mai, Haere Mai ki te Whare Wānanga o Waitaha

UC joins Earth Hour


Discovery Day 2008


April 2008 Graduation

News

Diagnosis of balance-related problems aided by grants (17 March)


Audiology students at the University of Canterbury can now gain valuable hands-on experience in diagnosing vestibular disorders — or dizziness and balance problems — thanks to generous grants from the Oticon Foundation and Oticon New Zealand.

Search

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Student Profile


Jody Hohaia, BA, GradDip in Te Reo Māori Bilingual & Immersion Teaching

Quick Links

Appendix 4: Main web page – University of Canterbury, 17th – 31st March 2008

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Te Whare Wānanga o Waitaha
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Latest News

Published by Communications and Development

Audiology masters students Gemma Caukwell (left) and Brenna Sincock test out the new equipment in the Vestibular Disorders Clinic.

27 March 2008

Multi-million dollar funding for UC collaborations
Six projects involving staff from the University of Canterbury have been awarded more than $6 million in the inaugural round of the Encouraging and Supporting Innovation Fund.

20 March 2008

Lucrative scholarships for UC's top achievers
Seven University of Canterbury doctoral students have been awarded scholarships collectively worth nearly $680,000 in the latest Top Achievers Doctoral Scholarships round.

17 March 2008

Diagnosis of balance-related problems aided by grants
Audiology students at the University of Canterbury can now gain valuable hands-on experience in diagnosing vestibular disorders — or dizziness and balance problems — thanks to generous grants from the Oticon Foundation and Oticon New Zealand.

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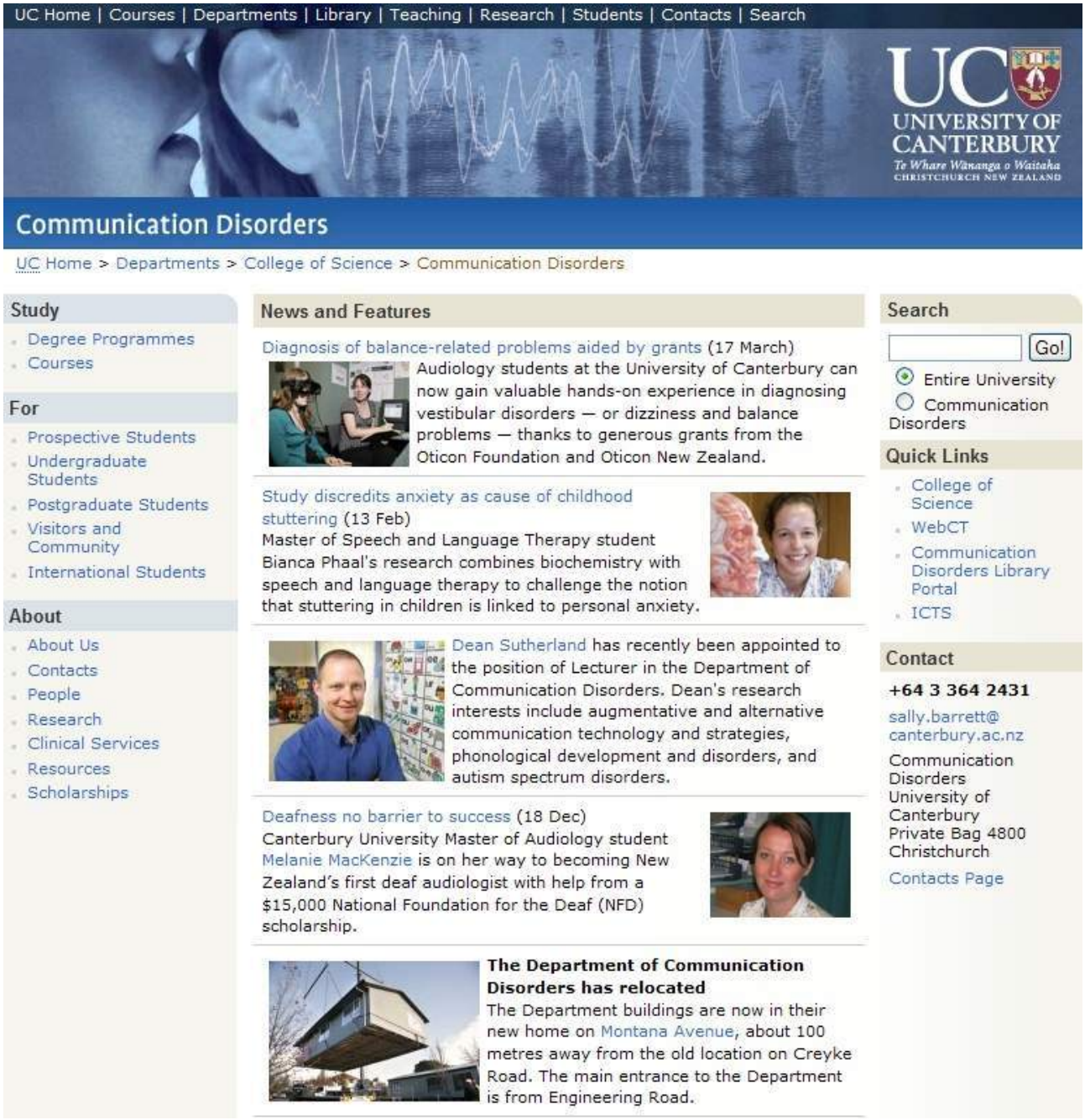
Contact
+64 3 364 2922
comms@canterbury.ac.nz
Communications and Development
University of Canterbury
Private Bag 4800
Christchurch
Fax +64 3 364 2679

Appendix 5: Latest News page – University of Canterbury, 17th – 31st March 2008



Appendix 6: Main web page – Communication Disorders, University of Canterbury from 17th March 2008