Taking steps to promote safe and healthy Ortho-k practice

The University has set up an expert panel comprising senior academics, local practitioners and overseas consultants to promote safe and healthy practices of Orthokeratology (Ortho-k) through conducting research, professional training and educating the general public.

At a press briefing held on 12 July, Prof. George Woo, Chair of Optometry and Dean of the Faculty of Health and Social Sciences, commented that in recent years local demand has been growing steadily for Ortho-k treatment — the technique of progressively reshaping the cornea using specially made contact lenses to reduce myopia.

"In a territory where 70 per cent of the young adult population is short-sighted and where the rate of myopia progression in young children reached 0.50 dioptre per year, patients' demand for myopia reduction will continue to grow, and it is important to take positive action to meet this demand in a safe manner," he observed.

Prof. Woo stressed that in receiving Ortho-k treatment, the chances of complication could be minimised through good communication with the contact lens practitioner, strict adherence to professional advice and regular aftercare consultations. He held that Ortho-k is relatively safe because infections caused by the lenses can almost always be treated with antibiotics, and corneal warpage is reversible.

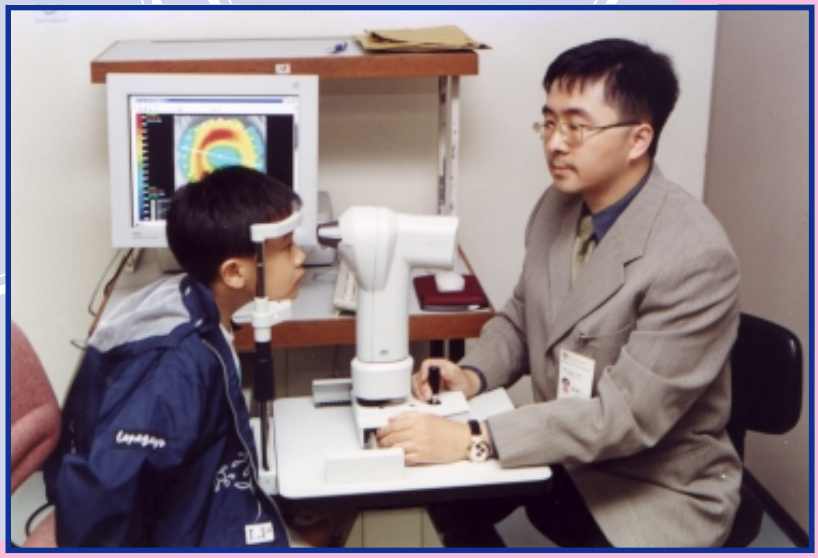
At the press briefing to call for safe Ortho-K practice.

As the sole provider of tertiary education in optometry in Hong Kong, Prof. Woo said the University is fully committed to further improving the service standard of local practitioners and to enhancing the public's knowledge of Ortho-k. He urged health care practitioners to work together to improve the safe and healthy practice of all myopia reduction methods for the good of the community.

Apart from Prof. George Woo, the five-member team at PolyU comprises Prof. Marion Edwards, Dr Pauline Cho, Mr Vincent Chui and Ms Peggy Cheung. They are now working with overseas collaborators and local practitioners to examine the safety and efficacy of Ortho-k techniques now in use in Hong Kong. The Department of Optometry and Radiography will continue to provide continuing professional training to private practitioners who are licensed to fit contact lenses. The team will also promote general knowledge of Ortho-k through organising public seminars, publications and the website at: http://www.polyu.edu.hk/or/OrthoK.

Furthermore, the researchers are working to develop customised Ortho-k lenses and treatment procedures for Chinese patients, whose corneal characteristics have been found earlier to be distinctly different from Caucasians.

To obtain a leaflet on Ortho-k, send a stamped self-addressed envelope to the Optometry Clinic on PolyU campus.



Ten-year-old Charles Lam Chiu-yiu takes his optometrist's advice in receiving Ortho-k treatment.

Baby dolphins a world first

Dr Brook overjoyed with the birth of the two dolphins.

Gina and her newborn calf.

The University recently joined Ocean Park in announcing the successful birth of the world's first two bottlenose dolphin calves as a result of artificial insemination (AI). The pioneering efforts represent a major leap forward in the field of assisted reproduction in marine mammals and put Hong Kong at the world's forefront of reproductive physiology research and controlled breeding of marine mammals.

Ada and Gina, two of the Park's female dolphins, delivered two healthy calves, a female and male respectively, in May 2001. The names for the calves have yet to be decided.

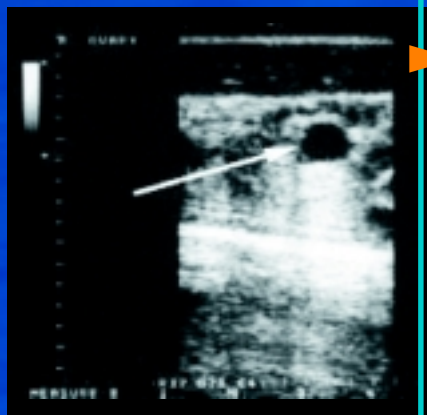
Ms Suzanne Gendron, Ocean Park's Zoological Operations and Education Director, said: "These successful births signify exciting new possibilities in maintaining and enhancing the genetic diversity of bottlenose dolphin collections world-wide."

Dr Fiona Brook, Associate Professor of PolyU's Department of Optometry and Radiography, who leads the Park's Controlled Breeding and Assisted Reproduction Program, said: "The development of successful AI techniques in bottlenose dolphins has many advantages. The most important of these being that there will be no need to risk animals and disrupt populations by transferring dolphins between facilities for breeding purposes. AI can be used to introduce new genes into otherwise isolated groups of animals, thus maximizing the use of the captive gene pool and reducing the need to take more dolphins from the wild."

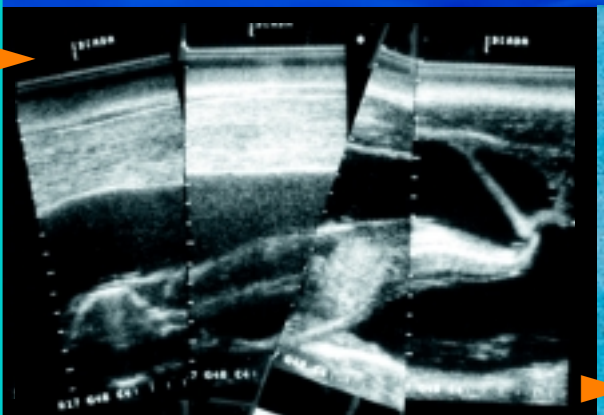
The Controlled Breeding Program was set up in conjunction with Dr Reimi Kinoshita of Ocean Park in 1993. Dr Brook, along with Ocean Park's team, led by Dr Natalie Rourke and Dr Crista Rayner, and Dr Todd Robeck of SeaWorld Adventure Parks, started to investigate AI procedures for bottlenose dolphins in October 1999. Mature female bottlenose dolphins were inseminated and the world's first AI pregnancy in a bottlenose dolphin was confirmed in June 2000.

In AI, semen is collected from the male, evaluated, prepared and inserted into the reproductive tract of an ovulating female. Accurate prediction of ovulation is crucial in producing pregnancy, and at Ocean Park, this was done with the help of ultrasound imaging, a relatively simple technique but one which Dr Brook was the first to use successfully in dolphins.

The two newly borns, together with Ada and Gina, can be seen daily at the Dolphin University of Ocean Park.



Ultrasound image of the ovarian follicle in Ada just before ovulation.



Ultrasound image of Ada's pregnancy at 170 days

Suzanne Gendron

Ada and calf 20 minutes after she was born. She is the world's first calf produced through AI to be born.

Saving energy in high rises

To improve environmental performance of buildings through encouraging reduction in electricity consumption, the Department of Building Services Engineering (BSE) is studying the energy usage of high-rise residential buildings. The research is linked to the Hong Kong Building Environmental Assessment Method (HK-BEAM), which BSE played a major part in developing.

Using high performance research software tools, the influences of various features on the energy usage, economics and indoor environmental performances of typical Hong Kong private flats have been evaluated. These features include the extent to which different spaces are air conditioned, the time patterns for the use of air conditioners, the wall, door and window properties, and solar shading.

Some very interesting conclusions are already emerging. For example, a simple and promising non-conventional application in Hong Kong flats of thermal insulation serves to decrease energy consumption.

The simulations indicate that a decrease in the yearly total cooling load of 6.8 per cent can be obtained when a 5cm thick thermal insulation layer is used facing the inside of a residential flat with a concrete wall of 10cm in thickness. A decrease in the maximum cooling demand of 7.3 per cent is indicated when a 5cm thermal insulation layer faces either the outside or the inside of the flat.

The study finds that higher investment costs using thicker thermal insulation layers and concrete layers, say, of more than 5cm and 10cm respectively, may not be worthwhile, as the decrease in the maximum cooling demand is so slight that it becomes uneconomical overall.

The research also demonstrates that for the sake of economy and environmental protection, detailed computer simulation studies of any building design in its specific location are worth making as a routine part of the design process.

One of the software tools used in the study is HTB2 (developed at the Welsh School of Architecture), a detailed building heat transfer simulation programme which is used to optimise the design of residential building envelopes. Two other tools used were developed by BSE: BECON simulates operation of air conditioning systems and predicts electricity consumption of a building; and BSENV calculates economic and environmental impacts of the simulated building.

Further details on the study is published in the paper: M. Bojic, F. Yik, P. Sat, "Influence of Thermal Insulation position in Building Envelope on the Space Cooling of High Rise Residential Buildings in Hong Kong", *Energy & Buildings*, 33/6 (2001) 571–583.

Interested in obtaining more research briefings like this on PolyU's Area of Strategic Development "Advanced Buildings Technology in a Dense Urban Environment"? Please contact Miss Liu on 2766 6046, by fax on 2334 6389 or email to ceesther@polyu.edu.hk .

Telehealth centre opens in Tsing Yi

The Telehealth Clinic – Tsing Yi Station, the first of its kind in Hong Kong, was inaugurated at a ceremony held on campus on 7 July. The initiative was jointly introduced by PolyU's Department of Nursing and Health Sciences, Princess Margaret Hospital and Kwai Ching District Council.

Operating on the basis of a Telehealth System and making use of the latest information technology, the "Clinic" offers free primary health services to the residents of Tsing Yi Island, which include helping them perform regular checkups, offering counselling and interventions on health concerns and establishing their computerised life-long health records. In addition, the centre provides an excellent facility for nursing students to practise community-based care, an opportunity that was lacking in the past.

The Clinic is located at No. 3–4, G/F, Hang Lai House, Cheung Hang Estate, Tsing Yi, New Territories. For details, please call 2431 5906.

Enhancing quality of life with ozone

Ozone is an important natural constituent of the atmosphere. When dissolved in water, it is extremely useful in thousands of applications, especially in the process of water treatment and disinfection. ***Dr Gilbert Chan****, Lecturer of the Department of Applied Biology and Chemical Technology, tells how the research on ozone conducted by his team and related activities can improve our daily lives.*

Best known for its superior disinfection capability and efficiency over other processes (see table), ozone is now receiving considerable attention for its use in household and commercial applications.

To further promote the use of ozone and develop its application in everyday life, a workshop entitled "Applications of Ozone Technology in Environmental Protection and Public Health" was recently held by the Department of Applied Biology and Chemical Technology in collaboration with its industrial partner Oasun Purification Equipments (Shanghai) Inc. Representatives from various commercial, industrial and government sectors were present to exchange ideas and experiences concerning the use of ozone.

Dr Gilbert Chan and Research Assistant Ms Helen Tse examine the applications of ozone.

Furthermore, researchers at PolyU and Oasun have worked together to develop two types of ozone equipment, Kitchen Guard™ and a drinking water machine. These machines are already commercially available in China and will soon be available in Hong Kong.

Kitchen Guard™ is a compact household machine for the production of ozonated water from normal tap water which can then be directly used for washing fruits, vegetables and utensils to fulfill the purpose of cleaning, removing residual pesticide and disinfection at the same time. This machine is of particular value in the light of the common occurrence of food poisoning as a result of the consumption of food products contaminated with either residual pesticide or toxins produced by microorganisms.

The drinking water machine was developed for both household and office to ensure the superior quality of drinking water simply by disinfecting the incoming water with ozone generated from a built-in generator. The excess ozone will be destroyed from the treated water before it is discharged for safe consumption.

Early this year, the PolyU research team conducted extensive laboratory work to further assure the disinfection, colour and pesticide removal properties of ozonated water generated from the developed machines. The positive findings not only provide scientific evidence for the value of ozone technology, but also shed light on the huge market potential which can be developed in the near future.

Currently, the team is also involved in another feasibility study on the application of ozone in landfill leachate treatment which seeks to improve the ease of maintenance and operation for on-site treatment.

Another research focus is the potential use of ozonated water in cleaning the market, especially for poultry cages and surrounding areas, as a preventive measure for the outbreak of the avian flu (H5N1) which struck Hong Kong in 1997 and again in 2001. Further applications of ozone are yet to be explored for the improvement of people's standard of living.

Comparison of commonly used disinfection methods

	Ozone	*UV*	*Heat*	*Filtration*
Purification of drinking water	✓	✓	✓	✓
Disinfection of chopping board, tableware and cooking utensil	✓	✗	✓	✗
Disinfection of nipple and feeding bottles	✓	✗	✓	✗
Disinfection of foods to be served without cooking	✓	✗	✗	✗
Disinfect and improve quality and shelf-life of viable food	✓	✓/✗	✗	✗
Food washing and prevent loss of vitamin	✓	✗	✗	✗
Removal of residual pesticide on fruits and vegetables	✓/✗	✓/✗	✓/✗	✗
Removal of aflatoxin	✓	✗	✗	✗

Major conferences at a glance

2-4 May

International Symposium on Intelligent Multimedia, Video and Speech Processing

Held in Hong Kong for the first time, it brought together engineering experts and researchers from 14 different countries. The keynote speakers were Dr Li Weiping of the US WebCast Technologies Inc and Dr Zhang Yaqin of Microsoft Research, China.

10 May

Second Travel and Tourism Industry Roundtable on the Environment

The Department of Hotel and Tourism Management co-hosted the roundtable with the Hong Kong Tourism Board to promote good environmental practices.

18 May

Symposium on Lessons of the California Crisis for Power Market Design

More than 200 scholars and professionals in utility planning and operation technologies attended the symposium to study power market design and deregulation of electricity industry in the light of the California energy crisis.

25-27 May

Second China Accounting and Finance Review International Conference

Jointly organised with Tsinghua University and the National Accounting Institute, the conference facilitated in-depth and comprehensive review of major research work, policy issues and practice related to accounting and finance in China.

1-2 June

Second IT and Multimedia in English Language Teaching Conference

The conference was organised by the English Language Centre to provide a forum for discussion on computer-based learning and teaching of English in and out of the classroom. It attracted almost 300 participants from around the world.

3 July

8th International Congress on Sound and Vibration

Jointly organised by the Department of Mechanical Engineering and the International Institute of Acoustics and Vibration, the congress brought together engineers, planners, government officials and representatives of major industrial corporations from different countries to share their knowledge of noise abatement.

18 July

International Association of Maritime Economists Annual Conference

Organised by the Department of Shipping and Transport Logistics, it attracted the attendance of over 60 world class maritime economists.

Connecting with academe across the world

PolyU has achieved significant progress in forging academic links with the international world of learning following its recent signing of cooperative agreements with several world renowned universities and entry to a consortium of innovative universities.

One of the University's new partners is the **University of Waterloo**, Canada. Under a Memorandum of Understanding for Educational and Scientific Cooperation signed with Waterloo, both parties will positively work on possibilities for cooperation, in particular in areas such as optometry, computer science and system design engineering. For nine years Waterloo has ranked number one in the national reputation survey of Canada's magazine *Maclean's*.

Another two agreements were signed separately with the **Northern Jiaotong University** on the mainland and the **University of the Philippines Diliman**, which will facilitate the exchange of scholars and students and promote collaborative research as well as sharing of academic and technology information.

Meanwhile, the Department of Nursing and Health Sciences entered into collaboration agreements with its counterparts in **Yale University** in the US, **Deakin University** in Australia, **University of Huddersfield** in the UK and **Fudan University** in China.

The agreements represent one further step in nurturing quality nursing professionals for Hong Kong through teaching and research collaboration in nursing and biomedical science education, student exchange as well as exchange of educational and research data.

PolyU teams up with Ecole de Technologie Superieure in research.

An agreement signing ceremony held on campus underlines PolyU's fruitful ties with Yale and Deakin.

Yale and Deakin, in particular, have made many contributions to the revamp of the programme Master of Science in Nursing offered by PolyU. The new version of this part-time programme, to be launched in September, is strengthened with a clinical focus to keep up with international development in the professional role of nurse practitioners.

Furthermore, the Department of Electrical Engineering and **Ecole de Technologie Superieure**, a prominent engineering school in Canada, signed an agreement to foster scientific collaboration between the two universities, especially in the field of power systems simulation and control.

PolyU's School of Professional Education and Executive Development and the **University of South Australia** entered into an agreement which aims to foster academic and cultural interchange. Both parties will explore the possibility of an articulation arrangement under which academic qualifications granted by either institution can be recognised for the purpose of credit transfer, or advanced entry to programmes offered by the other party.

At the same time, PolyU has been offered associate membership by the **European Consortium of Innovative Universities**, an academic network formed by 11 of Europe's most innovative universities. These members are all committed to developing new ways of teaching and research, experimenting with new management and administration style, and nurturing an innovative culture within the university.

As an entrepreneurial and progressive institution with strong academic strengths in engineering and social science, PolyU has been invited to join the Consortium and develop possible entrepreneurial collaboration in four areas, namely education, research, regional development and institutional development.