

NOMA



DAY

CENTRE INTERNATIONAL DE CONFERENCES
GENEVA, SWITZERLAND

WORLD NOMA DAY
22 MAY 2008

UNDER THE PATRONAGE OF Mr KOFI A. ANNAN
UNDER THE PRESIDENCY OF Dr BERTRAND PICCARD

SCIENTIFIC PROGRAMME

ORGANIZED BY THE INTERNATIONAL NO-NOMA FEDERATION
IN ASSOCIATION WITH THE WORLD HEALTH ORGANIZATION (WHO)
AND THE WORLD DENTAL FEDERATION (FDI)

In association with:



Noma
international noma federation
www.nonoma.org

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OUOBA, Prof. Kampadilemba

PASTER, Prof. Bruce

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VINZENZ, Prof. Kurt

MESSAGE FROM Dr BERTRAND PICCARD

PRESIDENT OF THE FEDERATION

Hearing its name for the first time, you don't know what it is. Hearing its description, you cannot believe it. Seeing it with your own eyes, you will never be the same person again. Noma is not only a disease that leaves indelible scars on the face of its little victims, but it also engraves the extent of its effects into the memories of those who encounter it; the shame of not knowing about it sooner, the horror something like this can still exist in the 21st century, the wondering as to why so few humanitarian associations are involved against it.

Every year, amidst general indifference, thousands of very young children living in the poorest regions of Asia, South America and Sub-Saharan Africa pay an unacceptably high price for malnutrition, poor hygienic conditions and ignorance. Beginning as gingivitis turning into necrotizing ulcerative tissues or as an undetected oedema in the cheek, the infection rapidly develops. Due to weakened natural defences, it becomes irreversible in just a matter of days. During those few days, however, common antibiotic therapy would still have been sufficient to halt the development of the disease, if only someone had known... The child is then condemned to have this gangrenous infection ruin his or her face, destroying soft and hard tissues, and so to show the so-called civilized world the true face of misery: hideous, revolting, unacceptable. Twenty percent of the victims will survive, but with appalling sufferings: yawning holes in the face, scars that restrict jaw movements and prevent normal eating, breathing problems and social rejection due to repulsive mutilation, children without a face. Did you know they exist?

Because Noma is not contagious, it is nobody's concern. Because it is directly linked to malnutrition and poor hygienic conditions, it's seen as a problem without solution. And yet it is a symbol. The symbol of the fracture in which our world is evolving; the gap between extravagant societies and starving populations, between ultra sophisticated technologies and total lack. It also is the symbol of our short-sightedness as we forget that humanity won't be able to move ahead very far leaving three-quarters of its population behind. Sounding the alarm is not just a simple motion of naive solidarity, but it truly addresses the problem of safety on our planet for the future.

Convinced by the importance of this cause, different actors committed to this fight have gathered together into the International NoNoma Federation, created and headed by the Winds of Hope Foundation. Its thirty-one members are dedicated to developing local and international synergies through etiological research, malnutrition prevention, health agent training, early diagnostic, primary care, reconstructive surgery and social reintegration. By gathering field specialists and health authorities together and by improving NGO support within the concerned countries, this first Noma Day is aimed bring us a step closer to eliminating this disease.

The fight against Noma is a pathway towards the most underprivileged populations of our world: let us walk in it together!

Dr. Bertrand Piccard President International
NoNoma Federation President
Winds of Hope Foundation

WELCOME LETTERS BY WHO

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ABOUT THE ORGANIZERS



International No-Noma Federation (www.nonoma.org)

The No-Noma Federation is a coalition of associations, foundations, and active NGOs united in the fight against noma and determined to collaborate to develop synergies while respecting an ethical code.

The mission statements of the Federation are:

1. To present a single voice interlocutor and representative to international and local health authorities
2. To offer its members a common platform of communication using new technologies to improve their actions in the areas of prevention, detection, research, and medical and surgical management



World Health Organization (www.who.int)

The World Health Organization (WHO) is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.



FDI World Dental Federation (www.fdiworldental.org)

The FDI World Dental Federation is one of the oldest international professional organizations in the world. It has currently a membership of more than 190 member associations in more than 135 countries, representing more than one million dentists globally. Its vision is to lead the world to optimal oral health and its missions are to be the worldwide, authoritative and independent voice of the dental profession; to promote optimal oral and general health for all peoples; to promote the interests of its member associations and their members; and to advance and promote the ethics, art, science and practice of dentistry.

HONORARY COMMITTEE

Mr. Pascal Couchepin	President of the Swiss Confederation
Mr. Laurent Moutinot	President of the State Council and the Republic and Canton of Geneva
Mr. David Hiler	Vice-President of the State Council
Mr. Robert Cramer	State Councillor
Mr. Pierre-François Unger	State Councillor
Mr. Charles Beer	State Councillor
Mr. François Longchamp	State Councillor
Mr. Mark Muller	State Councillor
Mr. Robert Hensler	State Chancellor
Mr. Patrice Mugny	Mayor of Geneva
Mr. Manuel Tornare	Vice-President of the Administrative Council
Ms. Sandrine Salerno	Administrative Councillor
Mr. Rémy Pagani	Administrative Councillor
Mr. Pierre Maudet	Administrative Councillor
Ms. Chantal Boni	First Lady of Benin
Ms. Chantal Compaoré	First Lady of Burkina Faso
Ms. Touré Lobbo Traoré	First Lady of Mali
Ms. Viviane Wade	First Lady of Senegal
Dr. Bernard Kouchner	Minister of Foreign and European Affairs of the French Republic
Dr. Juan Manuel Suarez del Toro Rivero	President of the International Federation of Red Cross and Red Crescent
Dr. Jacques Rogge	President of the International Olympic Committee
Dr. Luis G. Sambo	Regional Director of the World Health Organization Regional Office for Africa
Ms. Barbara Hendricks	
Ms. Tina Turner	
Mr. Igor Ustinov	

SCHEDULE OF EVENTS

GENERAL EVENTS

9:00 - 18:00	Village	Hall
11:45 - 12:30	Official Opening	
19:30	Gala Dinner Organized by the Winds of Hope Foundation	Halle de Secheron

SCIENTIFIC PROGRAMME

9:00 - 11:30	SCIENTIFIC LECTURE (OPEN TO GENERAL PUBLIC) Session One: The Disease, Risk Factors and Epidemiology	Auditorium
13:15 - 15:30	SCIENTIFIC LECTURES (OPEN TO HEALTH PROFESSIONALS) Session Two: Medical and Surgical Treatment	Auditorium
16:00 - 17:45	SCIENTIFIC LECTURES (OPEN TO HEALTH PROFESSIONALS) Session Three: Research and New Perspectives	Auditorium

YOUTH FORUM AND INFORMATION SESSIONS

13:15 - 13:50	Information Session	Hall
14:00 - 15:00	Youth Forum	Hall
15:00 - 15:50	Information Session	Hall

NOMA: THE FACE OF POVERTY

Noma, also called «Cancrum oris», is a gangrenous condition, which starts in the mouth as a benign oral lesion and rapidly destroys both soft and hard tissues of the mouth and face. Most noma sufferers are children under six years of age. The expert consensus is that the case-lethality rate is between 70 and 90 %. Noma flourishes where poverty is greatest, nutrition is poorest and general and oral hygiene is neglected.

In 1994, the WHO declared noma to be a public health issue. Noma exists throughout the world, predominantly in Africa.

The WHO strategy to fight against noma is based on prevention and early detection, immediate care, informing and educating the public, epidemiological data collection and the creation of a referral center to treat its after-effects.

In May 2007, the WHO Assembly adopted a Resolution urging support for programmes for the fight against noma in countries affected by the disease.

Objectives of World Noma Day

- alert the international community of the ravages of noma affecting children
- increase actions to prevent noma in the countries concerned
- reinforce the commitment of governments to fight this disease
- develop and foster partnerships between private initiatives and governmental authorities to improve the prevention of noma
- mobilize resources to fight against noma
- implement a policy of common actions to eventually eradicate this disease

THE SCIENTIFIC MEETING

Introduction to the Scientific Programme

The overall objective of the organization of Noma Day is to fight against the terrible ravages of noma by every possible means with a particular emphasis on the detection and prevention of the disease. The scientific session is also placed in the context of this fight, but its target is more specific: the fight against the lack of interest shown by scientists for an affliction which does not concern them, against ignorance, against erroneous information or false oversimplification, against amateurism. The prevention and adequate treatment of the disease cannot ignore a thorough knowledge of its aetiology and the socio-economic context of countries concerned. Financial means, goodwill and charity are certainly necessary, but they cannot be of any real efficiency without an improvement in current knowledge.

Unfortunately, for several reasons, very few scientists have really sought to investigate this topic, especially if one makes a comparison with more popular themes in the Western world concerning diseases even less frequent and less devastating than noma. The reasons for this indifference are due in part to a lack of finance, but even more to the difficulties inherent to research which must be conducted partially in countries without an adequate technical, medical and scientific infrastructure. Among the almost insurmountable difficulties confronting researchers can be cited the lack of precise data on the incidence and mortality and the multifactorial causative origin of the disease which, moreover, occurs in regions where numerous other endemic infections are already raging.

It has been repeatedly said that noma is the illness of misery, of poverty and malnutrition – but that does not suffice. To fight it, it is absolutely essential to extend much further our knowledge base. We need to know the environmental setting favouring its development and the warning signs for its onset. The same can be said for its treatment. It is known that antibiotics can

be efficacious if taken at an early stage of the illness. However, we also know that some noma cases have been cured without treatment and that others have not survived despite early treatment. There again, aetiological and bacteriological research informs us on the responsible pathogens and the most appropriate initial treatment.

As concerns the treatment and surgery of noma sequelae, the many facets of the facial mutilation created by necrosis cannot be corrected by simple surgical techniques which can be easily learned. Most often, these are complex surgical operations necessitating the involvement of surgeons highly specialized in facial reconstruction techniques. In this area, more than any other, any form of amateurism which can lead to prejudice for patients already severely handicapped is to be condemned. Again, substantial funding is necessary to finance these treatments but, also, surgeons already qualified need to be found who are willing to treat these patients and to transmit their knowledge to their younger colleagues.

We are indebted to the two organizers of this scientific meeting, Drs Denise Baratti-Mayer and Charlotte Ndiaye, for having invited a group of renowned speakers who are particularly committed to the fight against noma whether they be dentists, physicians, epidemiologists, biologists or social science researchers.

The road is still long, but we have every hope that this meeting will encourage a heightened awareness and commitment to help us better understand and treat this terrible disease.

Prof Denys Montandon

Welcome address by Scientific Secretariat

In the 1960s, Edmond Kaiser, founder of the humanitarian organizations “Terre des Hommes” and then “Sentinelles”, sees a case of noma for the first time: a South American child with a face atrociously mutilated. Deeply touched, he decides to devote himself to the combat against this scourge, ignored, unrecognized, forgotten, with all the energy for which he is known. Some years later, he contacts Professor Denys Montandon in Geneva to organize surgical treatment for all these children.

Today, in this same city, we are gathered together to celebrate the first day dedicated to noma with a slogan which would have been very close to the heart of Edmond Kaiser: React! Act!

The year 2008 will remain a landmark date for noma thanks to the organization of this event by the No-Noma Federation presided by the Winds of Hope Fondation, and thanks also to the commitment of partners such as the World Health Organization and the World Dental Foundation which we warmly thank for their presence and support.

The aim of this day is to alert the international community and to raise funds for the creation of efficient prevention and information programmes in the field. It is also the occasion to unite speakers and renowned specialists who will focus on the disease, its reality, appropriate treatment and future scientific perspectives.

The scientific committee, represented by Dr Charlotte Ndiaye and myself, would like to thank all speakers for having kindly replied positively to our invitation to participate. We are extremely grateful to them for having accepted to share their knowledge, their competence and their time for a cause which is important for us to be brought out of the shadows.

It is an immense pleasure and honour to welcome Professor Cyril O. Enwonwu who, since several decades, has been a pioneer of research on the cause of the disease, Professor Denys Montandon, one of the first surgeons in the Western world to treat noma cases, and Professor Brigitte Pittet who is pursuing this activity with ardour, competence and professionalism. May she know of our sincere thanks. In addition, we should like to thank Dr Klaas Marck, distinguished surgeon and noma historian, Dr Hans P. de Bruijn, co-founder of

the Sokoto Children’s Hospital, as well as Dr Andreas Schmidt and Professor Kurt Vinzenz, excellent surgeons, which we have the pleasure to welcome among us today.

We should also wish to extend our gratitude to those among us who, by their experience and their research, have contributed to expand our knowledge on the causes of the disease: Professors Didier Pittet, Andrea Mombelli, Jacques Schrenzel, Bruce Paster and Susheidni Naidoo, as well as Drs Reshma Phillips and Clemence Marimo. And let us not forget the presence of Professors Mapfumo Chidzonga and Kampadilemba Ouoba, who have travelled from afar to share with us their experience as surgeons working there where the disease is raging, treating these children under often difficult conditions... Without them, many children would no longer be with us.

Finally, our deepest thanks to all present for your participation and commitment so that, together, we may be able to help advance and to brighten the future of thousands of disfigured children. May this event heighten public awareness of a forgotten disease and bring to us, scientists, physicians and surgeons present, answers and new perspectives for the future in order to eradicate this disease confined to the poorest countries of our planet.

Dr. Denise Baratti-Mayer

SCIENTIFIC COMMITTEE

Chair	Prof. Denys Montandon	University of Geneva
Co-chairs	Dr. Burton Conrod Prof. Cyril O. Enwonwu	FDI World Dental Federation University of Maryland, USA
Scientific Secretariat	Dr. Denise Baratti-Mayer Prof. Charlotte Faty Ndiaye	University of Geneva WHO/AFRO
Members	Prof. Mapfumo M. Chidzonga Dr. Klaas W. Marck Prof. Kampadilemba Ouoba Prof. Poul-Erik Petersen Prof. Brigitte Pittet Prof. Didier Pittet Prof. Jacques Schrenzel	University of Zimbabwe Dutch Noma Foundation, The Netherlands University of Burkina Faso WHO, Geneva University of Geneva University of Geneva University of Geneva

SCIENTIFIC PROGRAMME

9:00-17:45, Auditorium

This meeting of experts, including the scientific committee presided by Prof. Denys Montandon, an eminent specialist in plastic and reconstructive surgery, will focus on the current state of knowledge on the cause and spread of noma.

Experienced physicians and surgeons from Europe, Africa and the USA will also be discuss treatment strategies and the future research perspectives for this complex disease.

Lectures will be presented in both English and French, with simultaneous translation.

Session One 9:00-11:30, Auditorium Open to the public

The Disease, Risk Factors and Epidemiology

Chair: Professors C.O. Enwonwu and D. Pittet

- 09:10 – 09:40** ENWONWU: Risk Factors for Noma
- 09:40 – 10:00** MARCK: A History of Noma
- 10:00 – 10:15** NDIAYE: Noma in the African region
- 10:15 – 10:30** NAIDOO: Oral and Facial Presentation of Noma
- 10:30 – 10:45** PHILLIPS: Noma in Children: Role of Micronutrient Deficiencies and Measles
- 10:45 – 11:00** Noma and HIV in Children in Zimbabwe
- 11:00 – 11:30** DISCUSSION

Session Two 13:15-15:30, Auditorium Open to health professionals only

Medical and Surgical Treatment

Chair: Professors D. Montandon and M.M. Chidzonga

- 13:15 – 13:30** OUOBA: Treatment of the evolutionary phase of noma in Burkina Faso
- 13:30 – 13:45** CHIDZONGA: Surgical Management of Noma in HIV-positive patient
- 13:45 – 14:00** B. PITTET: Surgical Strategy for Noma Sequelae
- 14:00 – 14:15** BARATTI-MAYER: Mouth contracture in Noma sequelae: long-term follow-up
- 14:15 – 14:30** de BRUIJN: The Noma Children Hospital in Sokoto Nigeria
- 14:30 – 14:45** SCHMIDT: The Sokoto Experiences with Microsurgical Reconstructions in Severe Noma Cases
- 14:45 – 15:00** VINZENZ: New trends in restoring oral function in noma patients
- 15:00 – 15:30** DISCUSSION

Session Three 16:00-17:45, Auditorium Open to health professionals only

Research and New Perspectives

Chair: Professors J. Schrenzel and B. Paster

- 16:00 – 16:15** MOMBELLI: Etiopathogeny and Bacteriological Factors
- 16:15 – 16:30** PASTER: Is Noma an Opportunistic Microbial infection?
- 16:30 – 16:45** SCHRENZEL: Description of Oral Flora in Children with Noma by Microarrays Technique
- 16:45 – 17:00** BARATTI-MAYER: First Epidemiological Results of the GESNOMA Research Project
- 17:00 – 17:30** DISCUSSION
- 17:30 – 17:45** Concluding Remarks by Prof D. Montandon

BIOSKETCHES AND ABSTRACTS



BARATTI-MAYER,

Dr. Denise

In charge of Scientific Secretariat

Speaker: Mouth contracture in noma sequelae. Long-term follow-up (Session 2) First Epidemiological Results of the GESNOMA Research Project (Session 3)

Following studies in both internal and dental medicine at the Faculty of Medicine of the Universities of Modena, Italy, and Geneva, Switzerland, and clinical practice in general and maxillofacial surgery, Denise Baratti-Mayer is, since 2001, responsible for the co-ordination of the multidisciplinary team of the Geneva Study Group on Noma (GESNOMA), attached to the Department of Plastic, Reconstructive and Aesthetic Surgery Service, Department of Surgery, University of Geneva Hospitals, Switzerland. She is also responsible for the recruitment and training of GESNOMA staff at the noma centre in Zinder, Niger, managed by the humanitarian organization "Sentinelles". This activity is combined with undergraduate and postgraduate teaching activities at the University of Geneva, Faculty of Medicine. Dr Baratti-Mayer is co-recipient of several grants for research on noma disease in the context of GESNOMA and author or co-author of several publications related to the topic. She is presently in charge of the Scientific Secretariat of Noma Day 2008.

Mouth contracture in noma sequelae: long-term follow up.
D. Baratti-Mayer, B. Pittet

Mouth stricture is perhaps the most challenging functional sequela of noma.

The mechanisms responsible for this stricture can be explained by the wound contraction which follows the cheek's internal tissue necrosis. In severe cases, the resulting fibrosis may involve the masseter and pterygoidian muscles, leading sometimes to a neo-ossification bridging the mandible to the malar region. It is not clear if this ossification is related to the duration after the acute phase of the disease, patient age, or to the localisation of the stricture itself.

To prevent the development of this sequela, physical therapy must be started as soon as possible during the wound healing phase.

Surgical management includes excision of fibrotic tissue and / or ossification, removal both coronoid process of the mandible and sometimes mandibular osteotomy. The reconstruction must bring enough tissue to recreate the mucosal lining of the cheek. This is best achieved by free skin flaps.

However, despite initial good results, recurrences are observed. Our follow-up of over 10 years for each operated patient, shows that the relapse of mouth stricture is insidious and develops progressively over the years. It is particularly prone to recur if the cause of the initial stricture is posterior, and if the reconstruction has been performed during childhood.

Physical therapy is essential in both pre- and post-operative periods and should be maintained over the years. These exercises seem to have a direct and immediate influence on mouth opening measurements. However, in several patients, reoperation might be necessary.

Preliminary Epidemiological Results of GESNOMA research project
D. Baratti-Mayer, A. Gayet-Ageron, S. Hugonnet, D. Pittet

Noma is a gangrenous disease leading to severe disfigurement and is responsible for high morbidity and mortality. It affects almost exclusively young children in developing countries. Due to the rapidity of the disease progression and to the remote areas where the disease impairs, only 10% of affected patients consult during the acute phase.

The two main objectives of our study were : 1) to investigate risk factors for noma in Niger; 2) to describe and compare bacterial oral flora of children with and without noma. The preliminary epidemiological results will be discussed here.

GESNOMA (Geneva Study group on Noma) is a research group, composed of a nursing team based in Zinder (Niger) and a multidisciplinary team in Geneva. It consists of a prospective case-control study (1:4), conducted from August 2001 to October 2006. Cases included were children less than 12 years old with acute noma. Four controls per case were matched by age and place of residency. Demographical data, vaccinal status, past and recent anamnesis and social context (proximity with animals, alimentation's habits, etc) were collected. General, facial and intra-oral exams were performed. Samples of blood, gingival fluid and mucosal swabs were collected at study inclusion. Data on survival were recorded since April 2008.

A total of 82 cases of acute noma and 327 controls were included. The epidemic curve shows a significant decrease in the number of cases during the study, but trimesters were not predictive for noma. All the cases but one have 4 controls. Matching of controls was satisfactory regarding the place of residency, but cases were significantly younger than controls. In April 2008, at a median time of 1.2 months after acute noma, 8 deaths were recorded. One death occurred three years after noma due to malaria complications.

In univariate analysis, the family circle was more numerous among cases than among controls. Cases were significantly more often acutely or chronically malnourished (cf. 1978-WHO recommendations). There was no difference regarding vaccination against measles. Microbiological analysis and vitaminic assessment are underway.

Our preliminary results confirm the association of noma with the presence of malnutrition. The hypothesis of an association between noma and a debilitating disease in the months preceding the onset of noma is justified.



DE BRUIJN, Dr. Hans P.

Speaker: The Noma Children Hospital in Sokoto Nigeria - Experience with 1500 Noma Patients (Session 2)

The lecture will be a multimedia presentation about the work in the first Noma Hospital in the world, the Children Noma Hospital Sokoto in Nigeria where in 11 years and by 39 international teams a total of 1600 Noma patients were treated.

Dr de Bruijn worked as a tropical doctor in Kenya from 1976 to 1980. He was trained both in general surgery and plastic surgery. He worked as a plastic surgeon in many developing countries in Africa, Asia, the Pacific and South America. He started the Noma project in Sokoto Nigeria in 1996. He is co-founder of the first Noma Hospital in the world, the Noma Children's Hospital in Sokoto Nigeria. Till now, 1600 noma children have been treated. He is co-founder of the Dutch Noma Foundation. He chaired six times a Noma reconstructive team to Nigeria and one to Ethiopia. Dr de Bruijn is author of 25 international publications and 58 international presentations.



**CHIDZONGA, Prof. Mapfumo
Midion**

Member of the Scientific
Committee, Co-Chair of
Session 2

Speaker: Surgical
Management of Noma in HIV-
positive patients: Experience
in Zimbabwe (Session 2)

**Surgical Management of Noma in HIV-positive patients:
Experience in Zimbabwe.**

The experience of managing HIV-positive patients with noma is described from clinical presentation to surgical management including pre-operative preparations and complications. Nutritional support, debridement, antibiotic cover and early reconstruction is advisable to improve the patient's quality of life. Surgery is safe and is without undue complications.

Professor Chidzonga is an oral and maxillofacial surgeon and current dean of the College of Health Sciences of the University of Zimbabwe. He is the founding chairman of the Department of Dentistry of the University of Zimbabwe. His current research interests are in oral health and noma in HIV and AIDS patients, research capacity building, clinical trials and bioethics. He has published extensively in several aspects of oral and maxillofacial surgery.

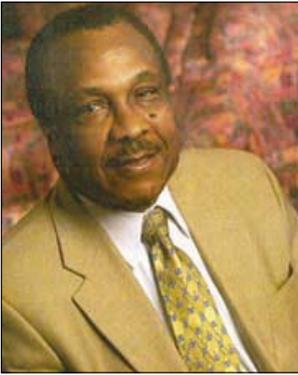


CONROD, Dr. Burton

Co-Chair of Scientific
Committee

Dr Conrod graduated from the Faculty of Dentistry at Dalhousie University in Halifax, Canada in 1976. He has practiced general dentistry for 31 years.

His experience includes terms as president of his local and provincial dental associations and as president of the Canadian Dental Association in 2000-01. He has also served as a member of an advisory panel to Canada's Minister of Health on the issue of tobacco control. Dr. Conrod was first elected to the FDI Council in 2001 and was elected to the position of president-elect in 2005. He has been the President of the FDI since October 2007. Dr. Conrod has a special interest in association governance and strategic planning and is chair of FDI's Governance Review Task Team. He is a Fellow of the Pierre Fauchard Academy, the American College of Dentists, the Academy of Dentistry International and the International College of Dentists.



ENWONWU, Prof. Cyril O.

Co-Chair of Scientific Committee,

Co-Chair of Session 1

Speaker: Risk Factors of
Noma (Session 1)

Prof. Enwonwu is a Professor of Biochemistry at the University of Maryland, Baltimore, USA. He received his dental degree from Bristol University, and a PhD from the same Institution. He subsequently received a Doctor of Science degree in Nutritional Biochemistry from MIT, Cambridge, USA.

Prof. Enwonwu's previous positions included Professor/Chairman of Medical Biochemistry at University of Nigeria (UNN), Deputy Vice-Chancellor of UNN, and Director of the Nigerian Institute for Medical Research. He is a member of the American Societies for Biochemistry and Molecular Biology, Investigative Pathology, and Nutritional Sciences, among others. Prof. Enwonwu has served as a member of several WHO Expert Advisory Committees/Panels and on the Board of Scientific Counsellors of NIDCR/NIH, Bethesda, USA. He was Chairman of the Advisory Board of the Inter-Country Centre for Oral Health in Jos, Nigeria, and also, Honorary Founding Chairman of the International Governing Board of the Noma Children Hospital, Sokoto, Nigeria.

Risk Factors For Noma

Poverty is the key risk factor for noma, and the evolution of oral inflammatory mucosal ulcers to the disease is rooted in poorly understood interactions between malnutrition, infections, and immunity. Noma occurs in communities with deplorable infrastructures and environmental sanitation, poor oral hygiene practices, intensive human interactions with dirty livestock, and very limited access to good healthcare services.

Malnutrition in the children usually commences prenatally as a consequence of poor maternal nutrition and infections, eg malaria, and continues into postnatal life with premature replacement of exclusive breastfeeding by indigenous weaning foods which are often contaminated and nutritionally inadequate. Poor nutrition, particularly micronutrient deficiencies, in pre-natal and early postnatal lives produce long term immunological consequences which persist beyond childhood and adolescence. Noma has also been reported in Native American children with severe combined immunodeficiency [SCID]. There is so far, no convincing evidence for genetic predisposition to the disease.

Victims of noma often report histories of prior recent debilitating, immunosuppressive infections, measles being the most frequent. Other viruses, particularly the human cytomegalovirus (HCMV) and other herpes viruses, incriminated in the causation of necrotizing ulcerative gingivitis (NUG), may play some role since NUG is considered a putative precursor of noma. NUG is characterized by prominent elevations in circulating levels of pro-inflammatory cytokines relative to increases in levels of anti-inflammatory/regulatory mediators. In recent times, noma has been reported in association with HIV-infection/AIDS in some parts of the world but not in others. Although the oral cavity of children at risk for noma shows tremendously increased preponderance of anaerobic organisms, attempts to assign the causality of the disease to any specific microorganism(s) have so far proved difficult. Effective public health measures against noma should emphasize poverty reduction as well as the importance of optimal health and nutritional care of children, pregnant and lactating women, and exclusive breastfeeding in the first four months of life, and timely immunizations of the children against common childhood diseases, particularly measles.



MARCK, Dr. Klaas W.

Member of Scientific
Committee

Speaker: A History of Noma
(Session 1)

Dr. Marck is a plastic surgeon (1952, The Netherlands) and has participated in many surgical noma missions since 1996. He was cofounder and chairman of the Dutch noma Foundation, and is (co)author of many scientific publications about noma and of two books about the affection: "Noma, the face of poverty" and "The surgical treatment of Noma".

A history of noma.

The subject of his presentation is the medical history of noma. This history reveals that noma is not related to geographic boundaries such as the tropics but an old companion of famine and mankind all over the world. It relates its existence in classical times, the Middle Ages, and the last three centuries, and demonstrates that noma can simply be eradicated by economical preventive measures.

The story goes with several paradoxes. Paradoxical is that most historical knowledge about the affection comes from the richest countries in the world at that time. Another paradox is the impercibility of the incidence of noma due to the fact that a society only starts to count its dead when it has enough food to keep its citizens alive. The same can be said for its pharmaceutical antimicrobiological treatment, as revealed in the concentration camps of World War II, and the surgical treatment of its sequelae: 'penicillin and plastic surgery' are available at all corners of our globe nowadays, but not for the poorest of the poor.



MARIMO, Dr. Clemence

Speaker: Noma and HIV in
Children in Zimbabwe
(Session 3)

Clemence Marimo is lecturer and consultant pathologist at the Department of Pathology and Microbiology, University of Zambia School of Medicine, Lusaka, Zambia. From 2003 to March 2008, Dr Marimo held the post of lecturer and consultant oral pathologist at the Departments of Dentistry and Histopathology, College of Health Sciences, University of Zimbabwe, Harare, Zimbabwe. Between 1997 and 1999, he was Deputy Director and, subsequently, Acting Director of Oral Health Services, Ministry of Health and Child Welfare, Zimbabwe. Dr Marimo was also chairman of the anglophile group of participants at the WHO Consultative Meeting on the Implementation of the Oral Health Integrated Approach for the African Region held in Harare in 2007. His current research interests include: the burden of HIV/AIDS disease among the disabled, in particular the deaf, blind and lepers; the pathophysiology of noma in Southern Africa; and the epidemiology of head and neck malignancies in Southern Africa.

Noma and HIV in children in Zimbabwe

The prevalence of HIV infection in Southern Africa appears to be leveling off but at high levels, while reported noma cases are on the increase in Zimbabwe, Southern Africa; well outside the 'noma belt' of east, central and west Africa. Notably, all these cases were HIV-1 seropositive at presentation. It is possible that noma is presenting as a secondary infection to HIV-1 infection. Noma and HIV-1 infection have public health features in common as both thrive in poor communities where malnutrition, stigma and discrimination prevail. The common features also extend to the cellular and molecular levels as the other predisposing factors of noma namely debilitating illnesses such as measles, malaria and herpes viral infections and poor oral and general hygiene have the same primary target of weakening the T-cell mediated immune system; same as HIV-1 infection. The T-cell mediated immune system is the protective vanguard against intracellular infections. Of all the predisposing factors to noma, malnutrition has the most profound effects on the T-cell mediated immune system resulting in an underdeveloped lymphoreticular system, impaired Th1 responses, leukopaenia and reduced levels of antibodies (IgG and IgA) and leptin, a pleiotropic hormone while cytokine levels of IL-10 and TGF- β are raised. The aetiology of noma appears to be multifactorial with each factor negatively affecting the T-cell mediated immune system in a 'relay fashion' and passing on the 'baton' for the next factor. Malnutrition and HIV-1 infection appear to do the ground work of weakening the T-cell mediated immune system for a debilitating disease such as measles to complete the 'relay' by overwhelming the residual functional T-cell mediated immune system.



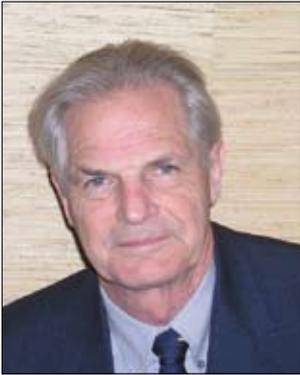
MOMBELLI Prof. Andrea
Speaker: Etiopathogeny
and Bacteriological Factors
(Session 3)

Andrea Mombelli is Professor and Chair, Division of Periodontology and Oral Physiopathology, and associate vice-dean, Faculty of Medicine, University of Geneva, Switzerland. He is also President of the Swiss Society of Periodontology. From 2001 to 2005, he served as President of the Dental Section of the Faculty of Medicine at the University of Geneva. Previously, he held the post of Head of the Laboratory for Oral Microbiology at the School of Dental Medicine of the University of Bern from 1992 to 1999. Professor Mombelli has extensive experience in the field of periodontology and has published numerous research papers on clinical and microbiological aspects of periodontal diseases and peri-implant infections.

Etiopathogeny and bacteriological factors

The establishment of the true role of specific microorganisms in the pathogenesis of noma is limited by three problems: First, it is likely that the use of culture techniques has led to an underestimation of the diversity of the flora, due to the impossibility to grow a large spectrum of fastidious organisms. Second, the fact that the disease develops rapidly and is predominantly seen in remote areas where access to medical facilities is difficult, precluded the study of early cases. The proliferation of many microorganisms found in great quantity in advanced lesions may thus be the consequence of changes in local ecological conditions ensuing the development of the disease, rather than its cause. Third, since this disease is occurring in populations of which even the normal oral flora is poorly investigated, it remains unclear if an organism is related to the disease or simply belongs to the normal flora of the investigated cohort, reflecting a particular lifestyle, socioeconomic status, or geographic location.

This lecture will review the evidence to implicate specific microorganisms in the etiology of aggressive periodontitis, in order to clarify the line of reasoning also applicable to elucidate the etiopathogeny of noma. A limited number of bacterial species show an evident association with aggressive periodontal diseases, including a higher prevalence in diseased cases than healthy controls, and a correlation between poor treatment outcomes and persistence after therapy. Current knowledge regarding the phenotypic and genetic diversity of suspected pathogens suggests that distinct sub-populations may have the characteristics of true pathogens, even if a species may be considered opportunistic, or even commensal in nature, as a whole. This has been demonstrated for *Aggregatibacter actinomycetemcomitans*, which can be subdivided into several genotypes, and only one of them seems to be uniquely associated with periodontal disease. The so-called JP2 clone (the initial isolate is strain JP2, from an African American child with prepubertal periodontitis) displays the properties of a true pathogen in at least one group of humans of North and West African descent. Prevention of transmission of a virulent clone may be a feasible preventive measure, and eradication may be a realistic treatment goal in some populations. In most cases of chronic or aggressive periodontitis the therapist is however confronted with an opportunistic infection, implicating a change in the equilibrium between bacteria and the host, requiring the suppression of a non-tolerated mixed microbiota.



MONTANDON, Prof. Denys

Chair of the Scientific
Committee and Co-Chair
of Session 2

Denys Montandon is former Head of the Division of Plastic and Reconstructive Surgery of the Geneva University Hospital and Professor at the Geneva Medical School. He is a life member of the American Society of Plastic Surgery, honorary member of the Swiss Society of Plastic and Reconstructive Surgery, founder and past president of the European Association of Plastic Surgeons (EURAPS), founder of the AEMV (Association d'entraide des mutilés du visage), and initiator and president of GESNOMA (Geneva Study Group on Noma). He has done pioneer work in the field of craniofacial reconstructive surgery, particularly in patients affected by noma, devising original operative methods. He has participated in various surgical missions, including teaching projects in African and Asian countries. He has published extensively in the field of reconstructive surgery, more particularly of the orbit, eyelids and nose as well as treatment of noma patients.



NAIDOO, Prof. Sudeshni

Speaker: Oral and Facial
Presentation of Noma
(Session 1)

Prof. Naidoo is a professor and principal specialist in the Department of Community Oral Health, Faculty of Dentistry at the University of the Western Cape. She is presently the Director of the WHO Collaborating Centre for Oral Health. She is involved mainly with post-graduate education and training and her main focus of research is on Infectious Diseases and Infection Control, with particular reference to HIV/AIDS, Hepatitis and TB, and a specific focus on the disadvantaged with regard to provision of Oral Health Care, Oral Health Quality of Life, Noma, Trauma and Child Abuse.

Prof. Naidoo has presented numerous scientific papers of her research findings and has been an invited and key note speaker, nationally and internationally on several occasions. She has developed educational material and organized innovative training programs, especially with regard to the diagnosis and management of the oral manifestations of infectious diseases.

Oral and facial presentation of Noma

Oral health and disease reflect socio-economic and environmental conditions. Noma is an infectious disease that develops in the mouth, establishing itself with a well-demarcated perimeter surrounding a blackened necrotic centre, and spreads rapidly to other parts of the face, destroying orofacial tissues and neighbouring structures in its fulminating course. The gangrene can involve not only the mandible and maxilla, but also the nose and infra-orbital margins.

The disease occurs mostly in conditions of poverty, poor hygiene and chronic malnutrition that increase exposure to viral, bacterial and fungal infections. In the oral cavity, malnutrition-induced mucosal disruptions in combination with poor oral hygiene are often expressed as candidiasis, angular cheilitis, stomatitis and severe periodontal lesions. Hypofunction of salivary glands in protein energy malnutrition results in xerostomia and failure to protect oral tissues against the numerous potentially pathogenic oral microbial organisms. Among the earliest features of noma are excessive salivation, soreness of the mouth, pronounced halitosis, tenderness of the lip or cheek, cervical lymphadenopathy, facial oedema and a greyish-black discolouration of the skin in the affected area. This devastating gangrenous lesion may involve the cheek, the chin, the infra-orbital margin, palate, nose, antrum and virtually any part of the face.

The orofacial lesion can occur unilaterally or bilaterally, but it is unilateral in many cases. The face on the affected side is swollen in most cases. There is general consensus that noma starts as gingivitis, most commonly in the premolar to molar and mandibular incisor regions, extending to the labiogingival fold and on to the mucosal surface of the cheek and lip. When the inflammation simultaneously involves the gingivae and the mucosal surface of the adjacent cheek, further progression leading to perforation of the cheek is rapid. Sequestration of the exposed bone and teeth occurs spontaneously after separation of the soft-tissue slough. The loss of orofacial tissues may affect a small area or may include more extensive destruction of the nose, upper lip, and premaxilla, and the infraorbital margin. Once noma has initiated, it progresses rapidly and surgical reconstruction of the face becomes an expensive management. Prevention rather than reconstructive surgery must be the aim of health programmes.



NDIAYE, Prof. Charlotte Faty

Scientific Secretariat

Speaker: Noma in the African Region (Session 1)

Professor Charlotte Faty Ndiaye is currently the Regional Advisor for Oral Health in WHO/AFRO.

She was involved in establishing the WHO/AFRO Noma programme; she was a member of the group of experts, which produced the Regional strategy for oral health for the period 1999-2008.

Charlotte Faty Ndiaye is an oral pathology specialist, as such she taught at the Faculty of Medicine at the University of Dakar; she has conducted several theses, and published articles on different themes like HIV/AIDS, Noma, Oral pathology, and on Public Health.

She is also a Public Health specialist, and set up and implemented the national programme of oral health in Senegal, she has conducted as principal investigator different studies with the University of Washington in Seattle on oral manifestations of HIV/AIDS.

Epidemiology of noma in the african region

Background: There is still very little known about diseases such as Noma. This disease which is slowly gaining ground in some poor countries of the developing world in particular, kills or disfigures its victims for the rest of their lives, and thus constitutes a real obstacle to the achievement of health for all. Most of the time those victims are children from 2 to 6 years old.

Global estimation on Noma (WHO HQ)

In 1994, WHO has organized an expert consultation using the Delphi method. Results came out are: a mortality rate 80% to 90%, the most reasonable estimate of the percentage of the referred cases is 10 to 15%.

According to WHO estimates, there are about 140 000 new cases of noma every year, with a mortality rate of approximately 80%-90% in the absence of treatment (World Health Report, 1998).

In 1994, Noma was declared a public health problem by the General Director. A global programme of Noma has been formulated with 5 areas of work: prevention, epidemiological surveillance, treatment and rehabilitation, research, resource mobilizations.

Noma Activities in AFRO

In 2001 the Noma programme has been transferred to AFRO, most of Noma cases are in the African continent and from 2001 to 2003 a technical officer on Noma had been recruited in AFRO.

Regular reports on activities undertaken among countries and IEC documents have been published by AFRO.

In 2007 a Noma survey has been undertaken. The objective was to estimate the number of affected countries by the disease and the number of reported cases during the period 2000-2006.

35 out of the 46 AFRO region have provided information to WHO. 11 have not responded as such Angola, Ethiopia, Eritrea, Liberia, Ghana known for having Noma cases.

Regional estimate of Noma incidence

The estimated number of cases of Noma in the AFRO region in 2006, based on Delphi method using data reported by 22 countries is: 42800 cases.

The assumptions made in the estimates: 10% of referred cases which are a percentage of total surviving cases and mortality rate of 90%.

Ways forward

WHO/AFRO has included NOMA disease in the Integrated Diseases Surveillance and Response and will set-up an epidemiological surveillance of the disease taking into account the growing number of reports coming from African countries regarding Noma cases.



OUOBA, Prof. Kampadilemba
Member of the Scientific
Committee

Speaker: Treatment of the
evolutionary phase of noma
in Burkina Faso (Session2)

Following medical and specialty studies at the University Cheick Anta Diop, Dakar, Senegal, Kampadilemba Ouoba holds the position of Professor of Medicine and Head of the Laryngology - Otolaryngology and Cervicofacial Surgery Service of the University Hospital Yalgado Ouedraogo, Ouagadougou, Burkina Faso. He is also senior lecturer for both specialty fields at the Faculty of Medicine and Pharmacy, and at the National School of Public Health for student nurses. Professor Ouoba is co-ordinator of the National Programme for the Prevention of Deafness and member of the National Programme for the Fight Against Noma. An active member of several professional societies in Africa, he is also the author of several publications.

Treatment of the evolutionary phase of noma in Burkina Faso

Summary: Noma is a continuing cause of facial mutilation in Burkina Faso.

Objectives: To illustrate the present situation of the disease in the country, report the reality of its treatment, and present future perspectives to combat it.

Country situation: As a developing country and despite political stability, Burkina Faso still encounters a food deficit and a lack of adequate primary health provision which represent a favourable context for the persistence of noma.

Epidemiological data: 23 cases of acute noma provide an idea of the current situation in the country. These cases have been reported between January 2002 and December 2006 (overall annual frequency of 3 cases). Mean age, 4 yrs; sex ratio, 1: 6. 76.82 % of them were from the poorest population and lived in families of 6-11 persons; 30.77 % had to travel more than 100 km to reach the hospital.

Diagnosis: The time to consultation was: 7 to 15 days. No patient was seen before the onset of necrosis and our cases were characterized by a predominance of widespread lesions. Various degrees of protein-energy malnutrition were present in all cases. Six children were HIV-positive.

Treatment and evolution: Patients were hospitalized. Treatment included providing adequate nutrition and correcting fluid and electrolyte imbalances, antibiotic therapy, and wound care. The length of hospital stay ranged from 11 to 61 days. A favourable evolution was observed in 84.61% of patients, unfortunately still resulting in severe sequelae. 15.38% deaths due to severe toxi-infection were recorded.

Prevention: Prevention is an essential element and remains the key to overcome noma in our regions. We consider that this is divided into two major parts: 1) heighten awareness of the problem by all possible means; and 2) early detection and treatment by using local resources available to the maximum benefit.

Conclusion: In the context of our practice and given the stage at which our patients are seen, noma presents few diagnostic problems. But it is also at this stage that treatment is difficult. If antibiotic therapy and local lesion care play an important role, we believe nevertheless that many children are still alive because of the provision of adequate nutrition and correction of fluid and electrolyte imbalances. However, these children will still have to bear the terrible scars of this disease during their entire life... For this reason, the National Programme to Fight Noma in Burkina Faso considers that prevention is primordial and of the utmost importance.



PASTER Prof. Bruce
Co-Chair of Session 3
Speaker: Is Noma an
Opportunistic Microbial
infection? (Session 3)

Dr. Paster received his BS in Microbiology in 1975 at the University of Rhode Island. He received his Ph.D. in Microbiology in 1981 at the University of Massachusetts, Amherst. He is currently Chair of the Department of Molecular Genetics at the Forsyth Institute in Boston Massachusetts. He is also Professor in the Department of Oral Medicine, Infection and Immunity at the Harvard School of Dental Medicine, Harvard Medical School. He has published over 100 peer-reviewed publications and over 20 book chapters. The focus of his research is to determine the bacterial etiologies of a variety of oral diseases or afflictions, such as rampant caries in children, halitosis, periodontitis, refractory periodontitis, necrotizing ulcerative periodontitis in HIV subjects, and Noma, a facial gangrene that primarily affects malnourished children in developing countries.

Is noma an opportunistic microbial infection?

Noma is a facial gangrene affecting primarily malnourished children in developing countries. The disease often leads to severe facial mutilation and mortality rate is extremely high. In advanced stages of the disease, lesions are open to the external environment resulting in a complex polymicrobial infection. Based on our earlier studies on children with advanced lesions, over 70 bacterial species were detected. The purpose of our more recent studies was to determine the predominant bacteria (including not-yet-cultivated species) in earlier stages of noma, and to determine if acute necrotizing ulcerative gingivitis (ANUG) may be a precursor to noma, as has been previously suggested. 16S rRNA genes were cloned into *E. coli* by PCR amplification of DNA isolated from early noma lesions and from ANUG. Sequences of cloned inserts were used to determine species phylogenetic identity or closest relatives by comparison with known sequences. Approximately 50 clones from each subject were analyzed. Only 6 to 13 species were detected per subject with only 1 or two predominant species in each sample. In the early lesions presumed to be noma, predominant species included *Ochrobactrum anthropi*, *Stenotrophomonas maltophilia*, an uncharacterized species of *Dialister*, and an uncultivated phylotype of *Leptotrichia*. In ANUG, *Streptococcus anginosus* and *Abiotrophia* spp. were the predominant species. In conclusion, in contrast to advanced noma lesions, there was surprisingly little bacterial diversity in early lesions. However, the microbial profile of one early noma lesion was similar to that of advanced noma lesions. However, there was no apparent correlation between the microbial profiles of noma and ANUG. Unlike classical ANUG infections, no spirochetes were detected in malnourished children with ANUG. The bacterial species detected in early lesions were similar to those found in oral health and other oral diseases suggesting that noma is an opportunistic infection in a severely compromised host. We also have developed 16S rRNA-based microarrays that allow simultaneous identification of approximately 300 oral species and phylotypes in clinical samples. These microarrays will be used on a more statistically significant number of samples to better establish microbial associations present in noma, ANUG, and other oral infections.



PETERSEN, Poul-Erik

Member of the Scientific
Committee

On 2 April 2002, Dr Petersen was nominated Chief of the Oral Health Programme at the World Health Organization in Geneva. Prior to this date, Dr Petersen was Professor in Community Dentistry at the University of Copenhagen. He has an academic background encompassing dentistry, public health and sociology, combined with broad international experience. Dr Petersen has worked in community oral health research, enhancement of public health in universities worldwide, health systems development as well as in planning and implementation of community health projects in an extensive number of industrialised countries, countries with economies in transition and in developing countries.

Dr Petersen worked in the WHO Regional Office for Europe as a consultant for several years, as a Director for the WHO Collaborating Centre for Community Oral Health Programmes and Research, and worked closely with numerous WHO Collaborating Centres in the field of oral health. He has assisted ministries of health, health authorities and health care planners throughout the world.

In addition to Denmark, Dr Petersen has studied in the USA and the U.K. He was elected Dean of the School of Dentistry at the University of Copenhagen, and was also Vice-Director of the School of Public Health at the University of Copenhagen. He has an extensive list of scientific publications within epidemiology, health sociology, health systems research, disease prevention and health promotion, and international health.

Within WHO Headquarters the Oral Health Programme is part of the Department of Chronic Disease and Health Promotion, this emphasizes the links between oral health and general chronic disease prevention. Within WHO, oral health also links with several of its activities, such as integrated NCD prevention, school health and healthy ageing networks, health promotion, tobacco prevention, nutrition, HIV/AIDS and infectious disease control, water and sanitation, health systems development, research for health, and surveillance of health and risk factors.



PHILLIPS, Dr. Reshma Susan

Speaker: Noma in Children:
Role of Micronutrient
Deficiencies and Measles
(Session 1)

Noma in Children: Role of Micronutrient Deficiencies and Measles.

Acute noma is a severe orofacial necrosis, found mainly in deprived children (age <4 years). The key risk factors for noma are poverty, malnutrition and infections such as measles.

Apart from protein energy malnutrition, deficiencies of micronutrients have profound effects leading to increased susceptibility to infections and poor prognosis unless promptly treated. Owing to the role of vitamin A in potentiating innate and adaptive immunity, my presentation will focus specifically on this micronutrient. Deficiency of this vitamin is endemic in children from resource poor regions of Africa and South East Asia. Additionally, premature and low birth weight infants born to vitamin A deficient mothers are at risk of having low hepatic vitamin A stores.

Even after the inclusion of measles vaccine under the Expanded Programme on Immunization for almost three decades, measles infection is still endemic in many regions of Africa and South East Asia. Mortality from acute measles is 20% or more and this figure can be reduced by appropriate vitamin A supplementation. Acute measles infection which is profoundly immunosuppressive, imposes severe metabolic demands on the malnourished child. In a vitamin A deficient child, the oral mucosa presents with impaired structural integrity and measles produces more extensive Koplik spots in that setting. The latter contributes to impaired oral immunity and development of acute necrotizing ulcerative gingivitis, the putative precursor of lesion of noma.

The importance of maternal nutrition along with micronutrient supplementation is well recognized and widely adopted in the developed world. This ensures adequate nutritional support for fetal development and intervenes to break the trans-generational cycle of undernourished mother and child. Initiation and continuation of exclusive breast feeding of infants up to six months of age (maternal health permitting), administration of appropriate immunizations, micronutrient supplementation and improved hygiene practices are all necessary to prevent noma. Eradication of noma will require major national and international commitments to improve the nutritional wellbeing of children.

Dr. Phillips has conducted research on the synergism between malnutrition and infections in oral inflammatory disease of noma under the mentorship of Prof. Cyril O. Enwonwu. This formed the thesis for her PhD degree from the University of Maryland, USA. She evaluated nutritional and immunological parameters of malnourished Nigerian children with noma compared to children from the same region without noma. Results from the studies showed severe impairment in the growth and immunological responses of the affected children.

Dr Phillips continued her post-doctoral training in the field and the findings from the studies were published in a variety of peer-reviewed scientific journals and presented at professional meetings. A public health graduate from the Johns Hopkins Bloomberg School of Public Health, she possesses advanced training in Maternal and Child Health with a focus on Nutrition.



PITTET, Prof. Brigitte

Member of Scientific
Committee

Speaker: Surgical Strategy for
Noma Sequelae (Session 2)

Brigitte Pittet is Professor of Medicine and Head of the Plastic, Reconstructive and Aesthetic Surgery Service, Department of Surgery, University of Geneva Hospitals, Geneva, Switzerland. She is also an associate vice-dean of the University of Geneva, Faculty of Medicine in charge of the Commission of International Cooperation. Professor Pittet has an extensive and longstanding experience in craniofacial reconstruction and microsurgical techniques and participates regularly in surgical humanitarian missions related to noma and burullu ulcer. The main fields of interest of her research group are wound healing, microcirculation and ischemia including survival of ischemic tissue, the mechanisms of the secondary aggravation of burn lesions, and flap surgery. She has received several awards for her research activities and is also the author of numerous publications.

Surgical strategy for noma sequelae

Noma is a gangrenous disease that causes severe destruction of the face. It affects almost exclusively children in developing countries. Survivors often bear highly mutilating sequelae that isolate them from their society. The Plastic Surgery Service of the University Hospital of Geneva (Switzerland) has been involved in the treatment of noma sequelae for more than 20 years. The less severe lesions are operated during surgical missions, the complex ones, requiring multiple operations or osseous reconstruction, are transferred to Switzerland. As patients are followed up for a long time, the complications that emerged, during our several years of experience, contributed to the development of new surgical techniques. For example, large free-flaps like the free serratus flap, for the reconstruction of soft tissues of the cheek to diminish the risk of mouth constriction; vascularized bone flaps like the prefabricated sandwich epicranial flap for the reconstruction of bone defect; the preservation of potential donor sites for sequential surgeries, particularly in nasal reconstruction. The surgery of complex noma sequelae requires good knowledge in cranio-maxillo-facial surgery and microsurgery. Treating these patients by inadequate techniques will lead to insufficient results and unacceptable surgical mutilations.



PITTET, Prof. Didier

Member of Scientific
Committee,
Co-Chair of Session 1

Didier Pittet, MD, MS, is the Hospital Epidemiologist and the Director of the Infection Control Programme at the University of Geneva Hospitals and Clinics (2500 beds), Geneva, Switzerland; Professor of Medicine and Hospital Epidemiology at the University of Geneva; and Attending Physician in Adult and Paediatric Infectious Diseases, University of Geneva Hospitals. He is also Visiting Professor, Division of Investigative Sciences and School of Medicine, The Hammersmith Hospitals, Imperial College London, London, UK. Professor Pittet serves on the editorial boards of the American Journal of Infection Control, the American Journal of Respiratory and Critical Care Medicine, The Lancet Infectious Diseases and Infection Control and Hospital Epidemiology. He is also an editorial consultant of The Lancet. Professor Pittet currently leads the First Global Patient Safety Challenge "Clean Care is Safer Care" of the WHO World Alliance for Patient Safety. He was awarded the CBE in 2007 by Her Majesty Queen Elisabeth II for services to the prevention of healthcare-associated infection in the UK. Current major research interests include the epidemiology and prevention of nosocomial infections, methods for improving compliance with hand hygiene practices, and methods for improving the quality of patient care and patient safety.



SCHMIDT, Dr. Andreas
Speaker: The Sokoto
Experiences with
Microsurgical
Reconstructions in Severe
Noma Cases (Session 2)

Andreas Schmidt is Head of the Department of Plastic, Hand, and Reconstructive Microsurgery at the BG Trauma Center Murnau, Germany, since 1998. He is an active member of Interplast Germany for the past 15 years and has acted as vice-president of the Munich section of Interplast from 1990-2003 and is now head of the Southern Bavaria Section since 2003. As member of a surgical team, Dr Schmidt has participated to several Interplast camps in Afghanistan, Myanmar, Iran, Namibia, and notably at the Sokoto Noma Children Hospital in Nigeria, a WHO Reference Centre for Plastic and Reconstructive Surgery and a unique institution treating cases of noma within their own country. Dr Schmidt is also an active member of several professional societies and a past co-organizer of an Alpine Workshop of Plastic and Reconstructive Surgery.

The Sokoto Experiences with Microsurgical Reconstructions in severe Noma cases

The Sokoto Noma-Children –Hospital is a unique institution to treat Noma cases within their native country.

Plastic reconstructive surgery was focused on pedicled flaps, thus creating additional donor morbidity in the head, neck and even the face. Although opposed by many plastic surgeons active in the field, microsurgical procedures seemed to me better adapted, more straight forward and creating less donor morbidity.

This showed to be true, and in addition the failure rate in this West African setting was not higher in microsurgery than in conventional flaps. So as not to create the so-called iatrogenic deformity in noma, surgery is better achieved with reconstructive microsurgery.



SCHRENZEL, Prof. Jacques

Member of the Scientific Committee, Co-Chair of Session 3

Speaker: Description of Oral Flora in Children with Noma by Microarrays Technique (Session 3)

Description of oral flora in children suffering from noma by microarray techniques

The enumeration of bacterial flora composition remains a challenge, even in the post-genomic era. Whereas everyone agrees that culture methods provide a biased and very limited picture, molecular approaches appear very diverse, technically demanding and costly.

To benefit from our prospective study organized in Niger (see Dr Baratti-Mayer's presentation), we had to develop an approach that would be as open as possible (to detect and identify a panel of unexpected bacteria), yet applicable to a large collection of clinical samples.

We report here the development and validation of an original microarray strategy that allows analysis of the phylogenetic composition of complex bacterial mixtures. The microarray contains 9,500 feature elements targeting 16S rRNA gene-specific regions.

Probe design was performed by selecting oligonucleotide sequences specific to each node of the seven levels of the bacterial phylogenetic tree (domain, phylum, class, order, family, genus, and species). This approach, based on sequence information, allows analysis of the bacterial contents of complex bacterial mixtures to detect both known and unknown microorganisms.

The presence of unknown organisms can be suspected and mapped on the phylogenetic tree, indicating where to refine analysis. Initial proof-of-concept experiments were performed on oral bacterial communities. Our results show that this hierarchical approach can reveal minor changes (<1%) in gingival flora content when samples collected in individuals from similar geographical origins are compared.

The application of such phylogenetic arrays on a subset of acute noma samples will be shown in comparison with a series of controls (healthy control kids and healthy mouth side of noma children, etc). The informative subset of probes selected by this approach will be used to generate low density arrays (up to 400 probes) for assessing the presence of their cognate bacterial targets across the whole collection of >1'000 clinical samples.

Jacques Schrenzel (1964) completed his specialization in internal medicine in Geneva and obtained the Swiss board of internal medicine in 1996. At the same time, he undertook a four-year specialization in infectious diseases to study the cellular biology of human phagocytes. In 1999, his work on electron streams as an anti-microbial defense mechanisms won him the Pfizer prize for research into infectious diseases (Nature 1998; 392: 734-7).

From 1997 to 2000, Jacques Schrenzel embarked on a post-doctoral specialization in clinical microbiology at the Mayo Clinic in Rochester, USA, where he worked in molecular biology and functional genomics. In 1999, he became board-certified in clinical microbiology and was awarded a research professorship by the Swiss national research foundation for his project on *Staphylococcus aureus* biofilms.

Since 2000, Jacques Schrenzel is attending physician in internal medicine and consultant in infectious diseases. In 2004, he became in charge of the Central bacteriological laboratory.

Together with Dr Patrice François, he founded the Genomic Research Laboratory (www.genomic.ch) that has developed genomic techniques on the pathogenesis of *S. aureus* infections and for early diagnosis in the fields of bacterial identification, sensitivity to antimicrobial drugs or genotyping.

He is the author of more than 75 peer-reviewed publications.



VINZENZ, Prof. Kurt

Speaker: New trends in Restoring Oral Function in Noma Patients

Prof. Vinzenz is Professor at the Clinic for Maxillofacial Surgery at the University of Vienna and Head of the Department for Maxillofacial Surgery at the Evangelisches Krankenhaus Wien_Währing, Vienna, Austria. He is also consultant for oral and maxillofacial surgery at the Department of Plastic and Reconstructive Surgery at the Wilhelminenspital, Vienna, since 1994. From 1996 to 1998, Professor Vinzenz served as President of the Austrian Society of Surgical Oncology and he has been the Founding President of the Society for Implantology and Tissue-Integrated Prosthesis since 2007. Prof. Vinzenz has been associated with the Austrian Society for Surgery since mid-2003. In 1996, he presented the first description of prefabricated complex transplants for reconstruction of facial defects together with Prof. J. Holle. Based on a positive experience with distraction osteogenesis in Austria, Professor Vinzenz has initiated a pilot project in Niger for local application in complex reconstructive surgery cases and presented the results at the 1st International Symposium on Noma held in Vienna in 2006.

New trends in restoring oral function in noma patients

Patients who survive noma develop a mutilated and disabled face. The sequelae include extensive midface defects and oral incompetence. Intense scarring leads to disfigurement and restriction of jaw movement.

The fact that the basis for important functional aspects like speaking, mastication, deglutition and effortless respiration are localized in the maxillofacial area, dictates the goal for any treatment: The most lifelike restoration possible.

To match these requirements microsurgery has entered its third generation by the new principle of the prefabricated composite grafts.

The distraction osteogenesis is now simultaneously being established as a treatment modality of first choice.

To date the most frequently used technique for reconstruction of extended defects is the transfer of vascularised osseous respectively osseo(-myo-)cutaneous free flaps. Fibula, scapula and iliac crest were the preferred donor sites.

Prefabricated complex composite grafts for a complete state-of-the-art reconstruction consist of preformed bone, implants and new mucosa like coverage tightly adherent to the bone and the periimplant region. Up until now the best clinical results could be achieved with this method. Furthermore they are histological and immunohistological evidence based.

An alternative approach for the predefined complete reconstruction is the craniofacial distraction osteogenesis. By use of a bone transport technique including the distraction histogenesis of the overlying masticatory keratinized gingiva similar results can be achieved – yet with far less effort in surgical setting and aftercare.

This reduces risks, costs and enables this technique to be used even in Africa without evacuation to Europe.

For this reason we have started a pilot project in Niger based on our positive experience with distraction osteogenesis in Austria and reported the results at the first International Symposium on Noma in Vienna on March, 25th 2006.

Lectures of the symposium were published in a special issue of the journal "Stomatologie" in 2007.

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