TRANSACTIONS

Journal of The Colleges of Medicine of South Africa (CMSA)

VOLUME 58(1) JANUARY - JUNE 2014

ISSN 0010-1095

Admission Ceremony October 2013

TRANSACTIONS

Volume 58 (1) January - June 2014

Publisher: Dr Douw GS Greeff
Production: Ina du Toit
Medpharm Publications (Pty) Ltd

Publisher: Medpharm Publications (Pty) Ltd
PO Box 14804 Lyttelton Manor, Centurion, 0140
Tel: (012) 664-7460 Fax: (012) 664-6276
E-mail: enquiries@medpharm.co.za

Designer: Mrs Jenny Hattingh (X-Axis)

Printed by: Remata

Contents

In support of contemporary Zulu telephone wire baskets

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Instructions to Authors

1. Manuscripts

1.1 All copies should be typewritten using double spacing with wide margins.

1.2 In addition to the hard copy, material should also, if possible, be sent on disk (in text only format) to facilitate and expedite the setting of the manuscript.

1.3 Abbreviations should be spelt out when first used in the text. Scientific measurements should be expressed in SI units throughout, with two exceptions; blood pressure should be given in mmHg and haemoglobin as g/dl.

1.4 All numerals should be written as such (i.e. not spelt out) except at the beginning of a sentence.

1.5 Tables, references and legends for illustrations should be typed on separate sheets and should be clearly identified. Tables should carry Roman numerals, thus: I, II, III, etc. and illustrations should have Arabic numerals, thus 1,2,3, etc.

1.6 The author's contact details should be given on the title page, i.e. telephone, cellphone, fax numbers and e-mail address.

2. Figures

2.1 Figures consist of all material which cannot be set in type, such as photographs, line drawings, etc.
(Tables are not included in this classification and should not be submitted as photographs).
Photographs should be glossy prints, not mounted, untrimmed and unmarked. Where possible, all illustrations should be of the same size, using the same scale.

2.2 Figures' numbers should be clearly marked with a sticker on the back and the top of the illustration should be indicated.

2.3 Where identification of a patient is possible from a photograph the author must submit consent to publication signed by the patient, or the parent or guardian in the case of a minor.

3. References

3.1 References should be inserted in the text as superior numbers and should be listed at the end of the article in numerical order.

3.2 References should be set out in the Vancouver style and the abbreviations of journals should conform to those used in Index Medicus. Names and initials of all authors should be given unless there are more than six, in which case the first three names should be given followed by 'et al'. First and last page num¬bers should be given.

3.3 'Unpublished observations' and 'personal communica¬tions' may be cited in the text, but not as references.

Article references:

- Price NC. Importance of asking about glaucoma. BMJ 1983; 286: 349-350.

Book references:

- Jeffcoate N. Principles of Gynaecology. 4th ed. London: Butterworths, 1975: 96.
- Weinstein L, Swartz MN. Pathogenic properties of inva-ding micro-organisms. In: Sodeman WA jun, Sodeman WA, eds. Pathologic Physiology: Mechanisms of Disease. Philadelphia: WB Saunders, 1974: 457-472.

Lost Members

The CMSA office in Rondebosch is eager to establish the whereabouts of the following "lost members", some of whom may be deceased. Please e-mail any information that may be of assistance to Naomi Adams at members@colmedsa.co.za or telephone (021) 689 9533.

Azam, Muhammed (College of Paediatricians)

Bennett, Margaret Betty (College of Radiologists)

Chatora, Tsitsi Vimbayi (College of Family Physicians)

Gibango, Nsungu Ntemo (College of Paediatricians)

Gibson, John Hartley (College of Obstetricians and Gynaecologists)

Ifeorah, Osita (College of Obstetricians and Gynaecologists)

Kok, Hendrik Willem Lindley (College of Neurologists)

Kuther, Annamarie (College of Emergency Medicine)

Lematla, Patrick (College of Obstetricians and Gynaecologists)

Mahachi, Nyikadzino (College of Family Physicians)

Maqhutxana, Sinazo Siphumze (College of Family Physicians)

Meyer, Julius (College of Psychiatrists)

Nakhjavani, Naseem (College of Paediatricians)

Ndimande, Benjamin Gregory Paschalis (College of Anaesthetists)

Phillips, Kenneth David (College of Family Physicians)

Raubenheimer, Arthur Arnold (College of Obstetricians and Gynaecologists)

Richmond, George (College of Physicians)

Segal, Dennis Selwyn (College of Family Physicians)

Teferi Woldetsadick, Nebiat (College of Otorhinolaryngologists)

Van Coller, Beulah Mariè (College of Paediatricians)

Van Greunen, Johannes Petrus (College of Obstetricians and Gynaecologists)

Wagner, Leigh (College of Paediatricians)

Information as at 11 April 2014

Transactions: Now on the digital platform of e-journals

As the idiom goes: "Time flies". This edition of *Transactions* marks my tenth year as its editor and 20th edition since I took over. Over the last 10 years, the journal has transformed from one that only provided information on the proceedings of the Colleges of Medicine of South Africa (CMSA) to one that now offers review articles and well written articles on the various academic and CPD lectures delivered by its members. The next transformation kicks in with this particular edition, which has moved onto the digital platform of e-journals. Most CMSA members will now receive *Transactions* via electronic versions on their Apple® and Android tablets, after downloading the appropriate apps, and as pdf versions through their e-mails. Only a few hard copies will be available for the older generation of members who insisted on receiving hard copies, following the 2013 survey. This digital migration from predominantly hard copies to electronic copies was as a result of escalating production and postage costs of the hard copies. We will have to be patient to see how our members embrace the various electronic formats of reading the journal.

This year marks the end of another triennium for the various constituent college councils of the CMSA. Election ballot papers were sent to members to nominate colleagues to serve on their councils for the next triennium (October 2014 to May 2017). It is important to note that in the electoral document for each college, the issue of demographic representation is expressed succinctly, that each council "will consist of at least 30% black members and 20% female members". It goes on to indicate that wherever possible, at least 50% will be black members. The latter was a CMSA senate decision, taken after the advent of South Africa's first democratic dispensation for the CMSA to have its transformation agenda in addressing the legacies of the past. In political lingo, the CMSA senate took the bold step of "levelling the playing field".

The completed ballot papers must be returned to the CMSA office by 25 July 2014 for counting the next day for the current electoral process. As soon as reasonably possible thereafter, but not later than Monday 15 September 2014, the newly elected members of each council will elect their president, secretary and senate representatives by confidential ballot. Let us all fulfil our civil duties by voting in individuals who will take our constituents colleges forward.

Another CMSA milestone will take place in 2015, when we celebrate the diamond jubilee of its formation (the 60th anniversary). Plans are underway on how the CMSA will mark and celebrate this important milestone. From the editor's desk, the two 2015 *Transactions* editions will focus on our past achievements as an examining body, and the evolving importance of our role as an important stakeholder in the country's milieu of determining specialist needs for the country. You will be kept informed as the time draws closer.

This editorial would be incomplete if mention was not made of some of the important contents of this edition. The presidential newsletter by Prof Gerhard Lindeque highlights some important developments within the CMSA in the last six months. The CMSA structure has transformed under the new Companies Act, with the formation of the board of Directors replacing the executive committee of senate, and the CMSA now functions as the body involved with the national exit examinations of specialists and subspecialists in the country.

The oration by Prof Salim Karim on the importance of perseverance in research provides a synopsis of his personal journey of almost 20 years towards the development of a vaginal microbicide to potentially prevent sexual transmitted infections, including human immunodeficiency virus (HIV). It is fascinating reading of having a vision, passion and resolve, through research, to find solutions for the many women exposed to HIV through unprotected sexual intercourse.

The minutes of the 58th Annual General Meeting held on 25 October 2013 give a summary of proceedings of the CMSA. Finally, the article by Prof Theo Le Roux of the University of Pretoria on *When tumour meets bone* meticulously reviews bone tumours from both a global and local perspective. His article reports that 70% of all malignant bone tumours is attributed to being metastatic in origin. The five most common carcinomas which metastasise to the bone are breast, prostate, thyroid, kidney and lung. I encourage you to read this article to be better informed about bone tumours. I definitely enjoyed it and learnt a lot.

The editor welcomes letters to the editor on any topic covered in the journal or of interest to the CMSA.

Prof Gboyega Ogunbanjo
Editor: *Transactions*
E-mail: gao@intekom.co.za

Nelson Rolihlahla Mandela: the iconic freedom fighter

On Thursday, 5 December 2013, South Africa and the world received the shocking news that the iconic freedom fighter and founding father of the democratic Republic of South Africa, Nelson Rolihlahla Mandela, was no longer with us. He had passed away peacefully after over 95 years on earth, 27 of which he was incarcerated on Robben Island near Cape Town. We were told that Madiba, as he was fondly called, inherited the name "Nelson" from Miss Mdingane, his primary school teacher in Qunu, who gave every student an English name. His Xhosa name, *Rolihlahla,* literally means "pulling the branch of a tree", but its colloquial meaning is "troublemaker". Madiba fought the apartheid system before and during his incarceration, as well as after his release from prison. This was exemplified during his inaugural address on 10 May 1994, which contained one of his famous quotations, which was: "Never, never, and never again, shall it be that this beautiful land will experience the oppression of one by another".

As we all stood in the various long queues to participate in South Africa's first democratic elections, held between 26 and 28 April 1994, it was like a dream come true for many South Africans who had never had the opportunity to vote for a government of their choice. The tears of joy were made possible by the sacrifices of many freedom fighters who were disenfranchised by the apartheid system, including Madiba, who became the symbol of the struggle for a just and democratic South Africa. Mandela's presidency was characterised by the successful negotiation of a new constitution: a start on the massive task of restructuring the civil service and attempts to redirect national priorities to address the results of apartheid, as well as the Truth and Reconciliation Commission, set up primarily to investigate the wrongs of the past.[1]

Nelson Mandela was the first:

- Black elected president in a democratic South Africa.
- Person for whom the United Nations designated an international day to honour his birthday: 18 July 2013.
- Past president who made it possible for South Africa to win the bid to host the first (2010) *Fédération Internationale de Football Association* (FIFA) World Cup on the African continent.
- Deceased president to have over 100 current and past state presidents attend his memorial service.

Madiba was a revolutionary leader, a visionary, a democrat and international political leader, who exercised his influence and ethical leadership with humility and respect for everyone. In addition, he was persistent in his resolve to fight all forms of discrimination, injustice and inequality.[2] Madiba made a strong resolve, first in his 1964 Rivonia trial defence statement, and again, repeated during the closing of his speech which he delivered in Cape Town on the day he was released from prison 27 years later on 11 February 1990: "I have fought against white domination, and I have fought against black domination. I have cherished the ideal of a democratic and free society in which all persons will live together in harmony, with equal opportunities. It is an ideal which I hope to live for, and to see realised. But my Lord, if needs be, it is an ideal for which I am prepared to die".

Nelson Mandela was awarded the Honorary Fellowship of the Colleges of Medicine of South Africa on the 20th of October, 1995. He fought the good fight against injustice and for the freedom which we all enjoy in South Africa today. Let us all honour his legacy by striving for a better non-racial South Africa. He has completed his race of life and he is now resting in peace. Goodbye, our hero; goodbye, our liberator; goodbye, our iconic freedom fighter!

Prof Gboyega Ogunbanjo
Editor: Transactions

References

1. South African history: The death of apartheid. SouthAfrica.info [homepage on the Internet]. 2012. Available from: http://www.southafrica.info/about/history/521109.htm#ixzz2n0ZUTGEg
2. Nelson Mandela biography. South African History Online [homepage on the Internet]. c2013. Available from: http://www.sahistory.org.za/people/nelson-rolihlahla-mandela

Presidential Newsletter

Prof Gerhard Lindeque

Dear Colleagues,

Thank you for the opportunity to again write a note to you regarding our Colleges.

Firstly, the Colleges of Medicine of South Africa (CMSA) is functioning in its new structure under the Companies Act. The Board of Directors, previously the Executive Committee of the Senate, has accepted the numerous challenges associated with managing this huge entity. The CMSA is a prominent organisation in South Africa, and an influential organisation around the globe. Prominent organisations always have to identify potential risk as it is always there. Therefore, events in the internal and external milieu should be carefully assessed to exclude, manage or minimise the risk to the CMSA. The CMSA is predominantly managed through three committees and the controlling administration. To ensure that the risk is considered, the Colleges, committees and offices are requested to be risk aware, risk knowledgeable and risk sensitive. Management depends on the alertness and action of members to successfully further this. While a risk committee considers the process, a risk reporting officer, the CEO, must report to the Board of Directors, who in turn, reports to Senate, and therefore to the various Colleges.

Secondly, the CMSA has emerged as the body that sets and regulates the standards pertaining to the professions in which we are involved. Standard setting is difficult in a changing world. There is no place for not seeing change, or denying that it is taking place. As the CMSA is the most important body involved with the exit examinations of specialists and subspecialists, it has to guard its values and levels of assessment. Modern assessment techniques must be imported into all of the Colleges as our response to the changing world. This is made possible by several annual courses and workshops, in which our members participate, and which can be accessed through the actions of the Examinations and Credentials Committee and the Academic Registrar. Support from the Honorary Treasurer has helped to make this important manoeuvre possible for all of the Colleges. Members are asked not to miss these opportunities.

Thirdly, the CMSA is a collection of professionals sharing the same values about, and concern for, our various professions. This is enacted through the very important role of examining our candidates. The examinations are intended to demonstrate success and proficiency in respect of what each College has determined its goals and standards to be. The CMSA needs the support of examiners from the training institutions, as well as the membership of the Colleges, in order to be successful in this endeavour.

Professionals examining professionals

Colleges must make a considerable effort to ensure inclusiveness within the College structures, as well as examiner panels of Fellows, Certificants, Members and Diplomates from the training institutes. Dear colleagues, it is essential to participate in the activities of your College and the CMSA. This is a special request for your involvement. The CMSA needs to fulfil its mandates and to retain its values and standards.

Lastly, by the time you have read this newsletter, the elections of the various College councils would have been underway. I extend my hearty thanks to all colleagues and members for their active involvement in the running of the CMSA.

My appreciation, expressed with gratitude, goes to all colleagues, as well as persons in the employ of the CMSA, for their commitment and loyalty. The only way to advance into the future is together.

Prof Gerhard Lindeque
President: CMSA

Admission Ceremony
24 October 2013

The admission ceremony was held in the Glenridge Hall, Masabalala Yenga Avenue, Durban.

At the opening of the ceremony, the President, Professor Gerhard Lindeque, asked the audience to observe a moment's silence for prayer and meditation.

Professor Salim Karim, President of the South African Medical Research Council, delivered the oration.

The President presented the Past President's Badge and the Ladies Brooch to Professor Anil Madaree and Mrs Sandy Madaree.

Honorary Fellowship was presented to Dr Ronald Zuker by the College of Plastic Surgeons. The citation was written and read by Professor Anil Madaree.

Five medallists were congratulated by the President on their outstanding performance in the CMSA examinations. Medals were awarded in the Fellowship disciplines of Orthopaedic Surgery, Paediatrics and Internal Medicine. Medals were also awarded in the Diploma discipline of Emergency Medicine.

The President announced that he would proceed with the admission of the new Certificants, Fellows and Diplomates to the CMSA.

The new Certificants were announced and congratulated.

The Honorary Registrar - Examinations and Credentials, Professor Mike Sathekge, announced the candidates, in order, to be congratulated by the President. The Honorary Registrar – Education, Professor Jay Bagratee, individually hooded the new Fellows. The Honorary Registrar – Finance and General Purposes, Professor Johan Fagan, handed each graduate a scroll containing the Credo of the CMSA.

The new Diplomates were announced and congratulated.

All in all, the President admitted 47 Certificants, 248 Fellows and 277 Diplomates.

At the end of the ceremony, the National Anthem was sung, whereafter the President led the recent graduates out of the hall. Refreshments were served to the graduates and their families.

Medallists

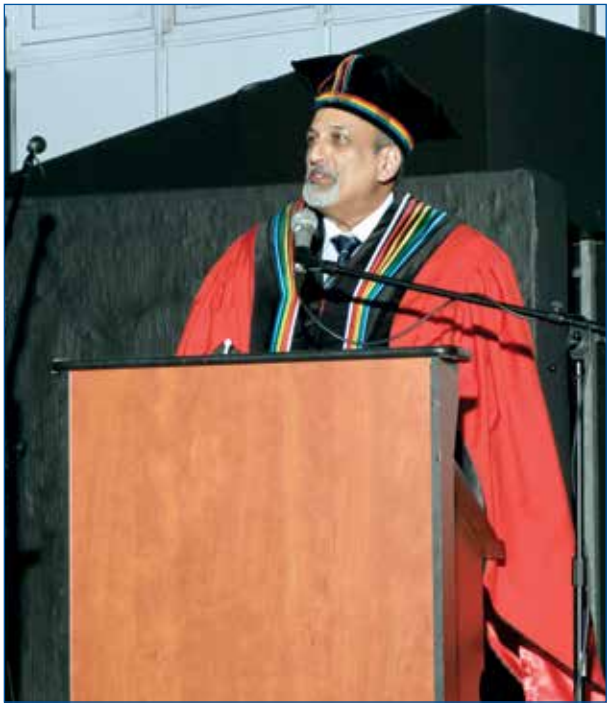
WALTER G KLOECK MEDAL & CAMPBELL MACFARLANE MEDAL:
VICTORIA LUCY ROETS

AM MEYERS MEDAL:
REENA KARA

JM EDELSTEIN MEDAL:
NEAL HILLEL GOLDSTEIN

ROBERT MCDONALD MEDAL:
YAVINI REDDY

The importance of perseverance in research
Professor Salim S Abdool-Karim



Globally, substantial progress has been made over the past decade in slowing the human immunodeficiency virus (HIV) epidemic, with a 33% decline in the number of new HIV infections from 3.4 million in 2001 to 2.3 million in 2012. The dramatic scale up and access to ART has resulted in a 29% decline in acquired immune deficiency syndrome (AIDS)-related mortality globally since 2005, and is beginning to impact on HIV incidence at community level. For example, the scale up between 2004 and 2011, of the routine AIDS treatment programme in rural KwaZulu-Natal, resulted in a 38% lower risk of HIV acquisition in communities where 30-40% of HIV-infected individuals were on antiretroviral treatment (ART), compared to communities in which less than 10% of the HIV-infected population were on ART. Major gains have also been achieved in scaling up ART programmes for HIV-positive pregnant women throughout the world, resulting in virtual elimination of mother-to-child transmission of HIV in some parts of the world, and a transmission rate of 2.7% in South Africa.

Despite these encouraging trends, we are still faced with a substantial HIV burden. In 2012, 35.3 million people were estimated to be living with HIV globally. The magnitude of the epidemic varies considerably between individual countries. In 2012, sub-Saharan Africa accounted for approximately 70% (25 million) of all HIV infections globally. Women bear a disproportionate burden of the HIV epidemic in this region, and account for approximately 60% of all infections. Young women are particularly vulnerable. HIV-infected women aged 15- 24 years represent 76% of total cases in sub-Saharan Africa. The rapid spread of HIV among adolescent girls and young women in South Africa has been described as explosive. National, annual, anonymous seroprevalence surveys on pregnant women utilising public sector healthcare facilities demonstrate that HIV prevalence increased from 0.8% in 1990 to 29.5% in 2011. Exceptionally high HIV incidence rates of 14.8 per 100 person-years [95% confidence interval (CI): 9.7-19.8] in women aged 18-35 years, and 17.2 per 100 person-years (95% CI: 2.1-62.2) in urban women younger than 20 years, have been recorded in KwaZulu-Natal.

Several factors contribute to the increased vulnerability of young women who acquire HIV in sub-Saharan Africa. Biologically, women appear to be more susceptible to acquiring HIV than men. According to the US Centers for Disease Control and Prevention, after a single sexual encounter, women are roughly twice as likely to become infected with HIV than men. The risk of acquiring HIV also increases with repeated exposure, co-infection with ulcerative sexually transmitted infections, genital immaturity, receptive anal sex, the circumcision status of the male sexual partner, the stage of the HIV infection and the susceptibility of the exposed individual.

While young women and girls are possibly more biologically prone to infection, this only partially explains the large gender difference in HIV prevalence. One of the defining features of the HIV epidemic in sub-Saharan Africa is the age-sex disparity in infection, whereby young women acquire HIV infection much earlier than their male peers. This age-sex disparity was first documented in South Africa in the early 1990s in a study in which I was involved, and these patterns remain to this day. This age-sex disparity is a consequence of young women partnering with older men. Data from several African countries have shown that young women who have sexual partners who are 5-10 years older than them are at an increased risk of acquiring HIV.

In addition to the intergenerational sexual coupling patterns, early sexual debut, rape and sexual violence also impact on the risk of young women acquiring HIV in sub-Saharan Africa. The likelihood of early sexual debut in South Africa increases if the first sexual partner is older or if the sex is coerced. Women who have been subjected to intimate partner violence have also been shown to be at an increased risk of acquiring HIV, and often adopt behaviour that places them at increased risk of this occurring. Desperate economic circumstances may also force some

women, particularly those from impoverished backgrounds, to form relationships with men for financial and social security.

Despite the greater vulnerability of women, the available options to reduce their risk of acquiring HIV infection are limited. Since the beginning of the epidemic, the most widely advocated HIV prevention methods have been the "ABCCC" campaign of abstinence, being faithful, condomising, counselling and testing, and later, circumcision. However, because of gender power imbalances, women are often unable to successfully negotiate condom use with their male partners, insist on mutual monogamy, or convince their partners to undergo an HIV test. Furthermore, medical male circumcision primarily benefits the male partner, and does not seem to directly reduce HIV acquisition risk in women.

Therefore, it is unlikely that the HIV epidemic will be controlled in southern Africa without reducing HIV infection in young women.

It is against this backdrop that I talk to you today about the importance of perseverance in your career. A large part of my research career has been dedicated to addressing the challenge of the high incidence of HIV in young women, and developing HIV prevention technologies which women can use and control. The journey has not been easy, and there have been numerous disappointments along the way.

I began my journey almost 20 years ago towards the development of a microbicide, a chemical product that a woman can apply to the vagina to potentially prevent sexually transmitted infections, including HIV infection. My team's initial studies on nonynol-9 film and gel, a widely available approved spermicide, were unsuccessful. The gel formulation of nonoxynol-9 was actually shown to be potentially harmful when used frequently. However, this did not deter us from the quest to find a safe and effective product that women could use to control their HIV risk. We went on to conduct the phase I trial of a polyanion product called PRO 2000®, which demonstrated that this microbicide was safe across a range of doses. I then led the $90-million, six-country phase II/IIb trial (HPTN 035) to assess the safety and effectiveness of PRO 2000® gel and BufferGel®, a vaginal defence enhancer. This trial produced promising results, which showed that PRO 2000® was partially protective against HIV. This was the first hint that a microbicide gel could potentially reduce a woman's risk of becoming infected with HIV.

Unfortunately, a much larger study, also evaluating PRO 2000® gel, did not show any protection against HIV, and the development of PRO 2000® had to be abandoned. That such a litany of studies has failed to produce a safe and effective microbicide over a decade should send a signal to us that we may be pursuing the wrong avenues. Undeterred, I drew upon these experiences to develop new approaches, and to refine existing methodologies, to optimise clinical trial design to demonstrate microbicide effectiveness. I also persisted in searching for a suitable product that could be used as a microbicide. In October 2004, the pharmaceutical company, Gilead Sciences, provided us with several kilogrammes of tenofovir, a known effective AIDS treatment medicine, to make tenofovir gel for efficacy studies in South Africa. In partnership with CONRAD and FHI360 from the USA, we pursued the idea of testing tenofovir gel in a trial in South Africa. In 2007, the Centre for the AIDS Programme of Research in South Africa (CAPRISA) 004 tenofovir gel trial was initiated. This trial involved 889 urban and rural women in South Africa, and proved the concept that ART can prevent sexually-acquired HIV infection in women. Specifically, this study showed that tenofovir gel, applied before and after sex, reduced HIV incidence by 50% after 12 months of gel use, and by 39% overall at the end of the 30-month study. The protective effect of tenofovir gel against HIV was noted in 54% of women who used the gel consistently during the study.

Furthermore, the study also showed that tenofovir gel reduced the risk of herpes simplex virus (HSV) 2 infection (also known as genital herpes) by 51%. Genital infection with herpes is an incurable lifelong condition which potentiates the spread of HIV infection. Tenofovir gel is the first medical technology shown to prevent genital herpes, one of the most common sexually transmitted global infections.

When the results of the CAPRISA 004 tenofovir gel trial were announced, they had a marked impact on the HIV prevention field as they provided new hope. It is estimated that the implementation of tenofovir gel will prevent approximately 1.3 million new HIV infections, and roughly 800 000 deaths over the next 20 years, in South Africa alone. Once implemented on a broad scale, tenofovir gel is set to save millions of lives and marks the turning point in the global HIV epidemic.

Thus, my advice to you is to expect setbacks along the way, but to persevere. My success and contributions to AIDS prevention were not instantaneous, and emerged as a culmination of more than two decades of epidemiological, clinical and basic research.

CITATION: Dr Ronald Zuker
Honorary Fellowship: College of Plastic Surgery

Dr Ronald Zuker

Dr Ronald Zuker hails from Canada. His present position is Professor, Department of Surgery, University of Toronto, Canada; as well as that of a Consultant in the Department of Plastic Surgery, Hospital for Sick Children, Toronto.

He completed his undergraduate training at the University of Toronto, and undertook his postgraduate training in plastic surgery at McGill University, Montreal; and at the University of Toronto. He was awarded the McLaughlin Travelling Fellowship which he pursued in Japan, Australia, New Zealand and Europe.

Dr Zuker's areas of interest include paediatric plastic surgery, cleft lip and palate surgery, microsurgery, burns surgery and facial reanimation surgery. He is a world authority on facial reanimation surgery, as evidenced by numerous publications, invitations to demonstrate surgery, and being on these panels. He has innovated and fine tuned many aspects of challenging conditions.

Dr Zuker has published extensively in the areas of his interest. This includes 151 publications in peer-reviewed journals, three books and 51 chapters in books. Because of his insight and publications, he has been invited to be an editor for several peer-reviewed journals, has presented at numerous fora, and been a special invited guest speaker and visiting professor at several institutions internationally.

He has also been the recipient of several academic awards, including an Honorary Fellowship of the Royal College of Surgeons of Edinburgh.

Dr Zuker is a person who assumes tremendous responsibility for the positions to which he is elected. He is a member of 27 professional associations, and has held senior and leadership positions in several of these organisations. These include being the Chair of the American Academy of Paediatrics, Chair of the American Association of Paediatric Plastic Surgeons, President of the American Society of Reconstructive Microsurgery and President of the Canadian Society of Plastic Surgeons.

On a personal front, Dr Zuker is married to Gail Zuker, and has three children; Jeremy, Andrew and Phillip. He has an interest in hockey, and was a hockey coach.

Mr President, it is indeed a privilege for me to ask you to confer Honorary Fellowship in the College of Plastic Surgery on Dr Ronald Zuker.

Prof A Madaree

List of Medallists: 2013

FCA(SA) Part I –
Janssen Research Foundation Medal
Dr Garth HORSTEN – May 2013
Dr Zahnne FULLERTON – October 2013

FCA(SA) Part I –
Abbott Medal
Dr Garth HORSTEN – May 2013

FCA(SA) Part I –
Hymie Samson Medal
Dr Zahnne FULLERTON – October 2013

FCA(SA) Part I -
GlaxoSmithKline Medal
Dr Garth HORSTEN – May 2013
Dr Willem Theodorus VAN TONDER – October 2013

FCA(SA) Part II –
Jack Abelsohn Medal & Book Prize
Dr Muhommed Ridwaan SYED – March 2013

FC Derm(SA) Part I –
Janssen Research Foundation Medal
Dr Karen KOCH – October 2013

FCEM(SA) Part I –
Campbell MacFarlane Memorial Medal
Dr Vanessa Gail GEORGOULAS – May 2013

FCOG(SA) Part I –
GP Charlewood Medal
Dr Nontando Sinawo NKANGANA – May 2013

FCOG(SA) Part II –
Daubenton Medal
Dr Zoe Louisa MOMBERG – May 2013
Dr Kasandri GOVENDER – October 2013

FC Ophth(SA) Primary IA –
Neville Welsh Medal
Dr Ernst Baard VAN DER MERWE – October 2013

FC Ophth(SA) Intermediate IB –
Ophthalmological Society Medal
Dr Shaheer ABOOBAKER – May 2013

FC Ophth(SA) Final –
Justin van Selm Medal
Dr Debbie LAAKS – October 2013

FC Orth(SA) Final –
JM Edelstein Medal
Dr Maritz LAUBSCHER – May 2013

FC Paed(SA) Part I –
Leslie Rabinowitz Medal
Dr Julie COPELYN – May 2013

FC Paed(SA) Part II –
Robert McDonald Medal
Dr Graeme SPITTAL – May 2013

FC Path(SA) –
Coulter Medal
Dr Janami STEENKAMP – May 2013

FCP(SA) Part I –
AM Meyers Medal
Dr Sara Tracy SAFFER – October 2013
Dr Faheem SEEDAT – October 2013

FCP(SA) Part II –
Asher Dubb Medal (Best Clinical Candidate)
Dr Anneli KORB – May 2013
Dr Mohamed A ALTEER – October 2013

FCP(SA) Part I & II –
Suzman Medal (Best Overall Candidate)
Dr Annari du Plessis – May 2013

FC Rad Diag(SA) Part I –
Rhône-Poulenc Rorer Medal
Dr Tamiya NAIR – May 2013

FCS(SA) Primary – **Anatomy** –
Frederich Luvuno Medal
Dr Fredrick FIGUEIREDO – October 2013

FCS(SA) Primary –
Trubshaw Medal
Dr Johannes Lodewickus FOURIE – October 2013

FCS(SA) Intermediate –
Brebner Award
Dr Sumana Lakshmi PILLAY – October 2013

H Dip Int Med(SA) –
YK Seedat Medal
Dr Sanet VAN STADEN – October 2013

Dip Allerg(SA) –
Eugene Weinberg Medal
Dr Jeanette HOLTZHAUSEN – May 2013
Dr Wendy Claire LEWIS – October 2013

DA(SA) –
SASA John Couper Medal
Dr Tristan Gavin Alexander LEONARD – October 2013

Dip HIV Man(SA) –
The HIV Clinicians Society
Dr Annette HOUSTON – October 2013

Dip Ophth(SA) –
Geoff Howes Medal
Dr Daemon Bruce MCCLUNAN – May 2013

Dip PEC(SA) –
Walter G Kloeck Medal
Dr Janine Claire VALLY – October 2013

Dip PEC(SA) –
Campbell Macfarlane Medal
Dr Janine Claire VALLY – October 2013

List of Successful Candidates: September 2013

Fellowships

Fellowship of the College of Anaesthetists of South Africa: FCA(SA)

ATIYA Ahmed	WITS
AWATH BEHARI Amit	UKZN
BANNAN Scott	WITS
BERGH Kobus	UCT
CASEY Michelle Elizabeth	UCT
DIESEL Frances Lee	WITS
DU PREEZ Irene Ada	WITS
FUNG Trevor Wayne	WITS
GERETTO Sandro	UCT
GOVENDER Komalan	UKZN
HOSKING Catherine	WITS
JURGENS Francois Xavierius	UP
KASSIRAM Priyesh	WITS
KUSEL Belinda Senta	UKZN
MAISTO Maria Jose	WITS
MITCHELL Kirsten Alison	UKZN
MORFORD Victoria	WITS
MOUTLANA Hlamatsi Jacob	WITS
PRINSLOO Jonette	UP
ROSSOUW Hendrika Susanna	UP
TELLIER Lara Roseanne	WITS
TOICH Stephen Frank	WITS
VAN HEERDEN Mariska Elizabeth	UP
WILLCOCK Taryn-Lee Colleen	US

Fellowship of the College of Cardiothoracic Surgeons of South Africa: FC Cardio(SA)

STRUWIG Daniel	WITS

Fellowship of the College of Dermatologists of South Africa: FC Derm(SA)

DU TOIT Jacques Pierre	US
GANTSHO Nomphelo	UCT
NEL Lenice Christine	UKZN

Fellowship of the College of Emergency Medicine of South Africa: FCEM(SA)

DANDREA Patrick Andrew	US
DUFOURQ Nicholas James	WITS
KILINDIMO Said Salum	US
MAHARAJ Suvarna	US
MAKALENG Boledi Mydah Agilaide	UP
MBAYA Khalid Rajabu	US
RAJBARAN Joshna	US
RAMRAJ Pranesh	UKZN

Fellowship of the College of Family Physicians of South Africa: FCFP(SA)

BEUTEL Bernhard	US
HANLEY Sherika	UKZN
JOSEPH Kuncheria	UP

Fellowship of the College of Forensic Pathologists of South Africa: FC For Path(SA)

ALLI Iekram Hoosen	UCT
MAHULUHULU Thandi	WITS
MATLALA Kwena Selaki	UL
MORULE Mosou Paul	WITS

Fellowship of the College of Neurologists of South Africa: FC Neurol(SA)

GOVENDER Shaelin	UKZN
KATHAN Puendran Shanti Prakash	WITS
MAKASI Zanele	WITS
PRETORIUS Erna	UFS
WYNAND-NDLOVU Lezanne Marisa	UL

Fellowship of the College of Neurosurgeons of South Africa: FC Neurosurg(SA)

MOTEBEJANE Mogwale Samson	UKZN
MOYENI Nondabula	UKZN

Fellowship of the College of Nuclear Physicians of South Africa: FCNP(SA)

BENNIE George Hofmeyer	UP

Fellowship of the College of Obstetricians & Gynaecologists of South Africa: FCOG(SA)

ALLAN-GOULD Heather	WITS
BHOORA Shastra Avendra	WITS
CHINULA Lameck	UCT
CHUNDA Reginald George	UCT
ERASMUS-HONING Myrtle Tome	UFS
FEKETSHANE Anthony Mfundo	US
FOSU-AMOAH Daphney Rebone	UP
GHANI Ayesha	UKZN
GONYA Sifundo	WSU
GOVENDER Kasandri	UKZN
JANSE VAN RENSBURG Karina	US
KADER Rahel	US
LUKHAIMANE Tshimangadzo Abigail	WITS
MACHETELA Mmatlawa Merriam	WITS
MASWIME Tumishang Salome	WITS
MOOSA Sumaya	UKZN
MSUSA Ausbert Thoko	UCT
NAIKER Manasri	UCT
SIBANDA Emanuel	UKZN
VAN DER WESTHUIZEN Andries Gerthardus	WITS
VAN HEERDEN Judith	UP
VAN NIEKERK Elizabeth Christine	US

Fellowship of the College of Ophthalmologists of South Africa: FC Ophth(SA)

CHETTY Shivona	UP
DE BOER Bernard Walter	UCT
DJAN Michael Kwame Gyedu	US
FISCHER Gratia-Marie	UL
LAAKS Debbie	US
MISTRY Jiten	WITS
MOTI Farah Razack	WITS
RAMAN Petronella Yureshinee	WITS
RAMDASS Kevin Andrew	UKZN
SRIKEWAL Jyothi	UKZN

Fellowship of the College of Orthopaedic Surgeons of South Africa: FC Orth(SA)

BAYES Graham	WITS
DANIEL Koshy Memuriyil	WSU
HARDCASTLE Peter	US
HELD Michael	UCT
HUGO Daniel	US
MATSEBULA Lindiwe Fortunate	WITS
MOSTERT Philip	UP
NAIDOO Arushka	UKZN
NORTJE Johan Gerhardus	UP
NUNES Daniel Domingues	WITS
O'BRIEN Michael George	WITS
OOSTHUIZEN Pieter Beyers	UP
RAUF Abdul	UP
RAWOOT Abdul Aleem	US
REDDY Praven	UKZN
STREET Matthew Russell	WITS
VAN ZYL Willem Jacobus	WSU

Fellowship of the College of Otorhinolaryngologists of South Africa: FCORL(SA)

BIPATH Rishan	UKZN
KAMEDIEN Mogammad Sauliegh	UCT
NAIDOO Janani	UKZN
SIBIYA Lindokuhle Andile	UP
STEPHENSON Katherine Anna	UCT

Fellowship of the College of Paediatricians of South Africa: FC Paed(SA)

ADEWUYI Olusegun Adeniyi	UL
ANDRADE Anabela De Sousa	WITS
BRINK Amelia Janetha	UKZN
BROWN Nicolette	US
CHOOPA Michelo Sharon	UP
CHUEU Sedima	WITS
DAVID Thuso	WITS
DE WET Matthys Johannes	US
FERREIRA-VAN DER WATT Talita	US
HLOPHE Sbekezelo	UKZN
JIYANA Samkelo	WSU
KESHAVE Amith	UKZN
KOCH Michelle	WITS
LUHANGA Vincent	WITS
MAFONGOSI Nandipa	WSU
MALAHLEHA Moelo	UKZN
MARTIN Trudy Ann	UKZN
MATHENJWA Zakithi Nonhlanhla	UKZN
MBATHA Sibongile	WITS
MIGAMBI Ismail	WITS
MONENE Khomotjo Angelina	UP
MOODLEY Kumaran	UKZN
MOTENE Aletta Lefentse	UKZN
NAIDOO Gitanya Davina	UKZN
NDLOVU Busisiwe Nonhlanhla	UKZN
NDZAMELA Nozibongo	UKZN
NGCOBO Busisiwe Patricia	WITS
NKUMANDA Nobuntu	UP
OOSTHUIZEN Karlien	WSU
POTGIETER Hannelie	WITS
RAKGOLE Maphotse Phillemon	UKZN
RUGAMBA Gilbert	WITS
TRIKAMJEE Thulja	UKZN
VAN DER WESTHUIZEN Tarryn Elizabeth	US
VAN WYK Nicole	WITS
WEBB Nicholas Guy	UCT
WESSELS Amanda	WSU

Fellowship of the College of Pathologists of South Africa – Chemical: FC Path(SA) Chem

HUDSON Careen Leigh	US

Fellowship of the College of Pathologists of South Africa – Virology: FC Path(SA) Viro

BRAUER Marieke	UP

Fellowship of the College of Physicians of South Africa: FCP(SA)

ADENIYI Aderemi Babatunde	US
ADHAM Zaheer	WITS
ALTEER Mohamed A	US
BANDERKER Ismail Abbas	UCT
BOUWER Francois	US
CASS Michael Peter	US
DAVIDSON Bianca Jane	UCT
DAWEHR Serajedden Ahmed	UKZN
ELMEZUGHI Khaled Khalifa	UKZN
ENSOR Jason Lance	WSU
GARDINER Emma Cora	WSU
GONDWE Lillian Matolase	UCT
GOVIND Ahshish	WITS
HARMSE Sean	UKZN
KARA Reena	WITS
KRAUS Sarah	UCT
KURIAN Anil	UP
MADANI Waheeba Mohammed Hussien	UKZN
MAJOVA Nompilontle	WSU
MALULEKE Themba Harry	WITS
MAMPANE Butsi Pheladi Regina	UL
MANGENA Phetho Mashaole Nkululeko	UCT
MERWITZ Brad Jarred	WITS
MOABI Rosemary Maud	WITS
MOKOTONG Placid Thabo Kobi	UP
MOTLEKAR Zaaheera	WITS
MTINGI-NKONZOMBI Lungiswa Stella	WSU
NEL Luchelle	UP
NKOSI Absalom Derek	WITS
NQWATA Lamla	WITS
OLOYEDE Oyekola Oluyimika	UL
PEYA Bukiwe Sharon	UCT
RAKUMAKOE Neo Mabitso Benedict	UP
SEBESHO Mpho	WITS
SONNEKUS Petronella Hendrina	UFS
VAN EEDEN Ronwyn Irene	WITS
VARIAVA Mohammed	WITS
VARIAVA Firdous	WITS

Fellowship of the College of Plastic Surgeons of South Africa: FC Plast Surg(SA)

NESER Clare	US
PILLAY Desigan	UKZN
ROGERS Alan David	UCT
SINGH O'Sharran Roy	UKZN
ZINN Richard	WITS

Fellowship of the College of Psychiatrists of South Africa: FC Psych(SA)

BUCKLEY Janice Anne	WITS
COMRIE Laura Jean	WITS
MOODLEY Linessa	UCT
PICKFORD Andrew	UKZN
PINGO Janine Kim	US
SMIT Inge-Marli	US
THELA Lindokuhle	UKZN

Fellowship of the College of Public Health Medicine of South Africa: FCPHM(SA)

MUVHANGO Ntshengedzeni Michael	UP
OHAJU Elizabeth	UP

Fellowship of the College of Public Health Medicine of South Africa - Occupational Medicine: FCPHM(SA) Occ Med

AYUK Julius Nkongho	US
ESSOP Ziyaad Hoosain	US
MAKWELA Mpho Hazel	UKZN
MWANGA Hussein Hassan	UCT

Fellowship of the College of Diagnostic Radiologists of South Africa: FC Rad Diag(SA)

CLARK Lizelle Mary	UCT
GANI Raumeen Suliman	WITS
HAINES Mario Michael Linsy	UKZN
JOHANNES Elrich	US
KEATING Kathryn Mary Louise	WITS
MAGWAI Mokgadi Granny	WITS
MAKAULA-CHIMUSORO Nomhle NF	UCT
MORKEL Carla-Louise	UCT
MOTSHUDI Thapelo Montgomery	WITS
NGCOBO Paulos Nkathiyoxolo	UKZN
PALLIAM Samantha	WITS
RATTAN Bishum	UKZN
ROSE Andrew	UKZN
SABAN Mogamed Adeeb	US
SEGWE Aobakwe	WITS
SEWCHURAN Tanusha	WITS
UDARAJH Kavistra	UKZN
ZIKALALA Zuzile	UKZN
ZULU Zinhle Nosipho	UKZN

Fellowship of the College of Radiation Oncologists of South Africa: FC Rad Onc(SA)

ASMAL Hasinah	UKZN
CHIYAPO Sebathu Phillip	UCT
KOMEN Ahmed Abdi	WITS
MWALE Maurice	WITS
NAIDOO Komeela	WSU
SUMAIDA Abdulrahman	UCT
VAN JAARSVELD Adriaan Zacharias Albertus	UCT
VAN ZIJL Petrus Wilhelm	UFS
WILSON Robert Alfred	UKZN

Fellowship of the College of Surgeons of South Africa: FCS(SA)

AWANG Peter Thomas Ajack	UCT
BANERJEE Deepanjali	UCT
BEZUIDENHOUT Abri	UP
DALWAI Ebrahim Khan	UCT
DANNATT Russell	US
DASRATH Ashish	UKZN
GOVENDER Kugeshen	UKZN
LATAKGOMO Matsobane Nelson	UL
LESETEDI Chiapo	WITS
MITCHELL Claire Eileen	WITS
NDLOVU Emil Vusi	UL
OKE Olalekan	US
PEDRO Maria Laurentina	UKZN
STEINBERG Isabelle	US
STROBELE Bernd Paul	WITS
TOBIKO Oidamae	WITS
VAN WYK Pieter	WITS

Fellowship of the College of Urologists of South Africa: FC Urol(SA)

ADOFO Charles Kwame	UP
BOSOMTWI Boateng	UP
COETZER Aubrey Moolman	UFS
DU TOIT Kenneth	US
JACOBS Frederick Julius	UP
NAIDOO Deon	UKZN

Certificates

Certificate in Cardiology of the College of Paediatricians of South Africa: Cert Cardiology(SA) Paed

DAMA Himal UKZN

Certificate in Cardiology of the College of Physicians of South Africa: Cert Cardiology(SA) Phys

BUTAU Martin Tawanda
HENDRICKSE Muhammad Chevaan UCT
MEEL Ruchika WITS
MIA Haroon UKZN
MOGOGANE Michael Thamaga WITS
SOOSIWALA Ismail Usman UKZN
VISAGIE Gideon Jacobus UFS

Certificate in Child & Adolescent Psychiatry of the College of Psychiatrists of South Africa: Cert Child & Adolescent Psychiatry(SA)

HENDERSON Terri Elizabeth UCT

Certificate in Clinical Haematology of the College of Pathologists of South Africa: Cert Clinical Haematology(SA) Path

MBERI Elson Tonderai UFS

Certificate in Clinical Haematology of the College of Physicians of South Africa: Cert Clinical Haematology(SA) Phys

MALHERBE Jacques Le Roux UFS

Certificate in Critical Care of the College of Anaesthetists of South Africa: Cert Critical Care(SA) Anaesthetics

ALLOPI Githesh UKZN
DE VASCONCELLOS Kim UKZN

Certificate in Critical Care of the College of Paediatricians of South Africa: Cert Critical Care(SA) Paed

SALLOO Asmaphy WITS

Certificate in Endocrinology & Metabolism of the College of Physicians of South Africa: Cert Endo & Metabolism(SA) Phys

GOVENDER Sedeshan Soobramoney UKZN
STEVENS Zane Douglas US
VAN ZYL Francois Hayward US

Certificate in Gastroenterology of the College of Paediatricians of South Africa: Cert Gastroenterology(SA) Paed

BUDREE Shrish UCT
STRÖBELE Silvia US

Certificate in Gastroenterology of the College of Physicians of South Africa: Cert Gastroenterology(SA)

MOTALA Naseem Ebrahim UP
PARSOO Nashtar UKZN

Certificate in Gastroenterology of the College of Surgeons of South Africa: Cert Gastroenterology(SA) Surg

GOVENDER Magenthran WITS
HOFMEYR Stefan US
RAMBARRAN Sharan Oogarchand UKZN

Certificate in Geriatrics of the College of Physicians of South Africa: Cert Geriatrics(SA)

BUTLER India Lucy Claire WITS
SINCLAIR Lindy WITS

Certificate in Infectious Diseases of the College of Paediatricians of South Africa: Cert ID(SA) Paed

DE GAMA Rene Yvette UP
LAWLER Melissa Ann Veronica UKZN

Certificate in Infectious Diseases of the College of Physicians of South Africa: Cert ID(SA) Phys

MANZINI Thandekile Cecilia UKZN
STEAD David Francis UCT

Certificate in Maternal and Fetal Medicine of the College of Obstetricians and Gynaecologists of South Africa: Cert Maternal & Fetal Medicine(SA)

VAN DER MERWE Johannes L US

Certificate in Medical Oncology of the College of Paediatricians of South Africa: Cert Medical Oncology(SA) Paed

VERMEULEN Johani UP

Certificate in Nephrology of the College of Physicians of South Africa: Cert Nephrology(SA) Phys

DIANA Nina Elisabeth WITS
LAHER Zaheer WITS
NDLOVU Kwazi UKZN
SEBASTIAN Sajith US

Certificate in Pulmonology of the College of Paediatricians of South Africa: Cert Pulmonology(SA) Paed

SAMADI Naisan UCT

Certificate in Pulmonology of the College of Physicians of South Africa: Cert Pulmonology(SA) Phys

GANI Raazik WITS

Certificate in Rheumatology of the College of Physicians of South Africa: Cert Rhuematology(SA) Phys

ABDELRAHMAN Hassan Yousif Hassan UCT
CHINNIAH Keith Jordan UKZN
KAROLIA Safoora WITS
NIKAKHTAR Nadia WITS
TARR Gareth WITS
WINCHOW Lai-Ling WITS

Certificate in Trauma Surgery of the College of Surgeons of South Africa: Cert Trauma Surgery(SA)

JACKS Gavin Rubin WITS
LAING Grant UKZN

Certificate in Vascular Surgery of the College of Surgeons of South Africa: Cert Vascular Surgery(SA)

FERNANDES Tiago Paulo WITS

Part I, Primary and Intermediate Examinations

Part I of the Fellowship of the College of Anaesthetists of South Africa: FCA(SA) Part I

ALTURKI Ibrahim Ali
ANAMOURLIS Prodromos Christopher WITS
BEN HAMEDA Khalid WITS
BULEY Helen UKZN
CALLEEMALAY Daren WITS
DANIELS Abigail
FULLERTON Zahnne UCT
GRANT Lizani WSU
HURRI Hemal WITS
INVERNIZZI Jonathan UKZN
JACOBS Elizabeth Johanna WITS
JOSEPH Lauren Ann
JOUBERT Andries Thomas
KISTEN Prabasshini UP
LAMBAT Fatimah Bibi Ebrahim WITS
LUSHIKU Lunganga Toms
MHLANGA Gugulethu Tsakani Jenny UCT
MOLLER Carien WITS
MUGERWA Andy Kawuki WSU
NAIDOO Kamini WITS
NEL Matthew UKZN
NGWENYA Tawanda Progress
NGWENYA Makhosazana Busisiwe WITS
NOCK Maria Elisabet
PIENAAR Adriaan Jakobus
PORTER Angela UP
RANDOLPH Ramiro UKZN
RAVID Nadav Binyamin WITS
REDELINGHUYS Cara
REDFORD Lindsey Elizabeth WITS
SAMUEL Theresa UCT
SHIVERA Theresia Shitoka UCT
STEADMAN Carl John
VAN DEN BOSCH Chloe Mary UKZN
VAN TONDER Willem Theodorus UP
VICKERY Nicola Justine UCT
WALLIS Julia WITS
WESTCOTT Georgina Elizabeth

Part I of the Fellowship of the College of Dentistry of the South Africa: FCD(SA) Part I

FERNANDES Nelson Alexander
GARACH Tarana
PADIAYCHEE Karusha

Part I of the Fellowship of the College of Dermatologists of South Africa: FC Derm(SA) Part I

AWOTEDU Temitope	
DE SILVA Roxanne Caron	UCT
DLADLA Khanyisile	UCT
KOCH Karen	WITS
MCHUNU Hlobisile Nana	WSU
MOODLEY Ameshin	UKZN
MOTAU Ayanda	
NOMBONA Patiswa	UKZN
PARKER Altaaf	US
ROUHANI NAJAFABADI Mary Mehrafarin	WITS
VAN DEVENTER Linda	US

Part I of the Fellowship of the College of Emergency Medicine of South Africa: FCEM(SA) Part I

BEUKES Johann Gerhard	UCT
CHAGANI Mohamedsuhel	US
LALLOO Vidya	UP
LEWIS Carolyn Mary	UKZN
PRETORIUS Johannes Jacobus	
ROOS Charlotte	UCT
SIKUVI Kaveto Andreas	UCT
SULAIMAN Mogamad Imraan	US
THOMAS Grant	US
VAN KONINGSBRUGGEN Candice Anne	UCT
WOOD Delecia	WITS

Part I of the Fellowship of the College of Family Physicians of South Africa: FCFP(SA) Final Part A

ADELEKE Olukayode Ademola	WSU
ADEYEMI Benjamin Olamide	UKZN
FALADE Ayodele Temitayo	UKZN
FALEYE Abidemi Samson	UKZN
LERATO-NKOANE Meisie Adeline	UL
MPEPO-HLONGWANE Kuhle	UCT
NKABINDE Thandaza Cyril	UKZN
OSA IZEKO Orobosa	UKZN
RAMOCHELE-NGWENYA Margaret-Mary Maselake	UL
SARUMI Akeem Abiola	UKZN

Part I of the Fellowship of the College of Forensic Pathologists of South Africa: FC For Path(SA) Part I

DU PLESSIS Marna	UL
SEFANYETSO Mogolelwe Maria	UL

Primary of the Fellowship of the College of Maxillofacial & Oral Surgeons of South Africa: FCMFOS(SA) Primary

DE LANGE Johny	
KUHN Jason Dale	
MHLANGA Joseph Gugulethu Austin	US
MUSSON Clarence Gregory	WSU
NKONYANE Mbali	WITS
SEKHOTO Mmathabo Gloria	
TITINCHI, Fadi	
VAN DER MERWE Petrus Jacobus	

Part I of the Fellowship of the College of Neurologists of South Africa: FC Neurol(SA) Part I

DENDERE Catherine	
GENGAN Kerena	
ROOPNARAIN Karisha	UKZN
SHABA MAMPANE Comfort	WITS
WELLS Cait-Lynn	UKZN

Part I of the Fellowship of the College of Obstetricians & Gynaecologists of South Africa: FCOG(SA) Part IA

BRAAM Natalie Alexandra Louise	WITS
CHUKWU Obinna Peter	UKZN
DEHINBO Tunde	UKZN
FLATELA Mlungisi	WSU
GEORGIOU Chrysanthi	WITS
GONDONGWE Lucia	
GONYA Sithembinkosi Manyoni	WSU
GXOWA Yanga	WSU
HLENGANI Rachel	UL
JAGOT Khatija Hoosen	WITS
KAROLIA Sameera Haroon	WITS
KGWEFANE Kebusitswe Grace	
LEVITT Annelize Julia	US
MAHLANGU Solomon Andrew	UL
MAKHUBO Nokubonga	WITS
MAMVURA Lucia Upenyu	WITS
MANYERE Ngatendwe Rosemary	
MASEBELANGA Ratsheng	
MATLA Ntshepiseng Charity	UL
MBUNGU Nomaphelo	WSU
MOHLALA Norman Boyman	UP
MOTHUPI Johannes Moisi	UL
MPIKO Liyanda Lennox	
NADKER Salma	WSU
NAVARRO RICARDO Juan Carlos	UKZN
NCHINYANI Mokgadi	UL
NENE Sizakele Charity	UKZN
NJENDA Phillemon Ngwarirai	
ODELL Natalie Patricia	
SHABALALA Esmon Makhosonke	UKZN
TEW Catherine Louise	WITS
TSHIKANDA Khathutshelo Ashley	
TSHIKOSI Rendani Osborn	US
VAN DER MERWE Melissa	WITS
VENTER Inge	UFS
WALTON Erika Gwen	US

Primary of the Fellowship of the College of Ophthalmologists of South Africa: FC Ophth(SA) Primary IA

ANDREAE Corinna Doris	
BAILEY Robert Allan	UFS
DANIELS Lauren Nadine	
DE JAGER Petrus Johannes Schbort	UFS
DEBEILA Khutsiso Mamorake Sekgololo	UL
GANGAI-SINGH Manisharani	
HAYES Morgan Philip	UKZN
JAY NARAIN Serisha	
KLEYNHANS Erika	
KRUGER Frans Jacob	UFS
LESENYA Isaac Kalushi	UL
MABOGO Maanda	
MBELWA Samkelo Leon	UL
MELANI Mahlatse Nancy	UL
MJWARA Mzwandile Mphathi	UKZN
MODISAESI Lerato Patience	WITS
MOFOKENG Thabiso	
MURUDKER Zahier	
PROXENOS Charles	WSU
RAMNARAIN Sureka	
SIBANDA Thobekile	
THOMAS Alton Irvine	WSU
TOMLINSON Megan	
VAN DER MERWE Ernst Baard	
VAN NIEKERK Hermanus Albertus	

Primary of the Fellowship of the College of Otorhinolaryngologists of South Africa: FCORL(SA) Primary

DIALE Ndivhuwo	
MDLETSHE Fanelesibonge Brightness	WITS
MOSITO Sylvia Motlalepule	UP
MUGANDA Erasmus	
NDEBELE Phumelele Bongiwe Nokwazi	UKZN
PENDUKA Moses Farai	UCT
TADERERA Priscilla	
WATCHAM Shelley	US

Part I of the Fellowship of the College of Paediatricians of South Africa: FC Paed(SA) Part I

ANTONIO LEITAO RIBEIRO Helena Vanda	WITS
BERKENFELD Sarah	WITS
BOERSEMA Maria Yolinde	UP
BOPAPE-CHINYANGA Thokozile Cora	WITS
CAWOOD Shannon Kim	WITS
CHAUKE-MAKAMBA Bonisiwe Cassildah	UP
DANIELS Adriaan	UCT
DEARDEN Carolyn Xandre	UP
DU PLOOY Elri	US
GAIBEE Zeenat	UCT
GOVENDER Samantha	UKZN
HOFFMAN Elizabeth	
KARSAS Maria	UP
KEELING Kathryn Helen	WITS
KUBHEKA Sibusiso Ephraim	UKZN
LEAHY Shannon	WITS
MAHOVO Rugare	WITS
MANO Runyararo	
MARAIS Sumari	US
MASHEGO Maganong Pamela Agness	UL
MATUKU Cynthia Vimbai	
MULAMBIA Yabwile	
NAIDOO Nayestha	UCT
NEPFUMBADA Mulalo	UL
NHOKWARA-MATENDA Precious Rutendo	
NTULI Nandi	WITS
OKWUNDU Charles	US
OLADOYINBO Abidemi	
PAGE Megan Anne	
PHIKO Sinazo	WSU
PIENAAR Michael Alexander	UKZN
PILUSA Jane Hlologelo	UP
RAMABOEA Ngwako Innocent	WITS

REDDY Kershinee	UKZN
REYNDERS Marelize	UFS
RIBEIRO Isaura Da Paixao	
RICHARDSON Chantel Jane	
ROOS Michelle	UCT
RULE Jessica Katharine	
SAYED Abdul-Quiyyum Abdur-Raoof	UKZN
SCHEEPERS Lynn Olivia	US
SEAKE Karabo Pertunia	WITS
SEBETSEBA Khutso Nkgosana	WITS
SETHOMO Warona Pricilla	
SHAZI Renneth Senzeni	UKZN
SHIMANGE Queen Nhlanhla	
SMIT Carine	US
STEENKAMP Aletta	UFS
VAN HEERDEN Linda	US
VAN STORMBROEK Ben	UCT
VAN VELDEN Mia	US

Part I of the Fellowship of the College of Pathologists of South Africa – Anatomical: FC Path(SA) Anat Part I

EBRAHIM Tasmeera	UKZN
KHABA Moshawa Calvin	UKZN
LAKHOO Deepna	WITS
MSIMANG Mpumelelo Zama	UKZN
MULENGA Maurice	UKZN
NHLONZI Gamalenkosi Bonginkosi	UKZN
SINGH Shivani	UKZN
SKEAD Garret Jonathan	UCT

Part I of the Fellowship of the College of Pathologists of South Africa – Haematology: FC Path(SA) Haem Part I

JALI Ayanda Gugulethu	UKZN
MAHROUG Esam	
NGQUMETYANA-MAZWI Lindelwa Diane	US

Part I of the Fellowship of the College of Physicians of South Africa: FCP(SA) Part I

ABRAHAM Anu	
WITS	
AHMED Anees	WITS
ALSHMANDI Mohamed Almokhtar Mohamed	
WITS	
ASIEDU Gloria Anibea	
BARDAY Zibya	US
BARRETT Claire Louise	UFS
BERMAN Catherine Iris	WITS
BOLOKO Linda	
BROMFIELD Michael Jared	WITS
CARTER Richard Michael Neno	
CHETTY Sivathasen Kasaven	UKZN
COETZEE Surita	WITS
CORNELISSEN Estelle Theresa	US
DIPPENAAR Andries Petrus	
ENGELBRECHT Cornel	US
ESSA Abubakr	US
GREYLING Christeman Jacob	
HARGEY Irfaan	US
HASSAN Karim Mohammed	US
HLOPHE Mbuso Alpha	UKZN
ISMAIL Hajira	
JACOBS Ashley	
JOSEPH Darren	UP
KAKOOZA Dominic	WITS
KESENOGILE Boikobo Veronica	
KHAN Uzma Nasir	
KHURWOLAH Mohammad Reeaze	UKZN
LALA Vikash Goolab	
LEVIN Menachem Zvi	WITS
LITELU Thabiso Ignatius	UFS
LOUW Elizabeth Helene	UFS
LUKHNA Kishal	
MABIKA Mazwi Nkosikhona	
MAKUKU Rakgopa	
MARAIS Charles Gerard	US
MAROKA Kafofora Gerald	UL
MAZONDWA Simthandile Fiona	WSU
MBUYAMBA Lumanda	
MFONO Vuyisa Jolly	WSU
MOKGACHA Kabelo	
MOLEKWA Mojaki Johannah	
MOLOBE Ludo Taboka	
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NGUBANE Zesizwe	
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PALKOWSKI Gregori Henryk	UCT
POULET Erma	UCT
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SEEDAT Faheem	WITS
SEPTEMBER Jason Ralph	US
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SIMBA Kudakwashe	
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SOGAYISE Phelisa	
TOM Tony	UFS
TSENOLI Thabang	UFS
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TSHIOVHE Ndikundisani Ananius	
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VAN ROOYEN Gisela	UP
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WAWERU Alvin Wachira	
WELGEMOED Waldo	US

Part I of the Fellowship of the College of Psychiatrists of South Africa: FC Psych(SA) Part I

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BUTHELEZI Thandi	WITS
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GERBER Erhardt	UCT
GOUNDEN Sharadini Karen	UKZN
JACOBS Kathleen Louise	WITS
JOUBERT Mia	UL
KORANTENG Promise Nonceba	WITS
LEBELO Eva Mamma	UP
LUYT Daniel Frederick	UFS
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SEFANYETSO Thato Cathrine	WITS
SELEMELA Letlhogonolo Patrick	WITS
SINGO Tshiwela	WITS
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ALMGLA Naser	UCT
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BOTES Stefan Nicolaas	UL
BOTMA Nicolaas	
BOYCE Bongani	UKZN
CARREIRA Jo-Anne	WITS
CHILTON Gareth Harvey	UCT
CHRISTOFIDES Chris	WITS
COETZEE Werner Carel	US
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DAHMS Willem	UFS
DE JAGER Louis Johannes	
DE WET Johannes Jacobus	WITS
DESAI Yussuf Mohammed	UKZN
DIVEY Mark	UFS
DUBE Nomthandazo Amanda	UL
ELS Timothy	
FIGUEIREDO Fredrick	UKZN
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FOURIE Johannes Lodewickus	UFS
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GROENEWALD Carolette	WITS
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KGOEDI Mohlakano Nelson	
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MADZHIA Mahlohonolo Puritan	WITS
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MAKGOKA Malose	
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MOSAI Fusi	
MSINGAPANTSI Mandilakhe	UL
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NAICKER Dharshen	
NAIDOO Kavitha	WITS
NAUDE Jaco Johan	
NGOBESE Amanda	UKZN
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NIEMOLLER Heinrich Gerhard	UP
NOCONJO Lubabalo	WSU
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NOWBUTH Vikash	UKZN
NTANZI Ntuthuko	UKZN
OKE Joy Ayodele	WITS
OOSTHUYSE Barend Gabriel	UFS
PENTELA Hanumantha Rao	UKZN
PHILLIPS Devola Cheryl	UKZN
PRETORIUS Rupert	UFS
RACHUENE Pududu Archie	UL
SCHAMROTH Nili Ronit	
SIFUBA Simphiwe	WITS
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TOKWE Tichaona Hilary	
VALLY Moinuddeen	
VAN DER MERWE Wian	UP
VAN DER MERWE Laurie Wiid	UFS
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VAN STADEN Gideon Francois	UFS
VLOK Adriaan Louw-Waldi	
WASSERMANN Petrus Hendrik	UFS
WEGOYE Emmanuel	UCT
YOUNG Christopher	UCT
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NKALA Hlezikuhle Pethezinhle	WITS
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THOMPSON Eddison	WITS
YOUNG Christopher	UCT

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LOURENS Hendrik Nicolaas	UP

Part I of the Fellowship of the College of Obstetricians & Gynaecologists of South Africa: FCOG(SA) Part IB

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GONYA Sithembinkosi Manyoni	WSU
HLENGANI Rachel	UL
HLONGWANE Tsakane Musa	
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KGOMO Koena Allen	WITS
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ODELL Natalie Patricia	
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Intermediate of the Fellowship of the College of Ophthalmologists of South Africa: FC Ophth(SA) Intermediate IB

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YORK Nicholas John	UKZN

Intermediate of the Fellowship of the College of Orthopaedic Surgeons of South Africa: FC Orth(SA) Intermediate

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ATEER Osama Ahmed	UKZN
BAKKAI Ali Mubarak	UKZN
BEZUIDENHOUT Carel Willem	US
CHARILAOU Johan	US
DUMA Mlekeleli Thembinkosi Ntando	UKZN
IQBAL Mohammad Nasir	WITS
JACOBS Hans Wessels	UP
KHALFALLAH Adel	WITS
KHAN Faraaz	UKZN
KRUGER Neil	UKZN
LEDIMO Letsie Peter	UP
NIEUWOUDT Luan	UKZN
PRETORIUS Johannes Lodewicus	UKZN
RAJPAUL Jitesh	UKZN
ROOPAN Shekar Naresh	UKZN
SMITH Stephen David	WITS
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VENTER Shawn	UKZN
YENDE Thabiso Wilson	UKZN
ZANATI Abdelhakim	UKZN

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APAI Pacifico	UCT
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DARR Humaa	UCT
DE JAGER Simon Grant	
DE VILLIERS David Johannes	UCT
DOUGLAS-JONES Paul	US
DUNYWA Khangelani	
GIGABHOY Ritesh	UKZN
GONYA Sonwabile	UKZN
GUJADHUR Bhaskar Fulena	UKZN
ISMAIL Shenaaz Banu	UKZN
JORDAN Lizalisidingalakho	WITS
JUGUNANAN Gourisha	WITS
KABONGO Kalangu	UKZN
KARJIKER Parveen	UCT
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LAWRENCE Bryan Garath	UP
LELUKA Mahlomola Daniel	UP
LIVHEBE Mbavhalelo Cynthia	WITS

MABASO Brian Mmiga	UP
MACHAEA Sello	UKZN
MADITSI Leretletje Mogatjiri	UL
MAHARAJ Sandhir Premlall	UKZN
MAHOKO Mosadi	US
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MSUKU Sandress Chankhulu	WITS
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PILLAY Sumana Lakshmi	UKZN
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ROODT Liana	UCT
SPENCE Richard Trafford	UCT
STEYN Corlize	US
VAN DEN BERGH Barend Hendrik	WITS
VAN HEERDEN Yentl	
VERMEULEN Abraham Jacobus	US
WAHAB Abdullah	
WITHERS Aletha Suphia	WITS

Higher Diplomas

Higher Diploma in Internal Medicine of the College of Physicians of South Africa: H Dip Int Med(SA)

TOP Gysbert	UFS
VAN STADEN Sanet	

Higher Diploma in Orthopaedics of the College of Orthopaedic Surgeons of South Africa: H Dip Orth(SA)

ABUGHALYA Mohamed Salem	
UKZN	
JAKWOT Morris Justin	UL
NGWAZI Muziwamandla Macleod	UKZN

Diplomas

Diploma in Allergology of the College of Family Physicians of South Africa: Dip Allerg(SA)

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BEDDY Chevaun	UP
DE CAMPOS Roselys Katya Vieira	UP
JAYE Tamara Heidi	WITS
LEWIS Wendy Claire	
MURRAY Louise Marie	UL

Diploma in Anaesthetics of the College of Anaesthetists of South Africa: DA(SA)

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ACQUAH Esi Bonniba	
AKII Agetta Jimmy	
ALEKA Patrick Aleka-Umbe	
BAILLIE Tamsyn Beth	WITS
BOSHOFF Marianne	UP
BOTHA Amorie	WITS
BREEDT Anneme	
BUITENWEG Lize	WITS
BURGER Adrian	
CARIM Janine	UKZN
CHABILALL Joshna Amrith	UKZN
CHAUKE Tintswalo Mercy	
CILLIERS Louisa Jacoba	
DE MENEZES-WILLIAMS Heloise	
DEDEKIND Shani	UP
DELPORT Jacobus Eduard	
DOUGALL Lauren Dawn	WITS
DRUDE Carmen	
FENING Nana Yaa Fenima	
FERNANDES Nicole Lucy	UFS
FRIEDMAN Lauren Emma	
FUENTES CARBONELL Maria Elena	
GELDENHUYS Lieze	UKZN
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GROENEWALD Chantel	UP
HARMSE Leani	
HLATSHWAYO Nozipho Philominah	
HUMAN Cindy Ray	
HUTTON Nicola Judy	WITS
JOOMRATEE Moubiin	UKZN
KAJEE Amina Abdool Haq	UKZN
KISTAN Kroshlan	UKZN
KOMMAL Terrence Omdutt	UP
LE ROUX Marzanne	
LEACH Joanne	
LEONARD Tristan Gavin Alexander	
MAHOMED Sameerah	WITS
MAIMANE Crystal Kagiso Lindy	
MALIMA Zolani Alan	
MALUMALU Utshudi Joe	WITS
MOLOKO Phenyo Mamosala	UL
MOORAD Sarah Yunus	
MUKWEVHO Tshifhiwa	
NAKAMWE Ndeufika Twahafifwa	
NANA Janita	WITS
NEUHOFF Wilhelm Jacques	
NTULI Nompilo Priscilla	
NUNDLAL Prenisha	
NYAMANDE Fhumulani Collet	UKZN
OBREE Nicola Lu	WITS
OLIVIER Michelle Jacqui	UP
OMAR Maryam	
PATHER Novida Laurika	US
PHEIFFER Lukas Marthinus	UKZN
RABE Mareike	
RACHELSON Anthea Shana	WITS
RAMKISSON Ushira	WITS
ROETS Amorie	UP
SANDERS Megan	WITS
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SATYAPAL Vedika Maniksha	UKZN
SITHOLE Shane King	
SLABBER Isak	
SOOKA Praveer Navin	
STEENKAMP Christo	
STEVENS Joanne Leigh	WSU
SWART Euodia Dorothea	UKZN
TANALE Lwando	
TUDHOPE Ralph George	US
WEINBERG David Marc	
ZWANEPOEL Wilhene	US

Diploma in Child Health of the College of Paediatricians of South Africa: DCH(SA)

ALING Anne Lauren	
ALLIE Nazneen	
BEKKER Carien	UCT
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CONRADIE Maureen	
EL-BORAEI Samah	
EYRE Candice Joanne	
GROBBELAAR Madelein	
HANNINGTON Juliet Louren	
HOOPER Sarah Kate	
KHAN Fatima	
LEVIN Candyce	UCT
LOTZ John-D Knipe	
MAPATHA Leshata Abigail	
MATHEW Grace Thangam	UCT
MOHAN Sruthi	
MOOSA Shireen	
NOWALAZA Zandiswa	WSU
OPPEL Kim Bianca	US
POTGIETER Belinda	
RAMSUNDER Prishani	
RIKHOTSO Glenrose	
ROBERTSON Caroline Helen	US
SCHOONRAAD Leilah	
SEBITOSI Sandra Nakayiza Namugga	
SPIES-HARRIS Mijaelane Stephany	UP
THOMAS Preethi	UCT
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VIRANNA Rishigen	
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Diploma in Forensic Medicine of the College of Forensic Pathologists of South Africa: Path: Dip For Med(SA) Pth

HLAHLA Mmachuene	UL
KGARUME Kenalemang	
LEISEGANG Simon Andrew	WITS
MANTANGA Luyolo Leonardo	WITS
MOJAPELO Moleka Vincent	
RAMELA Malerato	
SOUL Bathabile	

Diploma in HIV Management of the College of Family Physicians of South Africa: Dip HIV Man(SA)

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UKZN	
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ALAM Monzur	WITS
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BIRDSEY Bianca Caren	
BROMFIELD Michael Jared	WITS
BROWN Kirsten Louise	
BRUMSKINE William Lawrence	
BVIRIBVINDI Tafadzwa	
CHAMUNYONGA Felix	
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DAVIDS Lee-Ann	
DAY Cascia	UCT
DORWARD Jienchi	
DU TOIT Marcel	UFS
DUNLOP Jackie Lee	
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FARISANI Livhuwani Millicent Lucia	UP
FICK Candice Amanda	WITS
FRANCOIS Kerri-Lee	UKZN
GASARASI Ingrid	
GIDDEY Joel Dyason	
GILBERT-LEPHODISA Masego	
GOUDSWAARD Maartje Lotte	
GOUNDER Lilishia	UKZN
GREGORY Rebecca	UKZN
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HOMAN Roucille	UCT
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KANNIGAN Yashodhara	UKZN
KHAOLE Obakeng	WITS
KHUZWAYO Khulani Theodore	
KUNENE Mndeni Lindokuhle	
LAL Niharika	UKZN
LALA Vikash Goolab	WITS
LEVETAN Carly	US
LOMBARD Chanda	
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MANHANDO Kennedy	
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MASINGI Ntsakisi Innocent	
MBENENGE Nonhlanhla Glory	WITS
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MELESSEN, Jelleke Ankie	
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MKIZE Sarah Gugulethu Thobekile	
MMALEKUTU Godfrey Thabo	
MOHAPI Makgotso	WITS
MOJA Lebogang	WITS
MOKGOKO Didintle	WITS
MOKOENA Diana Kholeka	
MULAUDZI Selinah Idah	
MUNSAMY Vishelan	UKZN
NAICKER, Sathiamurthi Jesudasen	
NGANWA Patience Jennifer Kengyenya	
NKOMO Thanduxolo Smiso	UKZN
NONG Thato Mamotlhabe	
NORTJE Cornelius Johannes	
NORTON Gwen Robyn	UCT
NOVEMBER Vuyokazi Joy	WSU
NWAKO Azubuike Benjamin	
OSCH Refiloe Faith	
PARBHOO Dinen	
PARKER Tasneem	
PENTELA Naga Pallavi	UKZN
POTGIETER Belinda	
QOLOHLE Mzwamadoda David	WSU
RAUBENHEIMER Janine	
RIJKEN Dingeman	
SEEDAT Faheem	WITS
SETJIE Sewela	UL
SHER Rebecca Yael Nthabiseng	UCT
SINGH Elisha	UKZN
STADLER Jacob Adriaan Maritz	UCT
TJANGASE Anastinah	UKZN
VAN DER DOES Albertine Mechteld Barbara	US
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VINASITHAMBY Umathevan	WITS
WARD Amy Maree	UCT
WILLIAMS Porcia Kim	UCT
WILMORE Stephanie Margaret Selkie	
WRIGHT Claire Anne	
ZUIDEWIND Peter	US
ZUMA GWALA Ntokozo	
ZWANE Musawenkosi Ziphokuhle	

Diploma in Mental Health of the College of Psychiatrists of South Africa: DMH(SA)

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GYAWALI Subechha	WSU
MONA Khanya	
SIVARAJAN Anuradha	WITS
UBABUKOH Samuel Ozioma	WITS

Diploma in Obstetrics of the College of Obstetricians and Gynaecologists of South Africa: Dip Obst(SA)

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ADENIYI Oladele Vincent	WSU
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ASGHAR Adam Konrad	UKZN
DORBIN Gabrielle	
DYWILI Vuyolwethu Luthando	
HAASBROEK Roxanne	
HILL Dalene Catherine	
KAMBUNGA Maano Peyahafo	
KOTZE Adri	
LULENDO Folo Chedo	
MULOMB Kavul	
MUSHUNJE Munyaradzi	
MUTOMBO KYAKUBANDILA Roger	UKZN
NELSON Aurelie Kennedy	UCT
NOMLOMO Esihle	UCT
NZENZA Tinei	
NZUZI Mpaka	
SEREMA Thulaganyo Charmaine	
STEENKAMP Leandri	
TYHALA Brenda Bongiwe	
WEITZ Cameron Peter	
YOSE-XASA Bongiwe Agrinette	

Diploma in Ophthalmology of the College of Ophthalmologists of South Africa: Dip Ophth(SA)

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BOTHA Theunis Christoffel	
CHATTERJEE Pamela	WITS
KRIEK Jozef Albertus	WSU
MOODLEY Sanushka	WSU
NIEDER-HEITMANN Norman	

Diploma in Primary Emergency Care of the College of Emergency Medicine of South Africa: Dip PEC(SA)

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CARBONARI Alicia	
DAVIES Zaan	
DAWSON Alison Ann	
DE CAIRES Leonel	
ERASMUS Schoombee	
ERASMUS Elaine	
FURSTENBURG Phillip Pieter	
GILBERT John Paul	
HURRY Debra Lee	
JOHNSON Chrystal	
KRIEK Johann Christian	
LIAO Mandy	UCT
LOOTS Donovan Paul	
LOUW Candice	UCT
MELTZER Charles Jason	
MITEWU Jean Bruno Kabongo	
MOHAMED Zunaid	
MOOLLA Zuraida	
PETERS Rafeeqah	
TONKIN Gregory Mathew	
VALLY Janine Claire	
VAN DER MERWE Minerva	
VAN DER RIET Allison Lee	
VICTOR Johannes Ignatius	
WEEBER Heinrich Johannes	
WELSH John	
WINEBERG Devorah Leah	WITS
WITT Jonathan	
WRIGHT Kathryne Elizabeth	

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GOVENDER Romona Devi	College of Family Physicians
ROSS Andrew John	College of Family Physicians
MKIZE Dan Lamla	College of Psychiatrists

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The late Prof Robert McDonald founded the Robert McDonald Rural Paediatrics Programme in 1974 for "the propagation of paediatrics in the more remote and underprivileged parts of the Republic of South Africa, by an occasional lecture or visit by someone in the field of the care of children".

Requests for funding are invited from teams of medical practitioners and senior nursing staff to travel to remote centres and areas to promote paediatrics and child health and the better care of children, as well as to disseminate knowledge in that field, especially in underprivileged communities. This can also include visits by medical practitioners or nurses working in remote areas to larger centres or centres of excellence.

The closing dates for applications are 15 July and 15 January of each year. The guidelines that pertain to the programme can be requested from Sharleen Stone, 12 Glastonbury Road, Umbilo 3001, telephone (031) 260 4438, fascimile: (031) 260 4439 and e-mail: cmsa-edu@ukzn.ac.za

South African Sims Fellowship Sub-Saharan Africa 2014

Nominations are invited from Presidents of eligible Colleges for the South African Sims Fellowship Sub-Saharan Africa 2014. The objective of the Fellowship is to establish and maintain educational development programmes in sub-Saharan Africa. The disciplines of medicine eligible for the South African Sims Fellowship are the same as those that are eligible for the Sir Arthur Sims Commonwealth Professorship; i.e. Anaesthesia, Cardiothoracic Surgery, Medicine, Neurology, Neurosurgery, Ophthalmology, Orthopaedics, Otorhino-laryngology, Paediatrics, Plastic Surgery, Surgery (general) and Urology.

The nomination must be submitted with the of the nominee, a motivation from the President of the College (as above), and an outline of the proposed visit.

Nominations should reach the Chairman, Education Committee (CMSA), PO Box 59185, Umbilo 4075, by 31 May 2014. Electronic submissions will also be accepted, and these should be sent to Sharleen Stone at cmsa-edu@ukzn.ac.za

Further information on the Fellowship can also be obtained from Sharleen Stone via telephone (031) 260 4438, fascimile (031) 260 4439 or e-mail: cmsa-edu@ukzn.ac.za

Errata

- The name of Dr Clive Herbert Daniel was listed in the previous issue of Transactions under the Life Members (on page 53). The publisher wishes to apologise for misspelling his name.
- Dr Bryony Lynn Walker was awarded with the Coulter Medal as published in the previous issue of Transactions. The publisher wishes to apologise for indicating that it was the FC Path (SA) Part I instead of Part II.
- In the previous edition of Transactions 2013;57(2):18, Professor Sonja Boy was awarded the fellowship by peer review by the College of Pathologists and not the College of Emergency medicine.

CMSA Minutes - Annual General Meeting

FIFTY-EIGHTH ANNUAL GENERAL MEETING OF THE COLLEGES OF MEDICINE OF SOUTH AFRICA (CMSA) HELD AT 11:00 ON FRIDAY 25 OCTOBER 2013, IN THE BOARDROOM, NELSON MANDELA SCHOOL OF MEDICINE, UMBILO ROAD, UNIVERSITY OF KWAZULU-NATAL

PRESENT

Prof BG Lindeque	(President) in the Chair
Prof GA Ogunbanjo	(Vice President)
Prof A Rantloane	(Chairman: ECC)
Prof T Zabow	(Honorary Treasurer)
Prof JJ Fagan	(Honorary Registrar: FGPC)
Prof MM Sathekge	(Honorary Registrar: ECC)
Prof JS Bagratee	(Acting Chairman and Hon Registrar: EC)
Prof SM Aiyer	Prof BM Mayosi
Prof RD Barnes	Prof AJW Millar
Prof JG Brink	Prof V Mngomezulu
Prof R Dickerson	Prof SBA Mutambirwa
Prof BJS Diedericks	Prof S Naidoo
Prof RN Dunn	Prof SS Naidoo
Prof RW Eastman	Prof MV Ngcelwane
Dr HI Geduld	Prof S Seedat
Prof D Govender	Prof AM Segone
Prof F Guidozzi	Prof F Senkubuge
Prof AMP Harris	Prof LM Sykes
Prof DA Hellenberg	Prof J Vellema
Prof TE Luvhengo	Prof MG Veller
Prof LJ Martin	Prof A Walubo
Prof DS Magazi	Prof JM Warwick

APOLOGIES

The apologies were noted.

SECRETARY

Mrs Bernise Bothma	(CEO)

MEMBERS AND OTHERS ATTENDING BY INVITATION

Dr L Govender (Logie)

IN ATTENDANCE

Mrs Lize Trollip	(Deputy CEO)
Mrs Ann Vorster	(Academic Registrar)
Mrs Anita Walker	(Office Manager)
Mrs Sharleen Stone	(Deputy Office Manager)
Mrs Jane Savage	(Minute Secretary)
Mrs Jill Johnson	(Minute Clerk)

WELCOME

The Chairman welcomed everyone to the 58th Annual General Meeting.

1. REGISTRATION OF PROXIES

Mrs Bernise Bothma reported that she had received 16 proxies, and that there were sufficient members for a quorum.

2. MINUTES OF THE FIFTY-EIGHTH (58th) ANNUAL GENERAL MEETING, HELD ON 19 OCTOBER 2012

The minutes were adopted and signed and are now part of public record.

3. APPOINTMENT AND RESIGNATION OF DIRECTORS IN TERMS OF THE NEW MEMORANDUM OF INCORPORATION

Prof Lindeque explained that the new structure of the company comprised the members, Senate who made the decisions on behalf of its members, and finally the Board who formed the Executive Committee of Senate, and who functioned as the Directors of the Company.

At the Senate meeting yesterday, members of Senate who were not members of the Board resigned as Directors [what they used to be called before the new Memorandum of Incorporation (MOI) was finalised].

The Deputy CEO read out the names of the Directors of the CMSA as follows:

- Prof BG Lindeque
- Prof GA Ogunbanjo
- Prof D Kahn
- Prof JLA Rantloane
- Prof SS Naidoo
- Prof JJ Fagan
- Prof MM Sathekge
- Prof JS Bagratee
- Prof AM Segone
- Prof RY Seedat

- Prof J Vellema
- Mrs L Trollip
- Mrs A Vorster.

This information would now be lodged with the Companies and Intellectual Property Commission, together with a signed resolution by the CEO, making this effective from 25 October 2013.

Mrs Ann Vorster wished her name to be removed as one of the Directors.

Prof Lindeque remarked that at this stage the position was recognised as eligible for Directorship, and not necessarily the person. This would be resolved at the next Board meeting.

4. MATTERS ARISING FROM THE MINUTES OF THE LAST ANNUAL GENERAL MEETING

None.

5. ANNUAL REPORT OF CEO ON BEHALF OF SENATE FOR THE PERIOD JUNE 2012-MAY 2013

The CEO reported that the Annual Report of Senate appeared on pages 19-25, and covered the administrative, and well as the financial, issues of the CMSA, which Prof Zabow would present.

The Report basically dealt with the appointments of officers, the MOI, examinations and related matters, awarding of medals during the past year, awarded scholarships, non-examination-related awards, educational matters, CMSA properties, College membership issues, matters alluded to by the Risk, Social and Ethics Committees, as well as a number of other issues. This was followed by the Annual Reports of the various constituent Colleges, and she was pleased to notify members that all of the constituent Colleges had submitted their reports in time for publication in *Transactions.*

6. FINANCIAL REPORT OF HONORARY TREASURER: PROF T ZABOW

Prof Zabow reported that it was a statutory requirement that the Annual Financial Statements were presented to the Annual General Meeting, to provide members with a good overview of the operations of the CMSA, both financially and otherwise.

These statements were audited to the end of May 2013 and underlined the state of affairs. The Directors were responsible for recording transactions pertaining to the activities. The Auditors' responsibility was to express an opinion having evaluated these, and to offer suggestions when problems were encountered.

Prof Zabow was pleased to announce that no fraudulent risks had been noted, and that the CMSA was a going concern for the next year.

A draft budget is submitted annually, and discussed by the Finance and General Purposes Committee (FGPC). A quarterly income and expenditure report was submitted which identified areas of over- and under-expenditure.

The Auditors examined the state of operations, and submitted a management letter with appropriate comments. The Annual Financial Statements were then presented to the FGPC, where they were discussed and approved. These would then be published on the Internet to comply with the statutory requirements of them being available in the public domain.

The value of property and 2quipment was approximately R47 million (detailed on page 16 of the Annual Financial Statements). Investments totalled R16 million, and another R10 million were trust funds (committed money). Additional cash was available for levy funds for the various constituent Colleges and other unforeseen expenses.

The CMSA normally budgets for a surplus with respect to the Income and Expenditure charts. The surplus was less for this financial year than it has been in previous years. There was just under a 6% decrease before donations.

Receivable subscriptions, even with concerns about the number of annual defaulters, increased by 7.2%, compared to those year on year. These fees were adjusted by 4.5-5%, depending on the category. Interest earned increased by 14%.

Prof Zabow drew members' attention to Note 22 of the Annual Financial Statements, which relates to value added tax. This paragraph disclosed a possible contingent liability, which could result in arrears in VAT having to be paid.

Prof Dhiren Govender queried the resignation date of members of Senate, as indicated in the Annual Financial Statements of 29 April 2013. This was contrary to the audited statements, because as at 31 May 2013, the resigned Senators were still operating as Directors.

The CEO reported that owing to long delays in registering the new MOIs, the companies acted on the date that the returns were submitted for registration with the Companies and Intellectual Property Commission.

IT WAS AGREED THAT THIS WOULD BE NOTED.

Prof Rantloane raised a number of queries. Firstly, he queried bad debts and how they were constituted. Secondly, he wondered whether or not the generosity of members could be reflected somewhere in terms of unclaimed travel allowance, subsistence and donations. He also believed that other financial assets, in the form of scholarships, i.e. Life Health Care, should be indicated to enhance the status of the CMSA.

Prof Zabow explained that the money donated to the CMSA was invested in the Building Fund, and he would investigate how this could be reflected. Money for sponsorships was paid to the CMSA in trust or towards the various lectureships and scholarships. These figures were reflected in the Annual Financial Statements. However, the scholarships donated by Life Health Care were paid to the Universities.

Prof Ogunbanjo referred to the CPD activities which always generated little money, even though the CMSA was an accreditor and service provider, and asked whether or not this could be improved.

Prof Zabow asked Mrs Anita Walker from the Durban office to comment. She stated that the figure was generally very low. The fees had remained the same (R100) for many years, but were increased to R450 last year. However, people who used to have their accreditation conducted through the University of KwaZulu-Natal were now using the CMSA for this purpose. She suggested that the constituent Colleges should be encouraged to utilise the CMSA for all of their CPD activities.

The Deputy CEO explained that the CMSA was a non-profit organisation (NPO) and linked to income tax exemption, and that increasing the CMSA's profits might jeopardise its NPO status.

Prof Zabow thanked all three offices for their hard work, and for helping to keep everyone up to date on the finances of the CMSA. He paid tribute to the accountant, Mrs Margie Pollock, who always alleviated his work load.

THE ANNUAL FINANCIAL STATEMENTS WERE APPROVED.

The Honorary Treasurer's Report was adopted.

7. REPORT OF THE PRESIDENT: PROF BG LINDEQUE

The President stated that he would only provide a brief report as the standing committees would each report on their different functions.

In particular, he thanked Prof Madaree for the contribution that he made during his term as President.

Secondly, he emphasised the change of the CMSA structure, i.e. the adoption of the new MOI in compliance with the new Companies Act.

The Senate meeting makes the final decision on all matters brought to its attention from the Board of Directors and the three standing committees. The Board of Directors undertakes the work and planning, and is subject to review by the Senate. Thus, the success of the CMSA depends on the effective functioning of the three committees who manage College matters: The FGPC, the Examinations and Credentials Committee (ECC) in Johannesburg, and the Education Committee in Durban.

This was the last AGM that would be attended by the outgoing CEO, Mrs Bernise Bothma, and Mrs Anita Walker, Office Manager, from the Durban office. He congratulated both of them for their years of dedication to the CMSA; Mrs Bothma for over 37 years, and Mrs Walker for over 12 years. He thanked Mrs Bothma, in particular, for taking care of the business of the CMSA as the CEO, and wished her well for the remaining many years of her retirement.

ACCLAMATION

The core businesses of the College would be highlighted by the chairpersons of the various standing committees.

The President emphasised the importance of the CMSA's collaboration with different departments, such as the Department of Health, the Department of Higher Education and Training, and to a certain extent, the funding bodies, and in particular, its relationship with the Department of Health, where the CMSA is viewed as an important role player.

At the Senate meeting the previous day, a number of plans were illustrated pertaining to the projected building for the property in Durban, due to commence by June 2014, with an anticipated completion date of November 2014.

He reported on the increase in the number of constituent Colleges from 28 to 32, with the formation of four Colleges in Dentistry, which means that all of the specialties in Dentistry will have their own Colleges.

The President finally asked Senators to actively encourage their constituent College members to participate fully in the 2014 elections.

ACCLAMATION

The CEO alluded to her report in *Transactions* in which she paid tribute to the many Senators whom she had befriended over the years, as well as the staff members who supported her with their loyalty, some of whom were already employed at the CMSA. In conclusion, she welcomed Mrs Lize Trollip, who would assume her position with effect from January 2014, and wished her the best for the ensuing years.

Mrs Anita Walker expressed her appreciation for her enjoyable stay at the CMSA, which she would sorely miss.

8. REPORT OF CHAIRPERSON, EXAMINATIONS AND CREDENTIALS COMMITTEE: PROF JLA RANTLOANE

Prof Rantloane reported that the ECC had appointed a Management Committee that administered the day-to-day issues that arose in the Examinations office, and which had since proved to be very effective.

Transactions contained a photograph of officers and staff who attended the dedication of the new building, referred to as 25 Rhodes Avenue, which had been transformed into tasteful accommodation for the staff. He expressed his appreciation to those who contributed to the development of the offices.

He re-emphasised the important relationship that existed between the College and the Health Professions Council of South Africa (HPCSA), and for the benefit of new members, explained the role of the CMSA as the agent that would administer the single-exit examination or national professional examination for HPCSA. The Memorandum of Understanding between the two parties was due to be finalised.

Senate had deliberated on the nomenclature for the different qualifications, and Prof Rantloane was pleased to report that the new nomenclature for the subspecialty qualification had been approved, and would soon be in the public domain. In practical terms, this meant that holders of subspecialty certificates would now be asked to exchange these for new nomenclature certificates.

He encouraged constituent Colleges to reach out to colleagues who were not members of the CMSA, but who they believed should be part of the assessment processes. There were four avenues of entry into the membership (excluding the examination); Associateship, Fellowship by Peer Review, Fellowship *ad Eundem* and Honorary Fellowship, each of which have their own guidelines.

He projected an increase in the number of candidates entering the CMSA examinations of at least 20%. However, concern was expressed about the declining pass rate. The ECC would conduct interrogations this matter, but in the meantime, he assured all members that continued efforts were being made to improve the examination results. Keen attention was being given to identify factors that potentially place the examinations at risk.

He acknowledged the bulk of the work performed by Mrs Vorster and her team, which made the position of the ECC so much easier. He expressed his appreciation o the Management Committee and members of ECC for their attendance, which had improved over the past year, at meetings.

Prof Lindeque thanked the Chairman for his report, and also extended his gratitude to the Johannesburg team.

9. REPORT OF ACTING CHAIRMAN, EDUCATION COMMITTEE: PROF JS BAGRATEE

Prof Bagratee, acting as Chairman for the past five months, firstly wished to thank the staff in the Durban office for easing his task.

He knew Mrs Walker for many years, and was always able to trust in her ability to maintain a high standard of work. He also wished to acknowledge the efforts made on behalf of the CMSA by the previous Chairman of the Education Committee, Prof Anu Reddi. He had steered the ship over the past few years, and some present members had been privileged to work under his stewardship.

The Education Committee was tasked with ownership of continuing professional development (CPD) accreditation and examination regulations. To assist with the CPD arrangements, Dr Sageren Aiyer was appointed to shadow Dr Clive Daniel for the purpose of continuity. As far as the examination regulations were concerned, Prof Bagratee requested the Presidents of the various constituent Colleges to always keep the Committee updated on any changes to their regulations.

Finally, he wished to record his gratitude to Mrs Bernise Bothma for her sage advice and support over the years.

ACCLAMATION

The President thanked Prof Bagratee for staying on as Honorary Registrar of the Education Committee after the election of the Chairman, Prof Cyril Naidoo.

10. REPORT OF CHAIRMAN, FINANCE AND GENERAL PURPOSES COMMITTEE: PROF JJ FAGAN

Prof Fagan reported very briefly on unresolved issues around VAT, which were elaborated upon at Senate, and which would be pursued in the the new year, in close consultation with the President.

The other two issues were the question of whether or not examiners in full-time employment at the Universities should be paid an honoraria, and whether or not the President should fly business class when representing the CMSA abroad.

The FGPC decided to appoint a FGPC Management Committee to address issues that come about between the major meetings. This was established in February, and was constituted by the Chairman, Honorary Registrar, Prof Dunn representing the University of Cape Town, Prof Kariem, representing the University of the Western Cape, and Prof Kling of Stellenbosch University.

In terms of human resource matters, the Deputy CEO had been given the opportunity to relieve the organisation in the Cape Town office specifically, and was managing superbly. Job descriptions for all of the staff, except the CEO, had now been finalised.

He wished to compliment Mrs Margie Pollock, who managed the finances of the organisation, as well as the other Cape Town staff.

11. REPORT OF CHAIRMAN, SOCIAL AND ETHICS COMMITTEE AND THE RISK COMMITTEE: PROF MG VELLER

Prof Veller asserted that the Social and Ethics Committee was formed with the purpose of complying with the MOI and the new King III guidelines that relate to business in this country. The committee was in the process of determining its scope of activities, in order to align these with the CMSA structure.

He went on to explain the activities of the Risk Committee, which had achieved its initial goal, i.e. that of ensuring that the relevant parties associated with the CMSA structures were made aware of the potential risk. The Risk Committee members were satisfied that this was being implemented at every level, and recommended to Senate that error reporting and error-reducing strategies should now be developed in an open and non-punitive manner. This would assist in finding and remedying problems within the system.

He thanked the various offices of the CMSA who supported efforts made in accordance with his position, and particularly Mrs Bothma and Mrs Trollip.

ACCLAMATION

12. REPORT OF EDITOR OF *TRANSACTIONS*: PROF GA OGUNBANJO

Prof Ogunbanjo explained that due to the increasing costs of publishing the journal, a decision had been taken to transform *Transactions* to an electronic version with effect from 2014. The portable document format (pdf) would be e-mailed to those members who had indicated their agreement to this, and 1 000 copies would be printed for those who asked for hard copies, for Senators (who attend Senate meetings), as well as the various libraries who receive hard copies, and people who wish to purchase a single copy). Investigations were also being undertaken to develop applications for "smart phones".

He stated that the issue that had previously been raised with regard to Department of Higher Education and Training accreditation was being pursued with the assistance of the Honorary Deputy Editor, Prof Savvas Andronikou, who would be tasked with obtaining original articles from Fellows, Senators and Registrars.

He thanked the Honorary Treasurer, the CEO, Academic Registrar and Office Manager in the Durban office, who assisted him so ably in obtaining the data publication, and finally, Senate, who maintained its confidence in him as Editor.

ACCLAMATION

13. ANNUAL APPOINTMENT OF AUDITORS

Prof Zabow proposed that existing auditors should be appointed for the ensuing year, and for their appointment to be reconsidered in a year's time.

Prof Veller supported Prof Zabow's proposal, but reminded members that it had been raised and agreed two years ago that there should be a rotation of auditors.

14. CORRESPONDENCE

None.

The meeting concluded at 12:25.

FP Fouché Lecture:

When tumour meets bone

Le Roux TLB, MBChB, MMed(Orth,) FCS(Orth)SA
Colonel, Professor, Department of Orthopaedics, School of Medicine, Faculty of Health Sciences, 1 Military Hospital, University of Pretoria
Medical Director: The National Tissue Bank
Correspondence to: Theo le Roux, e-mail: brummer@icon.co.za
Keywords: tumour, bone, cancer, metastases, diagnosis, quality of life

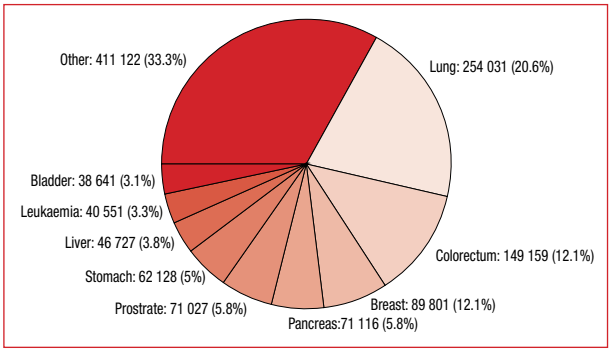
Introduction

In a series of 1 000 consecutive autopsies of patients who died of cancer, 27% were found to have bone metastases. Seventy per cent of all malignant bone tumours are metastatic in origin. Bone metastases are a dire consequence of cancer, portending poor survival. Median survival is less than six months. The diagnosis of bone metastases is usually devastating for patients with cancer. It suggests that the cancer is incurable and that patients are at an increased risk of developing skeletal-related events. Maintaining a good quality of life should be the optimal goal for these patients.

Metastatic bone tumours

Metastatic bone tumours arise from a primary tumour other than bone. The breast, prostate, thyroid, kidney and lung are the five most common carcinomas which metastasise to bone.

Cancer-related bone disease contributes significantly to healthcare costs (Figure 1). In 2004, the cost of metastatic bone disease in the USA was estimated to be $12.6 billion, or 17% of total oncology expenditure, by the National Institutes of Health.



Source: Brodowicz T, O'Byrne K, Manegold C. Bone matters in lung cancer. Ann Oncol. 2012;23(9):2215-2222
Figure 1: Cost of cancer-related bone disease in the European Union

Bone physiology

Bone is primarily made up of type I collagen, which is mineralised with hydroxyapatite crystals. Many hormones and molecules are involved in the close cross-talk among osteoblasts, osteoclasts and other cells within the bone microenvironment.

Collagenous precursors on bone matrix are synthesised by osteoblasts. They regulate bone mineralisation and express several molecules which are important for bone regulation, including parathyroid hormone (PTH) receptors, prostaglandins, oestrogen, vitamin D_3 and various cytokines. Osteoblasts are directly involved with the control of osteoclast differentiation through the expression of the receptor activator of nuclear factor κB ligand (RANKL). They secrete osteoprotegerin (OPG), a decoy receptor activator of nuclear factor κB (RANK) receptor, which inhibits osteoclast formation.

The complexity of metastases

The process of formation of metastases is inefficient. The majority of disseminated tumour cells perish in the circulation or pre-metastatic environment. The ability of circulating tumour cells to survive is determined by both their genetic phenotype and potential to adapt to the host environment. Disseminated tumour cells can harness multiple host cells for this purpose, including haematopoietic stem cells (HSCs), endothelial stem cells (ESCs), bone marrow cells, fibroblasts and immune cells. HSCs and ESCs possess the ability to migrate to peripheral sites and return to their bone marrow niche. This ability influences both the primary tumour site and the bone metastatic niche.

Mechanism of metastases

Intrinsic properties of tumour cells

Tumour cells have an ability to induce neovascularisation, cross the tumour stroma, modulate tumour cell adhesion molecules, and intravasate and evade the host immune response.

The haematogenous route is the most common vehicle of spread to sites of haematopoietic marrow in the adult skeleton. Large vascular sinuses allow the tumour cells to pass to the marrow spaces. Lung and renal cancer spreads to the distal extremities by arterial tree metastases.

Properties of the skeletal host reaction to tumour cells mechanisms

Tumour cells produce collagenases and metalloproteinases that extravasate to influence osteoclasts and osteoblasts [parathyroid hormone-related peptide (PTHrP) or endothelin-1 (ET-1].

Metastatic tumour bone physiology

Multiple steps are involved in the metastases of a primary tumour to any distant site. These include angiogenesis, which provides both nutritional support for tumour growth, as well as a route for tumour cell migration; local invasion through the basement membrane, a hallmark characteristic of a metastatic cell; adhesion to vessel endothelium in the target organs and extravasation into the tissue.

These events are supported by the tumour cell secretion of matrix metalloproteinases and cathepsin K. Tumour cells will establish a metastasis and grow at the distant site if the microenvironment is appropriate. As a result, growth and survival factors normally sequestered in the bone matrix are released, favouring tumour development.

Mesenchymal stem cells from bone marrow can become tumour-associated fibroblasts, have immunosuppressive function and facilitate metastases by epithelial-to-mesenchymal transition. Two other groups of cells within the bone microenvironment contribute to the metastatic bone niche, i.e. stromal cells and transient cells. Stromal cells arise from mesenchymal cells in the bone marrow and include adipocytes, fibroblasts and osteoblasts.

They support the differentiation and proliferation of cancer cells via molecules such as vascular cell adhesion molecule, syndecan-1 and matrix metalloproteinase-2. Transient cells include erythrocytes, T cells, and platelets, all of which have been shown to aid tumour growth and metastases through various pathways and molecules.

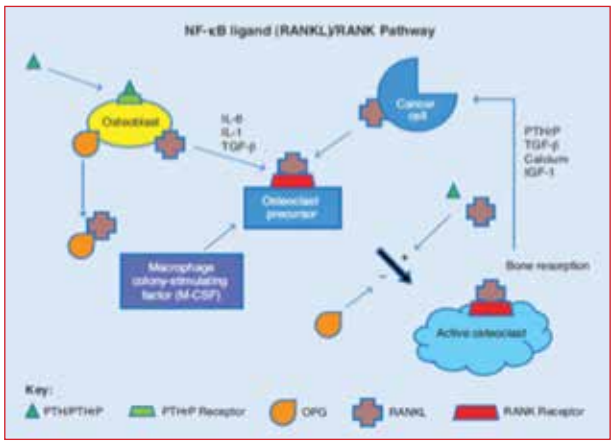
In turn, tumour cells affect the homeostasis of the bone marrow and bone, as well as the balance among haematopoiesis, osteogenesis, osteoclastogenesis and bone resorption. In bone marrow, the tumour cells find a niche that is rich in growth factors and cytokines, promoting their self-renewal, proliferation and survival. Osteoclasts also prime the bone microenvironment for tumour cell growth. They cause bone resorption, releasing many of these potential growth stimulating molecules into the milieu.

Metastatic tumours in bone consist of four types of radiographically defined lesions: osteolytic, osteoblastic, osteoporotic and mixed.

Osteolytic lesions are most common in breast cancer and multiple myeloma. This results from influences of the cancer cells, as well as normal cells, within the microenvironment. Bone metastases in prostate cancer tend to be osteoblastic in appearance, with disorderly excess bone deposition. ET-1 and platelet-derived growth factor-BB stimulate the formation of new bone through osteoblast proliferation.

The highly vascular metaphyseal bone, composed predominantly of trabecular bone, appears to be the preferred site for bone metastases. The mechanics of its sluggish sinusoidal vascular supply give the hematopoietic cells, as well as invading tumour cells, ample opportunity to move in and out of the marrow.

The bone microenvironment contains many elements which appear to favour the growth of metastases, including osteoclasts, bone-stored insulin-like growth factor-1, transforming growth factor beta (TGF-β), calcium, phosphate, stromal cells, and RANKL expression within the stromal cells. The RANKL/RANK pathway is very important in the activation of osteoclasts. RANKL is a member of the tumour necrosis factor (TNF) superfamily (Figure 2).



Source: Theriault RL, Theriault RL. Biology of bone metastases. Cancer Control. 2012;19(2):92-101
IL: interleukin, OPG: osteoprotegerin, PTH: parathyroid hormone, PTHRrP: parathyroid hormone-related protein, RANK: receptor activator of nuclear factor κB, RANKL: receptor activator of nuclear factor κB ligand, TGF-β: transforming growth factor beta

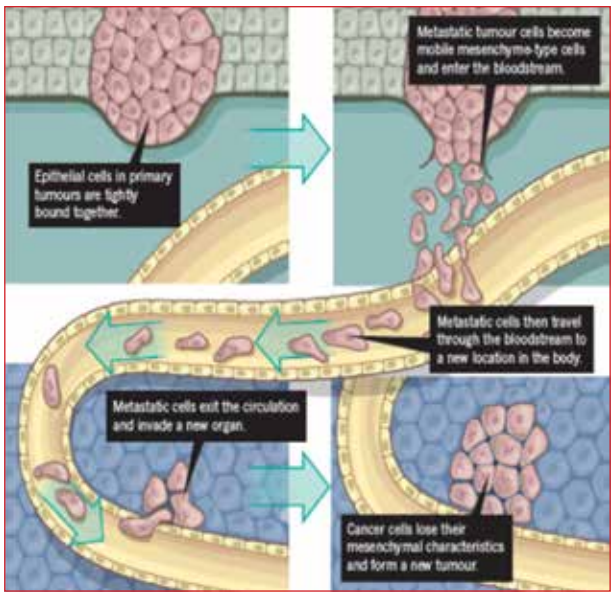
Figure 2: Nuclear factor κB ligand RANK pathway

The balance is maintained by OPG, a decoy receptor of RANKL, inhibiting its activity. Therefore, the RANKL to OPG ratio is an important regulator needed to maintain the bone equilibrium between bone loss (e.g. in osteoporosis) and gain (e.g. in osteopetrosis).

Primary tumours can also secrete chemokines, growth factors and proteases that are able to recruit HSCs and ESCs to assist in neovascularisation via vascular endothelial growth factor which aids tumour progression. In bone, the normal homeostasis between bone cells is disrupted by the production within the bone microenvironment of growth factors and cytokines by tumour cells. These tumour-derived factors influence the balance between osteoclasts and osteoblasts, leading to an increase in bone resorption.

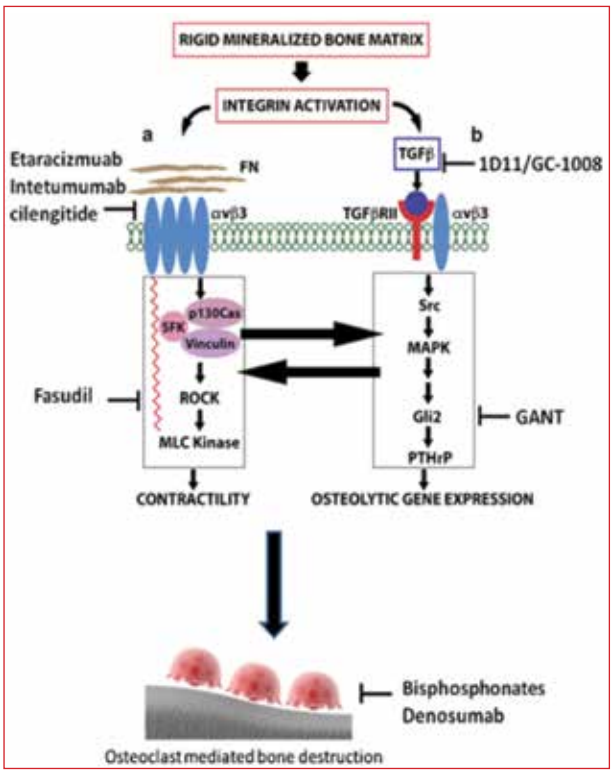
Cancer theory

Most cancer occurs in the sheets of epithelial cells which line organs. Epithelial cells are normally immobile, but some start to produce proteins associated with motility and shut down production of the proteins that



Source: Ledford H. Cancer theory faces doubts. Nature. 2011;472(7343):273

Figure 3: Reaction of a key developmental pathway



Source: Guelcher S, Sterling J. Contribution of bone tissue modulus to breast cancer metastasis to bone. Cancer Microenviron. 2011;4(3):247-259
MAPK: mitogen-activated protein kinase, MLC: myosin light-chain, PTHrP: parathyroid hormone-related protein, ROCK: rho-associated coiled-coil kinase, TGF-β: transforming growth factor beta
Figure 4: Rigid mineralised bone matrix pathway

glue the cells together during embryonic development. This transforms the cells into more mobile "mesenchymal" cells that migrate to their correct locations in the embryo. If the same epithelial-to-mesenchymal transition (EMT) takes place in cancer, it could explain how tumour cells detach from their neighbours and enter the bloodstream to seed a new tumour (Figure 3).

Once a metastatic cell has invaded a new tissue, its mesenchymal features melt away: "We don't see the full movie". Others suggest that cells break off from the tumour in clumps, and travel in packs: "But EMT is not to be dismissed". In cancer: "We can't dismiss anything".

What is the role of the rigid bone extracellular matrix in the regulation of genes which stimulate tumour-induced bone disease? The rigidity of bone specifically regulates PTHrP and Gli2 expression in a TGF-β and mechanotransduction-dependent mechanism (Figure 4).

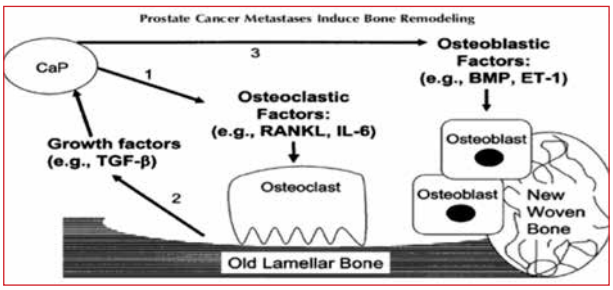
One of the major differences between bone and soft tissue is the rigidity of the mineralised extracellular matrix. It is approximately 1 000 000 times more rigid than normal breast tissue.

Once the pathway of metastasis is established in the bone, a vicious cycle is created among the metastatic tumour cells, osteoblasts and osteoclasts, which facilitates increased bone turnover and the survival of the metastatic cells.

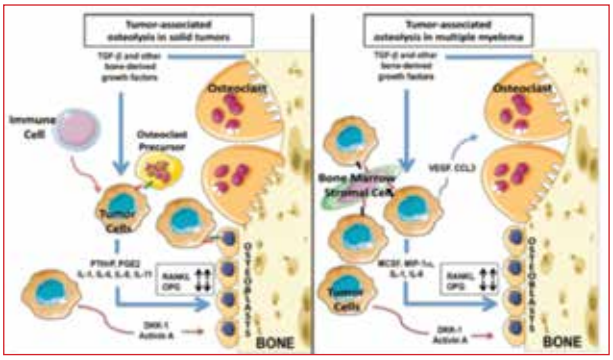
Bone metastasis in various types of cancer

Breast cancer

Breast cancer cells cause an overproduction of PTHrP. This is a major inducer of osteoclastogenesis, and its expression is specific to the bone



Source: Keller ET, Brown J. Prostate cancer bone metastases promote both osteolytic and osteoblastic activity. J Cell Biochem. 2004;91(4):718-729
BMP: bone morphogenetic protein, CaP: cancer of the prostate, ET-I: endothelin-1, IL: interleukin, RANKL: receptor activator of nuclear factor κB ligand, TGF-β: transforming growth factor beta
Figure 5: Osteoblastic bone metastases



Source: Coleman R, Gnant M, Morgan G, Clezardin P. Effects of bone-targeted agents on cancer progression and mortality. J Natl Cancer Inst. 2012;104(14):1059-1067
IL: interleukin, MCSF: macrophage colony-stimulating factor, MIP-1α: nacrophage inflammatory protein-1α, OPG: osteoprotegerin, PTHrP: parathyroid hormone-related protein, PGE2: prostaglandin E2, RANKL: receptor activator of nuclear factor κB ligand, TGF-β: transforming growth factor beta, VEGF: vascular endothelial growth factor
Figure 6: Mechanisms of tumour-associated osteolysis in solid tumours and multiple myeloma

metastatic niche. The osteoblastic expression of RANKL, with a decrease in expression of OPG, leads to a net increase in osteolytic activity.

Breast cancer cells also produce multiple cytokines, including interleukin (IL)-6, IL-11, prostaglandin E2, macrophage colony-stimulating factor and TNF-α, which act to promote bone metastases by inducing osteoclastogenesis and suppressing osteoblasts.

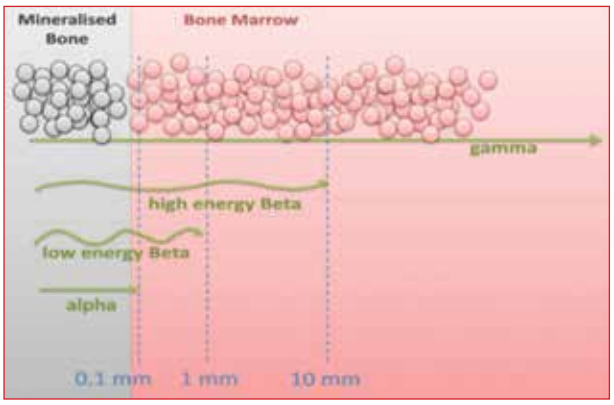
Prostate cancer

Prostate cancer forms osteoblastic metastases. The processes by which this occurs are less well understood than those involving osteolytic metastases. Prostate cancer is the second leading cause of death in men in America and Western Europe.

Emerging evidence suggests that chronic inflammation is a major risk factor for the development and metastatic progression of prostate cancer. Tumour-derived peptide ET-1 is a major determinant of osteoblastic bone metastases in prostate cancer, though its precise mechanisms of action remain to be elucidated (Figure 5).

Multiple myeloma

While multiple myeloma is a systemic disease, it is characterised by osteolytic lesions which are present in up to 80% of newly diagnosed patients. The bone loss owing to excess osteoclastic activity is enhanced by severe perturbations in the osteoblast cell function. Thus, the inability of osteoblasts to make new bone and repair bone that has been destroyed by osteoclasts results in severe bone "wasting" and an increased number of skeletal-related events.



Source: Brady D, Parker CC, O'Sullivan JM. Bone-targeting radiopharmaceuticals including radium-223. Cancer J. 2013;19(1):71-78

Figure 7: Penetration of γ rays, β particles and α particles into bone marrow

Factors involved in myeloma bone lesions include RANKL, OPG, IL-6, macrophage inflammatory protein-1 alpha and TNF-β. Multiple myeloma cells may acquire the functional properties of osteoclasts, and have the potential to directly degrade bone (Figure 6).

Unanswered questions

While much is being discovered about the pathways involved in the pathophysiology of bone metastases in cancer, a plethora of questions remain unanswered.

Such questions include: What exactly is the "metastatic signature" of any given primary tumour? Is there only one signature for all types of cancer? What triggers the growth of some tumour cells within bone marrow, while others remain dormant?

Diagnostic imaging and image-guided therapy of skeletal metastases

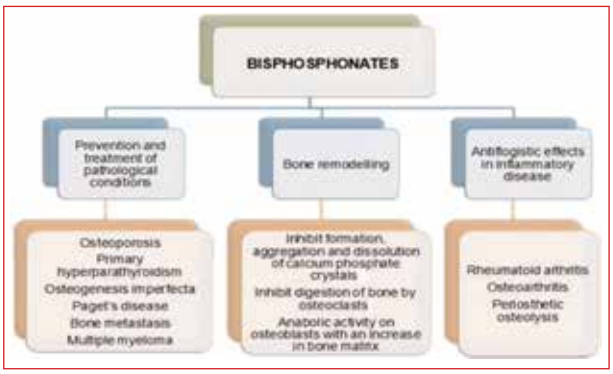
Skeletal scintigraphy provides a high sensitivity for detecting skeletal metastases, but targeted computed tomography (CT) or magnetic resonance imaging may be needed to increase specificity. Newer imaging modalities, such as positron emission tomography (PET)/CT, improve the detection of both lytic and blastic metastases.

Treatment and prevention of bone metastases

Traditional treatment options for bone metastases include surgery, radiation (both targeted external beam radiation and systemic radionuclide therapy), chemotherapy, bisphosphonates and endocrine therapy.

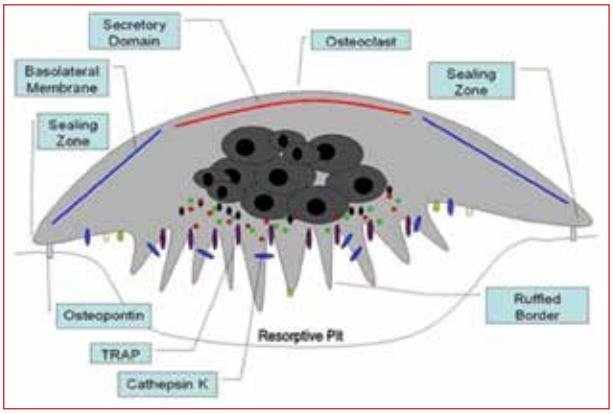
Prevention of bone metastases

In addition to the treatment of existing bone metastases, there is significant interest in the potential prevention of the development of such metastases. Systemic administration of therapeutic radioisotopes, such as strontium-89 and samarium-153, have been shown to safely and effectively palliate painful bone metastases associated with multiple types of malignancies. Furthermore, there is some suggestion that bone-seeking radionuclides may have a tumourocidal effect in prostate cancer.



Source: Iannitti T, Rosini S, Lodi D, et al. Bisphosphonates: focus on inflammation and bone loss. Am J Ther. 2012;19(3):228-246

Figure 8: Therapeutic effectiveness of bisphosphonates



Source: Modi ND, Lentzsch S. Bisphosphonates as antimyeloma drugs. Leukemia. 2012;26(4):589-594
TRAP: tartrate-resistant acid phosphatase

Figure 9: Effect of osteoclast

Figure 7 shows the penetration of γ rays, β particles and α particles into bone marrow.

What is the major problem in the treatment of bone metastases?

While the majority of research shows that surgery and radiation can improve quality of life and overall survival for cancer patients, these treatments do not target the underlying pathophysiology of bone disease.

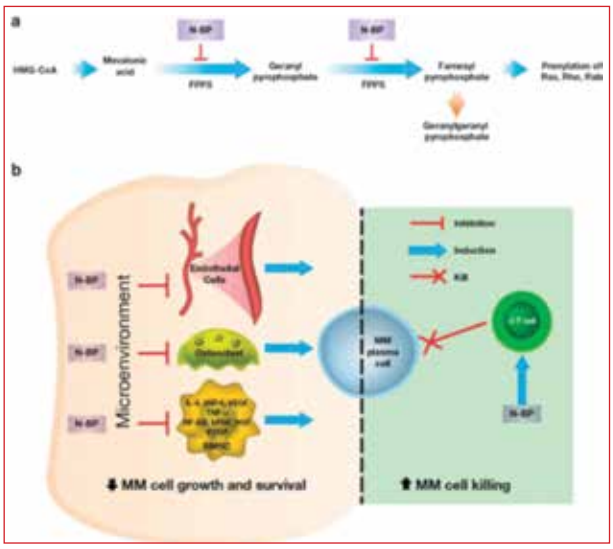
Bisphosphonates

Bisphosphonates are analogues of inorganic pyrophosphate which act by inhibiting osteoclastic bone resorption. They have a direct effect on cancer cells, inhibit tumour cell invasion and inhibit adhesion to bone matrix.

Currently, bisphosphonates are used in the treatment of hypercalcaemia of malignancy, and in the prevention of pathologic skeletal fractures. There are multiple therapeutic effects (Figure 8).

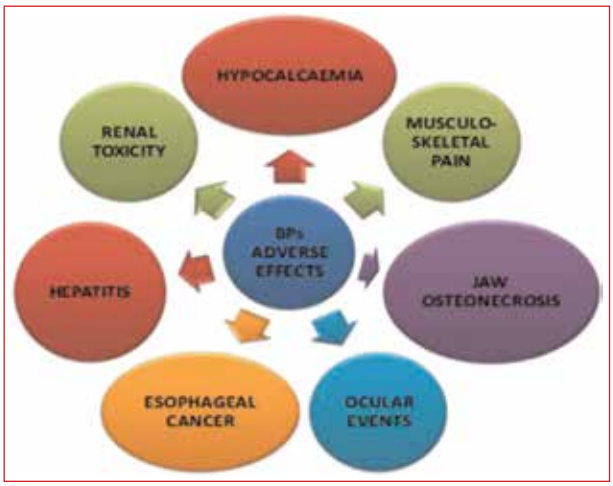
Despite their seeming differences, both osteoblastic and osteolytic metastases are treated with these drugs in order to reduce or block osteoclast activity and inhibit bone resorption (Figure 9).

These are not curative treatments. However, they slow the progression of the lesions, rather than restore bone health. Later-generation bisphosphonates, like zoledronic acid and pamidronate, are nitrogen-containing agents which are internalised by the osteoclasts, and inhibit their function by inhibiting farnesyl-diphosphonate synthase (Figure 10). The side-effects of bisphosphonate are depicted in Figure 11.



Source: Modi ND, Lentzsch S. Bisphosphonates as antimyeloma drugs. Leukemia. 2012;26(4):589-594
FPPS: farnesyl pyrophosphate synthase, HMG-CoA: 3-hydroxy-3-methyl-glutaryl-coenzyme A, MM: multiple myeloma, N-BP: nitrogen-containing bisphosphonates

Figure 10: Bisphosphonates as antimyeloma drugs



Source: Iannitti T, Rosini S, Lodi D, et al. Bisphosphonates: focus on inflammation and bone loss. Am J Ther. 2012;19(3):228-246

Figure 11: Common adverse effects associated with bisphosphonate therapy

Bisphosphonate therapy needs to be monitored closely in order to prevent adverse effects (Figure 11).

Zoledronic acid has also been shown to delay the time to first skeletal-related events, reduce the incidence of skeletal-related events and significantly reduce pain.

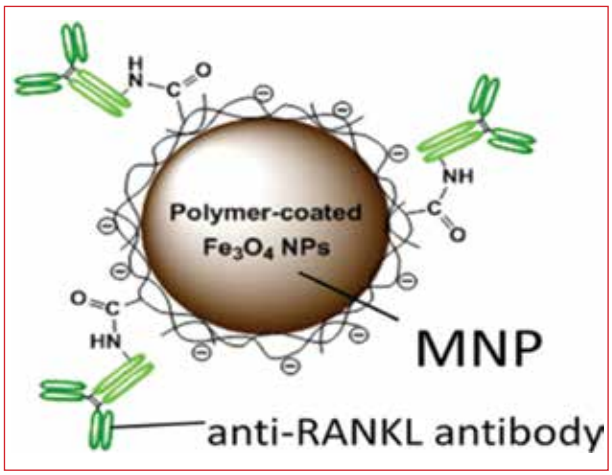
The US Food and Drug Administration has approved pamidronate and zoledronic acid specifically for the treatment of bone metastases. However, other bisphosphonates, including ibandronate and clodronate, have been used with similar effect.

The inhibition of bone resorption deprives tumour cells of bone-derived growth factors, e.g. TGF-β, required for the seeding and growth of tumour cells in the bone marrow.

Other bone-targeting therapies

The biologicals

Denosumab is the most recently approved therapy for osseous metastases. It is a fully human monoclonal antibody to RANKL. It neutralises RANK ligand and inhibits osteoclast function and bone resorption. Ongoing phase III randomised controlled trials are comparing denosumab to bisphosphonates.



Source: Kawai N, et al. Development of an anticancer hyperthermic therapy for bone specific metastasis in prostate cancer by using anti-RANKL antibidy conjugated magnetic nanoparticles. J Urol. 2013;189(4S Supplement)
RANKL: receptor activator of nuclear factor κB ligand

Figure 12: Nanoparticle-mediated, targeted delivery

Denosumab is a perfect example of targeted anti-cancer therapy. The inhibition of RANKL activity suppresses the osteoclasts' resorptive function, and so prevents skeletal-related events. Today, denosumab is one of the most powerful agents used for "bone-saving" treatment. A large, placebo-controlled randomised trial directly compared denosumab to zoledronic acid, and found that it was superior in delaying or preventing skeletal-related events in patients with breast cancer metastases to bone. TGF-β, which is implicated in metastases to various organs in breast cancer, is a potential target for new anti-tumour metastases drugs. Currently, multiple other therapeutic agents are being investigated. These include antibodies against PTHrP and pharmacological agents that block PTHrP, as well as osteolysis (in experimental models).

The preferential delivery of therapeutic agents to the bone has the potential to significantly improve the clinical outcomes of several bone-related diseases, such as osteoporosis, Paget's disease, multiple myeloma, myeloproliferative disease and skeletal metastases of several epithelial cancers.

Nanoparticle-mediated targeted delivery of chemotherapeutic agents to the bone is another attractive approach aimed at overcoming most of the previously mentioned problems (Figure 12).

Management of bone metastases

The multimodal, interdisciplinary treatment of bone metastases aims to achieve mobility, relieve pain and improve quality of life. An individual therapy plan has to be designed for each patient in a multidisciplinary team environment. The team members should include radiotherapists, oncologists and orthopaedic surgeons.

The extent of the intervention should be based on the 3 "S" principle of "save, short and simple". The prognosis of survival should influence the treatment regime. A biopsy is required if it is unclear whether or not a bone metastasis or a primary bone tumour is present.

The decision to offer orthopaedic surgery to patients with metastatic bone disease is often difficult and requires an understanding of the underlying disease, the patient's needs or wishes, and the expected outcomes and principles of surgery. Timely and appropriate surgical intervention reliably alleviates pain and improves quality of life, and can be undertaken with few complications in most patients. Although most procedures can be undertaken by non-specialists, consultation with other members of the multidisciplinary team is mandatory. Referral to a specialist orthopaedic oncology centre can be helpful in complex cases.

Does orthopaedic surgery relieve pain?

There is evidence that surgery can offer better pain relief than conservative management.

The impact of orthopaedic surgery on quality of life and physical functioning

The literature suggests that functional status and quality of life can be improved by the surgical treatment of bone metastases, although the level of the evidence is low (level III and level IV).

Will patients live long enough to benefit from surgery?

Predicting the likely survival of the patient is integral in decision-making with regard to surgery. Several systems have been described in the literature, but none have been prospectively validated.

Predicting a fracture

The Mirels' system has the advantages of being relatively simple as only clinical evaluation and radiographs are needed. This system is reproducible and valid. It has been more rigorously evaluated than Harrington's system. The disadvantages include the fact that it has not been evaluated prospectively, it overlooks between 9% and 15% of patients with a fracture, has relatively poor specificity (33-35%) in predicting actual fracture, and does not account for numerous potentially important non-mechanical factors.

Studies concluded that although Mirels' system was reproducible, valid and more sensitive than clinical judgement, more specific parameters were needed. While these systems can be helpful, the clinician should consider the patient as a whole when deciding whether surgical fixation is needed.

When is surgery indicated?

The general rule is that recovery time from surgery should not exceed life expectancy, but author opinion differs as to where to draw the line. Life expectancy of less than four weeks, six weeks and three months have all been stated to be major contraindications to surgery. However, it is clear that consideration of the individual patient's circumstances is important.

Complications of surgery

Significant risks are associated with complex surgical interventions in patients with metastatic bone disease. Cumulative complication rates as high as 38% have been reported. Multiple fixations attempted at the same operative session were associated with 50% mortality. The local recurrence rate after surgical excision is as high as 25%.

The risk that the fixation will fail increases with time. There is also a risk of local complications and systemic (thromboembolic, cardiac, pulmonary and cerebrovascular events) and local complications. The role of adjuvant radiotherapy in the postoperative period in preventing failure is uncertain.

Conclusion

Tumour has met bone!

Our aim as orthopaedic surgeons should be to:

- Provide pain relief.
- Preserve function.
- Preserve quality of life.

Research must continue. We should play an active role in research relating to the prevention of bone metastases, strive to alleviate our patients' suffering, and reduce the morbidity and mortality caused by bone metastases.

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