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SPECIAL COMMUNICATION

The practice of physical medicine and rehabilitation in sub-Saharan Africa and Antarctica: A white paper or a black mark?

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Abstract

Introduction. The medical specialty of Physical Medicine and Rehabilitation (PM&R) has had a proven impact on persons with disability and on healthcare systems. Documents such as The White Book on Physical and Rehabilitation Medicine in Europe have been important in defining the scope of practice within various regions. However in some continents the practice has not been well defined.

Objective. To explore the practice of PM&R in sub-Saharan Africa and Antarctica.

Methods. Medline searches, membership data searches, fax survey of medical schools, Internet searches and interviews with experts.

Results. The continents are dissimilar in terms of climate and government. However both Antarctica and sub-Saharan Africa have no PM&R training programs, no professional organisations, no specialty board requirements and no practicing physicians in the field. Since there are no known disabled children in Antarctica and adults are airlifted to world-class health care, the consequences of this deficit are minimal there. However, the 788 000 000 permanent residents of sub-Saharan Africa including approximately 78 million persons with disability are left unserved.

Conclusions. Antarctica is doing fine. Africa is in a crisis. Local medical schools, hospitals doctors, and persons with disability; along with foreign volunteers, aid groups and policymakers can impact the crisis. However government – specifically national ministries of health – is ultimately responsible for the health and well-being of citizens.

Keywords: *Physiatry, rehabilitation, Africa, Antarctica, health care policy, government policy, penguins*

Introduction

The WHO estimates that 1 in 10 persons in the world have a significant disability [1]. There is an extensive literature showing the effectiveness and cost-effectiveness of medical rehabilitation in returning persons with disability to independence and to productive lives [2]. Over the last half century, this literature along with the intuitive observation of those who have been exposed to rehabilitation has led to the rapid growth of the physician specialty which drives the medical rehabilitation process – Physical Medicine and Rehabilitation (PM&R), or Physiatry.

In Europe, the Americas, Asia and Australia, tens of thousands of physician specialists in the field of

Physiatry practice their trade of caring for people with strokes, brain injuries, spinal cord injuries, arthritis, back pain, developmental disabilities and numerous other medical disorders in settings ranging from private offices to large comprehensive medical rehabilitation hospitals. As this valuable ‘field that owns no organ system’ has matured, regional organisations in America, Europe and Asia have codified the specialty and quantified the reach of the field [3–5].

Perhaps the most influential and detailed of these is the *White Book on Physical and Rehabilitation Medicine in Europe* [4,6]. The result of collaboration between three different continent-wide specialty organisations, the White Book was published

simultaneously in two major journals. Its 46 pages document the problem of disability, the relevance of rehabilitation to persons with disability and to society, and the principles of Physical and Rehabilitation Medicine. It defines the specialty as it is practiced in Europe, outlines standards for clinical training and practice and provides a framework for future research in the field. Appendices quantify the number of practitioners and trainees, as well as various aspects of practice. This document has evoked a number of commentaries and contrasts with the field as practiced elsewhere [7–9].

Two continents have notably been absent from this type of documentation – sub-Saharan Africa and Antarctica. Sub-Saharan Africa is a continent of 788 000 000 men, women and children, many living in poverty, torn by war in some places, by infectious diseases in others [10]. Antarctica is populated by approximately 4000 wealthy scientists, most of whom go home for the winter, and a large number of penguins [11]. The International Rehabilitation Forum (IRF, www.rehabforum.org) is an organisation supported by a consortium of major academic Physical Medicine and Rehabilitation departments, with a goal of uniting them to build medical rehabilitation throughout the world. Because no other organisation appears to represent the specialty in these two regions, the IRF set out to provide documentation of the specialty as practiced in these regions.

Methods

A commission was established to seek out the leaders of all African and Antarctic professional specialty societies in Physiatry. Having found none, the IRF determined to include leading physicians practicing the specialty in Africa and Antarctica. Having found none, the IRF then sought out the most expert persons we could find: a Ghanaian general practitioner who had been awarded the Globus Fellowship from the International Society for the Study of the Lumbar Spine to study spine rehabilitation in the United States, an American Physiatrist who has volunteered for many years in East Africa, another American Physiatrist who has consulted on program building with universities and governments in West Africa, and an undergraduate student who was adept at internet searches. To represent Antarctica, we included a physiatrist who had visited the continent as medical director for an ultra-endurance running race.

The team performed a Medline literature search on the terms ‘Physiatry’ or ‘Physical Medicine’ and the various continents, covering the years from 1950 to October 2008 (Table I). The membership list of the International Society for Physical and Rehabilitation Medicine (ISPRM) was searched for members

from African countries. A Boolean search of internet resources including Google, Google Scholar, PubMed articles, National Library of Medicine, CINAHL, Cochrane and Medline Plus for Physical Medicine and Rehabilitation or Physiatry and Africa (including various nations) or Antarctica was performed, and the highest ranked ‘hits’ were traced to determine whether they contained any evidence for the practice of Physiatry on the continents.

No medical schools were found in Antarctica. All sub-Saharan medical schools listed on websites for the Institute for International Medical Education and the IMED online Search (website ref) were sought. These included schools in: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Republic of Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Republic of Congo, Côte d’Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, The Republic of the Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Swaziland, Tanzania, United Republic of Togo, Uganda, Zambia and Zimbabwe.

Websites of these schools, if available, were searched for any evidence of Physical Medicine and Rehabilitation specialists. A survey was sent via fax or email to those schools which posted fax or email addresses.

The commission contacted the West African College of Physicians and the South African College of Physicians asking for information on any Physical Medicine and Rehabilitation specialists in Africa. Throughout the process the Commission asked visitors to Africa, African expatriates, African medical personnel and international leaders in the specialty about the practice of Physical Medicine and Rehabilitation in Africa.

Results

The data was best summarised in Figure 1, which illustrates the number of Physiatrists per 10 million

Table I. Medline search for articles with English titles from 1950 to 2008 that matched the terms ‘Physical Medicine’ or ‘Physiatry’ and various continents.

Americas	2858
Europe	2492
Asia	290
Africa	60
Africa (pertinent)	2
Antarctica	0

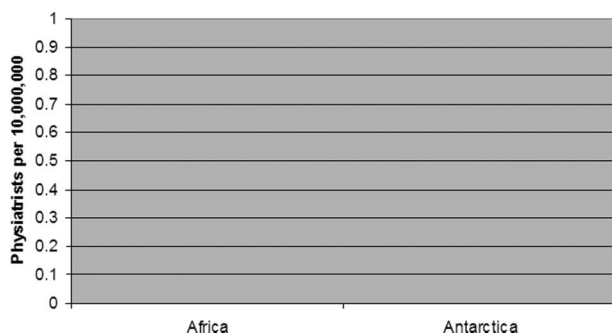


Figure 1. The number of Physiatrists per 10 million people in sub-Saharan Africa and in Antarctica.

persons living in Antarctica and sub-Saharan Africa. Detailed analysis is performed for each continent separately, as noted below.

Antarctica

A Google search of the term 'Antarctica physiatry' found that Brian Krabak, M.D., M.B.A., of the University of Washington, had acted as competition physician for an ultra-endurance running race in Antarctica [12]. Dr. Krabak was invited to join the commission. At the time of this article, he knew of no other physiatric presence on the continent.

Sub-Saharan Africa

The search found no Physiatry specialty organisations or specialty journals in Africa. There are no known training programs in Africa, and requirements for the field are not specified by any African regulatory body. No medical school website was found to have any mention of the specialty. There are no sub-Saharan Africa members of the International Society for Physical and Rehabilitation Medicine. Only two surveys were returned. One respondent suggested that there was a group of physicians somewhere in South Africa who may or may not have had formal training in the field. Contact with the South African Medical Association revealed that there were indeed six physicians in the country who specialised in Physical Medicine and Rehabilitation [13]. After extensive discussion with colleagues and numerous trips to the region, the West and East African consulting physicians were quite confident that there were no Physiatrists in those regions.

The Medline search from 1950 to October 2008 found 16 132 articles on 'Physiatry' or 'Physical Medicine'. For 'Africa below the Sahara' there were 135 373 citations. Combining these, only 60 joint citations were found. A detailed analysis of these 60 showed that almost all related to allied health

professionals were irrelevant. None could be traced to a practicing African Physiatrist. Aside from recent publications by the IRF, only two articles addressing the specialty in Africa were found. Both were written half a century ago by the same author [14,15].

Discussion

The research results suggest that the odds of an African with a disability meeting a physician who specialises in care for him or her are essentially zero. The tragedy and absurdity of this finding is not communicated well through simple statistics. Therefore, the absurd comparison with Antarctica is made clear in this study and illustrated graphically in Figure 2. Although the comparison may seem absurd, the research in preparing this work has been quite serious. The implications are both deadly to Africans and devastating to African economies.

The investigation has strengths and weaknesses. The thousands of articles relating to Physiatry on other continents were not searched in detail for relevance or for authorship by native Physiatrists. However they are clearly evident of an active and vibrant field everywhere in the world. Web searches used in this article typically turned up thousands of 'hits', most of which are completely irrelevant. Because of the volumes, we were not able to exhaustively prove that no web citation on Physiatry in sub-Saharan Africa exists. The response rate to the faxed survey was abysmally low. Whether that is because faxes were misdirected, arrived at offices that had no authority or because authorities did not choose to respond, the survey results may be challenged. However the search for individuals or organisations in Africa was fairly robust. The authors have met with African government and health leaders on a number of occasions; posed the question at numerous international specialty meetings, and earnestly sought information from leaders in the field. In the end, it is our honest belief that, aside from the handful of specialists in South Africa who are not members of the international society, there are no Physical Medicine and Rehabilitation doctors residing in sub-Saharan Africa.

Currently, there are over 10 280 specialists in PRM in Europe, over 7000 in the United States, and perhaps 10 000 in China. Self-evident in these numbers, but supported by a strong scientific literature, we know that multidisciplinary, physician led rehabilitation are both effective and cost-effective in returning people with disability to the community. Currently, 80% of the world's disabled population lives in low-income countries such as those of sub-Saharan Africa. The World Health Organisation (WHO) reports rehabilitative services-even basic



Figure 2. Above: *Spheniscus demersus* or blackfooted penguin in Antarctica. Below: *Homo sapiens*, or humans in Africa. Both groups have a statistically similar chance of interacting with a Psychiatrist. Note that the penguins all have legs. (Penguin photo courtesy of Katie M. Dugger, Ph.D., Oregon State University).

physical therapy—reach only 1–2% of persons with disability [16]. It is fruitful to explore potential reasons for this mismatch in Africa.

Some would say that there is no Psychiatry because Africa is a desperate place. Essentially, with people dying every day, the continent cannot afford to improve the quality of life of the living. It is a poor place, but not exclusively so. In South Africa last year 32 144 people purchased new Mercedes passenger vehicles [17]. In America there is 1 Psychiatrist for every 30 000 urban dwellers – some of whom we understand do not own a Mercedes Benz [3]. There are enough rich and middle-income Africans to support Psychiatry. However when an African Mercedes collides with an African Volkswagen or Ford or cow, no amount of money will bring a Psychiatrist to consult in the intensive care unit. The fallacy in the theory of Africa as a constant crisis is not just about the rich affording the luxury of rehabilitation. African society and the African economy depend on a positive ratio of consumption *vs.* contribution. Everywhere one looks in Africa there are people living with disability. They live, so they consume. They are untreated, so they and their families contribute less than they could to the economy. The WHO's estimate of 10% major disability means this is a very big drag on the African economy. Rehabilitation is a good social investment, even in poorer regions. Countries need to invest.

Global policies to date are a failure, some would say. What policy? The World Health Organisation

and many others have promoted a strategy of Community Based Rehabilitation (CBR) [18] in which people with disabilities and their families are taught to care for themselves. At face value this sounds quite empowering and democratic. The process is supported strongly by many disabled persons' organisations. It may have some value in social reintegration of persons with disability. But it has clearly failed in Africa. Why? Because the initial phase of rehabilitation is intensely medical; the nursing acuity of modern rehabilitation hospitals is often compared with that of an intensive care unit. People in Africa who survive their initial injury languish until they die or face complex and irreversible complications ranging from contractures to pressure sores to spasticity to hopelessness. They go home to families who are not trained about their care and their prognosis. In the rest of the world they go to medical rehabilitation wards run by psychiatrists.

Relegating the medical part of rehabilitation to the community is akin to developing a Community Based Neurosurgery program. Worse. Because in Africa the people with disability are the least educated, most impoverished and most ostracised members of the community. CBR is a politically expedient way to allocate the least amount of funds possible to the problem. After all, uneducated villagers do try to take control over their lives. They are cheaper than doctors, and they don't have the depth of medical knowledge to know what they're

missing. With no experts who understand the medical aspects of rehabilitation to advise or to advocate, and with WHO blessings, governments often give complete responsibility for rehabilitation to ministries of social welfare, education, employment or agriculture. CBR is insufficient. The WHO and other policymakers need to recognise that, in every country with reasonable rehabilitation services, the medical programs are led by physicians who dedicate their careers to this cause.

The local health care systems have some responsibility. With no *Physiatrist* role models on the entire continent, medical school deans, department chairs, practicing physicians and hospital administrators have no idea of what is missing. They look to Orthopedic Surgeons (typically very busy in the operating room and with little formal training in rehabilitation) and others to perform the services. They often view Physical Medicine as equivalent to Physical Therapy, perhaps with a nod to Orthotics and Prosthetics. Yet the literature on rehabilitation is clear – disability is multifactorial. A multidisciplinary team led by a physician expert always outperforms individual therapists. In fact, patient outcomes directly relate to the quality of team interaction [19]. Programs on all other continents (except Antarctica) succeed because of *Physiatrist* coordination of teams including Occupational and Physical Therapists, Speech–Language Pathologists, Rehabilitation Nurses, Rehabilitation Psychologists, Rehabilitation Social Workers, Vocational Rehabilitation counsellors, Rehabilitation Engineers and others. The medical expertise, leadership and specific skills of *Physiatrists* as documents such as the European White Book portray them are simply not understood. Local health care systems must build rehabilitation programs that look like the programs elsewhere in the world.

Deans of medical schools and the leadership of regional Colleges of Physicians might get the process started. The need for expert physicians is compelling. But aside from the absence of specialty training programs in *Physiatry*, other serious questions reflect the unmet educational need across the medical education system. Does an African medical student realise that the baby with cerebral palsy might be smarter than he or she is? Does the African general practitioner know how to manage contracture, autonomic hyperreflexia, neurogenic bladder and decubitus ulcers with physical means? Which medical school professor can tell the government of the functional impairment and societal cost of AIDS survival? Which of their hospital quality initiatives looks beyond the date of discharge to employment, social integration and even sex? Leadership in these areas will not occur until these entities name Chairs in *Physiatry*, develop programs for trainees, and hire *Physiatrist* medical directors.

African communities frequently rely on help from outside of Africa. Foreign governments typically provide exactly the aid that the African politicians request, rather than the aid that they need. So, for instance, the United States Agency for International Development spends billions of dollars to support Africa, but, aside from the small Leahy War Victims Fund, has almost no investment in rehabilitation. Major non-governmental organisations are often more focused on acute disasters than the large chronic disaster of living with a disability. Doctors without Borders, the Red Cross/Red Crescent, and others have no *Physiatric* representation among their leadership. As a result they are mostly not prepared for the medical acuity of disability management after crises. Their missions and their operational policies mean that they have less invested in the long term goal of saving function once lives have been saved. Still, numerous small and large private aid groups know the value of rehabilitation, and strive to build sustainable rehabilitation programs in Africa. Free wheelchairs make great photo-opportunities, but this kind of equipment supply without rehabilitation will never be sufficient and is not a locally sustainable intervention. Caring and thoughtful non-governmental organisations should look at policies that grow locally trained expert physicians and allied health professionals who will make a living doing rehabilitation and teach others to do the same.

In our investigation, we ran across dozens of *Physiatrists* who volunteer their time – and then go home. They know that rehabilitation is longitudinal, multidisciplinary and exceedingly culturally dependent. They would readily admit that they are no substitute for locally trained permanently employed specialists. They often petition their home country professional organisations for help, without much luck. Understandably national and regional organisations exist to serve their members. But small investments in international development can rally the membership around a cause greater than their day-to-day practice. Students are drawn to a field where there is a great need and a great compassion. It may be easier to define the scope of practice in the home country by showing how the specialists build programs elsewhere. We would argue that non-African professional organisations in *Physiatry* have self-serving reasons to reach out to developing countries.

In the final analysis, the responsibility lies with the Africans. Governments are responsible for the well-being of their people. As much as they care and as much as they may advocate, neither the people with disability, nor the specialty outside of Africa, nor the agencies that provide external funding are responsible. Although organisations like the universities

who have come together under the International Rehabilitation Forum can bring together the expertise, the responsibility rests squarely on the shoulders of each country's governing bodies. Ministries of health are charged with execution of health policy. Under the Ministries, colleges of physicians are responsible for deciding on specialty training programs. Under the Ministries, medical schools are responsible for training the physicians who will care for their country. These organisations must bear ultimate responsibility for failure or success, and the Ministries of Health must lead them responsibly.

Ministries are government, and governing bodies run on political power. Where does the political power come from? One curious observation about disability in Africa is that it does not spare the rich or the powerful or the intelligent members of society who can make changes happen. It is statistically likely that every parliament, every industry consortium and every medical school in Africa has members who secretly identify themselves or a close family member as disabled. However, the stigma against persons with disability is so strong in many African cultures that disability is often hidden from view. The situation is reminiscent of American president Roosevelt who, in the 1940s, hid his polio from a society which readily pretended that it was not there [20]. Half a century later in America, television advertisers find that healthy wheelchair users draw positive attention to their message. This hidden power is a critical force for change, but must be unleashed by pride, shame or commitment to do what is right.

In summary, as Figure 2 demonstrates, the chances that a disabled child in Africa receives the quality of care that children all over the rest of the world receive are similar to the chances that an Antarctic penguin is fed a mackerel by a Physiatrist. The difference, however, is important: African governments are elected by the child's family and friends.

Acknowledgements

There are no appropriate African rehabilitation journals. Therefore this White Paper/Black Mark is published simultaneously in prestigious journals that represent the best in rehabilitation as it exists on all of the continents except Africa. The International Rehabilitation Forum wishes to thank the editors of these journals for their courage to represent this unrepresented region of the world. The White Paper/Black Mark reaffirms their commitment to the core mission of academic publication: To better human health by presenting and debating the facts.

To ensure broad outreach to multidisciplinary audiences, this 'Special Communication' is being published in *Disability and Rehabilitation*, *Europa Medicophysica*, *Journal of Rehabilitation Medicine*, *PM&R*, and the *Chinese Journal of Physical Medicine* simultaneously. The copyright of this article remains with the International Rehabilitation Forum.

References

1. World Health Organization, Disability and Rehabilitation Team (DAR). <http://www.who.int/ncd/disability/index.htm>, accessed November 8, 2008.
2. Cardenas DD, Haselkorn JK, McElligott JM, Gnatz SM. A bibliography of cost-effectiveness practices in physical medicine and rehabilitation: AAPM&R white paper. *Arch Phys Med Rehabil* 2001;82:711-719.
3. American Academy of Physical Medicine and Rehabilitation: Review and update of the 1995 Physical Medicine and Rehabilitation Workforce Study. www.aapmr.org/hpl/studyc.htm, accessed January 26, 2008.
4. Section of Physical and Rehabilitation Medicine Union Europeenne des Medecins Specialistes (UEMS), European Board of Physical and Rehabilitation Medicine, Academie Europeenne de Medecine de Readaptation, European Society for Physical and Rehabilitation Medicine. White Book on Physical and Rehabilitation Medicine in Europe. *Eur Medico Phys* 2006;42:292-332.
5. Chino N, Ishigami S, Akai M, Liu M, Okajima Y, Koike J, Kobayashi K. Current status of rehabilitation medicine in Asia: a report from New Millennium Asian Symposium on Rehabilitation Medicine. *J Rehabil Med* 2002;34:1-4.
6. Anonymous. White Book on Physical and Rehabilitation Medicine in Europe. *J Rehabil Med* 2007;(45 Suppl): 6-47.
7. Haig AJ. Practice of physical medicine and rehabilitation on both sides of the Atlantic: differences and the factors that drive them. *Eur J Phys Rehabil Med* 2008;44:111-115.
8. Melvin JL. Physical and rehabilitation medicine: comments related to the White Book on Physical and Rehabilitation Medicine in Europe. *Eur J Phys Rehabil Med* 2008;44:117-119.
9. Negrini S, Ceravolo MG. The White Book on Physical and Rehabilitation Medicine in Europe: a contribution to the growth of our specialty with no boundaries. *Am J Phys Med Rehabil* 2008;87:601-606.
10. Population Reference Bureau. subSaharan Africa population: www.prb.org. Accessed October 27, 2008.
11. Index Mundi: Antarctica Population: <http://www.indexmundi.com/antarctica/population.html>, accessed October 15, 2008.
12. University of Washington Orthopedics and Sports Medicine: Brian Krabek, M.D., MBA. http://www.orthop.washington.edu/uw/tabID_3374/ItemID_85/mid_10331/Default.aspx, accessed October 15, 2008.
13. Myburgh, Marilyn, Head Operations/Database, South African Medical Association. email communication November 6, 2008.
14. Lomey AL. Physical medicine and rehabilitation: new aims in treatment. *S Afr Med J (Suid-Afrikaanse Tydskrif Vir Geneeskunde)* 1965;39:996-998.
15. Lomey AL. Physical medicine and rehabilitation: its scopes and problems. *S Afr Med J (Suid-Afrikaanse Tydskrif Vir Geneeskunde)* 1954;28:711-714.
16. Frye B. Review of the World Health Organization's report on disability prevention and rehabilitation. *Rehabil Nurs* 1993;18:43-44.

17. Mercedes-Benz Corporation: Mercedes-Benz South Africa Group in South Africa Bucks the Trend. Press release 27 March 2008. <http://www.autoworld.co.za/NewsArticle.aspx?Article=5697>, accessed November 1, 2008.
18. International Labor Organization, United Nations Educational, Cultural, and Scientific Organization, and World Health Organization. CBR: A Strategy for Rehabilitation, Equalization of Opportunities, Poverty Reduction and Social Inclusion of People with Disabilities. Joint Position Paper 2004. Accessed at: <http://www.who.int/disabilities/publications/cbr/en/index.html>, November 2, 2008.
19. Strasser DC, Falconer JA, Herrin JS, Bowen SE, Stevens AB, Uomoto J. Team functioning and patient outcomes in stroke rehabilitation. *Arch Phys Med Rehabil* 2005;86:403–409.
20. National Park Service: Franklin Delano Roosevelt Memorial: The Struggle with Disability. <http://www.nps.gov/fdrm/fdr/struggle.htm>, accessed November 8, 2008.