



EDITOR'S NOTE

Remembering 25 Years of Collegium — and moving forward!

This issue of the *Journal of Collegium Aesculapium* represents a significant milestone in the progress of our great organization. The first meeting of Collegium was held 25 years ago in October 1981 with Robert H. Hales, M.D., Roger L. Hiatt, M.D., Larry Noble, M.D., and Bruce H. Woolley, Pharm.D. in attendance. From that humble beginning has come the organization of today with hundreds of health professionals organized to support and participate in educational, service, and humanitarian efforts furthering the ideals and objectives of Collegium.

The first issue of the *Journal* was published in 1983 and set the pattern for the many issues that have followed. In that inaugural issue, Collegium's founding president wrote:

“The Collegium is for all LDS physicians [and health professionals] who wish to associate with others of similar beliefs. For those facing the difficult ethical responsibilities of life and death, research, and counseling, the organization provides a chance to share and exchange ideas. Many LDS [health professionals] have an ability to see the whole person in terms of the emotional and spiritual as well as the physical. It is through this gospel perspective that they are in a unique position to give support to each other, to promote education, and to serve the Church and the world. They desire to put the teachings of the gospel into their daily lives.”

As Collegium begins its second 25 years, it is significant to note that the same ideas and values of the founders remain in place today.

This issue of the *Journal* contains thoughts and wisdom gleaned from experiences in missionary service and professional practice. “Teach One Another” by Val Hemming and James Parkin provides experiences, observations, and insights into the role of LDS physicians in academic medicine.

Clinical information in this issue has been provided by Dr. Clifford Harman who relates his experiences in South Africa concerning HIV/AIDS among indigenous members of the Church and the general population. Dr. Joseph Jarvis shares his observations of the role of health care in a society and outlines his thoughts on how to improve it. Dr. Dean Belnap writes about the biological basis for Attention Deficit/Hyperactive Disorder and describes some emerging forms of management. Scott Woolley provides a connection between the role of hospice chaplains in conjunction with physicians and the strengthening of faith during the dying process.

Over the years, many have wondered what the LDS Church Missionary Medical Advisory Committee is and where it originated. Dr. Quinton S. Harris, the first Chair of the committee, tells us of the history and progress of the committee during its first 18 years.

This exceptional issue concludes with a discussion of how Greek intellect was a source for modern medical discovery and progress. Dr. Doty concludes by relating the importance of the source of all truth and knowledge—our Lord, Jesus Christ.

We hope you'll enjoy this meaningful issue and that you'll help us build Collegium for the next 25 years.

Bruce H. Woolley, Pharm.D.

EXECUTIVE DIRECTOR AND PUBLISHER

About Collegium Aesculapium

In a troubled world, physicians and healthcare professionals who are members of the Church of Jesus Christ of Latter-day Saints have the benefit of spiritual insights as well as the art and science of medicine.

Collegium Aesculapium addresses the ethical and spiritual as well as the physical aspects of medicine. Thus, we invite qualified professionals to embrace the Collegium and take advantage of insightful meetings and seminars, newsletters, service opportunities, and the *Journal of Collegium Aesculapium*, all of which include this important expanded dimension, as well as the constantly changing body of scientific information available to us.

For more information, see <http://www.collegiumaesculapium.org>.

How to join Collegium Aesculapium

Collegium Aesculapium encourages physicians, podiatrists, and doctors of pharmacy to become active Members of the organization (\$200 per year). Special rates are available for retired health professionals (\$100) and professionals in their first two years of practice (\$50). Nurses, physical therapists, pharmacists and others interested in Collegium are invited to join as Associate Members (\$100 per year). Residents (\$35) as well as medical students and upper-class premedical students (\$10) are also invited join the Collegium.

To join, send name, address, and membership fees to:

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Manuscript submissions should be emailed to: bruce@collegiumaesculapium.org

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Teach One Another:

Latter-day Saint Physicians and Academic Medicine



Val G. Hemming, M.D.
James L. Parkin, M.D., M.S.

In 1832, members of The Church
of Jesus Christ of Latter-day Saints were commanded:

...that you shall teach one another the doctrine of the kingdom. Teach ye diligently and my grace shall attend you, that you may be instructed more perfectly in theory, in principle, in doctrine, in the law of the gospel, in all things that pertain unto the kingdom of God, that are expedient for you to understand; Of things both in heaven and in the earth, and under the earth; things which have been, things which are, things which must shortly come to pass; [...] That ye may be prepared in all things when I shall send you again to magnify the calling whereunto I have called you.¹

The mandate to teach one another, and the evolution of Latter-day Saint congregational worship, made teachers of nearly every man and woman in the Church. The responsibility to teach is amplified by the calling of most young men and many young women to venture into the world as missionary teachers. Missionary service provides young Latter-day Saints with abundant teaching opportunities, responsibilities for leadership and unique experiences as mentors. Many faithful LDS men and women entering medical school, or those presently practicing medicine, have served missions. One might imagine that these teaching experiences would motivate many LDS medical students, and physicians in training, to seek professional careers that would permit them to continue or expand their roles as teachers. Few professions provide more opportunities for teaching and service than do medicine and surgery.

It seems that the idealism of the gospel and personal experiences in Church service would promote altruism and might motivate young women and men to seek careers in the healing professions. Many LDS medical students and physicians must share Dr. Cecil O. Samuelson's sentiments expressed during a recent address to the Collegium:

I am, and have always been grateful for the privilege of being a physician. Likewise, I have never had second thoughts about my choice of profession and discipline. I still believe what I think I told those who interviewed me for medical school admission. I said that the practice of medicine is attractive to me because it uniquely melds the opportunity to be involved in real scientific inquiry with the privilege of providing practical and necessary service to those in need. What could be better?²

Their backgrounds of missionary and church service, their quest for truth, coupled with the altruism of the gospel, suggest that LDS physicians should be well represented in the medical, surgical and research faculties of teaching hospitals and medical schools—in other words, in academic medicine. However, the authors of this essay

have observed, following lengthy careers in academic medicine, that LDS physicians are not proportionately represented on the full time faculties of American medical schools, research institutions, and teaching hospitals. Why might this be so? This essay describes the authors' own careers in academic medicine and speculates on the paucity of LDS physician scholars.

Over a century ago Walter Reed, M.D., on New Year's Eve, Dec. 31, 1900, penned a touching letter to his wife. Reed's Yellow Fever Commission had recently made a momentous discovery on the transmission of yellow fever between humans and mosquitoes. He wrote:

Only ten minutes of the old century remain. Here I have been sitting reading that most wonderful book, "La Roche on Yellow Fever" written in 1853. Forty-seven years later it has been permitted to me and my assistants to lift the impenetrable veil that has surrounded the causation of this most wonderful dreadful pest of humanity and to put it on a rational and scientific basis. I thank God that this has been accomplished during the latter days of the old century. May its cure be wrought out in the early days of the new. The prayer that has been mine for twenty years, that I might be permitted in way or at some time to do something to alleviate human suffering, has been granted.³

[Dr. Hemming]

My aspirations when I chose medicine as a career were similar to those of Reed. Throughout childhood and adolescence, I dreamed that a career in medicine would bring opportunities to serve, help others in need and somehow make a difference in the world. I don't know what triggered these strong altruistic feelings. Perhaps I was motivated by the death of a childhood acquaintance and a fanciful notion that had I been a physician I could have saved his life. A faith in the power of science was a powerful presence in my mind as I planned my courses in high school and college which would prepare me to attend medical school. No other member of my large extended family was a physician.

I was decidedly naïve about medicine when I entered medical school in 1962. I had assumed the existence of far greater medical knowledge than existed. As my education and training progressed, I was often surprised at how much and yet how little was known about cellular biology, genetics, and the physiological/pathological basis for human health and disease.

While in medical school, I worked in the laboratory for a biochemist and later for a pediatric neurologist. The work was challenging and sometimes exciting. At least twice my experiments yielded results that gave me the heady feeling that I knew something entirely new and important. These brief moments of epiphany were powerful motivators to

seek other opportunities to search out new knowledge. While in medical school I was even permitted to present a paper at a national pediatric research conference.

At medical school graduation, my introspection yielded a distressing feeling that I knew very little medicine and had acquired few medical skills in the preceding four years. My medical school mentors, including Patrick Bray, Eugene Lahey and Frank Tyler, reminded me that my feelings of inadequacy were integral to a successful quest for further medical education and training. I understood that I had far to go before I could fulfill my altruistic ambitions.

With guidance from others, I published my first papers while still a pediatric resident in Texas. I found patient care far more interesting if we prepared protocols and gathered clinical data that could assist in answering clinical questions regarding care for our patients. I was convinced that our research permitted better care for our patients. Upon completion of residency I entered a group pediatric practice. In this setting, I found it imperative to meet with my colleagues on a regular basis to discuss and to collectively learn from our patients. When we couldn't find answers, we commonly prepared protocols that permitted us to enroll patients in clinical studies designed to help answer some of our questions. Four years later, I entered a fellowship program that expanded my knowledge and opportunities. This training and experience provided opportunities to serve as a consultant and become a better teacher. My later work permitted me to direct a pediatric residency program, become a university department chairperson and later to serve as dean of a medical school.⁴

Throughout my more than 40 year medical career as a student, resident physician, fellow, medical school-based clinician and investigator, and medical school administrator, I expected that I would meet and have the opportunity to be taught by or work with other LDS academic physicians, surgeons and scientists. During these years, I taught dozens of active LDS medical students, residents and fellows. Yet, over the same years I worked with only about half a dozen LDS academic physicians and scientists.

[Dr. Parkin]

Recently, I had a conversation with a colleague who is a retired academic physician. He asked whether I would recommend an academic career to young LDS physicians. He said he would be reluctant to do so, stating there were more problems now in academic medicine and it was more difficult to be successful as a teacher, researcher and clinician. I was surprised by his conclusions. I asked him what professions have no problems. This interaction caused me to reflect on my academic career. Because of

the many satisfactions I received, I would have no reluctance in encouraging young LDS physicians to seriously consider academic medicine.

When I returned from the military in 1958 and entered the university, like many others with an interest in mathematics and science, I was influenced toward engineering; that was my initial educational pursuit. I then considered my desire to have more personal interactions with people. This desire was validated during my missionary service, and so the switch to pre-med was made. I was fortunate to receive early admission to medical school.

My financial situation required me to work several simultaneous part-time jobs to pay my expenses during medical school. One of those jobs was a summer research position in the department of pathology with Dr. M. Chiga where I conducted individual research, published a paper and presented it at a national meeting and was awarded a national prize for student research. I enjoyed those experiences. I was mentored by other faculty including Dr. Maxwell M. Wintrobe, who inspired in me an interest in academic medicine.

After a straight medicine internship at the University of Washington, I decided a surgical career was a better fit for me. I applied for and received a national Public Health Services fellowship; during that year I earned a Master's degree in physiology and biophysics, participated in basic science research and had opportunities to present at national meetings and was awarded a national award for best resident research that year. Again, I discovered I enjoyed the process of hypothesis-based research and the interaction with colleagues at the university and at the meetings I attended. I chose to give academics a try after my residency and fellowship.

Financially, the early years in academic medicine were less rewarding than private practice, but the income was sufficient for a good quality of life. The joys of interactions with patients and colleagues are present in both private and academic medical practice. There are additional opportunities for satisfaction in academics provided by teaching and interacting with bright students and house officers. These students and housestaff were reading the literature and asked questions which stimulated thinking and better patient care.

The opportunity to explore the frontiers of knowledge and push that frontier along is fulfilling. For example, it has been rewarding to see that due to advances in diagnostic and therapeutic technologies, acoustic neuromas can be diagnosed when they are small—making total resection possible with less morbidity. Instead of lengthy surgical procedures for large acoustic neuroma removal followed by serious morbidity, lengthy rehabilitation and lifelong compromised neurological function, early resection of small tumors is accomplished with much shorter hospital

stays and reduced long-term morbidity.

It is difficult to perform independent research while maintaining active clinical and teaching loads, but by partnering with basic scientists and other professionals, meaningful research participation occurs. Research activity also provides opportunities to attend scientific meetings and enjoy relationships with other investigators in this country and other countries; in such relationships, one can share and discuss ideas which stimulate and enrich the mind. Periodically, the researcher has the opportunity to see research application result in life-changing results. My research was mainly in the development and utilization of cochlear implants for the profoundly deaf. I recall one of our earliest implant patients explaining to me in the clinic the emotions of being able to hear and understand the voices of his children for the first time as he had lost his hearing before they were born. It was a moving experience for us both. Recently I talked to him (a deaf man) on a normal telephone, and he talked about how being able to hear for the past twenty-five years changed his life. It was a wonderful reward for research.

Careers in academic medicine also result in receipt of many administrative responsibilities. But, these responsibilities come also to private practitioners in their clinics, HMOs, hospital staffs, professional organizations and communities. Administrative chores were not my favorite part of academic practice. However, I felt that my Church administrative experiences helped school me in compassionate ways to accomplish these opportunities.

Would I advise a young LDS colleague to pursue a career in academic medicine? Indeed, I would. If work is toil with discomfort as opposed to enjoying what you do everyday, and if every day you enjoy what you do, as I did, then you really do not have to work for a living. My academic career was not without problems and challenges, but the rewards more than compensated. Were I to do it again, I would choose academics.

All physicians of today stand on the shoulders of researchers and teachers of the past. American scientific medicine has been in continuous transition for the past 150 years. Enormous progress was made by 19th-century European physicians and scientists who pioneered "cellular pathology," surgical anatomy and physiology, and the new bacteriology.⁵ In the last quarter of the Nineteenth Century, many American medical students and graduate physicians attended European medical schools and clinics to acquire the knowledge and tools to bring "modern" medicine to the United States.

Typical of that time is the story of William Henry Welch (1850-1934). After graduating from Columbia University College of Medicine, Welch was trained as a research pathologist in Germany before returning to the U.S. He was to become the founding dean of

Johns Hopkins School of Medicine in 1893. Welch was recruited to Hopkins by John Shaw Billings (1838-1913), America's foremost 19th-century hospital architect and medical bibliographer. Welch and his Hopkins colleagues developed a curriculum for medical students and an educational model for training physicians that was to become a medical education model for the entire world.⁶



In contrast to medicine practiced in Baltimore, Philadelphia or New York, health care in the Great Basin, the home of Mormonism during the waning years of the 19th century, was a backwater. Pioneer Mormon leaders such as Brigham Young, Heber Kimball and Wilford Woodruff were cynical of allopathic physicians. They preached faith, common sense, provident living and priesthood blessings in opposition to the commonly prescribed medical treatments of the period.⁷ Most of the allopathic physicians who migrated to the Utah territory during this time were gentiles. Few of these physicians had been trained in the "academic" medical schools in the eastern United States. The attitudes of those Brethren toward modern or "heroic" medicine and allopathic physicians appear to have persisted in rural Mormon communities through much of the 20th century.⁸

In 1904, the University of Utah (U of U) greatly expanded its department of biology to provide courses to prepare students to study medicine.⁹ On April 3, 1906, a proposal to start a two-year medical course was

presented to the Board of Regents and was approved soon after. The Board's motion directed: "That a Medical Department be organized with Dr. Ralph V. Chamberlin as Dean."^{9(p258)} For the next 37 years, at which point the College of Medicine was expanded to four years, 548 students completed the two-year program. Most transferred and completed their medical training at four-year institutions.^{9(p261)} The physician models and teachers for these two-year students were largely volunteer physicians and surgeons in practice in Salt Lake City.

In 1942, with WWII underway and Utah and the United States experiencing serious shortages of physicians, U of U President LeRoy E. Cowles appointed a committee comprised of four members of the university's Board of Regents, including two physicians (Louis E. Viko and A. Hamer Reiser), to prepare plans for expansion of the medical school to four years.¹⁰ As planning proceeded, Dr. Cyril Callister, a Harvard-trained surgeon practicing in Salt Lake City, was named part-time Dean for the expanded medical program and received a mandate to begin recruiting the full-time basic science and clinical faculty required for a four-year program. It was necessary for Dean Callister and President Cowles to recruit outside Utah to find the high-quality faculty desired to staff the expanded School of Medicine. They first recruited Dr. Louis Gebhardt, a well-known microbiologist at Stanford University, and Maxwell M. Wintrobe, an eminent internist and hematologist from Johns Hopkins University. Soon, other distinguished faculty members were added—including Philip B. Price in surgery, Louis Goodman in pharmacology, Leo T. Samuels in biochemistry and John A. Anderson in pediatrics. By the end of the war, this small but distinguished faculty was graduating a new class of physicians every nine months. Few of the new members of the full-time faculty of the expanded medical school were LDS. Yet, the majority of students enrolled in the expanded school came from Utah, and most were probably members of the Church. While it is not known how many early graduates of the U of U College of Medicine chose careers in research and teaching, it is likely that most chose instead to enter clinical practice.

The authors, both of whom graduated from the U of U College of Medicine in 1966, entered graduate medical education at a time when the US government was funding expansions of medical school student bodies, new hospitals and medical research laboratories and new medical schools. The promise of biomedical research offered solutions to America's serious problems in mental health, infectious diseases, cancer and heart disease. Full-time medical school faculties virtually exploded in these years. US academic medical centers offered abundant training opportunities for aspiring young academic physicians. Though the Viet Nam War was underway, the Selective Service System

assisted. Many promising medical school graduates were permitted to serve their obligated two years of uniformed service in Public Health System (PHS) billets, instead of in the Army, Navy or Air Force. They were assigned to conduct research at the National Institutes of Health, in regional public health laboratories as Epidemiologic Intelligence Service officers, or at the Centers for Disease Control. These PHS physicians completed specialty



training after their public service, and many proceeded to distinguished careers in academic medicine and surgery. The numbers of graduating LDS physicians who availed themselves of these opportunities is unknown. It appears that only a few chose this route for their careers.

Medical students are biased in their career choices by the missions of the medical schools they attend. State governments fund state medical schools, expecting their graduates to remain or return to the state's communities to provide health services. The U of U's mission has also focused on training practitioners for the Intermountain

West. Over many years, the U of U has selected a majority of its medical students from premedicine students from Utah colleges and universities. Currently, the legislature of the state of Utah mandates that 75 of the entering medical school class be residents of the state of Utah, own property in the state or have strong family ties to Utah. In addition, Utah has a contract with the state of Idaho to accept 8 native Idaho students as that state has no medical school. The 2005-entering class is typical.¹¹ One hundred two students may matriculate in the class of 2009. Eighty-three of the students are from Utah or Idaho. Seventy-five of them had completed their premedicine courses in Utah or Idaho schools. We have no information on the numbers of Utah students who attend medical school outside Utah. Their numbers most likely exceed those that attend the U of U School of Medicine.

Brigham Young University (BYU) has for the past 30 years had a large and successful pre-medicine program. Until recently, the program was directed by Dr. Donald Bloxham, who was recruited to BYU to direct this program in 1976. Dr. Bloxham provided the following enlightening information about the BYU program.

Each year, over each of the past more than 20 years, several hundred entering BYU freshmen express an interest in attending medical school. But, only about a third of these students ultimately will apply to medical school. Since 1993, between 250 and 349 BYU students applied each year to allopathic medical schools. Between 50-60 percent of BYU medical school applicants enter medical school each year. That means over 13 years, about 2000 BYU graduates entered and/or graduated from medical schools throughout the United States. Consistently, since 1993, about 20-30 percent of students matriculating at the U of U College of Medicine were BYU graduates. In addition to the U of U, the most frequent other schools attended by BYU graduates were the Uniformed Services University of the Health Sciences, St. Louis University, George Washington University, and the University of Wisconsin. According to Dr. Bloxham, only a small minority of BYU students applied to the prestigious private and highly academic medical schools such as Harvard, Johns Hopkins, Duke, Yale, Stanford, Emory, Columbia, etc. He estimated that only about half a dozen BYU alumni matriculate at these schools each year. In recent years, also about 5 to 10 BYU students each year entered M.D., Ph.D. programs. Many of these students would be expected to seek academic careers.¹²

The BYU, U of U, and U of U College of Medicine connections probably represent a large proportion of North American LDS students who became physicians in the twentieth century. But as the Church has grown, there are large LDS populations residing in urban areas throughout the United States and Canada. Growth of

Church membership has made it ever more difficult for many LDS students to attend Church-supported schools. Hence, presently thousands of LDS students attend other colleges and universities. It is not possible to determine the numbers of LDS premedicine students in these schools nor to know how many of these students are enrolled in and graduate from the more than 140 allopathic medical schools in the U.S. and Canada. One of the authors was Dean of the F. Edward Hébert School of Medicine (USUHS) from 1995 to 2002.¹³ During these years USUHS, the Department of Defense-owned medical school, regularly matriculated a dozen or more LDS students each year¹⁴ from Utah colleges and universities.¹⁵ Also admitted were LDS students from the three military academies, from the University of California System, and from Universities in Arizona, Oregon, Montana, Wyoming, Washington and Hawaii.¹⁶ Of course, it is not known how many LDS physicians are in practice in countries outside the United States that have large LDS populations (such as Mexico, Chile, Brazil, Philippines or the countries of Europe). The Collegium currently provides scholarships for five LDS medical students in Guatemala. All five are women.

It is evident that substantial numbers of LDS students are attending North American medical schools and that over the past 30 years hundreds of LDS physicians have graduated and proceeded to graduate training. It is not possible to know how many of these physicians choose careers in academic medicine. Neither can it be known how many intended to practice or do research in an academic setting, only to change their minds or, in mid-career, turn to full-time private or group practice.

To better understand how some LDS medical students and physicians have considered these issues and made their career decisions, the authors prepared and circulated four brief questionnaires: (1) a survey for a group of third- and fourth-year, self-identified LDS students attending the U of U College of Medicine in 2006; (2) a survey for LDS physicians who chose not to pursue careers in academic medicine; (3) a survey for LDS physicians who started a career in academic medicine, but later returned to private practice; and (4) a survey for physicians—representing a range of medical and surgical specialties—who are presently full-time academic physicians and scientists. Respondent numbers, representing these four groups, were small—making it not possible to validate the surveys or to statistically analyze the results.

Medical Students

Thirty U of U College of Medicine students (Classes of 2006 and 2007) responded to our questionnaire. Survey data show that 11 of the 30 students are considering academic careers. The specialty choices for the 11 students represent 8 medical and surgical specialties. Of the thirty

students, 21 served missions. Four of the 11 students had a physician family member engaged in academic medicine. Common reasons given for selecting academic careers included: interest in teaching and research, stimulating environment, the influence of medical school mentors, the influence of family members in academic medicine, and the ability to remain professionally current. Disadvantages to academic practice included pressure to publish, academic politics and less ability to choose practice partners. Surprisingly, income and debt payment seemed not to be large issues. The 19 student respondents not choosing academic careers listed lack of interest in research, financial considerations, interest in practicing in smaller communities and academic politics as deterrents.

Physicians Not in Academic Medicine

Thirty-one physicians responded to the questionnaire. When asked whether there were appropriate numbers of LDS physicians in academic medicine a majority answered "no" or "not sure." About half of the respondents answered that religion played a major role in their selection of medicine as a career (15 of 31). These physicians had graduated from medical school from as early as 1945 and as late as 1998. About two thirds of these physicians had served LDS missions. Reasons given for choosing non-academic careers in order of importance included: no interest in research, only modest interest in teaching, dislike for academic politics, better control of time, improved ability to pay medical school and training debts, and interest in small-town practice. Other disincentives included pressures to publish, inability to choose practice partners and the requirement for additional medical training after completion of a first residency training program.

Physicians Who Left Academic Medicine

Only one physician responded who spent time in an academic position and then left for private practice. It seems that pressures were applied to do something unethical. Offended, the physician chose to leave for private practice.

Academic Physicians

Responses were received from seventeen LDS academic physicians. Respondents graduated from medical school between 1950 and 1978. A few were retired, but had spent their entire careers in academic medicine. The others were currently fully employed in academic positions. Nine of 17 reported that religion had played a major role in their choice of medicine as a career and as a motivator to enter academic medicine. Thirteen of the respondents agreed that LDS physicians were not well represented in their academic disciplines. Only one respondent reported that

LDS physicians were well represented in his specialty (public health and preventive medicine). Eleven of the 17 had filled LDS missions. Nearly unanimously, the respondents stated that their interest in research and student/resident teaching were important motivators in their career choice. Also, almost unanimously, they noted that an academic mentor or mentors played critical roles in assisting their career choices. Too, the intellectual environment provided by an academic career was an important inducement. The major disadvantages to academic careers included: pressures to publish, lower incomes than they might earn in private practice and their distaste for academic politics. Yet, most said they would make the same choice again.

Two of the survey respondents gave specific reasons for their choice of careers in academic medicine: One said that his patriarchal blessing stated he would have a career in medicine including teaching and research. A convert to the Church, he had received his blessing as a 14-year-old. He felt his patriarchal prophesy was fulfilled by his rewarding and very productive academic career. The second reported that his medical school professors took a personal interest in him, became valuable friends and mentors who recognized his innate curiosity, attention to detail and convinced him that these attributes would serve him well in an academic career. He had done some moonlighting in a clinical practice that gave him experience to meaningfully compare private practice versus academic practice. He decided that he had strong feelings that best "resonated intellectually with the university environment."

Despite our small sample, our data support our premise that there is a proportionate paucity of faithful LDS physicians and scientists in North American academic medicine. We can only speculate why this is the case. However, several factors seem plausible. First, there is no LDS scholarly academic tradition as is common in Jewish and some Jesuit Catholic communities. This may be changing, as evidenced by several U of U graduating students who have family members in academic medicine and have chosen similar career pathways. Related to tradition is the powerful influence of academic mentors. The authors know of several young LDS physicians preparing for academic careers that were taught and mentored by LDS scholars.

Second, the medical schools being chosen, at least by BYU premedicine students, have less conspicuous traditions of training medical school teachers and biomedical scientists. One wonders whether the pre-professional program at BYU, BYU Idaho and the U of U ought to be encouraged to assist students in submitting more applications to more competitive academic medical schools. This is a difficult problem as most of these schools are private

and are far more expensive to attend. Too, the majority of LDS applicants probably come from the western United States and will likely continue to apply to less expensive medical schools closer to home. As Church membership increases in urban areas (including New England, Washington, D.C., the Midwest around Chicago, Cleveland and Detroit, San Francisco and Los Angeles), many more LDS students will apply and be accepted to academic programs in these areas. Further, similar to the story of Elder Russell M. Nelson, who entered a prestigious surgical training program in Minnesota following graduation from the University of Utah,¹⁷ some medical school graduates discover their interest in academic medicine during postgraduate training. Often, during postgraduate training, young physicians find role models, mentors and opportunities for research and teaching that strongly influence them toward careers in academic medicine. Both authors were strongly influenced in their choices by their experiences in residency and fellowship training.

Third, though traces of medical "anti-intellectualism" persist, left over from early Church attitudes, these are likely to gradually disappear in the coming generation. Certainly, it helps to have prominent physicians with academic credentials, such as Elder Nelson,^{17,18} Elder Samuelson and Elder William W. Parmely in prominent leadership positions in the Church. Too, in recent years other LDS scholars have served as Department Chairs, Deans and senior administrators.¹⁹ It is encouraging that 11 of 30 members of the U of U Class of 2006/2007 are planning careers in academic medicine. It is likely that Class of 2006 graduates from other medical schools also have LDS students with academic aspirations. Perhaps the subtle "town, gown, Church" tension that some of us felt at the U of U in the 1960s is also disappearing.

Enormous ethical dilemmas confront medicine in the twenty-first century. LDS scientists and scholars should be present for the dialogue to provide leadership and moral conscience as solutions are sought and implemented. Our voices cannot be heard unless we are participants in basic biological and clinical sciences. Students will not choose to enter the dialogue unless they are mentored and taught. Collegium Aesculapium should establish a proactive voice in encouraging more LDS medical students and young medical graduates to establish scholarly careers with an eye to adding their voices to improving the quality and access to health care of human populations throughout the world. With the proper credentials they can "be prepared to magnify the calling whereunto I have called you."¹

Val G. Hemming, M.D. is a professor emeritus of pediatrics and dean emeritus of the F. Edward Hébert School of Medicine at the Uniformed Services University. James L.

Parkin, M.D., M.S. is a professor emeritus of surgery, retired chair of surgery and associate vice president of health sciences at the University of Utah.

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18. Elder Nelson served as a third-year surgical preceptor for one of the authors. Cecil O. Samuelson, M.D., presently president of BYU, was trained as an academic internist and rheumatologist who also served as dean of the U of U College of Medicine and vice president for health sciences (1985-1990) (see *The Gift of Health Goes On: A History of the University of Utah Medical Center*. Salt Lake City: Office of Community Relations, University of Utah Health Sciences Center; 1990:101. Published to commemorate the 25th anniversary of the University of Utah Medical Center.
19. Two examples are John M. Matsen (former chair of pathology at the U of U, dean and vice president for health sciences and an internationally respected microbiologist, and Devn Cornish, presently the mission president in the Dominican Republic, but formerly professor and chair of pediatrics at Emory University College of Medicine and a nationally respected neonatologist.



The Impact of
HIV Infection
on African Converts

by Clifford A. Harmon, M.D.

A Simian immunodeficiency virus mutated and spread to infect humans in central Africa, probably by 1931 or earlier.¹ Over decades, it has quietly spread into the general population in Africa. The people of Africa, already faced with the challenges of grinding poverty, food insecurity, prevalent disease, and lack of educational opportunity, are further impacted by this human immunodeficiency virus (HIV) infection that has become the leading cause of death in many countries. There is an alarming loss of parents, workers and leaders that threatens catastrophic societal disruption.

New converts to The Church of Jesus Christ of Latter-day Saints are not excluded from the challenges of HIV infection in Africa. Their tenure of membership is short, and the incubation period of HIV infection can extend to a decade or more. Despite sincere baptismal covenants, these new converts bring with them the consequences of a prior lifestyle.

This paper will review the nature of the African HIV pandemic, world regional incidence numbers and trends, an estimate of HIV incidence among African LDS Church converts and the Church response.

Spread of HIV infection to non-African countries

In the late 1970s, an unusual pattern of intestinal infections was seen in the United States among homosexual men and was termed the Gay Bowel Syndrome.² A striking range of rare and opportunistic infections was seen in this population. The epidemiologists were intrigued with the pattern of spread among gay men and with concomitant evidence of impaired immunity. By 1982, this infectious process was called the acquired immuno-deficiency syndrome (AIDS), and the CDC released the diagnostic criteria for the AIDS complex that included a defect in cell-mediated immunity and one or more opportunistic infections or malignancies from a designated list.³ In the United States and in Western Europe, the AIDS complex cases were seen primarily among men having sex with men, among injection drug users, and among patients requiring pooled

blood products such as factor-eight fractions. In 1985, the HIV antibody test was licensed in the United States and worldwide surveillance of the infection began.

HIV INCIDENCE (MILLIONS)		
	WORLD	SUB-SAHARAN AFRICA
Infected since beginning	65.0	—
Deaths to date	25.0	—
Currently Infected	40.3	25.8
Deaths this year	3.1	2.4
New Infections	5.0	3.2

Source: WHO/UNAIDS 2005 Report

Figure 1

Previous page photos: Getty Images

Where did HIV come from?

There is a substantial body of evidence suggesting that the human immunodeficiency virus (HIV) evolved from a simian immunodeficiency virus (SIV) found in monkeys and chimpanzees in Africa. DNA and subgroup typing studies suggest that HIV-1, the major virus causing the worldwide pandemic, is closely related to the SIV lineage found in a species of African chimpanzee.⁴ HIV-2 is closely related or identical to the SIV found in the sooty magabey monkey in West Africa.⁵ These animals have traditionally been hunted for food or kept as pets, and their habitat corresponds to the endemic areas of the respective human infections.

Transmission to humans likely occurred during these activities. The earliest confirmed positive HIV antibody test was documented from serum drawn in 1959 from an African man of the Bantu tribe with AIDS-like symptoms. The serum, drawn in Zaire (Democratic Republic of the Congo), was frozen and transported to the United States where it was later tested and found to be positive.⁶

HIV worldwide prevalence and trends

HIV infection likely was established in Africa by 1931 or before when it spread to the general heterosexual population and had decades to spread before it was understood and could be dealt with. Figure 1 shows a 2005 WHO/UNAIDS report of the worldwide incidence of HIV infection.

The initial tracking documented that over 85% of infections worldwide were seen in people in sub-Saharan Africa.⁷ As the disease spreads to other regions of the world, the African predominance has diminished and now accounts for just over 60% of people worldwide living with HIV infection.⁸

Figure 2 lists HIV prevalence among adults (age 15-49) in selected sub-Saharan African countries. The rates are particularly astounding in countries in the southern part of the continent but are beginning to reach concerning numbers in some West African countries.

Figure 3 is from the WHO/UNAIDS 2005 report. There has been a steady increase in the number of people living with HIV infection in every region of the world each year since it has been tracked,

HIV PREVALANCE RATES 2003

Selected Sub-Saharan Countries

Botswana	37.3%
Cameroon	6.5%
Ghana	3.1%
Lesotho	28.9%
Nigeria	5.4%
South Africa	21.5%
Swaziland	38.8%
Zimbabwe	24.6%

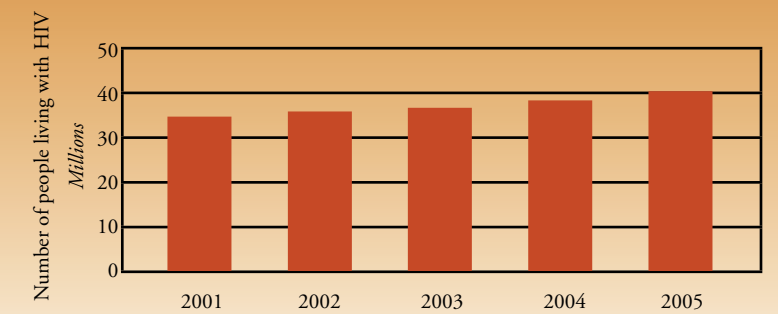
Source: WHO/UNAIDS 2005 Report

Figure 2

and the numbers have greatly exceeded initial predictions. The exception is in the Caribbean, the region most affected after Africa, where prevalence rates have remained the same during the last two years.^{8(p2)}

Differing but dedicated and long-standing efforts for change have reduced HIV prevalence rates in some countries around the world: in men having sex with men in many western countries, among youth in Uganda, among sex workers and their clients in Cambodia and Thailand, among drug users in Spain and Brazil, and in the heterosexual populations in Kenya, Zimbabwe and urban Haiti. On the bright side, there is a growing recognition that major change is needed to control the disease. Control of HIV/AIDS is possible when there is a combined effort by a critical mass of strategic local organizations and

ESTIMATED GLOBAL NUMBER OF PEOPLE LIVING WITH HIV, 2001-2005



Source: WHO/UNAIDS 2005 Report

Figure 3

when the effort is a combined activity for prevention, for treatment as well as for care of those suffering with advanced disease.^{8(p3)}

Treatment with antiretroviral drugs has not been economically available in developing countries until recently. Major humanitarian donations are beginning to make this treatment available now in most major urban centers through the developing world. As of the end of 2005, 10% of HIV-infected persons were receiving treatment worldwide. As this process expands, it offers the promise of slowing the rates of new infection and of progression to AIDS for those previously infected.

A disturbing feature of the HIV pandemic is the growing numbers of AIDS orphans in the developing world. There is estimated to be between 12 and 14 million AIDS orphans in sub-Saharan Africa. The traditional responsibility to care for these orphans in Africa falls to the extended family, but the sheer numbers following in the wake of the HIV epidemic has overwhelmed the system. Virtually every orphanage in Africa has a long waiting list for entry of a child; the large number of street children continues to grow in every community. These children are surviving by their own wits but are subject to abuse and deprivation. They are without the protection and cultural benefits of learning in a family environment and support themselves with criminal activity. Especially tragic is the transmission of HIV to babies born to infected mothers. Most of these die in their first two or three years, but cost-effective treatment of mother and baby at the time of birth can dramatically reduce the mother-to-child spread. Developed countries report a transmission rate of less than one percent from known infected mothers.

How is HIV infection spread?

The spread mechanism driving the HIV epidemic varies significantly in different regions of the world and even in areas within a single country. In Southeast Asia, and in Eastern Europe and Russia, injection drug use and linkage with commercial sex is predominant. In Africa, most HIV infection is spread through sexual contact. Worldwide, at least 75% of instances of HIV occurrence are thought to be by sexual means.⁹

In Africa, many cultural practices favor the spread of HIV. High on the list is the all too common practice of young girls having sex with older men and of men having multiple concurrent sexual partners. In a survey in Uganda, 45% of married men admitted to multiple

PREVALANCE OF HIV/AIDS IN A SOUTH AFRICA STAKE

Year	2001	2002	2003	2004	2005
# Members	2,328	2,504	2,686	2,868	3,050
HIV Prevalance	2	7	15	23	12
AIDS Deaths	3	11	17	2	11

(Unpublished)

Figure 4

concurrent sexual partners. In Tanzania, the number was 40%. Lack of women's rights is a major spread factor.^{8(p27)} Lack of education and taboos against discussion of sexual issues also contribute to the problem.

Infection among Church members in Africa

Because of their baptismal covenants, LDS converts might be expected to be relatively free from HIV infection. Yet, in the year 2000, anecdotal evidence accumulated suggesting that HIV infection was, in fact, a problem among church converts. Quantifying the number of infected members was challenging for several reasons:

1. Over 90% of HIV-infected people in Africa are unaware of their status until symptoms appear, often years after infection.
2. Because HIV is considered a shameful disease, members and leaders who do know of HIV infection tend to hide the fact.
3. Members who learn they are HIV-positive become less active and often move back to their ancestral villages where they are lost to surveillance.
4. There is no practical way to conduct an HIV-testing study.

The most visible evidence of HIV infection is the development of AIDS symptoms and death. The results of a study in one South African stake are shown in Figure 4.

It was thought likely that the number of AIDS deaths in that stake was several times the number shown. The ability to track deaths was limited to the 47% of active church membership and, in addition, the true cause of death was often misrepresented. The prevalence of HIV

infection in southern Africa in a given year has ranged between 10 times and 20 times the number of recognized AIDS deaths.⁹ From this information, it was speculated that the HIV infection rates among our members might range from one-third to one-half the country incidence. It was concluded that HIV infection among African church converts was a significant problem and one that could be favorably impacted by the application of gospel principles.

Church response to HIV/AIDS challenge

Elder Robert C. Oaks, the Southeast Africa area president, saw the need for an education program to correct faulty or deficient knowledge about HIV/AIDS and to bring to bear the enormous power of families and welfare committees to protect our members and to serve the many who were suffering with this disease. An education program was created and taught first in 45 eight-hour seminars to members of stake and district welfare committees and to welfare teaching specialists. The education program "The Gospel and HIV/AIDS" was subsequently taught in age-specific groups for four consecutive weeks during the Sunday block to all wards and branches throughout the Southeast Africa area, and in one stake in West Africa. The lessons are powerful because they begin by teaching the gospel principles and then discuss how those principles can help protect our families and ourselves. The responsibility to serve those who are suffering is stressed. During the HIV education seminars, over 95% of the leaders reported that they had a family member or someone close to them who was suffering from HIV/AIDS.

In the first six stakes taught, there was an evaluation of the effect of the teaching effort. Pre- and post-tests were administered, and age-specific focus group discussions were held in each ward. In one youth focus group in Roodepoort, South Africa, a 12-year-old girl explained the importance of the teaching by stating, "The discussions were important because we learned about HIV from a gospel perspective. In school, they teach us how to use condoms which is an invitation to have sex." Following the teaching, there was documentation of improvement in disease information and positive shifts in attitudes and intent. The discussions in the leadership groups and in the wards and branches were positively received universally as "the Gospel in action." So, many appreciated the Church involvement in the greatest challenge of their generation. Others reported that understanding the need for change had saved their lives.

Missionary applicants called from African countries are subject to the risks of HIV infection that other converts face. Although HIV infection rates among young men in Africa are about one-third that of young women,^{8(p8)}

a significant number of prospective missionaries are HIV positive. We don't know who they are unless they develop symptoms. Voluntary testing should be urged; and if a young man tests positive, he should be assisted in obtaining treatment. The Church policy toward them should be one of non-discrimination, and unless sick, a worthy applicant should be allowed to serve as a missionary.

A major emphasis during the education process was the responsibility of the welfare committees who were charged to provide on-going education and service. A repeat education effort at intervals was authorized in the Africa Southeast area for new converts and has been carried out in some wards and stakes. A proactive effort should be made to encourage our members to be tested for HIV infection and if positive, to avail themselves of treatment resources. Effective treatment at present cannot cure the disease but can limit the spread of the infection and can significantly delay the development of AIDS and its consequences.

The Church HIV education and family manuals are being updated with increased emphasis on testing and treatment and with current statistical information. A generic HIV/AIDS manual has been created and is nearing completion to share with other faith-based groups. A Health Fair (puppet show) HIV/AIDS module has been prepared and is in production.

While the task is daunting, meeting the challenge of HIV infection among African Latter-day Saints has seen some success — especially by using the natural support of Church members and organizations, and by applying the principles of the gospel of Jesus Christ.

Clifford A. Harman, M.D. is a retired _____ and recently served as the LDS area missionary medical advisor for South Africa.

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Called to Serve

A History of the Health Division of the Missionary Department

by Quinton S. Harris, M.D.

One day in early March 1988, Elder M. Russell Ballard invited me to lunch with him. I had returned from Mexico serving as a mission president in July 1987.

At this luncheon, Elder Ballard informed me of two calls he had received from two members living in his ward. One had a son serving as a missionary in Lima, Peru. His letters suggested that he might not be well, though there were no specifics. The second was a sister whose daughter had just received a call to serve in the Chile Osorno Mission. The mother had read in a magazine that the ozone layer in the atmosphere over Osorno had been depleted and the people there would be exposed to high doses of irradiation. I detected Elder Ballard's concerns about these matters. He asked for my help with these cases.

Within a couple of weeks, Elder Ballard asked that several professionals meet with him in his office. Present were Dr. Homer Ellsworth, Dr. Cecil Samuelson, Dr. Bruce Woolley, James Goodrich, Sherman Crump and myself. He explained that he was extremely concerned about the health and safety of missionaries throughout the world and asked us to serve as a committee to investigate, minimize and possibly resolve the problems that the missionaries might encounter while serving. We were given the charge to visit 116 missions in developing countries and carefully study their health systems, hospitals and other facilities available for care, determine the skills of physicians available, diseases extant, medications available, and public health problems that might threaten our missionaries in their work. I was appointed chairman of the committee.

As we met to get organized, we became aware of work that had been done previously, about 1980 in South America, by professors at BYU and infectious disease specialists at the University of Utah under the direction of Dr. John Matsen, with the help of nurses and laboratory technicians. It was determined that about 38% of the missionary force in three countries—Chile, Bolivia and Peru—were out of commission in any given week. Brother Goodrich participated in some of those studies along with Dr. DeVon Hale, an infectious disease specialist at the University of Utah, so we asked him to join our committee, which we called the Missionary Medical Advisory Committee.

Dr. Woolley, director of BYU Health Services at that time, had done a study with the help of professors at BYU in 1985 on 14,000 returned missionaries attending school there, and found that 56% of them still had illnesses related to their missions, mostly bacterial and parasitic types. They



Photo: Intellectual Reserve

estimated that approximately 85% of those who served in developing countries still were ill, in spite of seeing competent physicians here in the United States who were unable to diagnose and alleviate their problems.

To visit 116 missions in developing countries was a formidable task. Our committee felt we should all go together on the first site visit, which included the Ecuador Quito, Ecuador Guayaquil, and Peru Lima North and South Missions. The purpose was to coordinate our attack and get first-hand information of the problems. We found mission presidents spending 50% of their time struggling with sick missionaries. This was a real education. In addition, we found that the wards and branches were recycling their sacrament cups. The paper ones were filthy and covered with lip-stick stains. We tested the water in the baptismal font in the Lima Temple and found it “unfit for human consumption.” Missionaries were injecting each other with gamma globulin using a single needle for everyone or were not giving it at all. Even hospitals were reusing IV tubing and needles. Water and food everywhere was contaminated. Reporting this on our return home, it was quickly decided to provide the sacrament cups for every Church unit and to install water purification systems in the temples’ baptismal fonts.

We quickly established basic principles of health that we hoped to implement in all missions. Emphasis was on the following:

1. Prevention
2. If sickness occurred, assurance of the best medical care available
3. Minimization of down time
4. Control of costs

We started on fundamental principles of (1) washing hands, (2) boiling water, (3) soaking vegetables and fruits in a sanitizing solution, (4) avoiding eating with members, (5) establishing protocols to treat specific illnesses, (6) dealing with inadequate bathroom facilities, etc. Because of the prevalence of parasitic infestation, we encouraged treating every missionary every six months with specific medication, and made certain each was treated when he/she finished his/her mission in order to avoid bringing diseases home that could not be adequately treated in the United States.

Being now united in our approach, we subsequently traveled two at a time at first, then we recruited other physicians to accompany us as we developed expertise in our work to spread out more quickly. In three years, we had completed our visits of 116 missions, but the Church had divided missions quickly—so there were then 150 located in undeveloped countries. The Missionary Department

decided to release us at this time, but within 24 hours Elders Scott and Ballard reinstated us. They presumably realized that in doing our work we had learned something valuable that needed to be expanded throughout the world, and to lose what we had learned was not wise.

We looked at the health unit at the Provo MTC and found that a chaplain was the director. In consultation with the Missionary Department we determined that a physician would suit the position better, so Dr. Virgil Parker became the new director and served for ten years. We also created a mental health unit to aid those missionaries struggling with emotional problems. Dr. Brent Scharman was called to initiate this work.

Because of the marked changes in missionary opportunities following the fall of the Iron Curtain, we made an early visit to those new missions and found significant public health problems. Not only did they have all the water pollution found in Latin America, but also marked air pollution, insecticide toxicity and exposure to radioactivity. Rivers which were the major sources for drinking water and crop irrigation were polluted, so the food was contaminated. In St. Petersburg, for example, the minister of health admitted that the sewage was dumped into the Neva River three miles upstream from the location where they removed the drinking water. It had been that way for 85 years, and they had no funds to change it. Since then, many factories have been built on the shores of Lake Ladoga, and each empties its waste into the lake, which drains into the Neva River.

It was obvious that we needed to add water filters to missionary quarters. We worked with a local outlet to develop a filtration system that would eliminate not only organic materials (viruses, bacteria and parasites), but also pesticides and radioactivity.

Another Eastern Bloc challenge was that once emigration became possible, many of the best physicians left these countries for Western Europe or North America. For those that stayed, there was no motive to be helpful since their income in the socialized setting was less than a tram operator. Their medical books, journals, and methods were 40 years behind the times. A visit to the Kremlin Hospital—where Stalin, Andropov, Gorbechev, etc. were cared for, and therefore presumably the best—was a beautiful plant; however, they had seven X-ray machines that didn’t work, an EKG machine that sat in one corner unused, and a mini-laboratory that was used only for emergency tests—all because they had no funds to supply the needs.

In the early 1990s, missionaries were encouraged to eat with members in their homes more often. This proved to be a medical challenge, since we could not ensure safe cooking techniques. We attempted to encourage training sessions to emphasize proper hygiene; however, soon after

the practice was de-emphasized. Eating with members still occurs in many missions, however, even though health risks and consequences remain.

As physicians and their wives desired to serve missions, we put them to work as mission medical advisors. This was so successful in a few missions that Elder Ballard suggested in 1993 that we might have them cover a whole area. Dr. Talmage Nielsen and his wife were called to cover the South America North Area; the project proved very successful. They subsequently served another mission covering all of Europe. Since then, we have been blessed to have area medical advisors in each area office of the Church. Between 1988 and 2005, 427 physicians and their spouses have served faithfully. This has been a great blessing to missionary work. We realized early on that we couldn’t effectively carry on the work from headquarters only. We needed physicians nearer the missionaries to reinforce proper hygiene and supervise their care when ill.

In 1995, the Hepatitis A vaccine was released—which terminated the need for gamma globulin use. What a blessing! Malaria prophylaxis has been a challenge, and a search for insecticides that could be available everywhere to eliminate disease-producing insects has been only partially successful. Permethrin has been a real boon, but the issues involved in trying to get missionaries to use it properly or to have countries permit its shipment have been challenging.

Because of the development of Hepatitis B vaccine, we have been able to remove the threat of this disease that is so prevalent in many undeveloped countries.

In Africa, we encountered some real challenges with safety as well as health. Accidents were the most serious problem a missionary could encounter. In many countries, failure of electricity and, therefore, poor refrigeration were a constant threat everywhere. Poor medical facilities were more of a threat than a help. Illnesses that we had only heard about in medical school were prevalent. We became aware that many countries had received humanitarian aid in the form of technology, but there was no mechanism available to fix the equipment if it broke down.

We arrived in Suriname two weeks after a shipment of high-tech equipment arrived from our Humanitarian Department. The health authorities in the hospitals that had received it were impressed to see the equipment, however, they commented: “Do you know what we would really appreciate? Bandages, surgical gowns and gloves.” Everywhere we saw bedside monitors in intensive care units that did not work; laboratory equipment that we would have in our sophisticated hospitals went unused because it could not be maintained properly. They had no funds to even purchase x-ray film or reagents to run tests, even if the machines did work. In a 1,500-bed hospital in

Kampala, Uganda, which was a beautiful facility when the British had been there, the laboratory consisted of only one worker, one microscope, no reagents and no working equipment.

Many hospitals had large wards filled with hundreds of patients dying with AIDS and tuberculosis. They had no way to even run tests on their condition. Diagnoses were made by clinical guessing. In some hospitals, we found surgical suites were just rooms with a table, no windows or doors. Flies and dust flew everywhere. In Zimbabwe and Fiji, we encountered two major hospitals where they admitted the autoclave hadn’t worked for over a year, resulting in 100% infection rate on surgical cases. Many medications were fraudulent—a legitimate-appearing capsule filled with nothing significant.

Surprisingly, some of the worst hospitals were found in Europe. A 3,000-bed public hospital in Rome, for example, was a disaster. Similar facilities were found in Portugal, Paris, Eastern Europe, and Asia. In Catania, Italy, the director admitted they hadn’t had a new piece of equipment in 40 years. It was obvious that we had to search for private facilities which were adequate for treating missionaries. The reason for these problems was the socialized medical system. Only limited funds were allocated to medical care.

In Asia, we found the highest incidence of insecticide poisoning—even in Hong Kong, which was surprising. The city’s drinking water comes from China and its food from Southeast Asia where there are no public health measures to protect the people. Pusan, Korea, had built a new water treatment plant, but had never turned it on in two years because of lack of funds. We felt that water filters were essential throughout Asia as well as Eastern Europe, so they were installed in every missionary apartment. We did not recommend them for South and Central America because boiled or bottled water were readily available, and proper food handling was feasible. It was a matter of motivating the missionaries to take the proper precautions. This is a constant process by our Area Medical Advisors. This is why we suggested that the wives of the mission presidents assume the role of the medical coordinator in each mission, where practical.

In Taiwan, I asked one mission president if any of his missionaries had received acupuncture. He replied that he had never permitted it. However, when I asked the same question in a zone conference in his mission, 2/3 of the missionaries admitted they had received it at the suggestion of members. Of course, this is the cause for a high rate of Hepatitis C in Asia because of dirty needles. There is no vaccine to prevent this disease.

In many undeveloped countries, they still reuse syringes, needles and IV tubing, a practice which is obviously extremely hazardous to our missionaries. Blood transfu-

sions, which may be necessary and life-saving, might also lead to tragic consequences.

In the United States, we have unique problems. Those missionaries with significant medical challenges are kept here so they can receive good care. However, our current healthcare system is laden with incentives which create difficulties for those who are ill. Managed care systems limit costs by limiting access. Hospitals and medical care providers respond to limited reimbursement by cost-shifting. This results in excessive, frequently unnecessary, laboratory tests, X-rays, and other procedures which are not controlled. Liability threats lead to protective measures which usually mean defensive medicine. Government HIPAA regulations now limit sharing medical information to others, including mission presidents. This can create real problems for the mission.

We have found that the wife of the mission president is the best, most effective person to screen the medical concerns of the missionaries. Usually being a mother, she can readily advise from experience a course of action to alleviate the problem. In addition, the Missionary Medical Department has a cadre of skilled nurses who are always available to discuss the problems and advise if further action is necessary. Then, if the two of them agree that a physician should be consulted, our medical advisors are always available to review the case. We have observed that about 85% of cases don't need to see a physician if this procedure is followed.

Where this is not followed, the medical costs soar unnecessarily.

In more recent years we have created a mental health committee to tackle the emotional problems of missionaries. A mission president dealing with a missionary who has such problems is usually overwhelmed, and we weren't able to give much support until this committee was organized. Eventually, we asked for correlation with Family Services, and they became a valuable asset to the program. Fred Riley was very supportive, and Dr. Brent Scharman ably headed their efforts, correlating it with their agencies throughout the United States. As the need arose, we were able to put two full-time workers in the Missionary Department to work with the in-field representatives and mission presidents struggling in the field with cases. Several psychiatrists, psychologists, social workers, etc. volunteered for missionary service, so they were placed in Europe and the Orient with considerable success. Dr. Mason Redd has been very helpful in being available for consultation where a missionary might need medication and remain in the field.

A remarkable group of professionals has been assembled to screen missionary applications for emotional problems that might need help pre-mission. We have determined through careful study that approximately 60% of

missionary applicants with pre-existing health problems fail to mention these problems on their applications. This creates extreme challenges, especially in foreign missions, because of lack of necessary resources to deal with them. One of the most helpful resources are the four clinics organized through Family Services to aid early-released missionaries with emotional problems who otherwise would have difficulty accessing professional help.

We have a very competent committee assisting those who need to return home prematurely for medical reasons. With these resources, they can quickly obtain the appropriate medical care necessary that will hopefully resolve the problem so they can return and finish their mission.

To create this committee, we enlisted physicians who had served as medical advisors or mission presidents somewhere in the world to work in an office provided in the Missionary Department. They serve as a resource to the in-field representatives, mission presidents, stake presidents, parents and missionaries themselves who need medical advice. A team also worked carefully to screen applications to identify missionary problems and give helpful information to those making assignments, so each missionary can have a successful mission in which they can receive needed help during their service. Because of the lack of medical resources in many parts of the world, many with significant illnesses could serve if they were kept in the United States or their native country. We found that some parts of the United States were overloaded with these cases, and so recommended a better distribution.

Until 1998, every person who submitted an application was assigned to serve. In six weeks time, we had three very serious cases that challenged that practice—two heart transplants and one quadriplegic. They were all assigned to the Massachusetts Boston Mission because “good medical care” was available. One heart transplant died in the MTC. The other two struggled, along with their companions. Elder Scott made a profound statement that was reassuring to us who were grappling with the challenges: “No missionary should have to prop up his companion because of medical problems.”

We were advised to use our best medical judgment to make our recommendations. Then, the Missionary Committee could weigh the case and make a decision. The first day we were asked to consider “no full-time service” as a possible recommendation, there were 12 cases that fell into this category. After the committee's decision was made and notification given, each stake president involved called the Missionary Department to encourage the acceptance of his missionary for service. Before the day was out, only two were denied. Such incidents played a part in formalizing the broader concept of “raising the bar” for both physical and spiritual readiness, which was officially implemented in 2003.

Because of the excessive immigration practices in most countries, including the United States, it became obvious that missionaries working with ethnic groups would be exposed to the same diseases they brought from their home country. For example, we had three cases of active tuberculosis develop in Americans working with Russian immigrants in the northwest United States. Because of this, we decided that our medical advisors needed to cover the entire world, not just developing countries. This additional attention has been a great blessing to these missions.

There are over 1,500 international missionaries assigned to the United States who enter the Provo MTC yearly with many medical challenges. First, we must cure those infected with parasites. Then, we evaluate their dental and eye problems and rule out contagious illnesses. Recently, one active case of tuberculosis exposed 270 people.

Other examples of challenges include missionaries from the Pacific Islands going to West Africa, where the health risks are great. Unfortunately, these missionaries cannot receive effective immunizations in their own countries because of faulty refrigeration. This results in a serious threat to their health that has to be dealt with quickly in the Ghana MTC.

We have a very active dental committee that has developed a careful screening of new international missionaries at the Provo MTC. Those with major problems are addressed there and the rest when they arrive in the field. Over 700 LDS dentists have volunteered their services to help these missionaries at essentially no cost.

Several years ago, we discovered that 13% of the native Filipino missionaries that came to the MTC in Manila had active tuberculosis. That was a threat to everyone. Then, when we investigated the situation with the employees in the area office and the volunteers in the temple, there were additional cases. We requested an X-ray unit be installed there to assist in screening, and the request was approved. In the past year, the incidence has dropped to 0%. It has been very beneficial to screen those Americans returning from their missions.

Training of mission presidents, both at the seminar in Provo and in the field, has been significantly improved to prepare them better to effectively deal with problems as they arise. We have also worked to help take care of needy missionaries in the United States and reduce the costs of their care.

Extensive pre-field training of area medical advisors and their spouses has also been developed so they can be effective in their areas. More LDS physicians have been enlisted to serve from their homes to assist specific mission presidents with their missionaries' medical problems. The area medical advisor supervises their work. Spouses have been trained in ways to be useful in assisting their

physicians, and they contribute to the work in the time available. Many also work in family history centers, temples, mission offices, teach English classes, etc. in their spare time.

A public health committee has been very active in dealing with worldwide threats from the aftermath of hurricanes, SARS, dengue fever, malaria, AIDS, etc. Nutrition and pharmacy committees have grappled with fraudulent drugs, pesticide needs, and poor nutrition. We have been able to develop a system of communication that helps send X-rays, pictures of wounds, skin disorders, laboratory reports etc. from anywhere to specialists at headquarters who can advise proper care. This results in our team of specialists being available to our advisors anywhere in the world.

One example of the system in action is the following case: Dr. Kenneth Nielson was working in the office at the Missionary Department and answered a call from the in-field representative who had Dr. Keith Merrill on the phone from Accra, Ghana. He had a missionary from Nigeria Port Hartcourt Mission who had noted difficulty with his vision and reported this to his mission president. The president called Dr. Merrill who was suspicious about the symptoms and asked that the missionary be sent immediately to Ghana. On the elder's arrival, Dr. Merrill noted that he had developed large bruises on his extremities. A visual exam revealed hemorrhages in the retina, and a blood count showed he had acute leukemia. The elder was from Salt Lake, so Dr. Merrill asked what he should do. Dr. Nielson, knowing that there was no good medical care in Accra, said to get him on the next plane and send him home. One left in an hour, which he caught. Our team met him at the airport in Salt Lake, took him immediately to the University Hospital where they were waiting for him. Within two hours, he started to bleed profusely from the nose. Several transfusions and other medications were given. Finally, three years later, after a bone-marrow transplant and chemotherapy, he is doing well. If he had stayed in Africa, he would not have survived. Our team is grateful for divine direction, which is felt daily in our work.

Faith, prayer, and priesthood blessings are fundamental in the care of a sick missionary. We have seen many miracles. Our physicians have felt it a privilege to be able to share our skills in helping the missionaries with their problems.

Quinton S. Harris, M.D., is a retired internist, former president of the Mexico City North mission, and chair (emeritus) of the Missionary Medical Services Committee for the LDS Church.



Attention Deficit/ Hyperactive Disorder: Old Questions New Answers

by W. Dean Belnap, M.D.

Despite persistent skepticism, the most common childhood psychiatric disorder is increasingly understood to be a brain malfunction. Different forms of the disorder may have different biological roots. New versions of older drugs are being introduced, and new drugs are being considered. New methods of therapy beyond the use of medications are gaining increased interest, power and effectiveness. Old and new concerns about the risk of drugs are raised, and there is now some evidence for alternative treatments. Such is the case with the use of educational techniques in the school environment, extra school educational programs, and (of more recent intense interest), the use of biofeedback. Biofeedback has been with us for a number of decades, but the new instrumentation and methodology of measuring brainwaves has made this a very significant functional treatment which perhaps could be a dominant treatment of ADHD in the future.

Brain Malfunction

Discoveries in neuroscience are reinforcing a growing consensus that attention deficit, hyperactive disorder (ADHD) is not just a set of behavioral problems, but a biologically based disorder of brain function. The symptoms of impulsiveness, inattentiveness, a high level of distractibility and hyperactivity arise, the research suggests, because of misfiring of the brain's executive function in the prefrontal cortex—the brain's uniquely human management system—making it difficult to stay still, concentrate and exercise forethought and self-control.

We have come to realize that attention deficit disorder is specifically an inability to relate information between the hemispheres of the brain in the learning process, as well as an inability to transmit that information as it is developed by the left and right hemispheres of the brain up to the prefrontal cortex for value judgment and ultimate decision-making. The executive role of the brain is centered in the prefrontal cortex. Information from the prefrontal cortex down through the limbic system and to the basoganglia of the brain is found to be defective and slow in people with attention deficit, hyperactive disorder. The cause of this abnormality is a deficiency of formation and transmission capabilities in both directions through this system of nerve pathways.

The brain's inability to produce a specific enzyme has been most incriminated in recent research—namely its inability to form adequate amounts of norepinephrine, which is necessary for transmission in these perceptual pathway systems.

ADHD is known to have a strong genetic component—one of the highest among psychiatric disorders—and several genetic markers have been found. Similar symptoms have also been found in other syndromes, such as the so-called executive syndromes which include (in addition to ADHD) the bipolar disorders and Tourette's syndrome. We have even found exposure to abnormal functioning of the hormonal makeup of the uterus and placenta during pregnancy can be an added factor in the causation of ADHD or the increase towards that genetic predisposition.

The distortions come from the reversal of two hormones called catecholamines and prostaglandins. These two hormones from the uterus and placenta are essential, in proper ratio, for the optimal formation of the embryonic and fetal brain. Anxiety, tension, anger and distress, particularly among adolescents who are pregnant, commonly gives rise to this difficulty. Though the child may be later adopted after birth, it is interesting to note that about 45% of children with attention deficit disorder in child and psychiatric practices are children born out of wedlock from a young and disturbed mother.

Executive function involves so many brain pathways. There is strong evidence that in children with ADHD, the disturbance occurs in a circuit that runs between the frontal cortex, the seat of judgment and planning, and the limbic and then basoganglia systems of the brain, the sections that control habitual actions and convey reward signals. The vast majority of children studied with ADHD have shown indications by neuroimaging that they were unable to engage this network normally, but used other parts of the brain when performing certain tasks.

The inability to process the information in a reasonable period of time gives rise to an alteration of brain cybernation. The brain normally cycles nine to ten times per second from cortex to base, feeling out all of its systems; this methodic cycling is probably performed to keep coordination of all systems in harmony. The failure to process information in a timely way, or even at all, gives rise to a modification of this cybernating rhythm, increasing the electrical cycling to 20 to 25 per second, particularly stimulating the frontal cortex of the brain with what is called an electroencephalography, a very rapid beta rhythm.

Some experts regard the above networking problem as an inefficient reception of signals for delayed rewards. That causes impulsiveness, which in turn causes parents and teachers with high expectations to criticize and punish the child. After a while, the child stops trying to undertake projects that require long-range planning and never learns these necessary skills. Motivation becomes a problem of the prefrontal cortex in its executive function.

Medications

Those with ADHD have been found to benefit from medications generally entitled psychomotor stimulants. That term itself may be an anomaly. According to the national survey on children's health in this country, as well as in most European countries, the incidence of children and adolescents age four to seventeen with ADHD is about 5.5% of the population. Approximately 50% of those with the diagnosis are taking stimulant medications.

The most important recent development in the drug treatment of ADHD is the increased use of new formulations of these stimulants. There are now nearly two dozen versions of methylphenidate and dextroamphetamine under the old brand names of Ritalin and Dexedrine and the more recent labels, Concerta, Metadate, Focalin, Methylin, Adderall, and Dextrostat. Added labels like LA (long acting) and XR or ER (extended release) refer to gradual or staged, rather than immediate, release of the drug into the blood stream.

The long-acting and extended-release forms, which last eight-to-twelve instead of four-to-six hours, have conquered the market because both children and parents

prefer them. Users avoid the ups and downs produced by shorter-acting versions. Children taking the long-acting forms do not suffer the inconvenience of taking the drug three or four times a day or the embarrassment of taking it in school. Recent studies show that they are less likely to cease the regimen than those taking short-acting forms. The most widely used brand today is Concerta, a type of extended-release methylphenidate, with effects that last for twelve hours.

Meanwhile, spurred partly by reports of suicidal thinking and heart problems in children taking antidepressants, concern has grown about the risks of stimulant medication. There has been some literature that has pointed out an increased incidence of problems of depression or difficulties with suicidal ideation or suicidal attempts of those using psychomotor stimulation.

The Food and Drug Administration has explored the need of restrictions upon these medications in the information that accompanies them when they are dispensed pharmaceutically. The FDA has found that research done by the National Institute of Mental Health has demonstrated no

such problems. Those patients that have been referred to as having cardiovascular problems have only been those with significant preexisting heart disease. Studies done by others than the National Institute of Mental Health have pointed out that the above-mentioned compounds, including the newest medication which is not a psychomotor stimulant, Strattera, do not have adverse psychiatric effects, including aggression, hostility or suicidality; a review of the literature has shown no increased risk of suicide or suicidal thoughts.

It has become apparent over the last several decades that some spiritual groups and organizations have actually published their own material in "scientific literature," which indicates the serious harmful effects of some medications in question. They have also concurrently attacked the use of serotonin reuptake inhibitors, such as Prozac, and claim such inhibitors are a cause of suicidality. Their evidence has been found to be fallacious.

Complaints have also come forward in literature, some spurious, about the addiction question of dextroamphetamine and methylphenidate medications. These

substances have been found to be "addictive" only in those who have used them intravenously, as well as intranasally. The so-called hippie generation of the 1960's very often used these substances intravenously. The Food and Drug Administration, therefore, felt that that these substances should be labeled as "controlled" in order to prevent addiction.

Such claims of addiction have been proven also to be false. When taken orally, the medications have been found to be processed too slowly through the brain to produce the highs and lows of addiction. One reason for the popularity of Concerta is that it must be swallowed whole. It cannot be broken up into a powder and snorted or injected. The risk of addiction is even less when the drug is packaged for gradual or staged absorption.

Recent literature has also indicated that ADHD medications actually lower the risk of a predisposition to later addiction. This research, based upon control studies and correlation of them with substance abuse and substance dependency problems, has vindicated these substances as being a predisposing factor. There is no indication in the literature

for evidence forthcoming that taking ADHD medications affects the rate of addiction in later life.

The new product Strattera has proven to cause significant benefits in children over ten years of age and is definitely the primary choice of medication in the adolescent years. It is functionally utilized by adults as well. It is not a psychomotor stimulant medication. Occasionally, it will produce a reduced sleep pattern in the first few days of usage, but that can be adjusted significantly in the medication regimen. The slowly released forms of methylphenidate and dextroamphetamine have also become popular with adults who suffer from ADHD.

Other Forms of Management

Some of the explanations as to varied responses to medications and therapeutic management have been clarified by three major researchers. There are apparently about a dozen formats with nerve pathway differences that all center on the single diagnosis of ADHD. These alternative patterns of the syndrome at times give rise to

Although there have been reports of suicidal thinking and heart problems in children taking antidepressants, the FDA has found that research done by the National Institute of Mental Health demonstrates no such problems.

challenges with the use of medications thus far developed. We will discuss toward the end of this paper the use of a new approach to techniques of therapy that could radically change the approach to the treatment of ADHD, particularly those variant forms which become a challenge to conventional medications. These studies have come from Dr. Joseph Bideman, Professor of Child and Adolescent Psychiatry at Harvard University, Dr. Larry Silver, Professor of Psychiatry at George Washington University and Dr. Russell Barkley, Professor of Psychology at North Carolina University.

In spite of the absence of negative conclusions in the medical literature, many parents and even professionals still remain skeptical about medication. Concerns about their long-term effects, combined with the problem that many children and adolescents do not want to take medications, catalyze the persistent interest in alternatives. Now there is preliminary evidence that psychosocial treatment is significantly helpful as an adjunct to medication.

The modern approach to psychotherapy with those suffering from ADHD is first of all directed at helping correct and solve the problems of co-morbidity, which is very common. It is seen in over 50% of children suffering from co-morbid features of conduct disorder, depression, oppositional and defiant disorder and some even behavioral disorder patterns. Such can also be the case with adults still suffering from ADHD.

Childhood Factors and Persistence into Adulthood

There are a number of adverse influences that can challenge the recovery and therapeutic assistance with ADHD. The American Academy of Pediatrics and also the Academy of Child and Adolescent Psychiatry have indicated that children, particularly with ADHD, should not watch television for more than one hour a day. But according to the literature, the average exposure to television is three and a half hours a day by age four and is continually increasing with many children as they mature up through childhood into adolescence. It has been found that exposure to hours of rapid imagery and scene changes make non-virtual life seem boring by comparison and may even slow or divert brain development, but

cause and effect are not clear. Preoccupied or neglectful parents might let children watch too much television; and children who love television too much may also become more susceptible (for genetic or social reasons) to hyperactivity and distraction.

As with excessive stimulation from visual imagery, the modern extreme "rock rhythms," with their loud 3-per-second beats can be equally damaging to the development of the nervous system.

Not only are less exposure to television and intense rock music good, but more exposure to nature might be

good for children with attention problems. Several recent studies have found that impulse control and other ADHD symptoms improved when children had more access to out-of-door activity and playing close to nature. Regardless, it cannot hurt any child to spend less time as a "couch potato" and more time outdoors in parks and playgrounds, woods and fields.

The incidence of difficulty with adults was thought to be less than 10% of those experiencing an onset in childhood. It now appears that approximately a third of those having diagnoses of ADHD in childhood and adolescence carry on with symptomology into adulthood.

The numbers of adults receiving drug treatment for ADHD has more than doubled in the last four years alone. The symptoms may interfere with daily life more in adults than in children because adults have to exercise more self-control and do more planning.

In 2003, adult ADHD was included in a national survey for the first time. Approximately 3% of adults age 18 to 44 received the diagnosis, about half the rate found in children. The only childhood risk factor for persistence into adulthood was the severity of symptoms. ADHD is much more common in boys than girls, but adult women are now using ADHD drugs just as much as men the same age. Some think the symptoms are recognized more often in boys because of their behavior is generally more troublesome, and they seem to act out more. This appears to indicate that the incidence among girls and women is probably masked by less hyperactivity. There is no difference between the challenges of learning disabilities between the sexes, however.

In addition to reducing exposure to television and intense rock music, several recent studies have found that impulse control and other ADHD symptoms improved when children had more access to out-of-door activity and playing close to nature.

It has been said that identifying ADHD in adults can be like finding a missing jigsaw piece that solves the problem of behavior that looked like laziness, a character flaw or a learning disability. Medications, group social skills training, individual psychotherapy, vocational counseling and coaching may be helpful for adults with ADHD. The first controlled study of cognitive behavioral therapy for adult ADHD published last year found improvements in complications such as anxiety, depression and attention. This verifies the need for treatment with psychotherapy, as well as medication management.

We have found that those with ADHD, independent of their age, have either visual or auditory perceptual processing problems. This phenomenon has been found in a number of adults or famous people who have been cited in medical literature. To make reference to those summaries, we find that Albert Einstein had a marked visual perceptual processing problem that did not allow him to succeed at reading until he was age nine. Winston Churchill had visual perception problems and could never do mathematics beyond simple addition and subtraction. Thomas Edison and John F. Kennedy had auditory perceptual problems; both experienced childhood and adolescent communication disorders. It was interesting to note as well that the son of President John F. Kennedy, John Jr., had just the opposite genetic characteristic. His was a visual perception problem. He "flunked" the bar exam three times in Massachusetts and New York and was able to finally complete the test when Harvard University recommended that he take the test auditorily; in this capacity, he passed it with excellent grades.

Learning Disabilities and ADHD

The above-mentioned professors from Harvard, George Washington University and North Carolina University have indicated very strongly that there is no difference between ADHD and learning disabilities: "they are one and the same." The problem of perceptual processing difficulty, either auditorily or visually, is found equally in both sexes and is found in all cases that are truly diagnosed as ADHD in adults. There has been a tendency for educators and school personnel in the past to classify learning disabilities as a distinct condition contrasted or compared with ADHD. This is not true; 90% of symptoms overlap between both syndromes; again, "they are one and the same."

Biofeedback Therapy

An alternative to treatment has been present for the past two decades: biofeedback therapy. This, however, has modified itself by taking advantage of modern electronic and imagery instrumentality; such technology has allowed a total improvement of the therapeutic approach of neuro-

feedback. Neurofeedback has been accomplished in the past by the use of quantitative electroencephalography. With the discovery a few years ago of magneto electroencephalography, the process of EEG has been defined quantitatively and with remarkably increased accuracy compared to older models of electroencephalography. Magneto EEG is capable of measuring as many as 300 spots on the surface of the scalp and the function of the nervous system beneath. It is able to give pictures not only of the cortex and surface of the brain, but the whole scope of the brain organ in terms of three-dimensional brain imagery. This has been a great asset in the development of remarkably improved biofeedback procedures.

What is biofeedback?

1. EEG biofeedback, also known as neurotherapy, is a learning strategy that enables people to alter their own brainwaves.
2. When information about a person's own brainwave characteristics is made available, he or she can learn to change them.
3. A person may want to change a particular behavior, but finds it difficult or impossible to change despite working at it.
4. The individual "plays" a type of computer game which exercises the brain just as one can exercise one's body by working out at a gym.
5. Through the non-invasive computer accelerated exercise provided by the modern EEG neurotherapy, individuals are now capable of changing old behavior or adding new behavior they felt unable to accomplish in the past.
6. The training is used for many conditions and disabilities in which the brain is not working as well as it might. It is interesting to note that NASA utilizes this new Magneto form of computerized biofeedback as a means of working with their astronauts in preparation for their space adventures.

It has been gratifying to see the evolution of therapeutic techniques in the management of this, the most common of all psychiatric disorders in man.

W. Dean Belnap, M.D. is a specialist in behavioral pediatrics and adolescent psychiatry in Salt Lake City, Utah.

Strengthening Faith at Death:

Hospice Spiritual Care as a Resource for Physicians

by Scott B. Woolley, MBA



On June 8, 2006, a single-engine turboprop airplane traveling from southern Utah crashed in Utah Lake. The pilot, Blaine Pugmire, and the two passengers, Harold “Les” McGuire and Ray Hooper were killed. The three men left behind 13 children, and all three wives were expecting.

Blaine’s mother, Marianna Pugmire, was talking about the tragedy recently. It was suggested that the Lord had called Blaine home. She became distraught by my suggestion. She said, “What could be more important than being a husband and father to a young family?”

The question asked by Marianna demonstrates how those who experience the death of a loved one need their faith in the Lord’s plan strengthened as they deal with their grief and loss. Such a death can be a significant trial of our faith. We exercise our faith by trusting that the Lord’s hand is in all that we do; that He will make all our trials and experiences

work for our benefit and good as we trust in Him.

Elder Dallin H. Oaks recounts a story of a young woman who exercised that kind of faith and trust. For many months her mother had been seriously ill. Finally, the faithful father called the children to her bedside and told them to say goodbye to their mother because she was dying. The 12-year-old daughter protested:

“Papa, I do not want my mamma to die. I have been with her in the hospital ... for six months; time and time again ... you have administered to her, and she has been relieved of her pain and quietly gone to sleep. I want you to lay hands upon my mamma and heal her.”

The father, who was Elder Heber J. Grant, told the children that he felt in his heart that their mother’s time had arrived. The children left, and he knelt by his wife’s bedside.

Later he recalled his prayer: "I told the Lord I acknowledged his hand in life [and] in death. ... But I told the Lord that I lacked the strength to have my wife die and to have it affect the faith of my little children." He pleaded with the Lord to give his daughter "a knowledge that it was His mind and His will that her mamma should die."

Within an hour the mother died. When Elder Grant called the children back into her room and told them, his little six-year-old boy began to weep bitterly. The 12-year-old sister took him in her arms and said, "Do not weep, Heber; since we went out of this room, the voice of the Lord from heaven has said to me, In the death of your mamma the will of the Lord shall be done."¹

Elder Dennis E. Simmons recently said, "Faith is believing that although we do not understand all things, He does. Faith is knowing that although our power is limited, His is not. Faith in Jesus Christ consists of complete reliance on Him."² Those who remain need the support and strength of others, especially from beyond the veil, to bolster their faith as they work through the grieving process. As we interface with our patients and their families, we can help them strengthen their faith.

Healthcare professionals work diligently to aid their patients by providing both physical and emotional support to them. Many times, however, patients don't communicate the spiritual struggles they are experiencing. One sometimes overlooked resource physicians can use to help a patient and their family through times of death is to use the resources of certified hospices in the community.

A certified hospice provides extended bereavement support to the patient's family members for up to 13 months after the patient's death. A quality agency will provide both psycho-social and spiritual support through its chaplains to assist individuals in working through their crisis of faith.

Faith is also required by those who are passing through the trial of their own death. Faith is required to accept the will of the Father as one's life ends, sometimes prematurely, or to adequately prepare oneself for life on the other side of the veil.

Dan Horton, a hospice chaplain, recalls an experience he had with a member of the LDS Church. The man had served faithfully throughout his life in various capacities in the Church, including stake and other leadership callings. Dan was meeting with this man as his death became more imminent. The man asked Dan, "Can you assure me that all the things I have testified about throughout my life are true?" Dan took the opportunity to bear testimony to the reality of God's plan for His children. Dan's testimony had a reassuring effect on this man as it helped bolster his faith during a trying time.

Dan visited with the family at the funeral. He told the family of the experience that he had with their father.

The family was surprised that their father would express the lack of faith. They said that there was no way that their father would have ever made such a statement to his priesthood leaders or to family. He was like many in the Church who are reluctant, for many and diverse reasons, to identify their spiritual struggles or weaknesses to those around them.

Most of us have not had the opportunity to see through the veil and gain a sure knowledge about the reality of the life after this mortal existence. All must exercise faith, as we hope for the peace and serenity promised to the true believers in the next life. The physical, emotional, and spiritual anguish accompanied by the dying process can result in a real trial of any individual's faith during such times.

The family Dan helped was very grateful for a hospice chaplain who was willing and able to provide testimony to the reality of God's plan so that their father's faith would be strengthened during his last days. Hospice professionals have similar experiences frequently, as individuals prepare to cross through the veil and meet the God who created them. Such experiences bear much in common, regardless of religious affiliation.

Chaplains can help with other struggles with faith during the dying process. Layne Flake, a hospice chaplain in Utah, recounts the following experience:

As I worked with a particular active LDS woman who was dying of cancer, her children were deeply concerned that she was having so much difficulty "letting go" and achieving a peaceful death. She kept hinting at some unresolved guilt from a long-past transgression. She continually struggled with that dilemma but refused to directly discuss it. As a "disinterested party" I was requested to intervene.

Over time, I was able to reassure her of the compassion and forgiveness of a loving Heavenly Father and that, as the Lord's representative, her bishop could help her through her struggle. Finally, she consented to meet with her Bishop. As I briefed him prior to that visit, I sensed his deep love and wisdom. He expressed his sincere gratitude for me facilitating the opportunity to effectively minister to that dying woman. Following her confession to him and her welcomed release from her burden, she died serene, confident and peaceful.

Hospice chaplains often fill a skill deficit and help to facilitate an essential function, both in dealing with anticipatory grief and in achieving a spiritual peace for both the dying person and his or her family. And that intervention is best achieved, not in place of, but in concert with priesthood leaders and other assigned individuals.

One hospice chaplain dealt with an angry, dying man, who on his first visit challenged, "Have you ever died? So what makes you think you can help me?" Although a lifetime, active Latter-day Saint, he refused to share his considerable anger and fears with his family or priesthood leaders, believing that to do so would be perceived as lacking faith and a failure of testimony.

Many times it is believed that members of the Church require little spiritual support. Members do have a strong safety net with good bishops, home teachers and visiting teachers, and other ward members and family members to assist them with their spiritual needs at the time of death. But they are in need of support from others as well. LDS bishops receive very little, if any, specific training for end-of-life or grief counseling. Although these persons are blessed with significant inspiration and insight, I have found them, without exception, to be extremely appreciative of the assistance and intervention of professional spiritual counselors in this specific area, particularly those who share their own faith and values.

Physicians can find themselves in a unique position of trust with their patients. The position of trust is increased as the patient approaches difficult physical trials, especially as they deal with the reality of their terminal condition. A physician has several resources at their disposal to aid them in their practice, providing comfort to those who stand in need of comfort:

- They have their own faith and testimony. Demonstrating faith through the way one lives helps strengthen other peoples' faith. Providing testimony about the divine nature of life and death helps a patient through this difficult time.
- They have the Holy Ghost to guide them. Providing words of comfort and counsel, when moved upon by the Spirit, will greatly improve the relationship between patient and physician.
- They have healthcare professionals trained to assist individuals through and during such trials, especially hospice providers that have social workers and chaplains who are trained to meet the emotional and spiritual needs of the patients. A hospice can also provide nurses and physicians who are focused on symptom management supplementary to a primary care physician.

The Plan of Salvation requires all of God's children to leave our heavenly home to come to this world to be tried and tested to see if we will do the will of the Father. We leave our heavenly home and cross through the veil at birth. Birth is a joyous occasion for us in this life as a new spirit enters this world and blesses the family. Birth

is also the beginning of spiritual death as we are separated from our Heavenly Father. The feelings of separation and concern must occur for loved ones in the pre-earth realm as we leave their acquaintance for a period of time.

Physical death is also a very wonderful and distressing time in our eternal progression. When a loved one dies, they return to their Father in Heaven and to the welcoming arms of loved ones who have gone before. It is a joyous experience for the one who has died and for those on the other side of the veil. Death can represent for many the "true" spiritual re-birth as we return to the presence of God. For us who are left behind, we experience the pain and anguish associated with the separation from those who have passed.

In Alma chapter 31, verse 21 we read: "And now as I said concerning faith—faith is not to have a perfect knowledge of things; therefore if ye have faith ye hope for things which are not seen, which are true."

Faith in God's plan will help the one who is passing across the veil to do so peacefully and with confidence in their future existence. Faith will also help those left behind who know that the Lord will bless them and aid them with their grief and pain.

When faith is strengthened and spiritual preparations for the end of life are made, the experience and sting of death can be reduced. James Daniels, another hospice chaplain, recounts his own personal experience as his father neared death:

I remember being in the hospital in Alabama where my father had been taken because he was failing. We got rather distressed that the staff just kept up the treatment. All my father wanted to do was go home. Finally, we approached the doctor with some trepidation and told him that we didn't think anything more should be done for Dad. We wanted to take him home. The doctor quickly approved the plan and off we went. I remember going back and telling Dad that we were taking him home. He lifted his arm in the air as if to cheer. The next two days together with him at home remain one of my best memories.

For many like James, a death accompanied by symptom management and strengthening of faith can be one of their best memories.

Scott B. Woolley, MBA, is president of Hospice Specialists in Salt Lake City, Utah.

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Healthcare is a
GIFT
not a
COMMODITY

*Ancient prophets and modern charity tell us healthcare
is a gift from which no one should be turned away.*

by Joseph Q. Jarvis, M.D. MSPH

THE PROPHET EZEKIEL lived 2,600 years ago in the heart of what is now Iraq in the most powerful city of what was then the known world. He was a Hebrew slave laboring on the fabled Hanging Gardens of Babylon, captured during a Babylonian raid 10 years before the final fall of Jerusalem and destruction of the Temple of Solomon. In a post-mortem review of the causes of downfall of the Kingdom of Judah, Ezekiel said: "Woe to the shepherds of Israel who only take care of themselves! Should not the shepherds have strengthened the flock? ... You have not strengthened the weak or healed the sick or bound up the injured."¹ Six centuries later, and only a few years before Jerusalem would again be destroyed—this time by Roman legions, another Jewish prophet spoke of the need to care for the sick. In the last parable found in the Gospel of Matthew, Christ made the point that righteous people seek out the needy to assist them, including care for the ill. "I was sick, and ye visited me," He said, and He meant all sick people, even "the least of these."² These words have inspired generations of Christian doctors and nurses; likewise, they have induced the donations which have led to the construction of many hospitals, including most of the hospitals in Utah. King Benjamin, an American Christian monarch living more than a century before Christ, made the same point: "For the sake of retaining a remission of your sins from day to day ... I would that ye should ... [visit] the sick and [administer] to their relief."³ King Benjamin also made it clear that the care of the sick must be done wisely, which I take to mean efficiently, or in a sustainable fashion. The care of the sick must be a priority for all who would follow Christ.

Americans have generally tried to live up to that Christian principle. We have built thousands of hospitals with charitable donations and taxes.

Medical and nursing education has been publicly subsidized, as is most meaningful medical research. When private-sector funding for indigent and elderly medical care failed, we shouldered the dual burdens of Medicaid and Medicare. And then there are the countless other programs for the care of the sick: the Indian Health Service, the VA medical centers, the Child Health Insurance Program, Ryan White funds, family planning grants, the Women, Infants, and Children program, Children with Special Health Needs, Newborn Screening, and many others. And polling data over many years reflects our intent that every American should be able to receive the gift of health care. The Harris⁴ organization and the *Washington Post/ABC News* both found that 4 in 5 Americans support publicly funded health care for all. The goodwill and generosity of the American people speak volumes about our intent. We have believed the ancient Jewish prophets: Health care is

a gift we want to give to ourselves.

But we have allowed ourselves to fail to deliver this gift. While we generously spend twice as much per capita as any other country for health care,⁵ and we tax ourselves more than any other citizenry for health care, ours are the only citizens in the industrialized world at risk for having no or little health care financing when it is needed. More than 80 million Americans are now either uninsured or under-insured,⁶ leading to at least 18,000 premature deaths each year.⁷ The United States is ranked only 37th by the World Health Organization, in part because we have lower life expectancy⁸ and higher years of potential life lost than most other developed countries.⁸ The American infant mortality rate⁸ should be a national scandal. How is it that we pay more than any other country but receive so little return on our investment? Why has an epidemic of at least 20,000 deaths per year received so little notice?

The reason our health care dollars are so unfruitful may be that these dollars have been transformed from a charitable investment in the care of the sick and injured to an investment for personal gain. Health insurance, which began as a non-profit, community-rated mechanism for spreading the risk of hospital care, has become a highly profitable investment. Hospitals built with Hill-Burton funds and charitable donations have been bought by for-profit corporations and turned into cash cows. Pharmaceutical companies are the most profitable⁹ and least taxed among *Fortune* 500 entities. American health care institutions are not delivering promised health benefits, but they are the most profitable health enterprises in the world.

Americans are apparently no longer as persuaded by the wisdom of the ancient Jewish prophets as they are enthusiastic about the power for personal gain in the so-called health care marketplace. Our zeal for creating markets has led us to see health care as a commodity and ignore our time-honored tradition of giving the gift of healing to ourselves. Tony Snow,¹⁰ a conservative, syndicated columnist who is now press secretary for the White House said this in 1993: "In the real world, people stampede when somebody slaps up a sign that reads 'free.' This is the theory behind bargain basements, but it also applies to hip replacements and appendectomies." According to Mr. Snow, Americans would be foolish to organize health care as a charitable endeavor, because Mr. Snow asserts that health care is a commodity, not a gift. According to market principles,¹¹ demand for commodities increases to infinite as price declines towards zero. Conversely, demand for a commodity falls when the price rises. Mr. Snow believes that if you charge nothing for a hip replacement, Americans will stampede to get them. But if you charge a lot of money for the procedure, few people will seek new hips.

The further implication of Mr. Snow's assertion is that

the problem of high cost in health care has been artificially created by not charging enough to the patient for the services received. According to this theory of high health care costs, Americans have been protected from paying the costs of medical services by insurance that is too generous, and have, therefore, demanded too many surgeries. In short, he believes the ancient Jewish prophets are wrong; health care is not a charitable endeavor which we give to ourselves, it is a commodity best distributed through competing, investor-owned corporations which strive to make a profit.

The debate about health care between Mr. Snow and the ancient Jewish prophets has recently been mostly one-sided. It has become fashionable for American politicians to dismiss serious health care policy debate by assuring the citizenry that the market will efficiently distribute health care services to all (or at least to all who deserve them). No one,¹² it seems, stops to consider whether health care really does act like a commodity, or whether the prerequisites for a free market are, in fact, true of the health care sector. A market does not exist without competition between many suppliers who are freely able to bring their commodities to the attention of many buyers, who have both the time to shop and the information needed to make decisions in their own self-interest. Buyers and sellers are not coerced in a market; they can choose to produce, spend, withdraw, or save as they will. And what they barter for in the marketplace has no external consequence or value to anyone else.

One observation which should disturb Tony Snow is that high costs in American health care are apparently not caused by high utilization¹³ of physician and hospital services. Americans have fewer per capita physician visits and hospital bed days⁸ than do the citizens of most other industrialized countries, despite Mr. Snow's assertion that our first-dollar health insurance coverage has made health services artificially cheap in the U.S., thus allegedly increasing our demand. Nor is there any evidence that Americans will enthusiastically seek a hip replacement just because it is a covered benefit in a health insurance policy. People seek health care (even when it is offered with little out-of-pocket expense) only when they are persuaded by a physician that they need it, not because it is offered at a low price. On the other hand, when they are persuaded by a physician that they need health care, Americans will pay any price to get it, even if they can not afford the price.¹³ Half of personal bankruptcies in the United States are caused by the cost of illness and injury care.

In truth, health care does not fit the definition of a commodity which can be traded efficiently in a free market. On the supply side, sellers of health services—like hospitals and doctors—are highly regulated by society, giving health care providers extra market power that

According to modern market-driven theories, ancient Jewish prophets are wrong; health care is not a charitable endeavor which we give to ourselves, it is a commodity best distributed through competing, investor-owned corporations which strive to make a profit.

compromises competition. On the demand side, people purchasing health care are not customers or consumers; they are patients. They lack the special knowledge needed to shop for health care the way one shops for a car; they are too sick to explore various options in a market, and they are not free to choose an alternative use of their resources. Society, by insisting that all should have some access to health care, has partially severed the link between demand and private purchasing power—a prerequisite connection for a free market. Health care often benefits society beyond the price attached to it. For instance, it matters to society as a whole whether each person with tuberculosis receives appropriate treatment, thus complicating the transaction between the tubercular patient and the caregiver. And society expects doctors and nurses to act ethically and not simply in their own self-interest as sellers in a marketplace. For all these reasons, the assertion by Mr. Snow that the market is the only answer to all American health policy questions is in error. The ancient Jewish prophets are still right about health care—it is not a commodity; it is a gift that we are morally obligated to give to ourselves.

If we reject market principles as a proper means to realize either a moral or an efficient health policy, how can we organize health care financing so that we can give the gift of health care to each member of American society? Over the past five decades, Americans have endorsed and tried many different health policy options. Employment-based health insurance was born during World War II as an inducement to bring people to work even though wages were frozen. President Lyndon B. Johnson's "Great Society" brought Medicaid and Medicare. President Jimmy Carter was responsible for Health Systems Planning and the Certificate of Need programs. The Reagan Administration tried diagnostically related groups (DRGs) for Medicare and HMOs. The Clintons proposed employer

mandates and managed competition, which were thankfully rejected. President George W. Bush is now proposing Health Savings Accounts. All of these are flawed policies which have failed or will fail. When it comes to health care policy, I take solace in the words of Sir Winston Churchill: "Americans will always do the right thing, after they have exhausted all the alternatives." In the spirit of finally doing the right thing in health care, I propose that we follow six principles:

1. Do what the Bible says to do: give the gift of health care to every citizen.

Anything less is manifestly unfair and leads to unnecessary suffering and death. Virtually all of the uninsured and underinsured in America are either employed or dependent upon someone who is employed.¹⁴ Therefore, most uninsured people are taxpaying citizens who are paying the world's highest health care taxes and are helping to fund care for the elderly and poor in our country, but have no health care financing when they need help themselves. The uninsured, working poor are paying the taxes which provide Medicare to the retired wealthy; there is no more inequitable policy in our country. We can solve that problem by guaranteeing health financing for all medically necessary care. That is merely what the ancient Jewish prophets would advise us to do.

2. Let patients make their own decision about which physician can best serve them.

In the final analysis, the choice a patient makes when selecting his or her own doctor is based upon a non-economic judgment. Patients tend to choose a physician who matches their expectation of ethical, care-giving behavior. To allow business decisions to interrupt the patient-physician relationship is to reduce the chance that the full potential for quality health care made available by modern medical science will be realized. After choosing a doctor, there are no other health care decisions a patient can make independently.

3. Cover every citizen for medically necessary care and unfettered choice of physician without increasing per-capita health spending.

This principle may seem counter-intuitive, but here are the facts: Americans are now spending over \$6,600 per person for health care, with 60% of the health care revenues coming from taxes, 20% from out-of-pocket payments, and another 20% from private employers paying premiums for workers.¹⁵ By 2015, the Bush administration expects the per capita health care budget to grow to \$12,000 per person per year, or approximately \$4 trillion per year, or 20% of the GDP. Current health spending in Utah is more than \$10 billion. Most of the

To allow business decisions to interrupt the patient-physician relationship is to reduce the chance that the full potential for quality health care made available by modern medical science will be realized.

revenue growth will accrue through increased taxes and out-of-pocket spending. I conclude that we have enough money to cover all Americans with medically necessary services. Since the revenues are primarily from individual taxpayers, we already have the funds to give the gift of health care to ourselves.

4. The means to achieve budget neutrality while providing universal, medically necessary care are available if we limit health care overhead costs.

Estimates of savings available through reducing bureaucratic costs and profit throughout the U.S. health system indicate that we can legitimately save \$300 billion per year (\$1.6 billion in Utah)—enough to fund universal, medically necessary health care in the U.S. American¹⁶ businesses outspend competitors in other first-world countries by 13-fold for employee health benefits, while seeing double-digit increases in health premiums each year. Overall administrative costs in the U.S. are triple that of other first-world countries.¹⁷ The leading edge of administrative waste in the U.S. health financing system is found in health insurance and managed care companies which have substantially higher overhead costs than do government health care payers.¹⁸ Administrative costs in health financing should be held to less than 5%. And the health insurance and HMO bureaucracy¹⁷ force health providers, hospitals and doctors,¹⁷ to waste their funds on an endless crusade to get payment for services rendered, driving up the price for physician and hospital services. Our¹⁹ failure to use possible economies of scale such as mass purchasing for large populations allows sellers of medical goods, such as pharmaceutical companies, to overcharge us for their products.

5. The quality of health care can be improved by eliminating competition among health institutions and replacing it with cooperation.

At its core, health care is not competition. It is an

enterprise based upon the cooperative efforts of doctors, nurses, other professionals, and institutions such as hospitals, long-term care facilities, and public health departments. Optimal patient care is achieved only when institutions cooperatively deliver high-intensity services. Motivation in the health care delivery sector matters,²⁰ as repeated studies have documented higher costs and poorer outcomes when the profit motive is allowed. The biggest fine ever collected by federal prosecutors for fraud was not Enron or MCI; it was from HCA, the largest hospital chain in the US, and one²¹ of dozens of medical care fraud cases during the last decade. Despite paying \$1.7 billion in fines, HCA's profits are up ten-fold in the past two years, and not because they are just better at delivering hospital care. As the State Health Officer for Nevada, I observed that sick newborns in Reno died at a higher rate than did those in Las Vegas. The reason for the disparity was that only one hospital in Las Vegas had a high-level newborn nursery while two smaller hospitals in Reno were competing to provide those services, neither of which could muster the necessary support for optimal care in the newborn intensive care nursery. Competition in health care always raises the cost of the care and lowers the quality.

6. Finally, the vehicle for financing all health care should be a private, non-profit trust fund with public governance in each state, which I call a health cooperative.

Each state health cooperative would receive all revenues for health care, no matter the origin, and, under the direction of a publicly elected or appointed board of directors, would pay for all medically necessary health services in the state. Federal assistance in founding and maintaining the state health cooperatives would be assured by passage of an already-existing bill: the States Rights to Innovate in Health Care Act. This bill provides for the removal of all federal rules and regulations which prohibit the establishment of a universal health financing system, such as ERISA. The bill also authorizes a block grant of all federal health care funds to any state demonstrating the capacity to fund care for all residents. Each state would provide the health cooperative with all currently appropriated state and local tax funds. The remainder of health funding from out-of-pocket and employer contributions could be raised with progressive payroll and individual taxes.

Health care is a gift we give ourselves, and we will pay for the gift collectively and fairly. Our benefits will be as generous as we decide they should be. Physicians will bill fee for service according to a negotiated schedule. Hospitals and other institutions will be paid a negotiated operating budget, eliminating the burdensome billing system for hospital care. A capital budget held in reserve

will be used to increase capacity according to need. Using economies of scale, the state health cooperatives will negotiate wholesale prices for pharmaceuticals and durable medical equipment.

These six principles have obvious merits: health care for all without raising new revenues, a return of authority over health care from the federal government to the states, and an opportunity to realize improved health for every American. But more importantly, these principles fulfill the intent of the ancient Jewish prophets. Hanging in the halls of Massachusetts General Hospital is a quote from Dr. Edward Churchill, one of the 20th century's finest teachers and innovators in surgery, which says: "Charity in the broad spiritual sense—the desire to relieve suffering ... is the most precious possession of medicine." Health care infused with that sense of charity can never be a commodity; it is the gift we give ourselves.

James Q. Jarvis, M.D., MSPH, is a specialist in public health and general preventive medicine, a former state health officer and staff physician at the National Jewish Center for Immunology and Respiratory Medicine. He currently serves as president of the Utah Health Policy Project.

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Discovery in Medicine:

*from Ancient Greeks
to the Present*

by Donald B. Doty, M.D.

“Modern medicine is the product of the Greek intellect, and had its origin when that wonderful people created positive or rational science” said William Osler.¹ Review of the principles that have been known and taught in the past brings perspective to what can be done when those principles are applied over centuries of practice in medicine.

According to Greek mythology, Apollo, the Greek God of music and of healing was the father of Asclepius. His mother was Coronis, a mortal woman. Apollo sent his son to Chiron, the half brother of Zeus, to be raised and taught about the healing art, especially regarding plants and medicines. Asclepius the person lived about 1200 B.C. He became a skilled healer and is said to have cured abscess, blindness, and baldness. It is reported that he brought a dead man back to life. When Asclepius died, mythology holds that the great god Zeus brought him into the heavens as the deity of medicine. Later, worship of Asclepius evolved to a religious cult of healing.²

According to the Greeks, Asclepius’ family were also involved in some aspect of medical care. His wife Epione soothed pain. His daughter Hygeia was the deity for prevention of disease. Another daughter, Panacea, represented treatment, and son Telephoros represented convalescence. The connection to words commonly used in medicine today is obvious: Hygeia—hygiene meaning a system of principles for the preservation of health and prevention of disease; Panacea—panacea meaning a remedy, cure, or medicine for all diseases or ills, a cure-all.

Many temples of healing in honor of Asclepius were built between the 6th and 3rd centuries B.C. throughout Greece and Turkey, then part of the Roman Empire. One of the largest and most famous was located at Pergamon, known today as Bergama, Turkey. Pergamon is near Ephesus, the city made famous in the holy scriptures by the apostle Paul’s visit and letters. The healing temple (Asclepion) has been excavated. The excavated Parthenon of Pergamon is located on a hill overlooking the city of modern Bergama and the Asclepion. From the archeological findings, much has been learned about the Asclepion or healing temple. People with various maladies were brought to the temple to be healed by the priests. Only those with hope for cure were admitted; individuals with terminal illnesses were excluded. It is said that those with illness began to feel better immediately upon entry and passing along the “sacred way” or street leading to the sanctuary. Once in the sanctuary, patients were met with comfortable quarters, beautiful gardens and trees, a large amphitheater for presentation of drama and music, and the treatment areas. Treatment consisted of therapeutic bathing in specially constructed pools, diet, exercise, and massage. Some drugs derived from plants were employed. Most interesting was treatment during “incubatio” sleep

in an area designed for that purpose. Therapy during sleep was administered by priests of the Asclepius cult who visited the patients during the night and wakened them from spontaneous or drug-induced sleep. They employed dream therapy, prayer, sacrifice, and symbolism to excite the imagination. Touching and palpation was employed. Minor surgery was performed such as lancing of abscesses. Non-venomous sacred snakes were used.

Serpent symbolism was important in Greek mythology. Hermes, also known as Mercury, is always shown bearing a caduceus, a staff with wings at the top around which two sacred snakes are entwined. Mercury is a god to commercial or military interests. The double snake caduceus is symbol of the pharmaceutical industry and of the U.S. Army medical corps. Asclepius is always pictured holding a staff much larger than that of Mercury with a single snake wrapped around it. Thus, the staff of Asclepius with single serpent represents medicine or the healing art most appropriately.³

The tradition of the Asclepion has persisted over the centuries and is now known as spa medicine. Modern spas offer massage, baths, steam or sauna, cleansing and wrapping with plasters and poultices which leave the skin tingling, and a whole menu of purges or enemas (colonics) to remove normal succus entericus or fecal material from the intestinal tract to “detoxify” the body.

Hippocrates was born on the isle of Cos and lived during the period 460-375 B.C. His physical appearance is not known because most of the statues of his likeness were created after his death. Generally, he is depicted as bald and with a full beard. Over time, he has become more handsome, and the most recent modern likeness of him that I have seen shows him with a full head of hair, a young Hippocrates, I presume. Such a likeness surely would look better on a doctor’s desk than the one thought to be closest to his real appearance. He was probably of short stature, bald, with beard, and not at all handsome.² It was not his appearance that distinguished him. It was his intellect. Hippocrates is considered the foundation of Greek medicine. He and his students produced extensive medical writings which have been assembled as the “Corpus Hippocraticum.” He gave a code of medical ethics—the Hippocratic Oath. He presented a rational attitude toward medicine, free of religious or supernatural explanations—the Hippocratic Method. He stated: “...to know is science, to believe one knows is ignorance.”⁴

Libraries were important in the Roman Empire. After the death of Hippocrates, scholars compiled the works of Hippocrates under the title “Corpus Hippocraticum.” The collection was assembled in the 4th century B.C. at the great library in Alexandria. It includes writings of Hippocrates and of others, both contemporary and later. There are 72 hand-written books and 59 treatises on



Photo: Donald B. Doty

Evidence of use of sacred snakes on excavated column.

various medical subjects including anatomy, physiology, pharmacology, medicine, obstetrics, surgery, mental illness, and so on.

Hippocrates provided a code of ethical practice of medicine. He said: “The physician must have a worthy appearance; he should look healthy and be well-nourished... he must look to the cleanliness of his person; he must wear decent clothes...” The Hippocratic Oath, to which most graduates of modern medical schools swear, consists of a pledge to the gods, teachers, future students. It prohibits harm to patient, deadly drugs, abortion, surgery, sexual relations with patient or his household, and revealing secrets discovered during care. Doctors are sworn to act with purity and holiness. The Oath, however, is inconsistent with the Hippocratic Collection which has several references to abortion, contraceptives by pessary, and surgery. Also, the earliest reference to the Oath is during the 1st century A.D., and may reflect religious ideals of the time rather than the opinion of Hippocrates himself. So, if the Oath is non-Hippocratic, why has it remained the symbol of the physician’s pledge to his calling? The Oath is in part recognition of the man, Hippocrates, considered to be an ideal physician. The principle parts of the Oath that stick in the memory of the physician swearing to it are timelessly correct: “To act in purity and holiness, to act in a manner of behavior ideal for a physician.”

The rational attitudes expressed in the collected writings of Hippocrates represent a great advance in medical thinking, but required centuries of gradual development. The consistency of the rational approach shown by the Hippocratic authors is exceptional. There are four parts to the Hippocratic Method:

- 1. Observe all:** The doctor employed all senses; no finding was too insignificant to record; observations were to be collected without prejudice; intellectually unconfined examination lessened chance of missing a finding.

Hippocrates stated: “A great part, I believe, of the Art is to be able to observe.” “Leave nothing to chance, overlook nothing.”

- 2. Study the patient rather than the disease:** Place emphasis on how patients react to the illness, not just type of disease; oppose classifying diseases according to organs affected.

Today, we are able to make precise classification of disease, but may confine attention to detail and neglect observations of general appearance.

- 3. Evaluate honestly:** Report case histories faithfully, with accuracy and objectivity, including deaths; expectations should not exceed reality.

“Life is short; and the art long; and the right time an instant; and treatment precarious; and the crisis grievous.”

- 4. Assist nature:** The chief function of the physician is to make conditions appropriate for the natural forces in the body to reach harmony and therefore health.

“As to diseases, make a habit of two things; to help or at least not to harm.”

If Hippocrates is the *foundation* of Greek medicine, Galen must be considered the *apex* of Greek medicine.⁵ Galen lived from 129-203 A.D. He was educated in Pergamon, site of the famed Asclepius healing shrine, and later at Alexandria. He returned to Pergamon as physician to the gladiators where he gained reputation and stature. His authority, theory, and dogma were unchallenged for about 1,500 years. Galen established experimental physiology with studies of the circulatory, renal, and spinal cord function in living animals. He regarded anatomy as the foundation of medical knowledge. He shaped pharmacology with large collection of medicines prepared using precise plant and animal ingredients. He was a prolific writer with over 300 titles attributed to him. It is said

that he kept at least 20 scribes busy recording his every dictum.

Galen viewed the body as composed of three systems: (1) brain and nerves—controlling sensation and thought; (2) heart and arteries—providing life-giving energy to the body; (3) liver and veins—providing nutrition and growth. He thought the health required equilibrium of body fluids (humors) which are: blood, yellow bile, black bile, and phlegm. The humors may be hot, cold, wet, or dry. Thus, were many possible combinations or deviation of the body fluid conditions that may cause humoral imbalance, for example blood may be too hot or phlegm too dry or too wet. The humoral imbalance may be confined to an organ or exist in the body as a whole. It was the precise diagnosis of the imbalance that allowed specific treatment to restore body balance using drugs derived from plants.



Photo: Donald B. Doty

Entrance to an area for “incubatio” sleep therapy, Asklepion at Pergamon.

During Galen’s lifetime, surgical procedures had advanced and we know that operations were performed on the head, eye, extremities, mouth, bladder, and genitalia.

Galen’s methods were based on animal dissection because human dissection was prohibited in Greece at that time. Inferences regarding human anatomy were based on dissections of ape and pig, leading to some errors. He performed experiments on living animals and demonstrated that arteries carry blood, not air, as was taught previously. He understood the valves of the heart controlled direction of blood flow. He knew that the heart generated pulsatile force and filled during diastole and expelled blood during systole, but he thought it was sort of an ebb and flow bellows system. He did not appreciate

that the heart was a pump causing blood to flow through the entire circulatory system. According to Galen⁶, blood was formed in the liver and was considered a *natural spirit* which was carried by the veins to all parts of the body. The *arteries* were filled with brighter, warmer blood (*vital spirits*). Arterial blood was warmed in the ventricle and distributed to all parts of the body as vital heat. The two systems were closed and communicated with other by a small amount of blood seeping through the lungs between the pulmonary artery and the pulmonary veins, thereby being mixed with air, then seeping through minute pores in the ventricular septum.

Galen’s writings achieved wide circulation during his life. By 500 A.D. his works were taught in Alexandria and his theories dominated medical thinking. Medical and church authorities considered his work based on divine inspiration, therefore infallible (*Divinus Galenus*). Greek manuscripts were translated to Arabic languages about 1000 A.D. His works were translated to Latin and from about 1490 A.D. strongly influenced European medicine. His theories were not challenged until 1543 when Andreas Vesalius revolutionized human anatomy with the publication of *De Humani Corporis Fabrica*⁷ showing that Galen’s anatomy was more animal than human. Galen’s theory of the circulation lasted until 1628 A.D. In spite of some errors in his science, it remains remarkable that a single individual could influence medical so profoundly for 1,500 years.

Vesalius was a remarkable and controversial physician. He became chair of surgery and anatomy at the famous and important European university at Padua, Italy at age 24 years. He did his own dissections, mostly on human subjects. With him, the old didactic method of teaching anatomy disappeared. In 1543, the *Fabrica* was published (age 28) based on notes from his dissections. In every section, Vesalius enlarged and corrected the anatomic work of Galen. In spite of dissection of all the ramifications of the arteries, veins, and nerves, Vesalius remained so influenced by the physiology of Galen that he also missed the idea of a general circulation. It should also be mentioned that Leonardo da Vinci (1452-1519 A.D.), who actually preceded Vesalius by 50 years, made significant contributions to the understanding of human anatomy.⁸ While understanding and beautifully illustrating the function of heart valves, he also missed the concept of a general circulation.

William Harvey lived in England from 1578-1657 A.D. He is credited as the founder of modern experimental physiology, using quantitative methods to verify natural science. His publication of *Exercito Anatomica De Motu Cordis et Sanguinis in Animalibus* (“De Motu Cordis”)⁹ was a landmark in the history of science. This 72-page book, published in the Latin language in 1628,

demonstrated the circulation of blood in animals. He was stimulated to study the circulation by observations he made in the valves of veins located superficially in the forearm of man. His simple experiments showed that blood flows toward the heart rather than toward the extremities as Galen had taught. Because of valves in the heart, blood could only flow in one direction and because both ventricles contracted and expanded together, there was no pressure difference between them sufficient to drive blood through the septum. Therefore, the heart was a pump, not a bellows. Harvey’s description of his observations on the cardiac function are both interesting and correct: “The heart is erected and raises itself up into an apex...It is contracted every way, but more so at the sides...It becomes harder at the time of its motion...The activity of the heart consisted in contraction of its fibers by which it expelled the blood from the ventricles.” From his experiments on the circulation Harvey concluded: “I began to think whether there might not be a movement, as it were, in a circle.”

Moving ahead to the 19th century, William Osler (1848-1919) was called the “most influential physician in history.”¹⁰ He published extensively. He wrote *Principles and Practice of Medicine*¹¹, published in 1892. He had extensive knowledge of medical history, publishing his lectures *Evolution of Modern Medicine*⁵ in 1913. He combined physiological and psychological treatment of patients. His personal charm and warm character equaled his skill as a clinical teacher at the bedside, making him the best known physician in the English-speaking world in 1900.

Principles and Practice of Medicine is a text on internal medicine based upon advances in medical science, especially bacteriology, during the preceding 50 years. Osler wrote the text in 15 months between September 1890 and January 1892, working five hours daily in addition to other responsibilities as professor and chief of medicine at Johns Hopkins Hospital in Baltimore. He mentions “getting into the harness,” meaning the chair at the desk with pen in hand to get the job done. The book followed a rigid format with classification of diseases according to pathogenesis of anatomical position. After publication later in 1892, it was recognized rapidly as the standard text on clinical medicine. It went through 15 editions between 1892 and 1945. Osler provided clear descriptions of diseases giving a wonderful appreciation of how much was known in medicine at that time and how much has stood the test of time and science to the present. A good example is that pertaining to coronary artery disease: “Lesions due to Disease of the Coronary Arteries.—A knowledge of the changes produced in the myocardium by disease of the coronary vessels gives a key to the understanding of many problems in cardiac

pathology. The terminal branches of the coronary vessels are end arteries. The blocking of one of these vessels by a thrombus or and embolus leads to a condition which is known as—Anaemic necrosis, or white infarct... Complete obliteration of one coronary artery, if produced suddenly, is usually fatal. When induced slowly, either by arterio-sclerosis at the orifice of the artery at the root of the aorta or by an obliterating endarteritis in the course of the vessel, the circulation may be carried on through the other vessel.” Collateral circulation in the coronary system was well known to Osler. Here is Osler’s description of obesity: “Corpulence, an excessive development of the bodily fat, is a condition for which the physician is frequently consulted, and for which much may be done by a judicious arrangement of the diet...A very important factor is overeating, a vice which is more prevalent and only a little behind overdrinking in its disastrous effects. A majority of persons over forty years of age habitually eat too much...A second element is lack of proper exercise; a third less important factor is the taking largely of alcoholic beverages, particularly beer.” Osler is quoted in another source as saying: “More people are killed by over-eating and drinking than by the sword...The glutton digs his own grave with his teeth.”

Some aphorisms attributed to Osler¹ demonstrate his good sense, organized life-style, and his dedication to accomplishment. Said he: “The physician needs a clear head and a kind heart.” “Observe, record, tabulate, communicate. Use your five senses.” “Let each hour of the day have its allotted duty, and cultivate that power of concentration which grows with its exercise, so that the attention neither flags nor wavers, but settles with bulldog tenacity on the subject before you.” “When you have made and recorded the unusual or original observation, or when you have accomplished a piece of research in the laboratory or ward, do not be satisfied with a verbal communication at a medical society. Publish it.”

By the middle of the 20th century, John H. Gibbon, Jr. had developed a device to substitute for the heart and lung.¹² His experiments began in 1934. He was assisted by his wife. In 1953 he was ready to apply mechanical cardiopulmonary bypass in human patients. After an initial failure, success came in May 1953 with the successful closure of an atrial septal defect in an 18-year-old girl. Unfortunately, two subsequent patients died and Dr. Gibbon did not perform another open cardiac operation. The need for open heart surgery remained for another to achieve consistent success for cardiac surgery to become a clinical reality.

John W. Kirklin and his associates traveled from Rochester, Minn. to visit Gibbon and learned from him the design of his artificial heart machine. They did their homework, following the road established by Gibbon

and during the subsequent 2½ years perfected the Mayo-Gibbon oxygenator. They established a consensus among the clinicians involved in heart care at the Mayo Clinic for a clinical trial which would include five carefully chosen patients who would be operated regardless of the outcome. These patients operated in early 1955, four of whom survived, opened the modern era of open heart surgery using the pump-oxygenator.

I learned heart surgery from John W. Kirklin, whom I consider to be the finest heart surgeon of our time. I spent 2½ rigorous years with him beginning in 1969. He was a truly remarkable person. Personal attributes which contributed to his success included intellect, ability to learn from others, analytical approach to the science of medicine, intensity, tenacity, and operative technical refinement. He was a demanding person, and though he demanded much of those working with him he demanded even more of himself. He brought together in his life and works all of the attributes of greatness of those that preceded him in applying rapidly expanding technology to the practice of cardiac surgery. Scarcely days passed without hearing him declare: "Leave nothing to chance, overlook nothing," a direct quote from Hippocrates. Most of what I did during the practice of cardiac surgery was influenced by his example. He died on April 21, 2004 at the age of 86 years, leaving a legacy of the first successful series of patients operated using cardiopulmonary bypass, many patients alive who would have otherwise died of heart deformity or degenerative disease, the definitive textbook *Cardiac Surgery*, and his trainees, including myself, who have carried on in his footsteps.

During the 50 years between 1955 and the present, the equipment used for cardiopulmonary bypass has been refined. We now have greatly improved pump machines that are durable and fail-safe, supported by sophisticated devices to monitor the performance of the machine and the condition of the patient. The lung part or oxygenator has been greatly improved, employing all disposable plastic construction, and membranes on which oxygen is exchanged to the blood. These devices cause little damage to the blood allowing operations of four or more hours if demanded by the complexity of the situation. This allows nearly all cardiac pathology to be approached operatively.

Having taken this brief tour of 3,300 years of medical progress, what have we learned about discovery in medicine? Hippocrates commented on what can be learned from the past: "But on that account, I say, we ought not to reject the ancient Art, as if it were not, and had not been properly founded, because it did not attain accuracy in all things, but rather, since it is capable of reaching to the greatest exactitude by reasoning, to receive it and admire its discoveries, made from a state of great ignorance, and as having been well and properly made,

and not from chance."¹⁴ Let us summarize what we have learned from great physicians of the past. Asclepius employed spiritual and natural means of healing, diet, exercise, and some drugs derived from plants. Hippocrates provided a method of assisting nature in healing, using careful unbiased observation and honest, objective evaluation of the patient. Galen expanded careful observation into precise diagnosis allowing specific treatment using an array of accurately prepared medicines. He established experimental physiology and his anatomic studies and writings gave a scientific foundation to the practice of medicine. Vesalius and da Vinci corrected erroneous science and enlarged knowledge of anatomy based on human studies. Harvey used quantitative methods to verify natural science in understanding the circulatory system. Osler harnessed the power of concentration and tenacity in careful analysis of known science in the publication and teaching of medicine. Kirklin appropriately applied technology, focusing his attention on making operations on the heart possible and successful, bringing together in his life example all of the attributes that made discovery a reality in those who preceded him.

It is remarkable how much the ancients knew, yet how primitive their practice was using simple medicines extracted from plants and basic surgical procedures. As treatment tools have developed rapidly during the technological explosion of the most recent century, discovery has advanced rapidly. Yet what seems so advanced today will surely appear primitive to physicians practicing in the not-too-distant future as treatment is based on genetic and molecular biologic determinants of disease.

It is the cumulative effort of countless physicians and a few great ones over these many years, each building discovery from new inferences in their own style based on information known from the past, that brought medicine to its present state. Today, each of us should apply principles of discovery in our own practice. We must understand that the natural powers of healing are stronger than any medicine or operation that can be applied. Therefore, recognize that our task is to assist nature in the healing process. Careful, unbiased, objective, and intellectually honest observation is the basis of accurate diagnosis. Treatment should be firmly grounded in the basic sciences. Science should be enlarged and refined by correction as required, using quantitative methods whenever possible to verify that science.

As we learn to focus complete attention and the powers of concentration on the problems that confront us, we place our mind in a condition that invites inspiration to solve those problems. We may then clarify the solution in writing so as to refine it and to teach others likewise. Technology appropriately applied can rapidly advance the healing science.

This discussion would not be complete without comment as to the source of all truth and knowledge, our Lord, Jesus Christ.

And truth is knowledge of things as they are, and as they were, and as they are to come... The Spirit of truth is of God. I am the Spirit of truth, and John bore record of me, saying: He received a fullness of truth, yea even of all truth. (D&C 93:24,26)

He is the ultimate source of merciful healing.

Have ye any that are sick among you? Bring them hither. Have ye any that are lame, or blind, or halt, or maimed, or leprous, or that are withered, or that are deaf, or that are afflicted in any manner? Bring them higher and I will heal them for I have compassion upon you... and he did heal them every one as they were brought forth unto him. (3 Nephi 17:7,9)

I have had sufficient experiences during 35 years of practice of cardiovascular surgery to know that I did not work alone. I have had my mind guided in decisions made in the operating room and had my hands directed to perform technical maneuvers that were beyond my ability. I have seen the loving healing power of Christ called down by faithful bearers of His holy priesthood to benefit my patients, my family, and myself.

What qualifies one who focused on the cardiovascular system to lead a dedicated group of health professionals dealing with the general health problems of missionaries? Called as a missionary, I have been given the blessings and privileges of that calling:

"Behold, I send you out to reprove the world of all their unrighteous deeds, and to teach them of a judgment which is to come. And whoso receiveth you there I will be also, for I will go before your face. I will be on your right hand and on your left, and my Spirit shall be in your hearts, and mine angels round about you, to bear you up." (D&C 84:87-88)

"...I say unto you, whatsoever things ye shall ask the Father in my name shall be given unto you. Therefore, ask, and ye shall receive; knock, and it shall be opened unto you; for he that asketh, receiveth; and unto him that knocketh, it shall be opened." (3 Nephi 27:27)

"...lift up your voices unto this people; speak the thoughts that I shall put into your hearts... For it shall be given you in the very hour, yea in the very moment what ye shall say." (D&C 100:5-6)

Every health professional who has served as a missionary in support of missionary health and those of you who will feel moved to serve in the future, know that the Lord

Jesus Christ and the Comforter, the Holy Ghost, are our constant companions, allowing us to recall from a broad base of medical and scientific principles well known to us for as long as 50 years in order to make sound health recommendations even in areas we would not otherwise be competent.

Finally, since we began with a quote from William Osler, it seems appropriate to end quoting his personal ideals, which if applied in our own lives would assure greatness as a physician and personal maturity. Said he: "I have three personal ideals. One, to do the day's work well and not to bother about tomorrow... The second ideal has been to act the Golden Rule, as far as in me lay, toward my professional brethren and toward the patients committed to my care. And the third has been to cultivate such a measure of equanimity as would enable me to bear success with humility, the affection of my friends without pride, and to be ready when the day of sorrow and grief came to meet it with the courage befitting a man."¹

Donald B. Doty, M.D. is a specialist in cardiothoracic and general surgery and currently serves as chairman of the Missionary Medical Services Committee of the LDS Church.

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