

**A PROPOSED MODEL for DELIVERY of AN UPDATED CURRICULUM in
HEALTH CARE MANAGEMENT**

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EXECUTIVE SUMMARY

Globally, the provision of health care services is placing increasing demands on political, economic and social systems. Political entities advocate solutions conforming to capitalistic, socialistic, dictatorial, or benevolent aristocracy preferences. A long-range or mid-range systems view toward health care delivery is ignored in favor of established patterns or Weltanschauung advocated by the entrenched political-economic power holders. Change in health care delivery is vigorously opposed by the establishment.

Some national systems are forward thinking, many ignore the looming global crises in health care delivery, although radical system change is needed. Small, frequently useless, adjustments which prolong and exacerbate the problem are the approach of choice.

Medical technologies, though noted and utilized in selected settings, is employed partially and unsystematically. Electro-mechanical technologies, biotechnologies, proteonomics, epidemiologia, quantum neurologia, and sub-protein biologies in various life forms are frequently treated as specialty disciplines with only references to their value in health care provisioning. Certain political-economic systems advocate and promote prescriptive chemical drug solutions to diagnosed physical, emotional and neurological health problems. The solution of choice calls for chemical prescriptions in these countries. Other cultures employ what is referred to as Eastern Medicine, and/or Western medicine, and/or Mind-body, and/or Experimental medicine, and/or Native medicine practices-alone or in combinations, to address pathology, human illness, disease, and distress.

Demographic change, sedentary lifestyles, diet shifts, pollutants, and other causes point to the collapse of the health care delivery system. The costs associated with health care will accelerate exponentially stressing any and all economic systems. The haphazard introduction of technologies will accelerate the proliferation and cost of health care facilities, while the proliferation of new drugs will introduce new and exciting challenges to address side effects and unexpected reactions.

As health care becomes increasingly unaffordable, political-economic systems will find it necessary to initiate preventive medicine technologies, practices and systems to encourage populations to avoid detrimental practices and customs and lifestyles. At the same time, it will be necessary to proscribe healthy living practices on a class by class or person by person basis. Individuals with commitment to preventive care will be retested at health centers and their preventive programs will be reconfirmed periodically. Non-participants in preventive care will be required to financially support their own health care costs while fully participating persons in preventive programs will receive dramatically discounted financial coverage. Exponentially increasing health care delivery costs will contribute to the threatened collapse of economic systems and may encourage revolutionary change in political systems.

SECTION ONE

Background

Developments in technology, systems, practices, and the influence of emerging scientific research affect the delivery of health care. The human genome project has provided a rich source of material for analysis and experimentation. The advances in protein analysis and protease mapping pushes the walls of human research faster than allied fields can respond and conduct relevant studies. Micro-electromechanical devices applied to medical procedures are opening new opportunities faster than the newly developed devices can be tested and studied. Full body scanning machines are allowing radiologists to evaluate complex, three-dimensional rotated views of the whole organism as well as the smallest parts of organs and glands. Cellular biology and biochemistry advances offer enticing options for correcting genetic signatures before inherited diseases can strike. At the same time epidemics are raging-Alzheimer's, diabetes, heart disease and stroke fill entire wings of numerous health care facilities; and the patient numbers are growing in parallel with the graying of the planet. These patients will outnumber the carcinoma class in a few short time periods.

Health care professionals are encountering complex cases at an exponential pace. Individual cases like those with stroke, Alzheimer's and diabetes simultaneously on their charts represent increasing numbers at an alarming pace in institutions.

Charting and medical records are bloated with entries. Moving complex case patients and their complete files from care giving site to care giving site is a challenging project. Frustration, resentment, anger, and hostility frequently accompany poor or incomplete records, hard to read film, confusing pharmacy lists, and partial patient

histories frequently add to the challenges placed on all professionals. Telematics and other electronic entry processes are too slowly finding their way into patient records.

Health care facilities located in other than major cities find peer consultancy weak or lacking. The opportunity to consult with allied specialists on a complex case is rare in smaller communities. The absence of this collaboration sometimes adds additional complexity to an already difficult case. Telemedicine is slow to find its way into health care locations.

Recently, government patient privacy concerns have surfaced under HIPAA. That has added still another layer of effort to patient processing. Delays, though slight, add to the resulting challenge handed to professionals in emergency or stat environments.

Over the years, health care practices have evolved slowly and methodically, sometimes disdaining large technological changes and frequently ignoring smaller ones. In some institutions systemic changes can be implemented. Others are content to make minor adjustments and those not necessarily in a timely or complete manner. Is it possible that a new systems approach is called for? Are the conditions, costs, processes, technologies, and sciences setting up so that a new approach is dictated? The research questions below may help to explore the fields for some answers.

Scope

The research will examine different soft and hard technologies applicable to health care management. At the same time, three major health categories i.e., heart disease/stroke, Alzheimer's disease and diabetes will be of central interest in the research process.

Limitations

This study will not attempt to identify causes of diseases nor recommendations for addressing treatment strategies or processes. The research is restricted to identifying major trends in health care management and to suggest alternatives which can be addressed with training and education. This study is limited, addressing a regional model; though it will provide references to alternative processes in the USA and in other cultures and countries.

Intended Audience

The audience best served by this research includes educators, trainers, curriculum developers, health care physicians, executives and managers, managed care professionals, biochemists, biotechnicians, pharmaceutical professionals, and others in related fields.

Research Questions

This study addresses the following research questions:

- What are the philosophical and economic issues surrounding an improved and advanced health care delivery system?
- What characteristics can be identified in a minimized model of advanced health care delivery?
- What are the major technologies contributing to or expected to contribute to an advanced health care delivery system?
- What is the financial significance of employing selected technologies in health care delivery systems in the USA?
- What are the roles of educational and academic institutions in identifying needs and providing curricula creation for an advanced health care delivery system in the USA?

The research questions will be addressed in the several sections of the paper, while the curriculum will be provided as an appendix. Further, an additional appendix

will contain references too numerous to be included as a Bibliography. The references will include texts, books, manuscripts, WEB references, journal articles, speeches and other materials. Many references provided are from materials read and evaluated. Not all the secondary references have been reviewed, but are being provided for use by readers who would indulge themselves in expanded understanding of selected topics.

Research Methodology

This study will utilize descriptive research, bibliographic analyses, technology evaluation, much secondary research, small case studies, and limited field studies. Some primary research addressing future trends will be contained in an appendix. Objective research and evaluation of proposed curriculum, syllabuses, and educational processes will have to wait until after initial development, presentation and testing processes have occurred.

No sources of funding of any sort were used to assist in this research. The researcher has no conflict of interest directly relevant to the content of this study.

Participants

Contributors to this research include Ms. Shawna Coxley who researched many WEB sources and downloaded numerous articles addressing several topics in health care management and Ms. Casandra Gabor who did her best to organize all this information into one cohesive piece.

Ms Lynne M. Scanga, Manager, Continuing Education, Ohio Valley General Hospital, made several suggestions regarding educational needs of practicing health care

professionals. Ms Scanga particularly focused on the changing educational needs of nurses, physicians and technicians.

Ms. Dee Morgillo, Director of Education for AmeriNet Central, addressed educational needs of administrators, managers, and executives, in hospitals, nursing homes, and in rehabilitation centers, as well as in other settings where medical and health care interventions occur. She has curriculum development experience in academic settings and in currency training for medical and health care technologists.

Dr. Margaret Marcinek, Chairperson of the Nursing Program at California University of Pennsylvania suggested that practicing nurses need a curriculum that enriches and expands their nursing abilities by addressing the new technologies, practices and developments in their fields: especially, a systems view that includes emerging technologies, telemedicine, telematics, and complex case management.

Other assistance came from several practicing and research MD's, who expressed concern over the fragmented approach to addressing diabetes, Alzheimer's and stroke.

ABOUT THE RESEARCHER

John E. Michaels earned his Doctorate in Business Administration through the George Washington University in Washington, D.C., in 1976. His Masters, Bachelors and Associates degrees were all received at American University also located in Washington, D.C. His 27 years of academic experience include his current Director and Chairperson Position for the Professional Studies Department located at California University of Pennsylvania, Director Positions at the University of San Francisco and the University of Phoenix, Professorships and Full-Time & Adjunct Faculty Positions at Johns Hopkins University in Maryland and other universities throughout the United

States. He directed and contributed to the curriculum design and development for several high-level management and technology masters degrees within those universities he has served. As a faculty member for educational institutions across the continent, he has had the opportunity to assist in the educational advancement of students in the fields of Business, Economics, Engineering, Management, and the ever-changing field of Technology.

Dr. Michaels has consulted with and studied major firms in Korea. These activities examined the expansion of a \$10 Million Fishery Storage organization; a \$20 Million Paper Cup Manufacturer expanding into Japanese markets; a world-class Ski Resort sale, and also a \$32 Million Vending Machine business. In his native country, he has addressed the needs of private, public, and governmental agencies as high as the office of the President of the United States for organizational management, systems management, time-management, information management, personnel management, and more. His is a lifetime career dedicated to the constant improvement of the worlds of business and technology and to their smooth integration.

His many publications include: Aspects of Electronic Funds Transfer in Banking and Social Sectors of the Economy, C.E.I.R. Library, Washington, D.C., 1965; Contract Monitoring for Databases in 50 States, U.S. Department of Transportation, 1970; Economic Five-Year Forecast for the Mobile Home Industry, Centerville, VA, 1971; Economic Decision-Making for Computer Facilities Management, Westinghouse Corporation, Pittsburgh, PA, 1971; Drug Abuse and Social Forces in Industry, Report prepared for Fountain Associates for HEW, 1972; and Management Problems Encountered by a Securities Validation Firm in its Relations with Organizations in Public

and Private Sectors, Dissertation, The George Washington University, 1976. Numerous thesis, dissertations and research projects as director, co-author or researcher—from 1976 to the present—can be attributed to his dedication and perseverance to further improve education in businesses, governments and individuals.

SUMMARY OF SECTIONS

In the first section of this paper the reader will find a description of the mechanics, methods and approach to the research. Several paragraphs will address the background concerns leading to the need for the research.

The second section will provide a review of selected literature relevant to science trends. This section will explore philosophical issues and emerging science topics contributing answers to selected research questions stated in the mechanics section.

The third section will examine emerging methodologies contributing answers to other research questions. This section will examine regionalism and financial approaches to assessing costs associated with the employment of technologies in advanced health care settings.

The fourth section will review the role of academic institutions in creating, updating and delivering a curriculum addressing advanced health care management.

The final section will restate the research questions and show how each was answered. The researcher will then observe what might be done differently if the research is to be repeated. Recommendations for future research, what might follow in subsequent research studies; and other quantitative and qualitative suggestions will be provided.

Definitions, terms, glossary, and acronyms are provided in Appendix A.

The next section will address the research questions and expand the material embraced in this study.

SECTION TWO

This section will attempt to answer the following research Questions:

- What are the philosophical and economic issues surrounding an improved and advanced health care delivery system?
- What are the major technologies contributing to or expected to contribute to an advanced health care delivery system?

The rapid development of the INTERNET has led to a proliferation of professional papers appearing on WEB sites. Many papers are published in Journals and other specific publications, but appear on WEB sites sometimes as much as three months ahead of print. Not all valuable material is found in this fashion. Texts, monographs, theses, dissertations, laboratory and field study reports and much material from National Institutes of Health are best found in hard copy.

Examples from material found to contribute to the answers to the questions posed above follow.

Philosophically, it appears that the field of health care responds to the alerts of the day and to the swarming effect. SARS,⁴ smallpox threats, HIV-AIDS, Mad Cow disease, West Nile Virus, and other stimuli push research dollars and Euros in one direction or another. Not to suggest that dollars are pulled from earlier commitments, but to note that the squeaky wheel gets the attention. The National Institutes of Health have done a fantastic job with prioritizing research in spite of continuous political interference.

To the untrained eye, there seems to be no focus in national health care policy. However many would argue that the focus is as it always has been to address disease and especially those diseases that take on epidemic proportions. Accordingly, this research will address epidemiology.

The popular press has it that the next epidemic to strike the planet is Alzheimer's disease. Running parallel to the graying of the planet, the disease strikes persons from their mid-thirties on. In early years, the effects may be asymptomatic. From their thirties on, the same individuals may not become symptomatic until a decade or so later. The cumulative effect of brain cell loss will lead to the diagnosis which began its journey 10 or 15 years earlier. The three categories of Alzheimer's may, later, like the classification 'cancer' take on multiple sub classes and provide specificity where none now exists. But Alzheimer's, stroke and heart disease, and diabetes represent non-infectious epidemics.

However, methods in epidemiology dictate assessment concepts addressing associations, environmental factors, relationship of nutritional status, diet, lifestyle, intra-individual variation, sensitivity, and genetics as well as the application of biology and virology in evaluation and planning prior to the application of health care strategies.

Meta-Analysis

An example in DIABETES CARE¹, addresses diabetes and further divided the study to Arab Americans. The conclusions of this epidemiology study found the prevalence of diabetes and glucose intolerance to be extremely high among Arab Americans in a specific geographic area. The study separated categories according to sex, age, obesity, and family history of diabetes. The findings asserted that the study indicates a major clinical and public health problem. Using this as a model, various Standard Metropolitan Statistical Areas (SMSA's) could identify the major epidemics affecting the population in their specific area. For example, in Southwestern Pennsylvania, one could assert that Diabetes, stroke and heart disease and Alzheimer's are the major epidemics. Obesity could be regarded as a contributing factor. Using this

example, this research will maintain continuous reference to the three epidemics identified above.

Genetics are identified as a contributing factor in epidemiologic studies. How much weight should be attributed to genetics requires further research. However another aspect appears as genetics becomes a part of epidemiologic studies, and that is the effect of a defective gene on the individual or the class in the study. Many clinical studies uncover effects attributed to genetic defects. One such study is a straight forward example of the interplay of genetic defects. In a report² on Darier's Disease the authors assert that more work is to be done on understanding how genetic mutations give effect to other analogous dysfunctions. Most studies, clinical trials and disease management protocols accept the genetic issue. Few build the trial around 'genetic defects' as an expected and significant factor in pathology.

Lawlor, et al,³ examine lay epidemiology to explain the failure of programs owing to social class. Deprived populations contribute more to the failure of smoking cessation programs than those in non-manual and professional occupations. Economic cause and effect are significant factors. Perhaps economic/ financial status is a major epidemiologic factor in the three diseases mentioned above. It is doubtful that making everyone an upper – middle class member will solve the problems of diabetes, stroke and Alzheimer's diseases. But the effect of gene mutation may have as much weight as social status if those factors were studied exhaustively in today's epidemics. Because many studies are funded by governments, do the political systems even want to know some things?

Parasitic, bacterial and viral outbreaks constitute the three principal varieties studied in molecular epidemiology. Interestingly, the genogroupings seem to develop

strains and surface regionally (SARS)⁴ Studies conducted by different researchers yield mysterious results lacking a comprehensive insight into the phylogenetic relationships owing to lack of a standardized methodology, (Cardosa, et al).⁵ The compelling factor urging these studies relate to the highly virulent nature of certain viruses and the disease syndromes attributed to them. Materials and methods proscribed for researchers in clinical trials do not always accommodate the diseases represented by different strains of genes or their mutated offspring. And the discovery of rare diseases without epidemic outcomes is difficult to understand. For example, *Neisseria meningitidis* serogroup W135 was first identified in 1968 but the first large outbreak of the disease was observed 32 years later (Gold)⁶. Rare diseases use unknown catalysts to explode into epidemics. Too little is understood about the processes which accelerate or decelerate diseases. Are diseases related to age groups? This factor seems to have been refuted in studies. Increased rates of infection occur in age groups previously exempt entirely from the disease is identified in many studies (Moura, et al).⁷

Compatibility of viral, bacterial and fungal infection is increasingly observed. Noteworthy were the cases studied in HIV infected individuals (Mirza, et al),⁸ where fungal infections occurred some time after treatment of AIDS infected individuals. The fungal infections were absent in the early stages of the treatment. The high number of incident cases led to studies which identified AIDS treatments as contributing to the development of parasitic and fungal diseases. At the same time clinical studies addressing prostate cancer which seems associated with high-risk—low-risk populations, yields confusing results. Japanese men have a low incidence of this disease, but when Japanese men move to the USA their incidence of prostate cancer increases (Grönberg),⁹ but not

to the same levels as other Americans, and only to 25% the rate for African Americans. Inherited prostate cancer was estimated at 42% in some twin registry studies in Denmark, Sweden, and Finland. Polymorphisms in important genes associated with prostate development correlate highly with prostate cancer risk. Diet, chemoprevention using nutrients and selected foods provide lower incidence of the disease (prostate cancer) and more studies are needed to determine if the reduction in occurrence is temporary or permanent.⁹

In a study of hepatitis E virus, (Clemente-Casares, et al),¹⁰ the viral strains explored and analyzed indicated that hepatitis E is more common than previously thought and that its infectious level was far more dangerous than previously realized. Only through the protein studies evolving from recent research could strides in understanding this and other diseases come about. Variants of the virus swarm regionally and new strains are identified as protein studies are expanded. Philosophically, the outlook is hazy owing to the finer adjustments possible in research, clinical studies, and improved methods and materials. Although results are improved, in some sense old studies may have to undergo rework. It is necessary to add new dimensions to the research process and re-investigate previous studies in light of new knowledge.

Forensics relies on statistics, especially maximum likelihood testing, to support arguments intended to convince a jury. The molecular epidemiology processes are most necessary for diseases with a prolonged asymptomatic period. Difficulty is compounded when attempting, among subjects, to identify the effects of common variants and isolate those from common risk factors. The problem is compounded further if the sample is small (Gonzales-Candelas, et al).¹¹ But the issue is not just with forensics, the cases (subjects)

under study may be small⁴, as with SARS, but the threats ominous. Statistics and projections are as accurate as circumstances allow. The conclusions, treatment, case control methods, therapies, quarantines, surveillance and health care practices could exaggerate the importance of the epidemic. In other cases the evaluation may significantly underestimate the consequences of the epidemic, (Michaels, Aids epidemic estimation, 1983).¹²

Molecular events in cell growth are complex. The intercellular pathways are a complex web and interactivity is poorly defined and faintly understood. Especially as the growth of cell carcinoma has been observed and challenged pharmaceutically, science begins to understand that the answer to inhibiting such growth lies in understanding the messengers in cellular biology and molecular activity and memory (Rafferty)¹³. The cellular biology studies from carcinoma cells leads to understanding the cellular and gene transfer effects of cardiac myocyte (Basilia-Borgia)¹⁴. Intracellular serpins in human blood cells have been ‘borrowed’ by viruses and used by them to inhibit or suppress host inflammatory response (Coughlin)¹⁵. Cellular biology helps unravel the disease process. Understanding cell transformations and the interaction of cellular arrays and their pathways and inter and intracellular exchanges accelerates the identity of processes leading to organ destruction. (Zockbauer-Muller, et al.)¹⁶ summarize:

The use of techniques such as micro arrays for testing expression of nearly all human genes and their isoforms at the same time in lung cancer, or other genome –wide strategies involving proteomics, will provide large amounts of information. That need to be translated into clinical practice...and...understanding of cancer pathogenesis.

Disease processes, found in stroke, heart disease, diabetes and Alzheimer’s have sub-clinical roots and obscure expression. “Biochemical and pathological attributes of the

disease can exist for many years prior to the onset...”(St George-Hyslop and Martin Rosser)¹⁷.

The ethical concerns associated with health care seem to expand with technology. Bioethics is a case in point. Many examples of conflicts surface as science expands deeper into human make-up (Crigger)¹⁸.

Summary

Research has expanded into many facets of the health care universe. In the preceding section, research efforts were aimed at emerging problems while ongoing research into causes and contributing factors of AIDS, cancer, West Nile Virus, and other serious health threats continues along pathways identified as problematic to each disease. Pure research is needed to study non-clinical aspects of these diseases. But the philosophical approach is currently centered on physiologically related cause and effect studies. But how to create new approaches to research and who to encourage pure research remains a challenge. Economics seem to direct the research, especially when pharmacological answers offer to provide symptomatic relief.

On the other hand, emerging and advancing technologies contribute significantly to the reduction of time needed to conclude some studies and some research. For example, the ability to link fifty or one hundred PCs together to solve a complex RNA or genetics problem has led to a rapid identification of the human genome mystery. Similar efforts are addressing the genetic make-up of animals and plants. Similarly, the application of LASER Chromatography, the improvements in the electron microscope, super fast microprocessors, and other technological advances improve research results while shortening the research study times. These advances fuel other progress in

biochemistry, genetics, quark research, molecular biology, proteomics, and other sub-cellular research. With so much power in research instruments, the direction and breadth of studies must not ignore the less obvious non-physiological thrusts which may hold important keys to solving health problems.

NOTES

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- ¹ “Epidemiology of Diabetes Among Arab Americans,” Diabetes Care, Volume 26, Number 2, February, 2003, pp. 308-313.
- ² “Darier’s Disease: Epidemiology, Pathophysiology, and Management,” Am J Clin Dermatol 2003; 4 (2), pp. 97-105.
- ³ “Smoking and Ill Health: Does Lay Epidemiology Explain the Failure of Smoking Cessation Programs Among Deprived Populations?” American Journal of Public Health, Volume 93, Number 2, February, 2003, pp. 266-270.
- ⁴ “WHO issues global alert on respiratory syndrome,” News, Hong Kong, March, 2003.
- ⁵ “Molecular Epidemiology of Human Enterovirus 71 Strains and Recent Outbreaks in the Asia-Pacific Region: Comparative Analysis of the VP1 and VP4 Genes,” Emerging Infectious Diseases, Volume 9, Number 4, April, 2003, pp. 461-468.
- ⁶ “Epidemiology of Meningococcal Disease In Light of Recent Hajj-Associated Outbreaks,” CID 2003:36, March 15, 2003, pp. 684-686.
- ⁷ “Epidemiology of Meningococcal Disease, New York City, 1989-2000,” Emerging Infectious Diseases, Volume 9, Number 3, March, 2003, pp. 355-361.
- ⁸ “The Changing Epidemiology of Cryptococcosis: An Update from Population-Based Active Surveillance in 2 Large Metropolitan Areas, 1992-2000,” Clinical Infectious Diseases 2003:36, March 15, 2003, pp. 789-794.
- ⁹ “Prostate cancer epidemiology,” The Lancet, Volume 361, March 8, 2003, pps. 859-864.
- ¹⁰ “Hepatitis E Virus Epidemiology in Industrialized Countries,” Emerging Infectious Diseases, Volume 9, Number 4, April, 2003, pp. 448-454.
- ¹¹ “Epidemiology and Forensic Genetics: Application to a Hepatitis C Virus Transmission Event at a Hemodialysis Unit,” The Journal of Infectious Diseases, JID 2003:187, February 1, 2003, pp. 352-358.
- ¹² John Michaels, Confidential Research Study funded through a major west coast university for unidentified client, ‘Study, projections of the epidemic were within 5% of actual statistics in 10, 15 years after study completed. Client rejected, dismissed as exaggeratedly high, study results in 1983.
- ¹³ “An overview of the role and inter-relationship of epidermal growth factor receptor, cyclin D and retinoblastoma protein on the carcinogenesis of squamous cell carcinoma of the larynx,” Clin. Otolaryngol., 2001, 26, pp. 317-320.
- ¹⁴ “Life and death of a cardiac myocyte: principles of cellular biology,” Perfusion, 2001, 16, pp. 229-241.
- ¹⁵ “Intracellular Serpins in Haemopoietic and Peripheral Blood Cells,” British Journal of Haematology British Journal of Haematology,” 2001, 155, p. 763.
- ¹⁶ “Molecular Pathogenesis of Lung Cancer,” Annu. Rev. Physiol, 2002, 64, p. 697.
- ¹⁷ Unraveling the disease process,” The Lancet Supplement,” 358, December 2001, p. s1.

¹⁸ “Cases in Bioethics: Selections from the Hastings Center Report,” 3rd Ed., St. Martins Press, Boston, MA, 1998,

SECTION THREE

This section will address the questions:

- What are the major technologies contributing to or expected to contribute to an advanced health care delivery system? And
- What is the financial significance of employing selected technologies in health care delivery systems in the USA?

Meta Analysis

Minimized models as used in this study refer to non-national models. Some users of similar concepts prefer the term ‘regionalization.’ The contents infra will use the terms interchangeably. In the instant case the minimized model encompasses some 13 of the United States and the heart of that area would be south western Pennsylvania.

The technology referred to as telemedicine is explored here since the combined expression referring to the provision of health care in regions implies that some un-served groups can receive the benefit of improved service through the utilization of telemedicine. This topic has been discussed in the USA since the 1920’s as referenced in a work by Hassinger, in 1982. In Canada, cost-savings ideology has driven the regionalization telemedicine model to achieve improved management of health care in welfare-based populations (Cutchin)¹⁹.

According to managers at the United States Veterans Administration, (Vizcarrondo, 2003)²⁰, there are multiple benefits to administrators and patients when moving selected specialties to some hospitals. Patients are diagnosed using telemedicine technologies, and then transported to the care center best suited to address patient issues. Duplication of specialized care can be avoided and the best trained specialists are provided to maximize treatment results.

The term 'Telemedicine' embraces several technologies to include the use of wireless, television, broadband, FAX transmission, color printers, compact disk read/write capability, teleconferencing, personal computer cameras, radio and RF technologies, computer based education, telephone transmission of stethoscope soundings, EEC's, EKG's, and other teleradiology, laboratory testing results with simultaneous reporting to waiting health care professionals, and other emerging processes utilizing satellite technology coupled with global positioning locators. The latter currently used to precisely identify incidence of West Nile infected birds and people. Some observers regard the linking of data facilities employing synchronous optical network (SONET) as telemedicine. (Bio-IT World Vol2, issue 20 July, 2003)²¹

Others might regard the SONET application as enabling TELEMATICS. This term has been used in various ways to include scanned patient records, complex case management records, electronic patient records, automatic messaging, digital signal processing (DSP) of patient monitoring devices, and other technologies (Praba-Egge et al.)²². Some professionals use the term INFORMATICS interchangeably with TELEMATICS and TELEMEDICINE (²¹, ²²) (Izquierdo, et al.)²³. Other professionals employ the term INFORMATICS to imply disease information, protocols, processes, pathology, pharmaceuticals and their interactions, case management outcomes, side effects of treatments, and other concepts (Rinde, Eivind and Lise Balteskard)²⁴.

In a 2002 paper, Ohinmaa and Hailey²⁵ argue that telemedicine technologies are being universally applied and decision makers are concerned with assessment processes to measure the cost effectiveness and cost savings compared with conventional alternatives.

The researchers offer several methods which have shown results in measurement. As with most technology, monetary advantage usually occurs as users learn to identify and employ the technology specifically to instant organizational needs and models (Teich)²⁶. Others argue that telemedicine encourages international collaboration (Robinson, et al.)²⁷.

While a growing population of health care professionals expand the already voluminous characteristic telemedicine technologies to include Telehealth, E-health, networks, cellular, quality-of-service, and knowledge management (Tan, et al.)²⁸, others assess the value of the differing technologies, but only in specific cases. For example: concerns with the quality of interactive distance learning modules, led to analysis of the value of interactive distance learning (termed telemedicine), and came to the conclusion that web-based distance learning is the more appropriate delivery approach (Bangert, et al.)²⁹ for some applications.

Cost considerations affect licensing. For example, telephone triage, tele-home care, and temperature, pulse and blood pressure over telephone lines, as nursing functions can be carried out long distance. Nurses in one state can reach into several adjoining or even non-adjoining states to address nursing responsibilities. Licensing policies are determined by individual states. Do states need to address special licensing for the practice of telemedicine and how would that activity be monitored? Should tele-nurses and tele-physicians bill at the highest rate allowed in that state? Or should telemedicine have a separate table of fees? These questions are now examined in several states (Simpson)³⁰.

The term ‘Telematics’ is increasingly associated with automobile electronics. Others apply the term to telematic services in rural areas (Costopoulou and Anagnostou)³¹; and apply the term to agricultural information processing. The United States Department of Defense (DoD) conspicuously avoided the term in addressing the award of recent contracts to put all DoD’s personnel medical records into a data base configured by theater of war (Washington Technology)³². The article uses the term “Theater Medical Information Program” to describe what others might call ‘telematics’ or ‘informatics.’

Other parts of the world seem to favor the term Telematics to describe the ability to integrate (Information) society (Grimes and Collins)³³. In pharmacy, the use of personal digital assistants (PDA’s) to access prescription options in a hospital environment, in Michigan, successfully provides safety tips and other information to physicians and other health care professionals (McCreadie, et al.)³⁴.

The costs of technologies frequently are not measured to evaluate the payoffs of technology. Sometimes convenience, safety and a sense of cost effectiveness is enough for budget makers.

The fees for full body scans are usually denied by insurance company rules, only when prescribed by disease or accident do they reimburse. The value of preventive medicine seems to be a negative for insurance firms. Computed tomography (CT) and PET scanning techniques have improved to the sub glandular level in three dimensional takes (Tasota)³⁵. Clinically, the CT scan has been successful in detecting disease in asymptomatic individuals and the benefits outweigh the risks (Horton)³⁶. Scanning

technology is improving rapidly and professional organizations establish Scanning Centers to serve selected areas (Kappel)³⁷.

Even electronic filing systems (Phillips, et al.)³⁸ and electronic archiving and records management (Stephens)³⁹ fold over into medical files. (Simone)⁴⁰ and (Truell)⁴¹ Denmark represents the global leader since they are the first nation to authorize full electronic recordkeeping.³⁹ In a long article on personal electronic filing covering a twenty year period, the researcher provides sixty key issues associated with filing and retrieving materials (Wilson)⁴². The amplification and expansion of technology and the perfecting of technology techniques is accelerating the employment of technologies. The health care professionals have many sources to study for application to their specific discipline.

Summary

Health care is a study in growing complexity. “Seeing the doctor” is not so simple in today’s world and promises to become even more complicated. What was once a “doctor-patient” relationship is now a “doctor-patient-federal government-state government-local government-insurer-HMO-professional practice-lawyer-laboratory-pharmacy-etc.” relationship. Sometimes the right technology for a case is denied based on some rule embedded in one of the parties of the relationship. The use of MRI’s, and other scanners, is usually not a reimbursable insurance expense. But these scanners can identify pre-cursors to disease and can recognize emerging problems. The doctor-patient agreement to do the scan is interrupted by the insurers denial of fees. Is the doctor liable if some health issue comes up a bit later, a problem which may have been mitigated had

the scan taken place? Should the MD have “demanded” the scan? And, should she or he done so and no issue was identified by the scan is the waste(?) of the expense an issue?

Is it financially responsible to make high expenditures addressing a disease, when less expense directed at preventive medicine may have been the smartest tradeoff? The issue of preventive vs. curative is a non-issue. Everyone agrees on prevention as the best approach. However, there is weak focus on this approach. Generalized information is the norm and prescriptive lifestyle changes are addressed when symptoms appear. But a regimen of applying technologies, genetic analysis, chemistries and other approaches need to be the treatment of choice to prevent disease.

NOTES

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SECTION FOUR

This section will address the research question:

- What are the roles of educational and academic institutions in identifying needs and providing curricula creation for an advanced health care delivery system in the USA?

The following subsidiary questions will be addressed:

- What improvements must be made to existing health care management programs to meet imperative industry demands?
- What contents should characterize an integrated program satisfying impending needs in education for the health care industry?
- How can an improved delivery system of the curriculum be identified and implemented?

Complex Case Management represents a major challenge to health care professionals. The ability to manage effective and financially appropriate patient care has received significant attention from insurers. Medical personnel have been required to place extensive attention on this, taking away from their professional duties. Health care workers and professionals seem to have been disproportionately laced with financial and administrative concerns.

Some software providers have addressed these needs and provided integrated packages tasked to address multiple layers of administrative needs. (E.piphany)⁴³ But is software the answer? A seventy year old patient, seriously overweight with type two diabetes, showing signs of Alzheimer's disease and with chronic high blood pressure readings, mid level depression treated with Paxil, and experiencing stroke owing to 70% carotid artery blockage may be a complex case. Add a probability of amputation of the left leg and the case takes on added complexity. How is this patient managed from a financial standpoint is of major concern to insurers. The health care professionals are constantly interacting with insurer complex case managers and the interaction can be challenging.

HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPAA)

Passed as a broad federal legislative act in 1996, the effective date for compliance of this congressionally passed regulation set was April 14, 2003. Compliance is mandatory for this law addressing medical record privacy and confidentiality. Nurse administrators face about 35 issues that can cause serious problems if ignored (Calloway and Venegas)⁴⁴. Originally intended as legislation allowing employees to retain health insurance when changing jobs, Section 264 addresses privacy, disclosure of information and rights of individual patients. (Antognini)⁴⁵ One concern is with litigation expected to grow from the complex act. Insurers and health care administrators are expecting to deal with claims and lawsuits, further adding to the difficulty of managing complex cases.

Disease Management Association of America professionals met repeatedly with the Department of Health and Human Services to understand the application of HIPAA to disease management entities and their operations. (Regan)⁴⁶ The nursing profession has attempted to analyze and evaluate portions of the federal act, violations of which could lead to large fines up to \$250,000 and up to five years in prison. (Frank-Stromborg, et al.)⁴⁷ Law firms are providing insight into the ramifications of HIPAA and addressing consequences from a legal standpoint of patient, insurer, and health care provider. Frequently asked questions and other issues are covered in law firm releases. (Kouzoukas)⁴⁸ and (Gosfield)⁴⁹ Simpson⁵⁰ examines the informatics questions for nurses, addressing security i.e., through biometrics and smart cards as well as thin client solutions. Challenges in wireless, other technologies, and computerized physician/prescriber order entry give opportunities to violate the HIPAA regulations. The Journal of Dental Hygiene examined the responsibility of

dental offices and the interaction with plan insurers related to the privacy provisions of the act. (Gaston)⁵¹

Law firms are recommending appointment of Privacy Officer and workforce training and education to inform and control processes and to address changes which are expected under the provisions of the act. (Lawson, et al.)⁵² Others in family practice management have attempted to develop key forms to help avoid violations. (Bush)⁵³

All parties affected by this act are expecting more regulation even after the HIPAA transactions and code sets rule kicks in on October 16, 2003 (HR 3323). National health plan ID rule and other legislation are adding to and expanding the network of privacy and personal health information. (Maddox)⁵⁴

HIPAA affects Pharmacy practice, (Giacalone and Cacciatore)⁵⁵ Medical device design, (Fricke)⁵⁶ Research and clinical trials, (Durham)⁵⁷ diagnostic imaging, (McCormick and Elliott)⁵⁸ other information collectors and providers, (Swartz)⁵⁹ and especially, the effects on Human Resources personnel, and departments (Bakich and Pestaina)⁶⁰ are most significant.

CURRENT CURRICULUM MODELS

Regionally, several programs relating to Health Care are offered:

The Heinz School at University of Pittsburg offers Master of Science (MS) in Health Care Policy and Management. The curriculum emphasizes economics, finance, information systems and Management in the context of health care.

Duquesne University Offers a Master of Health Management Systems. The courses and concentrations include Health Information Sciences, Information Systems Support, Networking for Health Professionals, Health Care Systems Analysis and Design Health Information Processes, Decision Support Systems, Multimedia Design, Information Ethics, Healthcare Finance, and Outcomes Management. Courses are required, based on the concentration selected.

Carnegie Mellon University offers a program in Health Care Policy. The courses address strategic planning, policy formulation and implementation, information systems and other related course work.

Other regional universities and colleges offer similar programs, concentrations and coursework.

The programs these institutions offer meet needs of the health care community. As health care industry applications widen in scope and depth, change is necessary to address developments in technologies. These technologies include chemistry, biology, spectroscopy, as well as microprocessors, computer science related and other electromechanical inventions. From the research, several courses linked together, seem appropriate to today's needs in the region.

THE PROPOSED CALIFORNIA UNIVERSITY OF PENNSYLVANIA OFFERING

The Department of Professional Studies has a planned offering of Advanced Health Care Management. This offering is for a Master of Science degree in Business Administration with an emphasis on Advanced Health Care Management. The initial offering is intended to address deficiencies in existing health care management offerings. It is intended to compensate for the curriculum weaknesses which may be

present in programs currently offered by regional organizations. The program philosophy is not critical of the programs offered; those programs are appropriate, effective and fully address the goals outlined in the respective Program offering circulars. There are other courses offered through all institutions that account for the needs of the health care industry. The Proposal is for a Master of Science Program addressing integrated topics not covered as a program elsewhere. The proposed offerings are not given in the sequence they will be offered. The system of delivery is not to be assumed to be classroom lecture. The delivery of each course of instruction may differ. The topics, subjects, courses and concentrations proposed are:

Legal issues in Health Care- HIPAA, state laws, other federal laws, Contracts, torts, criminal code, related constitutional law, emerging legislation at federal and state level, trans state medical practice, outsourcing, contract labor, contract professionals, reference fees and other legal interactions with Department of Health and Human Services, Veterans Administration and National Institutes of Health.

Health care and medical economics- Course(s) address the budgeting process, strategic planning for five- seven year plans, Grant and project management, Medicare budgets, State health budgets, Welfare budget implications, family health budget concerns, national economics and GNP issues and trends affecting Health care providers, and other accounting, budgeting, and financial planning issues. Peripheral courses will examine complex systems acquisition and financial effects from complex projects in health care environments and facilities.

Complex case management- This course(s) will identify and define complex cases. The complex case offered as an example will be studied and analyzed from multiple view, e.g., insurers, nursing, physicians in several specialty areas, pharmacology, administration, radiology, therapy, post partum care, family and social viewpoints, legal wishes of the patient, medical ethics, HIPAA and state laws, and other views.

Technology acquisition and management- Course(s) address trends in medical technology devices, medical equipment safety, laboratory technology changes, use of cellular, wireless, and radio in health care environments, employing micro electro mechanical devices in vivo, computer based evaluations, use of artificial intelligence, knowledge management departmental set ups, emerging techniques in body and organ scanning, and other technologies.

Biotechnology- Course(s) address advances in biochemistry, bio-analysis, biology, Cellular biology, protease, proteomics and other protein chemistry and biology, DNA modification and cellular analyses , other biotechnical advances and their implications for health care practitioners and management.

Preventive health care-These courses will address topics associated with preventive medicine. Cell biology topics will examine disease causes owing to cell aberration, decay, morphology, and related issues. The course will examine the relationship among DNA, amino acids, proteins, and other sub-cellular research and relationship to disease. The contribution of cell DNA, amino acids, proteins, enzymes, peptides and molecular research on glandular health and immuno-responsive hematology will be examined relative to preventive health care.

Telemedicine- Course(s) will define and describe several terms used under this and related rubrics. These include informatics, telematics, broadband, satellite exchanges, televised specialists meetings, Information systems, Knowledge based systems, knowledge management, telecommunications, distance learning, DWDM, teleconferencing, wireless, Bluetooth and other radio frequency technologies, cellular, intra nets and internets, and web based technologies.

Epidemiology- This course(s) offering will overview principles and methods in epidemiology, definitions and examples of infectious diseases epidemiology, nutritional epidemiology, health policy, health risk assessment, case control and meta-analysis techniques in epidemiology.

Research Methodology- This course will begin in the first module of the four which constitute the program. Participants will prepare a research paper. The format will follow the American Psychological Association (APA) style manual. Participants will select a project of choice and complete the paper progressively over the four modules. The paper may be researched and written by one to five participants. Of course, the paper should reflect the work related to the number of participants researching the topic.

Papers are presented at or near the end of the final module and other professionals are invited to attend the formal presentation. The paper is graded progressively, that is its progress in each module is part of the grading criteria.

Decision Support Systems (DSS), Statistics and Quantitative Methods- This course addresses decision processes in the health care community. Some time is spent examining medical team case analysis. No small emphasis is placed on teleconferencing on complex cases owing to their impact on the patient, the family, insurers, and others affected by the outcome. DSS practices and models used in health care facilities will be examined and evaluated.

Statistics and their uses in the health care industry will be related to epidemiology, demographics, age-gender distributions, trends, global

comparisons, and to the application of statistical methods in research projects selected by class participants. A review of descriptive statistics and some in-depth coverage of inferential statistics will be provided. Decision-making supported by statistics will be addressed. Most class learning will employ PC-based programs since selecting the preferred statistical method represents the greater challenge in health care.

Quantitative Methods—selected quantitative methods will be part of the instructional process. For some participants, the exercises assigned will be business-based. These include inventory models, linear programming applications, Queueing Theory (related to triage and health care services), census evaluation, specimen trend models, productivity models and other health care related quantitative methods. Where possible, computer –based texts, programs and applications will be used to accelerate learning.

Health Care Human Resource Acquisition—the many dimensions of health care spread human resources needs from drivers, groundskeepers, maintenance, janitorial, through the business offices, nursing, MDs, MD specialists, research MDs, other researchers, technicians, clerical, nursing assistants, directors, executives, and board members. The staffing process is on-going, and cumbersome. The transient nature of some professionals sometimes gives the health care institutions an aura of transience or disorganization. A changing patient census adds to the complexity model. Finally, demographic and epidemiological trends destabilize this organic profession. Staffing models will be examined. Models incorporating the use of non-nationals in institutions and working with language anomalies, comprehension difficulties and other concerns adds to the staffing dilemma. The course will examine models and trends in staffing, retention, recruitment, training, education and benefits. General discussion of staffing for the major epidemics in this region will allow focus in these learning situations. Cases and examples will be covered.

THREE DISEASES OF MAJOR CONCERN

There are three diseases of special concern. These will be addressed as part of the Advanced Health Care Management curriculum. Heart disease including atherosclerosis and stroke; diabetes; and Alzheimer’s are three epidemics affecting the regions defined in earlier sections. Any one of the epidemic level diseases is too large a subject to address; a short synopsis of each disease will contribute to understanding why the health curriculum and the preventive approach advocated in the curriculum is of high importance.

HEART DISEASE—(Including Atherosclerosis and Stroke)

Experience with protease inhibitors and cardiovascular outcomes indicate that the protease interdiction led to myocardial infarction in about 2 or 3 per cent of cases. (Holmberg, et al.)⁶¹ But arguments exist for use of protease resistant proteins to address neurological disease. It appears that recent studies have identified a process for identifying abnormal structures in Parkinson's and in Alzheimer's disease. (Dickson)⁶² Caution is dictated when protease inhibitors are aggressively applied. The incidence of heart disease appears to be promoted when applying highly active antiretroviral therapy including the use of HIV protease inhibitors to reduce morbidity in HIV infected patients. (Hui)⁶³ Protease inhibitors decrease the viral load in patients, but these inhibitors induce an increase in the development of atherosclerosis (Dressman, et al.)⁶⁴ indicating a need for more research into disease profiles that tolerate protease inhibitor treatment. In group A streptococci (GAS), a streptococcal cysteine protease was shown to be important in GAS pathogenesis. (Kansal, et al.)⁶⁵ Indications point to acceleration of disease pathogens as a result of protease treatments. Important lessons may be learned as the administration and compatibility of inhibitors and their compatibility with diseases are better understood. With blood-feeding hookworms, the aspartic protease, Na-Apr-2, might be effective against human hookworm disease (Williamson, et al.)⁶⁶ giving hope for treatment of some other blood parasites. In some individual cases of disease treatment, certain protease inhibitors cause deterioration in glucose tolerance. Causes are unclear, but seem to be associated with other immuno disorders. (Woerle, et al.)⁶⁷ More is being learned as researchers apply improved evolving technologies to cleaved peptides and proteins. Mass spectrometry applied to specificity studies of proteases yields large steps toward the application of proteases to disease management. (Siigur, et al.)⁶⁸

Although there are genetic predictors of heart disease, (Cheek and Cesan)⁶⁹ profiling, genetic testing, genotyping, cardiovascular nursing and other approaches along with dietary fat analyses (Soinio,et al.)⁷⁰ provide little in the way of lifestyle changes needed to reduce and control this epidemic. Prevention protocols, including the use of statins, especially in older adults, have been shown to significantly benefit patients in primary and secondary prevention of coronary heart disease (CHD). (Shepherd,et al.)⁷¹ Other approaches employed lipid lowering, especially in those patients indicating diabetes (Gami, et al.)⁷² and patients indicating a tendency toward carotid atherosclerosis and CHD. The metabolic syndrome (WHO criteria) adds significantly to the mortality rate, but identification processes to identify patients, especially those with glucose intolerance, with the metabolic syndrome are weak or lacking.(Bonora,et al.)⁷³

In the protein studies addressing evaluation of high levels of C-reactive protein in exercise-induced ischemia patients with the incidence of inflammatory protein and heart disease (Beattie,et al.)⁷⁴ the incidence of myocardial infarction amplifies the risk of congestive heart failure (CHF). (Carter, Chuck, MD)⁷⁵ CHD risk is increased in patients with fat redistribution (increased visceral fat and/or reduced subcutaneous fat), implying that change can bring about incidence increases in certain classes of patients. (Hadigan, et al.)⁷⁶ But many ongoing studies are providing layers of additional information and knowledge which must be used in preventive medicine and preventive health care management to significantly reduce mortality and morbidity resulting from various forms of heart disease.(Stone, Peter H)⁷⁷

Atherosclerosis

Addressing preventive care in generalized atherosclerosis calls for diagnosing and treating the most common peripheral vasculopathies. Commonly acknowledged, “the carotid bifurcation is one of the most common sites for vascular turbulence and atherosclerotic plaque deposition,” (Dillavou and Kahn)⁷⁸ the researchers also identified 21 risk factors for stroke. Dillavou⁷⁸ also provides eight lifestyle modifications and suggestions for prevention whether medical or surgical therapy is involved in patient history.

Risk management has been refocused on lipid lowering strategies to lower the incidence of CHD. Lipid lowering therapies are used in conjunction with statins and other cholesterol lowering, and inhibiting therapies. (Fonarow)⁷⁹ The availability of certain foods and the geography of the area affect regional customs. Dietary habits dramatically affect the incidence of heart disease. (Morland,et al.)⁸⁰ It is well known that diet affects health in many ways. However, little is known about regional eating and foods availability to identify the changes necessary to reduce incidents in regional populations. Much can be gleaned in preventive medicine about such knowledge from studies conducted in relation to other issues.

The effects of vitamins, minerals and dietary supplements are thinly recognized because many studies are not reflective of rigid research techniques. Some studies are recognized (Violi, et al.)⁸¹ and others provide narrow evidence of benefits accorded from herbal remedies.

Not enough can be said for the benefits of disease management—especially the management of preventive strategies in the disease cycle. (Burns, et al.)⁸²

Stroke

It has been recently gleaned from investigations that stroke incidence has been underestimated by 50%. (Elkind, Mitchell, S:V)⁸³ Stroke is the third leading cause of death and the leading cause of chronic serious disability in the USA. Accordingly, it is a leading cost factor in health care and a serious disrupter of family harmony and family finances. The physical and psychological effects on the patient are echoed in the patient's family. Epidemiological studies indicate the burden is highest in minority and economically poor families. Case fatality rates are studied. Those sometimes tell only a part of the story since many do not deal with longer term health care. (Roberts and Goldacre)⁸⁴.

Studies attempt to identify quality of life for stroke victims. Some studies approach family issues but few have studied the problem in sufficient depth to form sound conclusions. (Tengs and Lin)⁸⁵

Cognitive impairment after stroke has been followed for three years in several studies, (Patel et al.)⁸⁶ further challenging financial resources since recovery of about 32% stays nearly constant over that time period.

Cognitive-motor interference in stroke recovery therapy has provided little of significant value since most studies employed a small sample; (Cockburn, et al.)⁸⁷ one study did confirm cognitive improvement was far less than the slight motor skill improvement identified.

A possible strategy to restore brain function after stroke involves cell transplants (Savitz, et al.)⁸⁸ indicating hope for cell therapy. There may be value in this therapy for Parkinson's and Alzheimer's patients. Other studies (Meek, et al.)⁸⁹ indicate that exercise after stroke has some beneficial effects. However these studies are weak in evaluation of the physical, social, and psychological factors contributing

to the improvements. No doubt exercise of the right kind, frequency, and intensity provides benefits. How much more valuable would be such regimens if taken to initially prevent the disability.

Women seem to have higher rates of morbidity and mortality than men, according to some studies; (Labiche LA, et al.)⁹⁰ while other studies (Center for Disease Control, Atlas of Stroke Mortality) indicates the differing pattern in stroke occurrence in the USA.

In other controlled trials, preventive actions and regimen tolerance contributed to reduced incidence of CHD and stroke. Lipid lowering and cholesterol reductions seemed to contribute most to success. (Sever et al.)⁹¹

DIABETES

This disease has reached epidemic proportions in the Region addressed in this research. In the decade 1990-2000 the incidence of the disease increases 49 percent and similar increases are expected in the future. But diabetes management in this epidemic varies greatly, mostly as a result of barriers associated with uninsured and underinsured patients. (Suwattee, et al.)⁹² Suboptimal care leads to increased cost of maintaining patient's ability to contribute to society. Impaired and amputees require even more care and the cost of patient management increases exponentially.

Studies addressing fat redistribution and insulin resistance play an important part in the development of this disease (Hayashi, et al.)⁹³ even in Japanese who classically have a low incidence of the disease. In this study, sansei (third generation American-Japanese) developed a higher incidence of the disease than counterparts in Japan.

Okinawa Japanese have almost no diabetes disease.

There is a correlation between hypertension and diabetes, (Vijan and Hayward)⁹⁴ shown in the study are results indicating that better blood flow decreases the negative effects of diabetes and decreases the hypertensive effects.

Old tales relate the intake of sugar to diabetes. Some studies indicate intake of sugar plays no deleterious role in prevention of type 2 diabetes, (Janket, et al.)⁹⁵ but racial and ethnic differences seem to contribute significantly to disease complications. (Bonds, et al.)⁹⁶ African Americans, Native Americans and Hispanics experienced higher rates as do economically poor individuals. There may be a relationship between blood pressure in young adults and type 2 diabetes. (Hill-Golden et al.)⁹⁷ If so, it may be that blood pressure is a precursor of Diabetes.

Lipid management reduces mortality from Diabetes (Inzucchi and Amatruda)⁹⁸ but few data are available from trials to confirm the long term effectiveness of lipid control.

Obesity is a world wide contributor to diabetes since calorie intake has become excessive in more and more regions, (Buchanan)⁹⁹ and interventions must begin earlier if cumulative threats are to be avoided. Klarenbach, MD and Jacobs¹⁰⁰ compared Canadian and USA National health surveys. They found that Canadian patients received better care and treatment of diabetes than American (USA) counterparts. Significant disparities must be eliminated in both countries to improve the prevention of this disease.

The efficacy of nurse/care management system in complicated diabetes can significantly improve medical outcomes as was shown in a Stanford study conducted by Taylor, et al.¹⁰¹

Diabetes screening for diabetic retinopathy has been conducted by telemedicine techniques as described by Kanagasingam, et al.¹⁰² Diabetic eye disease causes blindness and is the leading cause of blindness in the western world.

Telemedicine is administering diabetes education that is well accepted by patients, resulting in lowered diabetic related stress. (Izquierdo, et al.)¹⁰³

Any technologies and therapies and health care processes that reduce or prevent diabetes must be employed to reduce health care costs throughout the world.

ALZHEIMER'S

Much has been discovered recently about Alzheimer's disease. The epidemic levels of this disease are rapidly unfolding and will represent the next major epidemic on the planet. Causes are structural since the disease strikes older persons and the graying of the planet is an accepted statistic. Does the disease mimic others, like stroke, where many small events have a cumulative effect? Is it physical, neurological, or some other chemical/biological DNA-Genetically related phenomena? The role of the immune system plays an important part in the disease. (Blasko and Grubeck-Loebenstein)¹⁰⁴

Some researchers argue that identification in the preclinical stages is the best assurance of disease control (Palmer,et al.)¹⁰⁵; while enormous investigations have failed to clearly identify the pathological basis for the disease. (Vagnucci, Jr. and Li)¹⁰⁶.Other studies have it that some contributions to the pathology of Alzheimer's lie in extra-cellular accumulations of beta-amyloid. (David Lawrence)¹⁰⁷ Cotter, et al.¹⁰⁸ argue that cognitive function assessment should be base-lined with the assistance of the patient and a knowledgeable other to determine progress of the disease. A meta-analysis and other studies by Clark and Karwalish,¹⁰⁹ address the treatment options in addressing the disease and its three major strains. Vitamins,

stabilizers and inhibitors all play a role in disease maintenance and control. But there is no path to reverse the disease or to stop it at this time. Best is to slow its inexorable advances. Non-steroidal and anti-inflammatory drug use may contribute to the acceleration of the disease (Launer)¹¹⁰ but it is unclear if the drugs add to the inflammation of the brain cells or otherwise.

Some experimentation with galantamine hydrobromide has found it to be an effective inhibitor if formulated correctly for some patients. (Zarotsky, et al.)¹¹¹

No cure for Alzheimer's; no ability to stop the epidemic; no sure identification of the causes, and no successful treatment process has been established. The costs annually exceed 100 billion dollars and about 200,000 dollars per patient annually. Is prevention and complex case management an answer to these spiraling costs?

Summary

This section examined three subsidiary research questions as well as another research question. In an effort to identify an improved health care curriculum or program, other university offerings were examined. The management offerings from regional institutions are modeled by the offerings from Duquesne, University of Pittsburgh, and Carnegie Mellon University at the master's level. These programs are appropriate to their management offerings in Information Systems, Business Administration offerings, and Strategic Planning. All programs can be improved, but these common offerings are appropriate, so a new program with a different curriculum may be required to meet changing needs. The improvements needed are so broad as to require a new approach and an extensive curriculum change. The contents of a new program are at point.

Contents of an integrated curriculum must address topics examined in this section. The focus should be on the epidemics sweeping the region. These three were

addressed as the diabetes-obesity, Alzheimer's and stroke/heart disease epidemics. Then the program curriculum should address the research methodologies and the research body embracing the epidemic topics. The research must be ordered and examined to determine how these meta-studies contribute to a strategy for attacking the diseases based on a regional approach. Grants should be sought by program participants to scour the research and to answer appropriate research questions. Epidemiology macro approaches by program participants provides a background for the program which will include complex case management issues, telemedicine, telematics, and an examination of several medical technologies.

Continuing research on changing health care topics will be incorporated as part of the program curriculum and program requirements. The findings from this research should be a part of the changes, options and improvements in the curriculum. Every effort should be made to make the program dynamic. The field is dynamic; the curriculum cannot be successful under a static model.

The delivery system can and should incorporate late moving technologies. Use of Web-based and electronic TV exchanges, video tapes and audio tapes as well as i-Net messages are a few of the later technologies. As new approaches like teleconferencing are applied, those technologies should be adopted. Participants' visits to different health care sites to view technologies, practices and processes are characteristic of the improved health care delivery system.

Regardless of technologies for delivery, much can be said of human social interaction in face-to-face settings. Real time sessions allow for quick exchange of information, concerns, knowledge and experiences. Sometimes the shortcuts of body language and appropriate metaphors can replace pages of web-based material. Additionally, not all program participants prefer Web-based learning. Many

professionals gain greater benefits from human interactive rather than machine interactive learning.

For still others, courses may be the learning of choice. Rather than an integrated four semester program, others may be at a point in their lives where only a short course can fit into their schedule. The participants' needs should not be ignored. Can the program and curriculum needs of the health care industry be satisfied by academic institutions? Maybe! But a better model might include the recommendations (Ms. Dee Morgillo, Director of Education for AmeriNet Central), suggestions (Ms. Lynne M. Scanga, Manager, Continuing Education, Ohio Valley General Hospital), and advice (F.N. Parent, Jr., MD and Dr. Margaret Marcinek, Chairperson of the Nursing Program at California University of Pennsylvania) of other professionals. The Advisory Committee, the Participant (Student) Advisory Committee and attendance at seminars and conferences build the knowledge of the system.

Political views should be considered at all times and where possible the advice of well-informed (Senator Murtha) political figures should be incorporated.

Utilization and collaboration should provide a strong and viable curriculum development approach.

NOTES

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SECTION FIVE

OVERVIEW

This final section will address several matters. It will summarize the material provided (infra), while addressing the research questions posited in the first section. A summary of the research will be provided. Some conclusions will be drawn from the research readings, and recommendations will be provided based on the research and general observations. Weaknesses in the research will be noted. Finally, recommendations for future research will be offered.

SOME ANSWERS TO EACH OF THE FIVE RESEARCH QUESTIONS

Question One: What are the philosophical and economic issues surrounding an improved and advanced health care delivery system?

This question prompted investigation into the breadth and depth of changes occurring in health care delivery. Research indicates that health care is no longer centered on the human organ level but is peering deeper into DNA, proteins, nutrition, genetic abnormalities, and cell mutations. Philosophically, the disciplines addressing health care are expanding. Such expansion of disciplines represents a scatter diagram. However, it may be that these disciplines need to be coordinated much like a symphony conductor brings in various instruments and instrument groups often with increased emphasis or with delicate responses in progress toward a completed work. The research indicates that in few organizations is there the complex case management provided given an asymptomatic patient. Instead, as symptoms develop, health care specialists are introduced into the patients' case. The arguments for preventive medicine are most frequently denied by insurers. Although all health care professionals including insurers, encourage and advocate prevention of disease. There does not appear to exist a rigid,

required regimen, integrated among the professionals, to direct and prescribe healthy living protocols. Further, there is little to compel the patient to adhere to suggested regimen. This leads to economic disaster.

The small expense of preventive medicine is transferred, instead, into the super high cost of treating a fully developed or developing disease. Currently, insurers especially, advocate preventive lifestyle, exercise and diet. Mostly, this advocacy is generalized as to the population, age group, gender or culture. Some would urge that preventive processes be individualized, checked, and rewarded. Alas, medicine and health care seem concerned, as they should be, with bringing existing illness under control. Here it is obvious that low-cost preventive care delays or reduces very high cost, illness directed, health care processes.

Philosophy and economics appear to require restructuring and symphony-like orchestration to improve health care globally.

Question Two: What characteristics can be identified in a minimized model of advanced health care delivery?

Examine only three models of health care; i.e., preventive, illness centered, and recovery/rehabilitation. In this examination it appears that machines, technology, biochemistry, genetic alteration/identification, and full body (organ level, 3-D) scanning are underutilized at best. The emerging model provides substantial evidence that use of the technologies can identify emerging and potential illnesses and that such technologies can and should be progressively utilized to identify weakened and failing organs, tissues, and glands, as well as disruptive genes and cells. It appears that, rather than assuring progressive illness recovery, the search should be on to anticipate and address evolving

medical and health challenges. The weakened organism is the best candidate for future health care involvement.

Question Three: What are the major technologies contributing to or expected to contribute to an advanced health care delivery system?

Processes are technology artifacts; all technologies do not require hardware. Genetic analysis, gene therapy, biochemistry, nutritional (protein) analyses all utilize microscopes, computers, lab equipment, etc., but are more strongly identified with processes. These technologies are emerging as the most exciting to deliver results in health care. The magnetic resonance imaging (MRI) devices are broadly used. Fluoroscopes and especially tomography is emerging as technology of choice to identify latent health problems at or below the glandular level. Micro-electromechanical systems (MEMS) are being used invasively in cardiocare; while system-on-a-chip (SOC) technologies are imbedded, in vivo, to monitor and control biological processes. Telemedicine allows medical specialists in a single location to conference, in video and audio on complex cases located distances away. Telematics allows health care professionals to compile patient histories, pharmacy history, allergies, physical trends and other material in an organized manner for use by subsequent specialists addressing a complex case. Computers, software, PALMs, and the internet/WEB are emerging, haphazardly, as technologies in advanced health care delivery systems.

Question Four: What is the financial significance of employing selected technologies in health care delivery systems in the USA?

Financial decision making drives health care processes because organizations (employers) and insurance firms are central to the finances of health care. The federal

governments and sometimes local hospitals are central to the finances of health care. These systems are choking on costs owing to several causes, accordingly, these financial providers or contributors are loathe to add to the financial burdens by adding prescriptive health counseling, screening and preventive disease visits with medical practitioners. Although technologies exist to prevent or anticipate (and thus to minimize cost/effects), the small additional cost is seen as an unnecessary burden and prevention is relegated to generalized statements like eat from the five food groups, get exercise three times or more weekly, etc.

Question Five: What are the roles of educational and academic institutions in identifying needs and providing curricula creation for an advanced health care delivery system in the USA?

The educational institutions respond well to the needs of the health care community. Few futurists exist since enough must be done to address the issues of the day. Educational institutions lag behind the needs of the health care community. The professionals employed in training and education of health care providers are quick to identify new technologies and to prepare courses and workshops addressing the new and the unfamiliar. It is left to the formal education community to develop and establish integrated programs. To do this requires research efforts and thoughtful collaboration with the health care community. To have programs remain current and timely requires professional, academic management and an active change model to identify emerging trends and issues in health and then to blend such changes into an integrated curriculum of value to health care professionals.

RESEARCH SUMMARY

The research effort attempts to identify selected issues in health care management. The first set of questions is addressed in this paper. Evidently, other questions must be addressed, and those must be categorized appropriately so that research can be focused issue by issue.

The question here constitutes an attempt to describe the field and identify specific future research. The process utilized in this descriptive research called mostly for meta-analysis. Many articles from multiple medical sources in many regions provided an overall picture. Progress in health care practices evolves over several general areas. The research readings examined chemistry, clinical trials, experiments, technology uses and practices, course and program development at academic institutions and other laboratory findings.

CONCLUSIONS

The graying of the planet is contributing to a huge increase in the providing of health care. Original economic health care models failed to predict the extent of epidemics, the length of life, the rise in health care cost, the population growth, the increase in individual disposable income (leading to excessive food consumption), the increase in recreational time (providing more sedentary time), and the “laissez faire” attitude toward preventive health problems. The USA and other countries must address the new model and construct appropriate health care models centering on individual preventive medicine and utilizing all tested, emerging technologies to further preventive medicine. Individuals neglecting their health cause health care costs to rise for all others.

Some system of financial penalties should address this nonchalance by individuals. The educational organizations must construct programs explaining and describing emerging technologies. Then they must show how all these technologies and processes can work together to reduce pain, increase the quality of health care, minimize the impact of epidemics, and promote high quality of life for aging populations while considering cultural processes. These programs must be created, tested, modified, and improved with feedback from participants, advisory boards, and the health care community.

RECOMMENDATIONS

The research indicates a need for advanced program or programs in health care and health care management. The need is exacerbated by rapidly evolving technologies emerging from several fields. The rate of technology change and process change continues to grow at exponential rates. A collection of technologies imperatively affecting the health care communities can be identified. The technologies, processes, tools and instruments can be collected and ordered into courses relating to central regional issues. In the instant case, the proposed program has three foci; e.g., obesity with accompanying diabetes, Alzheimer's disease, and heart disease/stroke. These are laced through a curriculum containing hard and soft technologies which should be invoked to reduce ultimate health care costs and improve quality of life for large percentages of the population.

Culture has an effect on epidemiology and human behavior in different regional cultures is explored to weigh effects on health. Hands on with technologies and field visits and apropos to participants needs in academic programs round out the academic recommendations.

Outside the classroom, some system must be identified to compel or at least encourage improved life style on an individual basis or the healthy will bear an unfair cost to support others poor health habits.

WEAKNESSES IN THE RESEARCH

The research effort was narrow in the sense that most knowledge was gleaned from information contained in articles in medical journals. This presented a view of “what is” but did not fully investigate which institutions were active in implementing multiple processes and technologies. Nor was an effective model curriculum identified through a nationwide search. Small efforts explored other universities in parts of the USA, but these efforts were not exhaustive. A better set of conclusions and recommendations could have been formulated had the questions addressing research areas been made clearer and more precise. Given the time, a section of interviews with regional professionals would have flavored the study. Finally, a study showing the cost and failure of new technologies would have given the paper better balance.

RECOMMENDATIONS FOR FUTURE RESEARCH

The next research study should examine the results of technology intervention in treatment of patients. Large-scale clinical studies should be catalogued and followed to identify side effects, problems and other issues in genetic therapy.

Radiation and other effects in MRI, PET, Fluoroscopy and other technologies should present an alternative picture to the employment of these technologies.

Medical school curriculum should be surveyed and analyzed to determine existing and potential future direction in training of MDs. Some research should examine nursing programs.

Other research should also be considered, especially face-to-face interviews with medical directors examining their needs for technology-based programs for their professional staff.

Consider the bibliography for other areas to be researched.

Appendix A

GLOSSARY

GLOSSARY

Amyloid-- Glycoprotein deposited extra-cellularly in tissues in amyloidosis. The glycoprotein may either derive from light chain of immunoglobulin (AIO: amyloid of immune origin): 5-18 kD glycoprotein, product of a single clone of plasma cells, the N terminal part of lambda or kappa light chain) or, in what used to be referred to as AUO, amyloid of unknown origin, from serum amyloid A (SAA), one of the acute phase proteins that increases many fold in inflammation. The polypeptides are organised as a pleated sheet making the material rather inert and insoluble. Minor protein components are also found. Should be distinguished from amyloid deposited in the brain and that is derived from amyloid precursor protein.

CHD—Coronary Heart Disease

CHF—Congestive Heart Failure

Epidemiologia—Epidemiology

Galantamine—A cholinesterase inhibitor. It has been used to reverse the muscular effects of gallamine and tubocurarine and has been studied as a treatment for alzheimer's disease and other central nervous system disorders.

Genotyping—Determining the genetic makeup of an organism or group of organisms with reference to a single trait or set of traits.

HIV-AIDS—Human Immunodeficiency Virus-Acquired Immune Deficiency Syndrome

Hydrobromide—A compound of hydrobromic acid with a base; distinguished from a bromide, in which only the bromine unites with the base.

Laissez faire— the doctrine that government should not interfere in commercial affairs

Lipid—Any of a group of organic compounds comprising fats, waxes, and similar substances that are greasy, insoluble in water, and soluble in alcohol.

Neurologia—Neurology

Paxil—(paroxetine hydrochloride) Paxil is approved for use in adults for the treatment of Obsessive Compulsive Disorder (OCD), MDD, Panic Disorder, Social Anxiety Disorder (SAD), Generalized Anxiety Disorder, and Post-traumatic Stress Disorder.

Phylogenetic— of or relating to the evolutionary development of organisms
"phylogenetic development"

Protease—Any of a group of enzymes that catalyze the hydrolytic degradation of proteins or polypeptides to smaller amino acid polymers.

Protease interdiction—To impede the enzyme reactions of protease

Protomics—(proteomics) A new discipline, *proteomics*, has been initiated that complements physical genomic research. Proteomics can be defined as *the qualitative and quantitative comparison of proteomes under different conditions to further unravel biological processes*.

SARS—Severe Acute Respiratory Syndrome

Statins—Any of a class of lipid-lowering drugs that reduce serum cholesterol levels by inhibiting a key enzyme involved in the synthesis of cholesterol.

Streptococcal cysteine protease—Enzymes to break down the amino acids of the streptococcus bacteria

Telematics— Telematics is the blending of computers and wireless telecommunications technologies, ostensibly with the goal of efficiently conveying information over vast networks to improve a host of business functions or government-related public services.

Telemedicine— utilizes different kinds of telecommunication to assist in the practice of medicine.

Weltanschauung—A comprehensive conception or image of the universe and of humanity's relation to it.

WHO—World Health Organization

Appendix B

**PRESENTATION
BRUSSELS, BELGIUM
JULY, 2003**

THE PRESENTATION: BRUSSELS, BELGIUM (July 2003)

Advanced Health Care Management Proposed Curriculum

Dr. John E. Michaels
California University of PA
Brussels: July 2003

Health Care Has Several Dimensions

- Hospital
- Recovery
- Nursing or Assisted Care
- Hospice
- Preventives
- Medications
- Nutrition
- Complexity
- Nursing

Major Players

- MDs and Specialists
- Patients
- Pharmacology
- Biotechnology
- Epidemiology
- Genetics
- Insurers
- Employers
- Family care givers
- State/federal taxes
- Political system

Goals, Objectives, Strategies, & Processes

- Above are based on:
 - Weltanschauung—world view
 - All are in conflict, but all converge
 - Costs to each player accelerate
 - Processes suit each party but not all are satisfied

Major Questions

- Identify changes affecting health care
 - Biology
 - Biotechnology
 - Genetics
 - Pharmacology
 - Technologies
 - Telematics
 - Telemedicine
 - & others
- Identify issues
 - Epidemics
 - Regionalism
- Costs to:
 - Individuals
 - Insurers
 - Organizations
 - Governments

What Can Be Expected?

- Higher cost—much higher
- Increased complex cases
- Decreasing quality of health care delivery
- Political foci
- Decreased health care availability
- Long waiting periods for services
- Insurer rejections
- Minimum appointment times
- More pharmacy
- Higher pharmacy costs

Suggestions For Solutions

- Preventive medicine
- Lifestyle changes
- Change billing model
- Nutrition
- Exercise
- Broad spectrum of medical specialists
- Expand admissions to med schools
- Charge for poor lifestyle
- Add to medical cost of individuals
- Improve health care management curriculum

Curriculum

- Complex case management
- Epidemiology
- Telemedicine
- Biotech medicine and genetics
- Legal issues, HIPAA, and lobbying in health care
- Health care technologies
- Research methodology

Curriculum Continued

- Health care and medical economics
- Health care budgets and finance
- Telecommunications, wireless, radio frequency, and PALMs
- Health care human resource acquisition, compensation, training and education
- Decision support systems and statistical and quantitative methods

Discussion

- Alzheimer's—the next epidemic
- Heart disease and stroke
- Diabetes and obesity

The Future

- Implementation
- Evaluation
- ADAPTION

Thank you,
John E. Michaels, AA, S, MBA, DBA

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