APPENDIX 1

Physician Workforce Issues in the Nation and in South Florida

From 1960 to 1985, in response to a shortage of doctors and innovations in medical education, forty-two new medical schools were created in the USA, the last one being Mercer University School of Medicine, which received full accreditation in 1985. During this period of 25 years, most of the newly created schools were public, community-based medical schools.

During the 1980s and 1990s, however, most professional medical organizations and workforce analysts predicted that the country would experience an oversupply of physicians in the future. For example, the Graduate Medical Education National Advisory Committee (GMENAC) in 1980 predicted "the country would have an excess of approximately 145,000 physicians by 2000." Now that 2000 has passed, "no conclusive evidence has surfaced indicating that physician supply is exceeding demand" (American Association of Medical Colleges, The Reporter, 2/10/2002).

It is now accepted that many of these early reports had serious methodological flaws in their mathematical modeling methods. Because of these early assumptions of a surplus of doctors, however, no new medical schools were developed until Florida State University in the year 2000.

Projections of physicians workforce needs are notoriously unreliable. For example in the UK, surpluses of physicians were identified in 1957, 1978 and 1985, but shortages in 1944 and 1968. None of these projections were valid. The USA has a similar story. Projections are only as good as the assumptions upon which are based. Minor disagreements about assumptions can create large discrepancies in forecasting. Nobody, for example, predicted accurately the changes in technology or in physician productivity or the growth of other health professional careers that occurred in the last two decades.

New efforts are being made to correct previous estimates. The Milbank Foundation, the American Medical Association, the Association of American Medical Colleges, the Council on Graduate Medical Education and a number of researchers are all working on new projections and analyses of the physician workforce.

It is already evident that the pendulum is swinging back from a belief in a surplus of doctors. Recently published studies already illustrate that the very much-announced oversupply of physicians has not appeared and that shortages are now present in many geographical areas and medical specialties[1].

The market itself is sending strong signs of a shortage. Recruitment of doctors in many medical care institutions is becoming more difficult. Signing bonuses are now offered. Surveys of residents demonstrate that they have no problems in finding jobs. Starting salaries are increasing.

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[1] American Medical Association-Chicago, Council on Medical Education report 1-1-03, December 2003

There is a serious shortage of physicians in emergency rooms, one of the least preferred sites of practice.

The Association of American Medical Colleges' latest position statement on the physician workforce states that cogent arguments may be advanced "to justify some increase in the enrollment of medical schools and/or the establishment of new medical schools." Dr J. J. Cohen, AAMC President, stated, "The consequences for the public's health of a shortage of physicians are obviously much more significant than those of an oversupply. Access to equitable health care is already tenuous for many of our countrymen; a paucity of physicians would compound this problem enormously." (AAMC Reporter, February 2004).

This shortage may also be intensified by the increasing number of women who are entering into the practice of medicine. According to the AAMC, women are expected to form 33 per cent of the profession by the year 2010, up from 25 per cent today. While male doctors average 57 work hours of medical work a week, women average only 48 hours and a higher proportion of them than of men practice only part-time. (Journal of the American Medical Women's Association, 2002, 57, 185-190).

It is also accepted that specific areas of the country may have needs and require solutions unique to them and, therefore, workforce planning should take this local characteristics under consideration.

It is unfortunate that workforce projections have proven to be so difficult. It takes a minimum of 7 years to train a licensed physician, and thus new efforts to educate more doctors will not a have an impact until the crisis is well advanced. The new studies are very welcome and in the future they will provide a more detailed picture of manpower needs but, fortunately, enough evidence already exists to start considering new policies on the physician workforce.

At the national level, at least two new policies are proposed to expand the national pool of doctors:

Increase the number of first year admissions to existing medical schools
Establish new medical education programs.

Nationally, no voices have been yet raised proposing to increase the licensing of international medical graduates, theoretically a third possible approach.

At the state or regional level, physician workforce planners are advocating other possible actions, not directly related to medical education, to change the geographical distribution of health professionals. They consist mainly in practice and economic incentives to locate in specific areas. These actions will not improve significantly enough the total availability of doctors in the USA, but they may alleviate the problems of specific geographical areas or medical specialties.

In Florida, there are at least 4 possible approaches to deal with the shortage of doctors, particularly in the South Florida counties of Miami-Dade, Broward, Palm Beach, and Monroe. These include attracting more physicians through incentives or new programs, increasing the capacity of existing medical schools, and/or establishing new medical schools.

Financial incentives

Perhaps the cheapest and fastest approach to solving the physician shortage problem is to attract to Florida already trained physicians practicing in other regions. There are two such possible pools of physicians: doctors who have completed US medical training and are licensed in other states, and international medical graduates licensed overseas.

Florida already imports 4/5 of all its doctors. More than 2,000 new physicians are licensed every year. Many of them are international medical graduates. Among the US graduates, many are older doctors who move to Florida because they are attracted by its climate and quality of living.

These numbers show that Florida already is very attractive to many physicians. The challenge is to increase their numbers even more.

At least three different types of incentives are proposed to make the state more attractive for the practice of medicine.

The first type of incentive would be an education loan repayment/forgiveness program. At the moment, there are several successful federal and state programs that offer forgiveness. Perhaps the best known is the National Health Services Corps (NHSC) and the Indian Health Service (IHS). These two programs provide repayment of loans incurred for health professional education in exchange for a minimum of two years of services in a designated loan repayment priority site. These programs are highly valued by students, but many doctors move out of the shortage areas as soon the obligation is fulfilled.

The principle of these programs is the designation of "Health Profession Shortage Area" (HPSA) and "Medically Underserved Area or Population" (MUA/MUP). There are 3960 designated HPSA/MUA/MUPs across the USA. The three counties of Miami-Dade, Broward and Palm Beach have 61 HPSAs and MUAs. Monroe County, also included in the South Florida region, has no such designated areas.

Therefore, one possible approach could be to incorporate new areas, to change the minimum service requirements for doctors with extended contract periods, and to increase the maximum of $25,000 that is paid in the form of loan repayment or forgiveness.

Any added incentives would require additional state financial support and the development of a specific state program, since it is improbable that the federal government would be interested in solving the shortage of a particular state at the risk of causing or worsening physician workforce shortages in other states. However, because doctors tend to locate in the area where they do their residency training, it is doubtful that these changes will significantly increase the number of physicians in a particular area unless more residency positions are also available.

A final limitation on this approach is that, if there is a real national shortage of doctors, many other states will look for similar solutions, competing with Florida.

A second incentive to draw doctors to Florida is "to facilitate the practice of medicine" by

establishing tax exemption areas or granting tax relief for some of the patient care activities performed by doctors, by increasing reimbursement rates from Medicaid and Medicare, or by reducing the cost and/or changing the benefits of medical liability insurance. Any of these alternatives would of course also benefit all doctors already practicing in the state.

While changes in the tax status of doctors have been advocated in other countries such as Canada, nobody has yet proposed this approach in the United States. Therefore, we will exclude this alternative from our possible list.

Most experts agree that improvement of reimbursements and tort reform are necessary since both of them have an impact on the cost, access to, and quality of patient care. For many years, both issues, and particularly tort reform, have been the concern of most professional medical organizations. Florida has some of the highest insurance rates in the nation. In Florida at present, about 5 % of all doctors do not have malpractice insurance coverage, up from 4 % a year ago. In Miami-Dade County, nearly 20 % of the doctors are "bare" (or self-insured) due to the exorbitant costs of insurance.

In spite of the general agreement about the crisis medical reimbursements and medical malpractice, not much ground has been gained in changing either of them. The improvement of Medicaid and Medicare reimbursements would require large increases in public funding for health services and there is little stomach for that in state government. There has been some progress, however, in the matter of tort reform.

In Florida, some changes in malpractice legislation were made recently. On August 13, 2003, the Florida House and Senate passed a compromise bill capping non-economic malpractice damages (such as pain and suffering). Although most legislators appeared to be satisfied with the compromise bill, many physicians believed that this was not nearly enough, and claim that the bill will not affect insurance premiums. Also, in the Florida legislature other proposals are being discussed concerning some relief for emergency room doctors at private hospitals and HMOs.

The issue of liability costs is not much of a concern yet for medical residents, although once they start practice, residents become acutely aware of the problem. Therefore, the number of residency positions available will have a greater weight than tort reform in the re-allocation of practitioners.

The issue of malpractice is much less serious for doctors who are full time faculty of public medical schools in Florida (and therefore working for the government) since they have "sovereign immunity" that put limits on citizen's lawsuits against their government. This important benefit will, for example, facilitate appointments at the new medical school at FIU.

The situation of the faculty of private medical schools who are not included in such immunity is different. Recently, the University of Miami Medical School, seriously affected by the cost of insurance, asked the Florida legislature to grant protection to its medical faculty members at Jackson Memorial Hospital who treat patients who come into the hospital either through the emergency room or a Jackson clinic.

A third possible incentive to bring already trained physicians to Florida is to change licensing laws

in Florida or immigration criteria affecting foreign medical graduates. The goal would be to increase the number of American and international medical graduates who presently do not qualify for a license in the state.

Medical licensing has been developed to guarantee the citizens a minimum of safety and quality in the practice of medicine. The licensure process insures that all practicing physicians have appropriate education and training.

Applicants must submit proof of a prior education and training and provide details about their work history. After physicians are licensed in a given state, they must re-register periodically to continue their active status and are required to demonstrate that they have maintained acceptable standards of ethics and medical practice. In many states, they must also show that they have participated in programs of accredited continuing medical education.

In the past, many licensing laws had grandfather clauses that exempted some existing physicians from the regulations. For example, such exemptions were made years ago, to facilitate the practice of some Cuban medical graduates in Florida.

These exemptions are not so frequent now, although there are some states that still are using licensing laws as an instrument to facilitate the migration of doctors to their territory. One of the exemptions might be in the number of years of Graduate Medical Education necessary for licensing. For example, Florida requires a minimum of only one year of residency training. Most other states require a minimum of three years.

Theoretically, Florida could reduce even more the requirements for licensing. For example, modifying requirements for graduate medical education or obtaining visa waivers. However further easing its licensing laws would undermine the quality of patient care in Florida. Other states already have more demanding medical practice acts, since there is a direct relationship between licensing laws and the protection of the public from improper and incompetent practices.

The importance of rigorous licensing laws is especially true in the case of international medical graduates. One of every five practicing doctors is an international medical graduate (IMG) in the USA. In 2001, the Educational Commission for Foreign Medical Graduates (ECFMG) certified 5,934 international medical graduates, an increase of 15 % over the previous year.

In the USA, a very sophisticated and valid system of accreditation of medical schools controls the quality of medical education. Very few other countries rely on a similar system, although its use is now growing in the world. The quality of medical education differs tremendously between medical schools and countries. Hence the importance of rigorous competency assessments, verification of credentials and full requirements of similar graduate medical education for all IMGs who want to practice in the US cannot be overstressed. The requirement of residency training in ACGME approved programs is particularly important.

It has been proposed that the actual requirements for licensing international medical graduates should be increased, for example with a longer period of residency training and periodic competency assessment, as required in Canada. In fact, IMGs must not only pass English

examinations and the same licensing examinations as US graduates, but also since 1988 a new examination that has been added as a further barrier. Now a new Clinical Skills Assessment Test requires that all IMGs who want to pass the United Sates Medical Licensing Examination must travel to Philadelphia to undertake a practical examination of their English skills as well as their skills in evaluation and management of patients. Then they must return to their home country, wait for the result of the exam, and then apply for a J1 visa with ECFMG sponsorship.

The need for the visa is another very important restriction, particularly since September 11, 2001. ECGMG is the sole sponsor of non-citizens IMGs for the Federal Exchange program. The J-1 visa used by most IMGs was designed for educational purposes, as a temporary non-immigrant visa that requires applicants to demonstrate their intent to return to their home countries. The J-1 visa verifies also the credentials of foreign physicians and requires that the foreign physicians be accepted for training by an accredited residency program affiliated to a medical school. Visitors on a J-1 visa must return to their home countries for at least two years before they are permitted to apply for re-entry into the US. Only with a waiver can J-1 exchange visitors remain in the country. This decision is made only by the U S Department of State after careful consideration.

Some IMGs try to use H-1B visas that provide a loophole, circumventing many of the restrictions of J-1 visas. H-1B visas are granted to temporary workers with exceptional abilities. In FY 2000-2001, the number of such visas had been capped at 195,000 but it was reduced to 65,000 in FY 2004 as part of the visa restrictions since the September 11, 2001, terrorist attacks. By February 18, 2004, the worker-visa program reached its maximum allocation and no more foreign workers would be accepted during the 2004 fiscal year.

Many feel that H-1B visas are an inappropriate method for foreign physicians to enter graduate medical education. On February 10, 2004, the Association of American Medical Colleges expressed its opposition to use of the H1-B visa by IMGs.

Given the need to provide Floridians with adequate access to good quality, ethical medical care, all doctors in the state, independent of the place of training, should fulfill the same educational criteria for licensing. Therefore, relaxation of the licensing laws or immigration criteria to draw existing physicians to Florida is not a viable approach to solving the shortage of physicians in Florida.

New residency programs and positions

Creating new residency programs and residency positions would not affect the total available pool of physicians in the country but could contribute greatly to the number of available doctors in the state and in South Florida, since residents and fellows tend to practice close to their place of graduate medical training.

The deficit of residents and fellows in Florida is very serious. As mentioned in the main document, Florida ranks 45th nationally in allopathic residency positions (GME) positions per 100,000 population and would need approximately 2,700 additional MD and DO residency positions to meet national ratios.

Practically all GME positions (with the exception of some very small sub-specialties) are filled.

South Florida with more than 5,200,000 inhabitants has only 1,032 GME positions, 80 per cent of them or 829 in a single hospital (Jackson Memorial Hospital/Jackson Memorial System). Most of the remaining positions are in two other hospitals, Mount Sinai with 91 and Miami Children's Hospital with 72 (ACGME data base, 2/2004). Both institutions will be associated with FIU new medical school. The present academic affiliations of Mount Sinai are with the University of Miami; Miami Children's are with UF, UM, Nova, Ohio State and SUNY. The Cleveland Clinic in Weston also has another 34 residency positions in South Florida.

At the present time, there are financial caps on the direct and indirect financing of residency positions. Caps can be removed by regulation and any hospital that is willing to pay 100 % of the costs can create new positions. It is expected that due to the proposals to increase the number of medical students, caps will be removed in the near future. The AAMC has made this goal a priority of its legislative actions for 2004.

A new medical school may be in a preferred situation to obtain a waiver on the number of residency positions and in developing new programs for hospitals that do not have them. Medical schools directly sponsor almost half of all residency positions in the country. Some medical schools like the University of Washington also contribute to the cost of training residents, in some cases up to 25 % of the cost.

The relationship between medical schools and residency programs will become even stronger in the future. The new technology required for the teaching of medicine, like the development of virtual patients for the teaching of surgery, educational digital laboratories, and the use of standardized patients for evaluation, is much more frequently created and utilized in medical schools.

The single most important responsibility of any program of GME is to provide an organized educational program with guidance and supervision of the resident, facilitating the resident's professional and personal development while ensuring safe and appropriate care of patients. The quality of this experience is directly related to the quality of patient care (Accreditation Council of Graduate Medical Education, Essentials, 2/18/2004).

Not many hospitals without university affiliation qualify for ACGME accreditation. More than 70 per cent of ACGME accredited hospitals in the USA are University or University-affiliated hospitals. This is the case of the South Florida programs.

A critical bottleneck for increasing the number of residency positions in Florida (and particularly in South Florida) is in the number of faculty available to teach the residents. Other considerations are the availability of patients or facilities. The size of some of the existing programs suggests that they may be already at the maximum capacity. Jackson Memorial for example, with 829 GME positions, has 52 per cent more positions than the second largest program in the state, which is at the University of Florida in Gainesville.

Other hospitals however, like, Mount Sinai and Miami Children's have room and interest in expanding their programs, if they can increase their teaching resources. Other hospitals in South Florida, for example, Baptist Health of South Florida as well as other health care organizations like

the Health Choice Network have also expressed interest in developing new residency training programs in the future.

FIU strongly believes in the need for more residency positions in South Florida. Its new medical school will supply the faculty and resources to increase the total number of GME positions by 177 by the year 2013, in collaboration with the organizations mentioned previously.

These FIU new programs will also offer added training opportunities to the graduates of other Florida Medical Schools and therefore, FIU expects to contribute substantially to the total number of GME positions in the State.

Increasing the class size of existing medical schools

Increasing the size of entering classes of existing medical schools is a recommendation of the American Association of Medical Colleges for the country as a whole and certainly this is desirable for Florida.

American Medical Schools are not producing enough physicians to meet the country's needs. However they are limited in their ability to expand. Cooper et al. have recently surveyed 70 Deans of allopathic medical schools for a study published in the Journal of the American Medical Association (JAMA, Cooper et al, 290(22): 2992). Eighty-nine cited shortages of physicians in at least one specialty and commented on the potential for expanding class size. Expansions are already under way in 17 % of the schools, with an average of 8 % expansion of class size per school. However, 43 Deans had no plans for expansion and 23 Deans reported that their schools could not expand. Together with all the actual and planned expansions, aggregate class size could increase potentially only by 7.6 % over the next few years and generate a total of just 1200 new allopathic graduates a year. This is a drop in the bucket, given that more than 700,000 doctors are practicing in the US at the moment.

In Florida, the situation is similar. MGT of America in "Plan for a Four-Year Allopathic School of Medicine at Florida State University," Nov. 15 1999, stated on page 9 –2, "In preliminary discussions between UF and FSU medical education officials, concerns were expressed that little opportunity existed to handle additional students at either of the UF clinical sites in Gainesville or Jacksonville."

However, more recently, medical schools in Florida have expressed interest in expanding their class sizes. For example, the Medical School of the University of Florida now intends to admit five more students in each of the next ten years. (Dean Tisher, personal communication). The other three allopathic medical schools will probably follow the trend.

In total, it may be possible to accept another 100 medical students at the existing medical schools in Florida a year (at twice the national rate of increase). Expansion on this scale would not be sufficient to meet the State's needs for more physicians. Further expansion of the existing medical schools beyond those 100 new first year seats would require large capital investments in building laboratories for teaching the basic medical sciences. This situation is independent of the much larger number of patients required for thorough teaching.

While increasing the class size of the present Florida medical schools is an approach that should be developed, it will do little to solve Florida's and especially South Florida's needs. In South Florida, with more than 14,800 licensed allopathic physicians, only 13 % have graduated from Florida medical schools. About 3% are from the public medical schools (UF 1.48 % and USF 1.35 %) and another 10 % are from the University of Miami Medical School. Therefore, in South Florida, given current trends, an increase of only another 25 to 30 allopathic doctors a year could be expected from expanding all the state's medical schools (assuming that the new medical school at FSU also adds another 2 % of its graduating class and that no new residency positions are created).

Establishing new medical schools

Because of growing concerns across the nation over the medical workforce, plans exist or are being developed to create new medical schools or to build partnerships between medical schools in close proximity.

Introducing a new medical school into areas that lack physicians has resonated well with some communities (AAMC Reporter, Vol. 13, number 4, Feb 2004). For example, Texas Tech-El Paso has already obtained state authorization for a new medical school that will open in by 2008. Texas already has 8 medical schools and this school had strong opposition in the early stages. Since in El Paso and along the border with Mexico there is a physician shortage, and the vision for the school included an emphasis on diversity and a focus on Hispanic and border health issues, the Texas legislature finally funded the school. The University of California is also considering opening a new medical school in Fresno, and Arizona State University is developing a partnership with the University of Arizona, to join efforts in creating a new medical education program.
The University of Washington with a different approach is planning to expand its very successful WWAMI program (that includes students from Washington, Wyoming, Alaska, Montana and Idaho) by developing regional facilities.
Finally in Florida, besides FIU, it is well known that the Trustees of the University of Central Florida voted last November to begin researching whether it should open a new medical school in the Orlando area.

Building a new medical school is a long and complicated process and requires careful feasibility studies and detailed planning, including consideration of the economic impact.

Medical schools can provide significant non-academic advantages to their communities. They are engines of significant growth and have great appeal to large universities, since they bring prestige and community support. During the year 2002, medical schools' and teaching hospitals' combined economic impact generated more than $326 billion. Although most schools and hospitals are not for profit, they also generate large amounts of tax revenue ($14.7 billions in 2002), through income taxes paid by the faculty and staff, sales and corporate net income taxes, as well as capital stock and franchise taxes.

Medical schools in many cases are also magnets attracting vast amounts of biomedical research

grants to universities. Fifty per cent of all NIH research funding in 2003, more than $8 billion, was allocated to the 124 medical schools.
In Florida alone, the economic impact of the four allopathic medical schools is $11 billion a year. Florida is the 9th state in the nation in medical education impact benefit (AAMC Reporter, Vol 13, number 4, February 2004).

It takes a long time, at least three to four years to plan and develop a new medical school worthy of accreditation, and more than seven years on the average to train a physician. Therefore, some of the previously mentioned efforts may not have an impact in the overall physician workforce for at least 10 years. The main deterrents to the development of new schools in the past have been concerns about obtaining accreditation, belief on a physician surplus, and the supposed high costs of developing new medical schools. The situation has now dramatically changed with the publication on February 5, 2003, of the Liaison Committee of Medical Education's (LCME) "Accreditation Guidelines for New and Developing Medical Schools," demonstrating the Committee's interest in guiding the development of new schools; the emergence of a physician shortage; and the careful demonstration of the economic benefits of medical schools by Tripp Umbach Healthcare Consulting Inc. in September 2003 (www.tuhealthcare.com). Given all the previously mentioned considerations, we would expect that several new medical schools would be created in the next ten years in the USA, including two or three in Florida.

Conclusions

There are several different approaches to solve the upcoming severe shortage of physicians in Florida, and some should be used simultaneously, depending on their effectiveness and feasibility. In South Florida, "making the practice of medicine more attractive" is certainly a possibility. The issue of tort reform must be solved independently of the shortage problem. However, debt relief programs and tax exemptions to the degree that they may be possible will not generate enough appeal to change the place of practice of doctors. Improving the reimbursement rates to a level that would attract more doctors to Florida is also not very likely in the near future.
Changing the state licensing laws, unless to make them more stringent, should not be considered. The required number of years of graduate medical education should be raised to the national average and no exemption to the licensing examinations should be allowed. Increasing the class size of the present Florida medical schools is an effective and feasible approach that should be developed. The problem is that existing medical schools will not be able to generate enough graduates to fill the need (especially in South Florida) and not enough of these graduates will practice in the state, if current trends continue. In South Florida, only about 13% of all the more than 14,800 MDs are from the state-supported medical schools, with three quarters from just one medical school, the University of Miami.

The creation of new graduate medical education positions, increasing the number of residents and fellows should be a priority. Caps must be removed on the number of residents and new financing provided. However, for this approach to be regionally successful, it is also necessary first to increase faculty resources and to provide the new programs with affiliation to medical schools. After a careful study of all the options in South Florida, FIU believes that the development of new medical education programs combined with an increase in the number of GME positions is the best solution to physician workforce problems. FIU's proposed new medical school in South Florida

will provide more and needed access to medical education for Florida residents, and will also create a large number of new residency positions to solve much of the regional and state shortage of doctors. FIU is also supportive of increasing the class size of other medical schools in the state, will contribute to efforts (particularly tort reform) to make the practice of medicine more attractive, and will strongly support the increase in the total number of GME positions in Florida.

APPENDIX 3

Library Report

Budget Estimate of Library Materials for the Planned Medical School at Florida International University

Tony Schwartz
Associate Director for Collection Management

October 27, 2003

Executive Summary

This report is to gauge the size of a library materials budget for the planned medical school at Florida International University. It provides two main estimates (in 2003 dollars):

- The overall library materials budget (journals and books) would be on the order of $766K, according to peer-institutional benchmarking, which is the only feasible method of such cost projection at this early stage of planning.
- The FIU library materials budget as it now stands would need supplemental funding on the order of $300K to (a) acquire a core collection and (b) augment the current journal collections in fields allied to medicine: biology, chemistry, biomedical engineering, nursing, and health.

The two main categories of supplemental-funding expenditures—building the core collection and augmenting the journal collection—involve different methodologies. The core collection would be preliminarily based on the standard guide in the field, the *Brandon/Hill Selected List of Print Books and Journals for the Small Medical Library.* While that is an imprecise and incomplete guide, a **core-collection** cost projection for FIU of about **$200,000** is probably on mark.

The other main category of expenditures—the **journal collections** in fields allied to medicine— requires the chief methodology of collection assessment in the sciences: citation-impact journal ranking analysis. That approach is not explicit in the *Brandon/Hill* scheme, which does include some journals.

Whether **$100,000** (the balance of the proposed $300,000 supplemental fund) would cover the journal acquisitions deemed necessary by the medical-school faculty will be an open question until the school's curriculum is established. At that stage in the planning process, the library—working with the faculty—will be in a position to assess the science and allied health collections against the citation-ranked literatures of those fields relevant to the curriculum. (As an indicator of the overall size of the citation-ranked medical literature, it is spread over 32 fields comprising 1,864 titles.)

If such assessment were to show, in the estimation of the faculty, a substantial gap in the library's holdings of core titles based on the curriculum, the $100,000 component of supplemental funding will have been an underestimation.

Main Report

Assessment of Core Materials

Five spreadsheets are appended:

- The first is a framework of estimates of core books and journals in three categories—small medical library, nursing, and allied fields—with the journals adjusted to current holdings;
- The second is a four-year projection of those aggregate cost estimates for inflation;
- The last three spreadsheets compare the core-list journals to current holdings.

The spreadsheets are based on the standard guide to core collections: the *Brandon/Hill Selected List of Print Books and Journals for the Small Medical Library* (http://www.mssm.edu/library/brandon-hill/). This source was recommended by consultant Judith Messerle on her visit to FIU April 21-23, 2003.

However, Ms. Messerle advised in her report (of June 26) two collection development principles that are not accounted for in *Brandon/Hill:* that "the collection should be as online as possible," with "only a few basic high-impact journals excepted." *Brandon/Hill* uses paper-format prices and does not attend to the principal collection development method in the sciences: the journal literature assessed on the basis of citation-impact ranked lists. Still another difficulty is that it exaggerates the size of a core collection for any but the largest libraries.[1] On those three counts, *Brandon/Hill* is a useful but imprecise and incomplete method for collection development and cost projection.

At any rate, FIU has a fair share of the journal literature for a core medical school collection. As shown in spreadsheets 3-5, FIU has **60%** of the overall journals in the *Brandon/Hill* lists: 55% of those in the small medical library category (77 of 141 titles), 72% of those in nursing (62 of 86 titles), and 58% of those in the allied fields (46 of 79 titles).

According to the *Brandon/Hill* method, FIU should consider acquiring certain journals and books that would have—with journals (not books) adjusted to current holdings—an aggregate cost in paper-format of **$160,000**. This analysis is summarized in spreadsheet 1.

The books are not adjusted to holdings because nearly all of them would require updated editions at the time of medical-library collection development. Since books would be standing orders for new editions, they are subject to inflation factors, as are journals.

The $160,000 figure of the *Brandon/Hill* method cannot be fixed at this stage of planning for two reasons: some of the listed books and journals will drop off once the medical-school curriculum is created; and constant change in the networked scholarly communication system would give print-to-online cost corrections this early in planning a short shelf life.

However, an essential consideration is that any budget figure in this report—for a collection that is years away—is subject to intervening inflationary pressures. Spreadsheet 2 shows how the $160,000 figure (imprecise but suitable for illustrations) would grow to a range of $179,000 to $186,000 within three to four years—when actual acquisitions might commence.

Assessment of the Overall Materials Budget

Given the problems of the *Brandon/Hill* scheme and the prematurity of a journal collection assessment until the medical-school curriculum is established, the single feasible approach to budget estimation is to rely on peer-institutional benchmarking. Ms. Messerle's report suggests three peers: U. of New Mexico, U. of Kansas, and McMaster U. Certainly, this approach gives insight into online costs, interdisciplinarity, and the citation-ranked literatures.

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[1]As *Brandon/Hill* notes, "due to the diversity of the subjects covered, most people will probably not want to purchase all of the publications but instead will use the list

selectively for subjects pertinent to their particular institutions."

The following benchmark figures for medical-library budgets are adjusted to 2003 dollars.

	U. New Mexico	U. Kansas	McMaster U.	**average**	*FIU*
Journals	$702,759	$800,464	$606,266	$703,163	*$560,457* *
Books	59,113	56,002	74,560	63,225	*40,000* **
	$761,872	$856,466	$680,826	**$766,388**	*$600,457*

* The FIU figure for journals is the aggregate cost in biology, chemistry, biomedical engineering, nursing, and health sciences.

** The FIU figure for books is a project estimate, based on a recently revised approval plan profile that provides for coverage of university-press titles in most of the sciences.

Assessment of the Current Science Journal Collections

The extent to which FIU's current journal collections in fields allied to medicine have a direct bearing on medical research is the main unknown factor.

The overall picture is that the cost of developing a core collection will be on the level of $200,000 — leaving some $100,000 (on supplemental funding of $300,000) to augment the library's journal collections in fields allied to medicine. Whether $100,000 would suffice will remain an open question until the medical school curriculum is established. At that point in the planning process, the library—working with the faculty—will be in a position to assess the journal collections against the citation-ranked literatures of those fields relevant to the curriculum. If that assessment, in the estimation of the faculty, were to show a substantial gap of core titles in the collections, the $100,000 component of supplemental funding will have been an underestimation.

Over the past year, the library has assessed two of the collections allied to medicine against the citation-ranked literatures—with faculty review of the assessments for the library's long-range collection development plan. Although those reviews were done for present-day research needs rather than with medical-research in mind, a brief

overview of the outcomes might be useful.

Chemistry. Its core journal literatures comprise 466 titles (in seven fields). The library has 181 (39%) of them. Of the 285 not in the collections, the Chemistry program recommended that 59 (one in five) be acquired. Thus, for FIU a "complete" Chemistry collection according to current research interests would be 51% of the total citation-ranked literature (240 of the 466 titles).

The recommended acquisitions were prioritized: 33 are high-priority, and would have a total annual cost about $32,000; the other 26 would have a total annual cost of about $24,300. The overall annual additional cost would be on the order of **$56,000**.

Nursing. Its core journal literatures comprise 284 titles (in eight fields). The library has 173 (61%) of them. Of the 111 not in the collections, the Nursing program recommended that 25 (one in four) be acquired. Thus, for FIU a "complete" Nursing collection according to current research interests would be 70% of the total citation-ranked literature (198 of the 284 titles). The overall annual additional cost would be on the order of **$8,000**.

The collection assessment of **Biology** is under way. Its core literatures comprise 1,343 titles (in 21 fields). The library has 619 (46%) of them. The library has not yet requested that the Biology program make recommendations of collection-development priorities.

Such assessment for the medical library will require careful grounding in the FIU curriculum: the core literatures of **Medicine** are spread over 32 fields, comprising 1,864 titles.

In a nutshell, the proposed supplemental funding should cover three broad goals (with as many methodologies):

- Having a medical library materials budget on the order of $766,000 (benchmarking);
- Acquiring the core materials based on the curriculum (*Brandon/Hill* method);
- Augmenting the allied science collections (citation-ranked literature method).

Overview of Green Library Collection Development for a New Medical School

Tony Schwartz, Associate Director for Collection Management, FIU Libraries

Based on the Brandon/Hill select list of print books and journals for the small medical library (http://www.mssm.edu/library/brandon-hill/)

	List		FIU Holdings			FIU Needs		Priority Acquisitions: **books** according to the list **journals** based on need (list adjusted to holdings)	
	Titles	Cost	Titles	% of List	Cost	Titles	Cost	Titles	Cost
List 1: Small Medical Library									
Books	672	$ 88,833	not assessed (see note 1)			672	$ 88,833	251	$ 38,616
Journals	141	$ 55,653	77	55%	$ 32,597	64	$ 22,956	24	$ 9,602
sums		$ 144,486					$ 111,789		$ 48,218
List 2: Nursing									
Books	370	$ 18,334	not assessed			370	$ 18,334	143	$ 7,446
Journals	86	$ 14,591	62	72%	$ 11,443	24	$ 3,148	6	$ 685
sums		$ 32,925					$ 21,482		$ 8,131
List 3: Allied health fields									
Books	434	$ 22,718	not assessed			434	$ 22,718	169	$ 9,898
Journals	79	$ 14,026	46	58%	$ 9,291	33	$ 4,734	9	$ 902
sums		$ 36,744					$ 27,452		$ 10,800
Totals									
Books	1,476	$ 129,885				1,476	$ 129,885	563	$ 55,960
Journals	306	$ 84,270	185	60%	$ 53,432	121	$ 30,838	39	$ 11,189
		$ 214,155					**$ 160,723** *		**$ 67,149** *

* The Brandon/Hill methodology has pricing only for paper-format resources.

Overview of Green Library Collection Development for a New Medical School

Tony Schwartz, Associate Director for Collection Management, FIU Libraries

Based on the Brandon/Hill select list of print books and journals for the small medical library (http://www.mssm.edu/library/brandon-hill/)

Journal holdings summary:

Total of three lists' costs	$ 84,270	
Total value of FIU journal holdings	$ 53,331	63%

Total journals on three lists	306	
Total titles held by FIU	185	60%

NOTE 1: Why are book holdings not assessed?

Practically all of the books on the three lists would require updated editions for initial purchases, so current holdings are not relevant. Given the need for books to be placed as standing orders to receive new editions, they are subject to inflation factors as are journals.

NOTE 2: Cost estimates with inflation factors

The Brandon/Hill lists suggest rates on the order of 6% for books and 12% for journals.
Inflation-adjusted cost estimates are provided on sheet 2 of this file.

Cost estimates with inflation factors

Set 1: Brandon/Hill methodology

The Brandon/Hill approach suggests inflation rates on the order of **6%** for books **and 12%** for journals.

Since **books** are not revised every year, a working assumption is made that they are revised (with new editions) every three years; on that assumption, the annual inflation rate for the book collection as a whole is **adjusted to 2% per annum**.

	2003	**2004**	**2005**	**2006**	**2007**
Total resources to be acquired					
Books	$ 129,885	$ 132,483	$ 135,132	$ 137,835	$ 140,592
Journals	$ 30,838	$ 33,922	$ 37,314	$ 41,045	$ 45,150
	$ 160,723	$ 166,405	$ 172,446	$ 178,880	$ 185,742
Subset of priority acquisitions					
Books	$ 55,960	$ 57,079	$ 58,221	$ 59,385	$ 60,573
Journals	$ 11,189	$ 12,308	$ 13,539	$ 14,893	$ 16,382
	$ 67,149	$ 69,387	$ 71,759	$ 74,278	$ 76,955

SMALL MEDICAL LIBRARY JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Acquired Immunology Syndrome (AIDS)		
AIDS (Philadelphia)	$1,510.00	print
AIDS Patient Care and STDs	$339.00	print
Journal of Acquired Immune Deficiency Syndromes: JAIDS	$870.00	print
Allergy		
Annals of Allergy, Asthma, and Immunology	$145.00	NO
Journal of Allergy and Clinical Immunology	$414.00	print
Alternative/Complementary Medicine		
Journal of Alternative and Complementary Medicine	$289.00	NO
Anesthesiology		
Anaesthesia	$611.00	online
Anesthesiology	$491.00	print
Cardiovascular System		
American Heart Journal	$406.00	NO
American Journal of Cardiology	$322.00	online
Angiology	$385.00	NO
Circulation	$548.00	print
Heart	$514.00	NO
Journal of the American College of Cardiology	$370.00	online
Progress in Cardio vascular Diseases	$322.00	NO
Critical Care		
Critical Care Medicine	$379.00	NO
Journal of Critical Care	$303.00	NO
Dentistry		
Journal of the American Dental Association	$149.00	NO
Journal of Oral and Maxillofacial Surgery	$240.00	NO
Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics	$358.00	NO
Dermatology		
Archives of Dermatology	$400.00	NO
Cutis	$180.00	NO
Journal of the American Academy of Dermatology	$432.00	NO
Emergency Medicine		
American Journal of Emergency Medicine	$283.00	NO
Annals of Emergency Medicine	$260.00	print
Emergency Medicine Clinics of North America	$228.00	NO
Endocrinology and Metabolism		
Diabetes	$600.00	print
Endocrinology	$768.00	NO

SMALL MEDICAL LIBRARY JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Journal of Clinical Endocrinology and Metabolism	$585.00	NO
Evidence Based Medicine		
ACP Journal Club. (American College of Physicians)	$137.00	NO
Family Medicine		
American Family Physician	$144.00	NO
Journal of Family Practice	$299.00	NO
Gastroenterology		
Digestive Diseases and Sciences	$989.00	online
Diseases of the Colon & Rectum	$429.00	NO
Gastroenterology	$605.00	online
Gut	$514.00	NO
Genetics and Heredity		
American Journal of Human Genetics	$805.00	print, online
Geriatrics		
Geriatrics	$60.00	print
Journal of the American Geriatrics Society	$445.00	print, online
Journals of Gerontology: Biological Sciences and Medical Sciences	$550.00	print
Journals of Gerontology: Psychological Sciences and Social Sciences	$238.00	print
Gynecology and Obstetrics		
American Journal of Obstetrics and Gynecology	$420.00	print
BJOG: An International Journal of Obstetrics and Gynecology	$387.00	NO
Clinical Obstetrics and Gynecology	$443.00	NO
Fertility and Sterility	$340.00	NO
Obstetrics and Gynecology	$375.00	online
Hematology		
Blood	$915.00	print
Hospitals and Administration		
Health Care Management Review	$201.95	print
Hospital Topics	$79.00	print
Hospitals & Health Networks	$80.00	print
Journal of Healthcare Management	$95.00	print
Immunology		
Journal of Immunology	$620.00	print
Indexes		
Cumulated Index to Nursing and Allied Health Literature: CINAHL.	$396.00	online

SMALL MEDICAL LIBRARY JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Index Medicus	$630.00	print
Infectious Diseases		
Journal of Infectious Diseases	$535.00	print, online
Internal Medicine		
American Journal of the Medical Sciences	$543.00	NO
American Journal of Medicine	$270.00	online
Annals of Internal Medicine	$297.00	print
Archives of Internal Medicine	$340.00	print
BMJ: British Medical Journal	$685.00	online
CMAJ/Canadian Medical Association Journal	$220.00	online
Disease-a-Month	$209.00	NO
JAMA: The Journal of the American Medical Association	$365.00	print
Journal of Clinical Investigation	$620.00	print, online
Lancet	$635.00	print
Medical Clinics of North America	$209.00	NO
Medicine	$359.00	NO
New England Journal of Medicine	$499.00	print
Postgraduate Medicine	$70.00	NO
Laboratory Methods		
Clinics in Laboratory Medicine	$209.00	print
Journal of Laboratory and Clinical Medicine	$426.00	print
Medical Informatics		
Journal of the American Medical Informatics Association	$295.00	online
Neurology		
Annals of Neurology	$405.00	NO
Archives of Neurology	$365.00	print
Journal of Neurosurgery	$315.00	print
Neurology	$659.00	NO
Neurosurgery	$472.00	NO
Nutrition		
American Journal of Clinical Nutrition	$245.00	print
Journal of the American Dietetic Association	$270.00	print
Nutrition Reviews	$215.00	print
Oncology		
Cancer	$469.00	online
Journal of the National Cancer Institute	$330.00	print, online
Ophthalmology		
American Journal of Ophthalmology	$369.00	online
Archives of Ophthalmology	$375.00	NO

SMALL MEDICAL LIBRARY JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Orthopedics		
Clinical Orthopaedics and Related Research	$701.00	print
Journal of Bone and Joint Surgery. American volume	$228.00	print
Orthopedic Clinics of North America	$250.00	NO
Otorhinolaryngology		
Archives of Otolaryngology—Head & Neck Surgery	$395.00	NO
Journal of Laryngology and Otology	$355.00	NO
Otolaryngologic Clinics of North America	$301.00	NO
Otolaryngology—Head and Neck Surgery	$384.00	NO
Palliative Medicine		
Journal of Palliative Medicine	$389.00	NO
Pathology		
American Journal of Clinical Pathology	$415.00	print
American Journal of Pathology	$465.00	NO
Archives of Pathology & Laboratory Medicine	$195.00	print
Journal of Clinical Pathology	$724.00	print
Pediatrics		
Archives of Pediatrics & Adolescent Medicine	$340.00	print
Clinical Pediatrics	$297.00	NO
Journal of Pediatrics	$406.00	print
Pediatric Clinics of North America	$209.00	print
Pediatrics	$305.00	NO
Pharmacology and Therapeutics		
Clinical Pharmacology and Therapeutics	$422.00	NO
Journal of Pharmacology and Experimental Therapeutics	$671.00	NO
Medical Letter on Drugs and Therapeutics	$59.00	NO
Pharmacological Reviews	$201.00	NO
Physical Medicine and Rehabilitation		
American Journal of Physical Medicine & Rehabilitation	$309.00	print
Archives of Physical Medicine and Rehabilitation	$324.00	print
Physical Medicine and Rehabilitation Clinics of North America	$204.00	NO
Preventive Medicine and Public Health		
American Journal of Public Health	$250.00	print
Archives of Environmental Health	$350.00	print
Public Health Reports	$96.00	print, online
Psychiatry		
American Journal of Psychiatry	$399.00	print, online
Archives of General Psychiatry	$365.00	print
Journal of Nervous and Mental Disease	$398.00	print

SMALL MEDICAL LIBRARY JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Radiology and Imaging		
AJR, American Journal of Roentgenology	$250.00	NO
British Journal of Radiology	$720.00	NO
Radiologic Clinics of North America	$284.00	NO
Radiology	$450.00	NO
Respiratory System		
American Journal of Respiratory and Critical Care Medicine	$350.00	NO
Chest	$186.00	NO
Rheumatology		
Arthritis and Rheumatism	$699.00	print, online
Rheumatology	$650.00	print, online
Sexually Transmitted Diseases		
Sexually Transmitted Diseases	$436.00	print
Sports Medicine		
American Journal of Sports Medicine	$160.00	print
Clinics in Sports Medicine	$238.00	NO
Substance Abuse		
Journal of Studies on Alcohol	$175.00	print
Journal of Substance Abuse Treatment	$602.00	print, online
Surgery		
American Journal of Surgery	$242.00	online
Annals of Surgery	$475.00	NO
Annals of Thoracic Surgery	$433.00	online
Archives of Surgery	$340.00	NO
British Journal of Surgery	$297.00	online
Journal of the American College of Surgeons	$241.00	online
Journal of Thoracic and Cardiovascular Surgery	$444.00	NO
Journal of Trauma, Injury, Infection, and Critical Care	$391.00	print
Journal of Vascular Surgery	$432.00	NO
Plastic and Reconstructive Surgery	$551.00	NO
Surgery	$402.00	NO
Surgical Clinics of North America	$256.00	NO
Tropical Medicine		
American Journal of Tropical Medicine and Hygiene	$450.00	print
Urology		
Journal of Urology	$556.00	NO
Urologic Clinics of North America	$263.00	NO

SMALL MEDICAL LIBRARY JOURNALS

Total cost of all journals for SMALL MEDICAL LIBRARY	$55,552.95
Journals already held at FIU	$32,596.95
Adjusted cost for journals to be acquired	$22,956.00
Subset of INITIAL journals to be acquired	$9,602.00
Total number of INITIAL journals to be acquired	24

Total number of Journals 141
Total number of journals held by FIU 77 (55%)

NURSING JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
AANA Journal (American Association of Nurse Anesthetists)	$36.00	print
AAOHN Journal (American Association of Occupational Health Nurses)	$99.00	print
American Journal of Critical Care	$125.00	NO
American Journal of Hospice and Palliative Care	$203.00	print
American Journal of Infection Control: AJIC	$202.00	NO
American Journal of Nursing	$99.00	print
American Nurse	$30.00	print, microform
ANS: Advances in Nursing Science	$153.22	print
AORN Journal (Association of Operating Room Nurses)	$97.00	print
Applied Nursing Research	$152.00	print
Archives of Psychiatric Nursing	$126.00	print
Canadian Nurse	$35.00	print
Cancer Nursing	$173.00	print
Clinical Nurse Specialist: CNS	$159.95	print
Clinical Nursing Research	$295.00	print, online
Computers in Nursing	$215.00	print
Critical Care Nurse	$65.00	print
Critical Care Nursing Clinics of North America	$129.00	NO
Critical Care Nursing Quarterly	$153.22	print
CINAHL	$395.00	online

NURSING JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Dimensions of Critical Care Nursing: DCCN	$129.00	NO
Evidence-Based Nursing	$179.00	NO
Gastroenterology Nursing	$169.00	NO
Geriatric Nursing	$96.00	print
Heart & Lung: The Journal of Acute and Critical Care	$198.00	print
Holistic Nursing Practice	$153.22	print
Home Healthcare Nurse	$181.95	NO
International Journal of Trauma Nursing	$96.00	NO
International Nursing Review	$94.00	print, online
JOGNN: Journal of Obstetric, Gynecologic, and Neonatal Nursing	$390.00	print
Journal of Advanced Nursing	$1,102.00	print, online
Journal of the Association of Nurses in AIDS Care: JANAC	$240.00	NO
Journal of Cardiovascular Nursing	$153.22	print
Journal of Child and Adolescent Psychiatric Nursing	$79.00	NO
Journal of Community Health Nursing	$345.00	print
Journal of Continuing Education in Nursing	$99.00	print
Journal of Emergency Nursing: JEN	$218.00	print
Journal of Gerontological Nursing	$74.00	print
Journal of Infusion Nursing	$197.00	NO
Journal of Midwifery & Women's Health	$265.00	print, online
Journal of Neuroscience Nursing	$135.00	print
Journal for Nurses in Staff Development: JNSD	$239.95	NO
Journal of Nursing Administration: JONA	$299.00	print
Journal of Nursing Care Quality	$171.67	print
Journal of Nursing Education	$109.00	print
Journal of Nursing Scholarship	$63.00	print
Journal of Nursing Management	$348.00	online
Journal of Pediatric Health Care	$148.00	print
Journal of Pediatric Oncology Nursing	$193.00	print
Journal of PeriAnesthesia Nursing	$174.00	print
Journal of Perinatal & Neonatal Nursing	$153.22	NO
Journal of Practical Nursing	$15.00	print
Journal of Professional Nursing	$219.00	print

NURSING JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Journal of Psychosocial Nursing and Mental Health Services	$74.00	print
Journal of the Society of Pediatric Nurses: JSPN	$59.00	print
Journal of Vascular Nursing	$105.00	NO
Journal of Wound, Ostomy and Continence Nursing: WOCN	$202.00	NO
MCN: The American Journal of Maternal Child Nursing	$89.95	print
Neonatal Network	$66.00	print
Nephrology Nursing Journal	$45.00	NO
Nurse Educator	$189.95	print
Nurse Practitioner: The American Journal of Primary Health Care	$129.00	print
Nursing Administration	$171.67	print
Nursing Clinics of North America	$147.00	NO
Nursing Diagnosis	$81.00	NO
Nursing Economics	$65.00	print
Nursing Education Perspectives	$90.00	print
Nursing Management	$129.00	print
Nursing Law's Regan Report	$102.00	NO
Nursing Outlook	$97.00	print
Nursing Research	$169.95	print
Nursing Science Quarterly	$230.00	print, online
Nursing Times	$216.00	print
Nursing2002	$99.00	NO
Oncology Nursing Forum	$115.00	print
Orthopaedic Nursing	$45.00	NO
Pain Management Nursing	$97.00	NO
Pediatric Nursing	$45.00	print
Plastic Surgical Nursing	$45.00	NO
Public Health Nursing	$275.00	print, online
Rehabilitation Nursing	$135.00	print
Research in Nursing & Health	$760.00	print, online
RN	$39.00	print
Seminars in Oncology Nursing	$164.00	print
Urologic Nursing	$60.00	NO

NURSING JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Western Journal of Nursing	$585.00	print

Total cost of all journals for NURSING	$14,591.14
Journals already held at FIU	$11,443.02
Adjusted cost for journals to be acquired	$3,148.12
Subset of INITIAL journals to be acquired	$684.95
Total number of INITIAL journals to be acquired	6

Total number of Journals 86
Total number held by FIU 62 (72%)

ALLIED HEALTH JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
ALLIED HEALTH		
American Journal of Health Promotion: AJHP	$119.95	print
CINAHL	$395.00	online
Journal of Allied Health	$85.00	print
ATHLETIC TRAINER		
Journal of Athletic Training	$32.00	print
DENTAL HYGIENE AND DENTAL ASSISTING		
Dental Assistant	$20.00	NO
Journal of Dental Hygiene	$45.00	NO
DIAGNOSTIC MEDICAL SONOGRAPHY		
Journal of the American Society of Echocardiography	$231.00	NO
Journal of Diagnostic Medical Sonography	$270.00	NO
Ultrasonic Imaging	$290.00	online
EEG TECHNOLOGY		
American Journal of Electroneurodiagnostic Technology	$80.00	NO
Clinical Electroencephalography	$76.00	NO
EMERGENCY MEDICAL TECHNOLOGY (INCLUDING PARAMEDIC)		
Annals of Emergency Medicine	$237.00	print
Emergency Medical Services	$19.95	print
Emergency Medicine	$106.00	print
JEMS: Journal of Emergency Medical Services	$27.97	NO

ALLIED HEALTH JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Topics in Emergency Medicine	$146.81	NO
HEMATOLOGY		
Transfusion	$344.00	print, online
MEDICAL ASSISTANT		
PMA: Professional Medical Assistant	$30.00	print
MEDICAL RECORDS		
J AHIMA. (American Health Information Management Association)	$72.00	print
Topics in Health Information Management	$187.05	print
MEDICAL TECHNOLOGY		
American Laboratory	$235.00	NO
Biomedical Instrumentation and Technology	$149.00	NO
Biotechnic & Histochemistry	$220.00	print
Canadian Journal of Medical Laboratory Science	$16.75	NO
Clinical Chemistry	$673.00	print
Clinical Laboratory Science	$60.00	print
Journal of Laboratory and Clinical Medicine	$389.00	print
Laboratory Medicine	$60.00	print
MLO: Medical Laboratory Observer	$75.00	print
NUCLEAR MEDICAL TECHNOLOGY		
See also Diagnostic Medical Sonography; Radiology Technology		
Journal of Nuclear Medicine Technology	$100.00	NO
NUTRITION		
Canadian Journal of Dietetic Practice and Research	$75.00	NO
Journal of the American Dietetic Association	$270.00	print
Journal of Nutrition Education & Behaviour	$234.00	print
Journal of Nutrition for the Elderly	$500.00	print, online
OCCUPATIONAL THERAPY		
See Physical and Occupational Therapy		
PERFUSION		
Journal of Extra-Corporeal Technology	$130.00	NO
Perfusion	$710.00	NO
PHYSICAL AND OCCUPATIONAL THERAPY		
See also Rehabilitation		
American Journal of Occupational Therapy	$130.00	print
American Journal of Physical Medicine and Rehabilitation	$291.00	print
Archives of Physical Medicine and Rehabilitation	$296.00	print
British Journal of Occupational Therapy	$262.05	print
Canadian Journal of Occupational Therapy	$58.00	print

ALLIED HEALTH JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Journal of Hand Therapy	$98.00	print
Journal of Orthopaedic and Sports Physical Therapy	$215.00	print
JPO: Journal of Prosthetics and Orthotics	$99.00	NO
Occupational Ergonomics	$242.00	NO
Occupational Therapy in Health Care	$250.00	print, online
Occupational Therapy in Mental Health	$365.00	print, online
Orthopaedic Physical Therapy Clinics of North America	$136.00	NO
OT Practice. (American Occupational Therapy Association)	$135.00	print
OTJR Occupational Participation and Health	$74.00	print
Pediatric Physical Therapy	$165.00	print
Physical Medicine and Rehabilitation Clinics of North America	$186.00	NO
Physical and Occupational Therapy in Geriatrics	$450.00	print, online
Physical and Occupational Therapy in Pediatrics	$465.00	print, online
Physical Therapy	$95.00	print, online
Physiotherapy. England	$304.12	print
Physiotherapy Canada	$48.84	print
PT: Magazine of Physical Therapy	$85.00	print, online
PHYSICIAN ASSISTANT		
JAAPA/Journal of the American Academy of Physician Assistants	$50.00	NO
Physician Assistant	$159.00	NO
RADIOLOGIC TECHNOLOGY		
See also Diagnostic Medical Sonography; Nuclear Medicine Technology		
Applied Radiology	$95.00	NO
Canadian Journal of Medical Radiation Technology	$29.30	NO
Radiologic Technology	$49.00	NO
REHABILITATION		
See also Physical and Occupational Therapy		
Clinical Kinesiology: Journal of the American Kinesiotherapy Association	$60.00	print
Journal of Burn Care & Rehabilitation	$170.00	NO
Journal of Cardiopulmonary Rehabilitation	$239.95	print
Journal of Head Trauma Rehabilitation	$168.56	print
Journal of Rehabilitation	$65.00	print
Topics in Geriatric Rehabilitation	$146.81	print
RESPIRATORY THERAPY		
AARC Times. (American Association for Respiratory Care	$89.95	NO

ALLIED HEALTH JOURNALS

Bolded titles are suggested for initial purchase

Title	Price	FIU
Respiratory Care	$89.95	NO
RRT: The Canadian Journal of Respiratory Therapy	$39.00	NO
SPEECH PATHOLOGY/AUDIOLOGY		
American Journal of Audiology	$110.00	NO
American Journal of Speech-Language Pathology	$125.00	print
Dysphagia	$393.00	NO
Ear & Hearing	$178.00	NO
Journal of the American Academy of Audiology	$271.00	NO
Journal of Speech, Language, and Hearing Research	$300.00	print
SURGICAL TECHNOLOGY		
Surgical Technologist	$36.00	NO

Total cost of all journals for ALLIED HEALTH	$14,026.01
Journals already held at FIU	$9,291.28
Adjusted cost for journals to be acquired	$4,734.73
Subset of INITIAL journals to be acquired	$901.92
Total number of INITIAL journals to be acquired	9

Total number of Journals 79
Total number of titles held by FIU 46 (58%)

APPENDIX 4

Technology Report

Perspectives on Technology Support for a New Medical School at Florida International University

John McGowan
Vice President & CIO
Florida International University

Executive Summary

This concept paper originated following an extensive evaluation of the technology functions of the University that resulted in the development of the Comprehensive Technology Master Plan for Florida International University. The plan includes the self-evaluation by University Technology Services (UTS) and those of the Cross Functional Planning teams for the development of the Strategic Plan of the University.

While the requirements of an Academic Health Center (AHC) overlap with those of the academic community, consideration must be given to special technology requirements and those of security, i.e. HIPPAA. Additionally, the service and support must be enhanced notably to support those involved in clinical practice and research. This has prompted technology organizations to embrace information gathering and dissemination from the perspective of high availability and redundancy, while concurrently providing comprehensive security of the data regardless of form. This report defines the information resources and technology concept for a health care organization based upon current best practice.

Mission: The mission of the technology unit within the AHC is to facilitate excellence in education, biomedical and clinical research, and patient care through the application of innovative and effective information resources and technology.

The Development Model: The model to support the mission is based upon support of the clinical, research and education initiatives associated with the Center as an

extension of the currently successful organization of technology support for the University. The infrastructural support will include the provision of the FIU network, systems, security, data center and planning expertise to the definition of elements of the AHC model. It is acknowledged within the framework of this model that information technology, knowledge management, and informatics will require additional resources.

Major Strategic Technology Themes for the AHC:

- Ubiquitous access to information
- Data privacy and security
- The library as a knowledge management center
- The internet as a communications medium
- Technology as an innovative force in AHC educational initiatives
- Translational informatics including bioinformatics and clinical informatics
- Enablement of the research mission.

O*rganizational design:* The accrediting body for medical schools (Liaison Committee for Medical Education) does not stipulate the locus for technology support. It is the Vice President and CIO's mandate to offer all technology related services to the University community. Ubiquitous access to technology in a secure environment is fundamentally important to all members of the University. The varied technology requirements of each individual program within the AHC will require extensive evaluation of the internal and external programs developed as components of FIU's model of health and medical education. A separate unit within UTS, the Information and Communication Technology unit (ICT), would be located within the AHC. It would be dedicated to the functions of the AHC, directed by an associate vice president who would jointly report to the medical director and the Vice President of Information Technology and CIO.

Community Served: The allied health and public health students and faculty; FIU basic science faculty; clinical faculty; residents who become the local "faculty" for students in the third and fourth year; medical students; and hospital staff, must be able to access information related to their functional areas. This includes general off-site access to electronic databases by non-faculty and staff and access to on-line course materials. This argues for granting quasi-faculty status to those

working with the program in hospitals. Remote access to information services makes them accessible directly to doctors and students in cooperating hospitals.

Budget: The annual operating expense of today's ICT equivalent at other universities averages five million dollars. Budget details are not currently available but will be forthcoming as the evaluation of the AHC's requirements for different functional areas is completed. This number may change significantly due to the requirements for a medical records system that would be necessary for newly established clinics and a laboratory system if deemed necessary. However, the model is based primarily on the use of existing clinics and hospitals throughout the community, and the definition of all student administration and business functions within the framework of the enterprise system currently being implemented for the University.

Services: The services are proposed to be divided into those associated with the academic and research requirements of the AHC and ICT. The administrative functions related to business and student administration will be associated with UTS. Both AHC and ICT would be partners in a computing facility known as Academic Computing Health Sciences (ACHS). ACHS will provide computing support for biomedical research and the educational technology requirements of the Center; as noted previously this function is educational and it would not provide support for patient care or administrative functions. ACHS would be jointly funded and directed by ICT and the Vice President and CIO of the University. ACHS will provide a blend of hardware, software, services, and personnel to provide support for the academic and research computing needs of the health sciences community.

ACHS will provide support for research by providing specialized expertise in health informatics, biostatistics, data visualization, molecular modeling, molecular biology, and image processing. The organization would house the Office of Medical Education that provides support in the area of curriculum instruction and advanced multimedia applications. Support for more general needs (networking, word processing, and spreadsheets) would be provided through the ICT help desk; support for the computer access to MEDLINE would be provided by the Health Sciences Library.

Four specific computing laboratories would be located within ACHS: Health Informatics, Multimedia, Data Acquisition, and Data Visualization. The Health

Informatics lab will provide access to molecular biology, health care, and clinical practice databases and links to other health informatics databases throughout the world. The Multimedia lab will provides microcomputer based hardware and software for capturing and editing figures, film, and video images. The Data Acquisition laboratory will provides hardware and software for acquiring, displaying, and analyzing basic science image data (autoradiograms, X-ray films, and microscope images). The Data Visualization laboratory will provide high-performance workstations and software for molecular modeling and data visualization.

The AHC will encourage the integration of appropriate computing skills into the medical curriculum. The Office of Medical Education within ACHS will provide consultation on selection and evaluation of commercially available software packages. The University has standardized on Microsoft Office and Lotus Notes. Support will be provided to help faculty develop their own educational software packages or integrate electronic communications into courses using WebCT as the course management tool for on-line courses. The Computers in Medicine Education committee will support innovative uses of educational computing through a competitive seed grant program. Faculty can then receive awards of computing equipment or funds to purchase software or professional services needed to produce new educational products.

AHC computing will incorporate both wireless and wireline capabilities into the infrastructure. The University has just completed the implementation of a gigabit Ethernet network for all of the campus locations. This would be extended as the backbone to support the AHC for voice, video, data, and IP telephony. Medical students will be required to apply the technology components for use with their PDA's and notebook or tablet computers.

Administrative computing services for all AHC staff will be provided through the ICT with the exception (as noted previously) of the health services information system components and the administrative components. UTS will provide support and maintenance of these systems and the academic information system of the AHC. The academic information system of the University is the PeopleSoft Student Administration (SA) module. The SA module will support all of the functions associated with the process of admissions, registration and advisement.

The e-classroom and conferencing facilities – The AHC would house multimedia classrooms that are capable of supporting video, media, and broadcasting (inbound and outbound) streams to selected sites within the university or to the regional clinics and hospitals participating in the program. These may be in the form of lectures, conferences, or demonstrations, i.e. surgical procedures from participating hospitals.

In addition, FIU currently supports the Florida GigaPop (AmPath) and is connected regionally to all of South America, the Caribbean, and Madrid, Spain. AmPath functions as the major peering point for the research and education networks in these countries. AHC can take advantage of this capability to collaborate with those medical institutions regarding educational and research initiatives related to telemedicine, etc.

Audio and Video Production Services: The Media and Technology Support Unit of ICT (MTS) will maintain a technical group to provide audio-visual support for clinical and academic applications. Services would be provided for academic programs and include the following: engineering services (system design, equipment specifications, project management); production services (video recording throughout AHC or remote locations in VHS and SVHS tape formats, dubbing services will be available in 3/4" and international tape formats); post-production services (tape duplication titling, tape format conversion, digital video and audio editing capability, and digital special effects (DVE)); conference support services (furnish and set-up equipment for conferences and meetings, equipment operators, projectionists, and videographers will be available); and audio-visual equipment repair and preventive maintenance.

Additionally, educational video production will be available through a collaborative effort of the division representing patient care services and the MTS unit of ICT. Services provided will include needs assessment, script writing, production, directing, videotaping, editing, and graphics production. High priority will be given to projects that supplement and enhance the educational mission as well as projects which serve the needs of patients, family members, staff, and the community at large.

Medical Photography: Medical Photography will be a comprehensive visual support service for the AHC and the University community. Various forms of display, publication, and projectuals will be produced to support patient care,

teaching, and research. Medical Photography would act as an auxiliary unit and would recover cost on a fee for service basis. Cost estimates will be provided on each project as they currently are for the University.

Summary of Photography Services

- Copy Photography (originals: art, book illustrations, blue slides, physiologic tracings, slide duplications, radiologic films)
- Small Object Photography (electronic components, glass apparatus, surgical instruments, gross specimens, plates, gels and prosthetic devices)
- Photography through the Microscope (photomicroscopy/macroscopy: bright field, dark field, phase contrast and reflected light)
- Studio Photography (patients, gross specimens, special set-ups, equipment, apparatus, portraiture, application pictures, and passport pictures)
- Location Photography (autopsy, surgery, patients, laboratory, publicity, group pictures, architecture, emergency room -- accidents, rape and domestic violence on call for E.R. and O.R. photography 24 hours a day).
- Laboratory Services (color ektachrome (E6) slide film processing four times per day and overnight, black and white negative film processing with contact proof sheets four times per day and overnight. Routine black and white prints for publication one day and overnight service. Custom prints from x-ray films, prints for grants, thesis, and exhibits. Prints enlarged up to 16 x 20 and transparencies for Tran illuminated exhibits. Turnaround time will be determined per project by director. Coordination of outside vendor services will be provided for color printing.)

Printing and Copying Services: University Printing and Copying Services (PCS) will provide offset printing and copying to the AHC through offices in the complex. Any type of printing, duplication or xerographic copying will be provided quickly and conveniently. In the new center, PCS offers the widest possible range of copying and duplicating services, including full-color copies, digital imaging systems, and on-demand publishing. The latest technology from Xerox and other vendors will be used to meet graphics needs.

The heart of the Center will be a digital duplicating system. This state of the art imaging system will be connected with the FIU network to provide Internet access, which will allow patrons to place orders and transmit documents over the net directly from their office PC's for direct-image duplicating. With this system, every copy would actually be a laser printer original. Operators in the center will provide assistance and instruction to facilitate use of the new technology.

PCS will also provide high-quality color copies using the latest color imaging technology. Medical illustrations, color photos, and drawings or just about any color image on a flat surface will be able to be duplicated in full color. Color overhead transparencies, color calendars will be possible.

The PCS printing facility will provide additional services for larger volume duplicating, as well as a full range of printed materials. Departmental brochures, posters, booklets, forms letterhead, envelopes, and business cards will be printed through this location. Professional graphic design and desktop publishing services will be available

APPENDIX 5

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